Overview of Financial Stability

DeNederlandscheBank

EUROSYSTEEM

De Nederlandsche Bank Overview of Financial Stability

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Introduction

DNB is responsible for overseeing financial stability in the Netherlands, a task that is 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.

DNB publishes its Overview of Financial Stability (OFS) every six months. The OFS 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 publishes the OFS to make stakeholders – financial institutions, policy makers and the public – aware of systemic risks and the potential impact of shocks to the financial system. Where possible, DNB uses macroprudential instruments and issues policy recommendations to curtail these systemic risks.

The OFS does not include projections, but analyses possible scenarios. Chapter 1 lists the main current risks to financial stability in the Netherlands. It also includes a risk chart that summarises the main risks to financial stability discussed in this and previous issues of the OFS. The next chapter discusses the current use of macroprudential instruments that were developed specifically with a view to combating systemic risks. The last two chapters discuss other relevant financial stability themes, namely (i) risks of habituation to prolonged low interest rates and (ii) the implications of technological innovation for financial stability.

1 Overview of Financial Stability

Priorities and recommendations

- The past few months saw international financial market turbulence and a flight to safe haven assets. Equities and hybrid bank debt suffered severe corrections. Dutch banks were also hit by this negative sentiment, but are in a relatively good position where profitability and capitalisation are concerned, also because they anticipated on the introduction of systemic buffers. As a result of macroeconomic conditions and the recent ECB policy measures, it is expected that interest rates will remain low for the time being. This will negatively impact the solvency of pension funds and insurance companies in particular. In addition, prolonged low interest rates could lead to habituation; this may cause problems for highly indebted households and non-financial corporations when the interest rate eventually returns to normal levels.
- The Dutch economy is recovering and the housing market is picking up. The high level of mortgage debt in the Netherlands, however, continues to be a significant domestic vulnerability. As the housing market is expected to continue on its upward trend in the months ahead, the next government would be advised to continue the measures initiated by the current government to increase the shock resilience of the housing market in the years ahead. The loan-to-value ratio (LTV) limit could be lowered gradually to 90%, and the curtailment of mortgage interest tax relief may be accelerated. Vulnerable groups would do well to use the current low interest burden to improve their financial resilience. Households that have high and mainly interest-only mortgage loans are vulnerable if interest rates return to more normal levels.
- Technological innovation in the financial sector is on the advance. Financial technology (FinTech) may benefit financial stability and offers a great deal of opportunities for the financial sector, but it also entails risks. DNB plays a role of influence in the growth perspectives of FinTech in the sense of its authorisation policy and the public statements that it makes. Like its foreign peers, DNB endeavours to find a measured balance between being open to new initiatives while keeping a careful eye on the risks that they may pose to financial stability. The financial sector should be well prepared to meet the challenges of FinTech.

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Risk map



The risk map presents a schematic overview of the main risks to financial stability as discussed in the current and previous issues of the OFS. The size of the circles reflects the magnitude of the risk. The colour of the circles reflects whether viewed over the medium term, a risk increases (red), decreases (green) or remains unchanged (grey).

International developments

Financial market stress has been increasing since mid-2014 with the past six months witnessing a flight to safe haven assets. Volatility in the financial markets relevant to the Netherlands has increased (Chart 1). The growing risk aversion sharply depressed the prices of high-risk securities. This included equities, commodities and corporate bonds with low credit ratings (Chart 2). At the same time, prices of safe haven investments, like investment grade government and corporate bonds, rose.

Chart 1 Increasing financial market stress



Stress-index, based on indicators of equity, bond and forex markets relevant to the Netherlands and a health index of financial institutions.

The increased nervousness is partly induced by concerns over disappointing economic data. The direction of the Chinese economy continues to be uncertain, although growth in China has not slowed down to a significant extent. The uncertainty has induced a capital flight (Chart 3). Concerns spread to other emerging economies, as they are often dependent on China, or on exports of commodities, which saw sharp price drops. This applies to oil in particular. Lower oil prices have a positive effect on oil importing countries, but have a negative impact on oil and gas companies. This may spread to the economies of oil-producing countries and to financial markets, for instance because oil and gas companies account for a big part of the high-yield bond market. Recently, market participants have been showing growing concern about the growth prospects of advanced countries. The most recent OECD and ECB estimates have revealed that advanced economies are expected to grow less vigorously in 2016 than predicted previously. In addition, there is uncertainty in the market about a possible Brexit, the consequences of which are difficult to predict (Box 1).

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Chart 2 Flight into safe haven assets

Price trends in percentages since 7 October 2015.



Current position (8 April 2016)

Source: Thomson Reuters Datastream.

* Price trend since ABN AMRO's IPO on 20 November 2015.

** Index to track the performance of contigent convertible (coco) debt paper compiled by the Bank of America.

Central banks are still pursuing an accommodating monetary policy, due to fragile economic recovery and low inflation. In the past years, policy rates were brought down to exceptionally low levels and unconventional monetary policy measures were introduced, including longer-term refinancing operations for banks and large-scale bond market purchase programmes. In January of this year, the Bank of Japan surprised investors by cutting its interest rates on new deposits into negative territory (-0.1%). The ECB and the Swedish central bank had already decided to take a similar step, with the ECB lowering its interest rates further in March, causing its deposit rate to end up at -0.4%. The ECB also extended its asset purchasing programme to EUR 80 billion a month, from EUR 60 billion. The Federal Reserve (Fed) was the first to begin tightening monetary policy at the end of 2015, by slightly increasing its policy rates. Due to

Chart 3 Strong capital flight out of China

In USD billion.



* 2015: estimate

disappointing economic growth figures, further tightening of monetary policy in the United States will proceed more slowly than previously anticipated, however.

Accommodating monetary policy combined with the flight into safe haven investments is driving down yields of an increasing number of assets into negative territory. One third of bonds issued by euro area governments is currently returning negative investment yields. Negative market yields are now also occurring for bonds issued by some large European enterprises. These negative yields are putting the investment returns of investors depending on relatively safe investments under pressure.

Prices of bank securities fell relatively sharply on concerns among investors about the impact of slowing economic growth and prolonged low interest rates. Euro area bank shares lost more than 20% in the past six months. This is due to several factors. First of all, market participants are concerned about the aftermath of the financial crisis in some southern European countries, also because of the ongoing high percentage of non-performing loans on bank balance sheets in these countries. Secondly, an economic slowdown in Europe may cause credit demand to taper off and credit losses to rise. Thirdly, the low interest environment may impact the

Box 1 Impact of a possible Brexit

On 23 June 2016, the United Kingdom (UK) is to hold a referendum on its EU membership. The outcome of the referendum is difficult to predict. Due to increasing concerns over the impact of a Brexit, the pound sterling has been under pressure, depreciating substantially against the euro and the dollar since November 2015.



Chart 4 Pound sterling under pressure

Effective exchange rate based on trade weights, index 2005=100.

If the UK decides to leave the EU, this will not only impact its own economy, but the European economy as well. The UK is among the Netherlands' main trading partners. In the short term, trade may suffer from the uncertainty about the outcome of the referendum. In the longer term, the impact will depend on the trade agreements in force following a Brexit.

A Brexit may also impact the financial sector in different ways, which are all related to a period of economic and political uncertainty. The main risk is posed by unrest on the financial markets, particularly if market participants start worrying about European integration. This may cause the already increasing risk aversion on the financial markets to accelerate. If uncertainty arises about the position of UK banks, this may spread to other European banks, including Dutch ones. The Bank of England has indicated that it will provide liquidity where necessary to support the UK banking sector. European financial institutions are also exposed to possible losses on their exposure to the UK, if a Brexit causes the UK economy to slow down severely. The exposures of Dutch banks to the UK approximately amount to EUR 80 billion. Possible losses are expected to remain low as the exposure mainly concerns loans to banks and large enterprises, which are less sensitive to economic growth in the UK. A Brexit may also lead to operating expenses for financial institutions, as currently many of their activities and transactions are performed through London. New regulations may be implemented for activities in the UK, e.g. if the country is no longer bound to the Capital Requirements Directive (CRD) for banks, and UK financial institutions may no longer be able to use the single European licence for financial institutions.

profitability of European banks. The flat yield curve reduces the opportunities for banks to profit from maturity transformation. At the same time, investment yields are falling in an environment of low interest rates and accommodating monetary policy. And finally, investors are increasingly realising that they are in danger of losing money if banks run into trouble and governments are no longer prepared to cover the costs. Recently for instance, banks in Italy and Portugal needed bail-in, with investors losing a part of their investments, and bail-in of non-professional investors proved to be a politically sensitive topic. The manner in which bail-in was executed in these countries has also induced uncertainty among investors whether the new European legislation governing recovery and resolution of banks will be applied consistently.

Investors are now estimating the risks attached to hybrid debt instruments issued by banks to be higher. In addition to bank share prices, the price of these instruments (known as contingent convertible bonds, or cocos) came under pressure at the end of last year (See Chart 5). If banks run into choppy waters, coupon payments on cocos may be halted, the instruments may be converted into shares, or written off. The recent concerns over banks has brought home to investors that cocos issued by banks are not without risk. The price sensitivity to market unrest fits the loss absorbing character of these hybrid instruments.



Chart 5 Unrest on the market for bank shares and cocos

Impact on Dutch financial institutions

Although Dutch banks are affected by the negative sentiment, their resilience remains relatively high. The Dutch economy is picking up. Partly as a result, the number of non-performing loans of Dutch banks fell to 2.75% of total loans outstanding, which is low from a European perspective. The Dutch banking sector profit in 2015 rose to EUR 10 billion, an increase of over 50% on 2014. The low interest environment has to date had a limited effect on the interest margin (Chart 6), which narrowed in the run-up to the crisis, but has widened again since then. The average deposit rate in the Netherlands is now at around 0.8%, meaning that banks have some scope for further downward adjustment, in order to reduce their interest burden. Interest income on the lending side is under pressure, however, due to competition from other parties, especially in mortgage lending (see Chapter 2). Interest income on investments may also fall, due to the current low (or even negative) yields.



Chart 6 Net interest margin of Dutch banks as yet upheld

In the past years, Dutch financial institutions have on average not increased their investments in relatively high-risk securities. These include high-yield bonds issued by banks and other businesses, and government bonds issued by countries rated AA- or lower. The current low interest environment is prompting financial institutions to embark on a search for better yields. On a European level, investment funds and – to a lesser extent – insurance companies are for instance seen to invest increasingly in relatively high-yielding bonds with low credit ratings.' Dutch institutions have not displayed a similar trend to date (Chart 7). The proportion of relatively high-risk investments has declined for banks as well as insurance companies and pension funds (Chart 7). The proportion of relatively safe government and corporate bonds held in the portfolios of Dutch financial institutions has actually increased. This also means that these institutions are being hit less hard by the recent turnaround in market sentiment.

¹ See the ECB's autumn 2015 Financial Stability Review.

Chart 7 Percentage of relatively high-risk investments is decreasing



Proportion of total investment portfolio (in %).

Corporate bonds – high yield

Equities

Source: DNB.

Note: Countries with higher credit ratings are those with AA ratings or higher (S&P). Multilateral institutions mainly constitute government-held development banks. High-yield corporate bonds are bonds issued by banks and other businesss, with yields above 4.3% (2013) or 4.9% (2015). These figures correspond with yields on corporate bonds just qualifying as junk bonds.

Dutch financial institutions should factor in rising losses on exposures sensitive to commodity price risks. Dutch banks have EUR 38 billion outstanding in emerging economies vulnerable to falling commodity prices.² Their largest exposure is to Brazil and Russia. Pension funds have funds outstanding to these countries to the amount of EUR 30 billion. At EUR 1 billion, this amount is much lower for insurance companies. In addition, Dutch financial institutions have exposures to producers of fossil fuels, including oil and gas companies. These exposures total EUR 40 billion for the three largest Dutch banks, EUR 38 billion for the three largest pension funds, and EUR 9 billion for the three largest insurance groups (Chart 8). Banks mainly provide loans, which have a relatively low risk profile. A large proportion of these loans (around half) concerns trade finance with short maturities and collateral securities.

² Algeria, Argentina, Brazil, Chile, Colombia, Indonesia, Iran, Iraq, Kuwait, Malaysia, Nigeria, Peru, Qatar, Russia, Saudi-Arabia, United Arab Emirates, Venezuela and South Africa.

In addition, financial institutions may be hit by the bursting of a possible 'carbon bubble'.

The carbon bubble hypothesis argues that financial markets overestimate the value of fossil fuel reserves as the amount of carbon dioxide that may still be emitted is limited, based on the Paris climate ambitions. If these reserves cannot be extracted, they must be considered stranded assets. The costs of a gradual transition towards a low carbon economy will probably be manageable. In a scenario of abrupt transition, carbon-intensive companies may be written off abruptly, however. A bursting carbon bubble may not only negatively affect producers of fossil fuels, but also other carbon-intensive sectors such as energy generation, transport and agriculture. Exposures to these sectors account for a relatively large part of the balance sheets of Dutch financial institutions (Chart 8).

Chart 8 Dutch financial institutions are exposed to carbon-intensive sectors

Percentage of balance sheet total of the three largest Dutch banks, the five largest insurance groups and the three largest penson administrators.



Notes: 'Fossil' includes exposures of producers of oil, gas and coal, and direct supplier companies and services. 'Other' reflects the exposures to the remaining carbon-in-tensive sectors (energy generation, base industry, transport and agriculture). Data derived from DNB's Occasional Study, *Time for transition:* towards a carbon-neutral economy (2016).

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The funding costs of Dutch banks may rise if the negative market sentiment continues.

In order to comply with risk-weighted Basel III requirements, the leverage ratio and the European requirements enabling bail-in (minimum requirements on eligible liabilities - MREL), banks can make partial use of hybrid debt instruments. Hybrid debt instruments are popular among investors, owing to their relatively high yields. The increased risk aversion, however, caused this sentiment to turn around early this year. Market sentiment has meanwhile partly recovered. Episodes of market unrest may drive up costs for banks to ensure compliance with future Basel III capital requirements. The Dutch large banks have already reinforced their capital positions in the past years, among other things because they anticipated on the introduction of systemic buffers (see Chapter 2). At the start of 2015, the Dutch banking sector needed only a relatively small amount of EUR 1 billion in core capital to comply with the final risk-weighted requirements. In addition to this, there still was a EUR 8 billion deficit in hybrid debt instruments, which under the supervisory regulations qualify as supplementary capital. The Single Resolution Board (SRB) will determine the exact MREL requirements later this year.

The combination of low interest rates and deteriorating market conditions is having its effect

on Dutch pension funds and insurance companies. The low level of interest rates is pushing up the value of longer-term liabilities of pension funds and insurance companies. The fixedinterest investments offsetting these liabilities often have shorter maturities and their value rises less sharply, due to low interest rates. For institutions that do not hedge this interest rate risk, falling interest rates lead to deteriorating solvency. The past few years saw a sharp rise in the value of relatively high-risk investments, which partly offset this negative effect. However, in the past six months the value of these investments has been falling due to the deteriorating market sentiment, which has put further pressure on the solvency positions of pension funds and insurance companies.

Pension funds are being hit relatively hard. Pension funds on average hold higher-risk investments than insurance companies, and only hedge a part of their interest rate risks. The average coverage ratio of pension funds fell to around 100% in the past years from over 140% in 2007, and is currently even around 90% for a large number of pension funds (Chart 9). The 2015 European stress test confirms that the prolonged low interest rates are proving to be a big challenge for Dutch pension funds, and that these funds are relatively vulnerable to financial market shocks due to their limited buffers.³ Life insurance companies are less vulnerable to low interest rates and negative market sentiment than pension funds, but they are nevertheless facing severe challenges. The reduced demand for life insurance products in particular is putting their profitability and business models under pressure.

³ More information on the test outcomes can be found in the *IORPs Stress Test Report* 2015, published by EIOPA.

Chart 9 Falling interest rates are putting pension fund coverage ratios under pressure



Current coverage ratio. Based on MSCI World share index (2009 = 100). Risk-free interest rate is approximated here by the percentage yield on ten-year Dutch government paper.

It is important for pension funds and insurance companies to remain aware of the growing differential between the ultimate forward rate (UFR) and market interest rates. Due to the use of the UFR, the impact of low interest rates is not fully reflected in the solvency figures of pension funds and insurance companies. Under the UFR method, liabilities with maturities longer than 20 years are valued based on a yield curve level above the current market interest rates. The differential between the UFR curve and the long-term interest rates observed in the past six months has widened further as interest rates have continued to fall. This may lead to excessively high expectations among policyholders, unrealistic promises to investors and distorted incentives at institutions (see the spring 2015 OFS). Last year, DNB adjusted its calculation method for the UFR for pension funds, in order to achieve a more realistic determination of the actuarial rate of interest used. The UFR was lowered to 3.3% from 4.2% and linked to market trends. A similar step is warranted for the insurance sector, though this will need to be decided at the European level. For the time being, DNB requires insurers to factor in the distorting effect of the UFR in their dividend policies.

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Problems at insurance companies and to a lesser extent at pension funds may adversely affect financial stability. Large insurance groups may be systemically important, owing to their complexity and interdependence with other financial institutions and the economy. Inadvertent bankruptcy of a large insurance group may entail contagion risks. The Financial Stability Board (FSB) updates its list of global systemically important insurers once a year, adding Aegon, the largest insurance group in the Netherlands, to the list in 2015. Supervision on global systemically important institutions is more stringent; these companies are required to compile resolution plans, and higher capital requirements will be imposed on them from 2019 forward. Solvency problems at pension funds have a less dramatic effect on financial stability. This is because pension funds issue less firm guarantees: in case of solvency deficits, they may refrain from index-linking, increase pension contributions, or curtail members' pension rights. This may, however, have an add-on effect on the real economy, e.g. by way of deteriorating consumer confidence and lower consumption.

2 Macroprudential risks and policy in the Netherlands

The housing market is picking up on the back of the recovering economy, and mortgage lending is increasingly shifting to non-bank providers. Significant vulnerabilities, such as the number of underwater mortgage loans, are becoming less acute, but are not set to disappear any time soon. As the housing market is expected to continue recovering, the next government would be advised to continue the gradual lowering of the LTV limit by one percentage point annually to below 100%, and to accelerate the curtailment of mortgage interest tax relief. Credit growth is still at very modest levels, despite the economic upswing. This is why DNB decided to set the countercyclical capital buffer – which from this year onwards will be determined quarterly – at 0%. Five Dutch banks have been designated as systemically important. The size and concentration of the Dutch banking sector explains why the systemic buffers for these banks, which must be phased in from this year, are relatively high from a European perspective.

The Dutch economy and the housing market are picking up. The Dutch economy is recovering, making growth increasingly less dependent on exports and more on domestic dynamics.⁴ House prices are rising almost throughout the country (see Box 2). The recent developments in other European countries like the UK, Norway and Sweden show that the housing market as a whole may overheat, owing to the economic upturn and low interest rates, which increases the risk of bubble formation. There are currently no indications of a real estate bubble in the Netherlands.

Further phased reduction of the LTV limit after 2018 is desirable. Despite rising house prices, historical vulnerabilities (specifically high debt and underwater mortgages) are still substantial. The housing market is expected to continue recovering. The recovery can be used to continue the measures already taken to boost the resilience of the housing market in the years ahead. This applies to the LTV limit in particular (the maximum ratio permitted between the amount of the mortgage loan and the value of the property), which is to be reduced in stages to 100% in 2018, from the current 102%. The Financial Stability Committee (FSC) recommended that the next government continues reducing the LTV limit to 90% after 2018. ⁵ This will boost the financial resilience of young home owners in particular. It will also make the housing market and the overall economy more stable and market funding of banks less vulnerable. Tightening of the LTV limit will impact the housing market, e.g. it will push up demand for rented accommodation. This is why accompanying policies, directed at increasing the supply of rented accommodation, will need to be developed.

⁴ See the December 2015 issue of DNB's Economic Developments and Outlook.

⁵ See the FSC's 28 May 2015 news release, Financial Stability Committee recommends further reduction of the LTV limit to 90%.

Box 2 Recent developments on real estate markets

History has shown that real estate markets often play a significant role in the build-up of vulnerabilities preceding a financial crisis. In the past years, this was also seen in different countries, including the Netherlands. Like they did in the past, residential and commercial real estate markets are developing in different directions.

The residential real estate market in the Netherlands is clearly picking up. Chart 10 shows that house prices in the Netherlands are rising, although they are still substantially below their pre-crisis levels. The exception is Amsterdam where the housing market is even showing signs of overheating. Prices have bounced back to around their 2008 levels and the number of monthly transactions is at record highs. Falling interest rates, which have partly compensated for the tightening of lending conditions over the past years, are playing a role here (see Box 3 in Chapter 3). Developments in the Amsterdam housing market are, however, still relatively modest compared with some other countries like Sweden and the UK.

... but vulnerabilities are only

slowly edging lower

Percentages.

Chart 10 Housing market is picking up...

Price index, 2008Q4=100.



The housing market revival has made important risks less acute; a reduced number of mortgages is under water and the number of defaults is decreasing. This does not mean, however, that vulnerabilities have disappeared. Total mortgage debt in the Netherlands is still at very high levels, both in international and historic perspective. In addition, over 50% of home owners below the age of 40 still have homes with loan to value ratios of over 100%.

The outlook for commercial real estate remains unfavourable.⁶ On average, prices are stabilising, with prices of rented accommodation in particular recovering (Chart 11). The office and retail market is showing a mixed picture, with prices in prime locations recovering more quickly than those in less attractive locations. Structural factors like more efficient use of office floor space and online shopping are also playing a role. The recent wave of bankruptcies of large retail chains in the Netherlands illustrates the growing influence of online shopping.



Chart 11 Little if any recovery in commercial real estate

Price index based on valuations, 2008=100.

The past few years have brought the risks attached to commercial real estate to the surface in the form of losses at financial institutions. This is why DNB intends to collect more information on this market on a regular basis, by asking the three largest Dutch banks to provide information once a year. DNB will use the legal powers that it was given in 2015 to make requests for information for the benefit of its task of safeguarding financial stability. In addition, more transparency is necessary to improve management of real estate funding risks.⁷

⁶ See also the 'Chapter Commercial real estate: office and retail market' in the Autumn 2015 edition of the OFS.

⁷ See DNBulletin: *More transparency is required in the real estate market*, 31 March 2016.

Accelerated reduction of mortgage interest tax relief is feasible. The next government could accelerate the reduction of mortgage interest tax relief with the aim of cutting tax relief to 38% from the current 52% in 28 years (see also Chapter 3), so as to curb the incentive to borrow the maximum amounts allowed within a shorter time frame. The current low level of interest rates will accommodate accelerated reduction of mortgage interest tax relief, as tax benefits are relatively small in times of low interest rates.

The market share of non-bank providers in the mortgage lending market is growing. Mortgage lending is taking off slowly, but is still very modest. Institutional investors, (insurance companies in particular) and foreign providers are playing an increasingly significant role. Lending has become more attractive to them relative to other forms of investment, yields of which are under pressure due to low interest rates (see Chapter 1). The total mortgage loan portfolio of Dutch insurers came to EUR 46 billion at the end of 2015, more than double the amount recorded just before the crisis. Insurance groups are also active in mortgage loans outstanding. The exposure of pension funds to Dutch home loans is also growing, although this so far involves relatively small amounts: a rise to the total of EUR 15 billion at the end of 2015, from around EUR 10 billion at the start of 2013. Chart 12 shows that non-bank providers currently account for over 40% of new mortgage business.



Chart 12 The share of banks in mortgage lending is falling Share in annual new mortgage loans in the Netherlands, in %.

Source: IG&H.

In itself, the increasing diversity of credit providers is beneficial to financial stability.

More diversity makes the economy less dependent on the banking sector. It is as yet unclear, however, whether the role of non-bank credit providers will continue growing in the long term. If interest rates rise, it may become more attractive for non-bank providers to invest in other sectors. It also remains to be seen whether non-bank providers will have sufficient resources in the long term to take over a large proportion of the outstanding mortgage loan volume. The volume of mortgage loans outstanding amounted to EUR 639 billion at the end of 2015, two thirds of which is on bank balance sheets. Finally, a point for consideration is that new entrants to the mortgage lending market sometimes have little experience of assessing and managing mortgage-related credit risks.

DNB has decided to set the countercyclical buffer at 0%. Despite the recovering housing market, credit growth as a percentage of GDP is below its long-term trend (Chart 13). Based on this and other indicators, DNB will from this year onwards set a countercyclical buffer every quarter, an extra capital charge to protect the banking sector against risks attached to excessive lending. Owing to the very modest credit growth, DNB has decided to set the countercyclical buffer at 0%. The 0% rate also applies in most other European countries. Exceptions are Sweden and Norway, which have set the buffer requirement at 1%. Dutch banks with exposures to these two countries are required to maintain a countercyclical buffer on these exposures.

An international agreement has been made that large international banks must ensure extra resilience against unexpected losses. These banks play a central role in the global financial system and may cause contagion effects and disrupt the provision of critical financial services if they run into trouble. The FSB has designated these institutions as global systemically important banks, and imposed additional buffers of between 1 and 2.5% of risk-weighted assets. Especially banks located in the United States, the UK, France and China currently fall within this category. ING Bank is the only Dutch bank on the list of global systemically important banks.

The national authorities determine whether capital buffers or additional capital buffers are necessary due to the systemic importance of the bank on national or European level. DNB has been assigned this task in the Netherlands. The national authorities initiate the determination of these buffers, which acknowledges country-specific differences in the structure of the financial sector. All EU countries use the same assessment method, however. DNB and its European peers determine whether banks are strongly intertwined with other financial institutions and whether they have a great deal of cross-border activities, which makes them more complex and increases the likelihood of contagion effects to other countries. The joint European supervisory authorities also assess whether important activities of banks, such as their role in payments, may be easily taken over by other parties.





Total lending to the Dutch corporate sector and households is below trend.

Notes: 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.

When determining systemic buffers, DNB also considers topics that are specifically relevant

to the situation in the Netherlands. One example of this is the likelihood of contagion through the deposit guarantee scheme (DGS), which entails that deposit holders are reimbursed up to EUR 100,000 if their bank goes bankrupt. However, the other Dutch banks will have to foot the bill, as they guarantee each other's deposits. This continues to be a relevant issue for systemic importance, also in the presence of a pre-funded DGS that the banks are currently building up. As the size of the DGS fund is limited and it will not be fully paid-in until 2024, it cannot be ruled out that banks will be required to pay a part of the bill after all.

DNB has currently designated five banks as systemically important and has imposed systemic buffers on these institutions. They are ING Bank, Rabobank, ABN AMRO, BNG Bank and SNS Bank. BNG Bank was added to the list at the end of 2015, while the other banks had already been designated as systemically important. DNB imposed extra capital buffers of 3% of risk-weighted assets on ING Bank, Rabobank, and ABN AMRO, and 1% on BNG Bank and SNS Bank.⁸ Many other European authorities also recently published their lists of systemically important banks and the associated buffer requirements. If banks are imposed both global and domestic systemic buffers (like ING Bank), the higher of the two applies.

The Dutch banking sector has high systemic importance, which is why the imposed systemic buffers are considerable from a European perspective. The circles in Chart 14 for each country depict the average buffer for systemically important banks (SIBs), weighed by balance sheet total; larger banks are allocated heavier weights than smaller ones. The requirements vary widely, whereby the Netherlands imposes relatively high systemic buffers on SIBs, and some other EU countries very low ones, or even no buffers at all. The conclusion that buffers imposed on Dutch banks are relatively high follows from the above-average large size and high concentration rate of the Dutch banking sector (Chart 14). These are important measures for comparing the systemic importance of banking sectors between countries. This is because in countries with large banking sectors relative to their GDP, problems at institutions will pose larger risks to financial stability. In spite of shrinking in the past years, the Dutch banking sector is still four times the size of the Dutch economy. A high concentration rate means that the activities of one bank are relatively difficult for other banks to take over. The five largest banks in the Netherlands account for 85% of the country's banking sector. Chart 14 shows that the relatively low buffers imposed in other countries cannot always be explained by the size and concentration rate of their banking sectors.

The ECB has the power to make upward adjustments in the euro-area systemic buffers. Although the initiative for macroprudential policy lies with the national authorities, the ECB has the option to make upward adjustments in systemic buffers if necessary. This means that the ECB has the power to enforce imposition of sufficiently high systemic buffers with a view to safeguarding financial stability in the euro area as a whole. This is important as problems at specific banks in the euro area may have contagion effects on the rest of the European financial system.

⁸ When imposing these systemic buffers, several sections of the European Capital Requirements Directive are relevant, i.e. the buffer for other systemically important institutions (O-SII buffer), and the systemic risk buffer. The highest of these buffers applies. For more information, see: www.dnb. nl/binaries/Aangepast%20systeemrelevantieraamwerk%200p%20basis%20 van%20EBA%20richtsnoeren_tcm46-335615.pdf?2016032413 (in Dutch)

Chart 14 Systemic buffers of European banks vs size and concentration rate



Note: The size of the circle reflects the weighted average systemic buffer.

The Netherlands pursues an active macroprudential policy. Table 1 reflects the macroprudential instruments that have currently been activated in the Netherlands in order to address the risks depicted in this chapter.⁹ These instruments pertain to the banking sector and are determined by DNB, except for the LTV and LTI limits, which also apply to other financial institutions providing mortgage loans. The purpose of these instruments is to remedy system-wide vulnerabilities. This makes them complementary to the macroprudential measures taken at individual banks, which are aimed at mitigating institution-specific risks. DNB pays close attention to balancing micro- and macroprudential policies, both at national and at European level. Financial stability risks are recorded in a central register for supervisory authorities, for example, and they are used as input for microprudential supervision (see Annex 2). This Dutch practice is increasingly being adopted by other countries. Also when deploying macroprudential instruments, interaction with supervision is important. A basic proposition here is that tightening macroprudential policy should in principle not be compensated for by

⁹ For an overview of the macroprudential instruments that have currently been activated in Europe, we refer you to the ESRB's website: www.esrb.europa. eu/mppa/html/index.en.html.

easing microprudential supervision and vice versa. Both policy areas indeed focus on different risks that must definitely be considered separately.

Table 1 Current use of macro-prudential instruments

Instrument	Level	Notes
Systemic buffer	ING Bank: 3% Rabobank: 3% ABN Amro: 3% SNS Bank: 1% BNG Bank: 1%	These requirements will be implemented in stages, and must be fully completed in 2019. The systemic buffers for 2016 for ING Bank, Rabobank and ABN AMRO have been set at 0.75% of their risk-weighted assets, and for SNS Bank and BNG Bank buffers of 0.25% will apply this year.
Countercyclical capital buffer	0%	DNB reassesses the buffer level every three months.
LTV-limit	102%	This limit will be further reduced to 100% in 2018; the FSC recommends further phased reduction to 90% after 2018.
LTI-limit	Over four times gross income ¹⁰	Statutory arrangements based on gross housing costs relative to annual income (see Box 3 in Chapter 3).

According to the standards set by the Dutch National Institute for Family
Finance Information (Nibud) a household with a gross annual income of
EUR 50,000 would be able to take out a mortgage to a maximum amount of
EUR 228,364.

DeNederlandscheBank

3 Risks of habituation to prolonged low interest rates

The historically low interest rates have a negative impact on the profitability and buffers of Dutch financial institutions. They are, however, basically good news for households and businesses in debt. At the same time, there is also a risk for them in prolonged low interest rates. If the rate stays low for a longer period of time, this leads to habituation. When interest rates return to more normal levels, the interest burden will increase again. This may lead to increased credit risk at financial institutions that have large exposures to households with high and largely interest-only mortgage loans, and to low-solvency segments of the SME sector. It is especially important for these vulnerable groups that they factor in scenarios where interest rates return to higher levels, e.g. by building up financial buffers.

The prolonged low interest rates are proving to be a challenge to Dutch financial institutions. Both short-term policy rates and long-term government bond yields have fallen to unprecedented low levels. The low interest rate environment reflects the macroeconomic conditions, in which inflation expectations justify an accommodative monetary policy. Partly due to the recent additional steps taken by the ECB (see Chapter 1), it cannot be ruled out that interest rates are set to stay where they are for a prolonged period of time. Prolonged low interest rates have a negative impact on the profitability and buffers of Dutch financial institutions. The impact of low interest rates is most significant for life insurers and pension funds. Their liabilities often have a longer maturity than their investments. Consequently, a drop in interest rates leads to net losses. The challenge that prolonged low interest rates pose to Dutch financial institutions was discussed in detail in the 2015 spring issue of the OFS.

Low interest rates are keeping the interest burden for households and businesses in debt low.

Prolonged low interest rates are basically beneficial to governments, households and businesses in debt. The interest rates that Dutch households and businesses are paying on their debts have fallen in line with short- and long-term interest rates (Chart 15). The interest rate that the Dutch government is paying on its debt is also at historically low levels. As the period of low interest rates continues, more and more loans are renegotiated at lower interest rates, and the privatesector interest burden eases (Chart 16). In 1991, households and non-financial corporations still spent around 14% of GDP on interest charges. This has now fallen to more than 7% of GDP. The interest burden for non-financial corporations has fallen particularly sharply.

Dutch households have relatively high debts." The falling interest burden is offset by the high private debt levels in the Netherlands (Chart 17). This applies to households in particular. Household debt is at around 112% of GDP (Chart 18).

¹¹ The high debts of Dutch households are offset by relatively large but illiquid assets. For an overview of the balance sheets of Dutch households, we refer you to the 2015 DNB Occasional Study: *Wealth formation of Dutch households: a policy assessment.*

Chart 15 Interest rates for households and businesses have fallen sharply

Chart 16 Interest burden has eased

Interest rates on new mortgage loans and business loans, in percentages.

Interest paid on outstanding loans of households and non-financial corporations, in percentages of GDP.



Chart 17 Debt in the Netherlands is high from an international perspective

Uncosolidated debt as a percentage of GDP, year-end 2014.



Source: Eurostat.

This is mainly attributable to the amount of mortgage debt held by Dutch households, which at over 95% of GDP is among the highest in the world. Total mortgage debt declined slightly between 2012 and 2015. This is partly because affluent households have shortened their balance sheets by making extra repayments on their often already low mortgage loans. Over the past three years, Dutch households have made voluntary mortgage repayments of over EUR 45 billion. The low deposit rates are making it attractive to use savings deposits to repay mortgage debt. The number of new mortgages was also low during these years. The reduction of mortgage debt has meanwhile come to a halt, which is partly attributable to the upswing in the housing market (see Chapter 2). In addition, the majority of first-time buyers is still taking out mortgage loans that exceed the value of their homes (Chart 19). Besides, the fall in mortgage interest rates partly compensates for the recent tightening of the LTI (loan-to-income) standard (see Box 3).

Chart 18 Dutch household and corporate debt is still at a high level

EUR billion and percentage of GDP (right axis).



- \cdots non-financial corporations (right-hand scale)
- households (right-hand scale)

Source: Statistics Netherlands.

Notes: Debts of non-financial corporations in 2015 are adjusted for notional cash pooling and sector reclassification.

Chart 19 Most first-time buyers have high loan-to-value mortgage loans

Share in percentages as of 2015 Q4.



Source: DNB.

Dutch businesses also have substantial debts. The level of debt of Dutch non-financial corporations at the end of 2014 came to over 128% of GDP, which is high from an international perspective (Chart 17). The debt ratio of the Dutch corporate sector peaked around 2001, and started falling from there. However, over the past years absolute corporate sector debt has remained at a level of around EUR 800 billion (Chart 18). More than one third of these debts concerns intra-group loans. Adjusted for these loans, the debt level of Dutch non-financial corporations is at around 85% of GDP, which is still above the EU average.

Habituation to low interest rates may occur. As the period of low interest rates continues, the profitability and buffers of financial institutions come under increasing pressure. Prolonged low interest rates also harbour a risk for households and businesses, however; as the low interest rate period continues, they may become accustomed to the combination of high debts and a low interest burden. This may lead to increasing vulnerability to interest rate increases. If interest rates then return to more normal levels, the interest burden will also increase, and some households and businesses may run into trouble. This will for instance happen if the money saved on interest expenses has not been used to build buffers, but for consumption or less efficient business operations.

From a macroeconomic perspective, mortgage payments will adjust gradually when interest rates normalise. For most households, an interest rate hike will only feed through to their mortgage payments after some time. Based on the current bank mortgage loan portfolios, only one quarter of households will be facing interest rate adjustments in the first year after an interest rate rise (Chart 20). This number will then rise: within five years, two thirds of home owners will be facing interest.

Especially households with relatively high and largely interest-only mortgage loans may be confronted with sharply higher mortgage costs. If in 2019, mortgage interest rates would have more or less doubled relative to the current level, this would imply an average rise in net mortgage costs of EUR 110 per month for existing mortgages. There are large differences between households, however. Around 8% of households will be confronted with rises of more than EUR 300 a month. This group includes a large number of home owners in their forties with relatively high mortgage loans with large interest-only proportions. Consequently, this group of households is vulnerable to normalising interest rates in several ways.

Chart 20 Interest rate hike will feed through guicker for corporations

Bank loans to the private sector broken down by remaining term to maturity.



Original maturity > 1 year and remaining term to maturity > 1 year; interest rate review within 1 year

Source: DNB.

Original maturity > 1 year and remaining term to maturity < 1 year

Original maturity < 1 year</p>

Notes: Loans of non-financial corporations were adjusted for notional cash pooling.

Long fixed interest periods combined with repayments on an annuity basis protect first-time buyers against rising interest rates. Virtually all current first-time buyers have annuity or straight-line mortgage loans with 10-year fixed interest rates as a minimum (Chart 22). This means that they will have paid off part of their mortgage loans before being confronted with an interest rate hike: if the hike occurs ten years after the mortgage was taken out, these households will have already paid off almost one quarter of their annuity mortgage loans. This dampens the effect of an interest rate hike on the mortgage burden.¹² The financial resilience of households to interest rate shocks has been boosted by the policy launched in 2013 prescribing that households taking out new mortgage loans will only be eligible for mortgage interest tax relief if they fully repay their mortgages within 30 years on at least an annuity basis.

12 Annual gross interest charges on a EUR 250,000 mortgage loan at 3% interest will for instance amount to EUR 7,500 in the first year, both for annuity and interest-only mortgage loans. If interest rates were to rise 250 basis points, gross interest charges in the eleventh year - after the fixed-interest period expires - will rise to EUR 13,750 for the interest-only mortgage, but EUR 10,500 for the annuity mortgage loan, as one quarter of the latter will have been paid off by that time.

Box 3 The loan-to-income requirement and mortgage interest rates

A statutory loan-to-income (LTI) ratio applies to mortgage loans, which puts a cap on the percentage of income that households are permitted to spend on interest and repayments.¹³ This maximum percentage of financing burden, the income and the level of interest rates determine the maximum amount of mortgage loans that a household is allowed to take out.

Chart 21 Fall in maximum allowed LTI ratio

LTI cap amid gross income of EUR 50,000.





13 The LTI cap has been part of the Temporary regulation on mortgage lending since 1 January 2013 and is established annually by the Minister of Finance based on advice from the Nibud. In addition to the LTI cap, a 102% *loan-tovalue* (LTV) cap is currently in place for mortgage loans, which will be reduced in steps to 100% in 2018 (see Chapter 2). The maximum permitted mortgage loan amount has declined in the past years, primarily due to the rising burden of taxes and social security contributions. This means that households have less to spend on mortgage interest and repayments. In 2010, a household with gross income of EUR 50,000 was allowed to borrow five times its income at 5% interest rates, whereas in 2015 the maximum borrowing amount assuming the same income and interest rates had fallen to only 4.2 times gross income – a decline of more than 15% (see Chart 21).

The sharp fall in mortgage interest rates over the past years has partly compensated for the reduced borrowing capacity. This is because amid lower mortgage interest rates, households with an unchanged financing burden can borrow higher amounts of money. However, the borrowing capacity may only be calculated based on actual interest rates if the mortgage has a fixed interest rate period of at least 10 years. Mortgages with shorter fixed interest periods are subject to a reference interest rate, which is currently at 5%. In the example depicted in Chart 21, a household can increase its borrowing capacity by 8% by opting for a 10-year minimum fixed interest period. Chart 22 shows that these mortgages have become increasingly popular over the past years. In 2014 and 2015 two thirds of first-time buyers on average took out mortgage loans with a 10-year minimum fixed interest period.

From a macroeconomic perspective non-financial corporations will be hit quicker by normalising interest rates than households. About 50% of bank loans outstanding to non-financial corporations have a fixed interest period of one year (Chart 20). The attached interest rate risks are partly hedged by means of interest derivatives. Although not all companies are equally vulnerable to higher interest rates, a large number of them are struggling, especially in the SME sector. The relatively large proportion of non-performing loans (Chart 23) illustrates the vulnerable position of SMEs. In addition, the financial position of businesses in some sectors has deteriorated sharply since the crisis, specifically in construction and retail. These sectors are very dependent on domestic demand and have seen their buffers eroded by the slump in domestic demand. A substantial proportion of SME companies is active in exactly these sectors. Some 35% of valued added in the SME sector is earned in retail trade and construction.

Rising interest rates are generally beneficial to pension funds and insurance companies.

Whereas rising interest rates negatively impact the affordability of debt for households and businesses, they are generally beneficial to the financial position of pension funds and life insurance companies. The liabilities of pension funds and insurance companies usually have longer terms to maturity than their investments. This means that the current value of their liabilities will fall more sharply than the current value of their investments when interest rates rise.

Chart 23 More non-performing loans to SMEs than to large enterprises and households



As a percentage of total annual lending volume, average per year

Non-performing loans are defined as loans with an estimated probability of default of 100% calculated on the basis of the internal models method of credit risk.

If the financial position of pension funds improves, this is basically also good news for their members. For households, this may dampen the risks associated with rising interest rates. The extent to which this effect occurs, however, depends on the contributions and pay-out policies of individual pension funds.

Policy messages

It is especially important for vulnerable groups that they factor in scenarios where interest rates return to more usual levels. Although the current low level of interest rates is dampening the interest burden of households and businesses, there is a drawback that they may become accustomed to the combination of high debt and low interest charges. When interest rates return to more normal levels, the interest burden will increase again. This may lead to increased credit risk at financial institutions if they have large exposures to households with relatively high and largely interest-only mortgage loans, and to low-solvency segments of the SME sector. Vulnerable groups may arm themselves against future normalisation of interest rates, e.g. by building up financial buffers. For financial institutions, it is important to run regular stress tests in order to systematically identify potential losses related to increasing credit risk.

A more balanced tax treatment of debt and equity will boost the financial resilience of

households and businesses. Tax relief on interest charges stimulates (excessive) debt financing. Although the scope of mortgage interest tax relief has been reduced these past few years, the incentive to borrow the maximum amount allowed has not disappeared. Ongoing reduction of mortgage interest tax relief will in the longer term boost the financial resilience of home owners. For the corporate sector, too, debt financing is relatively advantageous, as businesses are allowed to offset interest charges against their pre-tax earnings. Empirical literature has revealed a definite connection between the level of corporate debt financing and the tax burden. A more uniform treatment of debt and equity would curb the incentive for debt financing, and in turn boost the financial resilience of businesses over time.

4 The implications of technological innovation for financial stability

Technological innovation in the financial sector is on the advance. This may improve the stability of the financial system through enhancements in efficiency, diversity, risk spreading and transparency. At the same time, innovation, especially in case of quick transition, entails risks for financial stability. Innovation may for instance lead to increased procyclicality and volatility in the financial markets. new market concentrations and growing operational risks. The viability of the business models of traditional institutions may also come under accelerated pressure. The direction of these developments is difficult to predict. The expansion of technological innovation also depends on public trust in innovative services. DNB plays a role here in the sense of its authorisation policy, its regular supervision and the public statements that it makes. Like its foreign peers, DNB endeavours to find a measured balance between being open to new initiatives and keeping a careful eye on the associated risks. The financial sector should be well prepared to meet the challenges of FinTech.

Technological innovation is developing at high speed and offers all sorts of opportunities for the financial sector. Recent innovations have dramatically changed the music industry, the transport market and the hospitality sector. In the financial sector, technological innovation is also on the rise. Investment in financial technology (FinTech) is growing explosively (see Chart 24) especially in the United States and the UK, but also in China for instance. Technological development is not a new theme to the Dutch financial sector, as witnessed by the growing number of new initiatives and players, including mobile banking, iDeal, contactless payments and service providers for e-commerce. The scale of the majority of innovations is, however, still relatively modest and initiatives are fragmented and taken by (to date) small players. There are over 50 crowdfunding platforms active in the Netherlands (some 10% of the EU total),¹⁴ but total capital generated is still very modest at EUR 128 million despite the sharp growth.¹⁵ In addition, traditional banks are also developing their own new services.

FinTech is driven by various factors. An important impetus for the rise of FinTech is that technological innovation reduces the costs of data collecting, storing, processing, and exchange. This enables specialist providers to offer specific components of financial services more efficiently than traditional players. Adapted rules and regulations also offer scope for new players. Based on the European Payments Directive II (PSD II) and with the consent of the account holder, external payment service providers may for instance be given access to consumer account details. This gives them the opportunity to provide payment services.

¹⁴ European Commission (2015), Crowdfunding: mapping EU markets and events study, September 2015.

¹⁵ Crowdfunding agency Douw & Koren (2016): Crowdfunding in the Netherlands 2015, 2 January 2016.

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Chart 24 Venture capital investment in FinTech is rapidly growing Amounts in USD billion.



*Note: Figures for 2015 are estimates for which there is no breakdown available.

Other incentives for innovation include market inefficiencies and changed consumer demands and expectations. These trends are leading to new forms of financial services to consumers and businesses.¹⁶

Innovations in payments transfer are currently the most visible. Recent examples include the mobile wallet, which enables payments by smartphone app, and blockchain technology (see Box 4). Blockchain technology provides a public, digital and decentral platform where all transactions can be tracked by all parties combined in a network. This eliminates the use of a central party and enables very quick payment transfers between the participants. This technology also lends itself to other types of transactions, including those related to legal agreements and securities. Developments with respect to lending are also gaining ground rapidly. Examples of this include peer-to-peer (P2P) lending, which involves lenders and borrowers being linked online, or crowdfunding, where projects are financed by the contributions of large numbers of private, non-professional investors. Other innovations focus on asset management (via automated investment), financial advice (robo advice using big data), or on insurance (e.g. using sensors to improve risk selection in automotive insurance).

¹⁶ DNB research report "Technological innovation and the Dutch financial sector", January 2016.

Box 4 Blockchain technology

Blockchain-technology is a new way of recording transactions. Traditionally, this is done by a central party in a network, the downsides of which are that this requires trust in the central party correctly recording transactions, that recording is relatively time-consuming and that transactions are usually not public.

Technological innovation enables all network participants (nodes) to trace a ledger with all transactions. After initiation, blocks of transactions are sent into the network and approved by all computers that receive them. Approval requires proof of work: each block has a unique code (known as hash), based on the transactions in that particular block and the code of the preceding block among other things. So the code indicates exactly where the block belongs in the chain. Code mining requires a great deal of computing power. In the bitcoin environment, the party that finds the code receives an amount of bitcoins.

As more blocks are added the transaction chain grows. The use of cryptography ensures that transactions are safe. Cryptography entails data encryption; in blockchain technology, this is achieved with the help of a specific algorithm. In bitcoin, asymmetrical or public key cryptography is used to create a pair of keys that monitors access to bitcoins: a public key to receive bitcoins, and a private key to sign off transactions enabling spending of bitcoins. By including the two keys in a new transaction, all computers in the network can approve them as it can be confirmed that the bitcoins were in fact owned by the legal owner at the time of sending the transaction.

The benefits of blockchain technology include its high transparency, the speed at which transactions can be recorded, and the irreversibility of transactions. A possible downside is the lack of governance. It is for instance unclear who the responsible party is in case of errors, or how adjustments to the system can be made. The efficiency benefits also strongly depend on the structure of the blockchain.

The blockchain technology has a potentially large influence on market infrastructure. The technology is used for bitcoin transactions, but may also be deployed in payments transfer, securities trading and legal documentation. This broad range of applications is prompting financial market participants to invest in blockchain technology. They are for instance exploring the opportunities for the use of blockchain technology in a closed network and the use of smart contracts. Smart contracts are computer programmes that can be linked up with the blockchain to perform transactions. Innovation is in principle beneficial to prosperity. It provides for better products and services, and increases competition, diversity, efficiency and transparency. Innovation is inherent to a sector that is exposed to market forces. In addition, innovation may also contribute to better functioning of the financial system in the sense that it can provide for better risk spreading, more efficient allocation of resources, or higher market liquidity.¹⁷ This will improve the resilience of financial markets to shocks.

Risks to financial stability

Innovation and stability may be at odds with each other. In the short term, innovation distorts the existing market order and may cause instability. In the longer term, too, innovations may destabilise the system if they erode shock resilience. This proved to be true during the subprime crisis, which was preceded by the rise of new financial products in the United States. These innovative products enabled the transfer of credit risks for instance, which in turn enabled institutions to diversify their portfolios better. These innovations were initially judged to be positive as they led to improved risk spreading across the entire financial system,¹⁸ but in the end they proved to have a counter-productive effect. The view on the actual risks was lost, while the interconnectedness of institutions grew, which caused the shock of the collapsing US housing market to spread very quickly throughout the financial system as a whole.

A first possible risk to stability is increasing procyclicality and volatility in the financial markets. Lending may for instance become more procyclical due to the expansion of market funding, largely carried out by non-financial corporations, such as P2P lending and crowdfunding. Private, non-professional lenders are probably less well able to assess and monitor risks. As individual loans are concerned, risks are less easy to pool. This means that it will be more difficult for private lenders to cushion shocks, which may cause them to withdraw their money all at the same time if the economy takes a turn for the worse. This increases volatility in lending operations, hampers efficient allocation of resources, and erodes the system's shock resilience. New investment services that are accompanied by robo buy and sell recommendations, e.g. based on big data and automated models, may amplify market volatility and reduce customer loyalty. Innovation may facilitate transferring deposits between banks for instance, which may cause liquidity problems. If this leads to forced selling, volatility in asset prices will also rise.

A second risk is the emergence of new market concentrations of innovative players, which may lead to too-big-too fail conglomerates: companies that grow to such a size that

BIS (2008); Innovations in credit risk transfer: implications for financial stability, WP 255.

¹⁸ See Camelia & Angela (2011), Financial Innovation and its Effects on Financial Stability and Efficiency, Ovidius University Annals, Economic Sciences Series.

their bankruptcy would have unacceptably severe consequences for the functioning of the financial system. These problems arise when one or small number of providers start dominating the financial services sector. Technological innovation offers more scope for a first-mover advantage and the winner-takes-all effect. This may create dependence on one single provider, making it systemically relevant by definition. Problems at such a provider would then almost automatically lead to system instability as there will no longer be sufficient alternatives. This risk not only plays a role in the retail market with direct customer contact, but also in the wholesale market, for instance if many banks use the same cloud. In addition, market concentration is more risky if one large foreign party becomes pivotal to financial stability in the Netherlands, specifically if there are not enough opportunities to influence the behaviour of this dominant market player.

A third risk is posed by growing operational and cyberrisks. For both new and existing market players, operational risks may arise if their governance and risk management are unable to keep pace with innovation. All the current digital and financial innovations are also leading to growing dependence and interconnectedness of IT systems. Technical failure of these systems, or a cyberattack may put business continuity under pressure and will have an increasingly big impact on the functioning of the institutions involved and the financial system as a whole.

A final potential risk to financial stability is a quick loss of viability of traditional banking

activities. If new entrants succeed in taking over large parts of the value chain of banks, they may undermine the profitability, liquidity and solvency of the established market participants. The rise of online lending and crowdfunding may for instance divert income from the banking sector. This effect is amplified if new market entrants succeed in taking over customer contact from the banks, as in payments transfer. Loss of customer contact may also impact cross-selling opportunities for banks. Current account customers are after all inclined to procure other financial services from the same bank; this effect will fade if visible payments transfers are performed by other parties. The pressure on income and liquidity of banks may be fuelled by the development of apps that help potential customers to find the cheapest bank or the bank offering the best returns, to change savings deposits and transaction service providers quickly. This may lead to significant changes in the deposits market. A handicap that the existing financial institutions are facing is that switching to new technologies requires a relatively large investment, as these new technologies must be integrated into their current systems, which are often old and complex.

A quick transition to new products and providers increases the likelihood of possible risks materialising as market players will have less scope to analyse and address such risks in time. The confidence effects related to an incident at one institution will also spread fast, as information spreads more and more quickly and transferring to another service provider is easy.



Figure 1 Stability risks of technological innovation



Growth of FinTech

The speed and manner in which the technological evolution or revolution will take place and where it will end is uncertain. The speed at which innovations will be adopted and which innovations will prove to be successful is difficult to predict at this point. With hindsight, the rise of online banking around 2000 was fairly painless for the traditional banks, while at the time there were also concerns about the strategic, liquidity, and operational risks.¹⁹

Quick expansion is possible. Three preconditions for growth seem to be present (see Figure 2). First of all, the marginal costs of expansion of virtually all innovative services are low, as making an app or a web-based service available is obviously quicker and cheaper than opening a new bank branch. The digitalisation of financial services has made it easier for customers to change providers. Secondly, sufficient funding seems to be available to give financial start-ups a chance to develop new products, also owing to investors' search for yield (see Chart 24).

Public confidence in FinTech is an important precondition for growth of financial innovation.

This is the third element. There may now be more fertile ground for gaining public confidence than say 15 years ago. Unlike the situation around the time of the introduction of online banking, the public image of traditional financial institutions has been dented in recent years. New market entrants and innovators are not affected by this sentiment, if anything they are benefiting from the positive attention for new technology. In addition, the current low interest environment is prompting businesses and consumers to look for alternative investments. In practice, Dutch consumers still have to get used to FinTech.

¹⁹ See DNB (2000), Electronic banking: some trends and the implications for banks and supervision.



Figure 2 DNB's financial stability role in financial sector innovations

Authorities including DNB play a role in gaining public confidence in FinTech. DNB for instance influences societal perception of FinTech by making public statements about the desirability of new initiatives. It can also influence confidence by means of its regular supervision and its authorisation policies. The public often views a banking authorisation as a 'seal of approval' of the business model. A banking authorisation also takes away a large proportion of financial risks to consumers because of the deposit guarantee scheme. The level of confidence may also influence the availability of funding for innovation. As agreed in the National Forum on the Payment System (NFPS), DNB assesses innovations with the help of a stylised assessment framework, and decides whether the innovation in question should be stimulated or discouraged based on the outcome of these assessments.²⁰

The rise of non-supervised players complicates the mitigation of stability risks. DNB has several macroprudential instruments at its disposal (see Chapter 2). However, these instruments are primarily geared towards the traditional role that banks play in the economy and have no grip on non-licensed new entrants and activities that can be performed without a banking license. It is for instance impossible to curb excessive lending by non-bank parties by means of increasing risk weights or countercyclical buffer requirements. In addition, no requirements for systemic relevance can be imposed on possible large players without banking licenses.

²⁰ NFPS (2015), Vision on innovations in the payment system, and the role of DNB and the NFPS.

⁴⁸ Policy

DNB welcomes new initiatives, but the approach to FinTech requires careful consideration of opportunities and risks.²¹ Where opportunities are often clear and specific, risks often only play a role after some time and it is uncertain whether or not they will occur. In order to facilitate a positive contribution from technological innovation, DNB for instance plans to explore a more differentiated approach to the authorisation process. Some options include temporary authorisations for experimental services (in line with the regulatory sandbox as launched by the British Financial Conduct Authority (FCA)) and authorisations based on particular activities or specific risks of financial institutions. A point for concern here is that the services and activities performed under a temporary authorisation must be clearly defined. At the same time, DNB is required to oversee financial stability in the Netherlands. This is a delicate balance.

DNB actively monitors the trends in financial innovation. In order to improve its understanding of innovation developments and the size and timing of risks to financial stability, DNB will engage in dialogue with market participants and innovators. The financial sector should be well prepared to meet the challenges of FinTech. DNB has also joined forces with the AFM in setting up an innovation hub for innovative market players to turn to with their questions on regulations and policies. In addition, DNB is studying the possibilities that blockchain technology offers, to keep close track of market trends.

DNB is also investigating how it can keep a grip on the possible stability risks attached to technological innovation (see Figure 3). Where innovations relate to activities subject to authorisation, DNB can use its current range of macro- and microprudential instruments, including e.g. concentration limits, guidance on outsourcing, and IT and integrity supervision. DNB also tests innovations on their impact on payments and the security of payments transfer. The recovery and resolution plans that supervised institutions have in place also make it easier to act in case of acute problems. When innovation with inherent micro- or macroprudential risks also starts to emerge outside of the supervisory frameworks, it may be necessary to adapt the set of supervision instruments. This may take an approach that targets specific activities rather than institutions. The existing set of micro- and macroprudential instruments may also be expanded in order to capture new players and activities.

The evolution of FinTech also has the full attention of supervisory authorities around the world. For now the response is primarily limited to close monitoring of FinTech trends. International cooperation among supervisory authorities is necessary as, even less than before, innovations and innovators are expected to limit themselves to one jurisdiction only, but will aim at setting up cross-border operations. International cooperation helps in creating an effective approach to these innovations, also because this contributes towards a level playing field.

²¹ See also OECD (2009): Regulatory issues related to innovation.

Figure 3 Innovation risks influence DNB's macroprudential policy



Annex 1: Macroprudential indicators

N	ost recent			Trer	ıd after 1998	
ol	oservation	Min	Max	Average	Period under review	
 Credit conditions						
Trend deviation credit/GDP ratio ¹	-19.9	-20.0	17.0	-0.2	1998	3Q1-2015Q4
Growth in household lending (y-o-y)	1.0	-2.1	17.1	6.9	1998	3Q1-2015Q4
Growth in non-financial companies lending (y-o-y)	0.4	-4.4	16.8	3.9	1998	3Q1-2015Q4
Credit terms non-financial corporations ²	0	-48	98	12	200	3Q1-2016Q1
Credit terms residential mortgages ²	-1	-33	98	21	200	3Q1-2016Q1
Leverage						
Leverage ratio CRD IV, fully loaded 3	4.1	3.4	4.1	3.6	2014	4Q1-2015Q4
Tier 1-capital/balance sheet total of the banking secto (up to 2013 Q4)	r 5.0	3.0	5.0	3.9	1998	3Q1-2013Q4
CET1-ratio of banks CRD IV, based on transition rules	14.7	12.9	14.7	14.0	2014 🖍	1Q1-2015Q4
Tier 1-ratio of banks based on CRD III (up to 2013 Q4) ⁴	12.5	8.2	12.8	10.0	1998	3Q1-2013Q4
Debt households (% GDP)	109.1	65.3	117.9	100.1	1998	3Q1-2015Q4
Debt non-financial corporations (% GDP)	105.0	100.5	120.6	110.2	1998	3Q1-2015Q4
Real estate						
Growth in house prices (y-o-y)	3.9	-9.9	20.0	3.9	1998	Jan-2016Feb
Growth in commercial property prices (y-o-y)	3.1	-7.8	9.4	1.9	1998	3Q1-2015Q4
Loan-to-value ratio first-time buyers 5	94.6	93.4	99.9	96.9	200	3-2015
Loan-to-income ratio first-time buyers (ratio)6	4.5	4.2	4.7	4.4	200	3-2015
Interest rate new mortgage loans 5-10 year (bp)	276.9	276.9	561.0	424.0	200	3Jan-2016Feb
Bank liquidity						
Loan-to-deposit-ratio ⁷	156.3	153.7	194.8	175.0	1998	3Q4-2015Q4
Proportion of market funding with maturities < 1 year	28.7	16.6	38.3	29.7	200	3Aug-2015Dec
Systemic importance						
Size of bank balance sheets as a percentage of GDP	373.2	306.5	562.5	419.4	1998	3Q1-2015Q4
Share of G5-banks in balance sheet total of the banking s	ector [®] 84.6	79.9	90.3	87.0	1998	3Q1-2015Q4
Rating uplift of systemically important banks (in steps)	9 1.0	1.0	2.3	2.0	2012	-2015
Internationale risico's						
Long-term interest rates (bp) ¹⁰	32.0	31.4	566.6	352.0	1998	Jan-2016Mrt
BAA-AA risk premium (bp) "	144.0	81.0	463.0	175.3	200	1Jan-2016Mrt
Risk premium in money market (bp) 12	10.2	1.2	186.0	22.5	1999	Jan-2016Mrt
Risk premium on senior unsecured bank bonds (bp) ¹³	87.3	12.6	321.5	86.0	1999	Jan-2016Mrt
Financial stress index 14	0.09	-0.55	3.11	0.22	1999)Dec-2016Mrt
Global credit growth non-financial corporations (y-o-y)	15 -1.6	-5.8	20.2	6.3	200	0Q1-2015Q3
Global growth in house prices (y-o-y)	2.0	-8.8	10.6	3.0	200	1Q1-2015Q3

Concentration of exposures of Dutch banks¹⁶

	Netherlands	Abroad
Total of debt securities and loans	53.7	46.3
Central bank	1.2	0.6
Governments	7.4	3.5
Credit institutions	1.6	12.5
Other financial institutions	2.9	6.4
Non-financial institutions	11.9	15.2
Of which: Small and medium-sized enterprises	2.4	3.0
Of which: Commercial property	4.3	2.3
Households	28.6	8.2
Of which: Mortgage loans	27.3	7.2
Of which: Consumer credit	0.9	0.4

Sources: CBS, BIS, IPD, Thomson Reuters Datastream, Bloomberg, Moody's, DNB. Figures are in (%) unless otherwise indicated. Bp = basis points.

- The difference between 1. The ratio of lending to the non-financial private sector (households and non-financial corporations) to the Gross Domestic Product of the Netherlands and 2. The long-term trend for that ratio as calculated in ESRB (2014), Operationalising the countercyclical capital buffer: indicator selection, threshold identification and calibration options, Occasional Paper No. 5.
- 2 The proportion of banks tightening credit conditions and easing credit conditions, with a positive number indicating a net tightening and a negative number indicating a net easing.
- 3 Calculated on the basis of the most recent definition of the 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 thirty at time the mortgage is taken out. DNB estimates based on a sample of Dutch mortgages.
- 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 thirty at the time the mortgage is taken out. DNB estimates 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 government bonds with ten-year maturities.
- 11 The yield differential between international BAA-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 exposure of all Dutch banks, based on reported consolidated figures for supervision purposes (Q4 2015).

Annex 2: OFS follow-up monitor

This annex discusses the follow-up on previous OFS recommendations since 2011. This list is updated with each edition of the OFS. Our purpose is to be transparent about the pursued actions, and to keep abreast of the progress made.

Table A.1 presents an overview of the actions that DNB has undertaken and the trend of risks since first being mentioned in the OFS.

The list shows that DNB followed up on the identified risks in all cases by taking action to mitigate the identified risks, or to urge institutions to do so themselves. In most cases, the envisaged effect is achieved, or risks develop in the desired direction. This is among other things reflected in the build-up of additional capital and liquidity buffers, examinations and thematic examinations performed to map out risks adequately and implementation of legal measures to mitigate risks. For their part some macroeconomic risks have a more structural nature and external macroeconomic developments have caused them to be still relevant today. This specifically refers to volatility in the financial markets and the possible consequences of stress or macroeconomic shocks. The low interest environment is also putting the pensions and insurance sector under pressure.

Table A.1 Overview of OFS risks and recommendations: follow-up and current status

Risks and recommendations (first citation in the OFS)	Relevant actions taken by DNB.	Status (since first citation in the OFS)	
Banks 1. Insufficient capital reinforcement: banks are required to strengthen their capital positions (autumn 2011).	DNB supervises accelerated movement towards Basel III capital requirements. Extra capital buffers imposed.	The rise in CET1 ratios proves that capital buffers have been reinforced. Systemically important banks are building up extra buffers.	
2. Funding risk: caution with respect to secured funding (autumn 2011); reduction of dependence on market financing (spring 2012).	DNB supervises accelerated movement towards Basel III capital requirements. Extra capital buffers imposed.	Monitoring shows that virtually all banks already comply with the LCR/NSFR requirements. The deposit funding gap is narrowing.	
3. Commercial real estate: structural factors are still putting demand for office and retail space under pressure, which may cause risks on bank balance sheets (autumn 2015).	Prompt identification of structural trends and build-up of possible new risks.	DNB examinations have led banks to fortify their buffers in order to cushion risks deriving from commercial real estate.	

Table A.1 Overview of OFS risks and recommendations: follow-up and current status (continued)

- 4. Upward interest rate shock: adequate management of risks of interest shock (spring 2013).
- 5. Ineffective bail-in: embedding of bail-in in European legislation resolution directive and launch (autumn 2013); sufficient bail-in buffers (spring 2015).
- 6. Financial market volatility: the tightening of monetary policy in funding risks at banks and its the United States, the slowdown regular supervision includes the in emerging markets, the reemergence of the European debt crisis, and drying up market liquidity may increase financial market volatility (autumn 2015).

- Examination into quality of interest rate risk management. DNB includes risks of interest rate Chapter 1). shock in stress tests.
- Implementation of European of national resolution authority. Attention is now focused on the level and quality of the bail-in layer.
- DNB monitors management of impact of market stress.

This risk remains in place due to low interest rates (see also

After implementation of the Bank Recovery and Resolution Directive (BRRD) and the establishment of the national resolution authority, it is now important to ensure that sufficient bail-in layers are created.

Financial market volatility remains high (see Chapter 1) and demands unabated alertness.

Insurers

- of life insurers: cost reduction (autumn 2011); working towards the sector to reduce costs and a sustainable business model (autumn 2014). Taking account of the situation that solvency may inadvertently prove to be inadequate (spring 2015).
- 8. Unit-linked insurances: efforts to find solutions to breach of duty of care (autumn 2011).

7. Sustainability of business models DNB performed examinations and made recommendations to increase profitability.

This risk has a structural character. The sector continues to be under pressure. The sustainability of business models continues to be an important component of ongoing supervision.

Together with the Ministry of Finance and DNB, the AFM monitors follow-up actions by insurance companies (activating customers).

Formulated target figures for follow-up action and activating of customers are embedded in law and must be complied with.

Table A.1 Overview of OFS risks and recommendations: follow-up and current status (continued)

9. Guaranteed returns: caution with respect to return guarantees (autumn 2013).

DNB monitors adequate valuation This risk remains and is included as proceed with care where issuing of new return guarantees is concerned.

of guarantees and that institutions a component of ongoing supervision of the sustainability of business models.

Pension funds

10. Sustainability of the pension system: pension funds are required to increase their buffers Assessment Framework) and (autumn 2011); pensionable age must be raised (spring 2012).

DNB issues advice for the purpose of the Pension Fund (Financial provides input for the debate about the future of the pension system.

Some steps have been taken to improve resilience (implementation of Financial Assessment Framework, increasing the pensionable age), but the fundamental debate on the sustainability of the pension system is still ongoing.

System-wide

- 11. Risks on the housing market: reduction of the LTV limit (autumn 2011); curbing of tax incentives (autumn 2011).
- 12. Cyberthreats: financial institutions must increase their resilience (autumn 2013).

13. Search for yield and bubble formation: formulating realistic return targets (autumn 2014).

14. Governance and variable remuneration policies: structural change in culture (spring 2015); no incentives for excessive risk-seeking (spring 2015).

The Financial Stability Committee issues advice on lowering of the LTV limit and curbing of tax incentives.

DNB is exploring measures to increase the resilience of financial institutions.

DNB performs examinations and urges financial institutions to be prudent.

DNB supervises compliance with the Regulation on Sound Remuneration Policies.

Risks have decreased. LTV limit and mortgage interest tax relief to be reduced in stages. Further steps are necessary from a structural perspective.

Risk remains topical. Long-term attention of institutions and DNB necessary in order to prevent incidents and distortions.

The current macroeconomic situation requires increasing alertness from DNB and the institutions alike.

Awareness is increasing, but the cultural change still has some way to go.

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