Spring 2018

Financial Stability Report

DeNederlandscheBank

EUROSYSTEEM

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Westeinde 1, 1017 ZN Amsterdam – PO Box 98, 1000 AB Amsterdam, the Netherlands
Telephone +31 20 524 91 11 – E-mail: info@dnb.nl
www.dnb.nl

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.

Every six months DNB publishes its Financial Stability Report (FSR). 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 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 prevent or mitigate these systemic risks.

The FSR does not provide projections, but analyses scenarios. It includes a risk map that summarises the main risks to financial stability emerging from the current and previous issues of the FSR. For an overview of the follow-up given to the recommendations made in previous editions of our FSR, see our website.[1]

1 See www.dnb.nl/en/news/dnb-publications/financial-stability-report.

Summary

International risks

A little more than a decade after the outbreak of the financial crisis, the world economy is growing robustly, partly owing to the very accommodative monetary conditions. The necessity for exceptional monetary impulses has meanwhile disappeared, however. Moreover, as the accommodative policy continues, financial vulnerabilities increase. Prolonged accommodative financial conditions stimulate debt accumulation by households, corporations and governments for instance. Partly due to this, global debt levels have risen to record highs. The exceptional monetary impulses are also fuelling a search for yield in the financial markets. This is pushing up asset prices, sometimes to above their fundamental values. Price/earnings ratios of US equities are for instance way above their long-term averages, while risk premia on European corporate bonds are at exceptionally low levels. The elevated risk appetite is also increasingly visible in the real estate and crypto markets for instance.

Phasing out the accommodative monetary policy is necessary, but this demands very precise navigation skills, as an unexpected adjustment of monetary policy may result in re-pricing of risk premia on the financial markets and a sudden rise in market interest rates. This may have a severe impact on debtors, who will see their interest burden rise. In the emerging countries, the corporate sector is particularly vulnerable; corporate debt in countries like China, Turkey and Russia has soared over the past few years. In the developed countries, government debt has risen particularly sharply since the crisis, while household and corporate debt remained at ongoing high levels.

The recent developments in Italy illustrate that the interplay between the debt position of governments and their banking sectors continues to be a major point for attention in Europe. Countries like Italy, Spain and Portugal are still relying heavily on their own banking sectors to finance their debts. If risk premia on government debt rise sharply, these countries' banking sectors would be severely hit in the form of losses on their investment portfolios. As deteriorating risk profiles of banks may lead to higher risk premia on public debt, the negative interaction between banks and governments may resurface in these countries. In addition, the banking sector in these countries is still battling with structural weaknesses like high levels of non-performing loans. Strengthening the European banking union remains crucially important in order to curb the interdependence between banks and governments. It would also be wise to phase out the current preferential treatment of public debt in the capital framework of banks.

If risk appetite were to diminish suddenly this may be accompanied by sharp price corrections. This applies in particular to assets whose valuations deviate strongly from their underlying fundamentals. Moreover, financial markets are increasingly vulnerable to self-reinforcing mechanisms, which exacerbates price corrections. Open-end investment funds are for instance playing an increasingly important role in the global financial system. A market correction may force these funds to liquidate their positions, which would further amplify the induced price correction.

Other factors besides the monetary policy stance may also lead market sentiment to turn. First of all, worldwide geopolitical tensions are relatively high. Investor confidence may be dented if the existing concerns about terrorist or nuclear threats and a renewed cold war were to rise or even materialise. In addition, a great deal of uncertainty exists about the future direction of international trade policy. There is a risk of an ever increasing number of trade restricting measures being implemented. This expression of de-globalisation has negative effects for worldwide economic growth.

Within Europe, Brexit continues to be an important point for attention. A hard Brexit – the United Kingdom abruptly leaving the EU without an agreement and a transition period in place – cannot be excluded, even though the terms of a transition period were agreed in principle in March of this year. A hard Brexit will be accompanied by risks to financial stability, especially if markets and financial institutions are ill-prepared. Financial services provided from the United Kingdom may for instance be disrupted, e.g. in the settlement of derivatives contracts. In view of the strong trade and financial ties that the Netherlands has with the UK, the Dutch financial sector must prepare itself for all possible scenarios of Brexit.

Financial stability in the Netherlands

The financial resilience of the Dutch banking sector was boosted considerably over the past years. Owing to their relatively strong capitalisation, Dutch banks are already largely meeting the stricter capital requirements under Basel 3.5. The Dutch banking sector is nevertheless still grappling with a number of vulnerabilities. The leverage ratio is low from an international perspective and Dutch banks are relatively dependent on market funding.

The Dutch housing market is gaining firm momentum and has bounced back to the record prices seen in 2008. House prices in the major cities have already risen above their 2008 levels. A spillover effect from the major cities is now also being observed: prices in the surrounding regions are also rising sharply. Partly owing the current low interest rates, homes are generally still more affordable than before the crisis, but financing costs for first-time buyers in the cities have now risen to above their pre-crisis levels. This is due to the soaring prices in the cities. Residential properties in the cities are increasingly being bought by private investors. This may contribute towards a growing private rental market, but it is also driving up prices.

Despite the sharp rise in house prices, mortgage lending growth has remained subdued to date. Mortgage lending for instance advanced by 1% last year. By way of comparison: between 1996 and 2000, when house prices rose by more than 10% annually, mortgage lending grew by around 16% a year. The current subdued mortgage lending growth is partly attributable to more redemption payments being made (either scheduled or voluntary), and buyers increasingly using their own funds to pay a deposit on their new home. If house prices continue on their current growth path, it stands to reason that mortgage lending growth will gain momentum again, and financial stability risks may increase.

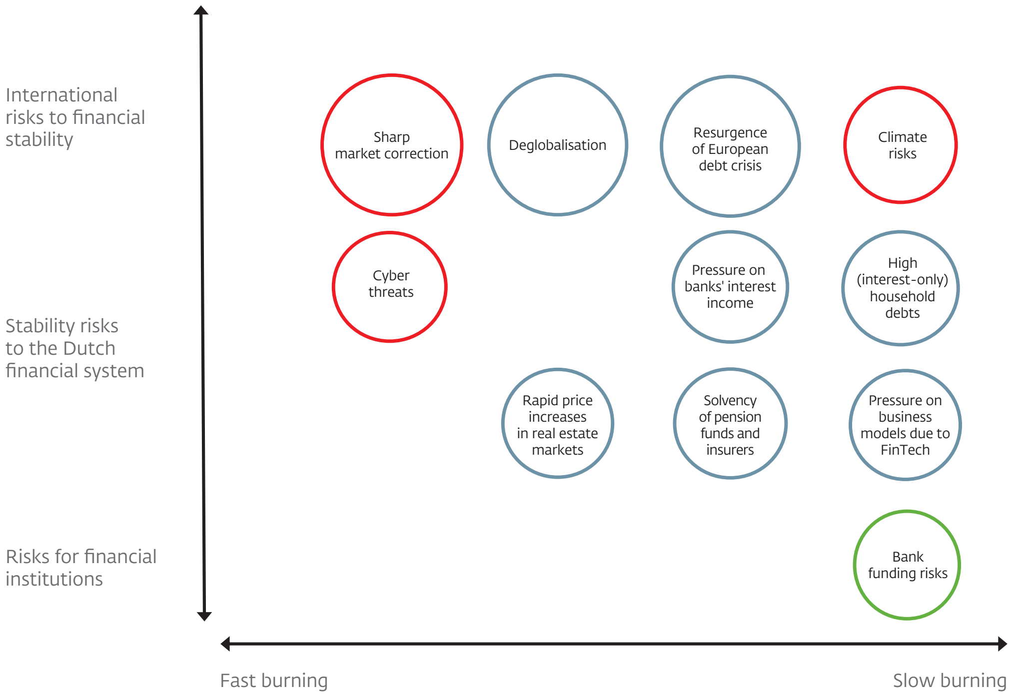
Several years ago, the economic slowdown and the housing market correction were mutually reinforcing. In the same way, the economic upturn and the housing market revival are now feeding each other. This procyclicality may be accompanied by unnecessarily high economic and social costs and is related, among other things, to the fact that mortgage interest tax relief and borrowing limits in the Netherlands are generous by international standards.
The scheduled accelerated phasing out of mortgage interest tax relief will have a dampening effect on procyclicality. Further reduction of the LTV limit for residential mortgage loans after 2018 is advisable. Although the LTV limit was reduced in stages over the past years – from 106% to 100% – the Dutch LTV limit remains very high from an international perspective. The current scarcity on the housing market should be remedied by increasing the housing supply, especially in the middle segment of the rental market.

The Netherlands may also be hit if interest rates suddenly increase. In the third quarter of 2017, household and corporate debt came to 106% and 120% of GDP respectively, which is high from an international perspective. When interest rates rise, the interest burden for corporations and households with high debts may increase sharply. As Dutch corporations often use more short-term funding than households, they will feel the consequences of rising interest rates sooner than households. Households have reduced their vulnerability to interest rate hikes over the past years by making more redemption payments on their mortgage loans and increasingly opting for longer fixed interest periods when taking out a mortgage. The effects of a rise in interest rates differ widely between households and between corporations. Vulnerable corporations and households would do well to keep track of the effects of an interest rate hike on the affordability of their debts and build up financial buffers on time.

For the banking sector, rising interest rates will initially have a negative impact as the increase in funding costs will outpace the increase in interest income on outstanding loans. This certainly holds true for banks that are heavily dependent on short-term market funding. For insurers and pension funds, the effect of an interest rate hike depends on how it materialises. If interest rates rise due to an increase in risk free interest rates, the financial position of pension funds and insurance companies should normally improve. However, if interest rates rise due to sharply rising risk premia, pension funds and insurance companies may be hit hard through losses on their investment portfolios.

IV

Risk map



This risk map provides a schematic overview of the key risks to financial stability according to this and previous editions of the FSR. 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).

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International developments

The world economy is growing robustly. Stimulated by the still very accommodative monetary conditions, the world economy is showing robust growth, ten years after the outbreak of the financial crisis. The IMF estimates global economic growth at 3.9% this year. The euro-area economy is also growing vigorously: the ECB projects GDP growth of 2.4% for 2018. The Dutch economy is no exception with projected growth of 3.1% this year.

The bright economic outlook, however, masks dormant risks to financial stability. First of all, policy uncertainty is high (Figure 1). The negotiations about the nature of the United Kingdom (UK)'s future relationship with the European Union (EU) are progressing with difficulty. The UK's exit from the EU without agreement and without a transition period in place (referred to as a hard Brexit) cannot be ruled out, even after the signing of a temporary agreement on a transition period in March of this year. A hard Brexit may be accompanied by risks to financial stability (Box 1). In addition, policy uncertainty in the area of international trade has increased further, due to the introduction by the Unites States of import duties on steel and aluminium for specific countries. The introduction of such import duties may induce trade hampering measures, which may have negative repercussions for global economic growth. And last but not least, the economic upswing has fuelled the lobby in some countries and sectors to moderate the more stringent rules and regulations put in place after the crisis. In the United States concrete steps have been taken for instance to relax the *Dodd-Frank Act*.[2]

Increasing geopolitical tensions across the globe may dent investor confidence. Due to military and diplomatic developments in different parts of the world (including the Middle East and Russia), geopolitical tensions rose in the past year and are now at a high level (Figure 1). The existing concerns about terrorist and nuclear threats and a new cold war, may rise in due course or may even materialise. This may undermine confidence in the world economy. If countries were to adopt a more isolationist stance, the authority of multilateral institutions like the IMF, the WHO and the Worldbank may come under pressure. This complicates achieving shared solutions in crisis situations.

2 The Dodd-Frank Wall Street Reform and Consumer Protection Act is a federal US law introduced in response to the 2007 credit crisis, and became effective in July 2010. Its objective is to enhance financial stability in the United States, by imposing more stringent regulations on financial institutions and protecting consumers against financial malpractices. In March 2018, the US Senate agreed with a legislative proposal (known by the name of Crapo Bill) to relax parts of the Dodd-Frank Act. The proposal among other things raises the limit above which banks are subjected to an intensified supervisory regime, and allows small banks to ease their acceptance criteria for mortgage loans.

Box 1 The financial sector must prepare for Brexit

On 29 March 2017, the United Kingdom (UK) formally set in motion its departure from the European Union (EU). One year after this decision, a temporary agreement about a transition period has been signed. Providing an agreement is in place, the United Kingdom will have access to the European internal market until 31 December 2020. The transition period provides more certainty to civilians and businesses in the near future. At the same time, a definitive exit agreement has not yet been concluded and the negotiations on the UK's future relationship with the EU are progressing with difficulty on some parts. An abrupt exit without an agreement in place and without a transitional period (a hard Brexit) may therefore still be on the cards.

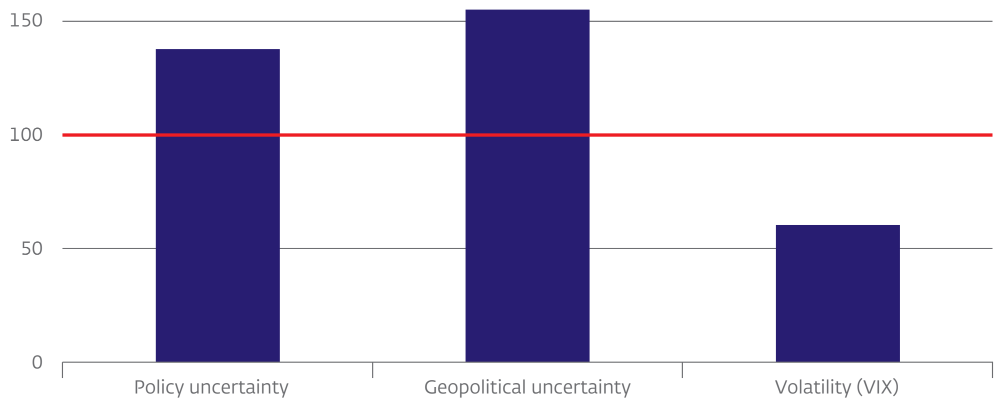
A hard Brexit will be accompanied by risks to financial stability, especially if markets and financial institutions are unprepared for a no-agreement outcome. A hard Brexit may induce volatility on the European equity and bond markets and financial losses for institutions with substantial investments and lending exposure to the UK. In the longer term, indirect risk may also materialise, e.g. because banks have extended loans to European corporations dependent on trade with the UK.

Without counter measures, a hard Brexit may also disturb financial services provided from the UK. The City for instance plays a prominent role on the international derivatives markets. Dutch financial institutions use these derivatives among other things to hedge interest rate risk. A hard Brexit may lead these services to be temporarily or permanently closed off to Dutch financial institutions, or may cause sharp cost increases. Complications may also emerge with respect to existing derivatives and insurance contracts. Derivatives contracts between parties in the UK and the EU will continue to be legally valid also in case of a hard Brexit. However, specific options in derivatives contracts relating to regulated activities, known as "life cycle events" (e.g. interim contract renewal or adjustment) can no longer be executed because the parties will not hold the required licence. Financial institutions may therefore be forced to review these contracts on a large scale, or to conclude them with parties in other countries within a short space of time. British (re)insurance companies may no longer be able to pay out damage claims to European citizens and businesses. After a hard Brexit, British (re)insurance companies will no longer fall within the scope of the European supervision framework, meaning that without additional measures, it will no longer be permitted to pay out claims for damages.

A more gradual transition to a new relationship with the UK will also be accompanied by friction and adjustment costs. Together with its European supervisory partners, DNB monitors whether Dutch financial institutions are charting the impact of Brexit in all possible scenarios, and are taking prompt measures. Postponing such measures is risky, even now that the two parties have agreed terms for a Brexit transition period. This is all the more important as the Netherlands is among the countries that have strong trade and financial ties with the UK, partly owing to our country's open economy and its large financial sector.

Figure 1 Policy and geopolitical uncertainty indices and VIX index

Indices; average between January 1997 and March 2018 = 100.



Source: Baker, Bloom and Davis (2015), Caldara and Iacoviello (2018) and Thomson Reuters.

Notes: Policy uncertainty is gauged by the Economic Policy Uncertainty Index, compiled by Baker, Bloom and Davis (2015). It measures the level of policy uncertainty by the frequency with which specific word combinations appear in major newspapers. Geopolitical risk is gauged by the Geopolitical Risk Index compiled by Caldara and Iacoviello (2018). This index measures the frequency with which international newspapers refer to geopolitical tensions. Volatility is measured by the VIX index. The bars represent the average values for the past year (average April 2017-March 2018), while the line reflects the average value between January 1997 and March 2018.

Monetary policy makers are meanwhile being faced with the challenge of phasing out the exceptionally accommodative monetary policy. As a result of the robust economic recovery and the improved inflation prospects, the necessity of exceptional monetary impulses has disappeared. In the United States, the Fed has already started phasing out its accommodative monetary policy. US policy rates were raised in March 2018 to a bandwidth of between 1.5 and 1.75% and the Fed started reducing its expanded balance sheet in October 2017. In the euro area on the other hand, policy rates are still at 0%, deposit rates are negative, and the Eurosystem's asset purchase programme is set to continue at least until September 2018. The ECB has, however, decided to lower its net monthly bond purchases to EUR 30 billion, from a net amount of EUR 60 billion. In the euro area, too, the exceptionally accommodative monetary policy needs to be gradually phased out over time, however.

The current accommodative monetary policy is accompanied by rising financial stability risks. As financial conditions remain accommodative for longer periods of time, households, corporations and governments will not only lose the incentive to reduce their existing debts, but will also be motivated to build up excessive debts. The accommodative monetary policy is also having a distorting effect on the financial markets. The exceptional monetary impulses are fuelling a search for yield, which distorts risk pricing. The sharp drop in risk premia on high-yield corporate bonds is a case in point (see the "Financial Markets" section of this report).

In addition, market volatility is being dampened by the current accommodative monetary policy, which leads to underestimation of risks and a heightened search for yield. Strong and prolonged monetary stimulation is also at the cost of the real economy as it hampers the process of creative destruction. Thanks to cheap funding, weak corporations can survive relatively easily in a prolonged low interest environment. An increasing number of weak firms may hamper efficient allocation of production factors. Rolling over of loans to these zombie companies is at the expense of lending to new and innovative companies. As a result, a relatively large proportion of capital goes to less productive firms. OECD research shows that a larger proportion of zombie firms is accompanied by lower investments and lower productivity growth.[3] In addition, the real economy will also be hit if prolonged accommodative financial conditions lead to postponement of necessary structural reforms.

High debt levels are making it more difficult to phase out the exceptionally expansionary monetary policy. According to BIS estimates, non-financial sector debt came to over 240% of aggregated gross domestic product (GDP) in mid 2017, relative to almost 210% in 2007.[4] While in emerging countries especially private debt has risen sharply since the financial crisis, developed countries have seen increasing public debt levels (Figure 2). Considering these high debt levels, the accommodative monetary policy must be phased out carefully.

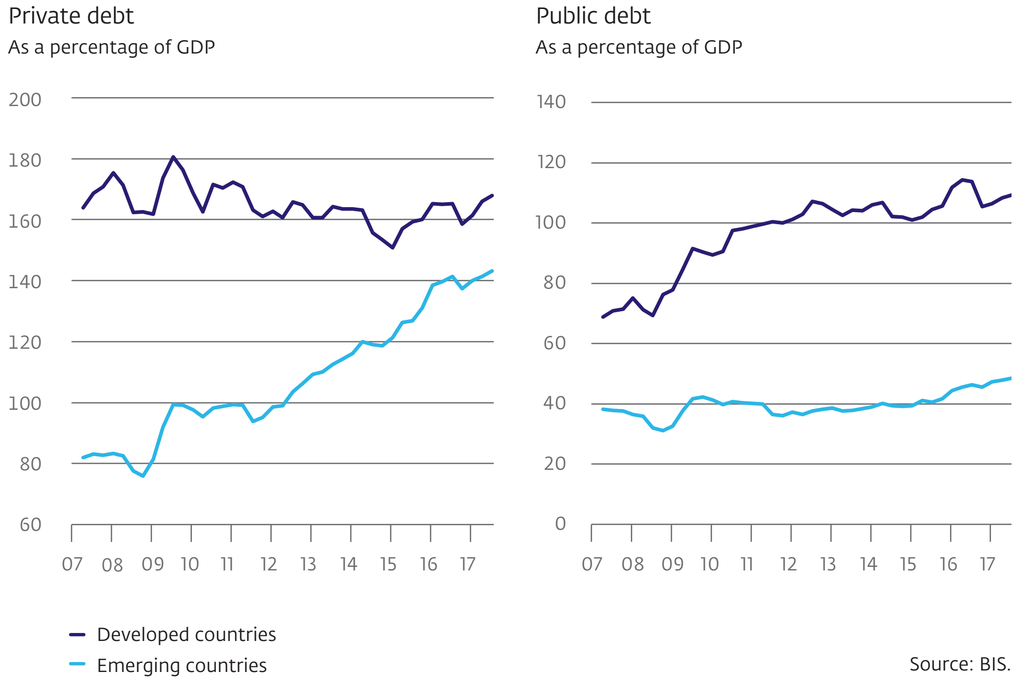
High debt levels make corporations in emerging countries vulnerable. Despite the favourable financing conditions, interest and repayment commitments on private debt have increased substantially in a number of emerging countries. Especially in China, Turkey and Russia, debt servicing costs are at historically high levels. In emerging countries, corporations use debt financing more than households do: in 2017 the corporate debt ratio in these countries came to 104% of GDP, relative to 38% of GDP for households. If financing conditions deteriorate, these corporations may be confronted with substantially higher debt servicing costs. On top of that, corporations that have run up debt in foreign currencies and have not hedged exchange rate risk, are vulnerable to currency fluctuations. In Turkey in particular, a large part of debt is denominated in foreign currencies.

The euro area has reduced its public debt only slightly since the crisis. Public debt in the euro area rose particularly sharply between 2007 and 2012 (Figure 3). This sharp increase is related to necessary interventions in the financial sector and the deep recession that followed the financial and European debt crises. Only a small number of governments have reduced their debts since then (Figure 3). Favourable market conditions have facilitated financing of public debt in developed countries. Credit default swap premia and interest rates have for instance dropped sharply in the past few years. This enabled some governments, including the Dutch, to issue bonds at very low, or even negative effective interest rates. In addition, more bonds

3 See McGowan, M.A., D. Andres and V. Millot (2017), *The Walking Dead? Zombie Firms and Productivity Performance in OECD countries*, OECD Economics Department Working Papers, No. 1372.

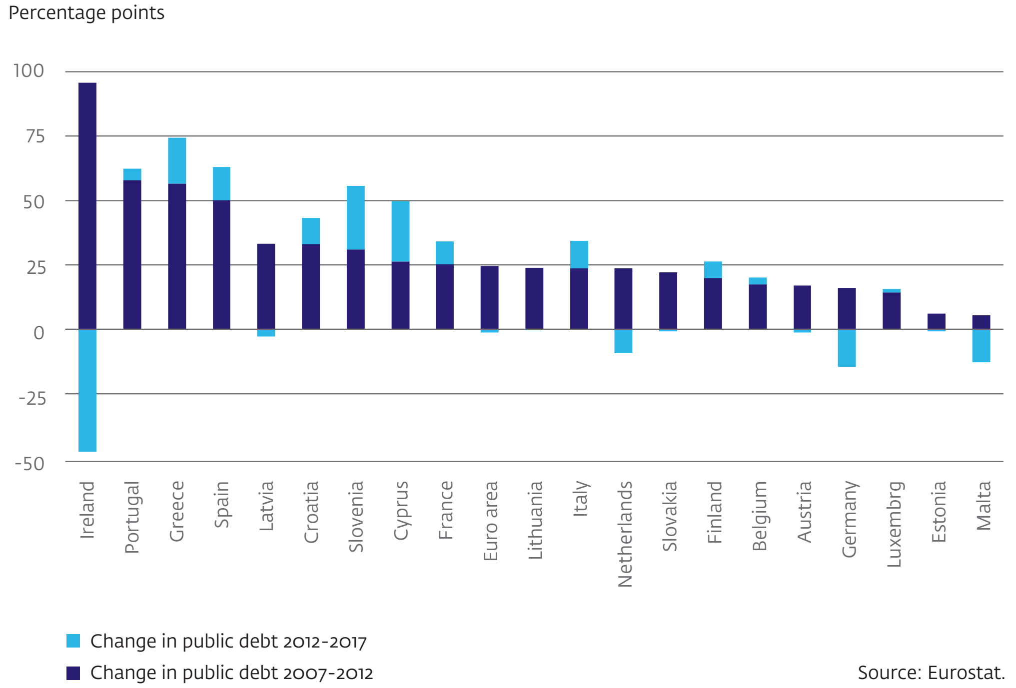
4 The BIS figures include 44 countries, both mature and emerging economies.

Figure 2 Private and public debt ratios in developed and emerging countries



Source: BIS.

Figure 3 Change in public debt in euro-area countries



Source: Eurostat.

with longer maturities were issued in recent years, driving up the average remaining term to maturity of outstanding debt.

The debt dynamics of euro area governments with high debts remain vulnerable. Greece, Italy, Portugal, Belgium and Cyprus at end 2017 had public debt levels of more than 100% of GDP, while those of France and Spain were only just below this level. In addition, a number of these vulnerable countries will have to refinance a substantial part of their public debt relatively soon. In Italy, Spain and France for instance, more than one fifth of public debt is due to mature within two years from now.[5] ECB calculations show that in countries with the highest debt levels, average public sector financing costs will increase sooner than those for countries with lower debt levels.[6]

The negative interaction between banks and governments may resurface. The Italian, Spanish and Portuguese governments are still relying heavily on their own banking sectors for financing of their debts.[7] If risk premia on government paper rise sharply, these countries may be affected through losses on investment portfolios. In order to break the "doom loop" that ties banks and sovereigns together, it would be wise to phase out the current preferential treatment of public debt in the capital framework of banks.[8] Concentration limits may also further restrict exposure of banks to governments.

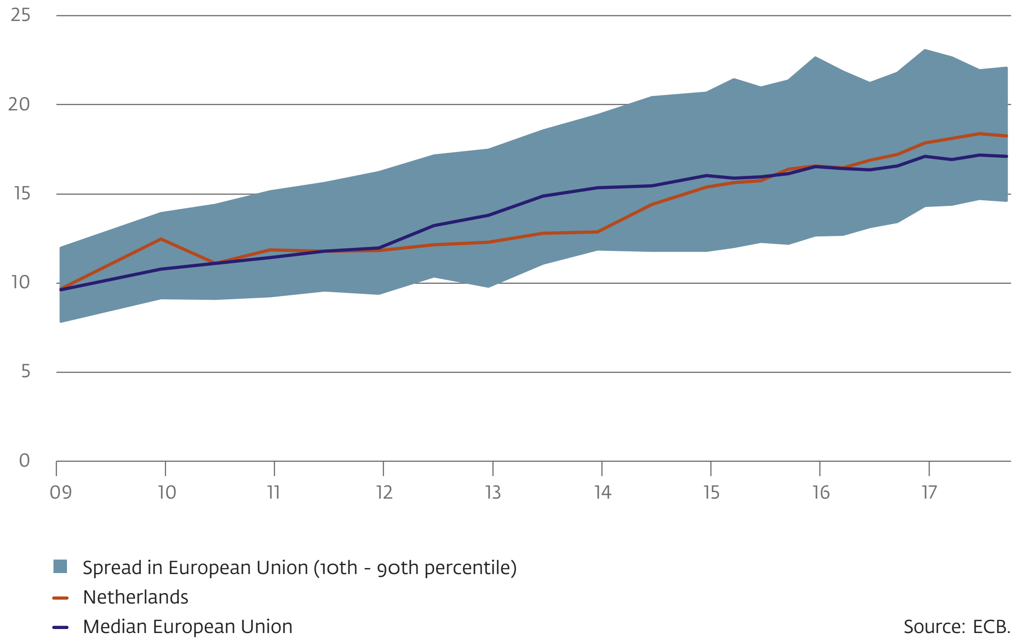
Strengthening of the European banking union will also loosen the ties that bind banks and governments together. Lifting prudential supervision and the handling of failing banks to the European level, reduces the likelihood of problems in national banking sectors affecting public finances in these countries. The banking union has not yet been completed, however. In addition to the formation of a European deposit guarantee scheme, it is important to further operationalise the joint European resolution framework. The recent experiences with failing banks confirm the importance of maintaining sufficient loss-absorbing capacity at banks. Some considerable steps still need to be taken in this respect, however.[9]

Although European banks have become more resilient, some parts or the European banking sector continue to show structural weaknesses. Since the financial crisis, European banks have improved their capital position by an average of 750 basis points, but there are significant differences between countries (Figure 4). Despite the improved capitalisation, a significant part of the European banking sector is facing structural weaknesses. This first of all concerns the large amount of non-performing loans on the bank balance sheets of some countries: in Greece and Cyprus for instance, over 30% of loans are still classifying as non-performing. Although

5 ECB, *Government Finance Statistics*.
6 ECB (2017), *Financial Stability Review*, November.
7 DNB (2017), *Financial Stability Report*, Autumn.
8 Basel Committee on Banking Supervision, *The regulatory treatment of sovereign exposures*, December 2017.
9 Estimates made by the Single Resolution Board (SRB) revealed that European banks at end 2016 still needed EUR 117 billion in order to meet the minimum requirements on eligible liabilities (MREL).

Figure 4 Capital ratios of banks in the European Union and the Netherlands

Tier 1 ratio



Source: ECB.

progress was made recently in reducing the number of non-performing loans, the pace at which problem loans are being reduced varies significantly between countries. In addition to this, the banking sectors of some countries are still grappling with high operational costs that are putting profitability under pressure.

Basel 3.5 must be implemented in European legislation and regulations on time and in full.
In December 2017, agreement was reached on the new Basel 3.5 capital framework for banks.[10] The agreement will bring more uniformity in the way in which banks calculate their capital buffers. This contributes towards confidence in the risk-weighted capital ratios of banks as an indicator of their creditworthiness. The agreement provides for global standards that will be incorporated into legislation. For the Netherlands this will be arranged within the European Union. For the sake of the credibility of the Basel standards and an international level playing field, it is important to implement the agreement in European legislation on time and in full.

10 In the wake of the financial crisis, the 2010 Basel III accord laid down agreements about an overall increase of the amount and quality of the capital that banks are required to hold. However, supplementary rules proved to be necessary soon after the accord was signed. These rules have taken form in Basel 3.5.

Technological innovation and increased digitisation are putting the European banking sector to the test. Technological innovation in the financial sector is making rapid strides. Although technological innovation may fuel competition in the financial sector, with positive effects for diversity and productivity in the sector and more options for consumers, it may also induce risks for financial institutions. The ongoing digitisation for instance increases the financial sector's vulnerability to cyberattacks. In early 2018, the large Dutch banks fell victim to various disruptions, due to DDoS attacks. Although financial stability was not in danger at any point, these attacks illustrate the vulnerability of banks to cyberattacks. Financial institutions are therefore required to invest continuously in their cyberresilience. In addition, the increased cyberthreats call for closer cooperation between the financial sector, other vital sectors, and public authorities. In addition to supervising information security at financial institutions, DNB has developed the *threat intelligence-based ethical red teaming* (TIBER) programme together with the sector. Under the TIBER programme, controlled attack tests are launched on institutions that are part of the financial core infrastructure, with the purpose of strengthening joint cyberresilience.

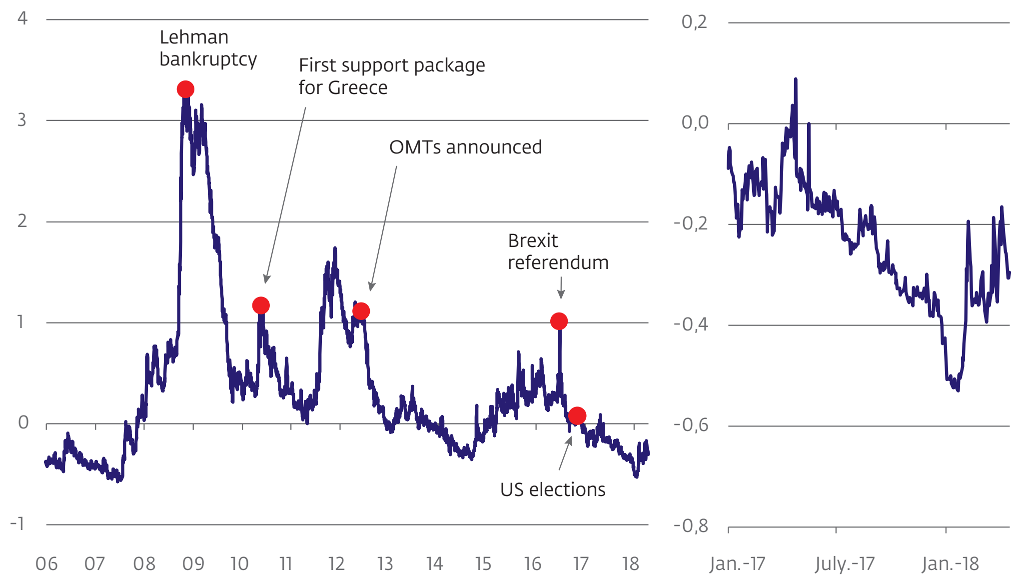
Climate change and energy transition may have a significant impact on the financial sector.[11] Climate change has a multifarious impact on the financial sector. Physical manifestations of climate change such as gales and hail storms may for instance negatively impact the results of non-life insurance companies, by causing a higher than expected claims burden. The financial sector may also be affected by the transition to a carbon-neutral economy. Downward revaluations of claims on carbon-intensive businesses, may for instance lead to capital losses in the financial sector. The exact repercussions of climate change and energy transition for the financial sector are uncertain. In order to improve its understanding of these risks, DNB has embedded climate risks more firmly in its supervision. As part of this effort, we are developing climate stress tests to map out the repercussions of climate risks. In 2017, a climate-related stress test was performed at non-life insurers, and a stress test that is to chart the possible consequences of energy transition for large Dutch financial institutions is being developed.[12]

Financial markets

Stress levels on the financial markets continue to be low, despite edging up a bit in the past months. Having waned in the past few years, financial stress recently resurfaced shortly on the equity markets, due to sharp price volatility (Figure 5). Between 26 January and 8 February of this year, equity markets saw sharp downward corrections. The S&P 500 and the Nikkei lost over 10%, the AEX 8% and the Eurostoxx 600 index 7% during this time. The downward correction was initiated by accelerating wage growth in the United States, causing the financial

11 DNB (2017), *The Dutch financial sector: safe and sound behind the dykes? An exploratory study into climate-related financial risks*.
12 DNB, *Non-life insurers relatively resilient against stress*, 19 December 2017.

Figure 5 Financial stress index



Note: Stress index based on indicators of financial markets relevant to the Netherlands and a health index of financial institutions.

markets to anticipate accelerated monetary tightening by the Fed. In early April, equity market volatility soared once again, partly due to growing concerns about a trade war.

The search for yield on the financial markets continues. To date, the recent surge of volatility on the equity markets has had small spillover effects only on other financial markets. The fact that risk appetite continues to be high is particularly visible in the more risky segments of the bond markets. Risk premia on high-yield corporate bonds are low for instance and interest rates on contingent convertible bonds have plummeted. And so the search for yield, which prompts investors to shift their investment portfolios towards higher-yielding, but riskier assets, continues unabated. This also fuels other markets, e.g. crypto markets (Box 2), real estate markets, or the leveraged finance market.[13]

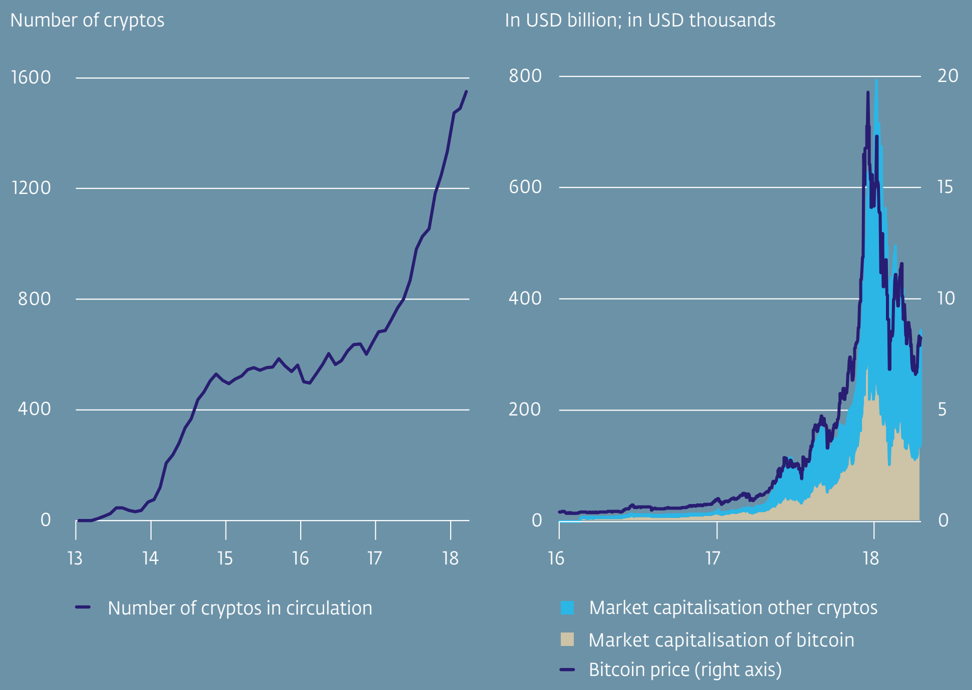
13 Leveraged loans are loans with an elevated risk profile to less creditworthy businesses, or to businesses that are already relatively dependent on debt financing. Firms use this form of funding among other things to finance specific high-risk activities, e.g. leveraged buy-outs, takeovers, or share buy-backs.

Box 2 Volatile crypto markets as yet no threat to financial stability

Cryptos were designed and developed to transfer value outside the existing monetary system, based on cryptography and without the involvement of third parties like commercial or central banks. Crypto trading reached the general public last year. As a result of an explosive price performance, the market capitalisation of cryptos soared within a short space of time. At the end of 2017, the market value of cryptos totalled almost USD 800 billion, around 10% of the market capitalisation of gold, and roughly comparable with the market value of Apple or Google. Sharp price corrections at the start of this year have meanwhile halved the market capitalisation of cryptos (Figure 6).

Despite their explosive growth and high volatility, cryptos are currently no threat to financial stability. Compared with official currency markets like the US dollar and euro markets, the cryptomarkets are still small. In practice, cryptos are not regarded as currencies because they do not function as a stable medium of exchange, suitable unit of account or credible store of value.

Figure 6 Cryptos: number and market capitalisation



Source: CoinMarketCap.

However, cryptos are not without risk either. Consumers and investors are not protected by regulations and supervision when holding or trading cryptos. Due to their anonymous character, cryptos also fuel risks of money laundering and financing of illegal activities, e.g. when they are exchanged for euros and vice versa. The supervisory authorities have therefore repeatedly warned the general public and the financial sector against the risks of cryptos.

The turbulent development of cryptos has caught the attention of worldwide supervisory authorities and policy makers. The March 2018 meeting of the G20 at length discussed the risks attached to cryptos.[14] It is important for supervisors to keep monitoring cryptomarkets and the development of derivative products closely. The cross-national character of this market moreover demands a concerted international approach. In Europe, the first steps towards a regulatory framework are being taken by bringing crypto trading platforms and issuers of electronic wallets within the scope of the European anti-money laundering directive.

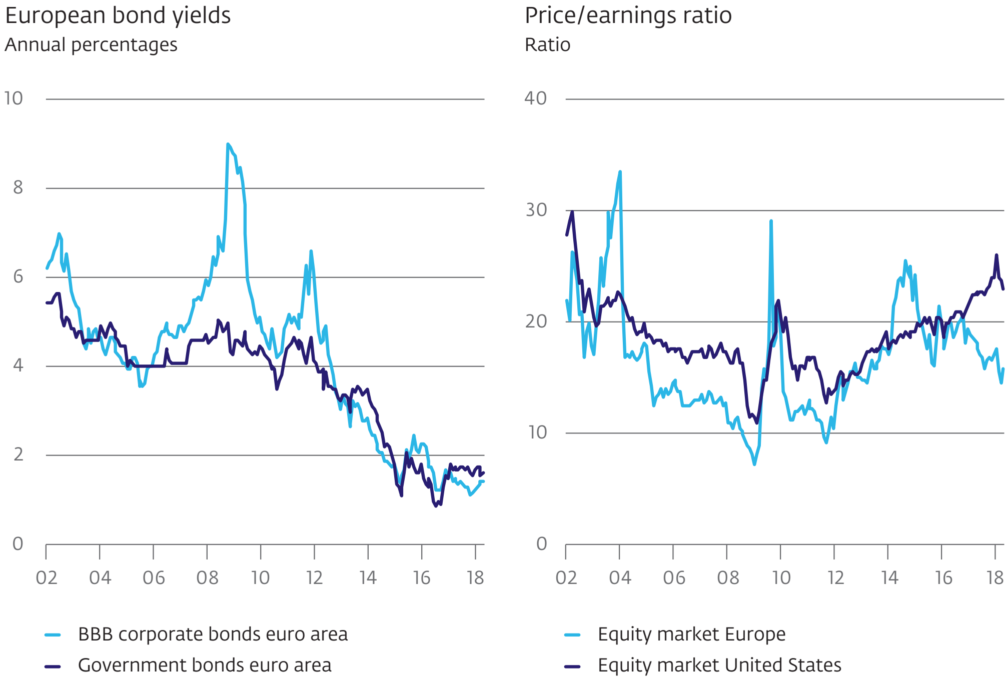
The sharply growing leveraged loans market illustrates an increasing risk appetite among investors. The issue of leveraged loans in Europe has returned to pre-crisis levels, and in the United States is even higher than before the crisis, while borrowing conditions are being eased further. In the United States, 70% of leveraged loans currently consist of covenant lite loans (loans that offer investors fewer guarantees and allow a bigger leverage) as compared with 30% before the crisis. Although the banking sector's exposure to leveraged loans is still relatively low (a little over 4% of bank corporate loan exposure in the euro area concerns leveraged loans), there are indications that non-bank investors are increasingly prepared to provide this form of funding in their search for yield.[15] This in turn induces firms to continue issuing these loans with an elevated risk profile.

High valuations may provoke new market corrections. Partly due to the search for yield and the improved macroeconomic conditions, various asset classes saw sharp price rises in the past year, sometimes to above their fundamental values. The price/earnings ratios of US equities are for instance way above their long-term averages, while risk premia on European corporate bonds are at exceptionally low levels (Figure 7). Although financial market sentiment is still upbeat, a turnaround cannot be excluded. Such a turnaround may for instance be prompted by unanticipated monetary policy adjustments, mounting geopolitical tensions, or an escalating trade war. If investors' risk appetite were to diminish suddenly, this may induce sharply rising risk premia. Especially assets with valuations deviating sharply from their underlying fundamentals may be in the line of fire.

14 https://www.g20.org/en/press/press-kit/press-releases/communique-first-g20-meeting-financeministers-and-central-bank.

15 IMF (2018), *Global Financial Stability Report*, April.

Figure 7 European bond yields and price/earnings ratios on equities



Source: Thomson Reuters.

Markets are vulnerable to self-reinforcing mechanisms. If market sentiment were to turn, there are several factors that may amplify price corrections on financial markets. First of all, investment funds are playing an increasingly important role in the global financial system.[16] Open-end investment funds are particularly vulnerable to liquidity risks and a market correction may force them to liquidate their positions (fire sales). This would further amplify the induced price corrections, which may in turn prompt other investors to demand their money back. The increasing role of passive investment strategies is also important. A shift towards more passive investment management may lead to self-reinforcing effects on account of withdrawing investors, as the underlying market liquidity is too tight relative to the outflow of liquidity. And last but not least, investment strategies based on the current low volatility have become increasingly popular in the past few years. The total market volume of volatility-driven investment strategies was estimated at USD 500 billion in October 2017.[17] However, if financial market volatility increases, large-scale portfolio rebalancing may exacerbate the downward market movement, as we saw in early February this year.

16 According to recent estimates published by the Financial Stability Board (FSB) the balance sheet total of investment funds grew by almost 9% in 2016, and investment funds are now accounting for over 11% of the global financial sector.

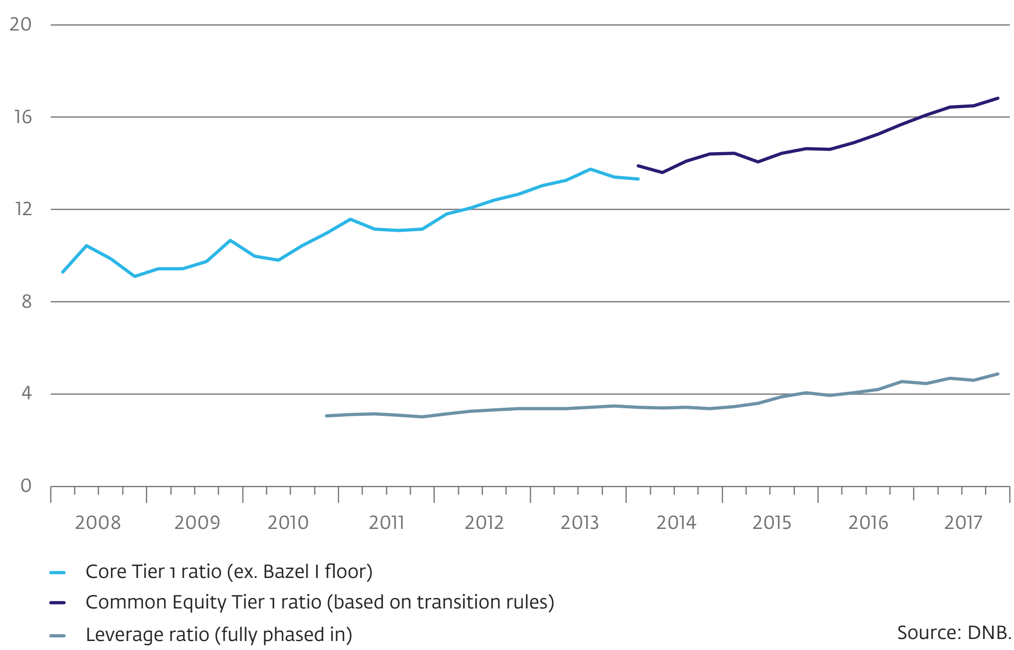
17 Luijendijk and De Vette, *Lage volatiliteit is lucratief, maar hoe lang nog?*, ESB 2018 (Dutch only).

The Dutch financial sector

The financial resilience and the profitability of the Dutch banking sector were boosted considerably over the past years. The risk-weighted capital ratio and the unweighted leverage ratio of the Dutch banking sector have unmistakably risen in the past years (Figure 8). Owing to the favourable economic conditions, the profitability of the majority of Dutch banks has also been picking up again since 2015. For the Dutch banking sector as a whole, return on equity came to almost 9% in 2017, relative to over 6% on average between 2010 and 2017. This makes the Dutch banking sector considerably more profitable than the European average. This is partly related to the high quality of the assets held by Dutch banks. Compared with banks elsewhere in Europe, Dutch banks have relatively few non-performing loans. Thanks to falling market interest rates, net interest income of Dutch banks has also clearly risen in the past years.[18] And finally, efficiency at the large banks has also steadily improved over the past years.

Figure 8 Dutch banking sector capital ratios

Percentage of risk-weighted assets; percentage of total exposures



Source: DNB.

Note: The common equity Tier 1 ratio is the ratio between a bank's common equity Tier 1 capital (CET1) and its risk-weighted assets. The leverage ratio is the ratio between a bank's Tier 1 capital and its total exposures..

18 This is because in times of falling interest rates, their funding charges generally drop faster than their interest income on outstanding loans. Banks partly hedge this interest rate risk, see DNB, *Financial Stability Report*, Spring 2017.

The large Dutch banks are to a large extent already meeting the higher capital requirements under Basel 3.5. If the Basel agreement is implemented in Europe in full and on time, this will lead to higher capital requirements for the large Dutch banks. Especially important is the tightening of the capital requirements for banks that use internal models to a minimum of 72.5% of the capital requirements under the standardised approach (i.e. the output floor). This floor is relevant for Dutch banks among other things due to their large mortgage loan portfolios.[19] Banks are to a large extent already meeting the higher capital requirements. In addition, the new requirements will be gradually phased in over a generous transition period.

The financial resilience of Dutch banks could be strengthened further. First of all, the leverage ratio (the ratio that indicates to what extent a bank is financed with own funds) is low from an international perspective.[20] Secondly, Dutch banks depend relatively heavily on market funding, which exposes them to refinancing risk. Although the deposit funding gap was reduced significantly in the past years, it still stood at 136% at the end of 2017. Thirdly, the Dutch banking sector is large and highly concentrated. The total assets of the Dutch banking sector amount to over three times the size of the Dutch economy, with the five largest banks accounting for 85% of the banking sector. A positive aspect is that competition in submarkets is increasing, e.g. in the mortgage lending market. And last but not least, the Dutch banking sector has become less diverse over the past years, partly owing to tightening of regulatory and legislative requirements. Whereas before the crisis there were large differences between Dutch banks with respect to their activities and geographical focus, since the financial crisis banks have increasingly focused on the Netherlands and on interest income. This has made them more sensitive to economic developments in the Netherlands and to developments in interest rates.

Partly due to the vulnerable state of the insurance sector, it was decided to implement a national recovery and resolution framework for insurers. A legislative proposal to this end was submitted to the Lower House of Dutch Parliament in November 2017; it gives new instruments and powers to DNB to intervene if insurance companies threaten to fail. This enables orderly resolution of insurance companies in case of financial difficulties and policy holders and financial stability will be better protected. Under the proposal, the majority of medium-sized and large insurance companies will be required to compile preparatory crisis plans specifying the measures they intend to take if their financial position deteriorates sharply. DNB will then draw up resolution plans for the larger insurance companies. Drawing up these plans will contribute towards underpinning the resilience of these institutions.

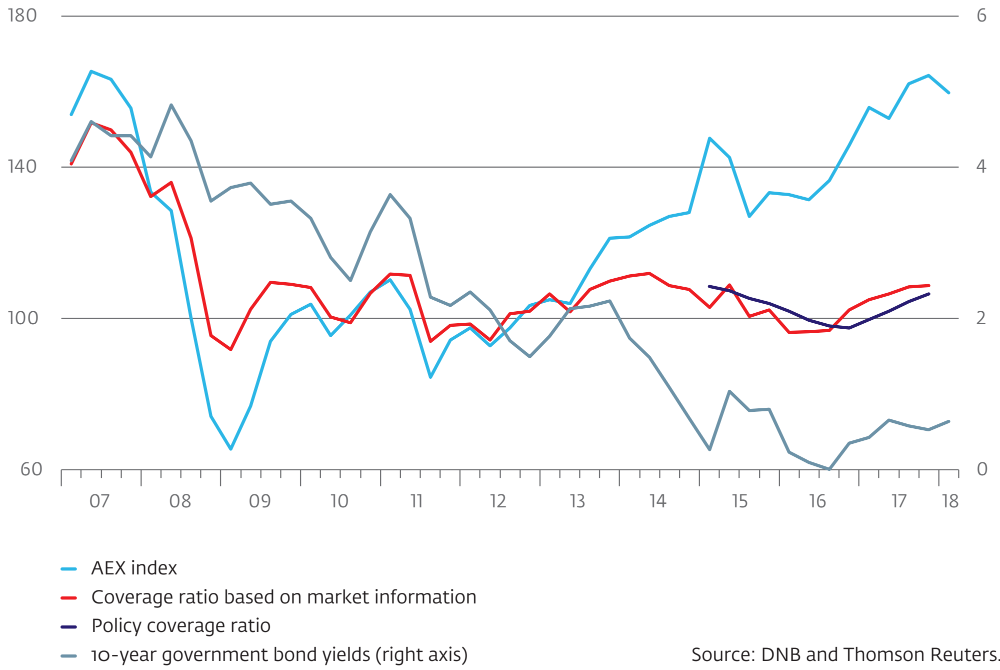
19 The Basel Standard Approach leads to a significantly higher risk weighting compared to the internal models method, the outcomes of which are based on the historically low losses on Dutch mortgage portfolios.

20 See for instance IMF, *Kingdom of the Netherlands: Concluding Statement of the 2018 Article IV Consultation*, 28 February 2018.

The financial position of Dutch pension funds has not yet returned to its pre-crisis level.
The financial position of pension funds has deteriorated in the past years, due to the financial crisis, the trend-based fall in interest rates and the increase in life expectancy. A substantial improvement was observed in 2017, however; the policy coverage ratio rose by nine percentage points in the past year to 106%. Both the higher interest rates, with which the value of pension liabilities must be calculated, and valuation gains on the equity markets have contributed to this improvement (Figure 9). Despite improving, the coverage ratio is still far below its pre-crisis level.

Figure 9 Coverage ratio of pension funds, AEX index and yields

AEX: index (2008Q3=100); coverage ratios as percentages; yields as annual percentages



Source: DNB and Thomson Reuters.

Effects of an interest rate hike for Dutch corporations, households, and the financial sector.

A rise in market interest rates is to be expected. Although global economic growth is accelerating, market interest rates are still at low levels. In view of this, interest rates are likely to rise at some point in the future. Higher market interest rates may not only be due to normalisation of monetary policy and improved macroeconomic prospects, but also to higher risk premia, due in turn to mounting uncertainty at financial market participants. This increased uncertainty may come from a sudden change in the monetary policy outlook, but may also be attributable to mounting geopolitical tension or an escalating trade war. This paragraph describes the impact of rising interest rates for Dutch corporations, households and financial institutions.

Impact on Dutch corporations and households

In the course of time, rising interest rates will result in higher interest expenses for corporations and households. The pace at which an interest rate hike filters through to the interest burden of corporations and households strongly depends on the fixed interest period of the finance extended to them. From the perspective of bank lending, corporations are impacted by an interest rate hike sooner than households.[21] Some 50% of bank loans outstanding to non-financial corporations have a remaining fixed interest period of less than one year (Figure 10).

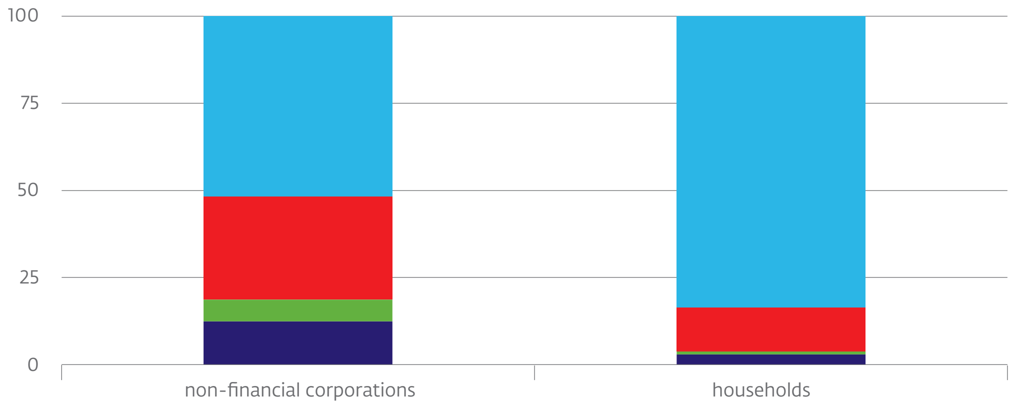
Partly due to the heterogeneous financing structure of the Dutch business sector, the impact of an interest rate hike varies widely. While small and medium-sized corporations in the Netherlands primarily depend on bank credit, their larger counterparts also have access to alternative sources of finance, e.g. private placement loans, or the issuance of debt securities. From a macro perspective, Dutch financial institutions finance 45% of Dutch corporate debt, while 10% of debt is financed by the issuance of debt securities (Figure 11 - left). The relative interest rate sensitivity of market funding is subject to two opposite factors. On the one hand, there are indications that the costs and availability of market funding are more sensitive to interest rate movements than those of bank funding.[22] On the other hand, corporate bonds often have longer maturities, which reduces the refinancing risk. Over 80% of bonds issued by Dutch corporations for instance have maturities longer than one year, combined with fixed interest rates (Figure 11 - right).

21 Bank lending is not the only form of financing, as corporations can also revert to market funding. In addition to this, the share of non-banks in the mortgage lending market is increasing.

22 ECB (2018), *Financial Stability Review*, May.

Figure 10 Composition of loan portfolio to corporations and households by interest term

Proportion of loan portfolio, February 2018



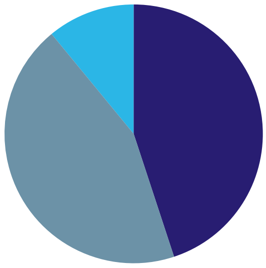
- Original maturity > 1 year and remaining term to maturity > 1 year; without interest rate review within 1 year
- Original maturity > 1 year and remaining term to maturity > 1 year; interest rate review within 1 year
- Original maturity > 1 year and remaining term to maturity < 1 year
- Original maturity < 1 year

Source: DNB.

Figure 11 Dutch corporate sector debt

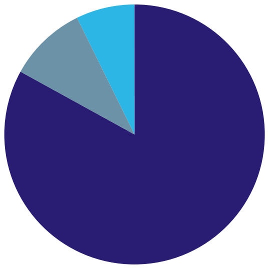
Shares; year-end 2017

Corporate debt



- Loans extended by Dutch financial institutions
- Loans extended by other institutions and abroad
- Debt securities

Characteristics of issued debt securities



- Maturity longer than one year; fixed interest rates
- Maturity longer than one year; variable interest rates
- Maturity shorter than one year

Source: Statistics Netherlands and ECB.

The effect of an interest rate hike on the future interest expenses of households is relatively small, generally speaking. Our analysis based on loan level data, reveals that a rise in mortgage interest rates of between 250 and 300 basis points would push up the net mortgage expenditure of households by an average of a little over EUR 1,000 per year.[23] By comparison, the average annual mortgage burden of individual households is some EUR 6,500. The effect of rising interest rates differs strongly between households, however. For 13% of households, mortgage interest payments would rise by more than EUR 2,400 annually, although this mostly concerns households with relatively high incomes.

Households have become less vulnerable to interest rate hikes over the past years as they now make more redemption payments. Since 2013, new mortgage loans have been eligible for mortgage tax relief only if they are fully repaid within 30 years based on at least an annuity repayment schedule. This has made annuity mortgage loans very popular among first-time buyers in particular: the proportion of annuity and linear mortgage loans in total mortgage debt has increased to around 20% from 2% in 2013. As repayments are made on these loans during their life, the outstanding debt declines, which reduces the sensitivity to interest rate hikes. In addition to this, older households in particular have made more voluntary repayments on their mortgages over the past years. Since 2013, an estimated amount of more than EUR 70 billion has been voluntarily repaid on outstanding mortgage debt.

Longer fixed interest periods also contribute to reduced vulnerability to interest rate hikes. In the past few years, an increasing number of households opted for a fixed interest period of ten years or longer. The longer the fixed interest period, the better a household is protected against rising interest rates.

It remains important for vulnerable groups to take account of rising interest rate scenarios. Interest sensitivity varies widely both between corporations and between households. Corporations and households would therefore do well to investigate the impact of rising interest rates on the debt servicing costs of their corporate and mortgage loans. This would give vulnerable groups the opportunity to take timely measures to prevent problems from occurring in the future, by building up financial buffers. Households should also be aware that rising interest rates may induce falling house prices (see also the section “The housing market in the Netherlands”).

23 These calculations are based on the following assumptions: the interest shock will occur in 2021 and if the current fixed interest period ends, financing or re-financing will take place at the then prevailing market rates. Voluntary extra repayments and extending of mortgage loans have been left out of scope.

Impact on the Dutch financial sector

When interest rates rise, bank profitability will initially come under pressure. As the funding raised by banks often has a shorter maturity than the credit they extend, their funding costs generally outpace their interest income on loans outstanding when interest rates rise. This certainly holds true for banks that are heavily dependent on short-term market funding.[24] Although banks partly mitigate this interest rate risk by entering into interest rate swaps, they will initially be negatively affected by rising interest rates on balance.[25] Moreover, an interest rate hike may in the course of time also translate into rising credit losses for banks as the higher interest charges for corporations and households will put their repayment capacity under pressure, especially if economic growth stays behind. This may in the longer term translate into rising credit losses for banks.

An interest rate hike will in principle have a positive effect on pension funds and insurance companies. For insurers and pension funds, the effect of an interest rate hike depends on how it materialises. If interest rates rise due to an increase in risk-free interest rates, pension funds and insurers will see their liabilities decrease as these are valued based on the risk-free interest curve.[26] At the same time, their fixed-income portfolios will lose value as a result of an interest rate hike. As liabilities usually have longer maturities, they will show stronger declines than fixed-interest investments. Pension funds in particular partly hedge the interest sensitivity gap between liabilities and investments.

Sharp financial market corrections may, however, hit pension funds and insurers hard through losses on their investment portfolios. When interest rates rise due to sharply increasing risk premia on lower-grade bonds (known as a snapback scenario), an interest rate hike may induce sharp corrections in the market value of investments of financial institutions. When such corrections are not accompanied by higher risk-free interest rates, the interest rate hike may negatively impact pension funds and insurance companies. Financial institutions with large, and relatively high-risk investment portfolios are especially vulnerable to such a snapback scenario. Pension funds and insurers in the Netherlands invest almost 60% and 50% respectively of their balance sheet in equities and bonds; for banks this is around 10%. In addition, pension funds apply a relatively riskier investment mix than insurers and banks (Figure 12). A calculation shows that a shock of this kind would lead to a loss of over 7% of the balance sheet totals of Dutch

24 Although Dutch banks have become less dependent on short-term market funding over the past years, they still depend heavily on this type of funding from an international perspective. The loan-to-deposit ratio of Dutch banks at end 2017 for instance came to 136%, relative to the European average of 118%.

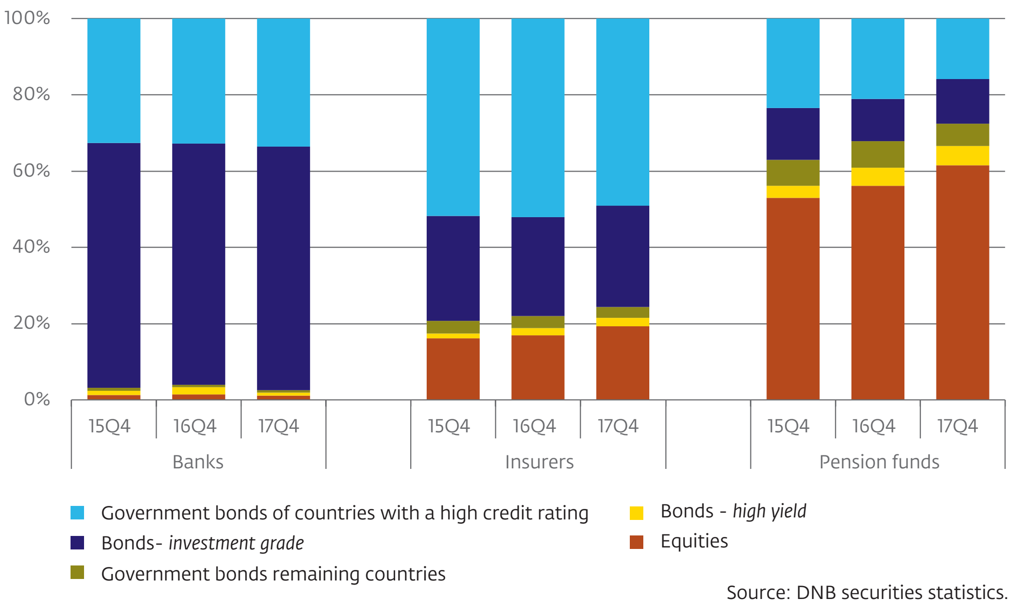
25 As time progresses, the negative effects of an interest rate rise will fade, as interest income on outstanding loans increases in principle. The growing competition from insurers and pension funds may, however, put interest margins in the banking sector under pressure.

26 This means that the anticipated future cash flows will be discounted at the current risk-free market rates; long-term liabilities are subject to the ultimate forward rate (UFR).

pension funds.[27, 28] The EIOPA stress test, which was published in December 2017, also shows that Dutch pension funds are very vulnerable to financial market shocks.[29] A shock of this kind would take over 1.5% off the balance sheet total of insurance companies.

Figure 12 Composition of equity and bond portfolios held by Dutch banks, insurers and pension funds

Proportion of total equity and bond portfolios



Source: DNB securities statistics.

Notes: Relatively high-risk securities include equities, high-yield bonds and government bonds issued by countries with credit ratings of BBB+ or lower. High-yield bonds have yields above 4.9% (2015), 4.1% (2016) and 3.7% (2017). These figures correspond with yields on corporate bonds that just fall into the junk category.

27 Specifically, it has been assumed that spreads of A and BBB bonds will rise 100 basis points and those with bonds graded below BBB 200 basis points; equity prices are assumed to fall 25% in the United States and 17.5% in the rest of the developed countries.

28 The impact of rising interest rates on the coverage ratio, however, varies widely between pension funds. In addition, coverage ratios currently differ substantially between pension funds. Based on the current financial position of pension funds, a market shock of this magnitude would result in expected curtailments of pension rights of between zero and almost 9%. For the sector as a whole, expected curtailments as a consequence of this market shock would amount to over 5%.

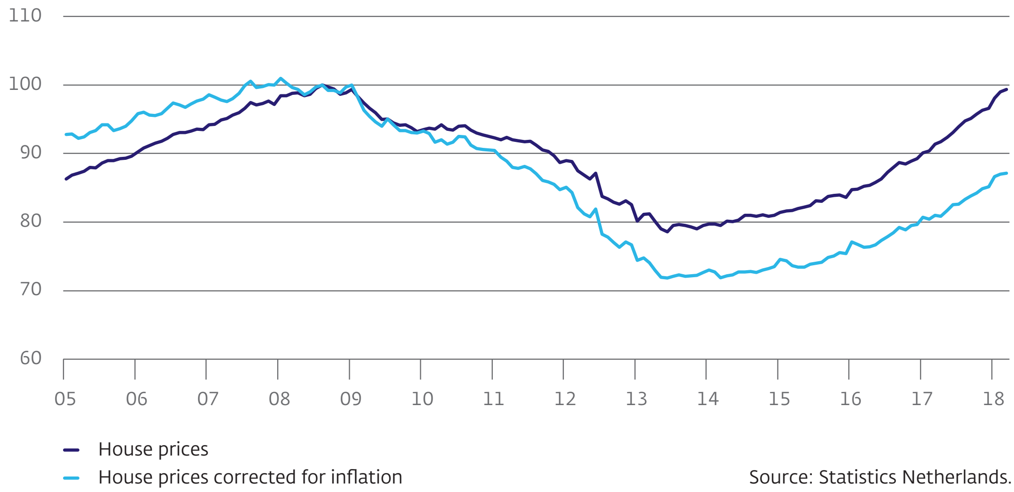
29 See https://eiopa.europa.eu.

The housing market in the Netherlands

House prices have returned to their 2008 record levels. The housing market is accelerating fast and has as good as recovered from the crisis. Since their 2013 low, prices have on average increased by 26% on average (Figure 13). Real house prices, house prices adjusted for inflation, are still 13% below their peak, however.

Figure 13 Nominal and real price index of existing owner-occupied homes

Price index; August 2008=100.

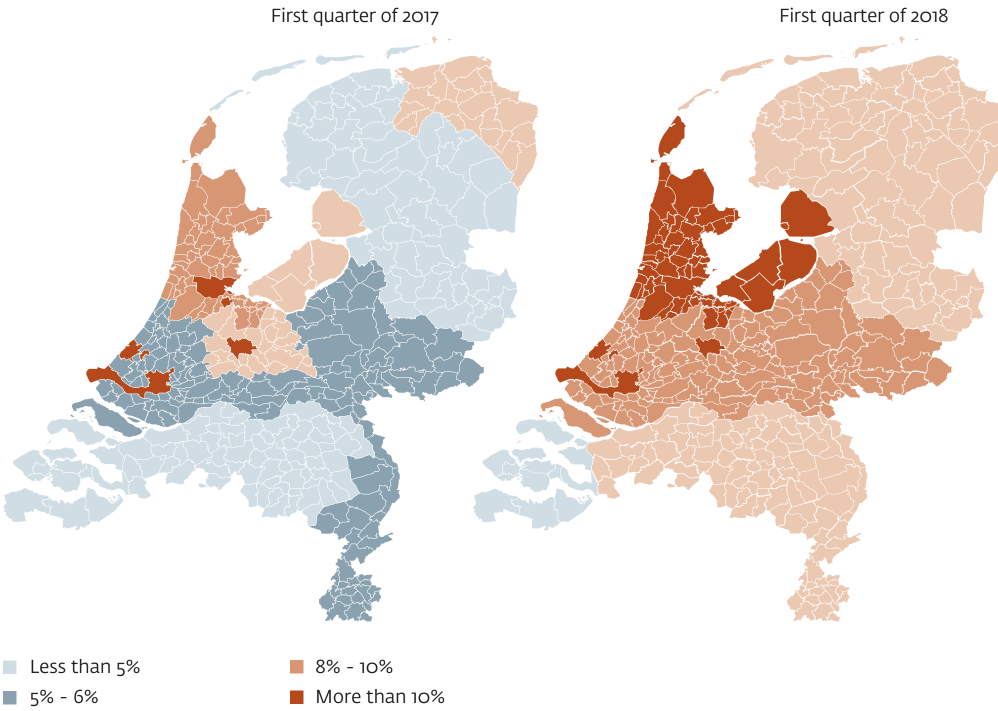


Source: Statistics Netherlands.

There is a regional spillover effect from the major cities. House prices in the four major cities (Amsterdam, Utrecht, The Hague and Rotterdam) are soaring. Prices of owner-occupied housing in Amsterdam have risen 14% in 2017 for instance. As a result of these rapid price rises, price levels in the major cities are currently 22% above their 2008 peak. The housing market in the regions surrounding the major cities is, however, also gaining strong momentum (Figure 14). In the provinces of Noord-Holland and Flevoland, prices of owner-occupied housing in the first quarter of 2018 were over 10% higher than a year earlier. Prices saw average rises of less than 5% in Zeeland only.

Figure 14 Regional house price trends

Nominal, year-on-year



Source: Statistics Netherlands.

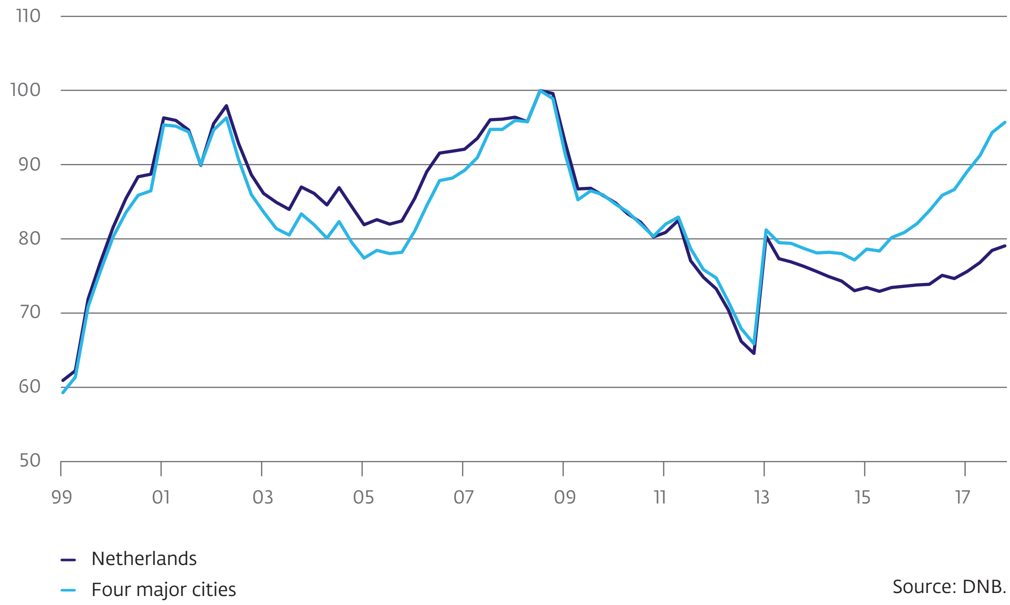
Note: Due to availability of data, price trends are only depicted at the city level for the four major cities; all other price trends are reflected at the province level.

Except for first-time buyers in the major cities, houses are still more affordable than before the crisis. Partly owing to the current low interest rates, financing costs (interest payments and redemptions as a percentage of disposable income) for first-time buyers in the Netherlands as a whole are 21% lower on average than in 2008 (Figure 15). The sharp price rises in the major cities have, however, made this difference substantially smaller. Financing costs for first-time buyers in the major cities have now risen to above their pre-crisis levels and are approaching their 2008 peak. For home movers, i.e. those who are moving from one owner-occupied house to another, houses are still substantially more affordable than before the crisis, also in the major cities.

Having been at record highs in 2017, the number of housing transactions in the Netherlands is now falling (Figure 16). Scarcity in the housing market in the major cities is growing as the supply of houses is drying up and houses change hands very quickly. In Amsterdam and Utrecht 9% and 3% fewer houses were sold respectively in 2017. In the country as a whole, the number of sales transactions still edged up in 2017, but fell to below its year-earlier level in the first few months of 2018.

Figure 15 Financing costs for first-time buyers

Index, 2008Q3 = 100

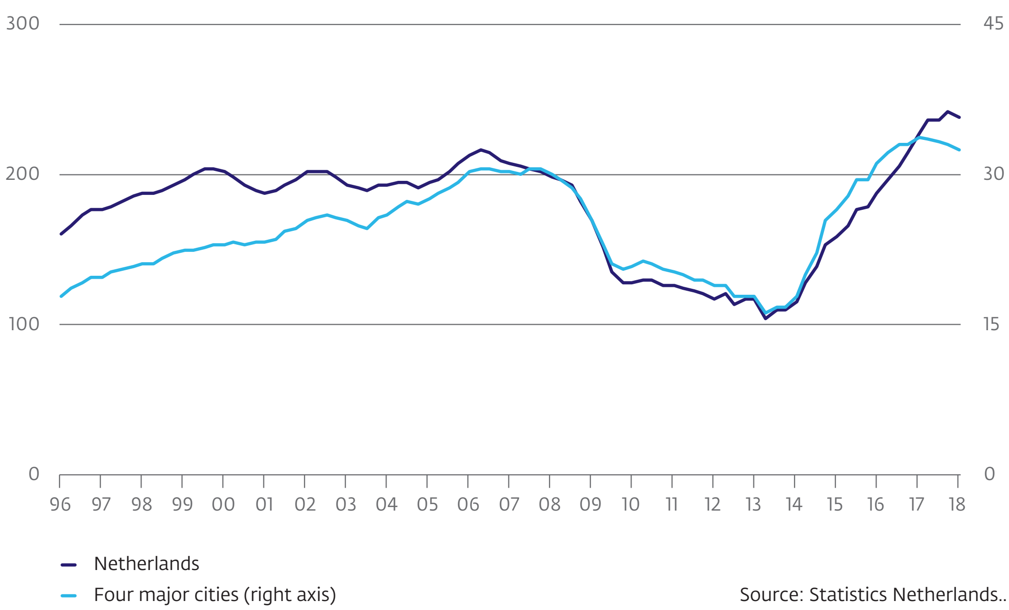


Source: DNB.

Note: Financing costs (net interest rates after mortgage interest tax relief, and repayments) are calculated based on the purchase of an average house fully financed by a 30-year mortgage loan. Until 2013, financing costs were calculated based on a mortgage loan consisting of 50% annuity repayments and 50% interest-only. Since 2013, financing costs have been calculated based on a 100% annuity mortgage loan.

Figure 16 Trend in the number of sales transactions

Number of transactions (thousands); four-quarter sum

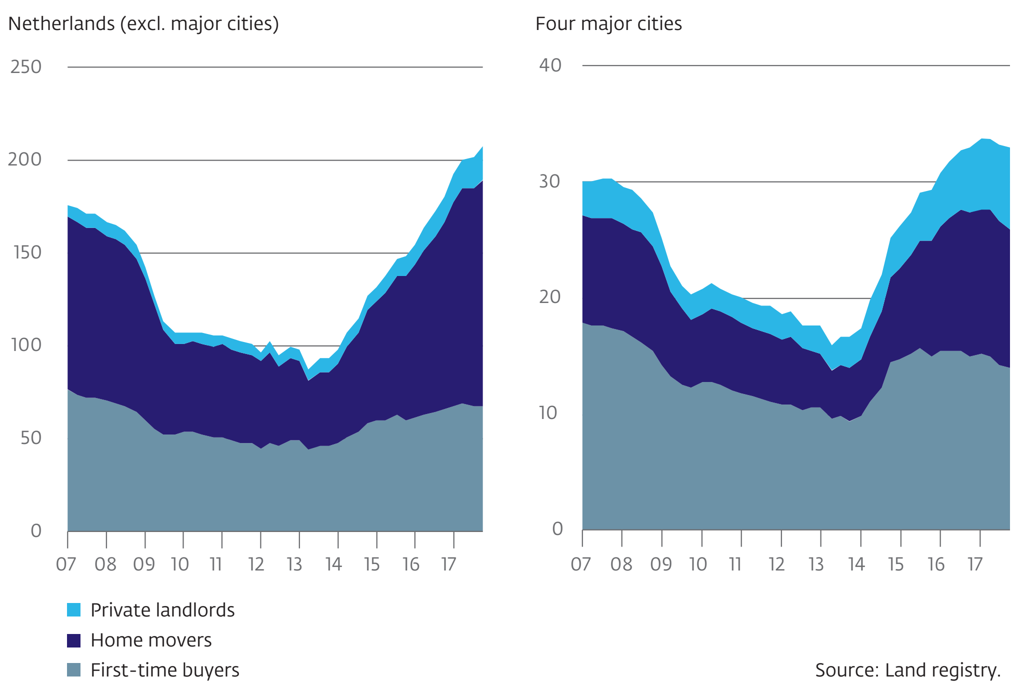


Source: Statistics Netherlands..

The four major cities are seeing sharp increases in the number of house purchases by private investors, while the number of purchases by first-time buyers and home movers fell in the past year (Figure 17). Private investors see the buy-to-let market as an alternative to the relatively low returns on other investments. In the third quarter of 2017, almost one quarter of the houses in Amsterdam and Rotterdam was purchased by private investors. The growing interest from private investors in residential property may contribute towards a growing private rental market, but is also driving up prices. Private investors often use their own funds to buy houses.[30] This gives them a competitive edge on other buyers as they can bid outright without financing restrictions. This may lead regular buyers to show risky behaviour, in order to have a chance of buying a house, e.g. bidding without financing restrictions. In addition, there is a risk that a part of private investors leave the market again as soon as they can get more return on their investments elsewhere (e.g. if interest rates rise), which may fuel price fluctuations in the housing market.

Figure 17 Number of house purchases by first-time buyers, home movers and private landlords

Number of transactions (thousands); four-quarter sum



Source: Land registry.

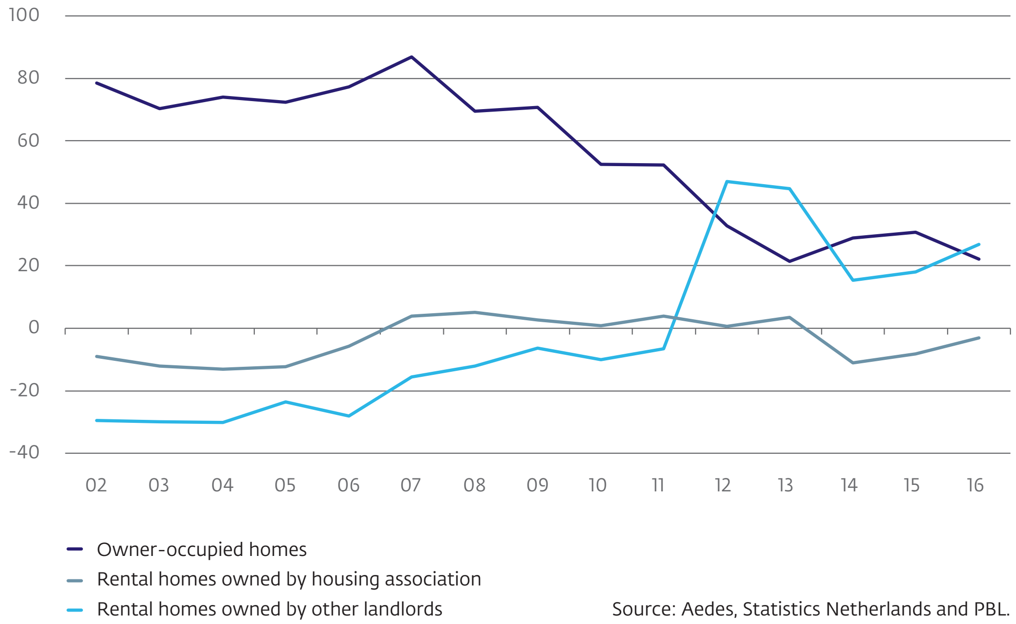
30 Research conducted by the Dutch Land Registry shows that for 61% of the house purchases made by owners of multiple properties, no mortgage is taken out. See the June 2017 article *Wie kopen er hypotheekloos?* published by the Dutch Land Registry (Dutch only).

The growing supply of homes is as yet not sufficient to keep pace with growing demand. In 2016, the number of households climbed by 73,000, whereas on balance the housing supply grew by 45,000 houses only. In 2014 and 2015, growth in the number of households outpaced that of the number of houses as well. Hence, the housing shortage increased in recent years. The growing number of citizens, increasing individualism and the ageing population is causing the number of households to accelerate faster than anticipated. This means that newbuilding will have to be stepped up substantially in order to keep pace with the growing number of households.[31] Recently, newbuilding seems to be accelerating: the number of issued newbuilding permits in 2017 rose 30% to 70,000. This is good start, but the housing supply needs to be increased further.

The accretion of owner-occupied homes is stagnating, while the number of newly built rental properties is rising (Figure 18). Since the start of the century, the annual increase in the supply of owner-occupied housing declined to around 22,000 in 2016, from around 80,000

Figure 18 Accretion of owner-occupied and rental homes

Net change (thousands); year-on-year



Source: Aedes, Statistics Netherlands and PBL.

Note: Rental properties owned by other landlords concern those in the possession of businesses, private individuals, and institutional investors among others. This category also includes rental properties of which the ownership could be established, but not the owner.

31 In addition to this, the housing supply is growing thanks to transformation and splitting of properties, and shrinking due to demolition, combining of properties, or changes in designated use. The number of properties that was added to or withdrawn from the housing supply in one of these ways differed substantially in the past years.

between 2002 and 2008. The supply of rental properties, which had been shrinking until 2011, has been growing since that year. This primarily concerns an increase in the number of rental properties owned by private or institutional investors; the number of housing corporation properties fell slightly between 2011 and 2016, partly due to the sale of these properties to investors.[32] The number of rental properties is growing in the major cities in particular. In view of the existing scarcity in rental properties, especially in the mid-price segment of the rental market,[33] newbuilding of rental housing is indeed urgently necessary.[34] By no means all newly built rental properties fall in the middle segment, however. Whereas nationwide 62% of new rental properties fell in the mid-price segment in 2017, this was only 7% of newly rented out homes in Amsterdam.[35] The lion's share of newly rented out housing in the capital last year fell into the top segment with rents of more than EUR 1,000 per calendar month.

There are as yet no signs of a credit-driven bubble: mortgage lending growth has to date remained subdued despite the sharp rise in house prices. Mortgage lending increased 1% last year. By way of comparison: between 1996 and 2000, when house prices rose by more than 10% annually, mortgage lending grew by around 16% annually. Credit growth is now more than before accounted for by non-banks; mortgage lending by domestic banks is hardly growing at all (Figure 19). The fact that mortgage lending has remained subdued is partly attributable to an estimated amount of EUR 70 billion having been repaid on outstanding mortgage debt since 2013, due in particular to the low savings rate and the gift tax exemption for owner-occupied homes. Another reason is the increase in the number of repaying mortgages since 2013 as since that year first-time buyers have been obliged to make repayments on their mortgage if they want to qualify for mortgage interest tax relief. In addition, average house prices in the Netherlands have been below their 2008 pre-crisis peak levels in the past years, and 9% of homes is still under water. This means that in a large number of transactions, mortgage debt on a property does not (or hardly) increase. And last but not least, more homes are being purchased with own funds.

Moreover, there are as yet no signs of a worrying increase in risky borrowing behaviour. The maximum loan-to-income limit in the Netherlands is determined by the financing costs criteria of the National Institute for Family Finance Information (NIBUD). First-time buyers are not exploring the boundaries of these criteria more often: the proportion of first-time buyers borrowing close to or at their loan-to-income limit has been hovering around 43% for several years (Figure 20, left panel).[36] In addition, the proportion of first-time buyers financing the

32 On 1 January 2011, housing corporations still owned 2,415,000 homes, which number had fallen to 2,384,000 on 31 December 2016, a decline of 31,000. Source: Aedes.

33 Rental properties with monthly rents of between EUR 711 and EUR 1,000.

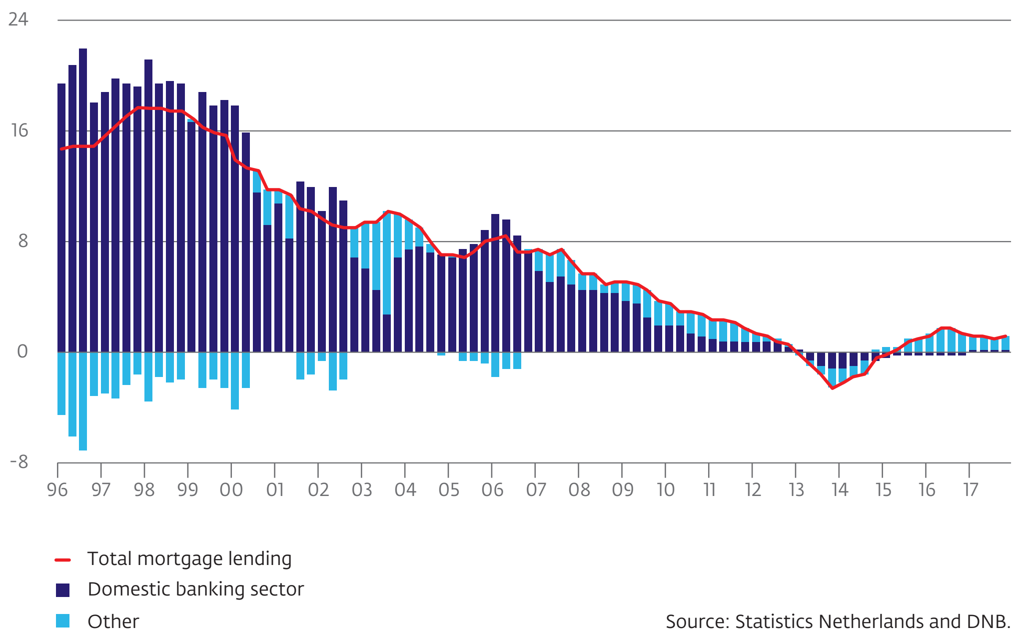
34 Melanie Hekwolter of Hekhuis, Rob Nijskens and Willem Heeringa (2017), The Housing Market in Major Dutch Cities, DNB Occasional Study, No. 15-1.

35 NVM, *Prijzen in vrije huursector blijven stijgen, ondanks meer nieuwbouw*, 7 February 2018 (Dutch only).

36 Home buyers' borrowing capacity has increased relative to 2008. See DNBulletin, *Income standards for mortgages not more restrictive than before the crisis*, 20 October 2016. In 2016, buyers could borrow 4% more on average than in 2008. In 2017, the borrowing criteria were eased a bit more on average; they will remain unchanged in 2018.

Figure 19 Mortgage lending by banks and non-banks

Year-on-year percentage change



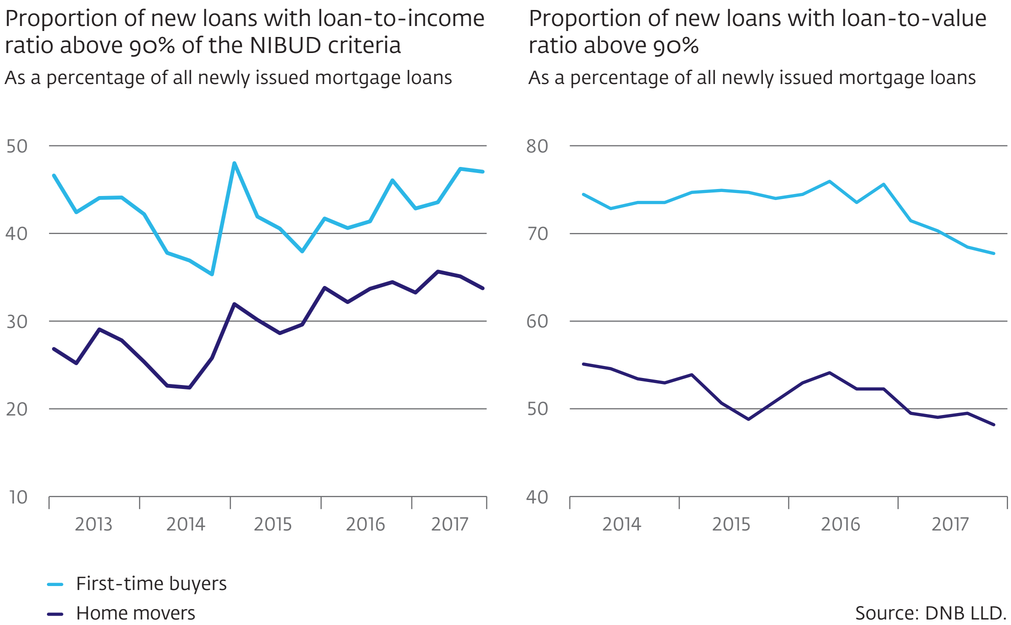
Source: Statistics Netherlands and DNB.

Notes: "Other" concerns domestic non-banking sectors (pension funds and insurers), the foreign sector, and statistical differences.

complete (or almost complete) purchasing price of their home with borrowed funds, is steadily declining. In 2014, 75% of first-time buyers borrowed more than 90% of the purchase price of their home. In the third quarter of 2017, this had declined to 68% (Figure 20, right panel). In the four major cities, first-time buyers on average make slightly larger deposits than those in the rest of the country: 64% of first-time city buyers have a loan-to-value ratio of more than 90%. The proportion of home movers with mortgage loans with LTVs of more than 90% is also declining, but home movers are now more often opting to borrow close to or at their maximum loan-to-income limit than some years ago.

Growth of mortgage lending is expected to accelerate again in the years ahead. The subdued mortgage lending growth is partly attributable to temporary factors. The own funds that can be used for voluntary redemption are not unending, for example. The most recent numbers are already showing a slight decline in voluntary redemptions. If in 2016 some EUR 16 billion was still voluntarily paid off, voluntary redemptions in 2017 came to around EUR 13 billion. If house prices continue to rise, the excess value on existing homes will increase, which will drive up mortgage debt accumulation when homes change hands. This is because in times of growing excess value, the mortgage debt that buyers enter into will often be bigger than the existing debt paid off by sellers. Hence, amid a further accelerating housing market, lending growth is expected to increase, although mortgage lending growth is unlikely to grow at the same pace

Figure 20 Borrowing behavior of first-time buyers and existing home owners



Source: DNB LLD.

Notes: LTI = Loan-to-Income ratio, the ratio between the amount of the mortgage loan and the borrower's income. The maximum mortgage borrowing amount relative to a household's income is determined based on the NIBUD household criteria, which depend on a household's income and the level of mortgage interest rates.
LTV = Loan-to-Value ratio, the ratio between the amount of the mortgage loan and the value of the property. The maximum LTV ratio stood at 106% in 2012 and was lowered by 1 percentage point per year to 100% in 2018.

as before the crisis, as first-time buyers are now obliged to make redemption payments if they want to be eligible for mortgage interest tax relief. Loan limits have also been tightened.

Households must be aware that house prices may fall again, e.g. when interest rates rise.
A scenario in which worldwide capital market interest rates are 100 basis points above the baseline for a longer period will lead to 5% lower house prices, relative to the baseline.[37] In this scenario, rising mortgage interest rates dampen mortgage lending and will depress house prices. Lower house prices will bring pressure to bear on household wealth, causing private consumption to decline. This has a negative influence on economic growth. This may cause property values for some households to fall below their mortgage debt levels again, which may frustrate their financial planning and possible plans to move house.

37 For a full description of the scenario and all outcomes, see DNB (2017), *Economic Developments and Outlook*, December.

Macroprudential policy in the Netherlands

Macroprudential policy can only do so much to counterbalance the side effects of accommodative monetary policy. Macroprudential policy may underpin the shock resilience of the financial system, e.g. by imposing additional capital requirements on systemically important institutions. The side-effects of the current extremely accommodative monetary policy can, however, not be fully neutralised by means of macroprudential policy. Macroprudential instruments do not have sufficient scope to achieve this.

The recent developments illustrate the procyclical character of the Dutch economy and the housing market. Several years ago, the economic slowdown and the housing market correction were mutually reinforcing. Similarly, the economic upturn and the housing market revival are mutually beneficial at present. Over 25% of economic growth since the second quarter of 2013 can be attributed to the upswing in the housing market.[38] This is among other things attributable to the rising house prices, which are boosting household wealth and private consumption. Housing investment has also been catching up since 2013.

The accelerated reduction of mortgage interest tax relief is dampening the procyclicality of the economy. A high level of debt financing amplifies the cyclical outlays in the housing market. Growing borrowing capacity leads to higher demand, which at a given supply of houses culminates in higher prices. The reduction of fiscal incentives for home ownership, dampens the incentives for debt financing, and, hence, procyclicality.

Further reduction of the LTV limit for residential mortgage loans after 2018 continues to be advisable. Although the LTV limit has been reduced in stages over the past years, from 106% to 100%, the Dutch LTV limit remains high from an international perspective. This does not benefit financial stability. A recent IMF panel investigation has revealed that countries with relatively high LTV limits more often experience boom-bust cycles in the housing market.[39]
The IMF therefore recommends in its recent Article IV Consultation to reduce the LTV limit of 100% further in order to reduce financial risks for households.[40] The Netherlands Financial Stability Committee issued the same recommendation in 2015. The current scarcity on the housing market should be remedied by increasing the housing supply, especially in the middle segment of the rental market.

38 DNB (2017), *Economic Developments and Outlook*, December.

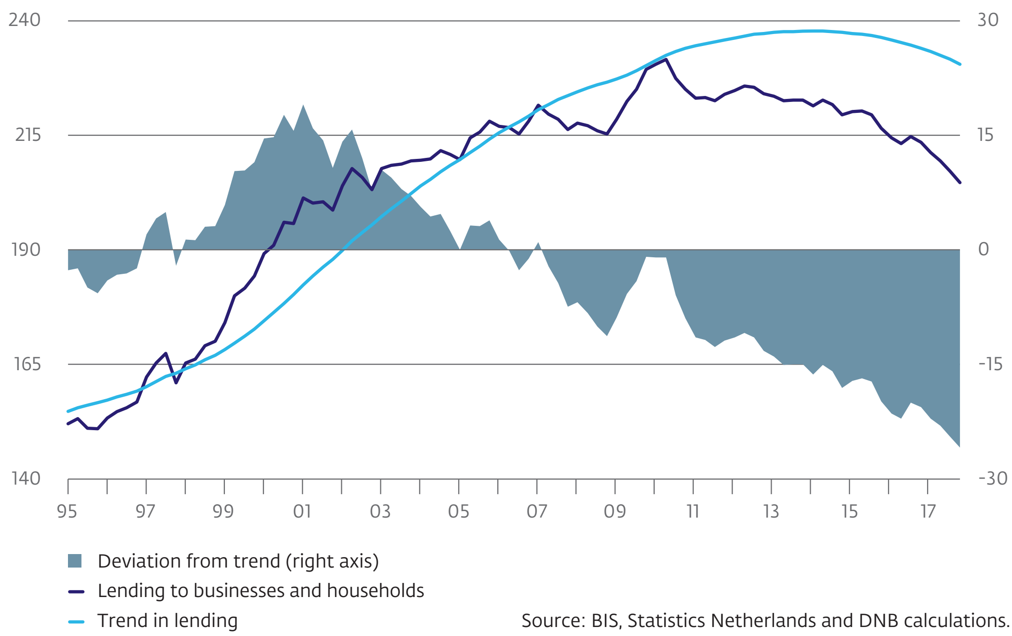
39 Cerutti, E., Dagher, J. and Dell'Ariccia, G. (2017), *Housing finance and real-estate booms: A cross-country perspective*, Journal of Housing Economics 38, December.

40 IMF, *Kingdom of the Netherlands*: *Concluding Statement of the 2018 Article IV Consultation*, 28 February 2018.

The countercyclical capital buffer (CCyB) is maintained at 0%. The primary objective of the CCyB is to boost the shock resilience of the banking sector. The underlying thought is that banks can use these buffers during a crisis to keep their financial services up to par, which has a countercyclical effect. In addition to this, phasing in of these buffers prior to a crisis or anticipated crisis can be seen as a means of keeping excessive developments in check. The credit gap, the difference between the actual and the trend-based level of lending, is an important indicator for determining the CCyB. Despite vigorous economic growth, the growth of lending has remained subdued. Lending to households is hardly growing despite the upturn in the housing market. Net lending (the balance of new loans and redemptions) by banks to corporations has been falling since 2013, although the scales are increasingly less negative now that investment and consequently, the funding requirement of corporations continues to increase. From a historical perspective, the credit gap is still very wide (Figure 21).

Figure 21 Lending

As a percentage of GDP



Source: BIS, Statistics Netherlands and DNB calculations.

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.

Extra capital buffers for systemically important banks remain in force. From an international perspective, the Netherlands has a relatively large and concentrated banking sector. DNB imposed systemic buffers on five systemically important banks, which may be built up gradually between 2016 and 2019. DNB evaluates the size of the buffer annually. End 2017, the systemic buffers imposed on ING Bank, Rabobank, ABN AMRO (3%), Volksbank and BNG Bank (1%) were left unchanged.

Table 1 – Current use of the principal macroprudential instruments

Instrument	Current status	Notes
Systemic buffer	ING Bank: 2,25% Rabobank: 2,25% ABN AMRO: 2,25% Volksbank: 0,75% BNG Bank: 0,75%	These requirements are implemented in phases: in 2019 ING bank, Rabobank and ABN AMRO will be required to maintain a systemic buffer of 3% of risk-weighted exposures, and Volksbank and BNG Bank of 1%.
Countercyclical capital buffer	Set at 0% effective 1 January 2016	Not activated thus far
LTV limit	100%	FSC advises further reduction to 90%
LTI limit	Over four times gross income	Statutory arrangements based on gross housing costs relative to annual income

Annex: Macroprudential indicators

	Most recent observation	Trend after 1998			
		Min	Max	Average	Period under review
Credit conditions					
Trend deviation credit/GDP ratio [1]	-25,9	-25,9	19,1	-3,4	1998Q1-2017Q4
Growth in household lending (y-o-y)	1,3	-2,1	17,1	6,3	1998Q1-2017Q4
Growth in non-financial corporations lending (y-o-y)	-1,0	-3,9	16,8	3,6	1998Q1-2017Q4
Credit conditions for non-financial corporations [2]	-27	-47	98	7	2003Q1-2018Q1
Credit conditions for residential mortgages [2]	-52	-53	100	15	2003Q1-2018Q1
Leverage					
Leverage ratio CRD IV, fully loaded [3]	4,9	3,4	4,9	4,0	2014Q1-2017Q4
Tier 1-capital/balance sheet total of the banking sector (up to 2013Q4)	5,0	3,0	5,0	3,9	1998Q1-2013Q4
CET1 ratio of banks under CRD IV, based on transition rules	16,8	13,6	16,8	15,0	2014Q1-2017Q4
Tier 1 ratio of banks under CRD III (up to 2013Q4) [4]	12,5	8,2	12,8	10,0	1998Q1-2013Q4
Credit to households (% of GDP)	104,3	67,1	118,3	101,8	1998Q1-2017Q4
Credit to non-financial corporations (% of GDP)	100,4	100,4	122,6	110,9	1998Q1-2017Q4
Real estate market					
Growth in house prices (y-o-y)	8,7	-9,9	20,1	4,2	1998jan-2018mrt
Growth in commercial real estate prices (y-o-y)	7,3	-7,5	9,1	2,2	1998Q1-2017Q4
Loan-to-Value ratio of first-time buyers [5]	92,4	92,4	98,0	95,8	2005-2017
Loan-to-Income ratio of first-time buyers [6]	403,0	403,0	491,5	448,3	2005-2017
Interest rates on new mortgage loans 5-10 years (bp)	232,0	228,0	553,0	427,9	2003jan-2018jan
Bank liquidity					
Loan-to-deposit ratio [7]	136,0	136,0	188,8	171,2	1998Q4-2017Q4
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 (% of GDP)	337,0	306,5	562,5	414,4	1998Q1-2017Q4
Share of five largest banks in balance sheet total of the banking sector [8]	83,8	79,9	90,3	86,7	1998Q1-2017Q4
Rating uplift of systemically important banks (in steps) [9]	1,0	1,0	2,3	2,0	2012-2017
International risks					
Long-term interest rates (bp) [10]	62,6	2,7	566,6	321,5	1998jan-2018mrt
BAA-AA risk premia (bp) [11]	84,0	74,0	463,0	166,2	2001jan-2018mrt
Risk premium in money market (bp) [12]	3,3	1,0	186,0	20,6	1999jan-2018mrt
Risk premium on senior unsecured bank bonds (bp) [13]	49,0	12,6	321,5	83,1	1999jan-2018mrt
Financial stress index [14]	-0,35	-0,55	3,25	0,22	1999dec-2018mrt
Growth in global lending to non-financial corporations (y-o-y) [15]	6,2	-5,9	20,2	6,1	2000Q1-2017Q3
Global growth in house prices (y-o-y)	2,4	-7,9	10,2	2,9	2001Q1-2017Q2

Concentration of exposures of Dutch banks [16)]

	Netherlands	Abroad	2017Q4
Total of debt securities and loans	50,1	49,9	
Central bank	2,7	1,6	
Governments	6,3	5,6	
Credit institutions	1,1	10,3	
Other financial institutions	1,7	5,5	
Non-financial corporations	11,9	17,4	
Of which: Small and medium-sized enterprises	2,7	3,8	
Of which: Commercial real estate	4,8	3,3	
Households	26,4	9,5	
Of which: Mortgage loans	25,0	8,1	
Of which: Consumer credit	0,7	1,0	

Source: Bloomberg, BIS, CBS, DNB, IMF, IPD, Moody's, Thomson Reuters Datastream.
Figures are expressed as percentages, except where 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 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 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 loan to the value of the home at the time the mortgage loan is taken out. First-time buyers are defined as individuals younger than 35 at the time the mortgage loan is taken out. DNB estimate based on a sample of Dutch mortgage loans.
6) The ratio of the amount of the mortgage loan to the income of the borrower at the time the mortgage loan is taken out. First-time buyers are defined as individuals younger than 35 at the time the mortgage loan is taken out. DNB estimate based on a sample of Dutch mortgage loans.
7) The ratio of loans (including securitized loans) to deposits made by the domestic non-financial private sector.
8) The five largest Dutch banks' assets (ABN AMRO, ING, Rabobank, Volksbank 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 Volksbank, 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 the five-year swap rate.
14) Index based on indicators of financial markets relevant to the Netherlands and an index of financial health of institutions.
15) Trend in 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.

De Nederlandsche Bank N.V.
PO Box 98, 1000 AB Amsterdam, the Netherlands
+31 (0)20 524 91 11
dnb.nl