

Spring 2017

# Financial Stability Report

De Nederlandsche Bank

EUROSYSTEM



# De Nederlandsche Bank Financial Stability Report

Spring 2017

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# Preface

DNB is responsible for overseeing financial stability in the Netherlands, a task embedded in the Bank Act. DNB expressly considers the interaction between financial institutions and their environment: other institutions, the macroeconomy, financial markets, and financial infrastructure. Early detection of systemic risks comprises an important part of DNB's financial stability task.

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DNB publishes its Financial Stability Report (FSR) every six months. The FSR outlines systemic risks that may affect groups of institutions or entire sectors as well as the Dutch financial system, and which may eventually disrupt the real economy. DNB issues the FSR to raise awareness among stakeholders - financial institutions, policy makers and the general public - of systemic risks and the potential impact of shocks to the financial system. DNB issues policy recommendations to prevent or mitigate these systemic risks and where possible, uses macroprudential instruments.

The FSR does not include projections, but analyses scenarios. Chapter 1 lists the main current risks to financial stability and includes a risk map that summarises the main risks to financial stability discussed in this and previous issues of the FSR. Chapter 2 analyses the effects of prolonged low interest rates, in response to the October 2016 Parliamentary motion put forward by Members Schouten, Harbers and Nijboer, asking the Netherlands Bureau for Economic Policy Analysis and DNB for an analysis of the effects of a prolonged low interest rate environment.<sup>1</sup>

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<sup>1</sup> See <https://zoek.officielebekendmakingen.nl/kst-34550-39.html>.



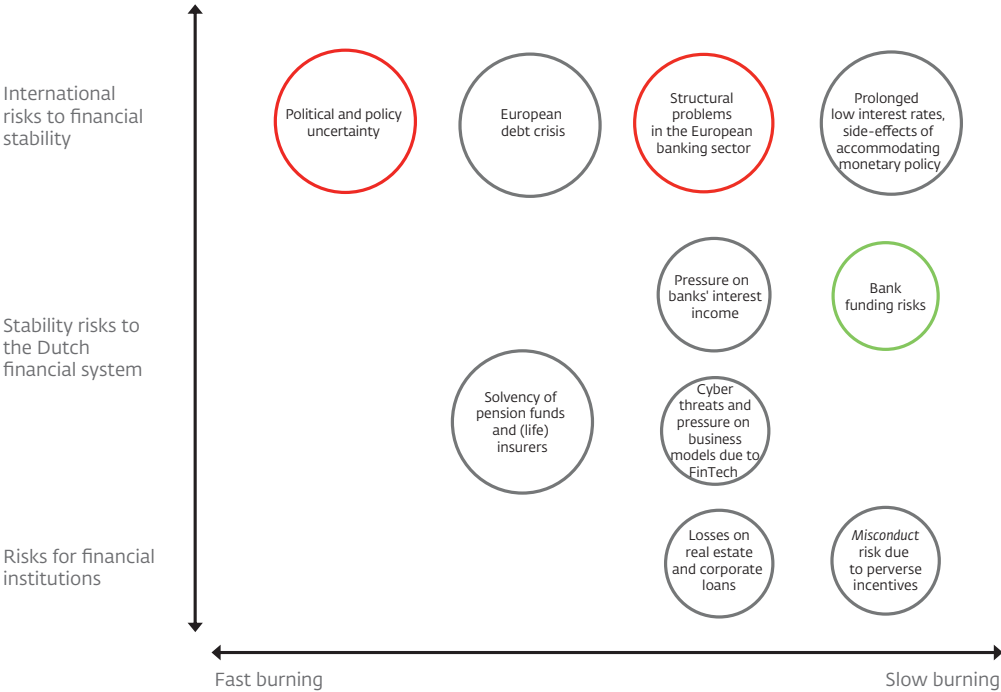


# 1 Overview of Financial Stability

Key points

- The accommodating monetary policy stance and the improved global economic outlook are fostering a positive financial market sentiment. The low market volatility, however, is in sharp contrast to mounting political and policy uncertainty. If market sentiment were to turn suddenly, e.g. due to unexpected geopolitical events, existing vulnerabilities may be amplified. Several European countries are still facing excessive debt levels for instance. The Dutch financial sector is also vulnerable to a sudden rise in risk premiums, for instance due to losses on investment portfolios.
- Interest rates have fallen to historically low levels. The interest rate decline reflects macroeconomic conditions where both cyclical and structural factors are at play. The accommodating monetary policy stance of the past years has been aimed at boosting economic growth and inflation. Generally speaking, falling interest rates have had a positive effect for the government, households and businesses with high debts as their interest rate burden has eased. At the same time, the interest rate decline has had a negative effect on pension funds and life insurance companies in particular, which saw their financial position deteriorate.
- The prolonged low interest environment entails risks for the financial sector and the real economy. Bank profitability will come under pressure, while pension funds and insurance companies will find it increasingly difficult to meet their commitments. This may induce them to look for higher-risk investment opportunities. Prolonged low interest rates may also lead to misallocation of capital in the real economy and further extended household balance sheets. As interest rates remain low for longer periods of time, households, businesses and the public sector may grow accustomed to them and may lose the incentive to reduce their debts. In time, new vulnerabilities may emerge as a result, e.g. when interest rates rise again or economic growth stagnates.
- Low interest rates also offer opportunities. Structural adjustments like the reduction of mortgage interest tax relief and increasing the sustainability of the economy can be stepped up in times of low interest rates.

Risk map



This risk map provides a schematic overview of the key risks to financial stability. The size of the circles reflects the magnitude of each risk. The colour of the circles reflects whether viewed over the medium term, risks increase (red), decrease (green) or remain unchanged (grey).

International developments

**Political and policy uncertainty has increased sharply.** Electoral support for more isolationist and protectionist policy stances is growing in several countries, as the surprising outcome of last year's Brexit referendum and the unexpected election of President Trump. The economic effects of these choices are uncertain. It will take time before the results of the United Kingdom's negotiations with the EU on the terms of Britain's exit become apparent (see Box 1), and it is unclear to what extent President Trump will be able to pursue his "America first" policy agenda. In addition, the new US government's approach to different policy areas is still unclear. The planned elections in several European countries may also increase pressure on the European project and fuel protectionist tendencies. Political uncertainty is being fed further by ongoing geopolitical tensions in some parts of the world (Syria, Korea).

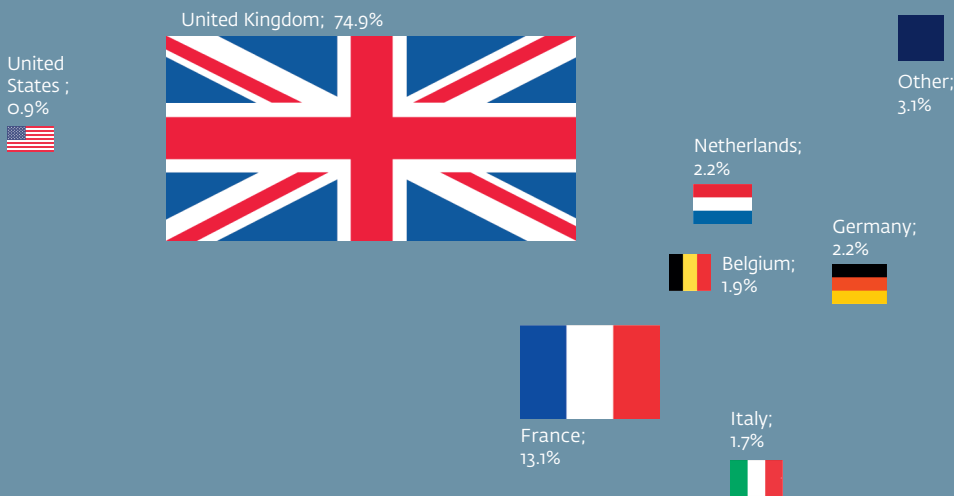
### Box 1 Brexit and the control of counterparty risk

On 29 March 2017, the United Kingdom (UK) formally set in motion its departure from the European Union (EU). A controlled Brexit is in the interest of both the EU and the UK, due to their strong economic interdependence. However, there is limited time available to come to an agreement and negotiations are full of uncertainties. A scenario where there is still no or very little agreement by spring 2019 cannot be ruled out offhand.

A blunt divorce between the UK and the EU will be accompanied by financial stability risks. The City plays a prominent role on the international central clearing market – taking over counterparty risk – of derivatives transactions (Chart 1). Financial institutions use these derivatives to hedge interest rate risk among other things.

Chart 1 The UK plays a prominent role in the central clearing market

Proportion of daily derivatives transactions (EUR 696 billion).



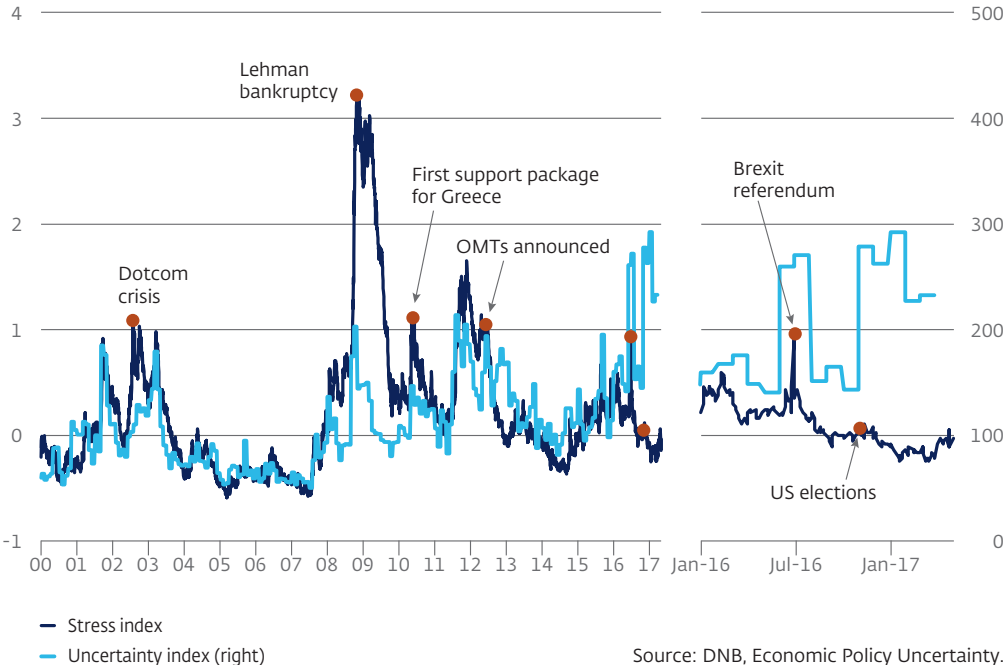
Source: BIS Triennial Central Bank Survey 2016.

Without a Brexit agreement or bridging measures, the recognition of central European market counterparties located in London will lapse on the exit date. Capital requirements for exposures to these parties will rise sharply as a result. European financial institutions may then be forced to transfer or terminate derivatives contracts.

In the interest of financial stability it may be wise to prevent or dampen financial market disruption upon the UK's exit from the EU. In order to prevent future losses due to market failure from landing disproportionately in the EU, it will be important to anchor the quality standard of supervision on central counterparties outside the EU and to put a functioning recovery and resolution framework in place.

The low financial market volatility is in sharp contrast to mounting uncertainty. Policy uncertainty and financial market volatility have always been closely related (Chart 2, left). This relationship was broken recently: financial markets remained calm while worldwide policy uncertainty climbed to record highs at the time of the Brexit referendum and the US elections (Chart 2, right). The highly accommodating monetary policy and the improved macroeconomic outlook contributed to the positive financial market sentiment. Growth and inflation prospects in the United States in particular were upwardly adjusted in the past six months, and economic recovery in the euro area is accelerating.

Chart 2 Decoupling of policy uncertainty and financial market volatility

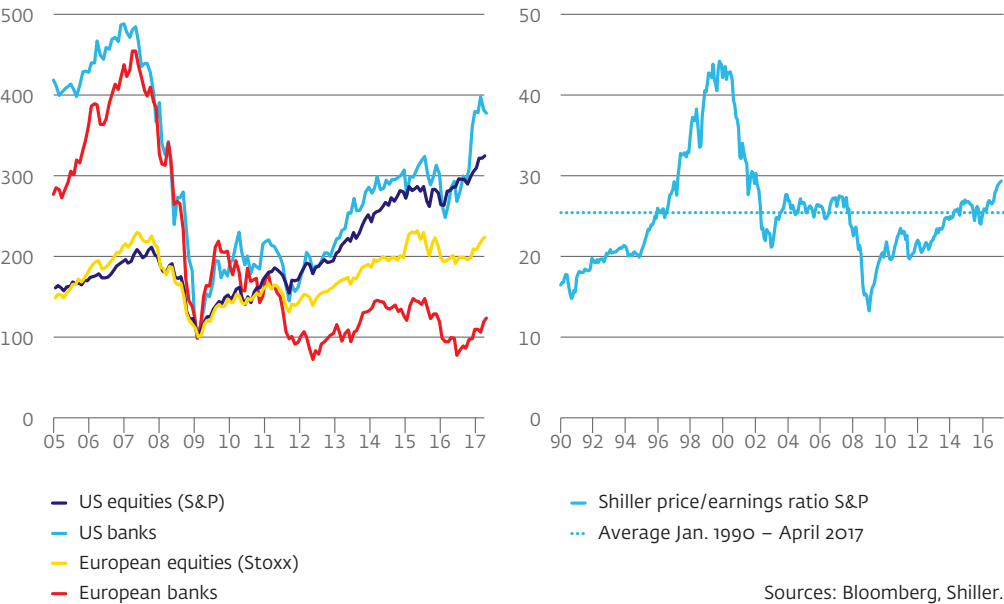


Note: Stress index based on indicators of equity, bond and forex markets relevant to the Netherlands and a health index of financial institutions. The uncertainty index is a GDP-weighted average of uncertainty indices in 17 countries, measuring the level of policy uncertainty by the frequency with which specific word combinations appear in major newspapers. These words are "uncertain or uncertainty" and "economy or economic" combined with words characterising a policy area, like "deficit" or "regulation". See [www.policyuncertainty.com](http://www.policyuncertainty.com).

US share prices in particular rode high on the bullish financial market sentiment. Financial markets initially reacted positively to the outcome of the US presidential elections: share prices jumped on the prospect of higher economic growth (Chart 3, left). US banks have clearly been on the rise in the past months, owing to the anticipation of reduced regulation in the United States in addition to the economic pick-up. Share prices of European banks also profited. Market sentiment with respect to banks improved as well, partly owing to the steepening yield curve. In addition, price/earnings ratios in the United States rose above their long-year average on the back of rising share prices (Chart 3, right).

Chart 3 Buoyant stock markets

Index, February 2009 = 100.



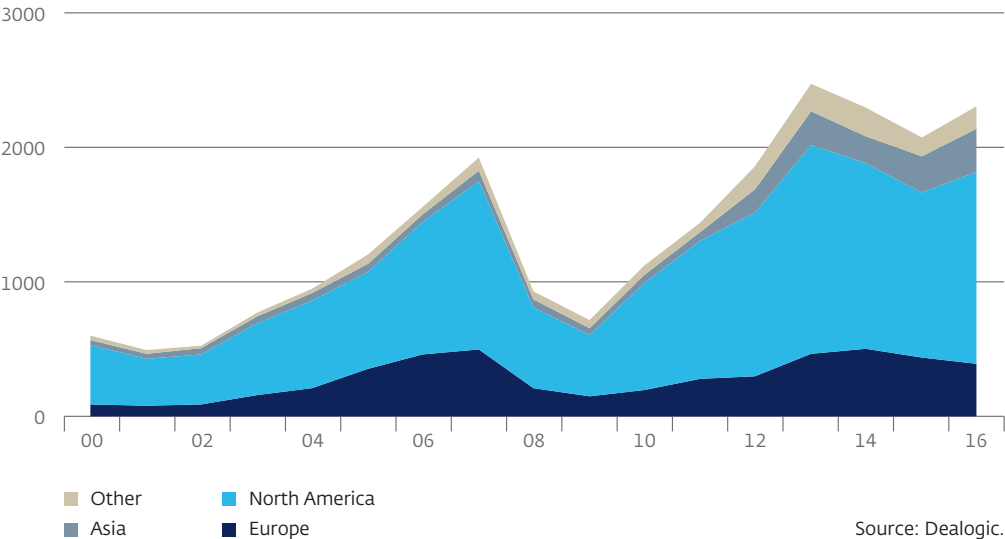
Note: The Shiller price/earnings ratio is based on average earnings over the past ten years (adjusted for inflation).

The buoyant financial market sentiment is also reflected in the issue of risky debt instruments. An example of these is leveraged finance, loans and bonds with elevated risk profiles. Businesses use leveraged finance among other things to finance specific high-risk activities, e.g. management buy-outs, takeovers, or refinancing of existing debt. Issue volumes of these instruments (leveraged loans and high-yield bonds) have now surpassed their pre-crisis levels, especially in the United States (Chart 4), with lending conditions being eased and risk premiums reduced. The sharp growth of leveraged finance illustrates lenders' growing risk appetite in their search for yield, partly induced by low interest rates. This not only applies to credit risk, but also to liquidity risk in the event of market sentiment turning and risk premiums rising again. Although leveraged finance has not taken off in Europe like it has in the United States, leveraged finance portfolios of European banks are growing. This is why the ECB recently published new guidance recommending banks to use clear and consistent definitions of leveraged finance and to develop transparent strategies for these transactions.<sup>2</sup>

2 ECB launches public consultation on draft guidance on leveraged transactions, 23 November 2016.

Chart 4 Increased issuances of risky debt instruments since the crisis

Issues in USD billion.



Note: Issuance concerns new leveraged loans and high-yield bonds. Breakdown into regions based on borrower (firms).

**Bond yields have risen, but are still at low levels.** Driven by the improved macroeconomic outlook, US bond yields rose in the second half of 2016 in particular (Chart 5), with their European counterparts following suit. Despite rising, bond yields are still at exceptionally low levels, historically speaking (see Chapter 2). The improved macroeconomic outlook has prompted the US central bank (Fed) to start phasing out its accommodating monetary policy.<sup>3</sup> It increased its policy rate to a bandwidth of 0.75% to 1%. The financial markets are anticipating the Fed to make two additional interest rate moves in the course of this year. In the euro area, the ECB is still keeping its policy rate at 0%. With respect to its unconventional monetary policy actions, the ECB in December 2016 decided to extend the asset purchase programme by nine months to at least end December 2017, and to reduce its monthly purchases to EUR 60 billion, from EUR 80 billion, starting 1 April 2017.

<sup>3</sup> The Fed ended its purchases under the third quantitative easing programme as early as October 2014; the first interest rate move was made in December 2015, followed by a second and third move in December 2016 and March 2017.

Chart 5 Bond yields have risen

Ten-year government bond yields.



Despite the low financial market volatility, sharp corrections cannot be excluded. Unexpected geopolitical events may cause the bullish financial market sentiment to turn. If investors' risk appetite were to diminish suddenly, this may lead to sharply rising risk premiums and sharply falling asset prices. The rise of investment funds is relevant here (see Box 2): due to their growing role in the global financial markets, price corrections may be amplified in times of stress (see Box 2). Ongoing policy and political uncertainty may also translate into higher risk premiums over time.

High debt levels make countries vulnerable to interest rate rises. Worldwide debt levels have never been as high as they are now. IMF estimates put non-financial sector debt at 225% of global gross domestic product, two thirds of which consists of private debt.<sup>4</sup> Not only is private debt high in developed countries, but also in several systemically important emerging countries like Turkey and Brazil. In addition, rising debt levels in emerging economies have often gone hand in hand with rising dollar exposure. This makes these countries vulnerable to rising interest rates (refinancing risk) as well as currency risk. Non-financial sector debt is also growing rapidly in China, although Chinese debts are largely financed domestically. High credit growth is pushing up risks in the Chinese financial system. For instance, corporate sector profitability in China is diminishing, making it more difficult to meet interest payments on high debts.

4 IMF (2016), Debt: Use it Wisely, Fiscal Monitor.

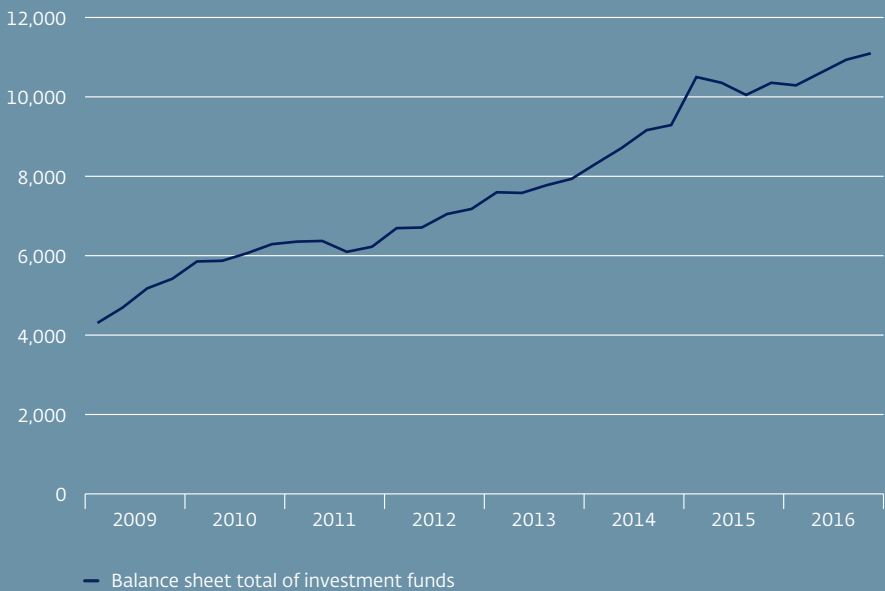


Box 2 Increasing role of investment funds enlarges market volatility

Investment funds are playing an increasingly important role in the global financial system. Their balance sheet total in the euro area more than doubled over the past few years to over EUR 11,000 billion at end 2016 (Chart 6).

Chart 6 Strong growth of investment funds in the euro area

In EUR billion.



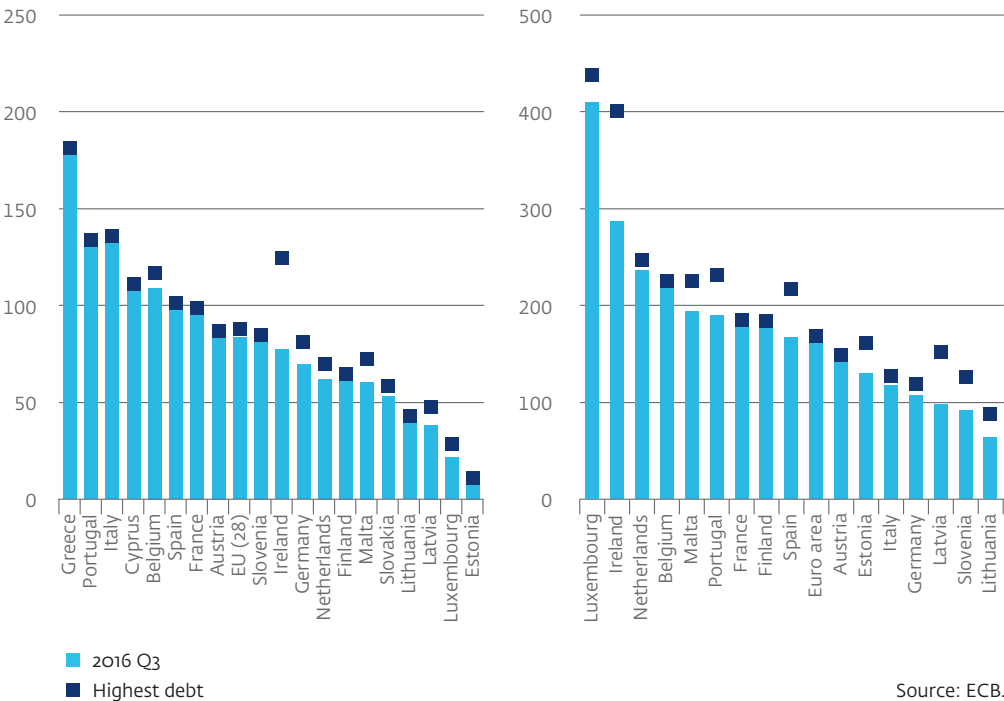
Source: ECB.

Although investment funds are less systemically important than banks, their fast growth does pose potential risks to financial stability. The business model of many of these funds is vulnerable to liquidity risk. This is because these funds often offer investors the opportunity to withdraw their invested capital at short notice (redemptions), while these funds' own investments may be illiquid. In times of market unrest, investors may want their money back at short notice, forcing the fund to liquidate positions (fire sales). This would further amplify the induced price corrections, which may in turn prompt other investors to ask for their money back. The quick capital outflows from British real estate funds following the June 2016 Brexit referendum are a case in point.

Several European countries are still facing high debt levels. At end 2016, average government debt in the euro area still stood at over 90% of GDP. In many countries government debt jumped during the crisis, but hardly declined in the past years (Chart 7, left). In addition, household and corporate debt levels are still very high in many European countries. As in the public sector, private balance sheet repair is progressing fairly slowly in many countries (Chart 7, right). Although public and private debt are easy to finance thanks to the low level of interest rates, the incentive to reduce high debts is correspondingly slight. If interest rates were to rise suddenly, debt sustainability in some countries would deteriorate rapidly.<sup>5</sup>

Chart 7 Ongoing high public and private debt in Europe

As a percentage of GDP; debt in 2016 Q3; peak debt levels between 2000 and 2016.



Source: ECB.

In Europe, Greece's debt position continues to be vulnerable. At the start of this year, the International Monetary Fund (IMF) judged Greek government debt as unsustainable. The IMF has repeatedly said that it will only sign up as a creditor in the third debt programme if the Eurogroup members give concrete form to their preliminary arrangement on debt relief. The IMF is not prepared to join the programme until the Fund is sufficiently confident that the Greek debt is sustainable.

5 OECD Sovereign borrowing outlook 2017.

## The Dutch financial sector

**Prolonged low interest rates constitute one of the major risks for the Dutch financial sector.**

Although interest rates have edged up slightly recently, they continue to be extraordinarily low from a historical perspective. Chapter 2 of this Financial Stability Report analyses the effect of falling interest rates on the different economic sectors, and depicts the effects of a scenario of prolonged low interest rates on the financial system and the real economy.

**Sharp financial market corrections may hit the Dutch financial sector hard through losses on its investment portfolios.**

Steeply rising risk premiums and falling share prices may induce firm corrections on the market values of investments made by financial institutions. Financial institutions with large investment portfolios like pension funds and insurance companies may be hit especially hard. Calculations show that a substantial downward shock in the equity and bond markets<sup>6</sup> may wipe about 2.5% off insurers' balance sheet totals.<sup>7</sup> Pension funds would lose over 8% of their balance sheet totals.

**Their strong dependence on market funding exposes Dutch banks to refinancing risk.** The credit crisis revealed that market funding carries higher refinancing risk than deposit funding.

Dependence on market funding can be measured based on the loan-to-deposit ratio. Since the credit crisis, Dutch banks have reduced this ratio to a little over 150% in September 2016, from 200% in 2008. In addition, the maturity of market funding has grown slightly over the past two years. From an international perspective, Dutch banks nevertheless still depend relatively heavily on market funding, which makes them vulnerable to financial market unrest. Amid a growing role for insurance companies and pension funds on the mortgage lending market (see below), the banking sector's need for funding will decline, which brings down the loan-to-deposit ratio further.

**The Dutch banking sector has relatively strong financial resilience.** The Dutch banking sector is relatively well capitalised: the core capital ratio in the third quarter of 2016 stood at 15.3%, against 14.1% in the euro area. Compared with banks elsewhere in Europe, Dutch banks have relatively few non-performing loans. The IMF's five-yearly regular Financial Sector Assessment Program (FSAP) based on its own stress tests concludes that the Dutch banking sector's financial resilience is adequate (see Box 3).

<sup>6</sup> Specifically, it has been assumed that spreads of A and BBB bonds will increase 100 basis points, and those of bonds graded BBB and below will rise 300 basis points; share prices in the United States and Europe are assumed to fall 20%. Risk-free interest rates are assumed to remain unchanged, therefore liabilities will not change.

<sup>7</sup> This approach leaves out of scope the mitigating effect of volatility adjustments on insurers' liabilities.

### Box 3 Positive assessment in the IMF's FSAP for the Netherlands

Every five years, the IMF performs a Financial Sector Assessment Program (FSAP) in countries with systemically important financial systems, including the Netherlands. The FSAP uses stress tests to thoroughly review the resilience and stability of a country's financial system. It also assesses the standard of supervision and the crisis management framework. The IMF recently completed its FSAP for the Netherlands.<sup>8</sup>

The IMF judges the financial resilience of the Dutch banking sector positively and concludes that major and far-reaching reforms have been made in the past years in financial sector supervision. Liquidity stress tests show that Dutch banks are able to withstand big shocks and that there is a limited risk of contagion among banks. The IMF mentions the low interest environment and the banks' ongoing dependence on market funding as the biggest current challenges to the sector. Banks are also vulnerable to the high level of household debt in the Netherlands, and the IMF finds the number of mortgage loans with high LTV and LTI ratios worrying, although it admits that banks did not suffer big losses on their mortgage loan portfolios during the crisis. The IMF considers the low level of interest rates to be a cause of concern for the financial position of the pensions and insurance sector.

Based on its findings, the IMF has issued several recommendations. It supports the Financial Stability Committee's (FSC) advice to lower the LTV limit further to 90% after 2018.<sup>9</sup> The IMF advises the banking sector to continue strengthening leverage ratios, as leverage (the ratio between debt and equity) is still relatively high. In addition, the IMF calls on the supervisory authorities to monitor the developments in the vulnerable insurance sector closely and welcomes the legislative proposal to enable resolving of insurance companies. The IMF further advises to strengthen the operational independence of the supervisory authorities. DNB, together with the government and the AFM, will follow up on these recommendations.

**Clarity on the future regulatory framework for banks (Basel 3.5) will be welcome.** Negotiations are currently underway in the Basel Committee to round off the Basel 3.5 framework. Its purpose is to improve the modelling of risk-weighted assets that underlies risk-weighted capital requirements for banks, and to enhance comparability between banks. DNB welcomes worldwide, uniform agreements, but also believes that differences in portfolio risk profiles between banks should be taken into account. For the Dutch banking sector, Basel 3.5 may result in a sharp tightening of capital requirements. It is important to have clarity on the impact of Basel 3.5.

8 IMF (2017), Kingdom of the Netherlands-Netherlands: Financial System Stability Assessment, 3 April 2017.

9 See <http://www.financieelstabiliteitscomite.nl/nl/nieuws/nieuwsbericht/34>

## Real estate markets in the Netherlands

**The Dutch housing market is recovering, but not without considerable regional differences.**

The recovery is underpinned by the economic upswing combined with low interest rates. Since bottoming out in 2013, house prices have gained over 16%, while the number of annual transactions climbed to almost 230,000 last year, from a little over 100,000 in 2013. However, there is a three-way geographical divide in the housing market: strong recovery in the major Dutch cities, acceleration in the surrounding towns and the periphery is lagging behind.<sup>10</sup> The strong recovery in the major cities is mainly being driven by catch-up demand after the crisis and the ongoing urbanisation trend among mainly young highly-educated people. The housing market in the surrounding towns benefits from the fact that families are leaving the city. Peripheral areas are paying the price for the pull of cities: the lack of economic perspective is driving young people away from these areas.

**Problems with underwater mortgage loans are ebbing away.** At 2016 year-end, a little over 20% of home-owners owed more on the balance of their mortgages than the value of their house, against almost 40% in 2013. In addition to rising house price rises, voluntary redemptions are contributing towards the reduction of the number of underwater mortgage loans: an estimated 10% of them has resurfaced as a result. The drop in the proportion of underwater mortgage loans is most significant in the big cities (Figure 1). In Amsterdam less than 10% of mortgages is currently underwater, against over 40% in 2013. By way of comparison: in the province of Flevoland 20% of mortgage loans is still underwater.

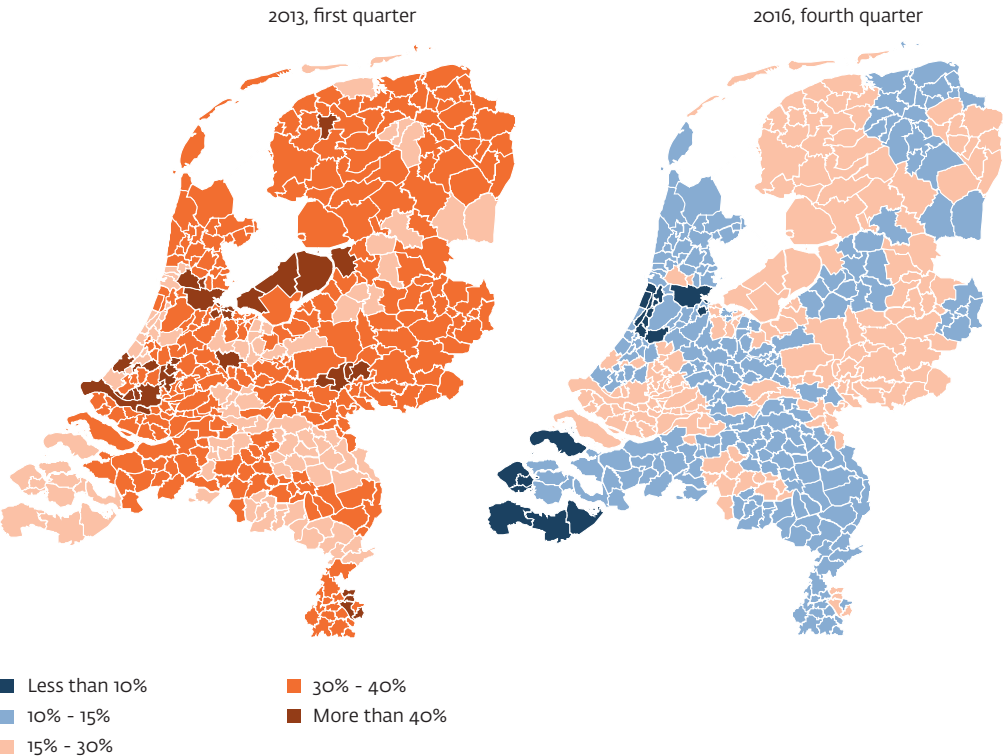
**There are as yet no strong indications of a credit-driven bubble in the major cities.** The housing market in the major cities is showing signs of overheating. A growing number of homes in the major cities is being sold above the asking price, sometimes even without mortgage contingency clauses. A recent survey among real estate agents in Amsterdam revealed that this is the case for 45% of home purchases in the city. Nevertheless, no credit-driven bubble seems to be developing yet. Mortgage credit growth in the cities is still fairly low (see below), and people are paying in relatively big amounts of their own money. So the soaring house prices in the major cities seem to be mainly attributable to scarcity pricing.

**Mortgage credit growth has remained limited, despite the housing market recovery.** Between 2013 and 2016, mortgage debt edged up only 1%, whereas house prices rose 10%. This is in the first place attributable to the increase in voluntary redemptions. Since 2013, an estimated EUR 55 billion was voluntarily repaid on outstanding mortgage debt. Redemption has become more attractive in the Netherlands, due to the low interest rates and the more generous gift tax allowance. The low rate of mortgage debt growth can also be attributed to demographic factors. In particular, due to the structural decline in the number of births, the proportion of

<sup>10</sup> Melanie Hekwolter of Hekhuis, Rob Nijskens and Willem Heeringa, The Housing Market in Major Dutch Cities, DNB Occasional Study (2017) No. 15-1.

Figure 1 Underwater problems are ebbing away

Percentage of underwater mortgage loans.



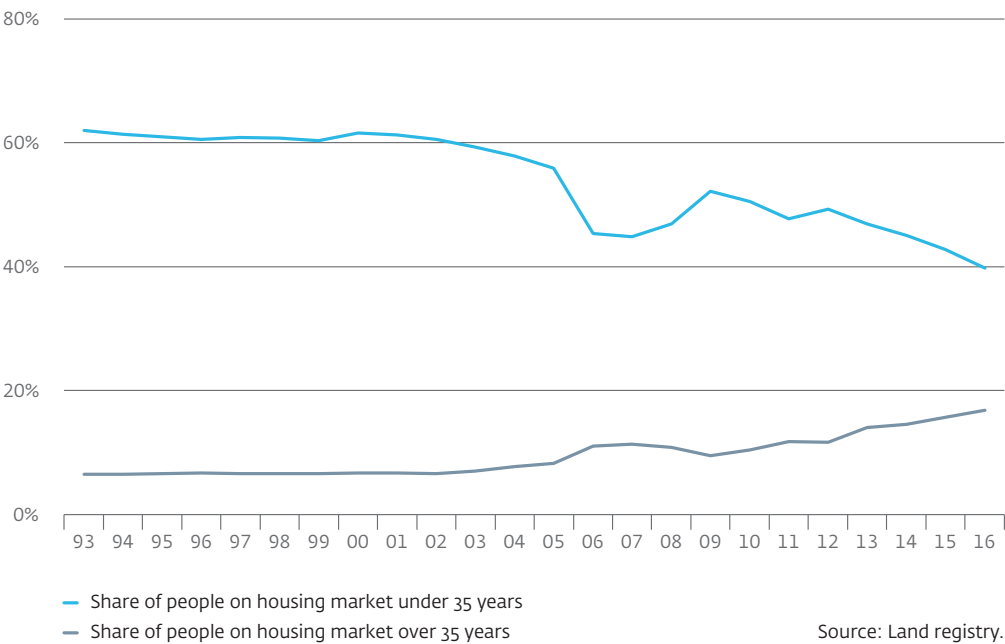
Note: Area delineation based on the first two postcode numbers.

young people declined to around 40% in 2016, while the number of older buyers and sellers increased to almost 20% (Chart 8). Older people on the whole have a lower borrowing requirement than young people, as they often have substantial savings. And finally, credit growth is being dampened by government policies, including lowering of the LTV ratio and limiting of mortgage interest tax relief to annuity and linear mortgage loans only.<sup>11</sup> These measures are making it more difficult to finance house purchases for first-time buyers in particular. However, due to low interest rates and income growth, home buyers can borrow a larger amount of money than before the crisis, notwithstanding more stringent income rules for home loans.<sup>12</sup>

11 Since 2013, households taking out new mortgage loans have only been eligible for mortgage interest tax relief if they completely repay their debt in 30 years, at least in equal annual instalments.

12 DNBulletin, Income standards for mortgages not more restrictive than before the crisis, 20 October 2016.

Chart 8 Share of young people on housing market declines, while share of older people rises

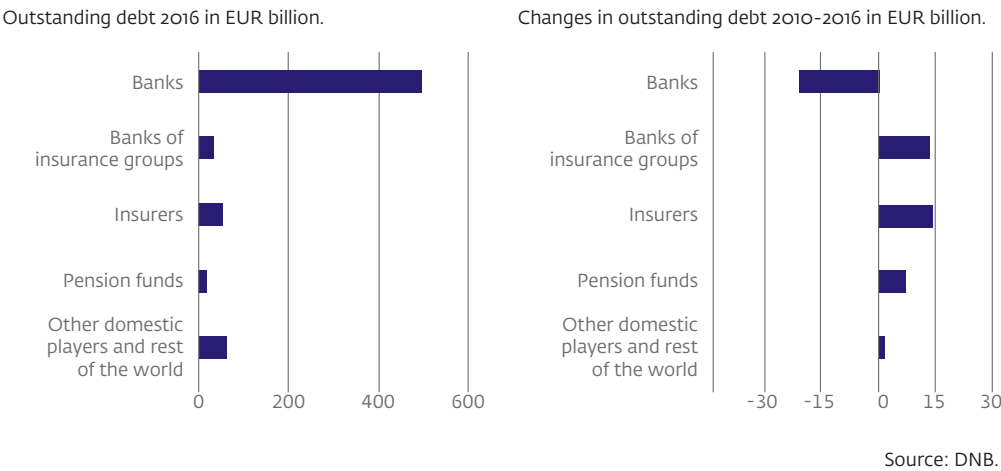


The growing role of pension funds and insurers on the mortgage lending market is welcome.

The increasing market shares of insurance companies and pension funds is at the expense of banks (Chart 9). The low interest rates have forced insurers and pension funds to search for yield elsewhere, e.g. by funding mortgage loans. Contrary to banks, these institutions have long-term liabilities, meaning that the shift in the mortgage market is contributing towards a reduction of maturity transformation in the financial system. It also increases diversity and competition in the credit market, which benefits consumers. However, this shift can also be accompanied by risks. Credit risks will for instance accumulate with market players whose risk management may be insufficient, or who are not sufficiently equipped to understand the risks they are exposed to.<sup>13</sup>

13 DNB, Credit markets in motion, November 2016.

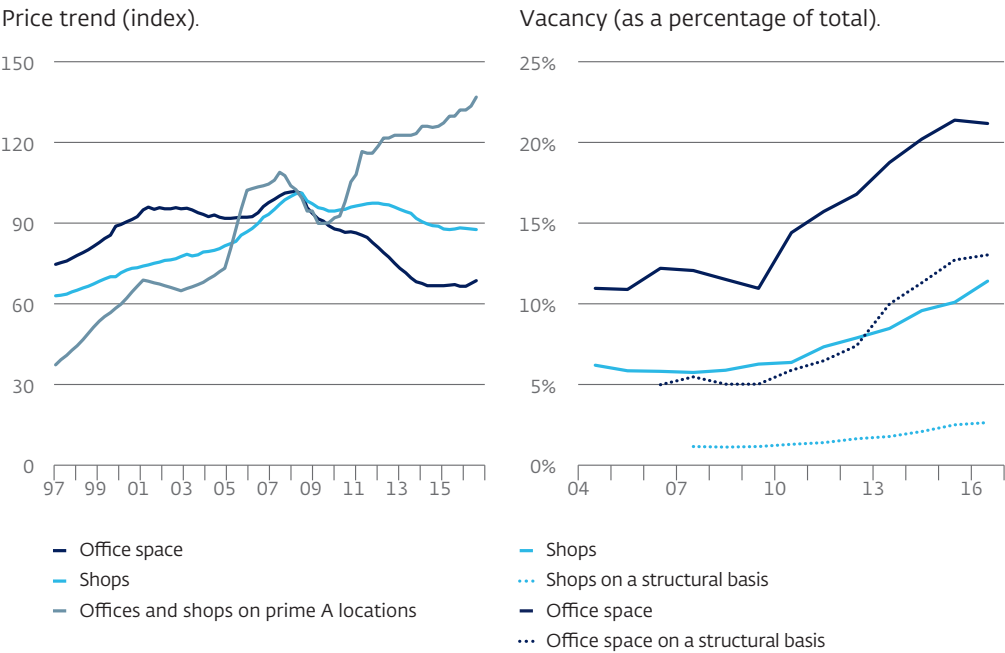
Chart 9 Growing proportion of non-banks in the mortgage lending market



Average price trends for commercial real estate are masking large regional differences. Prices for commercial real estate in top locations are rising sharply, while those for properties in less attractive locations are hardly moving and structural vacancies are rising (Chart 10). The price increases in top locations are partly attributable to domestic and non-domestic investors searching for yield, who consider commercial real estate an attractive investment, which increases the risk of bubble formation. At the same time, the outlook for the commercial real estate market is structurally unfavourable. Growing on-line retail sales and more efficient use of office space are dampening demand for retail and office space. Moreover, from 2023 onwards only office buildings with energy label C or above may be used. Both bubble formation and structural vacancy of offices and retail space may become a risk to banks and pension funds with relatively large exposure to commercial real estate.



Chart 10 Diverging trends in commercial real estate



Sources: ECB and Environmental Data Compendium.

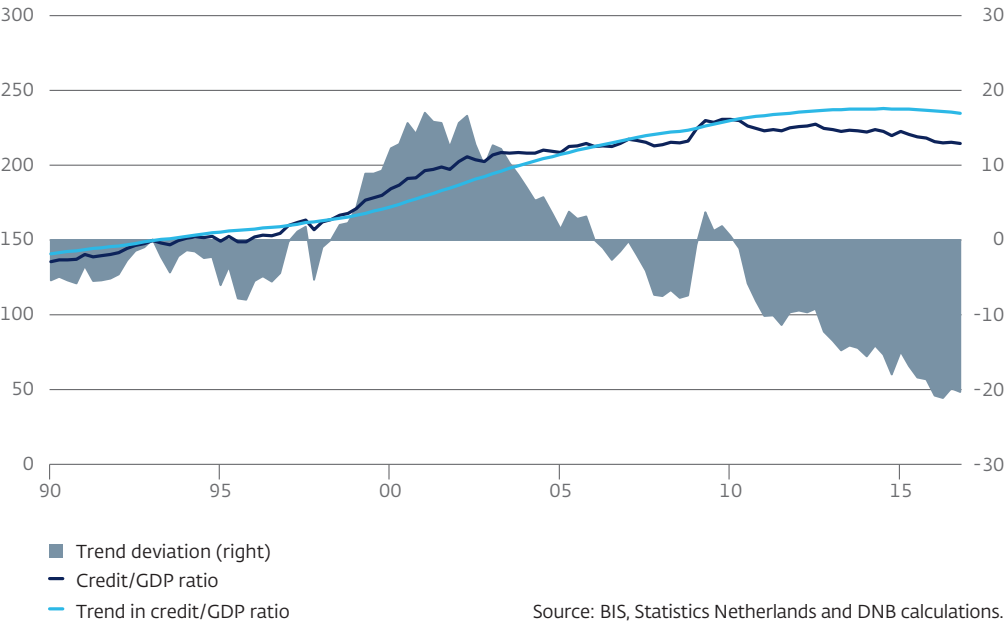
Note: Structural vacancy is any vacancy over three years.

## Macroprudential policy in the Netherlands

The countercyclical capital buffer stands at 0%. DNB can use macroprudential instruments like the countercyclical capital buffer to enhance financial stability. This instrument protects banks against systemic risks arising from excessive credit growth. It is a variable add-on to the minimum capital requirements of up to 2.5% of risk-weighted assets – or higher if circumstances so require. A key indicator when deciding whether to activate the buffer is the credit gap, the discrepancy between credit growth and its trend level. The credit gap is still clearly negative, which indicates a modest development of credit growth (Chart 11). Mortgage credit growth lagging behind house price rises fits this picture. Other indicators are also monitored, including real estate prices and subsector lending, which are not giving cause for activating the countercyclical capital buffer either. As said, there seems to be no evidence of a credit-driven housing market bubble, among other things due to the fact that home buyers are increasingly using more of their own money to finance their purchases.

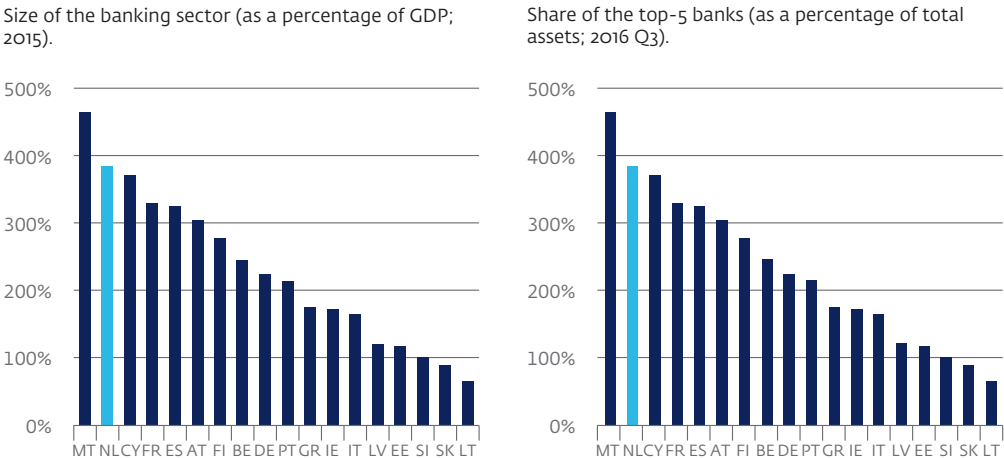
Chart 11 Credit growth in the Netherlands is below trend

Total lending to the Dutch corporate sector and households as a percentage of GDP.



Note: The trend was computed based on an HP filter. For more information see ESRB (2014), *Recommendation on guidance for setting countercyclical buffer rates*, ESRB/2014/1.

Chart 12 Dutch banking sector large and concentrated



Source: ECB.

**Extra capital buffers for systemically important banks remain in force.** From an international perspective, the Netherlands has a large and concentrated banking sector (Chart 12). This means that the Dutch banking sector is of significant systemic importance. DNB imposed systemic buffers on five systemically important banks, which may be built up gradually between 2016 and 2019. DNB evaluates the systemic importance of banks once a year. End 2016, the systemic buffers imposed on ING Bank, Rabobank, ABN AMRO (3%), SNS Bank and BNG Bank (1%) were left unchanged.

**Policy aimed at reducing the financial vulnerabilities of Dutch households must be continued.** In the past few years, various measures have been taken to mitigate the risks of the housing market to financial stability in the Netherlands. Income standards for mortgages have been tightened and mortgage interest tax relief is being phased out gradually. Over the past years, the loan-to-value ratio, the maximum mortgage loan possible relative to the value of the house has been reduced to 101% in 2017. This policy should be continued and intensified, especially now that the housing market recovery is ongoing and interest rates are low.

Table 1 Current use of macro-prudential instruments

Instrument	Status	Comment
Systemic buffer	Gradual phasing in until 2019	Applicable to Rabobank, ING Bank, ABN AMRO (all 3%) and SNS Bank and BNG Bank (1%)
Countercyclical capital buffer	Set at 0% effective 1 January 2016	So far not activated
LTV limit	Phased reduction to 100% in 2018	FSC recommends further reduction to 90% after 2018
LTI limit	Over four times gross income	Statutory regulation based on gross housing costs relative to annual income.

## 2 The effects of prolonged low interest rates

Interest rates are at historically low levels. This chapter will first analyse the effect of the interest rate decline of the past years on the real economy and the financial system and will subsequently discuss the effects of a scenario of persistently low interest rates. In this type of scenario, the benefits of falling interest rates, e.g. rising value of investments, will disappear. In addition, prolonged low interest rates may induce misallocation of capital, further household balance sheet extension, and habituation to low interest rates. In this scenario, bank profitability will be eroded further, while pension funds and insurance companies will find it increasingly difficult to meet their commitments. Prolonged low interest rates also offer opportunities, however. Structural adjustments like reducing mortgage interest tax relief and making the economy more sustainable can be stepped up in times of low interest rates, increasing economic resilience.

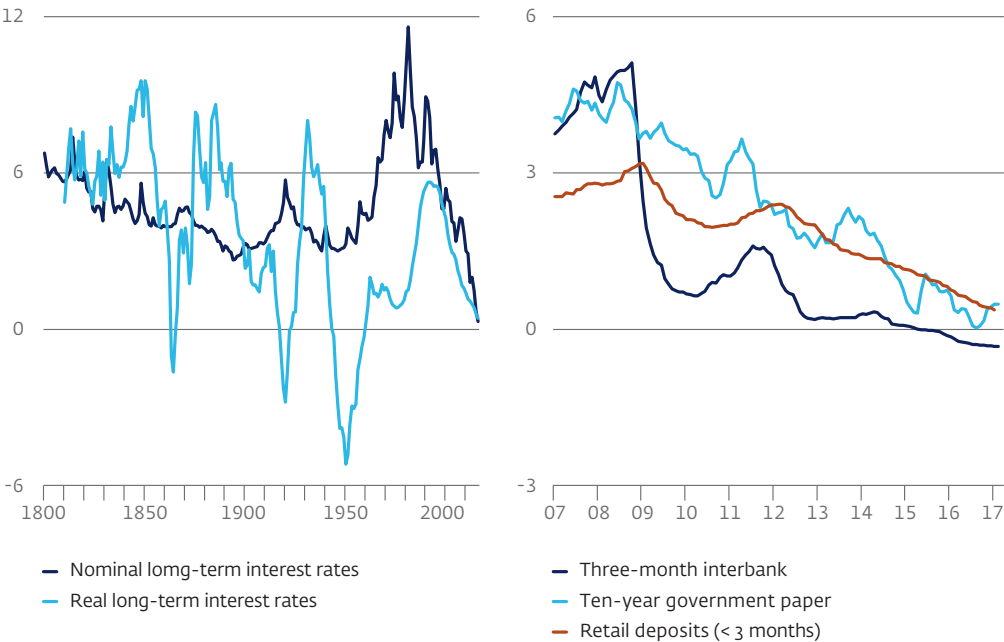
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### Steady fall in interest rates: a retrospective

Interest rates in the Netherlands are at a historic low. In the past three decades, interest rates have followed a downward trend (Chart 13), both in nominal and in real terms. The decline first of all reflects a drop in "natural interest rates" or equilibrium interest rates (see Box 4). This is the interest rate at which supply and demand of capital are balanced out, and the economy is in a state of full employment and price stability. Equilibrium interest rates are a reference value for monetary policy. In order to achieve price stability, it may be necessary to lower policy interest rates temporarily to below equilibrium rates in order to boost inflation expectations. The ECB lowered policy interest rates substantially over the past years and took other measures such as purchasing government bonds to lower market interest rates to below equilibrium rates. This accommodating monetary policy has contributed to capping deflationary pressures and to economic recovery in the euro area.

Chart 13 Dutch interest rates in a historical perspective

Annual percentages.



Source: Statistics Netherlands (CBS) and DNB.

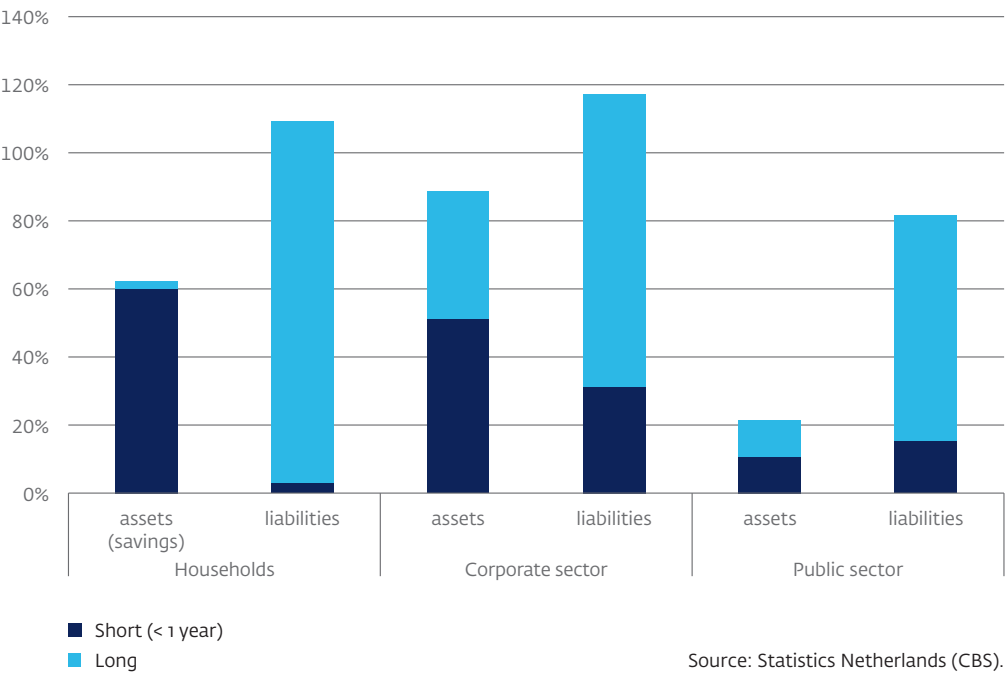
Note: Real long-term interest rates are a ten-year moving average based on consumer prices (from 1900), and various sources (before 1900). source: Reinhart/Rodoff database).

Consequences for the real economy

The drop in interest rates is good news for sectors with short-term debt, and longer-term fixed interest receivables. The interest burden for short-term debt will of course quickly decline whereas the value of longer-term assets grows over time. It will take a while before parties with longer-term debt can profit from low interest rates, while parties holding short-term receivables will see their interest income decline rapidly. Chart 14 gives an overview of financial balance sheets per sector. Household and government balance sheets are dominated by long-term debt, meaning that their interest rate burden has decreased steadily on balance over the past years. For the business sector, interest bearing assets and liabilities are more balanced out, meaning that the effects of low interest rates for the sector as a whole will be modest. The actual picture within these sectors is more heterogeneous than these figures reveal. Within the households sector, fixed-interest receivables and debts are spread very unevenly, and in the business sector, there are differences between industries and between large businesses and small and medium-sized enterprises (SMEs).

Chart 14 Uneven spread of interest-bearing assets and liabilities per sector

As a percentage of GDP at end 2016.



Households holding mortgage debt have seen their interest burden decline, but their pension prospects have deteriorated as well. Dutch households have long balance sheets with high mortgage debt and substantial wealth in the form of pensions and home equity.<sup>14</sup> Due to their high debt levels and relatively small savings deposits, the net interest burden of Dutch households is declining as a result of low interest rates. As the majority of mortgage debt has a fixed-interest period of between five and ten years, it will take some time for the interest rate decline to filter through to the household interest burden. The average interest rate on outstanding bank mortgage loans dropped to 3.6% early this year, from around 5% in 2008, while interest rates on newly issued mortgage loans have fallen to 2.4%. Interest rate drops also impact other household wealth components via indirect channels. Low mortgage interest rates benefit house prices, which pushes up the value of owner-occupied homes, but the lower interest rates also have a negative impact through pension assets as the funding ratios of pension funds are being eroded (see below). This may mean that household pension schemes will become less generous, or that household pensions are curtailed.

<sup>14</sup> Jante Parlevliet and Thomas Kooiman, Wealth formation of Dutch households: a policy assessment, DNB Occasional Study (2015), No. 13-1.

### Box 4 Explanations for low interest rates

Falling bond yields are a trend-based and worldwide phenomenon. Nominal interest rates have been falling for several decades (Chart 13), which is partly explained by declining inflation, but the bulk of the fall is related to the lower equilibrium interest rate. This is the real interest rate at which supply and demand of capital are balanced out and the economy is in a state of full employment and price stability. The equilibrium interest rate fluctuates with time, due to shocks in the underlying fundamentals.

#### Long-term trends

The equilibrium interest rate itself cannot be perceived and is therefore approached by means of model calculations. Based on such estimates, some studies conclude that the equilibrium interest rate in the euro area turned negative recently.<sup>15</sup> The equilibrium interest rate can also be approached by means of market expectations of long-term real risk-free interest rates. A measure for the euro area is the long-term expectation for the German real interest rate, which is currently at around 1%, as opposed to 3% before the crisis. These diverging estimates show that the equilibrium interest rate cannot be determined with any certainty, but various indicators are evidencing a worldwide trend-based fall in the equilibrium interest rate to a low level.

The decline is explained by low trend-based economic growth and by trends in savings and investments.<sup>16</sup> Trend-based growth is related to demographic developments and technological progress. These factors thus determine the marginal return on capital and real interest rates. Declining population growth in particular in Western Europe and Japan slows down growth of the labour supply, which is among the determinants of potential economic growth. In an ageing society, labour productivity and innovative power may also decrease. These developments are depressing trend-based growth, leading to a lower equilibrium interest rate. The reduced growth potential since the financial crisis is estimated to have depressed worldwide real interest rates by about 100 basis points.<sup>17</sup> By way of comparison: the long-term outlook for the euro area fell to 1.2% from 2.0% between 2007 and 2016 (source: Consensus Economics).

The equilibrium interest rate also reflects savings and investment behaviour. Research has shown that worldwide increasing savings and decreasing investments are the main reasons for the decline in the equilibrium interest rate. These factors together should account for

15 Vitor Constâncio, The challenge of low real interest rates for monetary policy, presentation at Macroeconomics Symposium at Utrecht School of Economics, 15 June 2016. Adrian Penalver, The natural rate of interest: estimates for the euro area, Banque de France, Eco Notepad, 23 March 2017.

16 See for instance Thomas Laubach and John C. Williams, Measuring the Natural Rate of Interest, The Review of Economics and Statistics (2003), 85(4), 1063-1070.

17 Lukasz Rachel and Thomas D. Smith, Secular drivers of the global real interest rate, Bank of England Working Paper (2015), 571.



two thirds of the decline in worldwide real interest rates since the eighties.<sup>18</sup> The structural increase in savings is among other things related to demographic trends. The average age of the labour force is rising across the globe. The first stage of ageing is accompanied by accumulation of wealth and savings, which has a depressing effect on real interest rates. The increased savings in emerging countries - particularly in Asia - are also playing a role. These countries keep reserves as a precautionary measure, which contributes towards the global excess of savings. The structural decline in investments can be attributed to falling prices of investment goods (in particular ICT), meaning that all other things being equal, fewer investment outlays are necessary. Public investments have also declined across the globe in the past decades, due to budget consolidation and privatisations.

**Financial factors**

Financial shocks and cyclical factors may also cause market interest rates to deviate temporarily from the equilibrium interest rate. Financial booms and busts are mostly accompanied by strong fluctuations in investments and savings.<sup>19</sup> These developments may undermine productivity growth, as during a period of financial boom, production factors may be misallocated to less productive sectors. Problems at banks and the liquidation of high debts following a financial crisis may also cause potential growth to fall to a lower growth path, as a faltering financial system hampers re-allocation of production factors to new growth sectors. As financial cycles generally last longer than economic cycles, a financial downturn may depress economic growth and real interest rates for longer periods of time. These reasons underlying low interest rates are expressed by, for instance, the BIS, which estimates misallocation between 2008 and 2013 to have depressed productivity growth in several countries by some 50 basis points per year.<sup>20</sup>

**Monetary policy**

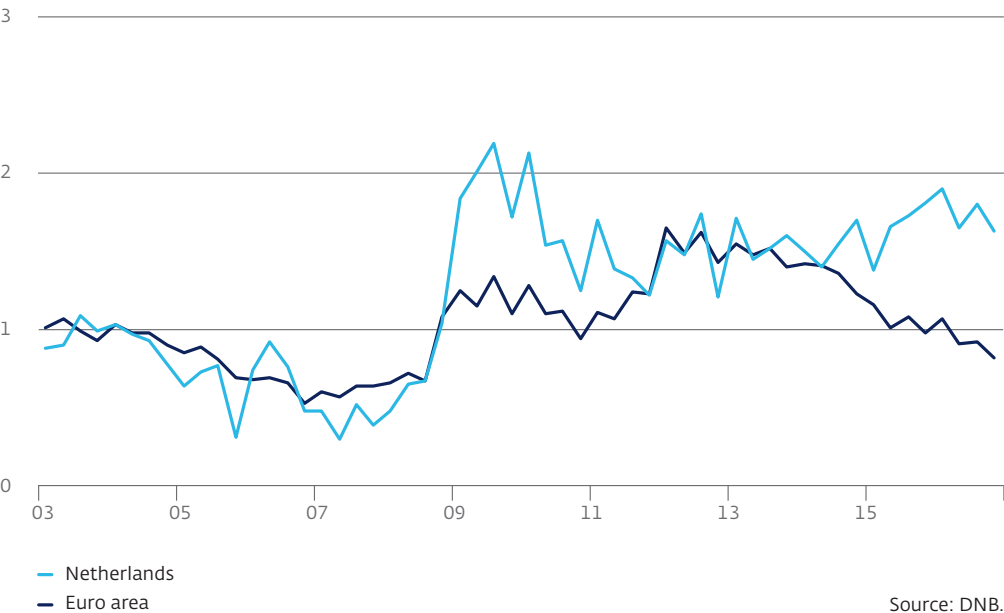
The equilibrium interest rate is determined by structural factors rather than monetary policy. At the same time, the equilibrium interest rate is a reference value for monetary policy. If policy interest rates (adjusted for inflation) are too high relative to the equilibrium interest rate, monetary policy is relatively tight, and if they are too low, policy is relatively accommodating. In order to achieve price stability, it may be necessary to lower policy interest rates temporarily to below the (estimated) equilibrium interest rate in order to boost inflation expectations. This is why the ECB in March 2016 lowered its policy rate to 0%, and its deposit rate to minus 0.4%. Also with policy rates at those levels, the Eurosystem managed to loosen the monetary stance further, among other things by

18 Rachel and Smith (2015), op. cit.  
19 Tarnim Bayoumi and Barry Eichengreen, Aftershocks of Monetary Unification: Hysteresis with a Financial Twist, NBER Working Paper (2017), 23205.  
20 Claudio Borio, Secular stagnation or financial cycle drag?, address to National Association for Business Economics, 33rd Economic Policy Conference, Washington DC, 5-7 March 2017.

buying up government bonds. Estimates of the impact of the unconventional monetary policy measures on the decline of the nominal long-term interest rate range between around 80 to 150 basis points.<sup>21</sup> It should be mentioned, however, that these estimates are surrounded by a great deal of uncertainty, as the different factors that influence interest rates are difficult to isolate.

Chart 15 Interest rate differential between small and large loans

In percentage points.



Note: Interest rate differential on loans of less and more than EUR 1 million.

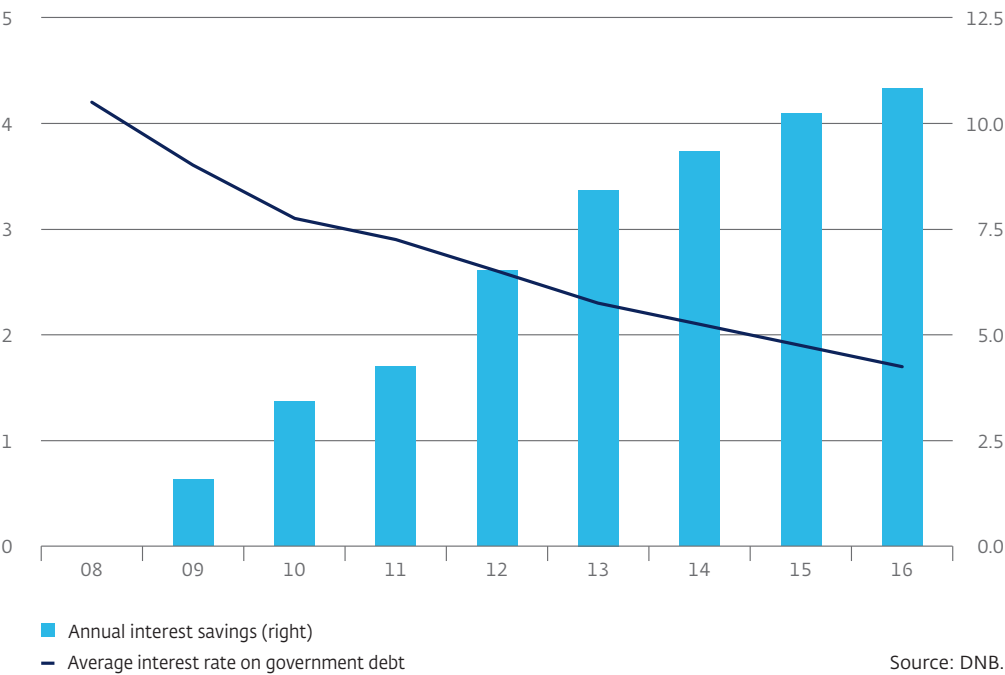
Within the corporate sector, large enterprises in particular have benefited from falling interest rates. Since the outbreak of the crisis, banks have tightened their lending conditions for small and medium-sized enterprises more sharply than those for large enterprises. In that context, interest surcharges above market interest rates for large enterprises have fallen on balance since the crisis, whereas those for small companies have actually risen. This pattern is also visible in the interest rate differential between relatively small and large loans (Chart 15). Since the outbreak of the crisis the differential has widened significantly, more so in the Netherlands than in the other euro-area countries. These observations are confirmed by

<sup>21</sup> The 80 basis points decline is the estimated impact on risk-free interest rates, whereas the 150 basis points decline is the impact on a weighted index of public debt issued by EMU countries, see Peter Praet, Calibrating unconventional monetary policy, 6 April 2017.

other sources like business surveys that show that small companies are experiencing more constraints in attracting funding than their large counterparts. Some of these constraints can possibly be attributed to the higher risk profiles that small companies have. Due to the lack of a credit register, banks have to spend a relatively large amount of time assessing the financial soundness of SMEs accurately. And finally, competition has diminished, especially in the SME loans market, due to consolidation in the banking sector. Large companies generally have less trouble raising capital from foreign banks, or tapping the financial markets.

Chart 16 Annual savings on Dutch public sector interest charges

Interest rates in percentages per year and savings in EUR billion.



Note: Mechanical estimation of savings on interest charges relative to a scenario where ten-year bond yields would have remained at 4.2% after 2008, and one seventh of government debt is refinanced annually. This scenario does not include the upward effect of higher interest burden on the actual trend of debt accumulation.

The government has benefited from falling interest rates. Owing to the downward decline in interest rates since 2008, government savings on interest charges have grown to an estimated amount of over EUR 10 billion per year (Chart 16). The easing interest burden of households and businesses is also delivering budgetary savings, as losses of taxation income due to tax allowances have declined. These savings enabled the Dutch government to consolidate to a lesser extent and to meet the European budget deficit rules quicker.

With DNB's macroeconomic DELFI model an estimation can be made of the effects of falling interest rates on the domestic sectors of the Dutch economy. This can be done by means of a counter-factual simulation experiment. This experiment examines how the Dutch economy would have developed if market interest rates in the Netherlands would have remained constant at the levels that they stood at on the eve of the September 2008 crisis. It does not include constant market rates outside the Netherlands and their effect on the global economy and world trade. So the quantification has a partial character and is surrounded by a fair amount of uncertainty, not least because the impact of the interest rate decline can hardly be seen separately from its underlying causes (see Box 4).<sup>22</sup>

#### Falling interest rates have benefited the Dutch economy from a macroeconomic perspective.

Without declining interest rates, three-month rates in the Netherlands in 2009 would have been 3 percentage points higher, climbing to 4.5 percentage points in 2016. Ten-year bond yields would have been between 1 and 3.5 percentage points higher, respectively. These higher interest rates would have translated into lower household consumption and corporate investments. Annual growth of household consumption between 2009 and 2016 would have been 0.9 percentage points lower on average. This is not only attributable to the downward effect on disposable income, but also to lower house prices. Growth of corporate investments would have ended up 1.5 percentage points lower on average, due in particular to higher cost of capital and lower production (accelerator mechanism). GDP growth would have been 0.4 percentage points lower on average. Annual employment growth would also have been dampened by 0.4 percentage points on average. All in all, unemployment would have been 2.4 percentage points higher in 2016. Without declining interest rates, the funding ratio of Dutch pension funds would have been sharply higher (around 30 percentage points in 2016); house prices on the other hand would have been substantially lower (15% in 2016). Government finances would also have suffered: the EMU-balance would have been 2.5% GDP lower, due to lower economic activity and higher interest rates.

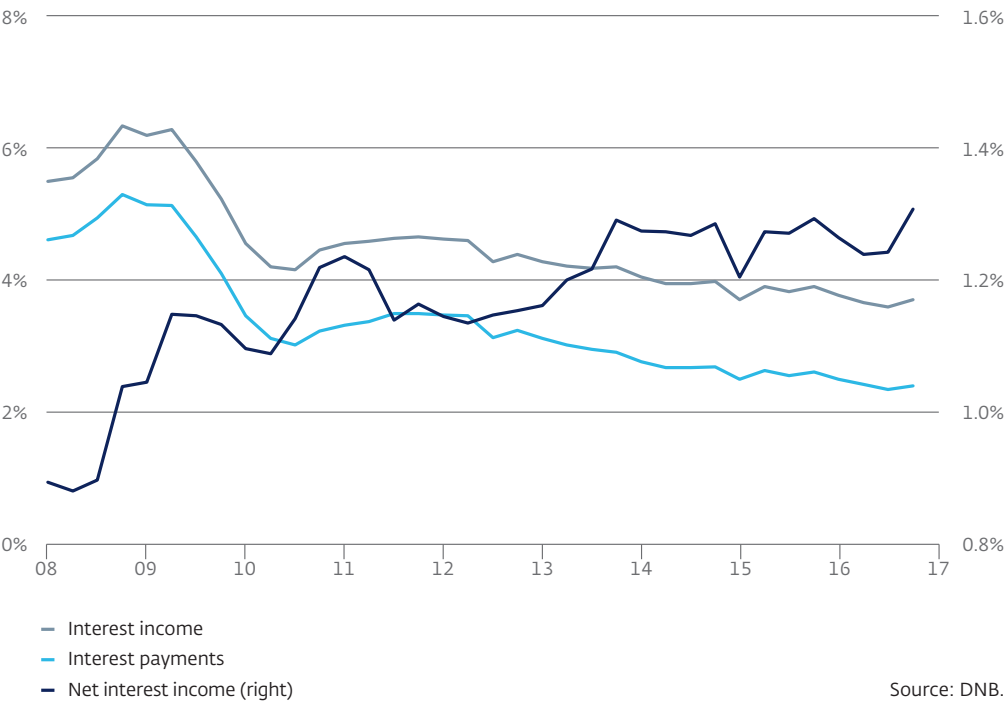
#### Effects on the financial sector

To date, Dutch banks have been able to keep their interest income at acceptable levels. In principle, loans issued by banks have longer fixed interest terms than the funding that they raised. In case of falling interest rates, their funding charges therefore generally drop faster than their interest income on outstanding loans. As a result, net interest income of Dutch banks has clearly risen in the past few years (Chart 17). It should be borne in mind, however, that banks largely hedge their maturity transformation-related interest rate risk with interest rate swaps, whereby they pay fixed interest rates and receive variable ones. These interest rate

<sup>22</sup> All stated effects of the simulation experiment are based on the assumption of unchanged policies and unchanged circumstances.

Chart 17 Net interest income of banks increased over the past years

As a percentage of balance sheet total; interest income and expenditure, excluding interest rate swaps, four-quarter moving total.



swaps limit the positive effects of an interest rate drop on net interest earnings, thereby also limiting the ultimate effect on net earnings.<sup>23</sup> Another important aspect here is to what extent banks adjust the interest rates on their loans and deposits to market interest rates. Between 2009 and 2014, interest margins on mortgage loans remained fairly high, but banks have not let their interest rates on retail deposits drop fully in line with money market rates in the past years. In addition, the downward trend in interest rates has also beneficially affected credit losses of banks, as the reduced interest rates have lowered the interest burden of debtors. And finally, bank bond portfolios have also gained value owing to the interest rate drop, but the overall effect is only small as bank bond portfolios valued at market rates are relatively small (about 8% of balance sheet total).

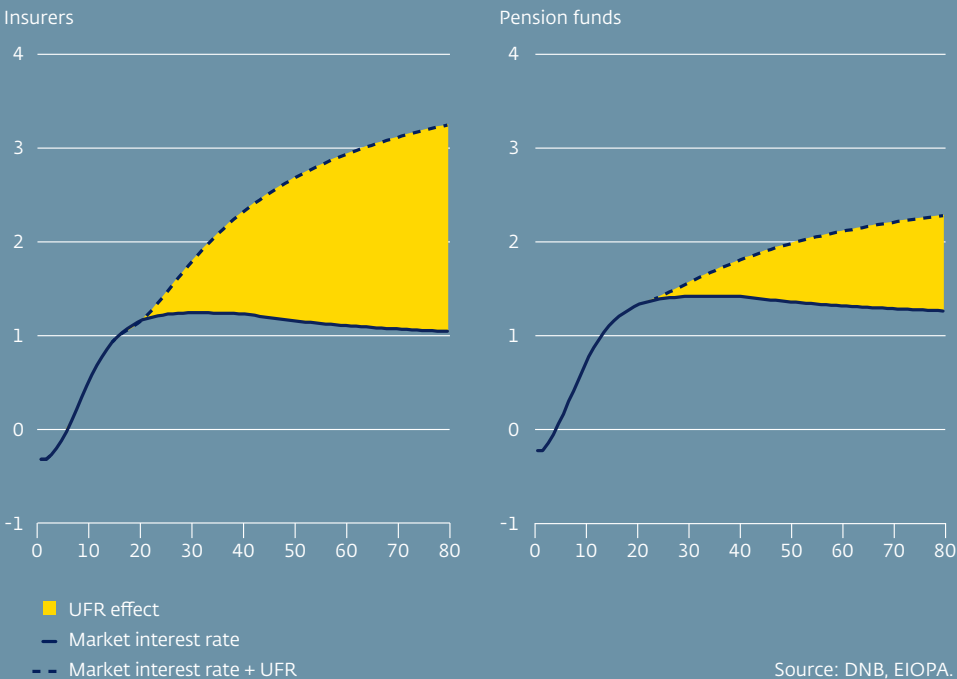
<sup>23</sup> Raymond Chaudron, Bank profitability and risk taking in a prolonged environment of low interest rates: a study of interest rate risk in the banking book of Dutch banks, DNB Working Paper, 2016, No. 526.

Box 5 The ultimate forward rate for pension funds and insurers

The liabilities of pension funds and insurance companies are valued based on a yield curve. This means that expected future cash flows are discounted against current market interest rates. For their long-term liabilities, these institutions are, however, permitted to use the ultimate forward rate (UFR). The UFR values liabilities with maturities over 20 years based on a yield curve that converges towards a fixed level. This approach has been chosen because the market for financial products with very long maturities is insufficiently deep, liquid and transparent.

Chart 18 Effect of the UFR on the yield curve for insurers and pension funds

Based on early 2017 data; interest rates in percentages (vertical), maturity in years (horizontal).



The UFR for insurers is determined at European level and is currently 4.2%, which means that liabilities longer than 20 years, are discounted at sharply higher interest rates than market interest rates (Chart 18). EIOPA, the European Insurance and Occupational Pensions Authority, recently developed a new method for determining the level of the UFR, which will cause it to drop gradually to 3.65% in the years ahead, which is still above the current market rates. DNB determines the UFR for pension funds based on a method that includes more

market data than the European UFR mechanism for insurers. This alternative approach for pension funds has been applied since 2015, and leads to a UFR that deviates substantially less sharply from market interest rates than the UFR for insurers. The UFR for pension funds is based on a 10-year moving average of 20-year interest rates and stood at 2.8% at end March 2017. As interest rates have been very low in the past years, the UFR for pension funds is expected to drop to below 2% within a couple of years. Owing to the use of the UFR, average pension fund funding ratios are currently over 4% higher than calculated based on market interest rates.

Although the recent reduction of the UFR for insurers is a step in the right direction, DNB is nevertheless in favour of ongoing adjustments in the direction of a more market-oriented approach, in line with the methodology adopted for pension funds. This is important in order to obtain a more realistic view on solvency, in particular in a low interest environment.

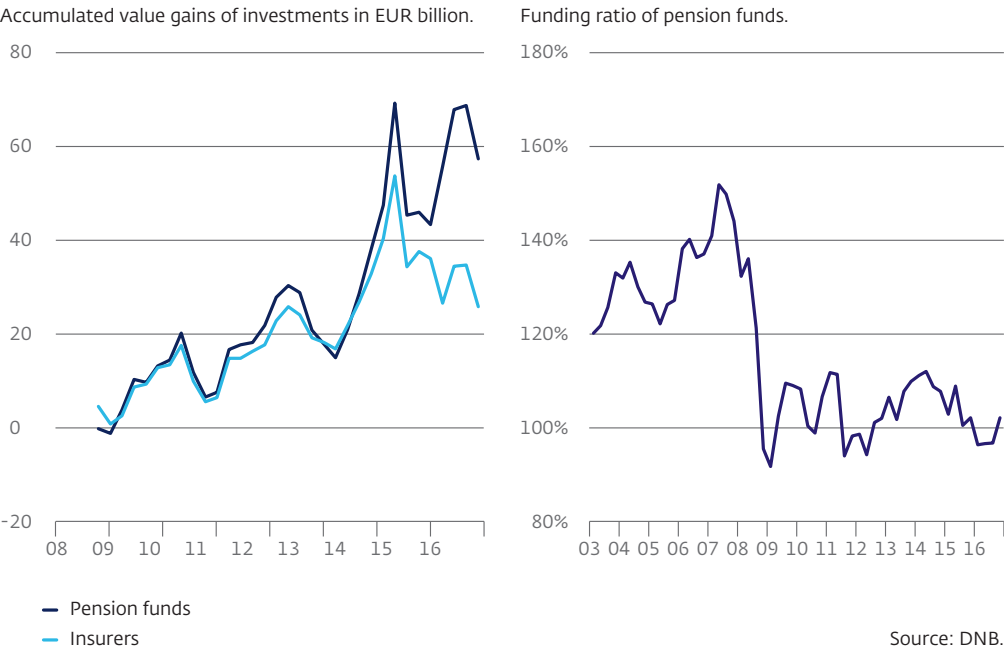
Falling interest rates have negatively impacted pension funds and insurance companies. These institutions have seen the value of their fixed-income portfolios rise owing to falling interest rates (Chart 19, left), but their liabilities jumped at the same time as they are valued based on the yield curve (see Box 5). The increase in liabilities has far outpaced the increase in value of fixed-income investments, as liabilities have longer maturities on average,<sup>24</sup> and they are much bigger in size than fixed-income investments, which only make up a part of assets.<sup>25</sup> Pension funds in particular only partly hedge the interest sensitivity gap between assets and liabilities. On average, pension funds hedge half of their interest rate risk, although there are vast differences between funds.<sup>26</sup> On balance, the interest rate drop has had a negative effect on the financial position, which is evidenced by the quick deterioration of the funding ratio (Chart 19, right). The majority of funds has been forced to take measures these past few years to boost their financial position, including suspension of indexation, curtailments on pension commitments or contribution hikes.

24 In addition, the impact of falling interest rates on increasing liabilities is underestimated. This is due to the fact that pension funds and insurance companies are permitted to use the ultimate forward rate in discounting their long-term liabilities (see Box 5).

25 Non-fixed income assets – equities in particular – are less sensitive to interest rates than bonds. Equities generally benefit from the positive effect that interest rate drops have on asset prices, but low interest rates are historically also associated with periods of modest economic growth, causing pressure on corporate profits and dividend payments.

26 DNB (2015), Rente-afdekking van pensioenfondsen (Dutch only). Analysis requested by the Ministry of Social Affairs and Employment.

Chart 19 Deteriorating solvency of institutional investors despite investment gains



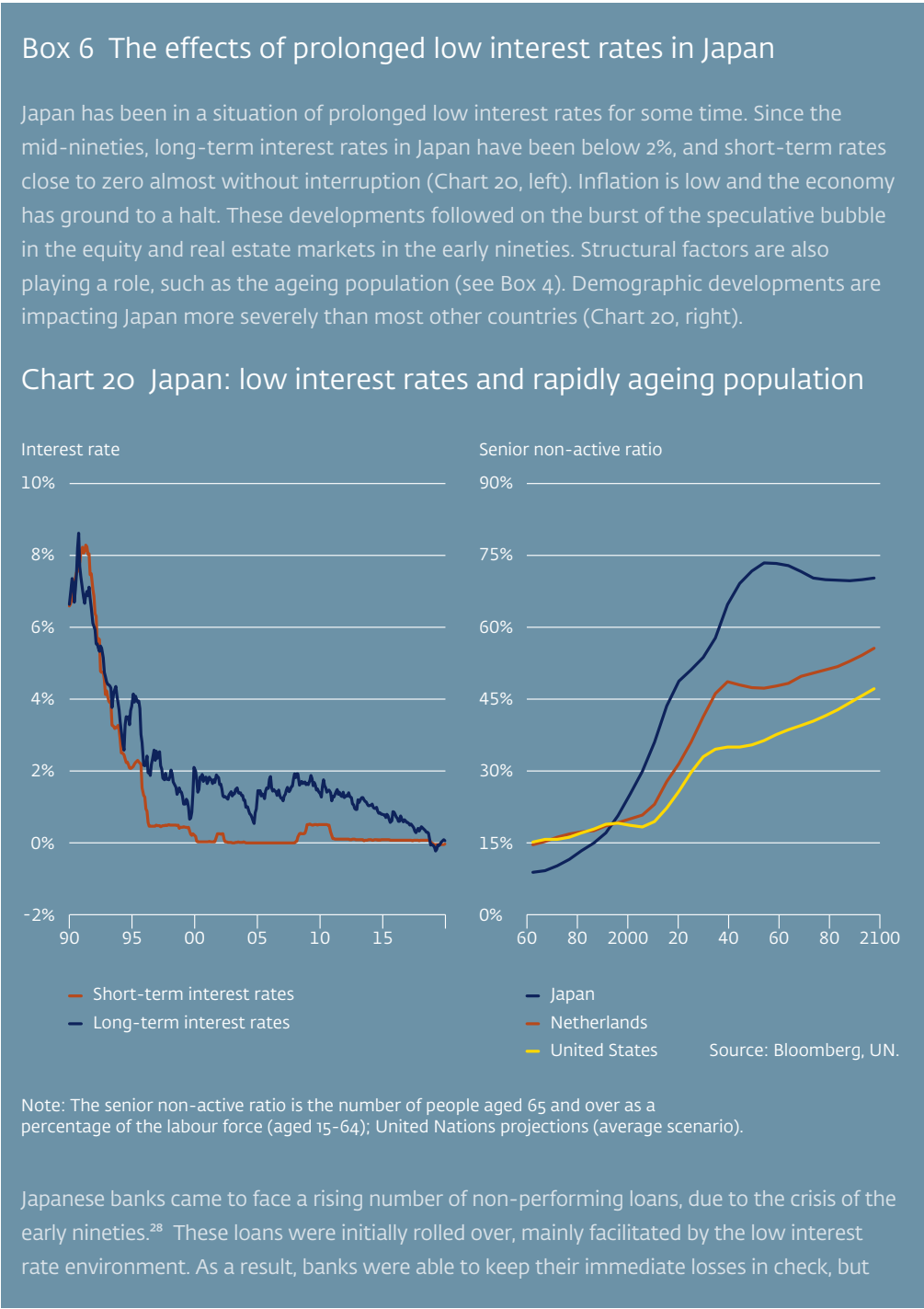
Note: The value of fixed income investments increases when interest rates fall. Presented are the accumulated value increases of investments, including indirect investments through investment funds.

The effects of prolonged low interest rates: a scenario analysis

The remainder of this chapter depicts a scenario where interest rates will remain at low levels for many years, as is the case in Japan (see Box 6). This is in response to the Parliamentary motion put forward by members Schouten, Harbers, and Nijboer, asking the Netherlands Bureau for Economic Policy Analysis and DNB for an analysis of the effects of a prolonged low interest rate environment.<sup>27</sup> Our scenario is based on prolonged nominal and real interest rates, both in the Netherlands and abroad. This assumption should not be seen as a projection, but as a possible scenario.

27 Motion put forward by members Schouten, Harbers and Nijboer, 5 October 2016 (Parliamentary paper 34 550, no. 39): *The House, having heard the deliberations, considering that worldwide interest rates are at a low level and will probably remain so for several years, requests the government to have the Netherlands Bureau for Economic Policy Analysis and De Nederlandsche Bank draw up a broad analysis of the effects of prolonged low interest rates on the public sector, the economy, households, the financial sector including insurance companies, pension funds, banks, lending and the shock resilience of these sectors, and proceeds to the order of the day.*





the downside was that many poorly performing businesses (zombie companies) were kept alive, negatively impacting the growth potential of the Japanese economy. Non-performing loans were not dealt with until after the turn of the millennium and banks were forced to take hefty losses. At the same time the low level of interest rates was eroding interest margins in the banking sector. Small, regional banks were particularly hard hit, as they mainly funded themselves with deposits whose interest rates have a downward cap in the form of the zero lower bound. Larger banks that mainly use financial market funding were affected less severely.

Japanese banks dealt with their problems in different ways. In order to reduce their dependence on net interest income, banks increased their income from other sources, e.g. commissions. They also expanded their activities abroad. The smaller banks in particular made major cost cuts, among other factors by reducing their branch networks and by consolidation within the sector.

### Effects for the real economy

Households are given an incentive to extend their balance sheets even further. The prolonged low interest rates are giving households the opportunity to take out higher mortgage loans at the same interest burden. There is a debt-service-to-income limit in force in mortgage lending, which puts a cap on the proportion of their income that households are permitted to spend on interest payments and redemptions.<sup>29</sup> If interest rates are low, the debt-service-to-income limit is less tight and households' borrowing power increases automatically. At the same time, households are required to make additional contributions to pay towards their pensions, based on their envisaged level of pension payments. Higher pension savings and mortgage debt leads to balance sheet extension, making households more vulnerable to interest rate fluctuations. This is not always the case for home owners with sufficient freely disposable income: the benefits from mortgage interest tax relief will also fall with declining interest rates, which removes the incentive for maximum debt financing. When households see returns on their savings decline, this may stimulate them to finance a larger proportion of the purchasing sum with their own money, or to repay a part of their mortgage debt ahead of schedule.<sup>30</sup> In the Netherlands, wealth accumulation in home-ownership is exempt from taxation on income from savings and investments.

<sup>29</sup> When determining the housing costs limit, actual interest rates may be used for mortgage loans with fixed interest periods of more than 10 years, which are the most common in the Netherlands. For shorter maturities, a minimum reference interest rate applies.

<sup>30</sup> Melanie Hekwolter of Hekhuis, Rob Nijksens and Willem Heeringa, The housing market in major Dutch cities, DNB Occasional Study (2017), 15-1.

**Low interest rates may harm the economy's growth potential.** In a prolonged low interest rate environment, weak businesses can survive relatively easily thanks to cheap funding (see Box 6). An increasing number of faltering businesses may harm efficient allocation of production factors, as these businesses lay a claim on economic production resources, which makes it more difficult for existing, healthy companies to continue growing and for new innovative ones to enter the market. A larger proportion of unhealthy businesses in an economy may therefore be accompanied by lower investments and lower production growth. This also shows from an elaborate study into "zombie firms" by the OECD.<sup>31</sup> Other studies demonstrate that the sharp decline in interest rates since the mid-nineties has contributed towards unfavourable allocation of capital and a downward effect on productivity growth, in particular in several Southern European countries.<sup>32</sup> Limited access to funding for small, but potentially productive firms proves to be an important factor here. There is hardly any detailed research available for the Netherlands about misallocation in relation to low interest rates. Nevertheless, in our country, too, small companies in particular are experiencing funding constraints. What we have learned from the recent studies held in other countries is that prolonged low interest rates are accompanied by an elevated risk of misallocation, which negatively impacts the economy's growth potential.

**Low real interest rates also make it more difficult to stabilise an economy.** On the one hand, there is limited scope for monetary stimulus given the zero lower bound (see below), and on the other prolonged low interest rates may be accompanied by the build-up of financial imbalances in asset prices and credit cycles. Excessive swings in these cycles contribute towards misallocation of capital and erosion of growth potential.

**Businesses and households may become habituated to prolonged low interest rates.** After some time, low interest rates will fully filter through in the form of a lower interest burden for businesses, households, and the public sector, which may cause them to rely on low interest rates too much. As they become more habituated to low interest rates, business and households will lose the incentive to reduce their debts. This may make them increasingly vulnerable to possible future interest rate rises and a growing interest burden. Calculations based on the DELFI model show that an overall 1 percentage point increase will after two years lead to 1.8 percentage points lower corporate investment and 0.9% lower expenditure. The corporate sector in particular will feel the pinch of a possible interest rate hike: almost 60% of corporate loans has a (remaining) interest term of less than one year.

<sup>31</sup> Müge Adalet Gowan, Dan Andrews and Valentine Millot, The walking dead? Zombie firms and productivity performance in OECD countries, OECD Economics Department Working Papers (2017) No. 1372.

<sup>32</sup> Gita Gopinath, Sebnem Kalemli-Oczan, Loukas Karabarbounis and Carlina Villegas-Sanchez (2015), Capital Allocation and Productivity in South Europe, NBER Working Paper No.21453 Gilbert Cetté, John.G. John G. Fernald and Benoit Mojon, The Pre-Great Recession Slowdown in Productivity, European Economic Review (2016), no. 88, pp 3-20.

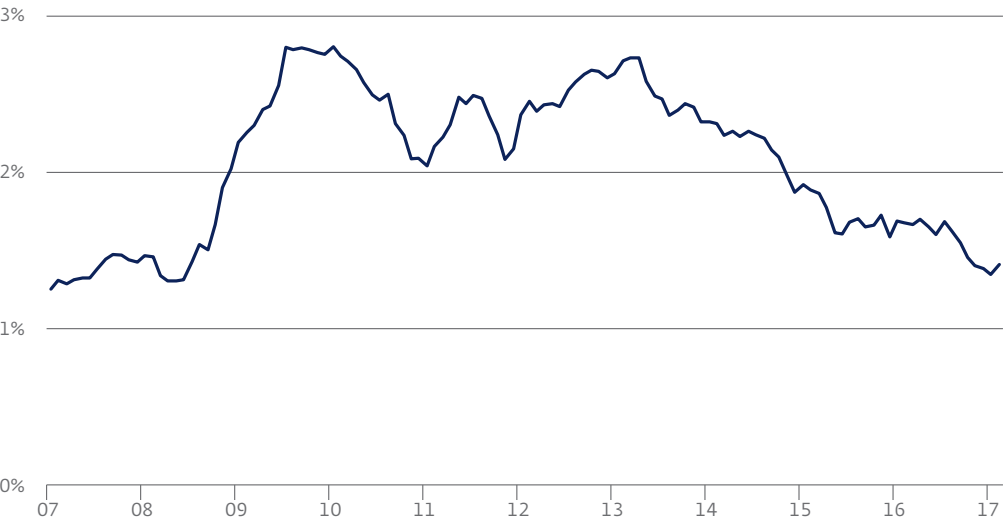
Effects on the financial sector

Banks

The positive effects of low interest rates will gradually ebb away. As indicated above, banks have been able to keep their interest income at acceptable levels in the past years, but if interest rates were to stabilise at a low level, the favourable effects will fade away. The flip-side of the initially positive effect of low interest rates on credit risk is that less financially sound businesses survive, which may in the longer term lead to rising credit losses after all, as experiences in Japan have clearly shown (see Box 6).

Chart 21 Interest margins on existing mortgage loans are shrinking

Interest margin in percentage points.



Source: DNB.

Note: The interest margin is the differential between mortgage interest rates and funding costs. Funding costs are calculated based on the costs of savings, market funding, central bank funding and own funds.

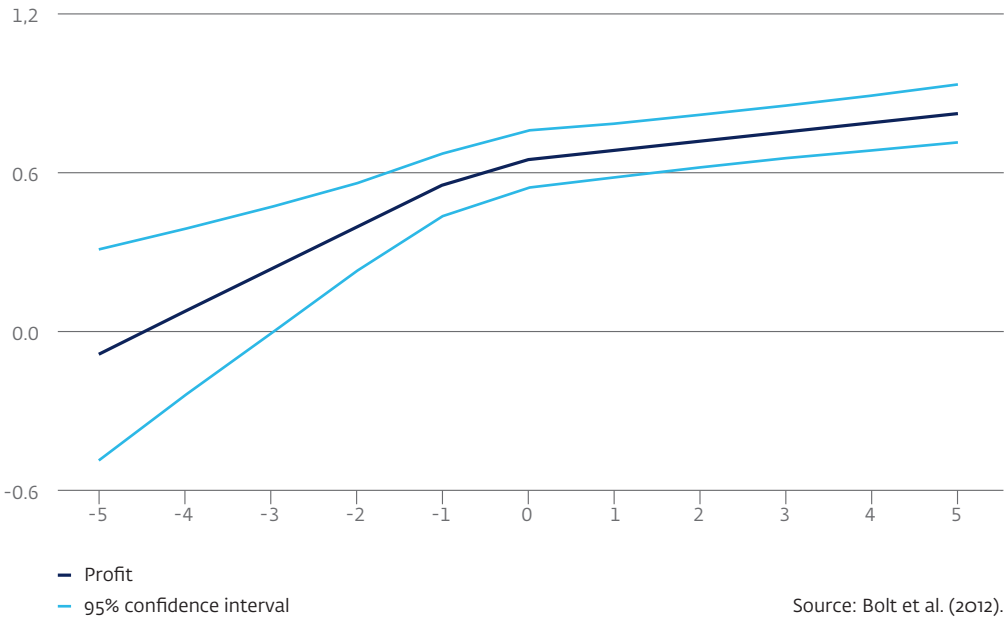
Relatively profitable loans are rolled over against less lucrative conditions. The interest margin on mortgage loans was relatively high especially between 2009 and 2014 (Chart 21). This is partly explained by temporarily waning competition: several suppliers withdrew from the Dutch mortgage lending market during these years, and the European Commission put restrictions on banks that received state support during the crisis. From around 2014, interest margins tightened again, due to new suppliers entering the market and increasing competition from pension funds and insurers, who are finding better yields in the mortgage lending market

than in other fixed-income investments. A large proportion of high-margin mortgage loans dating from 2009-2014 will be rolled over in the years ahead because their fixed-interest rate period is coming to an end. Moreover, a part of these mortgage loans is also redeemed early, when homes are sold and because home owners are using their savings to repay their mortgages. Between 2013 and 2016 one-off additional repayments to an estimated amount of EUR 55 billion were made (see Chapter 1). These two factors will cause the proportion of mortgage loans dating back to relatively high-margin years – which currently still account for about one third of total mortgage loan portfolios – to decline rapidly.

In addition, the zero lower bound is putting bank interest margins under pressure. Especially where retail deposits are concerned, it cannot be assumed that falling market interest rates will continue to translate into lower funding costs. Interest rates close to zero will make it more attractive for customers to maintain cash balances. This effective lower bound, known as the zero lower bound, is approaching; interest rates on retail deposits up to three months in the Netherlands were still at over 3% at end 2008, but had fallen to only 0.31% in March of this year.

Chart 22 Bank profitability declines rapidly in times of negative GDP growth

Bank profits as a percentage of balance sheet total (vertical), real GDP growth in percentages per year (horizontal).

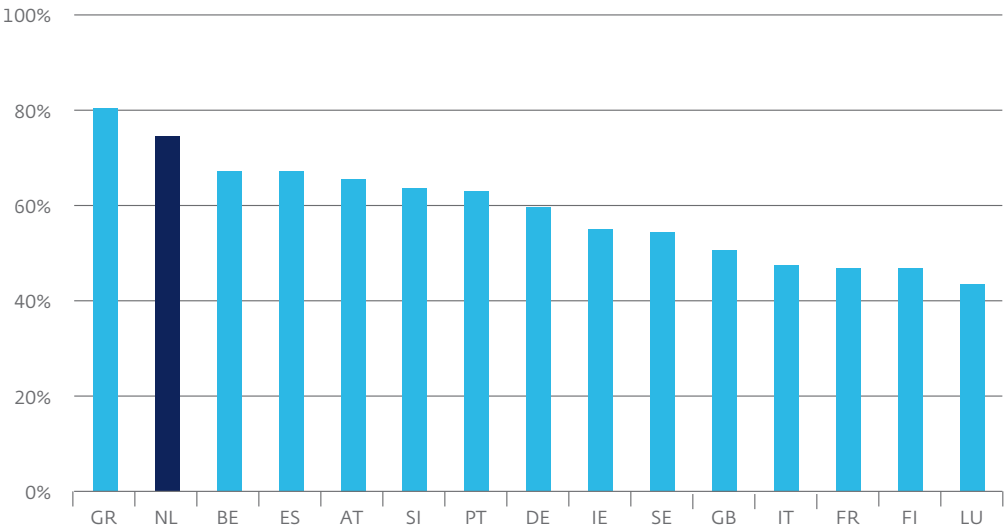


Note: Estimated link between bank profitability and real GDP growth, based on aggregated data of Dutch banks.

Profitability of banks can also come under pressure if low interest rates are accompanied by lower economic growth. In Japan, too, prolonged low interest rates have been accompanied by a structural economic slowdown. Rolling over of loans to insolvent companies, kept non-productive companies alive, which undermined economic productivity (see Box 6). If economic growth is at a lower level on average than previously, it will drop to close to or below zero in times of recession. This means that in times of economic downturns, credit losses will rise more sharply than before, when downturns were characterised by slowing growth without economic contraction. Research has shown that bank profitability not only declines in times of lower economic growth, but that the decline accelerates if economic growth turns negative (Chart 22). This is to a large extent attributable to the fact that banks make more provisions to cushion higher credit losses.

Chart 23 Dutch banks depend on net interest income

Net interest income as a percentage of total income; 2016 Q3.



Source: ECB.

Banks can underpin their profit margins by increasing their income from other sources, and saving costs. An obvious response of banks to their shrinking interest margins would be to increase their income from other sources. This is especially relevant for Dutch banks, as they are more dependent on interest income than banks in most other countries are (Chart 23). They can do this for example by directly charging for payment services, or by developing new profitable activities. A second option is saving costs. Dutch banks have already implemented large-scale cost saving schemes and have announced that they intend to achieve further retrenchment in the years ahead.<sup>33</sup>

33 Tijmen Daniëls and Shahin Kamalodin, Return on equity of large Dutch banks, DNB Occasional Study (2016), No. 14-5

## Pension funds and insurance companies

Amid prolonged low interest rates, returns of pension funds and life insurance companies will come under pressure, making it more difficult for these institutions to meet their commitments. When interest rates stabilise at low levels, these institutions no longer profit from value increases on their bond portfolios. For insurers, lower income from investments may become a problem as they issued guaranteed minimum returns to their policy holders. Although Dutch life insurers are issuing fewer – and less high – guarantees on new contracts than they used to, around 40% of their long-term commitments still consist of (old) policies, where on average a return of 3.6% is guaranteed. Pension funds are facing a similar challenge, as the majority of pension schemes in the Netherlands are defined benefit schemes. Such schemes include commitments about the level of pension benefits, and generally have the ambition to index-link them to wage or price developments.

Pension funds are more sensitive to interest rate risk than life insurers, but they also have relatively more recovery options. On average, pension funds enter into longer-term commitments than insurers and they invest a smaller proportion of their assets in fixed-income investments. This gives them a larger interest rate mismatch, which makes their funding ratio highly sensitive to interest rate movements. At the same time, guarantees issued by pension funds are less rigid than those given by insurers: pension funds can decide to abandon indexation, and if needed take recourse to curtailing nominal pension entitlements, or even review the future pension contract (in consultation with the social partners). The new Financial Assessment Framework, which has been in force since 2015, gives pension funds more time before they have to resort to curtailments and allows them to spread curtailments more over time.

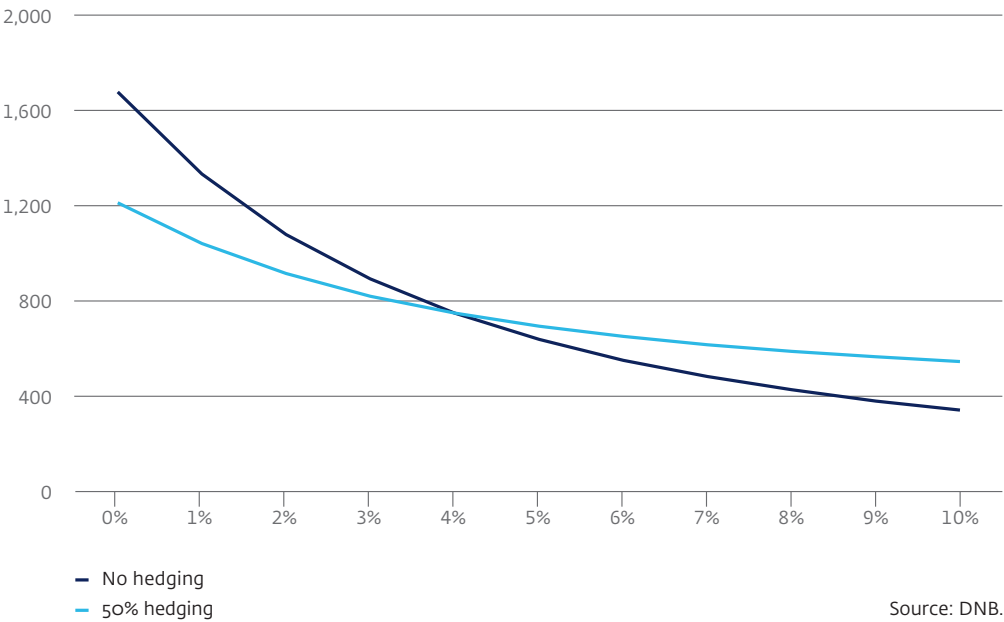
Low interest rates are inducing pension funds and insurance companies to look for new investment opportunities. The growing role that institutional investors are playing in issuing of mortgage loans, which have higher interest rates than Dutch government bonds for instance is a case in point (see Chapter 1). Their search for yield may also prompt pension funds and insurers to increase their risk profiles, as higher risks on the whole offer the prospect of better expected returns. As this also makes institutions more vulnerable, search for yield opportunities are curbed by prudential supervision. Underfunded pension funds are for instance not permitted to increase the risk profile of their investments.

Recent stress tests confirm that Dutch pension funds and insurance companies are vulnerable to prolonged low interest rates. In 2015, a European pension fund stress test was performed. It revealed that Dutch pension funds are vulnerable and have hardly any buffers to absorb shocks like further interest rate drops. In 2016, a European stress test was held among life insurers, focusing on the risks of low interest rates. This test also showed that Dutch life insurance companies are vulnerable to low interest rates, due to the maturity gap between commitments and investments, and because they issued relatively high guaranteed returns.

In addition, the interest rate sensitivity of long-term investments grows when interest rates are low. This may cause commitments and investments amid prolonged low interest rates to fluctuate more sharply than in the past. Chart 24 shows the convex relationship between the level of interest rates and total commitments of Dutch pension funds. The interest rate sensitivity of commitments is partly offset by fixed-income investments that also show a stronger response amid low interest rates. This compensation is, however, incomplete as fixed-income investments only make up a part of total investments and are less interest sensitive anyway than commitments.

Chart 24 Pension commitments extra interest sensitive at low interest rates

Pension commitments (vertical; EUR billion) vs actuarial interest rate (horizontal).



Note: Pension commitments at end 2015 at different interest rates, constant for all maturities (i.e. flat yield curve). Basis at 50% coverage is 4% interest, which was approximately the situation in 2008.



Pension funds and insurers have different ways of responding to low interest rates. First of all, it is important that they adjust their ambition levels. This may mean that insurers and pension funds issue fewer guarantees, e.g. by a further shift in the direction of no guarantee products (unit-linked, defined contribution pension schemes) or products with less long-term guarantees. If contributions are not sharply raised, it may be necessary to make downward adjustments to pension benefits. The switch to defined-contribution schemes may help curb contribution hikes, and therefore shift adjustments to pension ambitions mainly. In order to limit increased interest rate sensitivity at low interest rates (Chart 24) it may help to tune investments better to commitments. Institutions could also hedge more interest rate risk with interest rate swaps.

Impact of low interest rates

	Falling interest rates	Prolonged low interest rates
Real economy		
Households	Falling interest rates Deterioration of pension prospects	Risk of habituation Incentive for balance sheet extension
Corporate sector	Declining interest burden, in particular for larger firms	Risk of habituation
Public sector	Falling interest rates	Risk of habituation
Total	Support of the economy	Erosion of growth potential Limitation of monetary policy scope
Financial sector		
Banks	Decreasing funding costs Bonds increase in value Decreasing credit risks	Erosion of interest margin
Pension funds and insurance companies	Bonds increase in value Erosion of solvency	Returns under pressure Search for yield

## Policy messages

**Low interest rates are posing a challenge to the ECB.** The accommodating monetary policy stance of the past years has counteracted deflationary tendencies and contributed to the economic recovery in the euro area. At the same time, this policy is reaching its limits and is increasingly less effective. Its current side-effects including strong price increases in financial markets, erosion of the financial position of financial institutions, and the risk of habituation are becoming increasingly serious.

**Prolonged low interest rates are accompanied by new risks.** Parties that may profit in the short term will face risks if the low interest environment persists. Habituation to low interest rates may give rise to excessive debt accumulation, which may induce vulnerabilities if interest rates start to rise again in the future, or if economic growth remains weak for a prolonged period of time. Persistently low interest rates may also put the business models of financial institutions under increasing pressure, which may cause these institutions to search for yield in new and riskier investment opportunities. And finally, economic growth potential may be eroded by prolonged low interest rates.

**In order to assess the vulnerability of pension funds and insurance companies in time, adequate valuation of their commitments is essential.** Consistent valuation of both investments and commitments based on current value will immediately bring to light the effects of low interest rates. This is a strong incentive to take decisive action on the business models of insurance companies with long-term commitments and to make the pension system future proof. The recent adjustment of the actuarial interest rate for insurers, which puts more emphasis on current market rates, is a step in the right direction (see Box 5). We welcome ongoing adjustments of the actuarial interest rate for insurers in the direction of a more market-driven approach, in line with the approach taken for Dutch pension funds.

**Low interest rates are also offering opportunities to accelerate structural reforms.** Low interest rates for instance make it easier to reduce mortgage interest tax relief. This has now been spread over a long period of time, but the process could be accelerated. In addition, the Netherlands is facing an enormous challenge to make the transition to a more sustainable economy and move to carbon neutral energy sourcing.<sup>34</sup> This also is a gradual process that requires large investments. The current low interest rates enable major steps to be made in the near future to prepare our economy for a sustainable future ahead of schedule.





























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34 Guido Schotten, Saskia van Ewijk, Martijn Regelink, Diederik Dicou and Jan Kakes, Time for transition: towards a carbon-neutral economy, DNB Occasional Study (2016), No. 14-2



# Annex 1: Macroprudential indicators

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	Most recent observation	Min	Max	Trend after 1998	
				Average	Period under review
Credit conditions					
Trend deviation credit/GDP ratio <sup>1</sup>	-20.3	-21.1	17.1	-0.1	 1998Q1-2016Q4
Growth of household lending (y-o-y)	0.9	-2.0	17.1	6.6	 1998Q1-2016Q4
Growth of non-financial corporations lending (y-o-y)	2.8	-4.3	16.8	3.8	 1998Q1-2016Q4
Credit terms for non-financial corporations <sup>2</sup>	-19	-48	98	10	 2003Q1-2017Q1
Credit terms for residential mortgages <sup>2</sup>	-53	-53	98	17	 2003Q1-2017Q1
Leverage					
Leverage ratio CRD IV, fully loaded <sup>3</sup>	4.5	3.4	4.5	3.8	 2014Q1-2016Q4
Tier 1-capital/balance sheet total of the banking sector (up to 2013 Q4)	5.0	3.0	5.0	3.9	 1998Q1-2013Q4
CET1 ratio of banks CRD IV, based on transition rules	15.7	13.6	15.7	14.5	 2014Q1-2016Q4
Tier 1 ratio of banks based on CRD III (up to 2013 Q4) <sup>4</sup>	12.5	8.2	12.8	10.0	 1998Q1-2013Q4
Household debt (% GDP)	107.6	65.4	118.1	100.7	 1998Q1-2016Q4
Non-financial corporations debt (% GDP)	107.0	101.7	121.9	111.4	 1998Q1-2016Q4
Real estate market					
Growth in house prices (y-o-y)	7.2	-9.9	20.0	4.0	 1998Jan-2017March
Growth in commercial property prices (y-o-y)	5.4	-7.8	9.4	2.0	 1998Q1-2016Q3
Loan-to-value ratio for first-time buyers <sup>5</sup>	97.5	97.3	100.7	98.8	 2005-2016Q4
Loan-to-income ratio for first-time buyers <sup>6</sup>	390.0	390.0	450.0	414.2	 2005-2016
Interest rates on new mortgage loans 5-10 years (bp)	231.7	227.7	552.8	440.4	 2003Jan-2017Feb
Bank liquidity					
Loan-to-deposit ratio <sup>7</sup>	149.6	149.6	195.2	174.1	 1998Q4-2016Q4
Proportion of market funding with maturities < 1 year	27.9	16.6	38.3	29.7	 2003Aug-2016Dec
Systemic importance					
Size of bank balance sheets (% GDP)	363.8	306.5	562.5	417.3	 1998Q1-2016Q4
Share of G5 banks in balance sheet total of the banking sector <sup>8</sup>	84.7	79.9	90.3	86.9	 1998Q1-2016Q4
Rating uplift of systemically important banks (in steps) <sup>9</sup>	1.0	1.0	2.3	2.0	 2012-2016
International risks					
Long-term interest rates (bp) <sup>10</sup>	49.8	2.7	566.6	334.0	 1998Jan-2017Apr
BAA-AA risk premium (bp) <sup>11</sup>	94.0	81.0	463.0	170.9	 2001Jan-2017Apr
Risk premium in money market (bp) <sup>12</sup>	2.9	1.2	186.0	21.5	 1999Jan-2017Apr
Risk premium on senior unsecured bank bonds (bp) <sup>13</sup>	57.7	12.6	321.5	85.1	 1999Jan-2017Apr
Financial stress index <sup>14</sup>	-0.13	-0.57	3.18	0.21	 1999Dec-2017Apr
Global credit growth of non-financial corporations (y-o-y) <sup>15</sup>	6.3	-5.8	20.3	6.2	 2000Q1-2016Q3
Global growth in house prices (y-o-y)	2.5	-7.9	10.5	2.9	 2001Q1-2016Q3

Concentration of exposures of Dutch banks<sup>16</sup>

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	Netherlands	Abroad	2016Q4
Total of debt securities and loans	49.9	50.1	
Central bank	2.3	1.2	
Governments	6.7	6.1	
Credit institutions	1.3	11.3	
Other financial institutions	2.0	5.4	
Non-financial corporations	11.9	17.1	
Of which: Small and medium-sized enterprises	2.6	3.6	
Of which: Commercial real estate	4.7	3.0	
Households	25.8	8.9	
Of which: Mortgage loans	24.5	7.7	
Of which: Consumer credit	0.7	0.8	

Sources: Bloomberg, BIS, CBS, DNB, IMF, IPD, Moody's, Thomson Reuters  
Datastream. Figures are expressed in percentages, except when otherwise indicated  
Bp = basis points.

1 The difference between a) the ratio of lending to the non-financial private sector and Dutch GDP and b) the long-term trend for that ratio as calculated in ESRB (2014), Occasional Paper No. 5 *Operationalising the countercyclical capital buffer: indicator selection, threshold identification and calibration options*.

2 The proportion of banks tightening credit conditions and easing credit conditions, with a positive number reflecting a net tightening and a negative number reflecting net easing.

3 Calculated based on the most recent definition of leverage ratio as agreed by the Basel Committee in January 2014.

4 The Tier 1 ratio reported here includes the Basel I floor.

5 The ratio of the amount of the mortgage to the value of the property at the time the mortgage is taken out. First-time buyers are defined as individuals younger than 30 at the time the mortgage is taken out. DNB estimate based on a sample of Dutch mortgage loans.

6 The ratio of the amount of the mortgage to the income of the borrower at the time the mortgage is taken out. First-time buyers are defined as individuals younger than 30 at the time the mortgage is taken out. DNB estimate based on a sample of Dutch mortgages.

7 The ratio of loans (including securitised loans) to deposits made by the domestic non-financial private sector.

8 The five largest Dutch banks' assets (ABN AMRO, ING, Rabobank, SNS Bank and BNG) as a percentage of the Dutch banking sector's total assets.

9 The difference between credit ratings including and excluding government support, based on Moody's methodology. This is an average of ABN AMRO, ING, Rabobank and SNS Bank, weighted by balance sheet total.

10 Yields on Dutch ten-year government bonds.

11 The yield differential between international BBB-rated corporate bonds and international AA-rated corporate bonds.

12 The difference between three-month EURIBOR interest rates and the three-month EONIA swap index.

13 The yield differential between European senior unsecured bank bonds and five-year swap rates.

14 Index based on indicators of Dutch equity, bond and forex markets.

15 Development of lending to the non-financial private sector in all countries reporting to the BIS.

16 The share of Dutch and foreign counter sectors in the exposures of all Dutch banks, based on reported consolidated figures for supervisory purposes.

# Annex 2:

## FSR follow-up monitor

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This annex provides an overview of the follow-up given to the recommendations made in previous editions of our FSR. Our purpose is to be transparent about the pursued actions, and to keep abreast of the progress made. The risks identified in the FSR are addressed via different channels. The FSR contributes towards creating timely awareness and calls for tangible policy adjustments. DNB also deploys micro-and macroprudential instruments.

### System-wide

#### Low interest rates

##### Including resilience against an upward interest rate shock (spring 2016)

The tightened LTV and LTI limits have made households less vulnerable to upward interest rate shocks, but further steps are required. For instance, further reduction of the LTV limit to 90% and accelerated phasing out of mortgage interest tax relief in order to reduce the incentive for excessive debt financing. More balanced tax treatment of debt and equity of businesses is also important to bolster their resilience in the longer term. Below, we will discuss our recommendations on the effects of low interest rates on financial institutions.

#### Remuneration policy

##### Perverse incentives from variable remuneration (spring 2015)

The Remuneration Policy (Financial Enterprises) Act (*Wet beloningsbeleid financiële ondernemingen - Wbfo*) came into force in early 2015. This Act primarily focuses on preventing and counteracting irresponsible incentives contained in variable remuneration. After the Act came into force, financial institutions amended their policies accordingly. In 2017, the Ministry of Finance will evaluate the Act's effectiveness and possible side-effects. Based on the outcome of the evaluation, we may determine whether an actual cultural change has been achieved.

#### FinTech

##### The rise of technological innovation in the financial sector (spring 2016).

DNB and the AFM facilitate technological innovation by means of an inquiry service for all market participants (InnovationHub) and partial made-to-measure licences (Regulatory sandbox). We are examining the effects of FinTech on the business models of existing institutions, and in 2016 launched a survey into innovation strategies at the large Dutch banks. In 2017, a comparable study will be held in the insurance sector. These studies will provide us with a better understanding of the risks that FinTech poses to financial stability.

## Cyberthreats

### Resilience against cyberthreats (autumn 2014)

DNB contributed actively to the international guidelines published in 2016 for financial market infrastructures to bolster resilience against cyberthreats. These guidelines are intended as a supplement to the "principles for financial market infrastructures" published in 2012, and in 2017 we plan to introduce the TIBER framework for simulating cyberattacks and testing resilience against these attacks. We will also monitor the level of information security at financial institutions in 2017.

## Brexit

### The United Kingdom's exit from the European Union (autumn 2016)

There has been no immediate market unrest following the UK's decision to leave the EU. Due to the uncertainty surrounding the exit process, the final agreement, and its effects on financial stability, we will continue to monitor closely the effects of Brexit on financial stability.

## Banks

### Low interest rates

#### Effects on business models (autumn 2016) and return targets (autumn 2014)

In 2016, we held several on-site examinations into interest rate risk management in a low interest environment. In 2017, we will continue with a sector-wide examination at individual institutions into the impact of low interest rates on profitability and bank business models. The ECB and the national competent authorities will also perform a stress test fully aimed at interest rate risk. We will continue monitoring whether banks are increasing their risk profiles to underpin profitability.

### Commercial real estate

#### Varying price trends and structural factors (autumn 2015)

In order to manage the risks of commercial real estate effectively, DNB is committed to achieving more transparency and better real estate market data. We will also examine banks' commercial real estate portfolios in 2017.

## Non-performing loans

Non-performing loans on bank balance sheets and deficiencies in insolvency legislation (autumn 2016).

At the end of 2016, the European Commission published a legislative proposal to harmonise and update insolvency legislation in Europe. This minimum harmonisation is aimed at making insolvency procedures quicker and cheaper. The secondary market for non-performing loans in Europe is still quite small. The ECB and the national competent authorities are committed to making banks reduce their elevated levels of problem loans, based on their harmonised approach. There is a large number of non-performing loans on European balance sheets, which continues to threaten European financial stability.

## Treatment of public debt

Preferential treatment of public debt (autumn 2015)

The treatment of public debt in legislation and regulations is the subject of an international policy debate. In European and global forums DNB is championing regulation of public sector exposures to banks by means of introducing minimum risk weights and limiting balance sheet concentration.

## Liquidity risks

Dependency on market funding (Spring 2013) and reduced market liquidity (autumn 2015)

Basel III includes quantitative liquidity requirements in the form of the liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR). The majority of Dutch banks complies with the statutory LCR requirement of 100% already in place. The NSFR is currently being worked out at European level into a statutory requirement. The deposit funding gap has narrowed in the past years, among other things owing to the bigger role that insurance companies and pension funds are playing in the mortgage loan market as our research has shown.<sup>35</sup> Building up of buffers and decreasing dependence on market funding reduce liquidity risk.

## Ineffective bail-in

Credibility of the bail-in instrument (autumn 2013 and spring 2015)

The global policy debate on loss absorption capacity has culminated in a minimum requirement, the total loss absorbing capacity (TLAC). The EU is currently implementing this global standard based on a legislative proposal for adjustment of the determination of the minimum requirement for own funds and eligible liabilities (MREL) in the Bank Recovery and Resolution Directive published by the European Commission at the end of 2016. In the meantime, the Single Resolution Board in 2016 set indicative MREL targets in the context of the Single Resolution Mechanism (SRM) that must be converted to MREL requirements in 2017. As national resolution authority DNB is closely involved in these policy discussions and is concentrating on operationalising its resolution instruments. As part of this effort, we

<sup>35</sup> DNB (2016), Credit markets in motion



communicated our vision on the operation of the bail-in instrument in a consultation paper published in 2016. We plan to complete this in 2017. Rating agencies now no longer include the possibility of state support in their ratings of systemically important banks. In order to increase the credibility of the bail-in instrument further, it is important that banks build up a sufficient layer of bail-inable debt and that national and international policy initiatives preventing banks from investing in each other's bail-inable debt are effectuated.

### **Strengthening capital buffers**

[Banks are required to strengthen their capital positions \(autumn 2011\)](#)

The rise in CET1 ratios proves that capital buffers have been reinforced. These higher capital buffers have bolstered the banking sector's resilience against unexpected losses.

## **Insurers**

### **Low interest rates**

[Erosion of financial position \(spring 2015 and other publications\), guaranteed returns \(spring 2013\) and solvency calculations based on UFR \(Spring 2015\)](#)

DNB expects capital and dividend policies of insurance companies to include economic parameters. As EIOPA recently reviewed its methodology, the UFR is gradually being brought more in line with market interest rates. This will contribute towards a more realistic picture of the solvency position. Guaranteed returns issued in the past are difficult to achieve in a low interest environment and may put solvency under pressure. DNB monitors that insurers adequately value these guarantees and that they proceed with care when issuing new guaranteed returns.

### **Sustainability of business models**

[The sustainability of insurance business models \(Spring 2015\)](#)

Life insurers are facing prolonged low interest rates and declining premium income, which is why we are urging these firms to make their business models ready for the future. Follow-up examinations in 2016 have revealed that insurance companies have started working on this, but that they still have some way to go. DNB's Vision on the insurance sector published in 2016, emphasises the necessity of future-proofing business models.<sup>36</sup> DNB is monitoring progress closely. This risk is as relevant as ever, and it is therefore important that DNB is enabled to orderly resolve insurance companies if necessary. To this end, we work together with the Ministry of Finance on enhancing the recovery and resolution framework, which is expected to come into effect in 2018.

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<sup>36</sup> DNB (2016), Vision on the future of the Dutch insurance sector

### Unit-linked insurance policies

#### Claim risk and duty of care in unit-linked insurance policies (autumn 2011)

Under Solvency II, insurance companies are required to recognise claim risk of unit-linked insurance policies at an early stage and make provisions for this in the balance sheet if necessary. DNB has pointed this out to the insurance sector and will continue to do so. Unit-linked insurance portfolios are shrinking, but claim risk continues to overhang the market. Together with the AFM we are monitoring the follow-up that the insurance sector is giving to activating holders of unit-linked insurance policies taken out in the past.

## Pension funds

### Low interest rates

#### Erosion of financial position (spring 2015 and other publications)

In the pension sector we will continue emphasising together with the AFM and as a follow-up to our 2016 examination "financial structure and information" that pension funds correctly and transparently inform their members on possible curtailments and failure to provide index-linking. In addition, the low interest environment is exposing the vulnerabilities of the current pension system and the necessity of reforms.

### Sustainability of the pension system

#### Sustainability of the pension system (autumn 2011)

We are providing input on the future of the pension system in several committees. To ensure that pension funds are prepared for the transition to a new pension contract, we will in 2017 examine the sector's capacity for change, and the robustness of pension administrations. We expect pension funds with elevated vulnerability to address this, i.e. to resolve their activities in an orderly fashion.

## Central counterparties

### Ineffective resolution

#### Orderly resolution in case of bankruptcy (spring 2014 and spring 2015)

In November 2016, the European Commission published a proposal on recovery and resolution of central counterparties. This has laid the legal foundations for orderly resolution of central counterparties at European level. The FSB will issue its own guidance mid-2017. DNB is contributing actively to the international policy debate. Due to the systemic importance of central counterparties, orderly resolution of central counterparties in the event of bankruptcy is as relevant as ever. In order to ensure this, it is important to put legislation into place and have resolution plans drawn up.



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