Financial Stability Report 2017

NationalBank OF BELGIUM

Eurosystem

Contents

Executive summary

1. In a climate of structurally weak or moderate economic growth, persistently low interest rates may foster the emergence of macrofinancial risks. Even if the low interest rates are justified from the monetary and macroeconomic point of view, and provide the economy with the support and stimulus that it needs, systemic macroprudential risks may still lurk in the background.

2. The risks to financial stability resulting from this low interest rate environment are increasingly falling into two distinct types as the low level of interest rates persists. In the long run, persistently low rates and a flat yield curve may erode the profitability and/or structural solvency of financial institutions. In the case of insurance companies, prolonged low interest rates lead to a loss of solvency in the event of inadequate hedging, or if the hedging is satisfactory they require a prudent but thorough policy of reinvesting the income and capital gains derived from the assets. In the case of credit institutions, which initially enjoy a temporary improvement in their profitability when interest rates fall, the ultimate flattening of the yield curve leads to a narrowing of the intermediation margin, and that may have an adverse impact on structural profitability. Conversely, after interest rates have been low for an extended period, rising interest rates may also imply considerable risks for financial stability, certainly if the increase is too sudden – for example, if it is caused by a repricing of the risks. Persistently low interest rates may also prompt an excessive search for yield, and thus render the financial sector increasingly exposed to market risks at very low premium levels, e.g. on account of a lengthening of duration gaps, an increase in leverage on the balance sheet, and/or a reorientation of the balance sheet towards riskier assets which are less liquid or closely correlated. In the face of low risk premiums and the growing complexity and interdependence of financial positions, intensification of the search for yield increasingly exposes the financial sector to reappraisal of the likelihood of a sudden increase in risk aversion and risk premiums on financial markets.

3. The current low interest rates affect not only the financial sector but also the non-financial private sector. Portfolio adjustments made by households and firms (whether or not motivated by a search for yield) may lead to riskier positions – and particularly increased leverage – in the private sector, e.g. by linking investment financed by borrowing to investment in property. In the long run, excessive use of leverage may engender doubts about the sustainability of private sector debt, and hence threaten financial stability and hold back economic growth.

4. An intensified search for yield in a low interest rate environment makes the financial sector and the economy as a whole more sensitive to a general repricing of risks. Those risks have risen very considerably of late, owing to the current economic and political uncertainties and the decoupling of monetary policy cycles at global level. Thus, the ECB's unconventional monetary policy is still tending to depress risk premiums on bond markets, property prices in the euro area are soaring, and – more recently – the increased risk appetite and anticipated changes in economic and monetary policy in the United States have driven up stock market valuations. That can only heighten the sensitivity of global financial markets to changes in these market expectations or a sudden increase in risk aversion and risk premiums.

5. To preserve financial stability, it is therefore crucial to keep track of these potential threats and intervene promptly, if necessary, to address the heightened exposure of the financial sector (and, by extension, of the economy as a whole) to these risks. In this context, the Bank proposed to introduce a new macroprudential measure applicable to the housing market aimed at strengthening the sector's resilience and, more specifically, the banks' ability to absorb property market shocks.

Moderate growth in a low interest rate environment

6. For a small, open economy like Belgium, with a high degree of economic and financial integration within the monetary union, the macrofinancial environment is largely influenced by international trends and developments, and especially by those in the euro area.

7. Despite a rather unfavourable external environment, heightened uncertainty and waves of volatility on financial markets (caused partly by concerns about the European banking sector), the economic recovery is continuing in the euro area. However, the revival is still modest and the outlook for a structural rebound in the medium term remains somewhat fragile and limited. Owing to such factors as the substantial volume of impaired loans recorded on banks' balance sheets, the legacy of the financial and economic crisis is still hampering growth in a number of countries. More structural factors, such as the slower pace of productivity growth and demographic aspects, are also exerting more persistent (downward) pressure on economic growth in the euro area.

8. The particularly accommodative monetary policy pursued in 2016 and 2017 therefore continues to provide essential support and a significant stimulus for economic activity, notably by maintaining the highly favourable financing conditions enjoyed by the private sector. In 2016, as inflation in the euro area was still persistently below the set target, the ECB eased its monetary policy on two occasions: for instance, in March 2016, it once again lowered its key interest rate and its deposit rate, setting them at 0 % and –0.40 % respectively. In December 2016, in line with market expectations, the ECB Governing Council decided to extend its unconventional asset purchase programme until the end of 2017, or longer if necessary. In addition, as the threat of deflation was diminishing and inflation expectations had turned around, the ECB cut back the amount of its monthly purchases to the original figure of € 60 billion. It also stated that it expects the main interest rates to stay at their present levels for an extended period, and at least until the end of its unconventional asset purchase programme.

9. Low interest rates are not attributable solely to the accommodative monetary policy, but also reflect cyclical and structural factors which are bringing down the real equilibrium interest rate. For instance, the euro area faces a persistent imbalance between savings and investment, leading to a substantial current account surplus, a potential demand deficit and the under-utilisation of production capacity. This essentially cyclical component is combined with structural factors such as weak productivity growth, increased inequality in a number of countries, and demographic developments (population ageing) which have led to a downward trend in the real equilibrium interest rate in recent decades. Finally, in the wake of the financial crisis, the greater demand for safe havens remains a significant factor reducing risk premiums for the most secure types of assets. These factors could likewise depress the equilibrium interest rate in the medium term, and seem to indicate that the low interest rate environment will persist in the coming years.

The persistently low interest rates have a structural impact on the financial sector and create risks for financial stability

10. In view of the fundamental role of interest rates in the pricing of financial assets, the impact of their low level is felt in all financial markets and throughout the financial sector. Not only do persistently low rates ultimately affect the profitability of the financial sector, and especially that of banks and insurers, but they may also increase the risks to financial stability in the broad sense. The overvaluation of specific financial or real assets, the engagement in excessive and/or correlated risk positions motivated by the search for yield, and the growth of shadow banking activities may undermine the stability of the financial sector.

11. Since these risks only materialise in certain financial market segments, prudential policy – and particularly macroprudential policy – should be the first resort. That is certainly true for euro area countries, where property markets and some financial markets are still bound by national borders. The monetary policy defined at euro area level is less appropriate in cases where the causes and scale of the macrofinancial risks may differ from one country to another. The national component of macroprudential policy is therefore the best instrument for countering the country-specific threats to financial stability, while leaving monetary policy to concentrate on its primary objective of price stability.

12. Overall, there are as yet few signs of a very marked, general overvaluation of financial markets in the euro area. However, it is important to keep a close eye on those valuations, now that the reduction in risk premiums is extending from bond markets to other financial markets. Imbalances on financial markets in fact develop and worsen gradually and insidiously. Thus, in addition to exceptionally high bond market valuations, there are signs that stock market movements have become partly disconnected from the underlying corporate results, and there has been a recent surge in property market prices in the euro area. The Belgian housing market, one of the few euro area property markets not to have experienced any significant price correction during the financial crisis, has again been showing signs of overvaluation since 2015. It is therefore vital to maintain a close watch on that market.

13. Owing to the prolonged low level of interest rates, repricing risks have become more acute and ultimately constitute one of the most serious macrofinancial threats for global financial markets. The current macrofinancial context in fact features major political and economic uncertainties, and there is a growing danger of distortions caused by a sudden revaluation of risks on financial markets. For instance, the first signs of a "great rotation" are emerging, with risk premiums and yields increasing on bond markets while declining on stock markets. It is important for financial institutions – whether banks or not – to hold sufficient capital and liquidity buffers to cope with (sudden) repricing of risks on those markets. The stress tests concerning interest rate risk being conducted during 2017 can provide valuable insights on the subject. It is also important to note that, although banks and insurers generally hedge (part of) these risks by means of interest rate swaps, systemic risks of a different kind may emerge, such as interconnections or concentration of the ultimate interest rate risk of swap contracts on a small number of counterparties. Despite their potential systemic impact, particularly in the event of a sudden, sharp adjustment to interest rates, most of these risks – which are hard to measure in the current circumstances – still cannot be assessed.

14. The persistently low interest rates not only influence the valuation of financial assets and the increase in repricing risks, but they are also gradually beginning to affect the fundamentals of financial intermediation. After some time, persistently low interest rates, flattening of the yield curve and shrinking intermediation margins erode the structural profitability of financial institutions and could ultimately compromise financial stability.

15. In the event of a structural fall in interest rates, insurance companies – which in principle have negative duration gaps – immediately face negative valuation effects since the revaluation of their liabilities exceeds that of their assets. In addition, as the period of low interest rates persists and assets maturing are replaced with new, lower-yield assets, the return on the asset portfolio diminishes and the stock of liabilities with a high guaranteed yield begins to undermine the financial position of these institutions, rendering it increasingly precarious as time goes by. In that context, it is therefore vital for insurers to examine ways of incorporating the low interest rate environment as a structural component of their business model. In recent years, the Belgian insurance sector as a whole has continued to reduce its duration gap, notably by extending the average maturity of assets. In so doing, it has considerably reduced its interest rate risk exposure. If the income and capital gains derived from long-term assets are reinvested on a sufficient scale, the liabilities with high guaranteed yields can be largely honoured (at sectoral level). In that context, a number of institutions have also announced adjustments to their business model, mostly in the form of terminating or phasing out their life insurance business. In the sector in general, there is as yet little if any sign of an inordinate search for yield whereby institutions try to maintain their level of profitability at the expense of an increase in their risk positions. Although the insurance sector has reduced its interest rate risk exposure, its financial management of capital gains and the impact of repricing risks remain key points for the attention of prudential policy (as is evident from the stress test conducted by EIOPA in 2016).

16. In the case of the banks, structural profitability depends to a great extent on the intermediation margins relating to maturity and liquidity transformation. Insofar as the evolution of interest rates influences those margins, banks' profitability also depends on the level of interest rates. While rate reductions initially bolstered banks' intermediation margins and profitability, the persistently low level of interest rates and the flat yield curve represent a challenge for future profitability. At first, interest rate cuts temporarily widened banks' intermediation margin, as changes in market rates were reflected sooner in the banks' funding costs than in the return on their assets. That was also true for Belgian banks which, due to their financing structure based on savings deposits, were able to adjust their borrowing costs almost immediately to market conditions and increase their profitability. Belgian banks also benefited from the exceptional, one-off profits generated by reinvestment penalties, which increased significantly during the recent wave of loan refinancing triggered by the low level of interest rates. These were among the reasons for the continuing relatively high profitability of Belgian banks at this stage.

17. However, these temporary effects of the decline in interest rates came to an end in 2016, as is evident from the slight fall in net interest income, which is likely to suffer, in the future, a more structural reduction owing to the narrowing of the intermediation margin. That margin will be subject to further additional constraints owing to the implicit lower bound on savings deposit rates, as well as to the stress on bank lending rates fuelled by the growing pressure of competition in the sector. Although a minimum level of remuneration on deposits is essential to banks' financial stability, the fact that the deposit interest rate is approaching its limit means not only that banks' profitability is under stress, but also that the transmission of monetary policy stimuli via the banks has probably reached a saturation point.

18. In view of this tendency, Belgian banks are exploring various ways of preserving their profitability. Besides restructuring to cut costs and diversifying income sources, in particular via intermediation in investment products, banks may embark on an intensive search for yield, e.g. by taking more liquidity or maturity risks. At present, this is not a widespread phenomenon and there is no sign of any excessive search for yield. The relatively high profitability that banks currently enjoy as a result of past restructuring and the temporary effect of the decline in interest rates in fact affords them some latitude. Moreover, the latest signs of economic revival and the steeper interest rate structure offer some prospect of a (modest) easing of the pressure on profitability.

19. Nonetheless, there are some points that merit increased attention. That applies in particular to the trend in mortgage lending. Despite the May 2016 extension of the current macroprudential measure concerning property market exposures, and despite the Bank's numerous recommendations, it is evident that credit institutions are still focusing on mortgage lending and, in 2016, further relaxed certain lending conditions for mortgage loans. The (excessively) indulgent lending policy adopted by banks does not only give rise to additional credit risks for mortgage portfolios, it also fuels the upward trend in the debt burden of Belgian households. That debt is still tending to grow, while the debt ratio in the euro area has been falling gradually since 2010. Combined with the sharp rise in property prices in recent years, these developments caused the European Systemic Risk Board (ESRB) to issue an official warning in November 2016 concerning real estate-related risks in Belgium.

20. The risks confronting the financial sector are not only economic or legal; there are also operational and technological factors at play. The digital revolution is continuing apace and its influence on the functioning of the financial sector is constantly growing. In particular, banks have already digitalised their customer relations. The increasing competition and the pressure on profitability are forcing these institutions to consider implementing a greater degree of digitalisation in the organisation of their activities and their distribution channels. This nonetheless implies that the sector will face severe challenges, e.g. as regards cyber security and model risks, which could have repercussions on financial stability.

A resilient financial sector as the foundation of sustainable growth

21. A stable and efficient financial sector is essential for fostering and maintaining sustainable growth. In recent years, considerable efforts have been made – notably by the development of the banking union and the single supervisory mechanism (SSM) – to restore confidence in the sector and strengthen its resilience. These structural adjustments have proved their worth. During 2016, the financial sector was stronger and more resilient during the bouts of

financial volatility triggered in particular by Brexit. However, in view of such factors as the renewed uncertainty caused by Brexit and by the increased political fragmentation in Europe, it is necessary to continue the reforms and consolidate the European banking sector in order to achieve a sustainable economic recovery.

22. The non-performing loans on banks' balance sheets are not only detrimental to the financial situation of banks and possibly to financial stability, but they also obstruct the sustained recovery of the real economy. The considerable additional resources devoted to the management of these bad debts – both staff and financial resources in the form of supplementary reserves – lead to credit rationing for the real economy and therefore hamper the economic recovery. These claims, amounting to over € 1 000 billion for the euro area as a whole, are tending to perpetuate the structural economic problems in certain euro area countries and require a prompt structural response. Since economic growth in those countries is not strong enough to produce a market-driven solution, a consistent strategy is needed to clean up banks' balance sheets without delay.

23. Solving the bad debt problem will entail a number of specific measures. It is necessary to develop an active and sufficiently large secondary market for this type of claim. The establishment of hive-off vehicles (bad banks) or specialised asset management companies and/or the organisation of regular, substantial sales of this type of assets, with or without government support, may help to create that market. However, the new European legal framework established pursuant to the Bank Recovery and Resolution Directive (BRRD) makes such measures more difficult, as it requires the grant of public support to be preceded by the institution's resolution with a bail-in amounting to the equivalent of 8 % of the liabilities. Nevertheless, it is possible to waive these conditions in a "preventive recapitalisation" situation. That approach, which Italy is currently applying, must be extended if possible to other institutions in the EU. All the same, an efficient but flexible recovery and resolution framework remains an essential pillar of the banking union, and the bail-in clauses will ultimately make a decisive contribution towards the sector's financial stability and to severing the excessively tight (and vicious) link between the national governments' lack of budgetary scope and the level of confidence in the banking sector.

24. The Bank's macroprudential policy generally aims to maintain the stability of the financial sector. In this way, it fosters the conditions necessary for supporting sustained economic growth. In the exercise of that mandate, the Bank watches over the sector's absorption capacity and resilience. More specifically, the Bank's macroprudential policy pursues two goals. The first consists in limiting contagion risks that may arise from the concentration of financial activities in the hands of a small number of firms or the dominant positions of certain institutions. Since 2016, the Bank has identified systemically important banking institutions for the Belgian market on the basis of a set of EBA guidelines. In accordance with the EBA methodology, the Bank designated eight Belgian banks as domestic systemically important institutions, and divided them into two groups according to their level of importance. A 1.5 % capital surcharge was imposed on the first group (BNP Paribas Fortis, KBC Group, ING Belgium and Belfius Bank). The second group (AXA Bank Europe, Argenta, Euroclear and The Bank of New York Mellon) is required to hold a supplementary capital buffer of 0.75 %. These surcharges will be phased in over a three-year period. The Bank has decreed that these "O-SII buffers" applied in 2017 will be 1 % for the first group and 0.5 % for the second.

25. Apart from the financial sector's structural attributes, its cyclical characteristics and, more specifically, the phase of the financial cycle may also be a focus of macroprudential policy. For that purpose, several countercyclical instruments are available to the Bank, which can be deployed to smoothen the inherently procyclical character of the banking sector. The entry into force of a countercyclical capital buffer (CCyB) obliges the banks to supplement their capital in periods of strong credit growth, i.e. during the upward phase of the financial cycle. This supplementary buffer can then be released when the cycle turns around and begins to depress the granting of bank credit. In view of the current situation of the financial cycle in the euro area, no member country has yet activated this countercyclical buffer. In the current circumstances, that is also unnecessary in Belgium. The Bank reviews the CCyB rates on a quarterly basis.

26. One of the main attention points in the Bank's macroprudential analysis and policy concerns developments on the Belgian property market and the associated lending practices. Various indicators reveal that risks are still rising on this market leading, as already mentioned, the ESRB to issue a warning in November 2016. The trend towards rising debt levels for Belgian households, the return to too easy credit standards accompanied by still excessive credit risks in the mortgage portfolio, and the high valuation of Belgian residential property in a low interest rate environment

are serious points for attention in the Bank's risk analysis. On the basis of that analysis, the Bank proposed to extend its current prudential measure applicable to exposures to Belgian residential property (the flat-rate 5 percentage point increase in the risk weights for banks using an internal ratings-based approach) beyond 28 May, and to complement it with a new provision with a more targeted component. In addition to the said flat-rate measure for IRB banks which had the effect of increasing the risk weights from 10 % to 15 %. The proposal would have raised risk weights according to the risk profile of the loan. For mortgage loans with a high indexed loan-to-value ratio (over 80 %), the calculation of the risk weights under the proposed macroprudential measure would incorporate a higher minimum loss given default (LGD). By this means, the Bank intended to boost banks' capacity to absorb shocks on the property market and thus make the sector more resilient. With this proposal – which targets the risky segment of the loan portfolio – the Bank aimed at highlighting the need for mortgage loans to be subject to more responsible/prudent lending standards which better reflect the inherent risks. In conformity with the banking law, the Bank sebsequently demanded the Government to approve the issued regulation by royal decree. On 12 June 2017, the finance minister demanded the Bank, on behalf of the Government, to only prolong the current measure, i.e. the flat-rate 5 percentage point add-on, and to conduct a new risk analysis.

27. The scope of macroprudential policy is not limited to credit institutions but also extends to other areas of the financial system. Systemic problems affecting insurers could have considerable repercussions on financial stability, as these institutions provide significant risk coverage for other economic sectors and are themselves major investors in financial assets. In view of the scale of their liabilities involving high guaranteed yields, the persistently low interest rates are a critical factor for these firms, and more particularly for the life insurance branch, and require due prudential attention.

28. In these circumstances, insurers need to give priority to fulfilling their contractual obligations when allocating the capital gains on assets resulting from the downward trend in interest rates. A draft Decree recently approved by the Minister of the Economy enables the Bank, as the microprudential authority, to restrict the distribution of profits to policy-holders if the institution's financial position is compromised. In the case of new contracts, it is vital to base the maximum guaranteed yield on the relevant market interest rates. That principle is enshrined in the Law of 13 March 2016, whereby the rate is set according to the average yield over the 24 previous months on the Belgian government's 10-year linear bonds. That yield must not exceed 3.75 % and not be lower than 0.75 %. According to this principle, it should be cut from its current level of 2 % to 0.75 %. The Minister of the Economy exercised his right of veto in order to protect consumers and align the rules with the legislation on supplementary pensions where the minimum yield is 1.75 %.

29. Finally, macroprudential policy is not limited solely to the management of a broad range of available instruments (such as the countercyclical capital buffers and systemic risk buffers, the "O-SII" buffer, adjustment of the risk weighting and Pillar 2 capital requirements), but also involves the regular monitoring of potential risk factors for financial stability. Macroprudential policy is implemented by a very varied array of national and international authorities, including central banks and prudential authorities, governments and market authorities. The importance of good coordination and the proper exchange of information between these various players is commensurate with the current challenges and the burden that macroprudential policy will be required to bear in the coming years, during a period when, at the same time, the economic recovery still needs support, low interest rates have a structural impact on financial markets and institutions, and the possibility of a sudden reappraisal of risks materialises. All this implies potential repercussions for financial stability.

Macroprudential report

1. Introduction

The Law of 25 April 2014 [1] officially designated the Bank as the macroprudential authority. On the basis of that mandate, the Bank keeps a close watch on developments in the financial sector and focuses in particular on detecting risks that could endanger the stability of the sector – and of Belgian banks in particular. The Law of 25 April 2014 gives the Bank a mandate, when such systemic risks arise, to take the necessary macroprudential measures to prevent the continuing development of those risks and reduce the financial sector's vulnerabilities and exposure to those risks. Such measures comprise not only instruments for which the Bank is directly responsible, but also the publication of recommendations to other authorities with power to implement certain specific provisions.

In exercising its macroprudential mandate, the Bank has access to a wide range of instruments targeting the various types of risks to financial stability. One set of such instruments targets the structure of the financial market and is intended to attenuate risks arising from the dominant positions that some institutions may acquire or which result from a high level of interdependence between financial institutions. For instance, as the macroprudential authority, the Bank defines each year the supplementary capital buffers for Belgian banks which are of systemic importance in the Belgian financial sector and may have a major influence on the real economy. Other measures in its arsenal are aimed more at cyclical systemic risks which may arise from the self-perpetuating interactions between lending, on the one hand, and the valuation of the real and financial assets used as collateral for the loans in question. Finally, the Bank can enforce – in some cases jointly with other competent authorities – a range of instruments targeting specific risks. These are used, for example, in the prudent management of liquidity and capital positions in international banking groups, or in the adjustment of the capital requirements in line with developments on the property market, the latter being a particularly likely source of systemic risk.

An effective macroprudential policy is therefore unthinkable without regular, detailed analysis of the potential risks confronting the stability of the financial system, and the associated vulnerabilities for individual systemically important financial institutions or for the sector as a whole. The macroprudential risk analyses conducted during the period under review and discussed in the Bank's various committees are based on a risk assessment methodology comprising three pillars: the top-down approach, the bottom-up approach and the model-based approach (see MPR 2016). This structure facilitates the multidisciplinary interaction permitting the identification of both macrofinancial risks and risks which are more idiosyncratic in origin but have potentially systemic consequences, as well as the quantification of the impact of those risks on financial stability to the greatest extent possible.

The macroprudential risk analysis based on these three pillars, supplemented by expert judgment, is used to rank the specific risk categories needing more detailed analysis and monitoring, and to take decisions on the necessary supervisory policy measures, e.g. the activation of macroprudential instruments. For this purpose, a framework has also been created for the selection, calibration and evaluation of macroprudential policy instruments.

(1) Law of 25 April 2014 establishing the mechanisms of a macroprudential policy and spelling out the specific tasks devolved to the National Bank of Belgium in connection with its mission of contributing to the stability of the financial system.

In the context of the shared competences such as those referred to in Article 5 of the Regulation on the Single Supervisory Mechanism (SSM), these risk analyses are regularly shared with the ECB, which acts as the macroprudential authority for the euro area (with the power to top up the instruments under the CRR[1]/CRD[2]). In order to ensure efficient coordination between the national authorities and the ECB and to avoid risks of inaction on the subject, various structures have been set up at operational level, both at the ECB and at the Bank (see section 4 of the *Macroprudential Report 2015*). The Bank has therefore always played an active role in the working groups set up by the ECB to examine various subjects, such as the development of a methodology for detecting and analysing systemic risks, the property market, or the calibration of the capital surcharge for systemically important institutions and estimation of the economic impact of the various macroprudential instruments.

The Bank also works closely with the European Systemic Risk Board (ESRB), responsible for coordinating macroprudential policy at EU level. While the powers of the ESRB are less extensive than those of the ECB, being limited to issuing warnings and recommendations, its sphere of activity is broader since it extends to EU countries which are not members of the euro area and covers not only banks but the financial sector as a whole, including insurance companies and securities markets. The Bank has actively contributed to the work of the ESRB, not only by notifying it of its own macroprudential measures but also by participating in the ESRB's permanent assessment team, which examines all the notifications from EU Member States. In addition, the Bank works closely with the ESRB on developing the systemic risk analysis and the necessary set of instruments. Furthermore, it is represented in various working groups and expert groups which focus on matters such as the analysis of the property market or the shadow banking sector, the assessment of the interconnections within the financial sector, the development of 'heat maps' warning of potential systemic risks, contagion effects and the recognition of macroprudential policy measures.

In view of the importance of this macroprudential authority mandate and the extent of the means of action granted to the Bank, the law foresees various provisions to ensure transparency in the arrangements for exercising this new function. For instance, the Bank has to publish its decisions and recommendations, stating the reasons underlying them. It must also publish and submit to the president of the Chamber of Representatives an annual report explaining how it has performed its task of watching over the stability of the financial system. This Macroprudential Report meets that requirement. In what follows, this Report addresses the various points for attention and the various measures which the Bank has adopted in its capacity of macroprudential authority. Chapter 2 details the various macrofinancial risks and points for attention which the Bank is closely monitoring, and contains a description of the respective risks and the assessment of their potential impact on the financial sector. Chapter 3 presents the macroprudential measures adopted by the Bank in 2016.

2. Main risks and points for attention

During the year under review, the weak economic growth and accompanying low interest rate environment – partly due to the necessarily accommodative monetary policy stance – remained two significant risk factors for the medium-term stability of the Belgian financial system. If these two macroeconomic factors were to persist for an extended period, they would exert downward pressure on the long-term profitability of Belgian financial institutions. The first signs of that are apparent in the profit and loss accounts of banks and insurers, despite the ongoing revival of economic growth and the recent rise in long-term interest rates. It is therefore possible that the gradual but ever-increasing cumulative adverse effect that the environment of low interest rates and modest growth is exerting on their income may continue to present a challenge for Belgian banks and insurers for some time yet. In that case, financial institutions will have to make further efforts to offset those negative effects by cutting their costs, adapting their business model and/or charging more appropriate rates for certain risks (such as mortgage lending).

If these first two significant risk factors persist, a third risk will remain in the forefront, namely the search for yield. For financial institutions, search for yield may lead to banks taking unhedged interest rate risks – which bolster interest income in a low interest rate environment but expose the institution to heavy potential losses in the event of a sudden

(1) Regulation (EU) No. 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No. 648/2012.

(2) Directive 2013/36/EU of the European Parliament and of the Council of 26 June 2013 on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms, amending Directive 2002/87/EC and repealing Directives 2006/48/EC and 2006/49/EC.

and unexpected steep increase in interest rates – or investment portfolio shifts in favour of riskier assets. These changes in ALM and/or investment policy would expose financial institutions to potentially heavy losses in the event of a sudden rise in interest rates and/or increase in risk premiums. A surge in interest rates is therefore among the possible risk scenarios that must be considered in the current low interest rate environment, and that financial institutions must guard against. On financial markets, the search for yield in a low interest rate environment has led to lower risk premiums and higher prices for a wide range of financial and real assets; that heightens the risk of significant price shocks and turbulence occurring at a time when investors reduce their risk appetite. As the risk of such shocks on the markets is attenuated, in the short term, by the continuing accommodative monetary policy stance, including the financial asset purchase programmes, it is possible that investors may come to underestimate the risk of such market upheavals and take positions which prove untenable once the restoration of a more normal monetary policy stance has opened the way to higher interest rates and increased financial market volatility. The development of such financial bubbles erodes the resilience of financial institutions holding assets on their balance sheet which are inadequately remunerated for the risks involved. However, the search for yield may also have indirect effects, e.g. by weakening the financial soundness of banks' customers, be they households or corporates, or by favouring the development of new entities which are subject to little or no regulation (shadow banking system) and which, in the absence of adequate supervision, could tend to intensify financial risks. In that context, the Bank has also maintained a very close watch on developments on the Belgian residential and commercial property market and, in view of the persistent dynamism of bank lending in those sectors, has proposed additional measures for the housing market. Besides extending the measure first introduced at the end of 2013, the Bank proposed to take further steps to reduce the risk – which is reflected in a steady rise in household debt and the emergence of serious vulnerabilities in certain mortgage debtor categories – by adding a second component targeting more specifically loans with a high loan-to-value (LTV) ratio. These prudential measures, described in sections 2.2 and 3.1, were intended to strengthen the resilience of the market and of credit institutions in the face of larger-than-expected losses on Belgian mortgage loans, which could result from the significant proportion of mortgage loans with a high LTV ratio, a high debt-service-to-income (DSTI) ratio and a long duration.

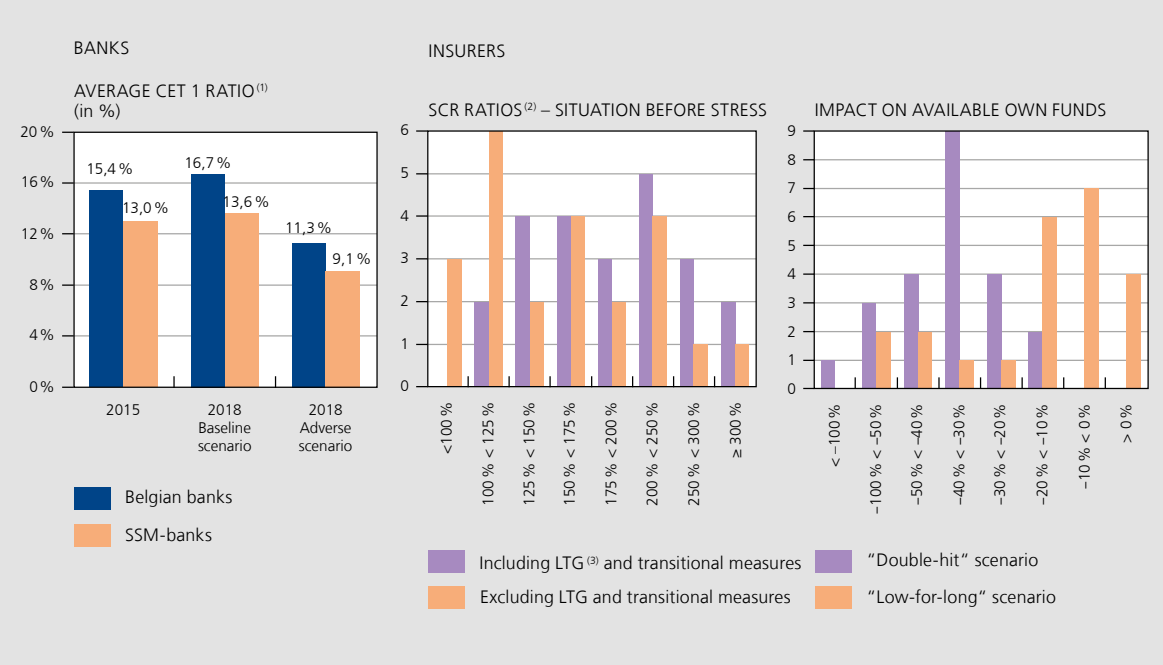
These four major risk factors – weak economic growth, low interest rates, search for yield and vulnerability in the housing sector – had already been highlighted in previous editions of the Macroprudential Report. They are not specific to Belgium but are present to varying degrees in most other euro area countries. The resilience of the leading Belgian and European banking institutions and insurers in relation to these four major risk factors was therefore tested in depth in the 2016 stress tests, which measured the impact of various scenarios on the solvency of each individual institution. Box 1 summarises these scenarios and the results of the stress tests conducted by the European Banking Authority (EBA) and the European Insurance and Occupational Pensions Authority (EIOPA) in consultation with the national prudential authorities.

Box 1 – Stress tests on banks and insurers

To determine the ability of financial institutions to withstand macroeconomic and financial risks, supervisory authorities use stress tests. In recent years, this prudential instrument has undergone continuous improvement to reflect as closely as possible the impact of shocks on the financial health of banks and insurers and to detect at an early stage the vulnerabilities of individual institutions and of the financial system as a whole.

In 2016, in accordance with the European legislation, the EBA and the EIOPA once again coordinated the stress tests on credit institutions and insurance companies at European level. In particular, that coordination takes the form of harmonisation of the stress scenarios used and the methodology to be applied by institutions in conducting their individual stress tests (bottom-up stress tests). Other competent authorities – namely the national microprudential and macroprudential authorities and, for banks subject to the SSM, the ECB – are also closely involved in this exercise, in checking the quality of the data and results in order to ensure conformity with the methods established by the EBA and the EIOPA.

RESULTS OF THE EBA AND EIOPA STRESS TESTS



Sources: ECB, NBB.
(1) Common equity Tier 1.
(2) Solvency capital requirement.

BANKS

To supplement the stress tests coordinated by the EBA in 2016 (which concerned 51 European banks, corresponding to around 70 % of the sector's assets), the ECB as the competent authority decided to extend the exercise to 57 institutions on the basis of a somewhat simplified EBA methodology. In Belgium, four credit institutions participated in the EBA exercise (KBC Group and Belfius as Belgian banks and ING Belgium and BNP Paribas Fortis via their Dutch and French parent companies) and three institutions took part in the ECB exercise (Argenta, AXA and Bank of New York Mellon). The stress test comprised a baseline scenario and an adverse scenario, both with a three-year horizon (2015-2018). The assumptions concerning the macroeconomic variables in the baseline scenario corresponded to the 2015 autumn forecasts of the European Commission (EC). The adverse scenario, designed by the ESRB, was a hypothetical scenario reflecting the systemic risks considered to represent the greatest threats to the stability of the EU banking sector. It simulates a deep recession over the three years from 2016 to 2018, featuring a cumulative decline in GDP compared to the baseline scenario amounting to 7.6 % in Belgium, as opposed to 6.8 % in the euro area, and a rise in unemployment in 2018 of 4.2 percentage points in Belgium and 2.3 percentage points in the euro area. In view of this recession and the already tense situation on the property markets of many Member States, the adverse scenario also takes account of a slump in property prices, to 20 % below the level predicted in the baseline scenario in both Belgium and the euro area at the end of 2018. Finally, to take account of the chance of a sudden rise in risk aversion, the adverse scenario also includes an increase in both short- and long-term interest rates and a widening of the spreads during the period under review. This scenario thus reflects the main systemic risks examined in this Report.

Although the stress test takes no account of the banks' possible response to the simulated shocks (in accordance with the static balance sheet assumption), the results of this exercise are still a useful analysis tool for assessing the extent

to which banks' balance sheets can withstand the specific shocks considered. The chart compares the average CET 1 ratio of Belgian banks (Belfius and KBC) and the SSM banks at the beginning and at the end of the stress test period in the baseline scenario and in the adverse scenario. Belgian banks were in a good starting position compared to the sample of large SSM banks participating in the stress test. At the beginning of the test, their CET 1 ratios averaged 15.4 %, comparing favourably with the 13 % average starting position of the CET 1 ratio for the sample of SSM banks. Both Belgian and SSM banks also started with a better solvency ratio than in the 2014 European stress test. In the baseline scenario, the CET 1 ratio of Belgian banks increased by an average of 1.2 percentage points between the end of 2015 and the end of 2018, whereas that of SSM banks increased by an average of 0.6 percentage point over the same period. Both increases were largely due to the EC's favourable macroeconomic and financial forecasts for Belgium and the euro area, and to a set of methodological assumptions made by the EBA (e.g. no market risk shock for 'available-for-sale' and 'fair value option' positions in the baseline scenario). For Belgian banks, the impact of the adverse scenario was broadly comparable to the impact on SSM banks: between the end of 2015 and the end of 2018 their CET 1 ratios declined by an average of 4.1 and 3.9 percentage points respectively. Taking account of their initial CET 1 ratios and the estimated fall in those ratios under the adverse scenario, the CET 1 ratios estimated for the end of 2018 in the adverse scenario averaged 11.3 % for Belgian banks, well above the average CET 1 ratio of 9.1 % for SSM banks. The more favourable starting positions of Belgian banks and their 2016 European stress test results also reflect, at least in part, the adjustments that those banks have made since 2014: they have in fact strengthened their capital positions, reduced their debts, lowered the risk of their core activities and pared down their legacy assets. During the 2014 stress tests, those assets had still seriously weighed on the banks' results.

INSURANCE COMPANIES

The persistently low interest rate environment imposes a heavy burden on the business model of the Belgian insurance sector, and especially the life insurance branch. The associated challenges are reflected in the results of the stress tests conducted by the EIOPA in 2016 jointly with the Bank for 23 Belgian insurance companies. This EIOPA stress test comprised the following two adverse scenarios:

- the "double-hit" scenario is a hypothetical scenario designed by the EIOPA jointly with the ESRB. The scenario reflects the ESRB's assessment of the main risks to the European financial system, namely a persistently low interest rate environment and an increase in risk premiums. The scenario concerns both the assets and the liabilities of the institutions, combining a fall in the risk-free yield curves with significant shocks affecting key asset categories in the investment portfolio (government and corporate bonds, loans (mortgages), equities, property, etc.);
- the "low-for-long" scenario simulates a structural stagnation situation in which a scarcity of profitable long-term investments and persistently weak growth (and low growth expectations) lead to a further decline in the risk-free yield curve, particularly for longer maturities. The stress curve is based on swap rates as at 20 April 2015, when they were low for most long-term interest rates. This swap rate was then subjected to the EIOPA extrapolation methodology in which the "ultimate forward rate" (the interest rate on which the EIOPA risk-free yield curve converges over a 60-year period) is just 2 % instead of the normal 4.2 %. This last assumption represents the prolonged period of weak growth.

The starting position for the exercise was the situation on 1 January 2016. This meant that the participants could use only long term guarantee (LTG) measures, transitional measures, company-specific parameters and (partial) internal models approved by the Bank[1] as at 1 January 2016. Most institutions (19) use "volatility adjustment" (VA) and only one applies the transitional measure for technical provisions. In the analysis of the results, the main focus was on the impact of the two scenarios on the balance sheet and own funds available to cover the solvency capital

(1) To take account of the often long-term character of an insurer's investment portfolio, the regulatory framework of Solvency II devises long term guarantee (LTG) measures which soften the impact by partly offsetting the widening of the spread by an increase in the discount rate applied to the technical provisions. The degree of offsetting depends on the type of LTG measure which can be applied. The transitional measures laid down by Solvency II for the technical provisions give insurers a period of 16 years in which to achieve linear convergence of their technical provisions calculated under Solvency I with those calculated under Solvency II.

requirement. The impact on the capital requirements was not calculated. The chart provides a brief summary of the results for the Belgian market:

- first, it presents a distribution of the solvency capital requirement (SCR) ratios of the 23 participants before the application of the shocks. The average SCR ratio was 196 % before the stress tests, indicating a comfortable starting position. All institutions respect the statutory SCR ratio (100 %) and around three-quarters of them have an SCR ratio of over 150 %. The impact of the use of LTG measures and transitional measures, especially VA, is clear from examination of the distribution of the SCR ratios which exclude those measures. The average SCR ratio drops by 55 percentage points to 141 %. Also, three institutions no longer meet the legal requirements, and fewer than half of the participants have an SCR ratio of more than 150 %. After taking account of the shock, there is a further substantial increase in the impact of the LTG measures and transitional measures. In view of the significant effect of these measures on the institutions' solvency, the Bank will continue to pay attention to the supplementary conditions and regulatory requirements that they must respect;
- the "double-hit" scenario is the one that has the biggest impact on the institutions' own funds, causing a 35 % fall, on average. In view of the severity of this scenario, the analysis focused less on the impact on own funds and more on the underlying factors explaining the impact, and on differences between institutions. The results indicated vulnerabilities in certain institutions which will be examined more closely on a case by case basis; that will help to determine the agenda for future stress test exercises.

The "low-for-long" scenario results in a weighted average reduction in the own funds of 14 percentage points (with a median of 11.6 percentage points). Two institutions exhibit a very large impact (ranging between –100 percentage points and –50 percentage points) on their capital, and two others lose between 40 and 50 percentage points. The ultimate impact on the undertaking's solvency depends on the starting position, as surplus solvency can absorb part of the shock. The results of this scenario confirm an earlier finding that emerged in the context of the analysis of interest rate risks, namely that some institutions are vulnerable to a persistently low interest rate environment. The Bank will continue to monitor how the most vulnerable undertakings can further reduce their exposure to interest rate risk and/or build up additional own funds or supplementary reserves ('flashing-light' reserve).

In view of the growing potential threats to the integrity of the IT infrastructure of financial institutions and market infrastructures – e.g. owing to the use of software developed externally, or targeted cyber attacks – the Bank considered it advisable to retain cyber risk on the list of major factors deemed capable of weakening the stability of the financial system. Also, the shadow banking sector and asset management were added to the list of potential risks as possible points for future attention.

The next four sections examine the main risks mentioned above. In addition to providing a detailed description of the nature of these risks, they discuss their impact on the business climate of banks, insurers and financial market infrastructures (FMIs) respectively, examining the systemic risks potentially associated with them, either because the risk in question has a good chance of materialising, and/or because it could have a major impact on the financial system.

This list is certainly not exhaustive. Although the Belgian financial sector has reduced its exposure to debtors in the weaker euro area economies, developments in some countries continue to figure in the macroprudential analysis owing to the second-round effects that could occur in certain scenarios and which could also spread to the operating framework of Belgian financial institutions via contagion effects on the financial markets. Financial institutions also need to protect themselves against the shocks that may accompany the United Kingdom's departure from the European Union ("Brexit" scenario) or other geopolitical and/or economic and financial shocks. Similarly, risks associated with the geopolitical situation via a general deterioration in the economic and financial outlook in some countries could give rise to new turbulence in the financial system – as in 2015 and early 2016 – further reinforcing, through second round effects, the main aforementioned risk factors. In addition, operational, reputational and financial risks may also emerge at the level of individual institutions in the case of abuse or misconduct, and spread very quickly throughout the

system via the numerous interconnections between markets and infrastructures. In view of their specific nature, these risks are less readily countered by targeted, temporary instruments and instead require the implementation of structural guidelines, compliance requirements and governance rules.

2.1 Moderate economic growth, low interest rate environment and search for yield

Gradual strengthening of economic growth

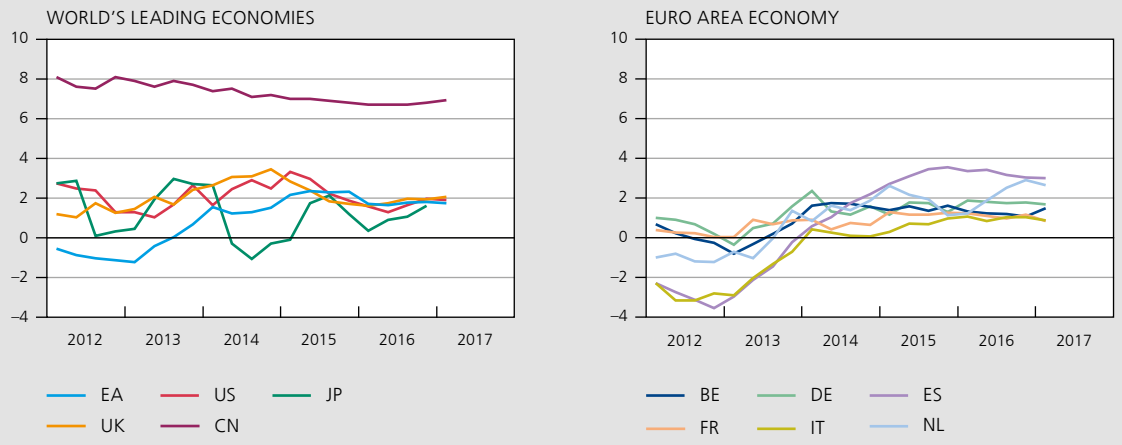
In the euro area, as in most advanced economies, activity has grown at a modest but steady pace over the past three years. In 2016, GDP growth reached 1.8 %, underpinned by the continuing low level of energy prices, favourable financing conditions due partly to the ECB's highly accommodative monetary policy, and the slightly expansionary fiscal policy stance. However, a number of factors continued to curb the economy's dynamism. They include the ongoing balance sheet adjustments in a number of sectors and countries, the inadequate implementation of structural reforms, and the emergence of many uncertainties. For instance, production capacity continued to be under-used in 2016, as is evident from the still high level of unemployment in the euro area and the investment deficit.

In Belgium, economic growth weakened slightly in 2016, dipping to 1.2 % compared to 1.5 % in 2015. This slowdown was primarily apparent at the beginning of the year, particularly following the March 2016 terrorist attacks in Brussels, coming soon after the November 2015 attacks in Paris. More generally, some countries which had been harder hit by the great recession and the euro area crisis are making a stronger recovery, and growth in Belgium has been down slightly compared to neighbouring countries in the past two years. The fiscal consolidation efforts and the climate of wage restraint could inhibit public and private consumption in the short term. In the longer term, however, they help to establish sounder economic fundamentals. They are already bringing sustained job creation and a fall in unemployment.

The economic recovery strengthened at the end of the year, and should persist in the medium term. In both Belgium and the euro area, household and business confidence indicators were above their long-term average at the beginning of 2017, and the growth prospects for the advanced economies were generally revised upwards.

On the one hand, those prospects are accompanied by continuing considerable uncertainty in view of the predominance of risk factors. Those factors are largely political, being concentrated around three elements: the impact of Brexit on the

CHART 1 REAL GDP GROWTH
(annual percentage change)



Sources: Chinese National Statistical Office, NAI, OECD.

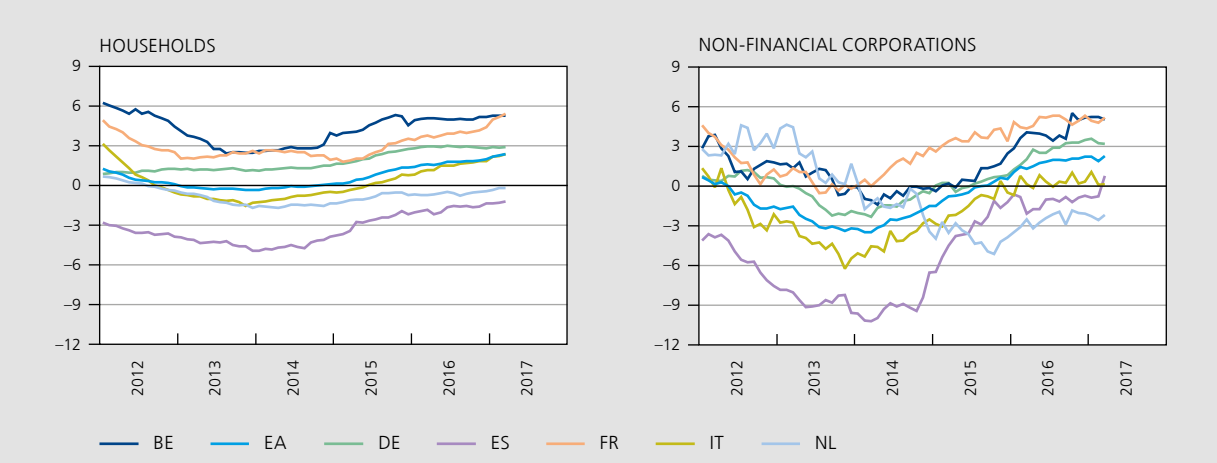
British economy and on the euro area, which has been limited so far, but could become more pronounced; the effective measures taken by the American government in key political spheres; and the significant population divide apparent at the time of the recent elections and referendums in Europe. Public debt remains high in relation to GDP in certain euro area countries, particularly where potential growth is relatively weak or even slightly negative. Geopolitical tensions, including those concerning substantial migration flows, could likewise dampen the economic outlook. Also, as the recovery continues and strengthens, the improvement in the outlook could give rise to a potentially abrupt adjustment on financial markets.

In this context of moderate but resilient economic growth, the dynamics of bank lending continued to strengthen in 2016 and early 2017 for loans to both households and businesses, in most euro area countries. According to the bank lending survey, the recovery was mainly due to a surge in demand for credit and, to a lesser extent, a slight easing of banks' lending standards. Demand for credit is likely to continue being supported by the low level of interest rates, corporate funding needs, the improvement in the outlook for the housing market and the revival in consumer confidence.

In Belgium, the annual growth of bank lending to households persisted at a relatively high rate. In March 2017, growth came to 5.3 %, close to the figure prevailing for the past year and a half, compared to 2.4 % in the euro area. This relatively strong and persistent credit expansion is primarily due to mortgage lending. The growth of bank loans to non-financial corporations also accelerated at the end of 2016, up from 3.6 % in September 2016 to 5 % in March 2017. However, that acceleration is partly supported by specific operations by AB InBev (one of the largest Belgian non-financial corporations).

CHART 2 LOANS GRANTED BY RESIDENT BANKS

(annual percentage change[1])



Sources: ECB, NBB.

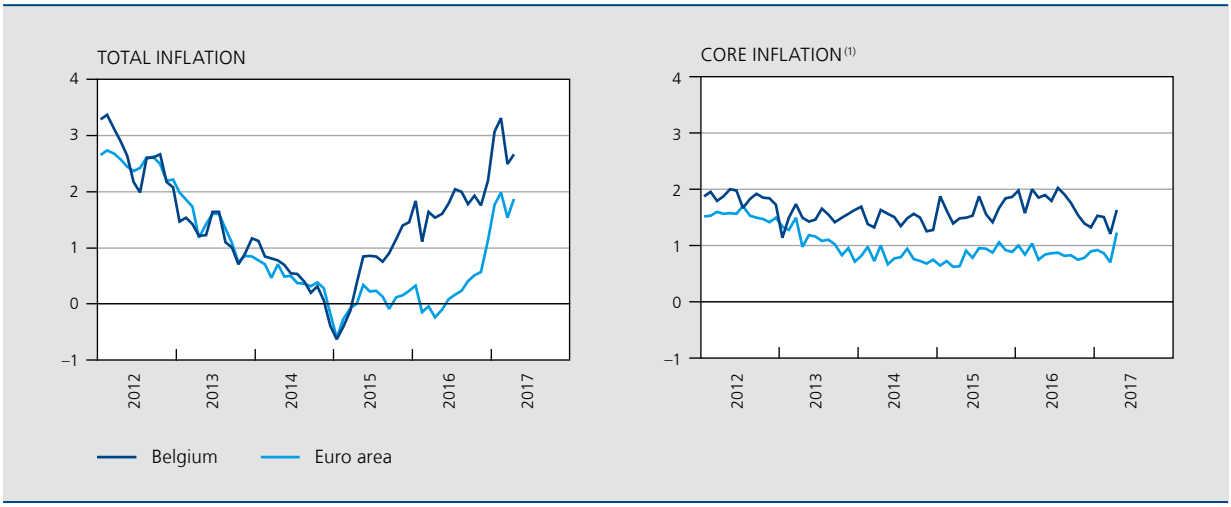
(1) Data adjusted for securitisation. In the case of Belgium, the data refer to loans granted by Belgian banks to households and non-financial corporations resident in Belgium. For the euro area and individual countries other than Belgium, they refer to loans granted to counterparties resident in the euro area.

Inflation surged in the euro area in late 2016 and early 2017, jumping from 0.6 % in November 2016 to 2 % in February 2017 before slightly declining to 1.9 % in April. Rather than resulting from a strong economic revival, this sudden rise was mainly due to base effects relating to the increase in oil prices, which had been particularly low a year earlier. Core inflation, i.e. excluding food and energy which are particularly volatile components, remained low in the euro area against the backdrop of continuing weak pressure from domestically generated costs, given the weak wage growth. In April 2017, it came to 1.2 % year-on-year.

In Belgium, total inflation came to 2.7 % in April 2017, with core inflation at 1.6 %. These figures were still higher than in the euro area owing to increases in indirect taxes and regulated prices in addition to a higher services inflation.

CHART 3 INFLATION

(annual percentage change in the price indices)



Source: EC.

(1) Core inflation is equal to total inflation minus the volatile components, i.e. food and energy.

Interest rates remain low in general despite a rebound in yields on sovereign securities

Although it seems that the growth of activity and credit in the euro area is gradually becoming self-sustaining, the ECB's expansionary monetary policy is still a major source of support. In recent months, the ECB has included bonds issued by non-financial corporations in its asset purchase programme, the expiry of which has been postponed to the end of 2017, or later if necessary. In addition, the ECB reduced its key interest rates and launched a second series of four targeted longer-term refinancing operations (TLTRO II). It confirmed that the key interest rates are likely to remain at or below their end-2016 levels for an extended period, well past the horizon set for the asset purchases.

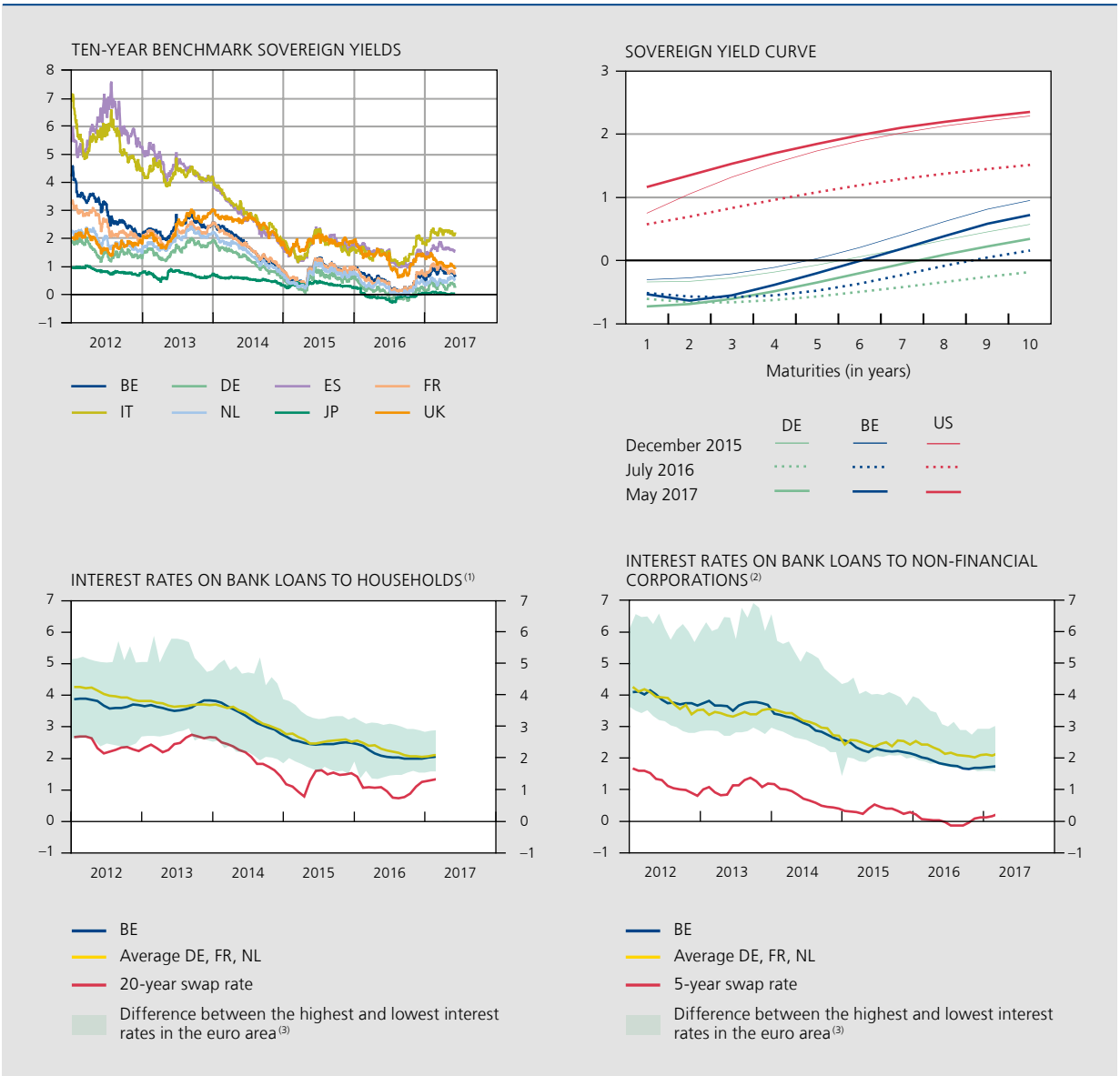
Under the impetus of the ECB's monetary policy, euro area sovereign bond yields declined further during much of 2016 to reach new lows, before beginning to rise again at the end of October. The yield on German ten-year Bunds increased from –0.05 % at that time to 0.3 % at the end of May 2017. On the one hand, this turnaround in the dynamics of sovereign yields represents a potential interest rate risk for banks and insurers, e.g. because they face a decline in the value of the sovereign bonds that they hold. On the other hand, it could facilitate the task of maturity transformation and financial intermediation since the rise in yields was particularly marked in the case of longer maturities, thus causing a steepening of the yield curve.

This trend reversal of sovereign yields in the euro area was accompanied by a more pronounced increase in American sovereign yields. That increase was triggered by the prospect of the presidential election in the United States, which could potentially lead to crystallising of the effects of the strong forecasts for American GDP and the favourable trend in unemployment; it reflects an increase in inflation (expectations). In these circumstances, the Federal Open Market Committee raised its target range for the federal funds rates in December 2016 and March 2017 for the second and third times respectively since the financial crisis. Via an increase in the term spread, the higher American long-term yields may partly reflect greater uncertainty over the economic outlook.

In the euro area, sovereign yield spreads in relation to Germany continue to reflect the risks concerning certain countries. Thus, in a context of political instability and structural vulnerability in the banking sector – low profitability, large volume of non-performing loans and relatively low capital ratios – the Italian ten-year sovereign yield (around 185 basis points at the end of May 2017) has risen above the Spanish yield spread (around 120 basis points), whereas the spreads had been similar for a number of years. In addition, the sustainability of Italian public finances could be questionable in a context of potentially weak or even slightly negative growth. There are similar concerns about Portugal.

CHART 4 INTEREST RATES

(in %)



Sources: ECB, Thomson Reuters, NBB.

(1) Interest rates on mortgage loans with an initial fixed interest rate period of more than 10 years.

(2) Interest rates on new bank loans of € 1 million or less with an initial fixed interest rate period of more than 5 years.

(3) Countries considered: Austria, Belgium, Finland, France, Germany, Italy, Netherlands and Spain.

Apart from some developments specific to a few countries, the interest rates on bank loans to households and non-financial corporations continued falling during the first half of 2016 in the euro area, indicating the transmission of the accommodative monetary policy. However, they remained relatively stable thereafter. Bank margins – as assessed by the difference between bank interest rates and money market rates for comparable maturities – remained stable for much of 2016 before declining at the end of the year following the rise in money market interest rates. They are likely to remain under pressure if money market rates have reached their floor or begin to rise. Belgian bank interest rates dropped to historically low levels in March 2017: they stood at 2.1 % for mortgage loans and 1.7 % for business loans, levels close to the average for the three main neighbouring countries and in the lower half of the euro area range.

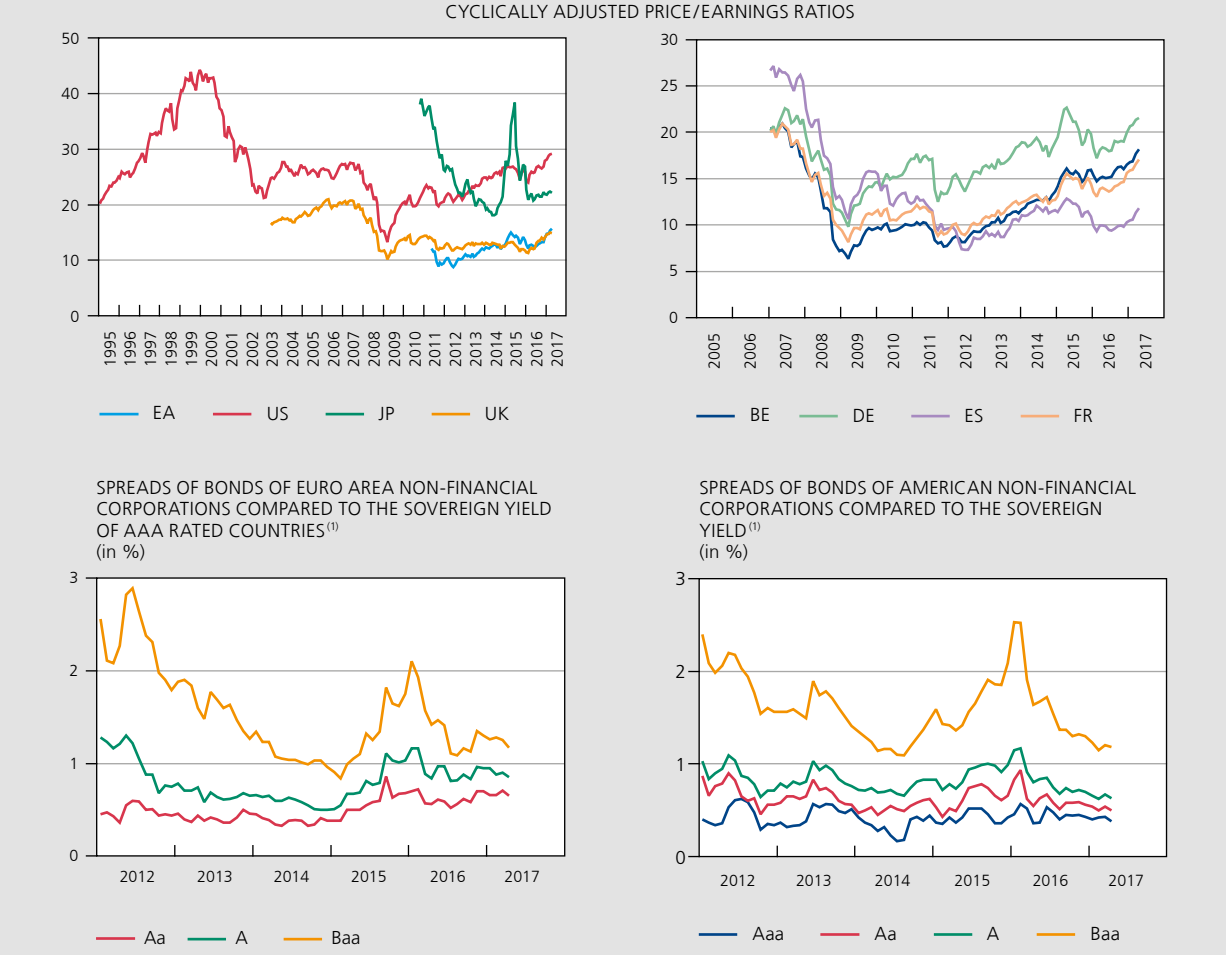
Risks of a search for yield in a low interest rate environment

Despite the increase at the end of 2016, sovereign interest rates are generally still at a low level. That could drive investors to make an ill-considered shift in favour of financial or immovable assets offering higher returns but entailing greater risks.

Stock market indices, including bank indices, were generally rising in the second half of 2016 and in early 2017 after undergoing a marked correction following the Brexit referendum, and despite several bouts of volatility, particularly against the backdrop of the American presidential election. Valuation ratios of some stock market indices are also beginning to show signs of tension. In some countries, they are at levels which, in the past, preceded significant corrections. In the United States, the cyclically adjusted S&P 500 price/earnings ratio has reached a level similar to that at the beginning of 1997, some time before the irrational exuberance accompanying the internet bubble. In the euro area and in Belgium, price/earnings ratios have also risen, but their level does not imply any clear sign of overvaluation.

The search for yield appears to be contained on other markets. For instance, following a sharp fall in the first half of 2016 as a result of the ECB's asset purchase programme, yields on bonds of euro area non-financial corporations increased at the end of the year in parallel with the rise in sovereign yields.

CHART 5 VALUATION OF FINANCIAL ASSETS



Sources: Barclays Capital, Thomson Reuters.
(1) Yield on an index of bonds with a term of more than one year denominated in euros (for the euro area) or in dollars (for the United States).

Finally, despite some financial market upheavals, the composite indicator of systemic stress in the euro area began falling in the second half of 2016 and in early 2017, whereas it had maintained a slight upward trend since the end of 2013. The sub-components comprising stock markets and financial intermediaries were contributors to that decline, whereas the sub-component comprising bond markets ceased rising.

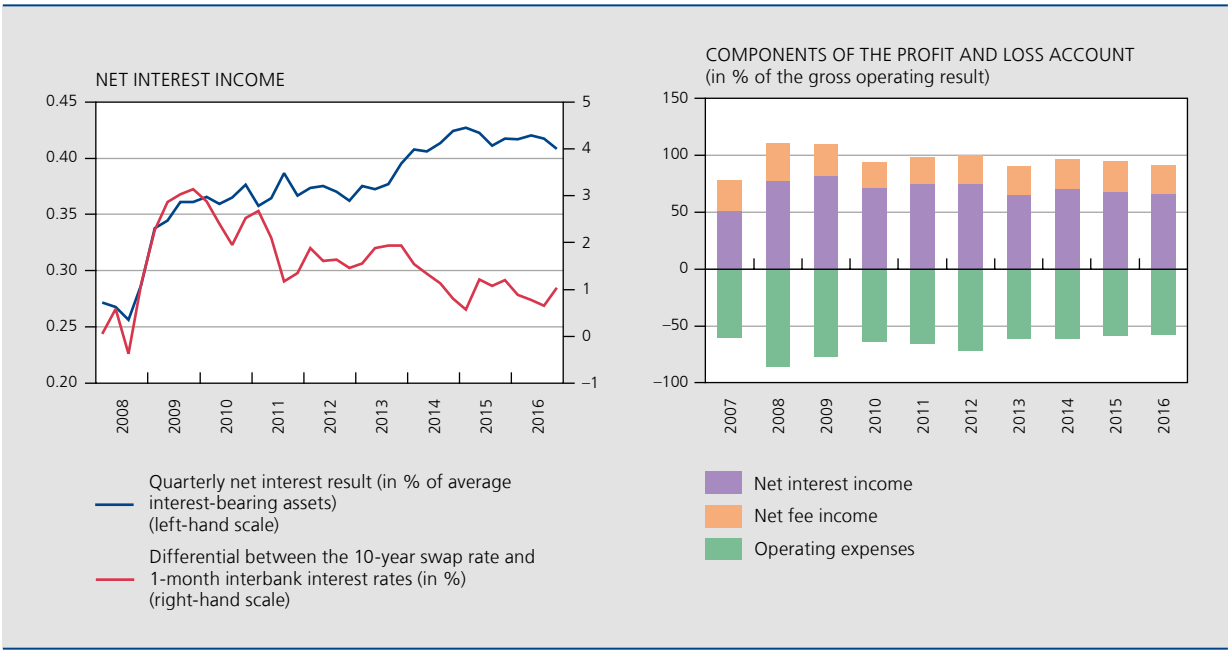
Impact on the financial sector and prudential measures

Following the global financial crisis, the leading Belgian credit institutions radically restructured their business models, primarily by refocusing on traditional banking activities in certain strategic markets. Today, Belgian banks enjoy sound ongoing profitability which, despite a slight dip during the year under review, places them in a favourable position at the start of a period in which their ability to generate profits will be put to the test. The position of insurance companies, particularly those operating mainly in life insurance, is less favourable.

The current economic context exerts downward pressure on the long-term profitability of both banks and insurers in Belgium and in the euro area, and those institutions will undoubtedly need to make additional efforts to continue adapting their business model and cost structure. Although the risks concerning economic growth seem to have diminished somewhat in view of the recent positive developments, the persistence of low interest rates presents a considerable challenge. In fact, while the low level of both short- and long-term interest rates has helped to limit the cyclical slowdown and support economic activity, the low – and sometimes even negative – interest rates are in themselves rather unfavourable for the profitability of the financial sector, and particularly for life insurance companies. The Bank pays close attention to this aspect in its macroprudential analyses.

All other things being equal, the persistence of low interest rates depresses the net interest income of the Belgian banking sector, which declined in 2016 following two consecutive years of growth. On the one hand, it erodes the advantage that credit institutions may obtain from very cheap resources such as sight deposits, on which the remuneration is only partly linked to market interest rates. Also, at maturity, securities or loans offering a high yield have to be replaced with others generating lower returns. In that regard, it should be noted that during the period under review several mortgage borrowers opted for refinancing their mortgages, thereby reducing the profitability of a key balance sheet item for many Belgian banks.

CHART 6 PROFITABILITY FACTORS OF BELGIAN BANKS



Source: NBB.

In previous years, various measures had been available to counterbalance the negative consequences of the interest rate levels on banks' interest income. First, banks reduced the remuneration offered on deposits, particularly savings accounts, thus cutting their funding cost while continuing to enjoy favourable borrowing conditions on the wholesale market. Second, Belgian banks succeeded in maintaining high commercial margins on new loans despite the fiercer competition on the market. In addition, as their balance sheets feature shorter maturities for the liabilities than for the assets, banks benefit from a situation in which interest rates are falling since the cost of their liabilities is adjusted to the new interest rate environment more quickly than the return on their assets. Thus, despite the unfavourable environment, the net interest income of Belgian banks increased in 2014 and 2015.

That was not the case in 2016. Despite a further reduction in the remuneration of retail customers' deposits and recourse to the cheap financing offered by central banks, banks were no longer able to sufficiently cut their funding costs.

The same will apply in the future, as banks have less leeway, particularly as regards the remuneration of retail customers' deposits, whereas conversely the return on their assets will continue to decline gradually. Thus, the persistence of low interest rates over a prolonged period will gradually reduce Belgian banks' interest income, which is their principal net income source. It should be noted, however, that a sharp and sudden rise in interest rates could also be detrimental for institutions which are not sufficiently hedged against an abrupt interest rate rise, as it would drive up their funding costs while the return on several assets is fixed in the medium or long term.

In recent years, Belgian banks have tried to ease the pressure on their net interest income by favouring fee income by expanding their asset management activities. However, total fee income was lower in 2016 than in 2015, suggesting that their ability to offset the expected decline in interest income in a structural fashion should be viewed with caution.

A prolonged period of low interest rates is also unfavourable for the insurance sector, particularly the life insurance branch, as it is characterised by liabilities which are generally of longer duration than assets, as well as historical commitments on which the past guaranteed yields are often very high. At the individual level, this duration gap varies widely between insurers, and developments during 2016 suggest that a range of operations and other measures have succeeded in significantly reducing the gap (which came to 1.5 years at the end of 2015) during the year under review (the figures for the situation at the end of 2016 were not yet available when this report was finalised). For institutions still characterised by a relatively large duration gap, the current low interest rate environment implies a substantial reinvestment risk which could be accompanied by a steep fall in profitability. As a result, the outstanding amount of life insurance contracts with a high guaranteed return and the level of that return represent very significant risk parameters for these insurers in a period of sharp reductions in interest rates on risk-free investments. Contracts offering a high guaranteed yield which, owing to the current low returns, cannot be (re)invested at a profit currently imply the most serious risk for the Belgian insurance sector.

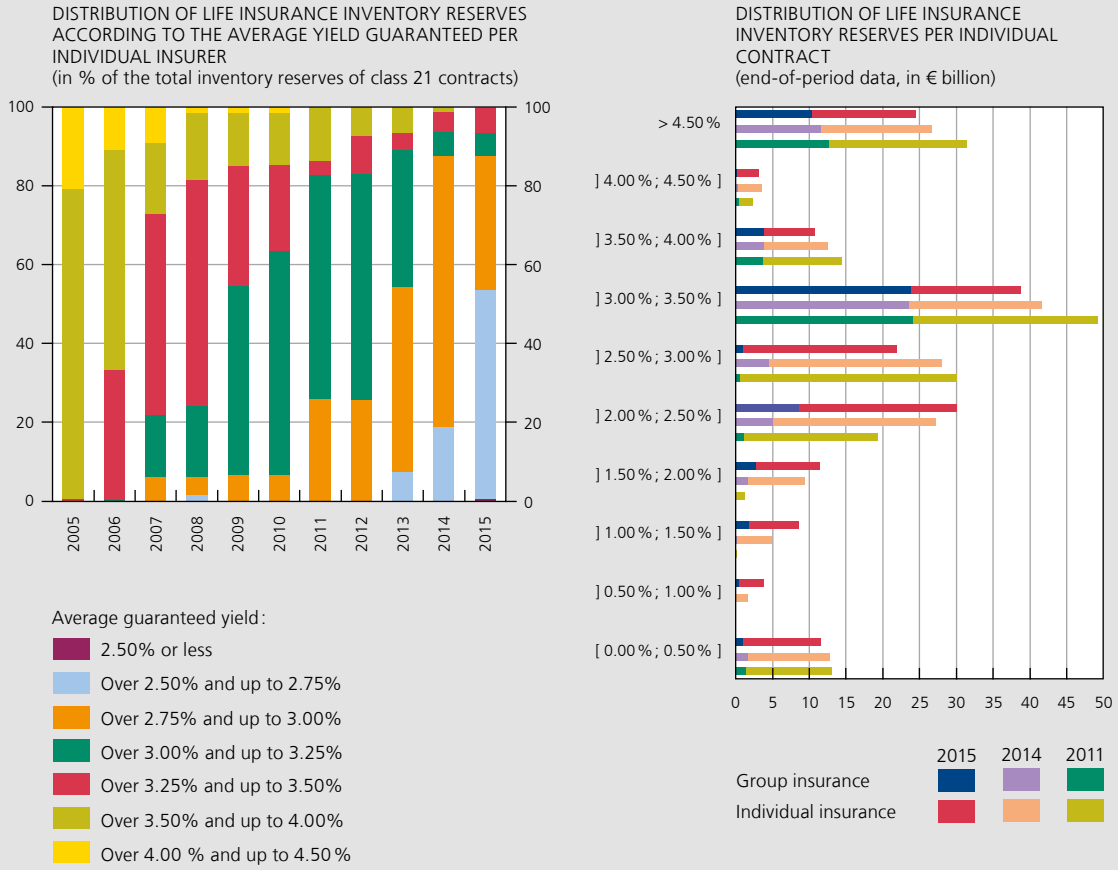
The total inventory reserves related to guaranteed yield contracts dropped from € 168.2 billion at the end of 2014 to € 164.3 billion at the end of 2015, the latest period for which the annual detailed reporting data were available. This decline in outstanding reserves is attributable to individual policies, where reserves are down by almost 5 %. In the case of group insurance, reserves are up by 3 %.

Although the proportion of contracts offering a guaranteed yield of over 2 % decreased slightly in favour of contracts offering lower rates, the legacy of current contracts on which the guaranteed return on the existing reserves and/or those to be built up by future premiums exceeded 4.5 % represented € 24.5 billion in 2015, or 15 % of the inventory reserves, compared to € 26.7 billion in 2014 and € 31.3 billion in 2011.

The persistence of low interest rates has prompted insurers to sell contracts more in line with market conditions, as the average guaranteed yield on class 21 contracts was trimmed from 2.91 % in 2014 to 2.82 % in 2015. Insurers also set a time limit on the interest rate guarantee, and promoted class 23 contracts which are backed by investment funds and do not offer a guaranteed return. Hybrid products have also been developed, combining class 21 and class 23 characteristics.

The Bank has repeatedly expressed its concern about the potential impact on the situation of insurers of an economic environment combining modest growth with persistently low interest rates. It has taken various steps and made

CHART 7 GUARANTEED YIELD AND BREAKDOWN OF LIFE INSURANCE INVENTORY RESERVES



Source: NBB.

recommendations to enhance the sector's resilience, as described below (section 3). These measures aimed to strengthen solvency without creating new operational risks, and they probably also encouraged the measures and operations that institutions carried out in order to reduce their exposure to the risks of a low interest rate environment. Nonetheless, insurers will need to continue carefully assessing the realisation of capital gains on the investment portfolio and limiting the payment of profits to policy-holders and shareholders if that is necessary to maintain their long-term resilience.

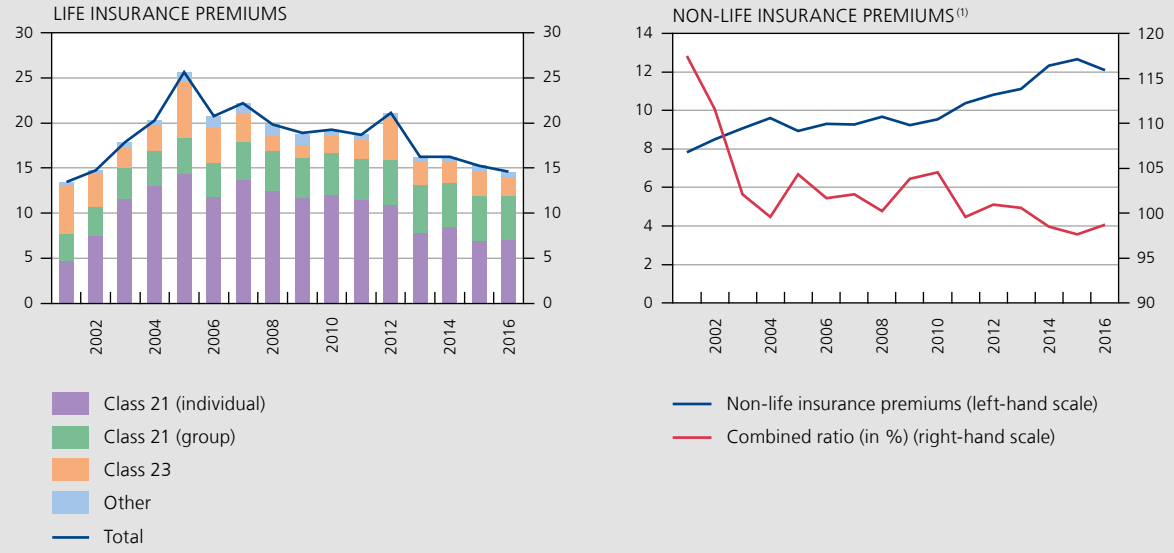
For insurers, the main consequence of the anaemic economic environment is reduced demand for life insurance products. Life insurance premium income stood at € 14.6 billion in 2016, the lowest figure since 2002. In the current economic environment, this downward trend will probably persist.

It is therefore highly likely that insurers will have to continue adjusting their operations and their cost structure, in addition to the measures already taken. Further reductions in operating expenses – possibly via consolidations – may prove necessary to bring the cost structures into line with the reduced volume of business. In these circumstances, a number of insurers have announced restructurings, against the backdrop of the downward trend in employment in the insurance sector.

The same applies to Belgian banks. Thus, even though the cost/income ratio recently regained its pre-crisis level, that recovery was partly supported by temporary factors, highlighting the need for more radical reforms of the sector's cost structure. For this purpose, in the past and again in 2016, many banks announced extensive measures to rationalise their expenses, concerning in particular their branch networks and staff. In 2016, the expenditure cuts were still limited but

CHART 8 PREMIUM INCOME AND COMBINED RATIO[1] FOLLOWING STATUTORY ACCOUNTS

(in € billion, unless otherwise stated)

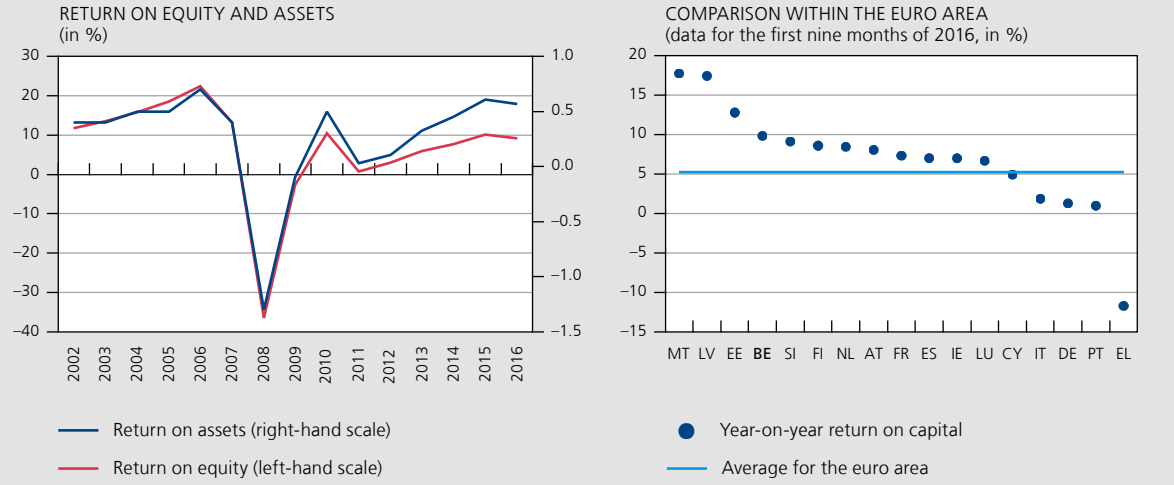


Source: NBB.

(1) The combined ratio is the ratio of the sum of the cost of claims plus operating expenses to net premium income.

are likely to become more pronounced in the future. While these measures are accompanied by potential risks both at operational level and in regard to governance or the potential loss of skills, they form part of the inevitable process of aligning banks' cost structure with their new business models.

CHART 9 PROFITABILITY OF BELGIAN BANKS



Source: NBB.

The digitalisation of banking products creates many opportunities for accelerating improvements in business efficiency. However, it will ultimately also lead to fiercer competition on certain key segments, such as asset management, which could hamper the ability of Belgian banks to generate profits on these activities. In 2016, Belgian banks managed to confirm the good results achieved in 2015, despite a decline in some of their structural income sources. The sector as a whole made a profit of € 5.7 billion, compared to € 6.1 billion over the same period in 2015. The year-on-year return on assets came to 0.6 % while the return on equity was almost 10 %, making the Belgian banking sector one of the most profitable in the euro area. Box 2 presents some considerations concerning the return on equity that investors demand from European and Belgian banks; according to analyses and estimates (which need to be interpreted with caution), that return hovers around 10 % for most banks.

Box 2 – Credit institutions' cost of capital

Belgian banks' relatively good profitability needs to be assessed in terms of the sector's cost of capital. That cost is changing as a result of many factors related to market conditions and the economic situation, such as the risk-free interest rate, and forecasts of inflation and economic growth, and also reflects investors' perception of the future level of profitability of the sector. If the cost of capital exceeds the sector's profitability, some institutions may have difficulty in raising new capital, and that will affect their ability to form a capital buffer to protect them against an adverse scenario.

Since the financial crisis, the cost of capital for European banks has remained high compared to the sector's current level of profitability, although in theory it should be lower today than during the period preceding the outbreak of the crisis. The decline in risk-free interest rates and the impact of the banking regulation on the sector's risk profile have contributed to a reduction in the yield on subordinated debt instruments issued by European banks in recent years, and should have the same effect on the cost of capital. Yet the latter cost was still high at the end of 2016, possibly because of geopolitical, financial and other uncertainties that drove up the market risk premium demanded by investors.

The cost of capital in fact represents the return that investors require in order to bear a risk. It is not observable and has to be estimated empirically using a range of methods which adopt different approaches. Sometimes these models produce very divergent results. It is therefore not advisable to compare the capital cost and the return on capital on the basis of a single indicator. However, it may be worth mentioning that, at the end of 2016, less than 50 % of European banks estimated their cost of capital at between 8 % and 10 %, according to a European Banking Authority survey. That percentage is slightly lower than the 55 % registered at the end of June 2016, essentially because the proportion of banks assessing their cost of capital at less than 8 % has risen (16 % of institutions in December 2016, against 8 % in June 2016). It seems that this result can be extrapolated to all Belgian banks according to certain market models, although there are considerable differences between institutions. It therefore appears that the profitability of the Belgian banking sector, though above the European average, only just meets the level of return that investors demand.

Thanks to the good results hitherto achieved, Belgian banks have so far refrained from any real search for yield. However, in the future, such tendency might materialise as banks attempt to maintain their profitability, for example in their interest rate risk management. Similarly, the renewed acceleration in the growth of mortgage lending since the end of 2014 is a point for attention, since it has been accompanied by an increase in the proportion of certain riskier sub-segments in the new production (see section 2.2. below).

In Belgian insurance companies, minor symptoms of a search for yield are evident in a small number of institutions, which seem to have made various shifts in their investment strategy. Although the portfolio changes are only gradual, a decline in the share of government bonds has been apparent for several years. Conversely, the loan portfolio has been

expanding for the past few years. At the end of the third quarter of 2016, it amounted to € 27 billion, corresponding to 10 % of total investment. Bonds, which totalled € 209.8 billion in the same period, nevertheless still made up the bulk of the investment, divided between government bonds (€ 147.5 billion) and corporate bonds (€ 62.4 billion). Over 60 % of these bonds were securities with a high rating (AAA or AA).

2.2 The residential property market and household debt

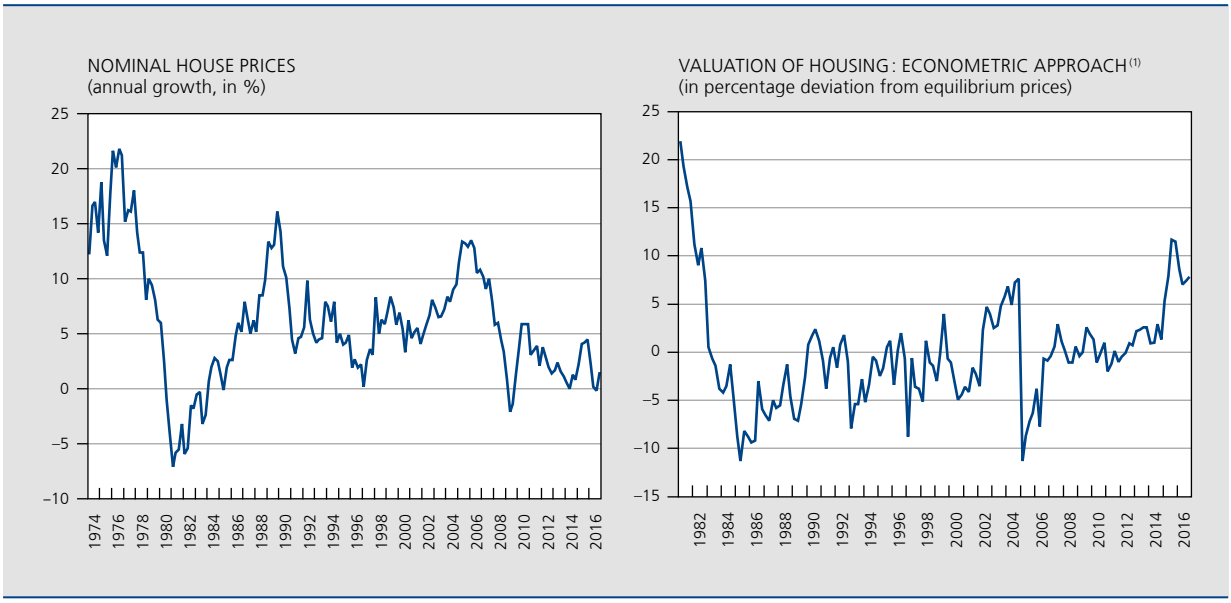
Risks

In Belgium, house prices have more than doubled in nominal terms since 2000, and the correction experienced during the great recession was very minor compared to that in many euro area Member States, in terms of both scale and duration. Thereafter, property price growth weakened steadily between 2011 and 2014, before rising sharply in 2015, despite the reform of the tax treatment of property, particularly in the Flemish Region. In 2016, the year-on-year change in property prices slowed significantly with a rise of barely 0.9 % over the first three quarters as a whole. However, in real terms, property prices were down slightly by 0.6 %.

Housing market activity was greatly affected by regionalisation and by the reforms of the tax deductions for mortgage loans that came into force on 1 January 2015. That was particularly true in the Flemish Region, where the number of transactions on the secondary market showed a marked rise in the final quarter of 2014 before declining in the following year. In 2016, property market activity began expanding again, reverting to levels close to those observed in the past. Overall, the number of property transactions in Belgium increased by 8.3 % during the year under review.

In this context, the estimated deviation of house prices from the equilibrium value determined by econometric models that take account of fundamental factors such as household disposable income, mortgage interest rates and demographic pressures settled at 7.8 % at end-2016. That figure was lower than in 2015, when the overvaluation of this market was up sharply at 11.7 % in the third quarter, mainly owing to the absence of negative pressure on property price growth following the reform of the housing bonus in the Flemish Region. However, the exact degree

CHART 10 EVOLUTION OF RESIDENTIAL REAL ESTATE PRICES AND VALUATION



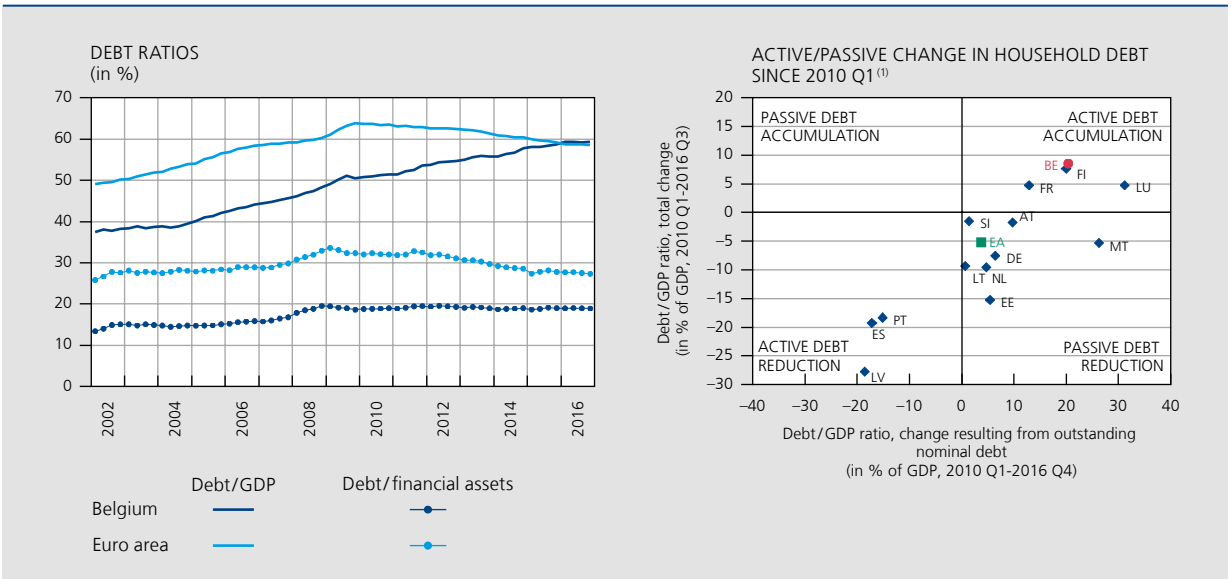
Source : NBB.

(1) This indicator corresponds to the residual of the regression of house prices on a series of fundamental determinants, namely household disposable income, mortgage interest rates, number of households and various measures intended to take account of the changes in the tax treatment of mortgage borrowing. All variables are expressed in real terms.

of overvaluation on the property market is surrounded by a degree of uncertainty, as numerous factors may influence property prices movements in either direction, such as a change in the current accommodative monetary policy.

As a result of the persistently strong expansion of the stock of mortgage loans, which reached € 208 billion, the gross household debt ratio maintained its upward trend, reaching 59.4 % of GDP in the fourth quarter of 2016. Since the beginning of 2016 the Belgian household debt ratio has been slightly above the euro area average (58.6 % of GDP), which has been falling since 2010. A breakdown of the change in the debt ratio since 2010 into a part attributable to nominal GDP growth and a part relating to the volume of credit reveals that Belgium is among the euro area countries where the debt ratio has risen most sharply and where the debt level has actively increased, i.e. via an expansion of the volume of loans.

CHART 11 HOUSEHOLD DEBT



Sources: ECB, NBB.
(1) No data for Cyprus, Greece, Ireland, Italy and Slovakia.

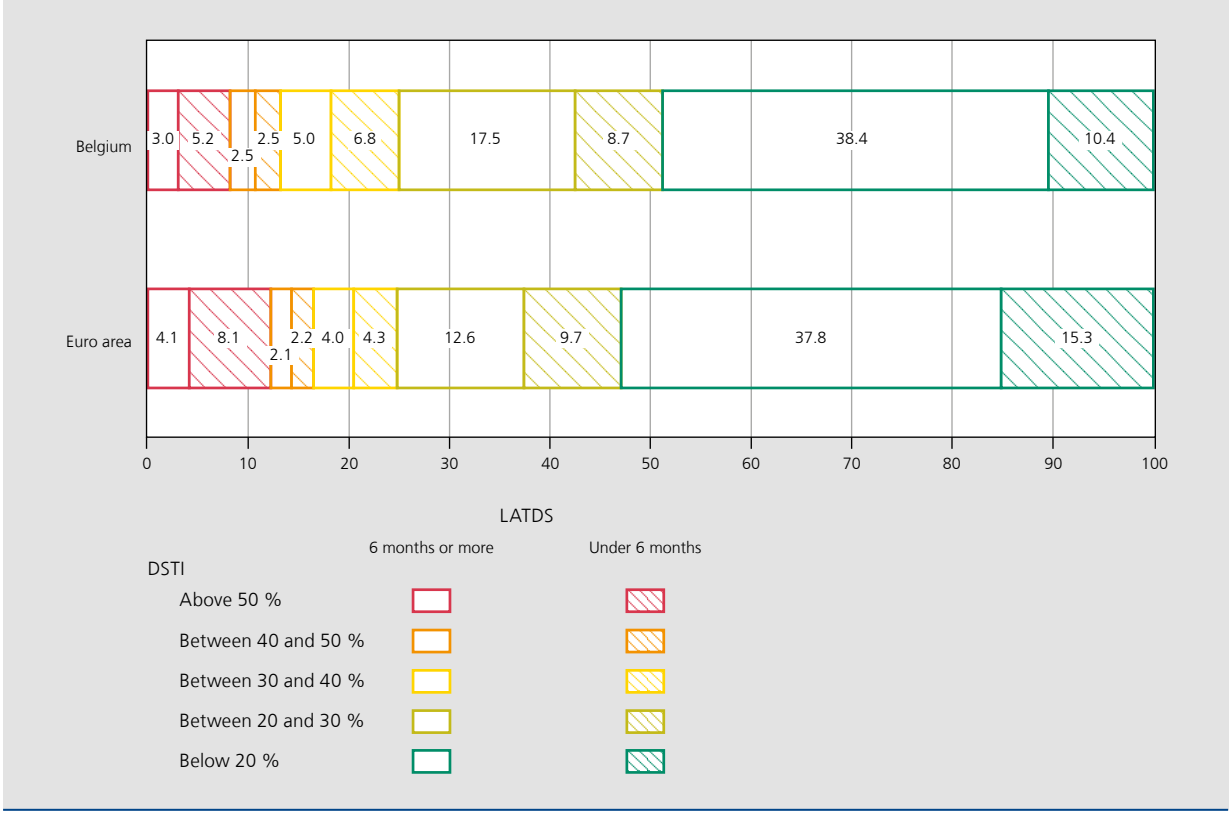
The microeconomic data obtained from the Household Finance and Consumption Survey (HFCS) reveal the existence of large vulnerable segments in the outstanding stock of mortgage loans ("pockets of risk"). For instance, some households in Belgium, as in the euro area, have contracted such heavy debts in comparison with their income or liquid assets that their repayment capacity is limited. According to the data from the 2014 survey, 13 % of the outstanding amount of mortgage debt is repaid by households that have to devote over 40 % of their disposable income to that item. Moreover, these households generally have few financial assets and are relatively more likely to resort to loans with a high LTV ratio. According to the Bank's mortgage loan (PHL) survey of banking institutions, new loans granted in 2015 and 2016 showed no reduction in these risky segments.

These are the reasons why the ESRB issued a formal warning in November 2016 addressed to Belgium and seven other countries, regarding the increased risks associated with the mortgage market. In particular, households' repayment capability is likely to be eroded by a less favourable macroeconomic environment, such as a rise in interest rates or a deterioration in the labour market situation and economic activity. In anticipation of such a scenario, the Bank in its capacity of macroprudential authority has already taken actions to limit the risks relating to the property market and the increase in the household debt ratio.

That said, there are various factors mitigating the risks related to the debt level and the increase in indebtedness. First, Belgian households generally hold considerable financial assets, so that their financial position measured by the ratio

CHART 12 BREAKDOWN OF THE OUTSTANDING AMOUNT OF HOUSEHOLD MORTGAGE DEBT IN 2014 ACCORDING TO THE DEBT-SERVICE-TO-INCOME (1) (DSTI) RATIO AND THE LIQUID-ASSETS-TO-DEBT-SERVICE (2) (LATDS) RATIO

(in % of the total outstanding amount of household mortgage debt)



Source: Eurosystem HFCS (2014).

(1) Monthly mortgage loan payment stream divided by the household's monthly gross income stream.

(2) Value of liquid assets (deposits, bonds and saving certificates, listed shares and investments in mutual funds) of a household divided by the monthly mortgage loan payment stream.

between their debts and their financial assets or net financial worth, is much sounder than that of euro area households. The low percentage of mortgage loans in arrears recorded by the Central Credit Register (1.1 % in April 2017) confirms that the current repayment burden is still under control for most households at the moment.

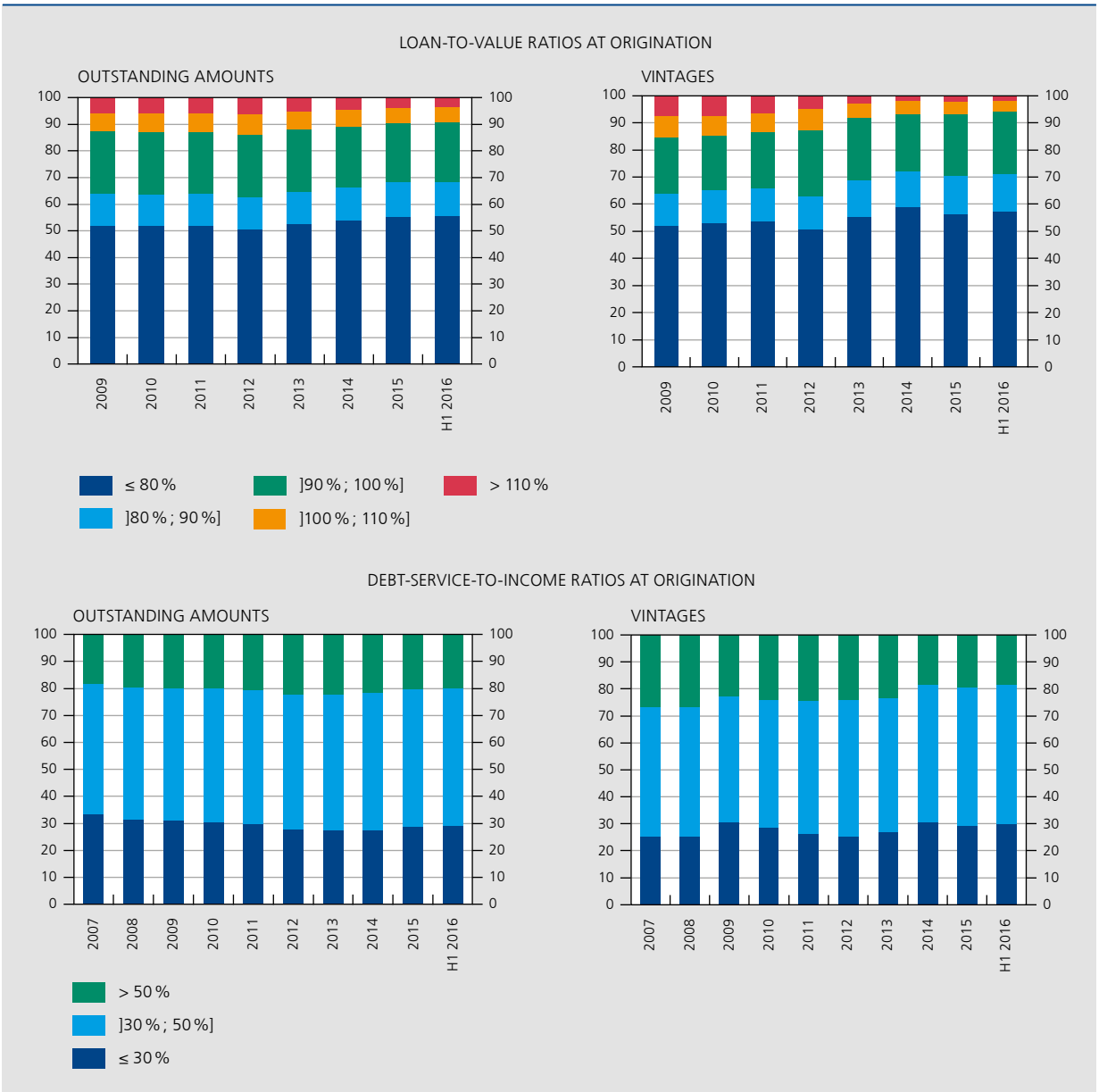
Impact on the financial sector and prudential measures

In response to such factors as the radical reforms implemented by the banking sector following the global financial crisis, Belgian banks seem to be turning more than in the past to the domestic mortgage market as an income source, leading to a steady rise in the volume of lending. On the demand side, the new expansion of the mortgage loan portfolio was also encouraged by the persistence of low interest rates in 2016. The outstanding total of the Belgian banking sector's mortgage loans, which represent the bulk of Belgian household debt, thus increased from € 177.4 billion at the end of 2015 to € 187.2 billion at the end of 2016, representing year-on-year growth of over 5.5 %. Over the same period, the gross production of mortgage loans reached € 52.9 billion. This figure includes internal refinancing amounting to € 16.3 billion while external refinancing – or in other words those concerning loans originally granted by a different bank – totalled € 6.8 billion. Since 2000, when the outstanding amount was around € 50 billion, mortgage loans granted by Belgian banks to Belgian households have therefore almost quadrupled. At present, mortgage loans represent, on average, around 18 % of the sector's balance sheet total, although the figure may exceed 40 % for some institutions.

A shock occurring on the Belgian residential property market, e.g. in the form of a slump in house prices, would therefore not only have serious detrimental effects on the real economy but could also have significant repercussions on the stability of the Belgian banking sector. In that regard, it is worrying that the marked expansion of mortgage

CHART 13 LENDING STANDARDS APPLIED TO BELGIAN MORTGAGE LOANS

(in % of the total volume of loans at the end of the year or the total volume of loans granted during a given vintage)



Source: NBB.

lending in 2015 and 2016 was no longer accompanied by a notable tightening of lending standards, as was the case between 2012 and 2014. While the proportion of new production of mortgage loans with a contractual maturity of over 25 years remained close to 2 % in 2016, the proportion of loans with a DSTI ratio of more than 50 % did not decline further despite the low interest rates. More importantly, the low level of interest rates has also led to a further rise in the average amounts borrowed under new loans. As a result, new lending has reverted to higher average LTV ratios. Although these developments have kept within the limits set by the banks' lending policy, a considerable proportion of new mortgage loans production still features high LTV and DSTI ratios. These developments in credit standards are among the vulnerabilities recently identified on the Belgian mortgage market.

As a result of these findings, the Bank, as the macroprudential supervision authority in Belgium, decided to extend the macroprudential measure applied since 2013 and proposed a new measure aimed more specifically at loans with a high LTV ratio. Section 3.1. of this Report reviews these actions in greater detail. Even though the percentage of mortgage

loans in arrears has so far remained low – and actually displayed a further slight fall from 1.2 % at the end of 2015 to 1.1 % at the end of 2016 – banking portfolios still continue to comprise large sub-segments of loans which could lead to heavier than expected losses in the event of shocks affecting the housing market or, more generally, the Belgian economy. Those vulnerable sub-segments concern the significant proportion of loans with both high LTV and DSTI ratios and/or a long duration. Thus, at the end of June 2016 loans with an indexed LTV ratio exceeding 90 % represented no less than 16.1 % (namely € 28.4 billion) of the outstanding stock. Adverse movements in house prices would drive that ratio upwards and – for a significant proportion of the portfolio – would bring the value of the mortgaged property below the outstanding balance of the loan, leading to considerable losses for banks in the event of the borrower's default. As in the case of the credit standards applied to new mortgages, during the year under review there has therefore been no improvement concerning the vulnerabilities of the outstanding stock. At the same time, the average risk weights of Belgian mortgage loans – as calculated by the banks using the internal ratings-based model (IRB model) to determine their minimum regulatory capital requirements – hovers around 10 % (excluding the macroprudential measures already in place which provide for a flat-rate 5 percentage point increase in risk weights). In this connection, it should be noted that, as internal risk models are calibrated using historical data on loan losses, these low risk weights are partly due to the absence of any serious crisis in the history of the Belgian residential property market and to the generally buoyant market conditions of the past twenty years. It is therefore possible that risk weights resulting from IRB models may be insufficient for the losses that could occur if market conditions were to deteriorate and if risks inherent in certain sub-segments of the Belgian mortgage portfolios of the banking sector were to materialise. In that context, and in view of the relatively large proportion of domestic mortgage loans on Belgian banks' balance sheets, the Bank has undertaken a series of macroprudential actions to increase banks' resilience and reduce the concentration risk (see section 3.1).

The Bank has also focussed on a more detailed analysys of the commercial property market, in light of the steady increase in bank lending to non-financial corporations operating in the Belgian real estate sector. According to the figures from the Central Corporate Credit Register, bank loans of this type have increased from less than € 30 billion in 2005 to more than € 50 billion since 2014, and now represent a quarter of total loans granted by Belgian banks to non-financial corporations. That expansion is in sharp contrast with the more stable picture concerning lending to other economic sectors. Although ensuring sustainability on the housing market will help to preserve the credit quality of this type of loans in the event of shocks hitting the Belgian property market, the Bank is also paying particular attention to developments affecting specific sub-segments of the commercial property market. In addition to the close monitoring of the sector, the Bank will also shortly engage in initiatives to collect more detailed data on market developments in accordance with the ESRB's recommendation on the subject[1]. If necessary, the Bank will also adopt appropriate additional measures to prevent the emergence of risks or to mitigate existing vulnerabilities.

2.3 Cyber risk

Risks

The financial sector is already highly computerised, and the progressive digitalisation of its business processes, especially those concerning interactions with customers, is ongoing. As well as bringing benefits for the sector, this digitalisation also carries its own risks, including cyber risks.

Recent events have shown that the management of cyber risks is quite often insufficiently fit to the growing use of standardised software components, the dependence on a small number of technologies, sustained, targeted attacks and "social engineering" (staff manipulation).

There are many ways of compromising the integrity of the IT systems of a financial institution or financial market infrastructure. The intentional or inadvertent installation of malware may result in alteration of the data and system configurations. Software components may also contain backdoors which can be used to circumvent the authentication processes of those components.

(1) Recommendation of the European Systemic Risk Board of 31 October 2016 on closing real estate data gaps (ESRB/2016/14).

Cyber attacks are becoming ever more sophisticated and damaging. Similarly, attacks compromising the integrity of IT systems and data are on the rise. This is a source of concern for the Bank as the prudential authority. In this sphere, the Bank is primarily interested in the security of financial institutions, individual financial market infrastructures as well as of the sector as a whole, and the confidence that they inspire. Operational security and the robustness of services critical to the smooth functioning of the sector are crucial in this regard.

In addition, the importance of the human factor in cyber risks must not be underestimated. Cyber criminals who succeed in gaining the trust of an employee (social engineering) may persuade that person to perform a particular procedure. For example, some employees are authorised to perform payments, adapt the system configurations or change the access rights. Systems providing security against cyber attacks are often unable to prevent these apparently legitimate actions.

Impact on the financial sector and prudential measures

Financial institutions and financial market infrastructures manage data systems for storing book money, processing financial transactions and managing (confidential) customer data. These systems must be properly protected against various forms of cyber crime, cyber espionage and cyber terrorism. An in-depth assessment of cyber risk management is one of the top priorities for prudential supervision and the oversight of financial institutions and financial market infrastructures.

The number of sustained, targeted cyber attacks is likely to increase. Since cyber criminals are sometimes able to conceal the attacks, it can take a long time before anyone notices that sensitive or critical financial data have been stolen, or even deliberately made public, altered or destroyed. Furthermore, the IT systems of the various financial institutions are becoming increasingly interdependent. If one institution's IT system is infected, that can therefore have significant repercussions on the operations of other financial institutions with linked IT systems.

Both the prudential supervision and the oversight of financial market infrastructures have focused particular attention on the protection of financial infrastructures and institutions against cyber risks, with European and international cooperation becoming ever more important in that regard. For instance, in 2016, the SSM analysed the cyber risks concerning a number of institutions. On the basis of those analyses, other checks were planned and carried out. In addition, within the SSM a group of IT experts was set up to improve the coordination, direction and monitoring of the supervision of the various IT risks and cyber risks specific to the sector as a whole. The EBA's working group on IT surveillance drafted a proposal for new guidelines on the way in which the European supervisory authorities should assess IT risks, including cyber risks. The Secure Pay Forum on the security of retail payments in Europe remains a leading platform for cooperation in the drive to combat cyber risks.

The Bank which, pursuant to the law on critical players in the financial sector, acts as the sectoral authority and is also responsible for inspections to assess the effectiveness of the critical financial infrastructure control systems, also supports the sector in the assessment of protection against cyber risks. The sector was encouraged to continue reinforcing its measures and efforts to protect against cyber risks, taking account of the cyber risk management strategies being developed on an intersectoral basis in Belgium and abroad.

The close cooperation with entities such as Febelfin and the Federal Computer Crime Unit in order to limit fraud in e-banking services was continued. In this connection it should be noted that in 2016, as in 2015, there was no increase in instances of e-banking fraud, which remained at a low level in Belgium thanks to the efforts of the financial institutions and following some successful interventions by the Belgian police and judiciary. Concerning mobile banking services in Belgium, the Bank is also maintaining a close watch on the existing threats and the security solutions installed by financial institutions.

The Bank did not limit its efforts to close monitoring of cyber risk developments, but it also devised instructions for improving cyber resilience. For systemically important institutions, the Bank issued a circular spelling out the prudential expectations concerning operational continuity and security, paying particular attention to cyber resilience. That circular came into force in December 2015 and deals with such matters as security awareness in software development, the physical and logical segmentation of internal IT systems, the use of rigorous authentication solutions for privileged management access to critical or sensitive systems, and the periodic organisation of large-scale security tests in which independent experts check

the effectiveness and quality of security on the basis of realistic attack scenarios conducted in an ethical way. The circular also highlights the great importance of taking steps to make staff properly aware of cyber risks.

2.4 Point for attention: the shadow banking sector and portfolio management

Risks

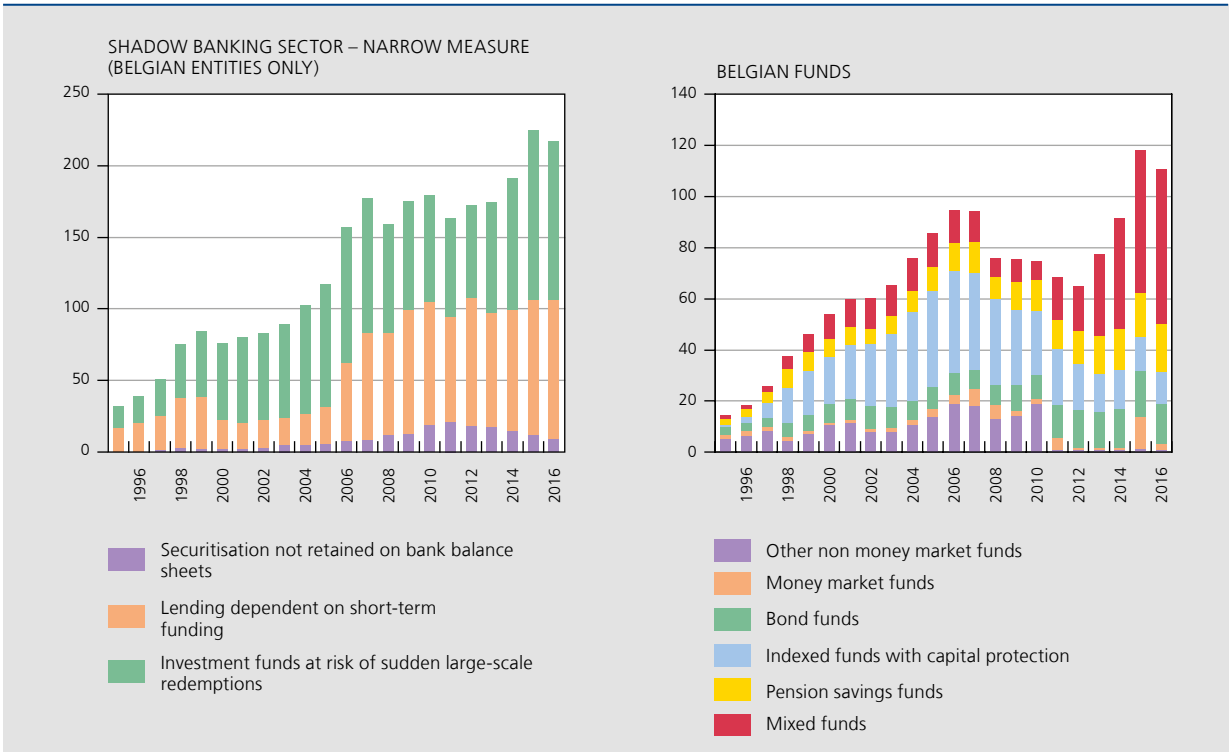
The shadow banking sector is defined in accordance with the FSB's narrow measure as a system of non-bank credit intermediation involving risks similar to banking risks for the financial system. Such bank-like risks concern maturity and liquidity transformation, leverage and credit risk transfer. According to the narrow measure, at the end of 2016 the Belgian shadow banking sector amounted to € 217 billion, corresponding to 51 % of GDP. That figure consists largely of investment funds (€ 111 billion at the end of 2016), and more specifically Belgian money market and other funds – excluding equity funds – which are almost all open-ended and therefore at risk of sudden, large-scale unit redemptions. The second largest category in the shadow banking system concerns the granting of loans dependent on short-term funding. These loans are arranged via other financial intermediaries such as leasing and factoring companies, commercial credit companies and mortgage lenders (€ 97 billion at the end of 2016). This category can be sub-divided into true shadow banking activities – not all other financial intermediaries grant loans – and non-consolidated entities[(1)]. Pending the completion of the statistical work it was decided, for reasons of prudence, to include them all in the narrow measure of the shadow banking sector. The third and last category of shadow banking activities comprises securitisations which are not retained on the balance sheets of Belgian banks (€ 10 billion at the end of 2016)[(2)].

(1) Entities which, for prudential reasons, are consolidated in a banking or insurance group should be excluded from the shadow banking sector since they are already subject to proper regulation and supervision.

(2) Securitisation retained on bank balance sheets should be disregarded. The vehicles used for that purpose take loans from a bank and turn them into debt securities which are given back to the same bank for use as collateral for accessing central bank funding.

CHART 14 DEVELOPMENTS IN THE BELGIAN SHADOW BANKING SECTOR

(in € billion)



Source: Own calculations based on NSI data.

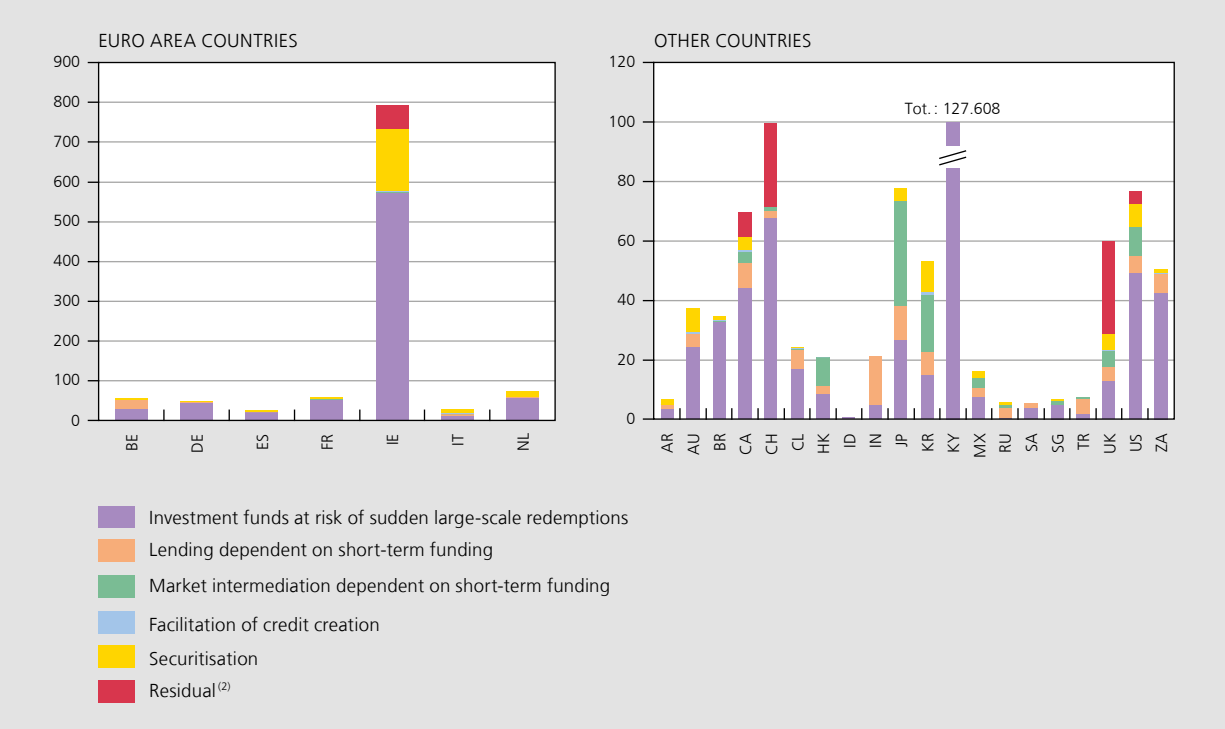
In addition to these purely Belgian entities, foreign investment funds also play a significant role. They are largely offered and managed by Belgian banks and are therefore closely linked to the Belgian banking system. From that point of view, they are included for analysis purposes in the narrow measure of the shadow banking sector, which thus increases by an amount equivalent to Belgian nationals' investments in foreign funds (€ 199 billion at the end of 2016) to reach € 416 billion, corresponding to 99 % of GDP. This approach conforms to the FSB methodology[1], since the FSB excludes them from the narrow measure in order to avoid any double counting between countries; purchases of foreign funds by Belgian investors are included in the narrow measure of the country concerned.

Since 1995, the shadow banking sector has expanded almost continuously, except during 2008-2011 and more recently in 2016. Investment fund developments are the outcome of net purchases or sales and valuation effects. After six years of decline during and after the economic and financial crisis, investment funds staged a recovery in 2013-2015 followed by a renewed fall in 2016. That fall was due to net sales, whereas valuation effects were slightly positive. The loss of interest in investment funds mainly concerned money market and bond funds, and funds offering capital protection. The stock of money market funds thus reverted to a historically more normal level, following the surge in 2015 due to a temporary change in the investment strategy of funds with a floor monitoring mechanism. In the second main shadow banking category – lending by other financial intermediaries – there are traditionally significant fluctuations which are often connected with the inherently varied composition of this category and which have no economic explanation. In regard to securitisation which is not retained on Belgian banks' balance sheets, the loss of interest first evident in 2013 persisted.

The proportion of GDP represented by the Belgian shadow banking sector is comparable to that in Spain and Italy, but it is smaller than that in the Netherlands, Germany and France[2]. As in Belgium, investment funds constitute the main

(1) The FSB defines this type of funds as offshore funds, as they are based abroad and managed/offered within the country.
(2) The international comparison is only possible for 2015 on the basis of the data published in the FSB's Global Shadow Banking Monitoring Report 2016.

CHART 15 INTERNATIONAL COMPARISON OF THE SHADOW BANKING SECTOR: THE FSB'S NARROW MEASURE[1]
(end of 2015, in % of GDP)



Sources: FSB, NBB.
(1) Excluding entities consolidated in a banking or insurance group, if that information is available.
(2) Residual: part of the shadow banking sector which cannot be classified under an economic function.

category. Ireland's exceptional position is due to its role as an international financial centre and, more specifically, to the substantial presence in Irish territory of investment funds and securitisation vehicles which have often been set up by foreign financial institutions.

In addition to the risks associated with the shadow banking sector, the asset management sector is also monitored. That sector partially overlaps with the shadow banking sector, however these two concepts should not be considered interchangeable. While Belgian funds other than equity funds and investments by Belgian nationals in foreign funds are included in the definition of the Belgian shadow banking sector and account for, respectively, € 111 billion and € 199 billion (at the end of 2016), the total asset management sector is estimated at around € 500 billion on the basis of a broad approach that takes account of the various links between Belgium and the different forms of asset management. Asset management does not encompass only funds, i.e. collective asset management, but also discretionary management and investment advice, as well as the wealth held that is invested directly in financial instruments on the basis of that advice. Moreover, there may be various links with Belgium: for example, in the case of the funds considered, funds under Belgian law, funds held by Belgian nationals, funds managed in Belgium and funds marketed by Belgian banks are all taken into account. For completeness, it should be noted that – apart from the direct inclusion of part of the asset management sector in the definition of the Belgian shadow banking system – an additional amount may also be included indirectly, since the entities in the shadow banking system entrust (part of) their assets to the asset management sector.

Impact on the financial sector and prudential measures

The shadow banking system offers considerable advantages in that it diversifies the sources of funding for the economy, the investment opportunities offered to investors, and the banks' income sources, as well as spreading direct risks across multiple investors. Yet, the financial crisis showed that non-bank financing can become a source of risk when the transactions have characteristics similar to banking activities, involving maturity and liquidity transformation and leverage. More specifically, the liquidity and leverage risk inherent in the business model of certain investment funds can cause financial instability. Adverse developments in the shadow banking sector may have negative repercussions on other sectors owing to the tight links between the shadow banking sector, other financial institutions and the real economy. Shocks can be transmitted both by contractual obligations and by reputational considerations. Similarly, some financial activities, whether conducted by shadow banks or other entities, also imply risks to financial stability. More specifically, the use of derivatives and securitisation-based funding can lead to procyclicality and entail leverage risks and liquidity risks.

It is therefore essential to maintain constant monitoring of developments in the shadow banking sector and of the associated potential risks. The Bank was closely involved in the work conducted at European level under the aegis of the ESRB and the ECB, and in 2016 participated for the first time in the FSB's annual monitoring exercise concerning the shadow banking sector. Major efforts have been made to monitor and assess the sector on a regular basis, however differences between institutions' definitions of the shadow banking sector still exist, and data gaps could not yet be entirely filled. In the specific case of Belgium, the interconnections between shadow banking sector entities and the other financial and real sectors of the economy were analysed. An internal working group is currently preparing a report jointly with the Financial Services and Markets Authority (FSMA), in response to the recommendations of the High Level Expert Group (HLEG) on the monitoring of (systemic) risks associated with the shadow banking and the asset management sectors. The Bank's analyses cover such subjects as the contractual and non-contractual links between asset management vehicles and Belgian financial institutions, and the way in which they are treated for the purpose of risk management. The work will also lead to the design of a framework for the regular monitoring of developments in the shadow banking sector and the asset management sector in Belgium.

Apart from the monitoring of the shadow banking sector, the international regulatory framework was further extended. In 2016, the FSB issued policy recommendations designed to limit the liquidity mismatch and the leverage effect in open-end investment funds, to reduce the operational risk of portfolio managers and the risk associated with the use of securitisation-based financing by funds and asset managers. Furthermore, it recommends that funds conduct stress tests to examine the degree to which the redemption obligation can be met in difficult market circumstances. In that context, on the basis of the existing microprudential legislation relating to investment funds, the ESRB is currently examining a broad range of options for addressing risks related to liquidity mismatches and leverage effects. A framework is also being devised for stress testing investment funds.

3. Macroprudential measures adopted by the Bank

3.1 Residential property

At the end of 2013, the Bank introduced a first macroprudential measure consisting in a 5 percentage point rise in the risk weights on Belgian residential real estate exposures for banks calculating regulatory capital requirements through an internal ratings-based (IRB) approach. This measure was enforced with a Bank regulation approved by Royal Decree on 8 December 2013[(1)], and was then implemented in 2014 under Article 458 of the CRR[(2)]. This measure increased the average risk weight of banks adopting the IRB-approach from around 10 % at the end of 2012 to almost 15 % since the end of 2013. However, in view of the cyclical nature of this measure, the Bank has kept a close eye on market developments during the year under review so that it could continuously assess the appropriate level of this add-on.

The analyses conducted by the Bank showed that, although the mortgage loan default rate is fairly stable, various factors point to an increase in the risks on the residential property market. First, in contrast to other European countries and despite the steep price increases observed in the past, the housing market in Belgium did not experience any substantial price corrections during the financial crisis. A number of indicators as well as the Bank's model-based analysis point to some overvaluation of the property market, although it is very difficult to estimate the precise degree of that overvaluation. Furthermore, the property market remains highly sensitive to any fluctuations in interest rates. Second, the household debt ratio has maintained its upward trend, and is higher than the euro area average. The rise in the debt ratio contrasts with the general trend observed in the euro area, where the debt ratio has been falling since 2010. Third, the Bank considered that the riskier segments still account for an excessive proportion of new mortgage loans.

On the basis of this risk analysis, the bank concluded that, during the year under review, the 5 percentage point add-on (corresponding to an additional capital requirement of around € 800 million) still provided a necessary extra capital buffer for the risks identified, but not sufficient to address the increasing vulnerabilities in the riskiest segments. Therefore, during the 9 June 2016 meeting, the Bank decided to replace the existing prudential measure, upon its expiration at the end of May 2017, with a new macroprudential measure based on two components. The first component was intended to mirror the existing measure consisting in a flat-rate 5 percentage point increase in the risk weights on mortgage loans financing Belgian residential property calculated through an internal ratings-based approach. The second – more targeted – component of the new measure was intended to provide for an additional increase in the same risk weights according to the risk profile of each mortgage loan. Specifically, for riskier loans, i.e. those with an indexed LTV ratio greater than 80 % or 90 %, this component would have resulted in the creation of an extra macroprudential capital buffer for banks, proportional to the risk weight increase resulting from the imposed amendment of the minimum loss given default (LGD) of 20 % and 30 % respectively. Alternative, stricter measures imposing a limit on borrowers (concerning the LTV or DSTI) have not been considered, notably because of the limited impact on banks' capital requirements.

By introducing this new more targeted macroprudential measure, the Bank – as the macroprudential authority – aimed to safeguard the financial stability of the Belgian banking sector. First, the measure would have ensured an increase in the capital held for risks inherent in the housing sector, and therefore it would have preserved the banking sector's ability to absorb and withstand significant property market shocks. Also, the measure would have introduced an additional incentive for banks to apply due caution in determining lending standards for mortgage loans, particularly in what concerns the LTV ratio. Furthermore the measure would have remained proportionate to the risks identified.

To allow for the introduction of the new macroprudential measure, the Bank's proposal underwent a relatively lengthy and complex notification and decision-making procedure with the ECB, the ESRB and the EBA in accordance with Article 458 of the CRR and Article 5 of the SSM Regulation. In view of the positive (non-objection) opinion of those authorities, the EC did not put forward any arguments against introducing the new measure for two years. In conformity with the banking law, the Bank subsequently demanded the Government to approve the issued regulation by royal decree.

(1) Royal Decree of 8 December 2013 approving the National Bank of Belgium regulation of 22 October 2013 amending the National Bank of Belgium regulation of 15 November 2011 on the capital of credit institutions and investment firms.

(2) Regulation 575/2013 of the European Parliament and the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Resolution 648/2012.

On 12 June 2017, the finance minister demanded the Bank, on behalf of the Government, to only prolong the current measure, i.e. the flat-rate 5 percentage point add-on, and to conduct a new risk analysis. Such risk assessment and the evaluation of macroprudential measures will further rely on the Bank's in-depth analyses of the mortgage market, paying particular attention to the evolution of trends in household debt, the vulnerable sub-segments (on the basis of granular data available in the HFCS) and the risk profile and quality of credit institutions' mortgage portfolios.

3.2 Countercyclical capital buffer

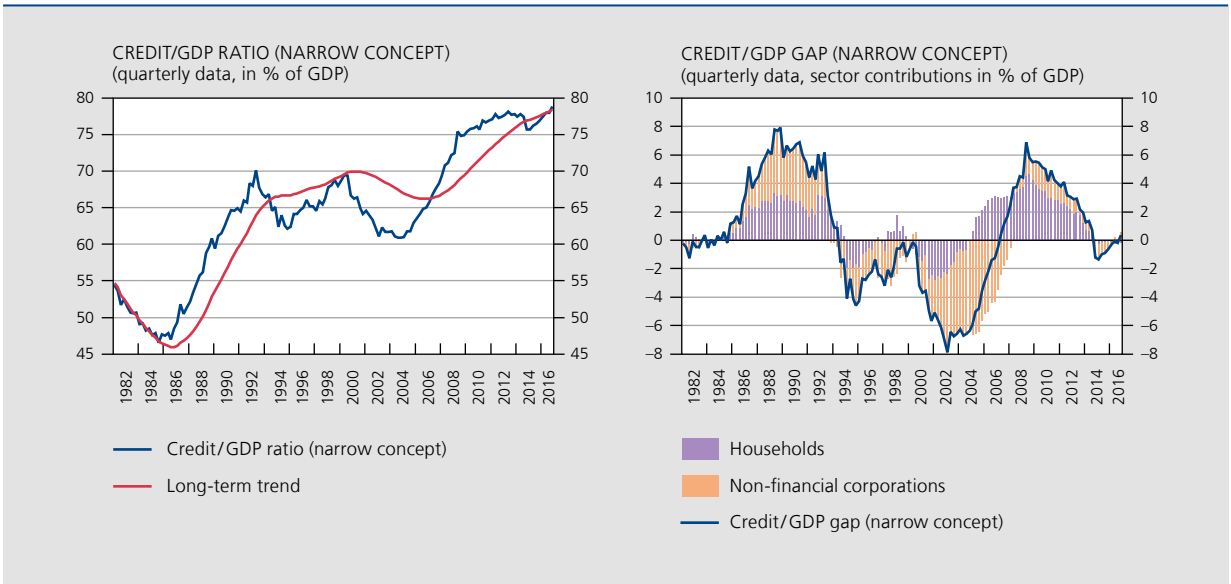
During an economic boom, excessive credit expansion combined with an easing of lending conditions may exacerbate the vulnerabilities of both the financial and the non-financial private sector. An economic downturn following a credit boom can lead to heavy losses for the banking sector, which may themselves cause a procyclical intensification of the downturn if the banks adopt measures to repair their balance sheets. The aim of the countercyclical capital buffer (CCyB) is to support sustained lending throughout the business cycle by strengthening banks' resilience in the event of an increase in cyclical systemic risks (e.g. in the case of excessive credit growth).

For the purpose of monitoring cyclical systemic risks, the Bank relies on a wide range of information, paying particular attention to a set of key indicators for determining the countercyclical buffer rate applicable to credit exposures on counterparties located in Belgium[1]. These key indicators cover four significant dimensions of cyclical systemic risks, namely the credit cycle of the non-financial private sector, financial and asset markets, and the resilience of the non-financial private sector and the banking sector. However, there is no mechanical link between the evolution of the indicators and the setting of the countercyclical buffer rate; the framework for monitoring the countercyclical capital buffer forms part of the Bank's broader risk assessment framework. Also, expert judgment plays an important role at each stage in the macroprudential decision-making process. The use of key indicators helps to ensure that the Bank's quarterly communication concerning the countercyclical capital buffer rate is simple and comparable over time.

In accordance with the Belgian banking law and the ESRB recommendation on guidelines for determining the countercyclical capital buffer, the credit/GDP gap is one of the key indicators considered. At the time of the April 2017

(1) See "Setting the countercyclical buffer rate in Belgium: A policy strategy" (www.nbb.be).

CHART 16 CREDIT/GDP RATIO AND CREDIT/GDP GAP



Source: NBB.

decision on the countercyclical capital buffer rate applicable to credit exposures on counterparties located in Belgium, the Bank estimated the (narrow) credit/GDP gap at 0.4 % of GDP in the final quarter of 2016 (–0.2 % of GDP for households and +0.6 % of GDP for non-financial corporations).

As stated in the summary of the main risks and attention points, despite this neutral credit cycle position, relatively strong growth of lending to households tends to result in a further increase in household indebtedness. Moreover, the growth of lending to non-financial corporations is also becoming more marked. The Bank keeps a close eye on these developments, but remains of the opinion that the credit cycle position combined with the evolution of a broad set of indicators considered relevant for signalling the rise in cyclical systemic risks provide sufficient grounds for keeping the countercyclical capital buffer rate on hold at 0 % for credit exposures on counterparties based in Belgium. That decision was submitted to the ECB and published on the Bank's website together with the key indicators.

Belgian banks also have to apply the buffer rates imposed by foreign authorities on their credit exposures in those countries. The table below presents an overview of current and future countercyclical buffer rates. In 2016, in response to the ESRB's recommendation on recognising and setting countercyclical buffer rates for exposures to third countries, the Bank identified three third countries where those exposures were significant (Turkey, the United States and Switzerland) and defined a framework for monitoring cyclical systemic risks in those countries.

TABLE 1 COUNTERCYCLICAL BUFFER RATES IMPOSED BY FOREIGN AUTHORITIES

(in %)

Country	Current buffer rate		Future buffer rate	
	Percentage	Entry into force	Percentage	Entry into force
Hong Kong . . .	1.25	01-01-2017	1.875	01-01-2018
Sweden	2.00	19-03-2017	unchanged	
Norway	1.50	30-06-2016	2.00	31-12-2017
Czechia	0.50	01-01-2017	unchanged	
Slovakia			0.50	01-08-2017

Sources: BIS, ESRB.

3.3 Buffers imposed on domestic systemically important banks

Domestic systemically important banks (D-SIBs or "O-SIIs")[1] are institutions whose failure could have a significant impact on the national financial system or the real economy of the country concerned. The high economic and social costs that would accompany the failure of those institutions are the reason for boosting their resilience by means of supplementary capital requirements.

In the fourth quarter of 2016, on the basis of the EBA methodology, the Bank confirmed the list of eight Belgian O-SIIs compiled in 2015. The capital surcharges announced in 2015 for those O-SIIs and the phase-in period for their introduction still apply[2]. In 2017, the capital surcharge amounts to 0.5 % of risk-weighted assets for Argenta, AXA Bank Europe, The Bank of New York Mellon (BNYM) and Euroclear, and 1 % for Belfius Bank, BNP Paribas Fortis, ING Belgium and KBC Group.

BNP Paribas Fortis, KBC Group, ING Belgium, Belfius Bank and Euroclear were automatically designated as O-SIIs on the basis of their quantitative systemic importance score. That score is calculated as an aggregate of the mandatory

(1) In the EU legislation, D-SIBs are called other systemically important institutions ("O-SIIs").

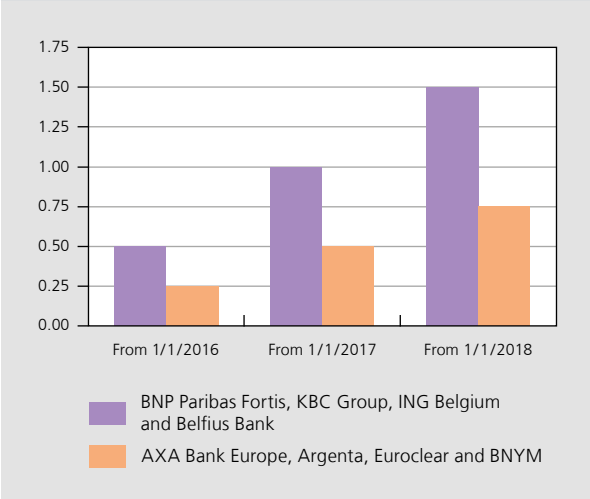
(2) For more detailed information on the decision and methodology concerning the definition of Belgian O-SIIs and the definition of the capital surcharges, see the "Annual publication on the designation of Belgian O-SIIs and the capital surcharge to be applied (1 January 2016)" (www.nbb.be).

indicators relating to the size, complexity, interdependence and substitutability of the banks, accompanied by fixed weighting factors. When a bank's systemic importance score exceeds a certain threshold, the institution is automatically classified as an O-SII.

AXA Bank Europe, BNYM and Argenta were classed as O-SIIs according to information obtained from supplementary indicators. The considered supplementary indicators include the banks' share in deposits and loans in Belgium, debts and claims with Belgian financial counterparties, and assets under custody. The choice of these supplementary indicators is justified because indicators which are national in scope are considered more appropriate for designating domestic systemically important institutions than European or global indicators. Moreover, the indicators imposed by the EBA do not always reflect the specific character of the business model, as in the case of BNYM, for example. The updated list of Belgian O-SIIs was published on the Bank's website.

CHART 17 LEVEL OF THE CAPITAL SURCHARGE FOR BELGIAN O-SIIs

(in % of risk-weighted assets)



Source: NBB.

3.4 Recognition of macroprudential measures

The Belgian financial sector is characterised by the presence of some major international players. In addition, Belgian banks have substantial investments in emerging European economies. That is why the Bank takes into account the cross-border aspects of its macroprudential policy and supports the efforts made to ensure a level playing field at international level by applying the principle of reciprocity. Reciprocity implies that the macroprudential rules of a given Member State apply equally to branches of foreign banks and to direct lending (via freedom to provide services) by foreign banks in the said Member State, whereas the macroprudential measures of the Member States do not generally apply to foreign banks.

The Bank adheres to the ESRB framework on voluntary reciprocity of macroprudential measures[1] and issued a Regulation[2] on that subject in 2016, outlying a flexible recognition procedure for three types of macroprudential measures in case the ESRB recommends their recognition. These are (1) national measures targeting macroprudential or systemic risks, adopted on the basis of Article 458 of the CRR; (2) countercyclical capital buffer rates in excess of 2.5 %; and (3) macroprudential or systemic risk buffers (if not specific to systemically important institutions). In 2016, the Bank thus recognised the 1 % systemic risk buffer applicable to exposures on Estonia incurred via branches located in Estonia

(1) ESRB Recommendation of 15 December 2015 on the assessment of cross-border effects of and voluntary reciprocity for macroprudential policy measures.
(2) National Bank of Belgium Regulation of 24 February 2016 on the recognition of macroprudential measures, approved by the Royal Decree of 20 May 2016. For more information, see the article "Reciprocity of macroprudential measures: general framework and application in Belgium" (www.nbb.be).

or by direct lending in that country. The Bank's decisions on the recognition of macroprudential measures adopted by other countries are published on its website.

Seven Member States recognised the Belgian surcharge of 5 percentage points on the risk weighting of residential mortgage loans: Denmark, France, Latvia, Lithuania, Luxembourg, the Netherlands and Portugal. That recognition implies that this surcharge also applies to mortgage loans granted in Belgium by banks originating from those Member States via branches or direct lending[1].

(1) The measure applies only to banks that use the internal ratings-based approach to define the risk weighting applicable to mortgage loans in Belgium. The recognition by Luxembourg applies only to loans granted by branches located in Belgium.

Financial Stability Overview

Financial stability can be defined as a condition in which the financial system – made up of financial intermediaries, markets and market infrastructures – can withstand shocks without major disruption to financial intermediation or the effective allocation of savings to productive investment. This article reviews recent developments in the Belgian banking and insurance sector, with data and analyses covering profitability, solvency and risk exposures. The financial market infrastructures are covered in the new Financial Market Infrastructures and Payment Services Report, published on the Bank's website in May 2017.

As the financial performance and resilience of the Belgian banks and insurance companies is affected by overall economic conditions and developments in financial and real estate markets, the article starts with a brief summary of a number of key developments – and potential future risks – in the operating environment of the financial sector. Several of these are also covered in the Macroprudential Report (MPR) article in this publication, which summarises the main elements of the Bank's macroprudential risk assessment and reviews the macroprudential measures taken or proposed in response to the identified risks. This Overview article complements the analysis of sections 2 and 3 of the MPR.

1. Operating environment

1.1 Financial markets and the euro area banking sector

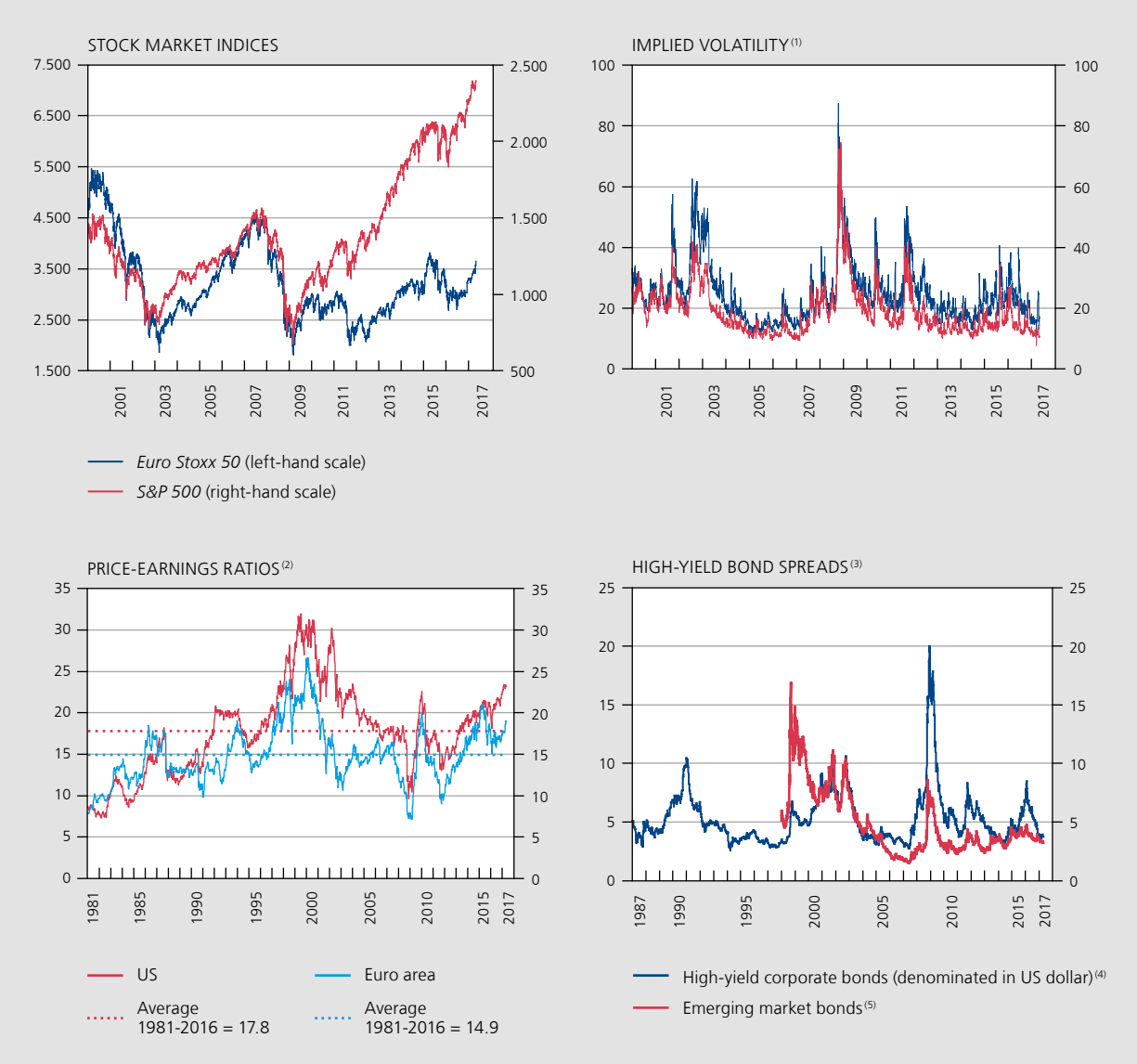
Political and geo-political factors have been a major driver of financial market developments during the year under review, particularly in the run-up to and in the aftermath of a number of major political events such as the referendums in the UK and Italy and the presidential elections in the US, France and Austria. These events created episodes of high uncertainty over the outlook and future policies in several large advanced economies and led to risk reversal and flight to safety in financial markets. When outcomes were not anticipated by financial markets, as in the case of the UK referendum and the US presidential election, the first market response led to sharp asset price volatility and, in the case of the UK referendum, the temporary suspension of redemptions in a number of UK real estate investment funds. This being said, markets continued to function in an orderly way and no major impairment of market liquidity occurred, which allowed a quick recovery of investor risk appetite once the new environment was priced in.

Economic activity also proved to be resilient to these unexpected political events. China made further progress in rebalancing its economy to consumption and services and commodity-exporting countries continued to adjust to the lower level of commodity prices. Advanced economies experienced accelerating economic growth on the back of supportive financial conditions and a cyclical recovery in manufacturing and trade. Under the IMF's baseline scenario, world economic growth is now projected to accelerate from 3.1 % in 2016 to 3.5 % in 2017 and 3.6 % in 2018, albeit with major downside risks. These include the potential adoption of inward-looking economic policies in advanced economies – threatening global economic integration and the cooperative global economic order – and the persistence of structural impediments that hold back an even stronger recovery of the global economy (such as low productivity growth).

The improved outlook for global economic growth provided the backdrop for the resilience of the global financial system to the unexpected political developments and policy uncertainties that were at the forefront of financial market participants' concerns during the year under review. While the UK referendum and US presidential election initially sent strong shock waves through the financial markets, the turmoil subsided relatively quickly afterwards. In the case of the UK referendum, this recovery was supported by central banks' commitments to provide liquidity if needed and the Bank of England's decision to release the countercyclical capital buffers for UK banks (from 0.5 % and 0.0 %), followed by monetary policy easing in August. In the case of the US presidential election, the tension dissipated quickly as equity markets turned their focus to the prospect of a massive infrastructure investment plan, tax cuts and deregulation, as advocated by the President-elect. Following a brief panic in the immediate aftermath of the vote, stock markets rallied, especially in the US, where the indices reached new record levels in the weeks and months following the presidential election (chart 1).

CHART 1 EQUITY AND HIGH-YIELD BOND MARKETS

(in %, unless otherwise stated)



Sources: JP Morgan Chase, Thomson Reuters Datastream.

(1) Based on the implied volatility derived from options on the S&P 500 and Euro Stoxx 50 indices.

(2) Stock market indices in local currency, calculated by Thomson Reuters Datastream.

(3) Spreads relative to US Treasuries, in percentage points.

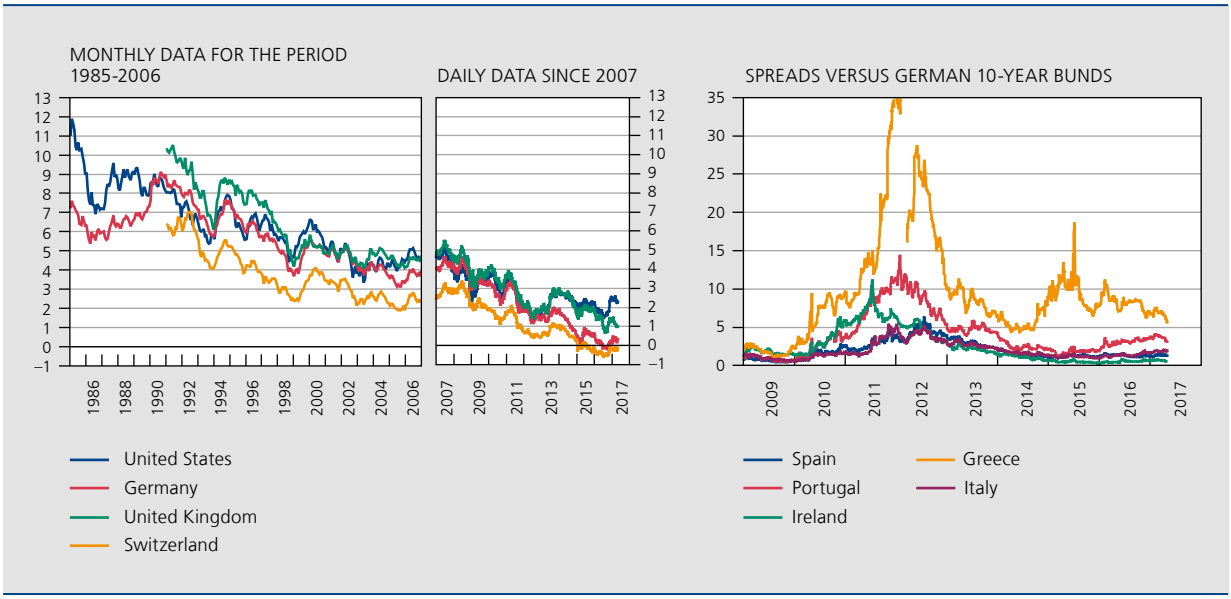
(4) Difference between the yield on corporate bonds denominated in US dollar with a rating below BBB/Baa3 and the interest rate on ten-year US Treasury bonds.

(5) JP Morgan Chase EMBI+ index; spread relative to interest rate on US Treasuries with a corresponding maturity.

Equity markets in Europe also rebounded strongly, boosted by signs of improving economic growth, rising business and consumer confidence and an improved outlook for corporate profits. Rising equity prices went hand in hand with a drop in the measures of volatility implied in stock index options – in the US even to levels not reached since the pre-crisis period – and a further increase in the price-earnings ratios to levels well above historical averages. Risk premiums also dropped in the credit markets, as shown by the declining spreads on high-yield corporate and emerging market bonds. Whether these developments are justified by the underlying fundamentals will depend to a large extent on the continuation of the recovery in the global economy and the actual implementation of the growth-enhancing economic policies that investors seem to have priced in as part of the so-called reflation trade. Given the very low level of various risk premiums and the high level of market valuations, the current configuration of asset price valuations may not reflect correctly the underlying risks and in this way magnify the probability of a scenario involving a disorderly repricing of risk in financial markets. In such a scenario, unexpected shocks, combined with a return of investors' risk aversion, could result in a longer-lasting repricing of risky assets than occurred during the most recent temporary bouts of market turbulence. Such an abrupt repricing of major asset classes could be triggered by a faster-than-expected normalisation of monetary policy conditions in the US, possibly in combination with a return of term premia in fixed-income assets to more normal levels. The associated tightening of financial conditions would likely spill over to other asset markets and lead to asset price declines and higher risk premia, potentially amplified by second-round effects through changes in investors' desired asset allocations. Higher interest rates would probably also re-focus the attention on the still high levels of public and private sector debt in many advanced economies and the conditions required to keep these at a sustainable level.

CHART 2 TEN-YEAR BENCHMARK GOVERNMENT BOND YIELDS

(daily data, in %, unless otherwise stated)



Source: Thomson Reuters Datastream.

A key factor for global financial markets in the coming quarters will thus likely be the development of medium- and long-term interest rates. As shown in chart 2, ten-year government bond yields in the US, Germany, the UK and Switzerland dropped to new record lows in the third quarter of 2016. According to estimates published by the BIS, the pool of government debt trading at negative yields briefly exceeded $ 10 trillion in July, before signs of accelerating growth and higher inflation led to a gradual recovery of medium- and long-term interest rates from these historical lows. The US presidential election on 8 November was followed by a significant further upward correction, in view of the perceived inflation risk associated with the fiscal stimulus plan of the new US President for the American economy in a virtually full employment situation. As part of the above-mentioned reflation trade, investors rotated from fixed-income to equity markets and this resulted in a sharp rise in the yields on US Treasuries during the week after the

election. Yields in the euro area echoed this upward trend, albeit not to the same degree. This happened together with a widening of government bond spreads vis-à-vis the German 10-year benchmark at the end of 2016 and the beginning of 2017 as investors priced in uncertainty over the political and financial situation in Italy (constitutional referendum on 4 December, followed by the resignation of the Prime Minister, and recapitalisation needs in the banking sector) and France (presidential and parliamentary elections in the first half of 2017).

From a historical perspective, government bond yields nevertheless still remain at extremely low levels in the major currency areas. These low yields indicate that term premiums in sovereign bond markets remain compressed and imply a weak remuneration for market participants taking on duration risk. For investors that have recently extended the maturities of their fixed-income investments in order preserve positive returns, this search for yield could expose them to potentially rapid and major market movements should this term premium return to more normal levels in combination with other factors driving up interest rates.

The future path of medium- and long-term interest rates in the major currency areas will be determined to an important extent by the timing (and the modalities) of the gradual exit from the highly accommodative monetary policy stance that central banks have adopted in response to the global financial crisis now almost ten years ago. Monetary easing included both interest rate and balance sheet measures and involved a major expansion of central banks' balance sheets.

During the period under review, the US Federal Reserve pursued its exit from the highly accommodative monetary stance in a gradual way, raising its key interest band by an additional 25 basis points (to 0.50 %-0.75 %) in December, about one year after putting it up for the first time since the outbreak of the crisis. This was followed by an additional rate hike of 25 basis points in March. Markets expect additional rate hikes before the end of the year or by early 2018. Yet, these market expectations are likely to move closely in line with the underlying developments in the US economy, which is already characterised by a very low unemployment rate and a headline inflation rate close to the central bank's objective.

In the euro area and the United Kingdom, monetary policy was characterised by a continuation of the accommodative monetary policies. The Bank of England launched a new range of stimulus measures to soften the economic impact of the Brexit referendum by cutting its benchmark rate by 25 basis points to 0.25 %, stepping up its total purchases of government and corporate bonds and introducing long-term refinancing operations. The ECB's accommodative monetary policy stance was also maintained in order to strengthen the economic recovery and steer inflation back towards its target. While the key interest rates were kept unchanged at respectively 0 % and –0.4 % for the main refinancing operations and the deposit facility, the Governing Council confirmed at its December meeting that they would remain at or below these levels for an extended period of time, and well past the horizon envisaged for the large-scale asset purchase programme (of mainly government bonds, but also including covered bank bonds, asset-backed securities and bonds issued by non-financial corporations). The scheduled end of this programme, which was launched in 2015, was extended from the end of March 2017 to the end of December 2017 (or beyond if necessary), albeit at a reduced size of the monthly net asset purchases from € 80 billion to € 60 billion as from April 2017.

This extension of the ECB's asset purchase programme kept a lid on the upward movement of the euro area's medium- and long-term interest rates (and related risk premiums) in the first months of 2017, which was driven by rising inflation expectations and, to a lesser extent, spill-overs from the above-mentioned developments in the US Treasury markets. As the short end of the yield curve remained at very low levels, the yield curve steepened.

Steeper yield curves could help European banks to strengthen their interest margins – and European bank stock prices recovered indeed in line with the steepening of the yield curve –, but they are unlikely to be a panacea for the underlying profitability problems in large segments of the euro area banking sector and certainly not the solution for some of the persisting structural problems in several national banking sectors. While the low level of interest rates attenuates the cyclical slowdown and supports economic activity, it is also detrimental to the profitability of the core intermediation activities of many banks relying on net interest income for a large share of their income. In some cases, these cyclical profitability pressures are combined with legacies from the past (including settlements for previous misconduct) and business models and operational frameworks that are ill-suited to deal with the new regulatory environment and/or the challenges coming from the growing digitalisation of finance and the emergence of new FinTech competitors. To varying degrees, the subdued bank performance can also be explained by high price competition stemming from overbanking

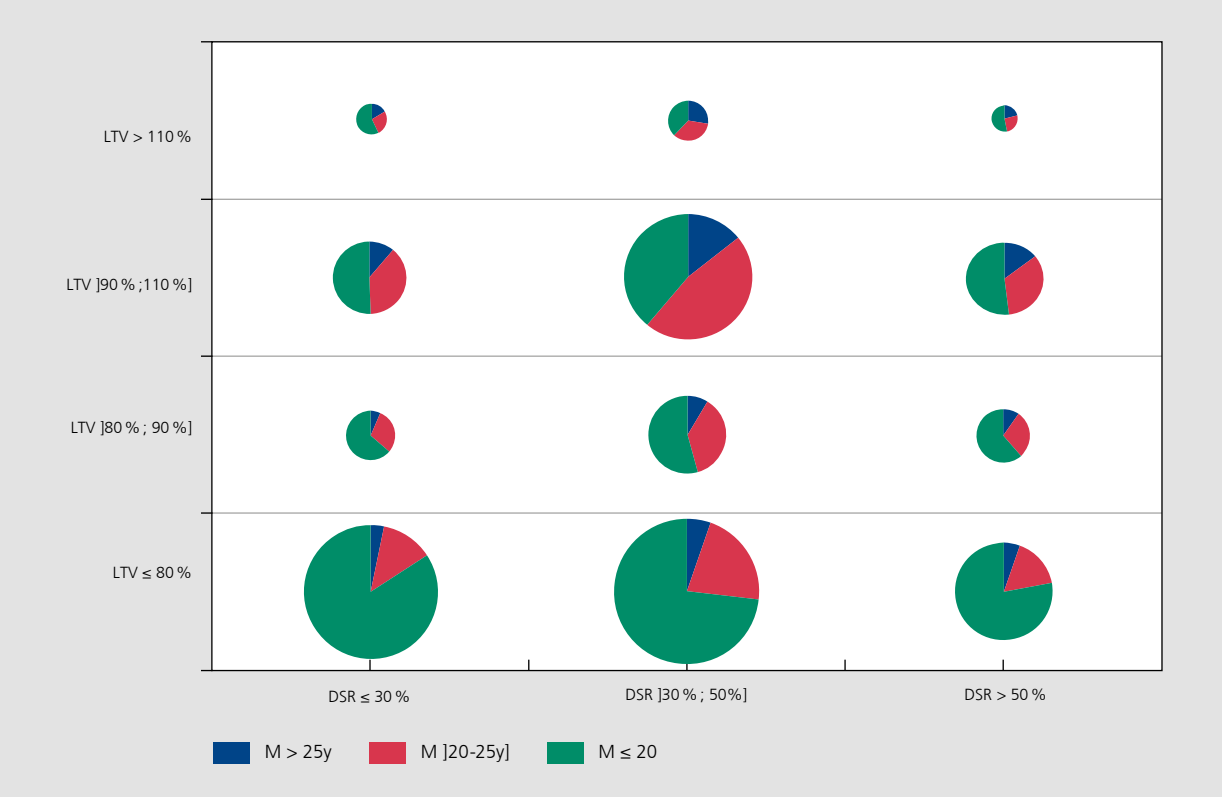
(pressuring revenues), a still high cost structure (related i.a. to the number of bank branches) and problems concerning asset quality and credit risk. The balance sheets of some national banking systems are indeed still burdened by high amounts of non-performing loans (NPLs) and require strong capital buffers to deal with them. While one major Italian bank was able to raise capital from private sources, other Italian banks required public support to replenish their capital reserves. In order to deal with the widespread problem of high NPLs in a number of countries, the SSM drew up detailed and exhaustive standards concerning the appropriate management of those loans, and asked some banks to submit a concrete plan for reducing the volume of their non-performing loans. To accelerate the resolution of high NPLs, more fundamental reforms of the judicial system will also be necessary in some Member States, particularly to enhance the efficiency of recovery and bankruptcy procedures. These reforms are essential to increase the value of non-performing loans on the secondary market and thus encourage the sale of those assets.

1.2 Credit and debt developments in Belgium

A key goal of macroprudential policy is to avoid the build-up of credit market imbalances that could lead to financial instability through debt defaults and high levels of NPLs in the banking system. The Macroprudential Report analyses in more detail the recent credit and debt developments in Belgium and the related macroprudential policy stance (see sections 2 and 3 of the MPR article). As will be shown in the next chapter of this Overview article, also the Belgian banks are confronted with the challenge of maintaining a sufficiently high level of profitability and are looking for new sources of revenue. In this connection, the Belgian banks' business plans still seem to indicate a collective strategy to further boost their mortgage lending activities to support revenues in a low growth plus low interest rate environment.

CHART 3 BREAKDOWN OF THE PORTFOLIO OF MORTGAGE LOANS OF IRB BANKS BY LTV, DSR AND MATURITY AT ORIGINATION (1) (2)

(non-consolidated data, end-2016)



Source: NBB.

(1) The three indicators are calculated at the time of granting the loans.

(2) The relative size of the circles reflects the relative size of the portfolios, while the level of the outstanding amount of loans in relation to the value of the property (loan-to-value, LTV) and the ratio between the debt repayments and the borrower's income at the time of granting the loan (debt service ratio, DSR) are broken down by specific intervals. In addition, each portfolio is broken down according to the initial maturity (maturity, M) of the loans expressed in years.

During the last two years, this seems to have led to a reversal in the tightening of mortgage lending standards witnessed before 2015 and a further build-up of the high-risk sub-segments within the stock of Belgian banks' domestic mortgage loan portfolios. These sub-segments consist of loans that combine high loan-to-value ratios, long loan maturities and (or) high debt service ratios (chart 3) and could be the source of higher-than-expected credit losses for banks if conditions in the Belgian housing market were to become less buoyant than they have been over the past 20 years. Given the big increase in mortgage debt over the past 20 years during a period of steadily rising house prices, the observed reversal in the tightening of mortgage lending standards was therefore a main point of attention in the macroprudential risk assessment and policy of the Bank during the period under review (cf. Macroprudential Report article).

1.3 Disintermediation and shadow banks

Potential risks for financial stability related to credit intermediation might also be building up outside the banking sector. Due to the very low risk-free rates, funding costs for many borrowers are at historically low levels, contributing to sustained high volumes of new debt issuance in these markets and a continuation of the gradual shift in global credit intermediation away from the banking sector and towards the debt securities markets. This development results in part from more subdued banking intermediation business, as credit institutions have focused on repairing balance sheets and cutting back non-core balance sheet exposures. But this disintermediation has also been fostered by investors' increasingly frantic search for yield in a low-yield environment through direct investment on the capital markets and through other financial intermediaries or financial instruments, such as exchange-traded funds (ETFs).

This structural change in the credit markets could be shifting the locus of financial stability risks from the banking sector towards the non-banking (or "shadow banking") sector and/or capital markets. In this connection, it should be noted that a greater role for non-banks in financial intermediation could have many benefits, as it provides economies with a "spare tyre" alternative to bank-based finance and potentially increased availability of risk-sharing capital. These benefits are among the principal motivations for the Capital Markets Union project in the European Union.

In terms of financial stability, a greater role for non-banks in financial intermediation could also be desirable, as banks are predominantly financed with short-term debt, exposing them to both solvency and liquidity risks, while investment funds, in contrast, mostly rely on the issuance of shares, shifting most of the investment risks to the end-investors. But because these non-banks rely to a much larger extent than banks on financial markets to manage their assets, a key issue for future financial stability is the resilience of financial market liquidity in periods of stress, and the ability of market participants relying on this market liquidity to cope with episodes of impaired liquidity.

On the market liquidity demand side are large segments of the rapidly growing shadow banking system, and in particular some sub-segments of the asset management industry. Over the past few years, assets managed by investment funds (other than money market funds) have expanded rapidly and the sector is highly interconnected with other parts of the financial system. If the investment funds hold relatively less liquid assets but give investors the right to redeem their holdings at short notice, there is a risk that, in periods of stress, investor redemptions could exhaust available liquidity in the asset management vehicle, causing the need to liquidate part of the less liquid holdings. Such pressure to liquidate assets can be magnified if leverage is used by investment funds, including through derivatives transactions.

In the current low rate environment, risk-taking by investment funds could be building up, which in turn harbours the risk of future unravelling. A possible trigger for sector-wide outflows is a repricing of low risk premia in many financial markets. Such market-wide stress could lead to high redemptions of investor holdings in investment funds or higher margin requirements, both resulting in forced selling into illiquid markets and amplifying the stress in these markets. The impact of selling pressure on market conditions could be aggravated by correlated investment and herding among fund investors and asset managers.

An update about the recent work of the Bank on this shadow banking and asset management sectors can be found in the MPR article (section 2.4).

2. Banking sector

2.1 Profitability

While the uncertainties related to the moderate economic growth in the euro area abated during the course of 2016, Belgian banks' profitability has been further pressured by the persistently low interest rates, despite the limited steepening of the yield curve observed in the last quarter of the year. Net profit amounted to € 5.7 billion, lower than the 2015 figure but still much higher than profits observed since 2008. With a return on equity that remained close to 10 %, Belgian banks performed on average relatively better than their EU peers in 2016. Those good results nevertheless hide the pressure building up on the banks' most structural sources of income.

First, Belgian banks' net interest income, by far their main source of income, declined in 2016 after two consecutive years of increase to reach € 14.8 billion from € 14.9 billion in 2015. Interest margins went down (slightly) as the average interest paid on liabilities fell less rapidly than the yields on assets and positive volume developments were not sufficient to offset the negative impact of lower margins.

Due to their balance sheet structure, characterised by longer durations on the assets side than on the liabilities side, Belgian banks benefited from falling, albeit low, interest rates in 2014 and 2015 as funding costs, including yields on savings and sight deposits, were adjusted faster than asset yields. However, in 2016, banks were not able to markedly reduce deposit rates and other funding costs anymore as these were already close to zero. The repricing of assets to the low interest rate environment thus started to dominate, the flatter slope of the yield curve putting pressure on the banks' intermediation margin, which is determined as the difference between yields on longer-term assets and costs of shorter-term funding sources.

Together with the commercial margin, the intermediation margin forms the net interest margin. In periods when the yield curve shows a flat profile, banks' net interest income generation becomes increasingly dependent on commercial margins. Banks raised their commercial margins on new loans considerably at the onset of the economic and financial crisis, reflecting better product pricing. In recent years, commercial margins on new mortgage loans for instance nevertheless seem to have narrowed again, despite the high volume of remortgaging which tends to have a higher commercial margin. This trend could be due to heightened competition on the Belgian mortgage market.

Chart 4 shows the results of the Belgian banks' net interest income projections for the next three years, as available in the supervisory reporting that covers the measurement of interest rate risk in the banking book (IRRBB). In this IRRBB-reporting, the net interest income development over a 3-year horizon is reported under strict constraints – detailed in the related Circular letter – and according to different interest rate scenarios, including a scenario of interest rates remaining constant at the levels recorded at the time of reporting. The objective of the strict constraints on banks' calculations for these net interest income projections is to reveal the effect of the repricing of assets and liabilities on the future development of net interest income under the various interest rate scenarios, all other things being equal. They can thus be very different from the net interest income projections that banks make under their financial plans. The constraints of the IRRBB-reporting consist for example in the assumption of a static balance sheet (the balance sheet should be kept constant, in size and composition) and strict hypotheses as regards the behaviour of client rates on sight and savings deposits in the various simulated interest rate scenarios.

A scenario in which interest rates gradually go up should support profitability in the medium term and make the interest rate environment less unfavourable for Belgian banks, as simulated by a 100-basis-point upward parallel shift in the yield curve (chart 4). In this case, banks should be able to reflect the rate increase gradually, through new production, but fully on their assets side while they should be able to do so to a lesser extent on the liabilities side, for instance on retail deposit yields.

Two scenarios would be potentially much more detrimental to banks' net interest income. A scenario in which interest rates stay at their current level or fall further would be very detrimental to Belgian banks' net interest income, as simulated by a 100-basis-point downward parallel shift in the yield curve (chart 4). In this scenario, the scope for

TABLE 1 MAIN COMPONENTS OF THE INCOME STATEMENT

(consolidated data)

	In € billion								In % of operating income (2016)	*p.m. P&L derived from foreign activities, in € billion (2016)*
	2009	2010	2011	2012	2013	2014	2015	2016		
Net interest income	**14.89**	**13.77**	**13.99**	**13.57**	**13.29**	**14.53**	**14.87**	**14.82**	**66.1**	***4.42***
Non-interest income	**3.29**	**5.57**	**4.75**	**4.49**	**7.05**	**6.16**	**7.10**	**7.62**	**33.9**	***2.06***
Net fee and commission income (including commissions paid to bank agents)	5.02	4.34	4.38	4.48	4.97	5.34	5.87	5.63	25.1	*1.68*
(Un)realised gains or losses on financial instruments [1]	–2.74	–0.04	–0.8	0.04	0.79	–0.06	1.17	1.50		*0.21*
Other non-interest income	1.01	1.28	1.17	–0.03	1.28	0.88	0.06	0.50		*0.17*
Total operating income (bank product)	**18.18**	**19.34**	**18.73**	**18.05**	**20.34**	**20.68**	**21.97**	**22.44**	**100.0**	***6.48***
Total operating expenses (–)	**13.98**	**12.48**	**12.32**	**13.01**	**12.36**	**12.66**	**12.87**	**13.11**	**58.4** [2]	***3.35***
Staff expenses (excluding commissions paid to bank agents)	7.30	6.59	6.57	6.86	6.53	6.52	6.54	6.47		
General and administrative expenses (including depreciation)	6.67	5.90	5.75	6.15	5.83	6.14	6.33	6.64		
Total impairment and provisions (–)	**7.36**	**1.83**	**5.02**	**2.61**	**2.95**	**1.35**	**1.30**	**1.76**		***0.39***
Impairments on loans and receivables	5.59	1.76	3.05	1.98	2.31	1.30	1.14	0.90		
Impairments on other financial assets	0.29	–0.09	1.37	–0.84	0.00	0.00	0.02	–0.04		
Other impairments and provisions	2.06	0.16	0.60	1.46	0.64	0.05	0.13	0.90		
Other components of net operating income [3]	**0.11**	**0.45**	**–0.37**	**0.25**	**0.32**	**0.22**	**0.24**	**0.37**		***0.13***
Net operating income	**–3.04**	**5.48**	**1.02**	**2.68**	**5.35**	**6.89**	**8.04**	**7.94**		***2.86***
Tax on profit from continuing operations	**1.78**	**–0.51**	**–0.05**	**–0.74**	**–1.62**	**–1.79**	**–1.22**	**–1.56**		
Total profit or loss on discontinued operations	**0.00**	**0.97**	**–0.31**	**0.00**	**0.00**	**0.00**	**–0.05**	**0.03**		***0.00***
Net profit or loss including minority interest	**–1.27**	**5.94**	**0.66**	**1.94**	**3.73**	**5.10**	**6.76**	**6.41**		***2.35***
p.m. Net profit or loss (bottom-line result)	*–1.22*	*5.56*	*0.36*	*1.59*	*3.28*	*4.52*	*6.14*	*5.75*		

Source: NBB.

(1) This item includes the net realised gains (losses) on financial assets and liabilities not measured at fair value through profit or loss, the net gains (losses) on financial assets and liabilities held for trading and designated at fair value through profit or loss, and the net gains (losses) from hedge accounting.

(2) This figure is the cost-to-income ratio of the Belgian banking sector.

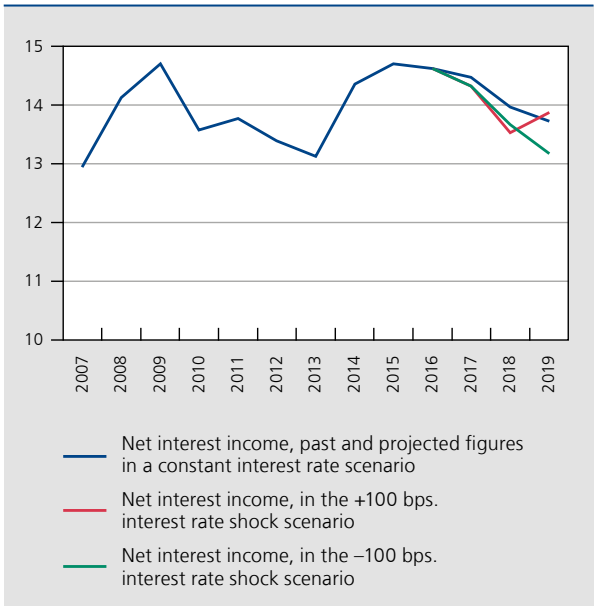
(3) Other components of net operating income comprise the share in profit or loss of associates and joint ventures accounted through the equity method, and the profit or loss from non-current assets, disposal groups classified as held for sale, not qualifying as discontinued operations and the negative goodwill recognised immediately in profit or loss.

additional cuts in funding costs is very limited while maturing assets are replaced by lower-yielding claims. This repricing of assets has been accelerated in the last three years by the big wave of mortgage loan refinancing. While in the past, the negative impact of remortgaging was offset to some extent by the inclusion of early redemption fees, this positive effect had already started to wane in 2016.

Another unfavourable scenario would be an abrupt and sustained increase in short-term and long-term interest rates. If a lot of assets were taken on at low and fixed rates during the low interest rate period (including – refinanced – mortgage loans), increasing funding costs could outpace the repricing of assets. This would put pressure on net interest income, if banks are not properly hedged against higher short-term rates.

Banks willing to protect their net interest income in the first scenario (persistently low interest rates), through adjustments to their hedging strategy, tend to make themselves more vulnerable to the occurrence of the second one (abrupt increase in interest rates). Hedging and asset-liability management policies that support current profitability levels should thus also be considered in the light of potential interest rate scenarios over the medium term and the repercussions of these for the profitability of the envisaged hedging strategies. Even though long-term rates rose in the final quarter of 2016 and, to a lesser extent, in the first quarter of 2017, the yield curve has not yet shown any major signs of steepening. Hence, interest rate movements or the absence of any movement in the near future at both the short- and long-term ends of the curve will be a key determinant of the banks' capacity to generate substantial net interest income.

CHART 4 PAST AND PROJECTED[1] NET INTEREST INCOME
(in € billion)



Source: NBB.

(1) This chart shows the results of the Belgian banks' net interest income projections for the next three years, as available in the supervisory reporting that covers the measurement of interest rate risk in the banking book (IRRBB). In this IRRBB-reporting, the net interest income development over a 3-year horizon is reported under strict constraints – detailed in the related Circular letter – and according to different interest rate scenarios, including a scenario of interest rates remaining constant at the levels recorded at the time of reporting. The constraints of the IRRBB reporting consist for example in the assumption of a static balance sheet (the balance sheet should be kept constant, in size and composition) and strict hypotheses as regards the behaviour of client rates on sight and savings deposits in the various simulated interest rate scenarios.

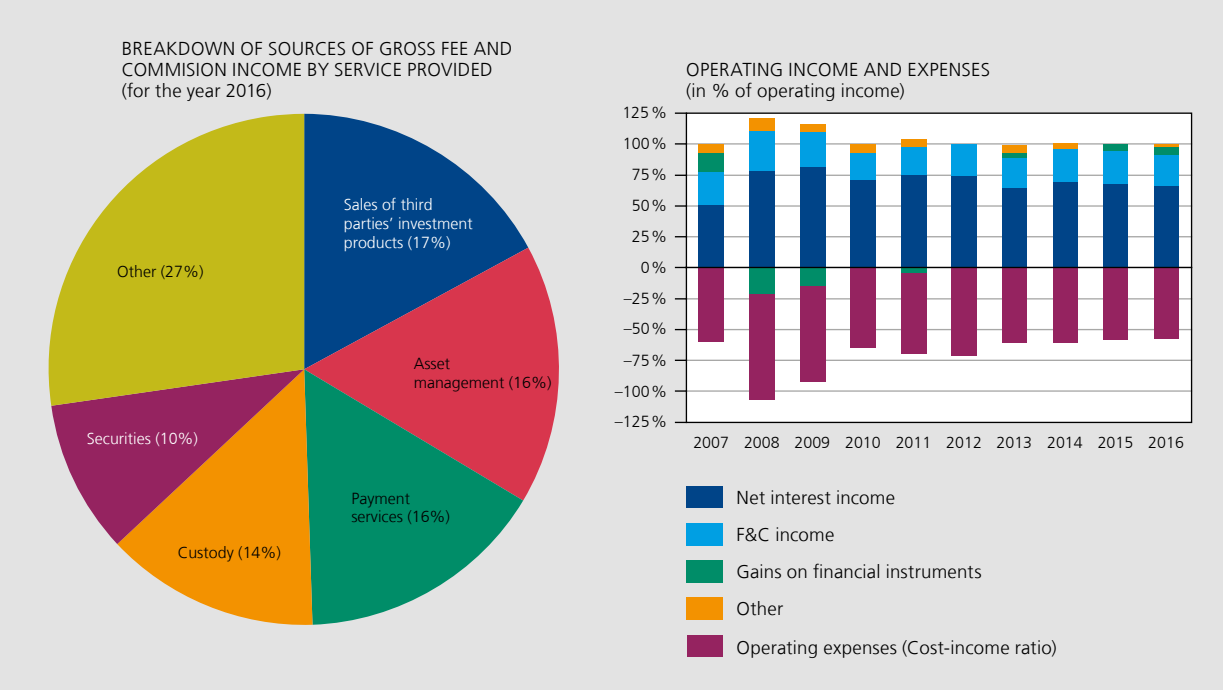
To compensate for the expected decline in net interest income and to circumvent the many issues related to the current low interest rate environment, banks have started to gradually shift income generation towards business generating fees and commissions, instead of interest flows. However, those revenues declined from € 5.9 billion in 2015 to € 5.6 billion in 2016, mainly on the back of lower fees from securities transfer orders and issuances.

Commissions earned through asset management services and sales of third parties' investment products accounted for a third of total gross fees in 2016 (chart 5, left-hand panel). This revenue largely comprises commissions on purchases by customers of shares of collective investment funds. While volumes of customers' assets channelled through such funds,

whether managed by the customer's bank or another institution, increased further in 2016, they did so to a lesser extent than in 2015.

As banks want to diversify their income base, they have boosted their fee-generating business which is also less subject to regulatory capital requirements. However, the competition on markets such as those for investment products, where non-banks are active too, is strong and growing. Moreover, in recent periods, transactions for (collective) investment products were to an important extent driven by the low(ering) yields offered on alternative investment possibilities, such as deposits, and transaction levels cannot be expected to remain as high in the future. Since part of the fees for collective investment products are (one-off) entry fees, the amount of which depends on the number of transactions, the expectation that revenue from commissions will (fully) offset the expected decline in net interest income should be regarded with caution. Competition for payment services is also expected to increase looking forward. Although the remuneration of custodian services is in general low relative to the assets under custody, custodian fees account for a relatively large share of total fees due to large volumes of custodian assets concentrated in the hands of two Belgian banks with a specific business model.

CHART 5 SOURCES OF FEE AND COMMISSION INCOME AND BREAKDOWN OF NET OPERATING PROFIT
(consolidated data)



Source: NBB.

To a greater extent than in previous years, Belgian banks' operating income was supported in 2016 by gains on financial instruments, which rose from € 1.2 billion in 2015 to € 1.5 billion in 2016, although they were unevenly spread among banks. While their share in operating income was fairly small over the period 2008-2012, it increased thereafter to 7 % in 2016.

Unrealised gains from trading instruments were higher in 2016 compared to 2015, as long-term interest rates came down again over the full year 2016. Realised gains, booked when assets are sold at a profit, were well up on 2015 (2.5 times as high) as banks sold shares and, with the help of the ECB's asset purchase programme, bonds, mainly government bonds. Both realised and unrealised gains helped to offset the negative impact of losses incurred on hedging positions, part of which were driven by sales of assets as the related hedges became ineffective. Mainly driven by dividends, other sources of operating income were also up, reaching € 0.5 billion in 2016.

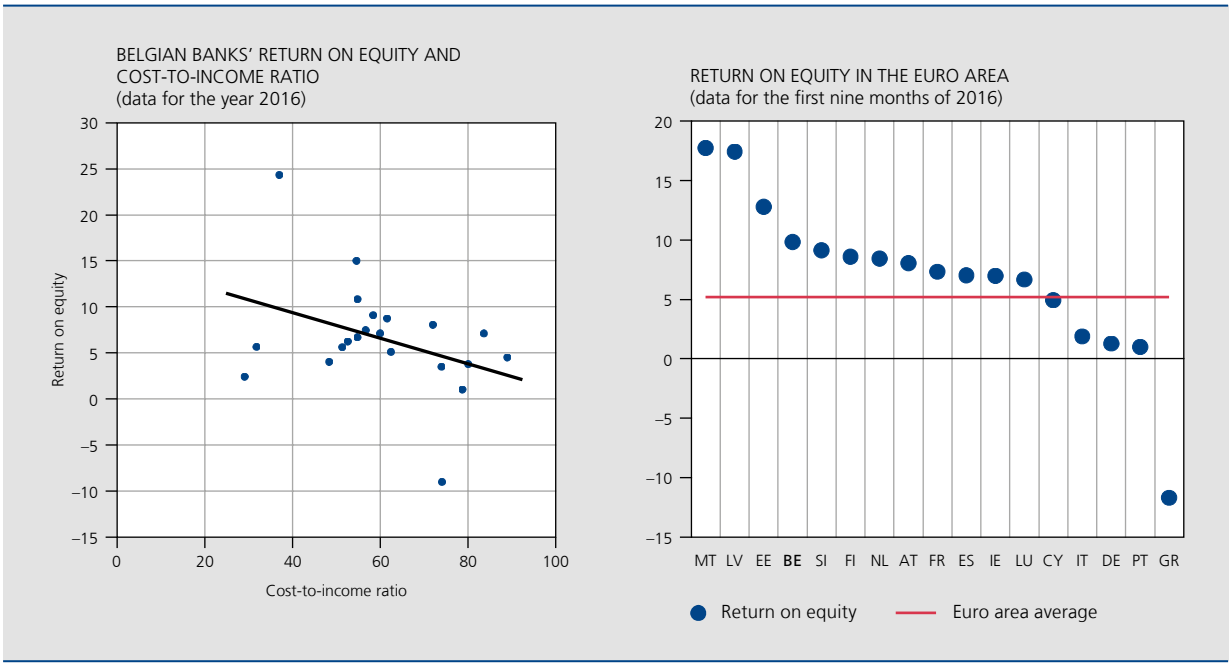
Even though the Belgian banks' most structural income sources – net interest income and fee and commission income – declined in 2016 compared to 2015, their gross operating income increased on the back of higher but also more volatile and hence potentially unsustainable gains on financial instruments and other sources of income.

To support their profitability, banks can also adjust their cost structure. However, the rise in income was accompanied by a further increase in operating expenses, leading to a fairly stable cost-to-income ratio at around 60 % (chart 5, right-hand panel). This increase was mainly due to a rise in general and administrative expenses which is in part explained by the contribution to the European Single Resolution Fund which further added to the share of bank levies in banks' expenses. While the shift towards much more digitalised banking services opens up numerous opportunities for banks to improve their operating efficiency and hence reduce costs, the need to adjust and update (IT) systems, amplified by the growing competition from potential new entrants on specific markets, at the same time weighs on banks' profitability.

Staff expenses have remained broadly unchanged over the last four years at around € 6.5 billion. While these expenses have covered a somewhat larger scope of activities over time and sometimes reflect increasing activities abroad, the stability of the sector's aggregate shows that cost-cutting measures take time to bear fruit, also due to rebalancing of the workforce structure towards higher average wages.

Developments in staff expenses nonetheless differed between individual banks, depending on the extent to which these measures have already been implemented. Cost-to-income ratios also vary considerably between banks, reflecting differences in business models but also in efficiency. Therefore, lower cost-to-income ratios tended to be associated with higher return on equity in 2016 (chart 6 left-hand panel).

CHART 6 RETURN ON EQUITY AND COST-TO-INCOME RATIO
(consolidated data, in %)



Sources: ECB, NBB.

At sectoral level, the return on equity, although down slightly on 2015, reached 9.1 %, well above the average observed for the euro area (chart 6 right-hand panel). The banking industry's relatively high profitability was partly attributable to exceptional developments, such as tax losses carried forward by one of the country's biggest banks. Looking ahead, income from mark-to-market gains on portfolios of financial instruments or the sale of securities is no longer expected to be as high as in 2016. At the same time, interest margins are expected to narrow. There is also some uncertainty about

the fact that other sources of income could be structural replacements for interest income and the extremely low levels of loan loss provisions look unsustainable.

However, major provisions have already been set aside in 2016 against a background of large-scale restructuring plans announced in areas such as branch office networks and workforce. This should limit any further negative impact from those plans on the income statement in the future. While spending cuts proved quite moderate in 2016, they are likely to gain traction in future as banks are still in the process of adjusting their cost structures to their new business models.

That said, Belgian banks do enjoy rather healthy underlying profitability and find themselves in a robust starting position from which to face a time in which their capacity to turn a profit will be tested.

2.2 Assets

This healthy profitability can explain why, at sectoral level, no signals have been observed so far that banks are significantly seeking more yield by engaging in riskier transactions.

On the contrary, the fact that banks have stepped up their balances at central banks despite their negative yields suggests they were not envisaging riskier transactions. This is reflected in the increasing amounts reported as "other assets" in chart 7 (left-hand panel), a category which had however also grown due to the transfer of major leasing activities to the Belgian subsidiary of a foreign bank.

Other developments on the assets side pointed to a fairly stable balance sheet in 2016. After the financial crisis, the Belgian banking sector underwent a vast deleveraging and de-risking process which translated into a global reduction of the sector's balance sheet, from around € 1 700 billion at the end of June 2008 (just ten weeks before the bankruptcy of Lehman Brothers) to € 960 billion at the end of 2013. Since then, total assets have stabilised at around € 1 000 billion, reaching € 1 022 billion at the end of 2016. Interbank positions proved rather volatile during the year 2016 but came back close to the level observed at the end of 2015. Exposures to foreign financial and non-financial counterparties also remained relatively stable (see chart in Section 4).

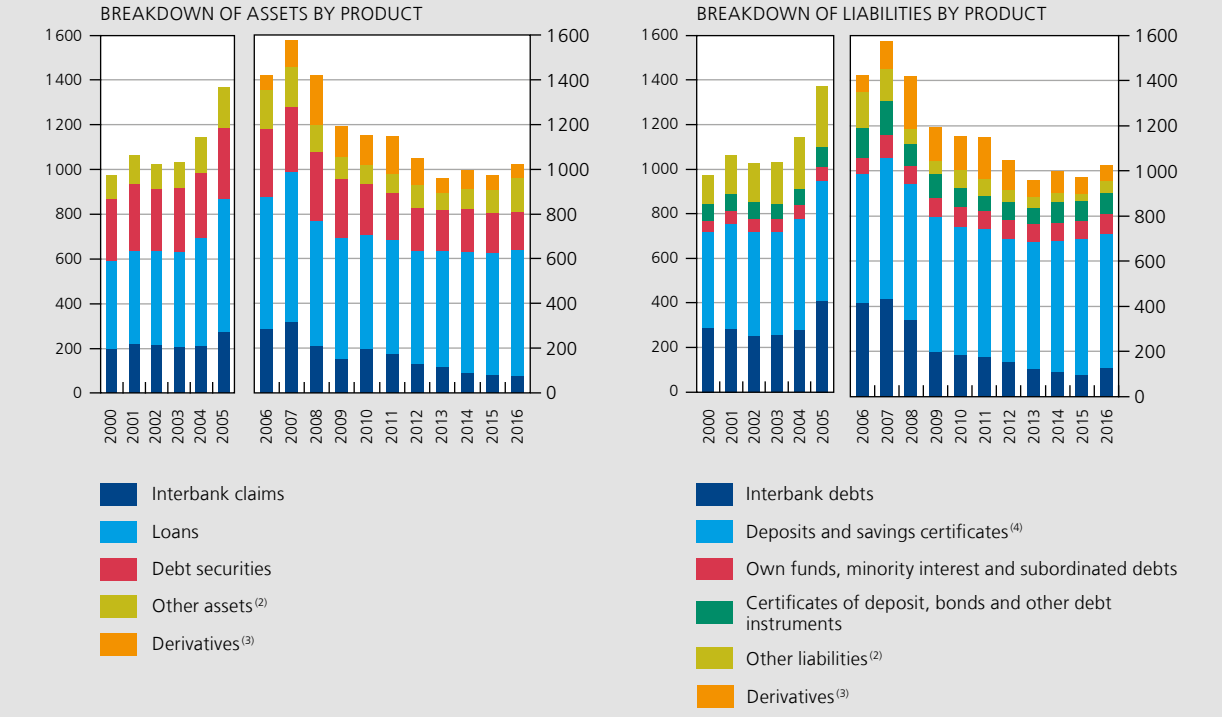
Developments observed in 2016 mainly concerned a further shift in the composition of the sector's balance sheet towards more traditional business activities. In particular, Belgian banks further increased their exposure to the domestic mortgage market. The total outstanding amount of mortgage loans to Belgian households rose to € 187 billion at the end of 2016, from € 177 billion at end-2015, i.e. a year-on-year growth rate of 5.5 %. Gross new business in mortgage loans worked out at € 53 billion in the period, including € 16 billion in internal refinancing, with external refinancing – i.e. where borrowers turn to a different bank – amounting to € 7 billion.

In 2015 and 2016, the upswing in mortgage loans was no longer accompanied by a further tightening of lending criteria, as had been the case between 2012 and 2014. While mortgage loans with maturities in excess of 25 years remained very marginal in the 2016 production, there was no further decline in the percentage of new loans with a debt-service-to-income (DSTI) ratio in excess of 50 %, despite the prevailing low interest rates.

One finding that stands out even more is that low interest rates also triggered a further rise in average amounts contracted in new loans. This took new mortgage business to higher average loan-to-value ratios (LTVs), i.e. the size of the mortgage in relation to the value of the property. The left-hand panel of chart 8 shows that, while there has been a gradual reduction in the share of new loans carrying the highest LTV ratios (> 100 %) over the past seven years, the share of loans with LTV ratios below 80 % dropped markedly over 2015 and 2016. It should be recalled that the large volume of refinanced loans in recent years has had a positive effect on these LTV vintage figures, given that remortgages are often classified as new loans by banks with their LTV levels being updated and usually showing low ratios. Data collected from banks where loans used for (internal) refinancing are excluded from the vintage figures thus tend to show even higher shares in new production of loans with an LTV of more than 90 %. More specifically, the share of loans with an LTV of more than 90 % in the entire new production in 2016 amounted to 30 %, whereas this share was 35 % when not taking into account internally refinanced loans.

CHART 7 BALANCE SHEET STRUCTURE OF BELGIAN CREDIT INSTITUTIONS[1]

(consolidated end-of-period data, in € billion)



Source: NBB.

(1) Data compiled in accordance with the Belgian accounting rules until 2005 (Belgian GAAP) and IAS/IFRS from 2006.

(2) "Other assets" mainly comprise balances with central banks, shares, tangible and intangible assets, and deferred tax assets. "Other liabilities" are primarily short positions, liabilities excluding deposits and debt securities, provisions and liabilities for defined benefit obligations. Liabilities linked to transferred assets are no longer recognised under "other liabilities", but are included under different items on the liabilities side.

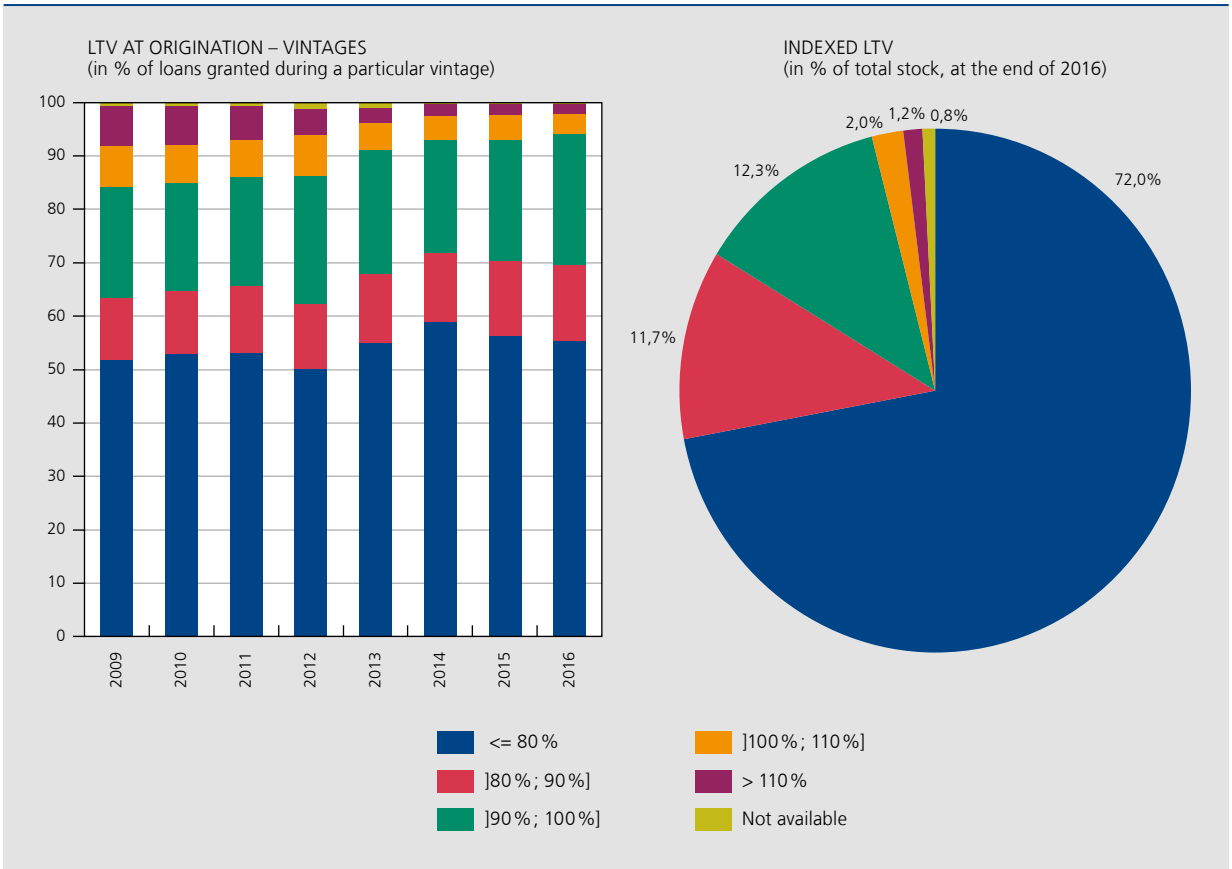
(3) Derivatives are recorded at their market value including, from 2007, income receivable and expense payable.

(4) From the third quarter of 2014, savings certificates are no longer included in "deposits and savings certificates", but rank under "certificates of deposit, bonds and other debt securities".

This reversal in the reduction of high-LTV loans in new production has recently been identified as one of the vulnerabilities of the Belgian mortgage market. In addition, the surge in mortgage loans further increased household debt burdens, while signals of overvaluation persist, even though they slowed down somewhat in 2016. It must be taken into account that, besides overvaluation, which is still hard to determine exactly, price developments remain sensitive to potential changes in interest rates. This analysis of the Belgian mortgage market is broadly shared by the ESRB which sent out a warning in November 2016 to eight European countries, including Belgium.

These observations led to the conclusion that the current measure, consisting of a flat-rate 5-percentage-point add-on to the risk weights calculated by the banks using an IRB model, was no longer sufficient. The Bank therefore announced its intention to introduce a new measure with an initial component identical to the current measure but also introducing a second and more targeted component, further raising the risk weights for the riskier mortgage loan segments. This new macroprudential measure was not endorsed by the Belgian federal government (approval is required in the Banking law). It would have led to the formation of a CET1 capital buffer of around € 1.4 billion, broken down between around € 800 million for the first component, a capital amount already set aside at the end of 2016 by the banks concerned, and around € 600 million for the second and new component. More details about the measure can be found in sections 2 and 3 of the Macroprudential Report article. In addition to extending the existing add-on, the government asked the Bank to reassess the vulnerabilities on the Belgian housing market.

CHART 8 LOAN-TO-VALUE INDICATORS FOR BELGIAN MORTGAGE LOANS
(non-consolidated data)



Source: NBB.

The second component of the proposed measure would have been applied to the stock of loans showing a current or indexed LTV ratio above 80 %. This ratio takes into account loan amortisations and developments in collateral value and offers a good picture of the LTV-related riskiness of Belgian banks' domestic mortgage loan portfolios. Loans with an indexed LTV higher than 80 % accounted for around 27 % (or € 50 billion) of the total outstanding stock at the end of 2016, 16 % of which (or € 29 billion) represented loans with an indexed LTV higher than 90 % (right-hand panel of chart 8).

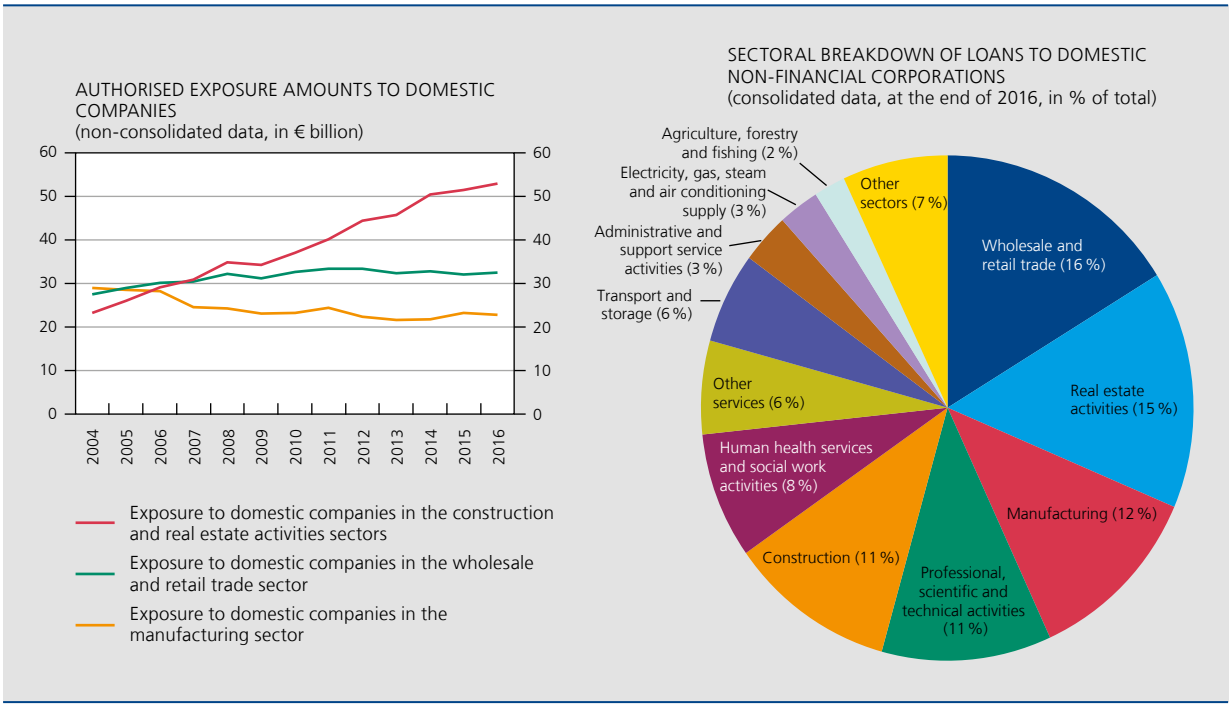
The dynamism observed over the recent period in mortgage lending has probably been partly supported by buy-to-let transactions by private investors in search of higher yields than those currently offered on traditional instruments, such as deposits, which are kept at very low levels in line with the interest rate environment. Buy-to-let loans are estimated to account for between 7.5 and 10 % of all new mortgage loans during the year 2016. While banks usually tend to apply more conservative lending standards to such loans than for loans to owner-occupiers, losses cannot be ruled out should the rental market or the housing market in general suffer corrections.

While the lack of historical data for individuals' buy-to-let transactions does not enable a full assessment of evolutions, anecdotal evidence shows that such transactions could be on the rise. Statistics related to commercial real estate have shown dynamic developments for some years. While the exact exposures of banks to income-producing immovable property is hard to determine, CRE exposures can be approximated using data from the Central Corporate Credit Register. The left-hand panel of chart 9 shows the change in the maximum loan balance or credit limit authorised ("authorised exposure amount") by the banking sector to domestic non-financial corporations reported on a non-consolidated basis in the Central Corporate Credit Register. These data highlight that the authorised amounts for exposures to non-financial corporations in the construction and real estate sectors have grown dynamically over the last decade. At the end of 2016, the total amount of credit authorised by Belgian banks to domestic companies in the construction and real

estate sectors amounted to slightly more than € 50 billion. About € 5 billion of these loans went to Belgian regulated real estate investment companies (REITS), which raise funds from private or institutional investors and purchase real estate properties in order to generate rental income. Real estate investment companies constitute an important link between commercial real estate markets and other sectors of the economy. Belgian households actually own about one-third of these companies' issued shares. Real estate investment trusts are therefore regulated and subject to obligations laid down in the Law of 12 May 2014.

In contrast to CRE-related sectors, the share of authorised exposures to non-financial corporations in the wholesale and retail trade and manufacturing sectors have both shrunk. Data for the year 2016 confirm this longer-term trend. The right-hand panel of chart 9 illustrates that loans to domestic non-financial companies active in the real estate and construction sectors together account for 26 % of banks' domestic corporate loan portfolio, followed by loans to non-financial corporations in the wholesale and retail trade sector (16 %) and the manufacturing sector (12 %).

CHART 9 BELGIAN BANKS' CLAIMS ON CRE-RELATED AND OTHER DOMESTIC COMPANIES

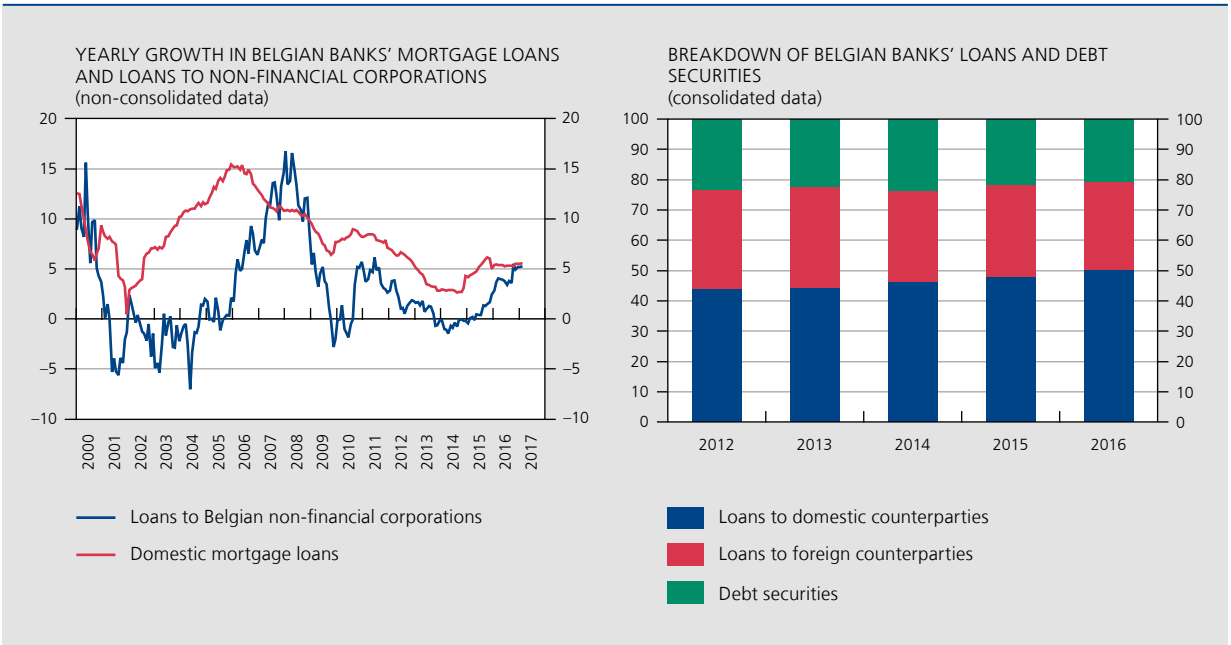


Source: NBB.

Loans to CRE-related domestic companies have contributed to the strong growth observed in lending to the Belgian non-financial private sector. While, until recently, credit to the private sector had been mainly supported by (mortgage) loans to domestic households, loans to domestic NFCs rose in a similar way in 2016, with both categories showing an annual growth rate above 5 % at the end of the year (left-hand panel of chart 10). This dynamism in lending is reflected in the increasing share of loans in total interest-bearing assets, particularly for the loans granted to domestic counterparties (right-hand panel of chart 10). Belgian banks' holdings of government bonds contracted markedly in 2016, by around € 10 billion, particularly reflecting the sale of Belgian public bonds, partly through sales operated under the ECB's public sector purchase programme (PSPP). These developments lower the concentration of banks' public sector exposures to Belgium. But claims on the domestic public sector are still by far the largest among public sector exposures (see chart 23 in Section 4).

The observed trend towards a larger share of loans, at the expense of government bonds, reflects banks' preference for the higher yields they can earn by granting credit rather than by investing in public sector securities. Credit trends are still closely monitored by the Bank, in its capacity as macroprudential authority, because they can lead to undesirable developments should they become excessive (see the Macroprudential Report article in this connection).

CHART 10 BELGIAN BANKS' LOAN AND DEBT SECURITIES PORTFOLIOS
(in %)



Source: NBB.

2.3 Funding and liquidity

In terms of liquidity too, the dynamic growth in credit has had its consequences. It led to an increase in the loan-to-deposit ratio which went up to 95 % at the end of 2016, well up on previous years (see table 6 in Section 4).

The growth in loans was not offset by similar growth in deposits. Over the course of 2016, household deposits did actually increase to € 364 billion by the end of the year, up from € 340 billion at the end of 2015, thus accounting for 36 % of Belgian banks' liabilities at the end of 2016. Typically, Belgian banks' household deposits largely consist of savings deposits, for which a first sizeable tranche of interest payments is exempt from Belgian withholding tax and for which the yield is floored by law at 11 basis points, including the fidelity premium. At the end of 2016, savings deposits volumes reached a similar level to end-2015. While this trend is partly explained by one large bank's decision to transform regulated savings deposits of companies into unregulated ones (to which the floor does not apply), it also reflects the fact that, as interest rates on sight and savings deposits are both at very low levels, households tend to keep their money in sight deposits rather than savings deposits or, alternatively, redirect part of their funds into other types of assets such as investment funds (see chart 25 in Section 4).

The fact that wholesale funding sources rose only slightly at the same time shows that Belgian banks had sufficient funding to absorb developments on the assets side. Part of the small increase in wholesale funding reflects the fact that Belgian banks locked in the cheap funding provided under the TLTRO II programme (see chart 24 in Section 4). Belgian banks also had greater recourse to covered bonds, mainly under the legal framework for Belgian covered bonds that was introduced in 2012. At the end of 2016, the outstanding amount of covered bonds issued by Belgian banks stood at € 24 billion on a consolidated basis, up from € 21 billion at the end of 2015. This increase came at the expense of ABSs. As covered bonds are so-called dual-recourse instruments for which investors have a claim on the pool of assets covering the bonds as well as on the issuer, such instruments provide a relatively cheap source of debt funding compared to unsecured bonds. The over-collateralisation usually required for secured funding sources suggests that wider recourse to such funding sources brings with it an increasing encumbrance of the balance sheet. Box 1 describes in detail the major reasons for encumbrance of Belgian banks' balance sheets.

Box 1 – Belgian banks' asset encumbrance

Banks can use their assets as collateral in various transactions and for different purposes. For example, they can pledge mortgage loans in a cover pool to obtain funding from the issuance of secured bonds, or they can provide collateral against cash in repo transactions with private counterparties or central banks. Banks also have to provide collateral for derivatives with a negative market value.

Assets which are pledged become encumbered, meaning that they can no longer be freely transferred and are no longer liquid for a period of time. Unsecured creditors do not have recourse to encumbered assets. Excessively high levels of encumbrance should be avoided as this would subordinate unsecured creditors too much and could drive up the cost of such funding sources. Therefore, the Belgian framework for covered bonds limits the amount of assets in the cover pool to 8 % of the bank's total assets, and in order to protect unsecured (retail) creditors, the Bank monitors Belgian banks' ratios of unencumbered assets to the deposits granted a preference by the Belgian Banking Law[1] and eligible for an official guarantee.

The table below shows the main sources of Belgian banks' asset encumbrance at the end of 2016 (in each row) and, for each of them, the type of assets provided as collateral (in the columns). For every source of encumbrance, the extent to which the amount of collateral provided exceeds the carrying amount of liabilities for which it is pledged is reported as "over-collateralisation ratio" and for each collateral type, the table shows to what extent the assets within a certain class are already encumbered ("asset encumbrance ratio"). Note that the assets provided as collateral can be both a bank's own assets or collateral received and re-pledged.

At the end of 2016, the two main sources of asset encumbrance for Belgian banks were derivative transactions and covered bond issuances for which € 37.4 billion and € 30 billion, respectively, worth of collateral had been provided. The collateral provided for derivative transactions largely consisted of loans to financial institutions which is in fact cash collateral. For covered bond issuances, the Belgian framework specifies that the cover pool has to exist, for at least 85 %, of mortgage loans, loans to public sector entities or securitisation instruments backed by such loans and issued by an intra-group entity. At the end of 2016, Belgian banks covered bonds' cover pool consisted almost entirely of mortgage loans (€ 26 billion). The ratio of over-collateralisation was 128 %, far above the 105 % which is the minimum required in the Belgian framework.

Repo transactions represent another important source of encumbrance for Belgian banks. As such transactions are carried out mainly for short-term liquidity purposes, volumes are rather volatile and can be significantly higher or lower depending on the moment in time. Repo transactions are mainly collateralised by government bonds, thus contributing significantly to the high encumbrance ratio for this asset class: at the end of 2016, 20.5 % of Belgian banks' government bond holdings were used as collateral. The overall encumbrance ratio of Belgian banks' assets came to12 %.

The collateral provided for central bank funding totalled almost € 20 billion at the end of 2016 and, apart from a small amount of bonds, was mainly composed of bank loans. Bank loans can either be directly/individually pledged at the central bank or in an indirect/securitised form, where they are first pooled to issue ABSs (that are retained by the bank) and then (partly) pledged at the central bank[2]. Central banks' collateral rules specify that only loans to non-financial corporations and to public sector entities can be directly pledged (when they meet several other criteria), so that loans to households have to be securitised in order to become eligible[3]. Since securitisation vehicles are often consolidated into banks, retained ABSs which are pledged at the central bank appear as encumbered loans on the banks' consolidated balance sheets. At the end of 2016, the amount of central

(1) Communication NBB_2016_34 / "Recovery plans – Obligations concerning encumbered assets".
(2) See also Working Paper N° 318: Using bank loans as collateral in Europe: The role of liquidity and funding purposes, Koulischer, F. & Van Roy, P. April 2017.
(3) The Eurosystem only accepts the senior tranche of the ABS as collateral, which has to have a minimum rating of A- (assigned by an external credit rating agency).

bank funding actually received by Belgian banks amounted to around € 15 billion. The over-collateralisation ratio was thus around 133 %, reflecting an average haircut of about 25 % on the amount of collateral pledged at the central bank.

BELGIAN BANKS' ASSET ENCUMBRANCE

(amounts of collateral provided, consolidated data, at the end of 2016, in € billion, unless otherwise stated)

	Collateral type							Total	Ratio of over-collate-ralisation (in %)
	Govern-ment bonds	Other bonds	Loans to households	Loans to non-financial corpora-tions	Loans to financial institutions	Loans to central banks and general govern-ments	Other assets / collateral received		
Source of encumbrance									
Derivative transactions	10.1	0.0	–	–	22.9	–	4.5	37.4	113.3
Repo transactions and other deposits (excluding central banks)	17.4	2.8	0.2	–	–	0.8	0.1	21.3	120.1
Issuance of covered bonds	–	–	26.1	–	0.3	3.3	0.4	30.0	127.8
Issuance of ABS	–	–	1.9	1.2	–	–	0.0	3.1	131.7
Central bank funding	1.3	2.2	4.6	8.6	0.0	3.0	0.0	19.7	132.8
Other sources of encumbrance	0.8	2.2	3.0	1.3	–	0.0	1.1	8.4	197.7
Total	**29.6**	**7.2**	**35.8**	**11.0**	**23.2**	**7.0**	**6.0**	**119.9**	**125.3**
Asset encumbrance ratio (in %)[1]	**20.5**	**12.4**	**12.7**	**12.7**	**12.7**	**12.7**	**3.0**	**11.9**	

Source: NBB.

(1) Asset encumbrance ratio as defined in the Commission Implementing Regulation (EU) No 2015/79 (paragraphs 9-11 of Annex III), calculated as $\frac{\text{total encumbered assets + total collateral received and reused}}{\text{total assets + total collateral received and available for encumbrance}}$.
Here, as in the EBA methodology, assets are measured at the carrying amount and collateral is measured at fair value.

As retained securitisations are consolidated in the banks' balance sheets, the figures in the table for collateral provided for ABS issues only reflect non-retained securitisation, issued by a consolidated entity and sold to third-party investors.

The share of encumbered assets within total assets is an important aspect of a bank's liquidity position, as the higher the level, the lower the share of assets that remain available to cover unsecured bondholders, which might also push up the cost of this funding source.

To manage Belgian banks' liquidity risks, Basel III regulations have set two ratios: the liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR). While the LCR was designed to attenuate short-term liquidity risks, by requiring banks to maintain an adequate level of liquid assets to withstand a stressed funding scenario lasting for one month, the NSFR, which is projected to enter into force in 2018, is intended to improve the banks' structural liquidity position.

More specifically, the LCR is defined as the ratio between the stock of high-quality liquid assets (HQLA) within a bank and its net cash outflows in a 30-day stress scenario. The HQLA represents a set of unencumbered assets that can be

converted into cash on private markets in times of severe liquidity stress, such as central bank reserves and marketable securities issued or guaranteed by sovereigns. At the end of 2016, the Belgian banks' total liquidity buffer amounted to € 185 billion on a consolidated basis. The denominator of the ratio represents a bank's net cash outflow, that is, the difference between its total out- and inflows, during the prescribed liquidity stress scenario. At the end of 2016, the estimated net liquidity outflow of Belgian banks in such a scenario came to € 132 billion on a consolidated basis. These net outflows are calculated by applying "stressed" weights to the various sources of outflows and inflows. For example, the run-off rate of deposits from non-financial corporations ranges from 20 to 40 %, while outflows from retail deposits are mainly assigned a 5 % run-off rate. At the end of 2016, the sector's LCR came to 140 % on a consolidated basis; slightly up on end-2015, with all banks showing ratios above 100 %.

2.4 Asset quality and solvency

As already indicated by recent movements in the loan loss ratio, the quality of Belgian banks' exposures in the form of loans improved in the course of 2016 (see table 7 in Section 4). The ratio of impaired claims to total loans declined from 3.6 % at the end of 2015 to 3.4 % at the end of 2016. More specifically, the ratio sharply improved for loans to non-financial corporations, located both in Belgium and abroad. The coverage ratio, expressing the extent to which banks have provisioned for loan losses, amounted to 45 % by the end of 2016, close to the level observed at the end of 2015.

All other things being equal, better-quality debtors ensure a lower probability of default for bank assets, as determined by banks' internal models. However, in risk-weighted asset calculations, this positive effect is more than wiped out by the rise in exposures subject to credit risk. Risk-weighted assets (RWAs) rose from € 345 billion at the end of 2015 to € 370 billion at the end of 2016 (table 2). The increase was driven by a surge in credit risk RWAs from € 283 billion at the end of 2015 to € 308 billion at the end of 2016, which reflects the developments observed in lending but also the transfer of leasing activities to which a high risk-weight was applied.

TABLE 2 BREAKDOWN OF TIER I CAPITAL AND RISK-WEIGHTED ASSETS
(consolidated end-of-period data, in € billion, unless otherwise stated)

	2010	2011	2012	2013	2014	2015	2016
Tier I capital	57.8	56.5	55.9	55.6	53.6	55.1	60.0
composed of:							
Core Tier I capital	50.9	49.8	51.4	52.1	–	–	–
Hybrid capital	6.9	6.6	4.5	3.5	–	–	–
Common equity Tier I capital	–	–	–	–	51.7	53.3	58.1
Risk-weighted assets	372.5	373.8	352.7	339.4	350.0	345.4	369.5
composed of:							
Credit risk	322.8	312.9	301.0	287.7	290.1	282.8	308.1
Market risk	10.7	21.9	16.6	9.9	7.3	9.5	6.1
Operational risk	35.1	35.2	35.0	34.2	34.9	36.0	38.7
CVA	–	–	–	–	8.2	6.9	5.5
Other[1]	3.9	3.8	0.1	7.6	9.5	10.3	11.0
Tier I capital ratio (in %)	15.5	15.1	15.9	16.4	15.3	16.0	16.2
Core Tier I capital ratio (in %)	13.7	13.3	14.6	15.3	–	–	–
Common equity Tier I ratio phased-in (in %)	–	–	–	–	14.7	15.4	15.7
Common equity Tier I ratio fully-loaded (in %)	–	–	–	–	–	14.8	15.2
Leverage ratio phased-in (in %)	–	–	–	–	4.7	4.8	5.5

Source: NBB.
(1) This item includes the 5-percentage-point add-on to the risk weight applied to Belgian mortgage loan exposures by banks using the IRB approach.

At the same time, common equity Tier 1 capital (CET1) went up from € 55 billion to € 60 billion, reflecting the transfer to capital of the high profits recorded during the year, as well as intra-group capital transfers related to the transfer of a foreign bank's leasing activities to its Belgian entity. These positive developments more than offset the overall negative impact of the phase-out of Basel III transitional measures.

Belgian banks' CET1 ratio was slightly up at the end of 2016, at an average 15.7 %, compared to 15.4 % at the end of 2015. As of 2016, the Capital Requirements Directive (CRD IV) prescribes the gradual implementation of various add-on buffers. The capital conservation buffer, which consists of a fixed margin on top of the required minimum, was set at 0.625 % for 2016 and will gradually rise to 2.5 % by 2019. A countercyclical buffer will need to be activated in the event of excessive lending growth in the economy – this was set at 0 % in Belgium in 2016. Lastly, add-on buffers were imposed on eight banks within the framework provided by CRD IV, as these banks have been designated as systemically important in Belgium. The Directive also envisaged a gradual phasing-out of transition measures by 2018. If CRD IV had been fully in place in 2016, CET1 ratios would have merely edged down to 15.2 %, which is still a respectable level. It is nevertheless important to note that, for many banks, the phasing-out of transition measures led to an increase in CET1 capital as mark-to-market gains on AFS instruments are gradually taken into account. Depending on the future movement of interest rates, among other things, these gains could be reduced or disappear, thus weighing on regulatory capital buffers. Belgian banks, on average at least, occupy a comfortable solvency position that should allow them to absorb potential negative solvency shocks.

3. Insurance sector

For the Belgian insurance sector, the year 2016 was marked by the introduction of the Solvency II prudential framework and some notable company-specific strategic decisions and restructuring operations. In the context of a further fall in interest rates to record low levels (in the third quarter of the year), many companies undertook a strategic review of their activities and a few of them decided to put all or part of their business into run-off. These changes focused almost exclusively on the life insurance business and they reflect the difficult operating environment for life insurance in Belgium. Other companies switched their internal structure from a subsidiary to a branch. Some companies also undertook actions to strengthen their capital position.

3.1 Balance sheet and solvency under the new Solvency II regime

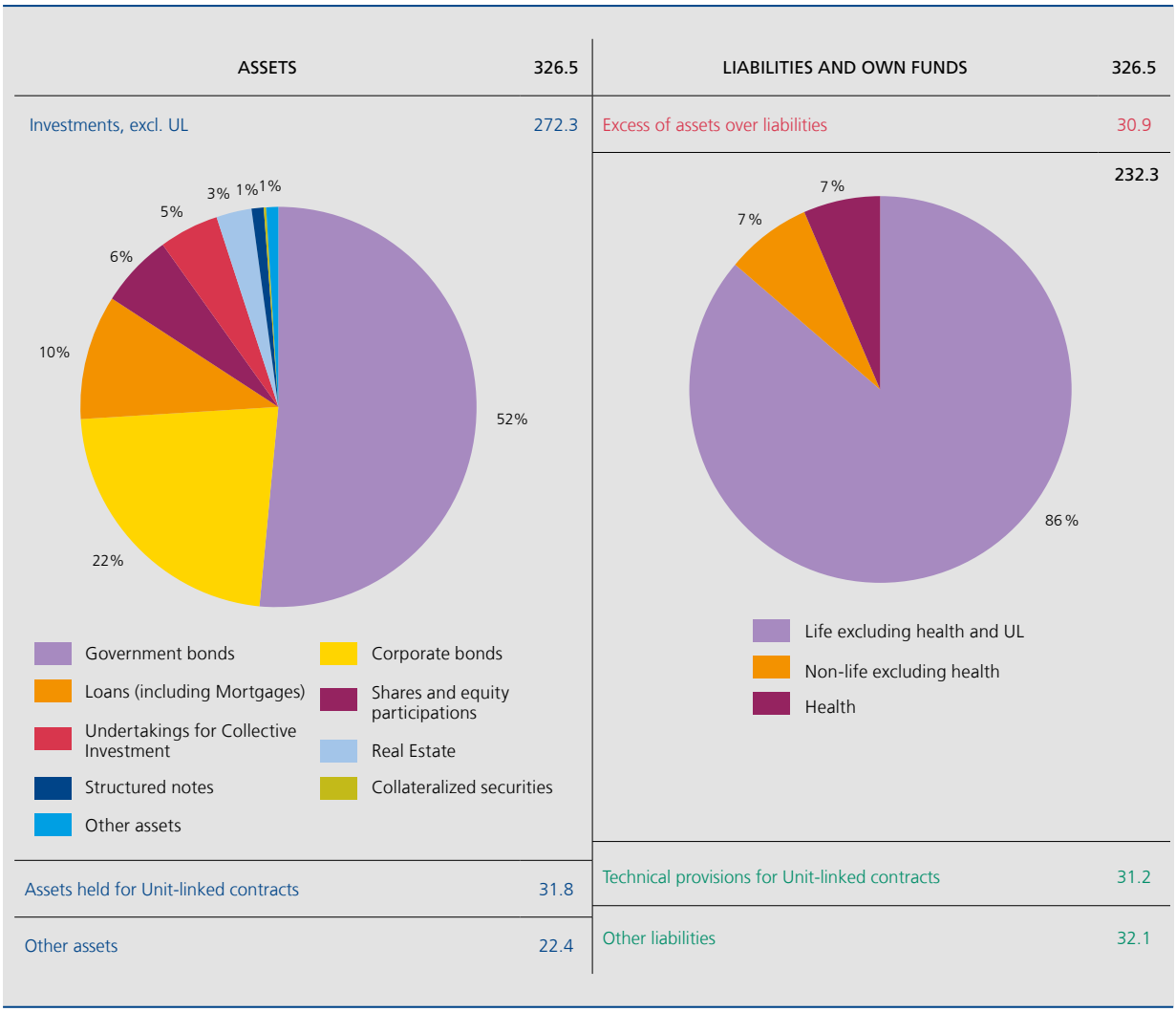
On 1 January 2016, the Solvency I framework was replaced by Solvency II, which constitutes a fundamental reform of the prudential solvency regime for the insurance sector. Under Solvency II, assets and liabilities are valued at market or market-consistent prices and the insurance company's own funds are defined as the difference between these assets and liabilities measured at market value. At the end of 2016, the balance sheet total measured as such amounted to € 326.5 billion (chart 11).

In line with the Solvency II rules, assets are valued on the basis of quoted market prices where available, while the fair values of other assets are calculated on the basis of assumptions reflecting market conditions, interest rates, the probability of events etc. As shown in chart 11, the investment portfolio of Belgian insurance companies – excluding the assets held for unit-linked class 23 contracts – is dominated by government bonds (52 %) and corporate bonds (22 %), which together account for almost three-quarters of total investment. The total market value (based on market prices or market-consistent valuation) of this investment portfolio amounted to € 272.3 billion at the end of 2016. Section 3.3 below will provide further details about this main component of the Belgian insurance sector's balance sheet.

The balance sheet identifies assets and liabilities related to the unit-linked or class 23 life insurance contracts separately. When analysing the financial stability risks facing the insurance sector, it is indeed important to distinguish between two classes of life insurance (class 23 and other classes). The great majority of life insurance premiums – for both individual and group policies – are collected on contracts under which the insurer bears at least part of the risks relating to financial market developments. The other life insurance policies with variable capital, better known as class 23 products

CHART 11 MAIN COMPONENTS OF THE BALANCE SHEET

(non-consolidated data, at the end of 2016, in € billion)



Source: NBB.

or unit-linked products, are comparable to mutual investment funds, since the policy-holders/investors bear all the investment risks. The assets covering these class 23 insurance policies were worth € 31.8 billion at the end of 2016 and they are mainly made up of undertakings for collective investment (UCIs).

Insurance companies' liabilities are mainly technical reserves (for which actual market values are not available) and the value of these reserves is the present value of the incoming and outgoing financial flows, calculated on the basis of the discount rate. At the end of 2016, the value of the Belgian insurance sector's technical provisions, excluding unit-linked contracts, amounted to € 232.3 billion, shared between technical provisions for life insurance activities (86 %, excluding health insurance contracts similar to life insurance), non-life activities (7 % without health insurance similar to non-life) and health insurance 7 %. The discount rates that must be used to calculate the present value of the projected incoming and outgoing cash flows are set by the European Insurance and Occupational Pensions Authority (EIOPA) and are based on market-based swap rates for maturities up to 20 years (the 20-year maturity constituting the so-called last liquid point) and an extrapolation towards the ultimate forward rate of 4.2 % for maturities beyond 20 years. Due to this link with market interest rates – albeit only partial and increasingly weaker for maturities beyond 20 years due to the extrapolation towards the UFR –, the estimated value of the technical reserves is sensitive to changes in the overall level of interest rates and will be higher when market interest rates are lower, all other things being equal. Lower interest

rates can therefore also put pressure on the value of a company's equity if the higher value of the liabilities is not fully matched by an equivalent increase in the value of the assets.

In order to smooth the transition towards the new regulatory framework, Solvency II has put in place transitional measures, some of which will apply until 2032, by which time the balance sheet position of insurance companies will be fully estimated at market value. The transitional measure under Solvency II concerning technical provisions allows insurers to spread over a 16-year period, in a linear fashion, the changeover from the calculation of the technical provisions under the Solvency I rules to the Solvency II rules. This transitional measure can only be used with the supervisor's prior approval and, furthermore, it only applies to insurance and reinsurance liabilities existing as at 1 January 2016. So far, in Belgium, the Bank has only authorised one undertaking to use the transitional arrangement for technical provisions.

These transitional measures are supplemented by other adjustments in the case of long-term insurance contracts, such as life insurance or disability insurance, for which interest rate levels and changes in interest rates could have a major impact on the economic value of the balance sheet, since the potential long-term liabilities generally have a maturity that is longer than the associated financial investments. The long-term guarantee (LTG) package of Solvency II thus partly corrects the above-mentioned mark-to-market principle by defining the way long-term products will be valued under Solvency II under certain circumstances – and subject to the approval of the supervisor –, allowing insurers to not recognise the full extent of short-term volatility in asset prices. These LTG adjustments include the matching adjustment (a mechanism, subject to supervisory approval, that prevents changes in the value of assets caused by market movements in the spreads of these assets) and the volatility adjustment (which covers insurance products that would not be eligible for the matching adjustment). The volatility adjustment is an artificial spread, determined by EIOPA, that is added to the risk-free rate curve used by companies to calculate their technical provisions, to compensate for the change in spreads on the assets side. When spreads widen, the volatility adjustment increases as well and, as it raises the discount rate, it reduces technical provisions. It has a countercyclical effect, because when assets are hit by a spread shock, the shock is partially absorbed by a reduction in technical provisions to lessen the impact of the spread shock on own funds. No approval is needed by the Bank to use the volatility adjustment, but insurance undertakings have to inform the Bank before using it.

As the UFR of 4.2 % could be considered too high compared to the current level of long-term interest rates, EIOPA published a Consultation Paper in April 2016 on the methodology for deriving the UFR and its implementation, which may lead to a future reconsideration of its level, probably with a phase-in period. The impact of such a measure would be limited as long as only the UFR level is reviewed; when combined with an extension of the last liquid point to a maturity beyond 20 years, the impact would be more significant. Such a revision of the last liquid point is not yet on the agenda at EIOPA.

For the Belgian insurance sector, the difference between the market value of assets and liabilities – the so-called excess of assets over liabilities – amounted to € 30.9 billion at the end of 2016. This excess of assets over liabilities constitutes a key element of the regulatory own funds under Solvency II. Total eligible own funds under Solvency II are indeed obtained by adding to this key component the other eligible forms of own funds that comply with the rules concerning the definition of Tier 2 and Tier 3 capital.

The solvency capital requirement (SCR) is the minimum level of eligible own funds that insurance companies must have in order to be able to absorb significant losses and therefore guarantee to the policy-holder that the company is sound and will fulfil its commitments. The requirement is determined to ensure that the own funds of the company cover its risks with a probability of 99.5 % under a one-year horizon. In accordance with Solvency II rules, insurance companies can either use a standard formula to calculate the SCR or an internal model with the approval granted by the supervisor. Undertakings using an internal model have their own methodology for calculating their SCR (see Box 2 for some additional information on the use of internal models under Solvency II). Under the standard formula, the approach is the same for all companies and the solvency capital requirement is calculated by aggregating pre-defined risk categories, called risk modules. To take into consideration the potential simultaneous realisation of the risks, the aggregation is done using correlation matrixes. Companies using internal models must provide the SCR information under both the standard formula and the internal model, the latter being the one with which the company has to comply with.

Box 2 – Use of internal models under Solvency II

Conditional on approval by the supervisor, insurance companies can opt to calculate their regulatory capital requirements under the Solvency II prudential framework on the basis of an internal model. The internal model can cover the whole calculation of the SCR (full internal model) or only some specific modules of the SCR (partial internal model). Its use allows for greater effectiveness on several fronts but its implementation, very demanding in terms of resources, has discouraged many potential interested undertakings. In Belgium, only two insurance companies apply a full internal model while four use a partial internal model (out of 68 undertakings). However, this represents a significant share in terms of size of the companies, as around 40 % of the sector's total SCR is calculated with a partial or full internal model.

When undertakings use an internal model to calculate their solvency capital requirement, it has to be calibrated to match a 99.5 % value at risk (one-year horizon). It means that the SCR will cover losses in 99.5 % of the cases. It is the same definition as the standard formula, except that the latter does not necessarily fit the company profile. In order to calculate their SCR with an internal model, Belgian insurance undertakings first need the approval of the Bank.

As part of the supervisory reporting for prudential purposes, insurance companies have to report a detailed list of their financial investments and the reporting quality needs to satisfy the requirements of the Solvency II Directive in order to ensure a correct computation of the solvency requirements. Box 3 provides some additional details on this important issue of data quality and the ways in which it has been cross-checked for the Belgian insurance sector against other data sources.

Box 3 – Verification of data quality of Solvency II reporting

The Pillar 3 reporting requirements under Solvency II distinguish between qualitative and quantitative reporting. The latter is based on a set of templates (QRTs) to be submitted at different frequencies and includes mainly the balance sheet, own funds, assets (also on a look-through basis), derivatives (including transactions), premiums, the solvency capital requirement, the minimum capital requirement and the technical provisions.

For the supervisor, insurance data quality is a regulatory issue especially in light of the explicit link between data quality and capital requirements. For this reason, several processes have been developed to verify the data submitted. Efforts have been focused on the QRT list of assets which contains very detailed information on assets with 27 items of information on each individual security and 16 on each position held. Cross-template checks between the lists of assets and derivatives and the balance sheet have been performed, while consistency and completeness validation rules for some reported key cells of the assets lists have been drawn up.

Statistical sources like the CSDB (Centralised Securities Database), the ECB financial institutions lists etc. have been used to validate the data submitted. In order to assess the acceptability of the complementary identification code (CIC), the securities reported by ISIN codes have been mapped with the securities features stored in the CSDB. While most of the bonds are registered in the CSDB, equity and funds are not totally represented, particularly non-listed shares and internal funds. The CIC code assessment using statistical data was easier to perform for government bonds, equity and funds than for corporate, structured, and collateralised bonds because there is not just one correct CIC code for any specific asset of these latter categories. This multi-allocation allows undertakings to decide which risk is the most representative from their perspective but compounds the difficulty of validating the data submitted. Furthermore, the CSDB provides more granular data making it possible to cross-check a lot of information

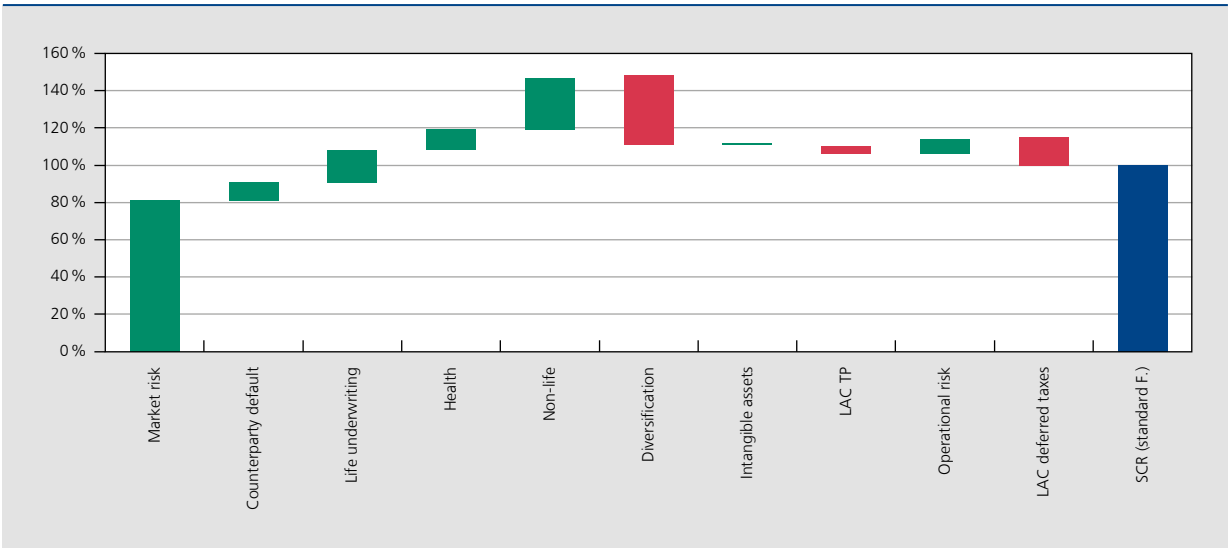
items such as the country of issuance, the credit rating, the institutional sector etc. In this connection, corporate bonds reported as sovereign guaranteed bonds without capital requirement have been identified and controlled for.

Chart 12 depicts the main components of the solvency capital requirement, based on the standard formula for the Belgian insurance sector including companies with internal models. On average, the largest component of the SCR is market risk with 80 % of the final SCR. It is especially important for life insurance companies, as it mainly covers the risks related to investments, including spread risk, equity risk, interest rate variation risk, property risk, etc. In line with the results of the stress test performed by EIOPA (see section 3.4), spread risk is particularly relevant for insurance companies. It covers for example the impact of wider spreads on corporate bonds for the level of insurance companies' own funds. As bonds account for more than 70 % of their assets, the instability of spreads can obviously have a strong impact on the solvency position of insurance companies. In the standard formula, each category of assets has a solvency capital requirement that depends on their characteristics. For bonds, the SCR depends on both duration and the credit quality step (bonds issued by European governments have no solvency capital requirement in the standard formula). Real estate for own use and property investment have both a capital requirement of 25 %. For equity investment, it depends on market index trends and in such a way that it acts as a countercyclical buffer (capital requirements are lower when equity market indices are low and vice versa). Mortgage loans can be treated under counterparty risk if they meet a list of criteria and under this methodology, the solvency capital requirement for this asset class can be significantly lower than what banks must hold under the Capital Requirements Regulation.

In terms of impact, after market risk follow risks related to non-life activities (28 % of final SCR). The impact of correlation matrices, that are used to aggregate the different modules of the SCR, forms the "diversification" and this leads to a reduction of 37 % compared to the final SCR. Further elements that allow a reduction of the SCR are the loss-absorbing capacities (LAC) of technical provisions (4 %) and of deferred taxes (15 %). The first LAC reflects the fact that insurance companies will reduce profit participation in the event of a shock, thereby reducing technical provisions. The LAC related to deferred taxes is supposed to take account of the drop in future taxes that the company will have to pay due to the lower profit it records following the adverse shock.

CHART 12 BREAKDOWN OF THE SOLVENCY CAPITAL REQUIREMENT INTO ITS MAIN COMPONENTS [1]

(non-consolidated data, on 1 January 2016, in percentage of the solvency capital requirement under the standard formula)



Source: NBB

(1) Components and breakdowns of the SCR according to the standard formula; for insurance undertakings using internal models, the values of the standard formula are being taken as if they were using it.

Table 3 provides more information on the development of the solvency capital requirement ratio (SCR ratio) since the implementation of the Solvency II regime on 1 January 2016. The SCR ratio shows the extent to which the total eligible own funds meet the SCR. With an average SCR ratio of 176 % in December 2016, the Belgian insurance sector appears well-capitalised and well placed to confront the challenge of a prolonged period of low interest rates. Considering that fluctuations in the SCR ratio can be driven by changes in the level of interest rates, the solvency ratio has indeed fluctuated over the year 2016 but it has been relatively stable on the whole. The resilience of the sector to the level of interest rates can be seen in the level of own funds (relatively high, in spite of the very low rates), while the capital buffer for a variation of interest rates is part of the SCR. However, this relatively good solvency at sector level disguises considerable divergence of solvency positions among individual insurance companies. While many insurance companies have largely sufficient own funds, a company-by-company analysis of solvency ratios also reveals weaker situations. Compared with the situation one year ago, at the time of the introduction of Solvency II, the solvency positions of some companies clearly improved. At that time, the Bank had requested the institutions concerned to take additional measures to comply with the solvency criteria. But the low interest rate environment combined with the new regulatory framework could lead to the restructuring of the weakest companies or an absorption by undertakings with stronger capitalisation. These developments have been followed very closely by the Bank. In particular, companies are expected to use their profits cautiously given the numerous challenges they face. In December 2016, insurance companies reported plans to distribute € 1.6 billion in dividends.

TABLE 3 MAIN COMPONENTS OF THE SOLVENCY CAPITAL REQUIREMENT RATIO IN 2016

(non-consolidated data for the year 2016, in € billion, unless otherwise stated)

	Day One	Month			
		03	06	09	12
Total eligible own funds	32.9	31.5	32.8	31.8	32.4
Solvency capital requirement	17.9	18.3	18.0	19.2	18.4
SCR ratio (in %)	**184**	**172**	**182**	**165**	**176**

Source: NBB.

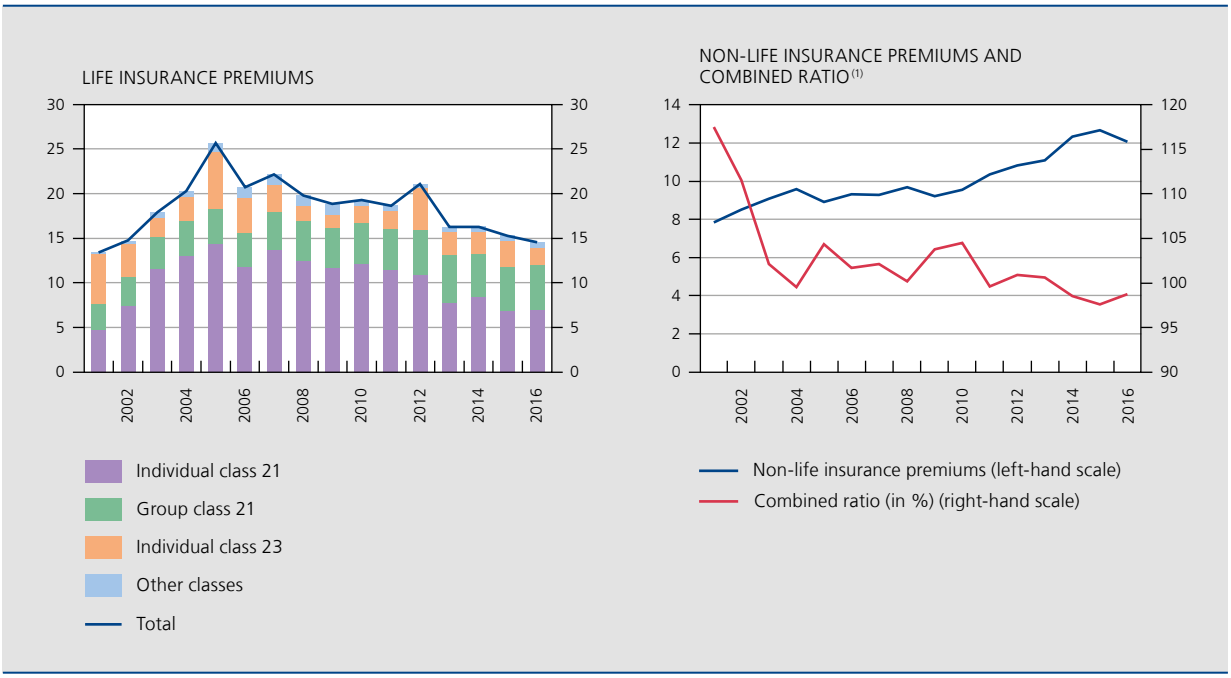
3.2 Premiums and profitability

The profitability of the Belgian insurance sector has been under growing pressure since 2012, resulting in a drop of the sector's net result to € 1.2 billion in 2015. In 2016, this net result stabilised at € 1.3 billion. The corresponding return on equity – which had averaged 20 % before the financial crisis – reached 9.8 % in 2016 versus 8.2 % in 2015.

In 2016, gross written life premiums only reached € 14.6 billion (chart 13). Disregarding the temporary surge in premium income in 2012 – which was mainly the result of premium payments brought forward given the increase, as of 1 January 2013, in the tax on new life insurance premiums from 1.1 % to 2 % –, the downward trend in life insurance premiums observed since 2005 does not yet seem to have come to an end. The main reasons for this continuous decline in life insurance premiums are the low yield environment (some high-guarantee products are no longer offered), the higher premium taxes and the non-renewal of a lot of maturing contracts concluded 8 years ago (the contracts' 8-year term is the minimum maturity for beneficial fiscal treatment). In the past, the renewal of 8-year contracts was frequent but that is no longer the case today. This trend reflects the overall drop in attractiveness of life insurance products and it is in this context that several insurance companies have announced they would stop selling traditional life insurance contracts with guaranteed rates. Unit-linked premiums amounted to 14 % of total life premiums of 2016, as such unable to stop the decline of the life insurance business.

CHART 13 PREMIUM INCOME AND COMBINED RATIO [1] FOLLOWING STATUTORY ACCOUNTS

(non-consolidated data, in € billion, unless otherwise stated)

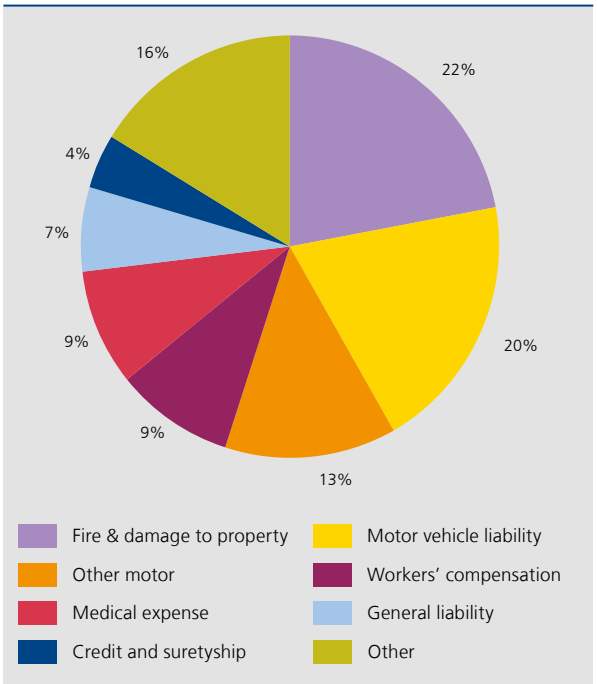


Source: NBB.

(1) The combined ratio is the ratio of the sum of the cost of claims plus operating expenses to net premium income.

CHART 14 BREAKDOWN OF NON-LIFE INSURANCE PREMIUM INCOME

(non-consolidated data, in % of total)



Source: NBB.

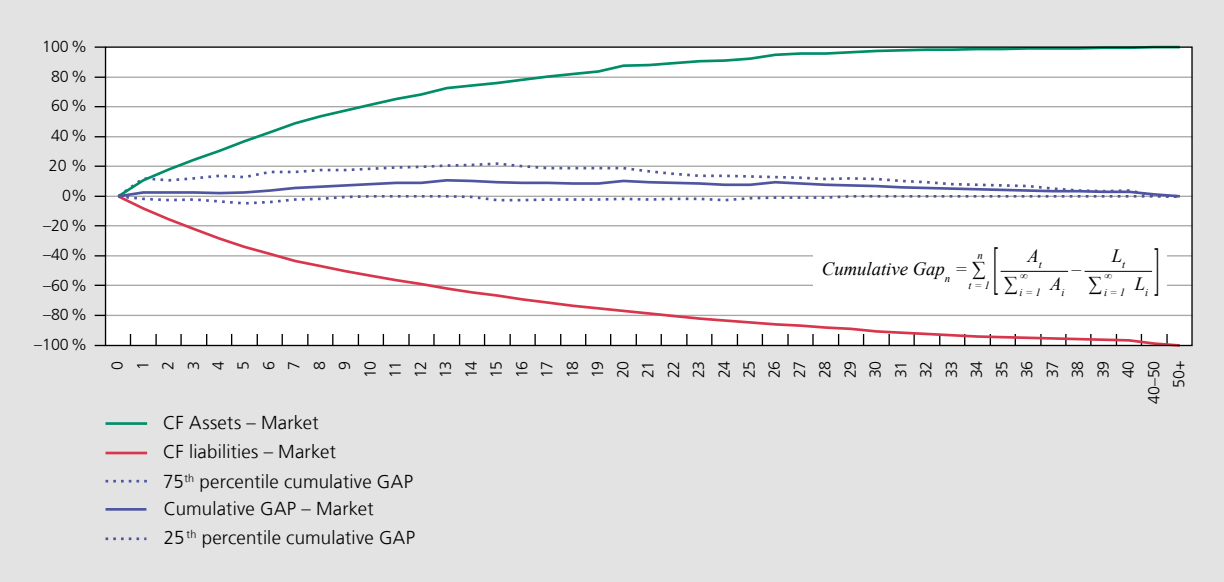
The insurance premiums in the non-life business amounted to € 12.1 billion in 2016. The combined ratio remains below, but close to, 100 %. According to the premium information available in the new Solvency II reporting, non-life insurance premiums stemming from vehicle-related business represents the largest share of non-life insurance premiums with 33 %, divided between motor vehicle third-party liability insurance and other motor insurance (e.g. comprehensive insurance) with respectively 20 and 13 % (chart 14). Fire and damage to property accounts for 22 % of non-life insurance premiums.

3.3 Life insurance legacy, assets and reinvestment risk in a low interest rate environment

Under a solvency regulation where both assets and liabilities are valued at market value and are influenced by any variation in the interest rate curve, it is important for insurance companies to have an appropriate ALM strategy, and even more so in a low interest rate environment. Data gathered by the Bank through an *ad-hoc* data collection for interest rate risk show that the assets and liabilities in the Belgian insurance sector are relatively well matched. At sector level, the data for end-2015 show an average duration of assets and liabilities of 7.9 years and 9.4 years respectively, implying a negative duration gap of 1.5 years. As expected, the duration of assets is shorter than that for liabilities because the cash flows of the assets are on average shorter.

CHART 15 CUMULATIVE FIXED-INCOME ASSET AND LIABILITY CASH-FLOW SCHEDULES (1)

(non-consolidated data, in % of total)



Source: NBB.

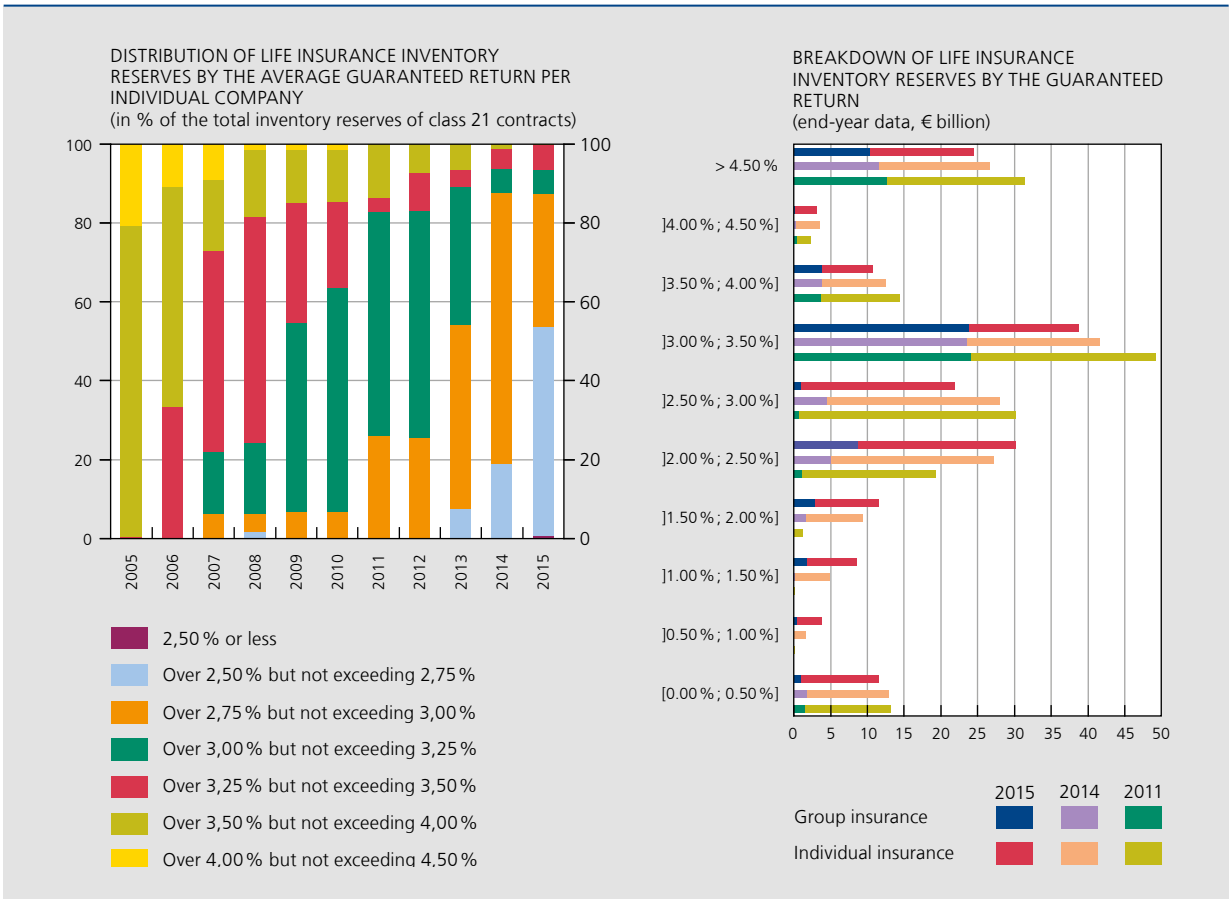
(1) Under the assumption of balance sheets in run-off. Sector distribution information added for the gap measure.

Chart 15 shows the cumulative asset and liability cash-flow schedules, this is the evolution of the maturing fixed-income assets and liabilities over the next (50+) years under the assumption of a balance sheet in run-off. The upper curve (green) depicts the cumulative cash flow of assets over time, while the lower curve (red) provides the same information for liabilities. On average, the assets start to mature somewhat faster than the liabilities, as for instance after 10 years, 61 % of assets will have matured but only 53 % of the fixed-income liabilities, resulting in a gap of 8 %, which is represented in the chart by the blue line. The distribution of the cumulative gap (25th and 75th percentile) shows that the extent of asset/liability mismatches varies between insurance companies. For a quarter of the companies, this gap reaches 18 % or more. The net economic value and profitability of insurance companies with a comparatively large gap is more sensitive to a low interest rate environment. This sensitivity comes from the fact that maturing assets will have to be rolled over in new financial investments to match the cash-flow profiles of all outstanding liabilities, exposing the insurance company to reinvestment risk. This reinvestment risk could materialise especially if the current low interest rate environment were to persist for a long period.

The stock of life insurance policies offering guaranteed rates of return and the level of these guaranteed rates of return are particularly important risk parameters for insurance companies when risk-free interest rates fall to very low levels, as has happened in the recent period. Chart 16 provides more information on the structure of the guaranteed rates of return on life insurance policies, giving the situation at the end of 2015. At that time, the Belgian insurance sector still had large numbers of contracts offering high guaranteed rates of return for policy-holders. These liabilities are to a significant extent the legacy of contracts concluded a long time ago, in most cases guaranteeing these rates of return on future premiums as well.

CHART 16 DISTRIBUTION OF CLASS 21 LIABILITIES WITH GUARANTEED RATES OF RETURN

(non-consolidated data, in € billion, unless otherwise stated)



Source : NBB.

Analysis of the data broken down by contract in the right-hand panel of chart 16 reveals that contracts concluded in the past and still offering a guaranteed return of more than 4.5 % came to € 24.5 billion, or around 15 % of the inventory reserves. The comparable figure for 2014 was € 27.4 billion and for 2011 € 31.3 billion. In the 1990s, insurance companies had tended to offer their customers a guaranteed rate of return of 4.75 %, which was the statutory ceiling in force up to the end of June 1999. In July 1999, this ceiling was reduced to 3.75 %. Most liabilities related to class 21 group insurance contracts are associated with a guaranteed rate of return of at least 3 %, because insurance companies, spurred on by competition, tended to offer a guaranteed yield on these policies that was at least in line with the minimum rates that companies sponsoring group insurance policies had to guarantee then on employer (3.25 %) or employee (3.75 %) contributions according to the 2003 Law on the supplementary pension system (second pillar). The maximum reference rate for long-term life insurance contracts was cut to 2 % in early February 2016, from 3.75 %, and will be kept at the same level in 2017. From 1 January 2016, employer-guaranteed returns on supplementary pensions were set at 1.75 % for member and employer contributions. Without these cuts, employers might well have scrapped

the supplementary pension system altogether as they would have been in the same position as insurers and unable to pay the guaranteed returns. In the case of individual insurance, the inventory reserves relating to contracts with a guaranteed rate higher than 2.5 % fell by 13 % between end 2014 and 2015 in favour of contracts offering a lower rate of close to 2.5 %.

The left-hand panel of chart 16 analyses the same data, but broken down by company rather than by contract. It focuses on the average guaranteed rate of return offered by each individual insurance company, taking all class 21 life insurance contracts together. The chart confirms that, for some years now, insurance companies have adapted to the lower interest rate environment by offering contracts more in line with market conditions, resulting in a decline in the average guaranteed rates of return. At the end of 2015, around 93 % of the class 21 inventory reserves were held by insurance companies offering an average guaranteed return of 3.25 % or lower, whereas in 2005, hardly any companies had an average guaranteed rate of return lower than 3.5 %. More than 50 % of the inventory reserves was held by companies where this average rate has dropped to 2.75 % or lower.

Life insurance companies have succeeded in reducing their average guaranteed rate of return by lowering the guaranteed rates of return for new life insurance premiums, including for a large number of policies providing only a capital guarantee while offering a larger range of profit-sharing rates and mechanisms. However, the biggest reduction in the interest rate risk for insurance companies resulted from injecting greater flexibility into setting the guaranteed rate of return. Whereas, in the 1990s, the guaranteed rate of return prevailing at the time of conclusion of the contract generally also applied to all future premiums, most of the contracts concluded during the past decade have only guaranteed the rate of return prevailing at the time of collection of the premium, so that the guaranteed rate of return can be adjusted according to changing market conditions. Some of these contracts also offer policy-holders more flexibility, allowing them to terminate their policies more easily or to scale them down without incurring heavy penalties. That means that some insurance companies are exposed to a greater risk of surrender or cancellation, especially if interest rates rise strongly. In those circumstances, they would face a choice between raising the rate of return on their contracts or accepting a cut in their volume of business. In both cases, that would impair the profitability of class 21 life insurance policies.

At the end of 2015, the average guaranteed rate of return on class 21 contracts was 2.82 %, down from 2.91 % at the end of 2014 (table 4). This rate has gradually decreased since the end of 1999 when it was at 4.5 %. Prudential rules oblige insurance companies to book additional annual provisions, the so-called flashing-light provision, in their accounts to ensure they can meet their liabilities despite low interest rates. The total reserved amount in the provision, for which no exemptions for the requirement have been granted since 2013, stood at € 6.6 billion at the end of 2015. The provision requirement stayed in place over the period of the transition to Solvency II and these additional provisions will also need to be topped up under Solvency II unless a conditional exemption is granted (renewable annually).

TABLE 4 AVERAGE GUARANTEED RETURNS IN LIFE INSURANCE AND ADDITIONAL PROVISIONS

(non-consolidated data, in %, unless otherwise stated)

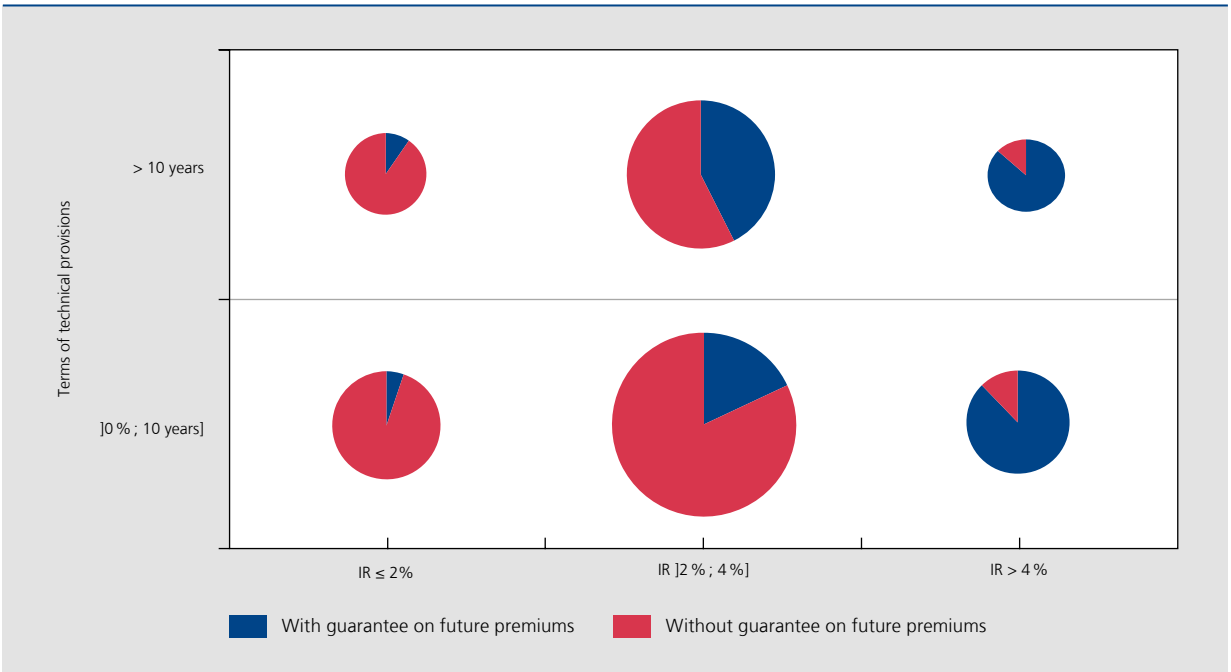
	2011	2012	2013	2014	2015
Average guaranteed returns on existing contracts	3.17	3.12	3.04	2.91	2.82
Group insurance	3.59	3.54	3.41	3.25	3.19
Individual insurance	3.01	2.95	2.88	2.72	2.64
Additional provisions (in € billion)	**2.5**	**3.0**	**4.1**	**5.5**	**6.6**

Source: NBB.

To what extent the insurance companies will be able to further reduce the average guaranteed return on existing contracts will also depend on whether the contract guarantees the minimum rate of return on future premiums or not. Chart 17 provides more information on this aspect of the legacy of life insurance contracts with guaranteed rates of return. Contracts offering high guaranteed rates of return for policy-holders in many cases also guarantee these rates of return on future premiums as well, and this is even more so the higher the guarantee. Chart 17 indicates that the vast majority (87 %) of contracts offering a guaranteed return higher than 4 % guarantees this return on future premiums as well. Other things being equal, contracts offering high minimum returns with a long maturity bear the greatest burden when it comes to profitability and solvency. Indeed, until the maturity of the contracts, they will generate a high cost with a potentially strong impact on profitability. As regards solvency, since the interest rate used to update the future cash flow is no longer the interest rate on the contracts, but the risk-free interest rate, the market-consistent valuation of those particular contracts plays a more important role under Solvency II when compared Solvency I.

CHART 17 BREAKDOWN OF LIFE INSURANCE TECHNICAL PROVISIONS ACCORDING TO LEVEL, MATURITY AND FUTURE PREMIUM COVERAGE OF THE MINIMUM GUARANTEED RATE OF RETURN (1)

(non-consolidated data for the end of 2015, in % of total)



Source : NBB.

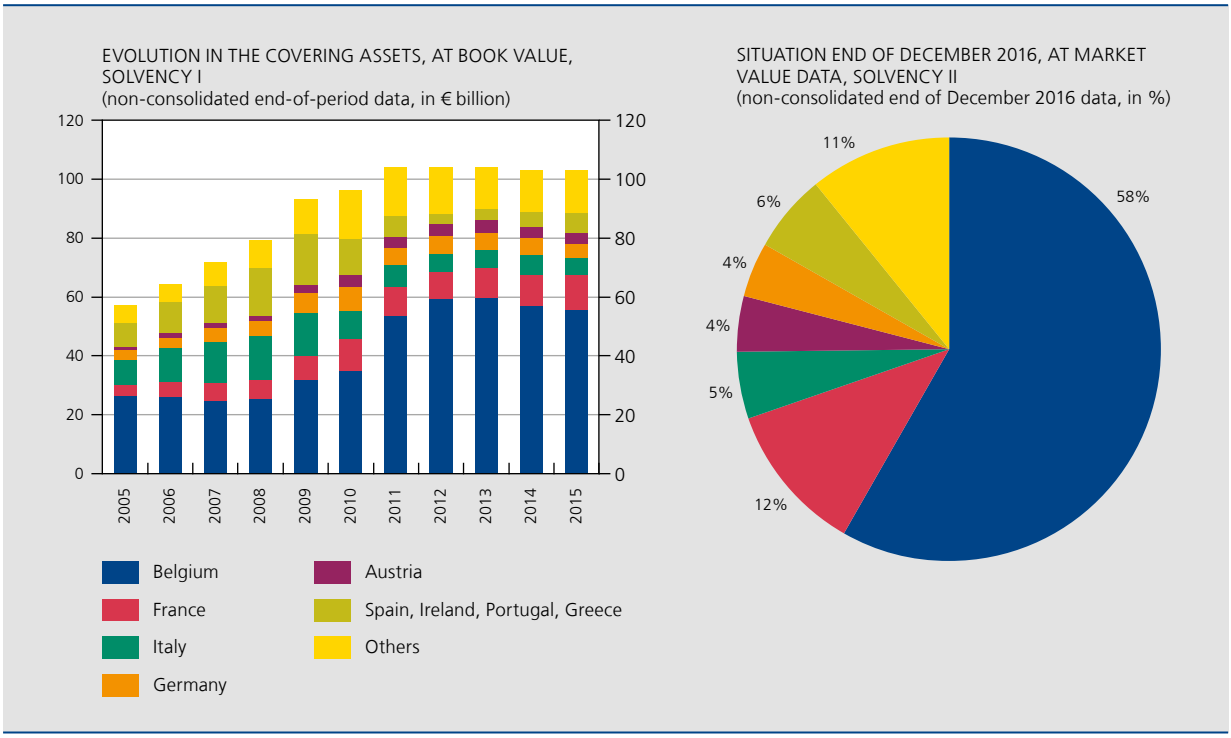
(1) The relative size of the circles reflects the relative size of the technical provisions broken down by the terms of technical provisions and the guaranteed interest return. In addition, each portfolio is broken down by the presence or not of an additional guaranteed rate on future premiums.

This unfavourable structure of the stock of life insurance policies with guaranteed rates of return prompted some insurance companies to take non-conventional measures in the form of buy-back operations of technical provisions with an incentive. They were held among others by Axa Belgium and Ethias for respectively the crest20 and First A accounts. During the year 2016, the surrender of life insurance contracts, including buy-back operations as well as any other traditional surrender, amounted to € 7 billion, accounting for 4 % of the life technical provisions (Solvency I) at the end of 2015. This has had a positive impact on interest rate risk, by reducing reinvestment risk, and it has often also had a positive impact on solvency positions (under Solvency II) because in the current context of low interest rates, the surrender value paid by insurance companies is often lower than the market value of the contract, especially those that guaranteed high rates of return.

Due to the sharp fall in long-term interest rates, the long-term profitability of the remaining insurance contracts with a guaranteed rate of return could come under considerable pressure in those insurance companies that have not fully matched assets and liabilities for these contracts. Low interest rates for risk-free assets and the associated reinvestment

risk could indeed put severe pressure on the profitability and solvency position of these companies, and in turn trigger a search for yield exposing the company to higher risks of market shocks and losses on the assets side. Given the low return of traditional investments making up the insurance companies portfolio, several undertakings do seem to have started shifting their strategic asset allocation toward higher-return assets. Given the current very low level of many risk premiums, the risk taken on by these companies may not always be sufficiently rewarded. As assets invested by insurance companies have long-term maturities, the evolution of the portfolio is slow and proportional to asset maturities. However, over a number of years, the weight of government bonds in the investment portfolios has declined in favour of a growing share of other investments. As was shown in chart 11, in December 2016, € 201.6 billion were invested in bonds, allocated among government bonds (€ 140.4 billion) and corporate bonds (€ 61.2 billion). The amount held as cash and deposits is also declining in comparison with last year. In reference to the allocation of assets at the end of the year 2015, the main beneficiary is the investment in loans (including mortgage loans) which shows a continual increase for several years. By the end of 2016, they accounted for no less than € 27 billion or 10 % of all investments. These investments are less liquid and offer higher returns than traditional government bonds. As insurance companies' business models normally do not require as much liquidity as banks do, some insurance companies might consider that they can take advantage of illiquidity premiums for some asset classes. While such a development reflects the diversification of insurance companies' investments, it can also be interpreted as an initial sign of a "search for yield". An increasing exposure to illiquid assets may also raise liquidity risks, which could emerge if there is a rapid and abrupt rise in interest rates for instance. As better-yielding alternatives become available on the market, some policy-holders might be tempted to surrender the contracts that offer a low return in order to enter into a new contract with a higher interest rate provided there is no contractual or fiscal clause that would discourage them to do so, which is often the case. In fact, for the stock at the end of December 2015 for example, only around one-quarter of life technical liabilities seemed at risk of surrender as policy-holders of the remaining contracts had no incentive to surrender. Therefore, for the majority of insurance undertakings, the risk of a rise in surrender rates following an interest rate increase remains contained. But not all companies are immune to this risk, and should interest rates increase at a strong pace, this will be closely monitored by the Bank.

CHART 18 GEOGRAPHICAL BREAKDOWN OF THE PUBLIC SECTOR BONDS

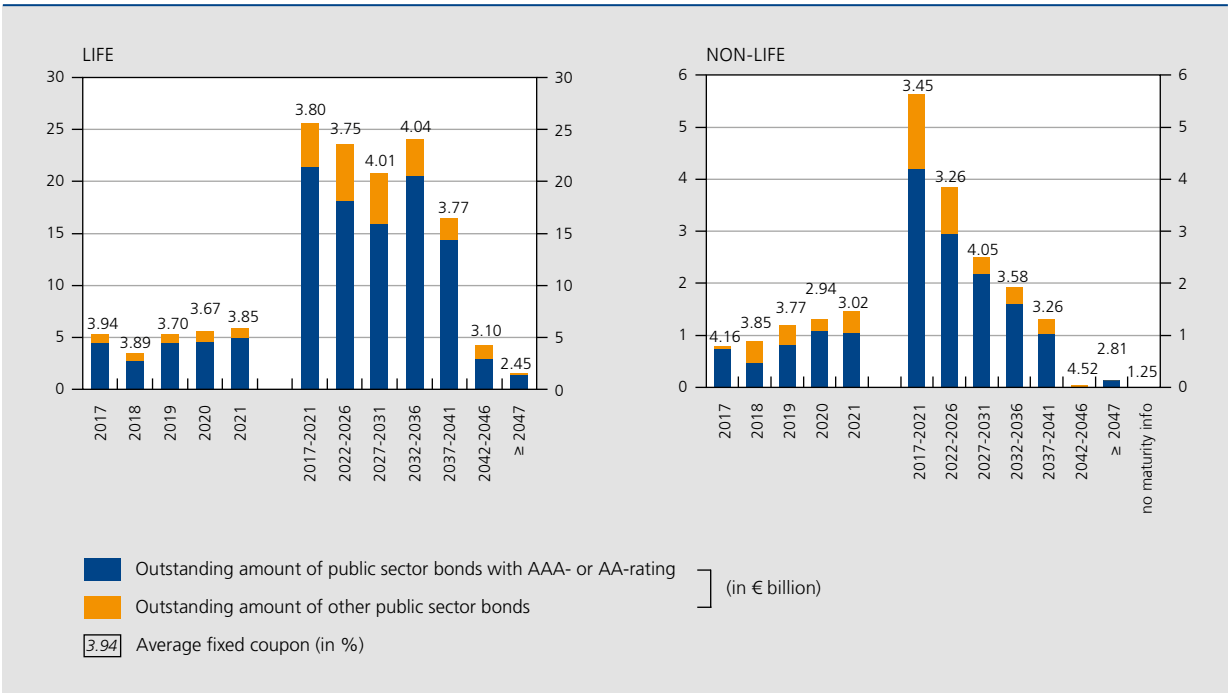


Source: NBB.

The reason for the still substantial presence of government bonds in the investment portfolios held by life and non-life insurance companies is that, in the past, these bonds were regarded as risk-free assets owing to the very low probability of default. In addition, government bonds are available in a wide range of maturity dates (from 1 year to 30 years and sometimes longer), widening the scope for matching the typically long-term liabilities in the life insurance business. Charts 18 and 19 and table 5 provide more detail on the composition and main features of insurance companies' investment in fixed-income instruments issued by public sector entities. The analysis is based on detailed information on the individual financial securities included in the public sector bond portfolio, combined with data on the ratings of the individual bonds and their issuance date, maturity date, coupon rate, currency, etc., as available in the Centralised Securities Database. By mapping the maturity profile and coupon rates of public sector bonds in the portfolio, it shows the amounts that insurance companies may have to reinvest in coming years at yields that may be lower than the maturing coupon rates if the current low interest rate environment were to persist.

A breakdown of public sector bonds by issuing country (chart 18) shows that the insurance sector maintained its high investment in Belgian government bonds in 2016, after the major reallocations that took place between 2010 and 2012 and that resulted in a significantly lower exposure to public sector bonds from peripheral euro area countries. At the end of the year under review, investment in government bonds in Italy, Spain, Ireland, Portugal and Greece – which had been scaled down markedly after June 2009 by bond sales or write-downs – reached a market value of € 8.3 billion. Investment in Spanish public sector bonds slightly rose while the exposure on Greece remained negligible. Belgian government bonds still accounted for 58 % of the total public sector bonds held in the insurers' portfolio at the end of last year (up from 34 % in 2009). This concentration exposes the insurance sector to idiosyncratic shocks as regards the sovereign risk premium on Belgian government bonds. In 2011, investment in Belgian government bonds rose by around € 21 billion. This major reallocation of exposures towards Belgium echoed developments in other countries, as insurance companies in many euro area countries showed a greater home bias as a result of the intensification of the euro area sovereign debt crisis. This shift in government bond investment towards the home country occurred at a time of relatively high yields on Belgian government bonds (OLOs), due to the prevailing political uncertainties at that time. In 2011, the ten-year OLO yield reached an average of 4.2 % (versus 3.4 % in 2010), even peaking at levels above 5 % in November. As a result, at the end of 2016, the average coupon on Belgian government bonds – accounting for € 81.6 billion in the insurers' portfolio – was still 4.35 %. A mechanical simulation shows that, all other things being equal, if these Belgian sovereign bonds were to be reinvested when they arrive at maturity at the

CHART 19 BREAKDOWN OF PUBLIC SECTOR BONDS BY YEAR OF MATURITY AND AVERAGE FIXED COUPON RATE



Sources: ECB (CSDB), NBB.

current low OLO yields, in line with the original lifetime of the matured OLOs, it will not be until 2026 that the total weighted average coupon of the OLO portfolio will fall below 3 % and 2032 before it drops below 2 %.

Chart 19 maps the credit rating composition, maturity profile and average coupon rates of the public sector bonds for both life and non-life insurance business. The investment-grade ratings account for approximately 96 % of the total book value of public sector bonds in life insurance. The other 4 % is composed of either speculative-grade bonds (0.5 %) or bonds without a rating (3.2 %). Public sector bonds with an AAA rating amount to € 12.0 billion or 9 % of the total. This largely reflects holdings of public sector bonds issued by Germany, the Netherlands and the United States and international financial institutions. Bonds with an AA rating are the largest category of total public sector bonds, accounting for € 101.3 billion or 72 % of total market value. This exposure is mainly the counterpart of the € 67.1 billion invested in Belgian AA-rated public sector bonds for the assets covering life insurance, but it also includes € 15.3 billion of AA-rated bonds issued by French public sector entities covering all businesses. Within the remaining investment-grade ratings of A and BBB, the main issuers behind the BBB-rated public sector bonds are Italy (€ 7.1 billion) and Spain (€ 5.4 billion). As regards the coupon rates and repricing risks, the left-hand panel of chart 19 shows that, in the coming years, Belgian life insurance companies may have to reinvest significant amounts of maturing AAA- and AA-rated bonds at yields that may be lower than the maturing coupon rates if the current low interest rate environment were to persist and if reinvestment of these assets were required in order to cover the related liabilities (i.e. for companies with a duration gap). For companies with no current mismatch between assets and liabilities, reinvestment of maturing assets would not be required in principle. While the data available suggest that the Belgian insurance sector's assets and liabilities are relatively well matched, the sector's duration gap averages 1.5 years. Reinvestment risks are thus present in many portfolios, though to very different degrees between individual companies. In this perspective, the information in chart 19 presents some scale of the reinvestment risks in a low interest rate environment – and in particular of the potential challenges related to the relatively high guaranteed rates of return on some life insurance contracts – even if these coupon rates are not necessarily a reliable indicator of the effective yield to maturity of these public sector bonds in Belgian insurance companies' covering assets. This yield to maturity depends not only on the coupon rate but also on the price at which the bond was acquired. Moreover, it disregards all other aspects of insurance companies' asset and liability management, including hedging policies, that need to be considered to arrive at well-informed conclusions about current investment yields and the associated reinvestment risks in a low interest rate environment.

For life insurance activities, the left-hand panel of chart 19 shows that, within the next five years, around € 25 billion of public sector bonds will come to maturity, accounting for 22 % of public sector bonds for life business. This € 25 billion includes € 21 billion of AAA- and AA-rated bonds, which are likely to be the most sensitive to downward repricing risks if the current low interest rate environment were to continue for a long time. For non-life insurance activities, the right-hand panel of chart 19 shows that around € 6 billion of public sector bonds will come to maturity during the first five years, representing 37 % of public sector bonds for non-life business. This € 6 billion includes € 4.2 billion of AAA- and AA-rated bonds. While the predominance of public sector bonds with an AAA or AA rating has limited the spillover of the euro area's sovereign debt crisis to the Belgian insurance sector, continuation of such an asset allocation may expose insurance companies to significant profitability pressures if maturing AAA and AA public sector bonds need to be rolled over in similar investments at the current historically low primary or secondary market yields on these bonds. However, as can be seen from chart 19, the Belgian insurance companies' public sector bond portfolio is well laddered in terms of maturities, in both life and non-life insurance activities. In life insurance, half the portfolio will not reach maturity until the end of 2028, suggesting that the entire public sector bond portfolio of the life business is repriced, on average, every 20 years. For non-life insurance activities, half of the portfolio will only come to maturity by the end of 2023, suggesting that the entire public sector bond portfolio of the non-life business is repriced, on average, every 12 years.

At the end of 2016, the average coupon on all the public sector bonds in life insurance covering assets was 4.3 %, about 10 basis points lower than at the end of 2012. As shown in table 5, this average is the result of a wide distribution of coupon rates on individual public sector bonds, where the bulk of them still carry a fixed coupon of more than 3 % (up to 6 %). The average remaining time to maturity of these bonds is still quite high, ranging from 10 years for bonds with fixed coupons between 3 % and 4 % and 14 years for bonds with fixed coupons between 4 % and 5 %. In non-life, the average coupon on all the public sector bonds around 4 % at end of 2016.

TABLE 5 COUPON AND MATURITY BREAKDOWNS OF THE PUBLIC SECTOR BONDS

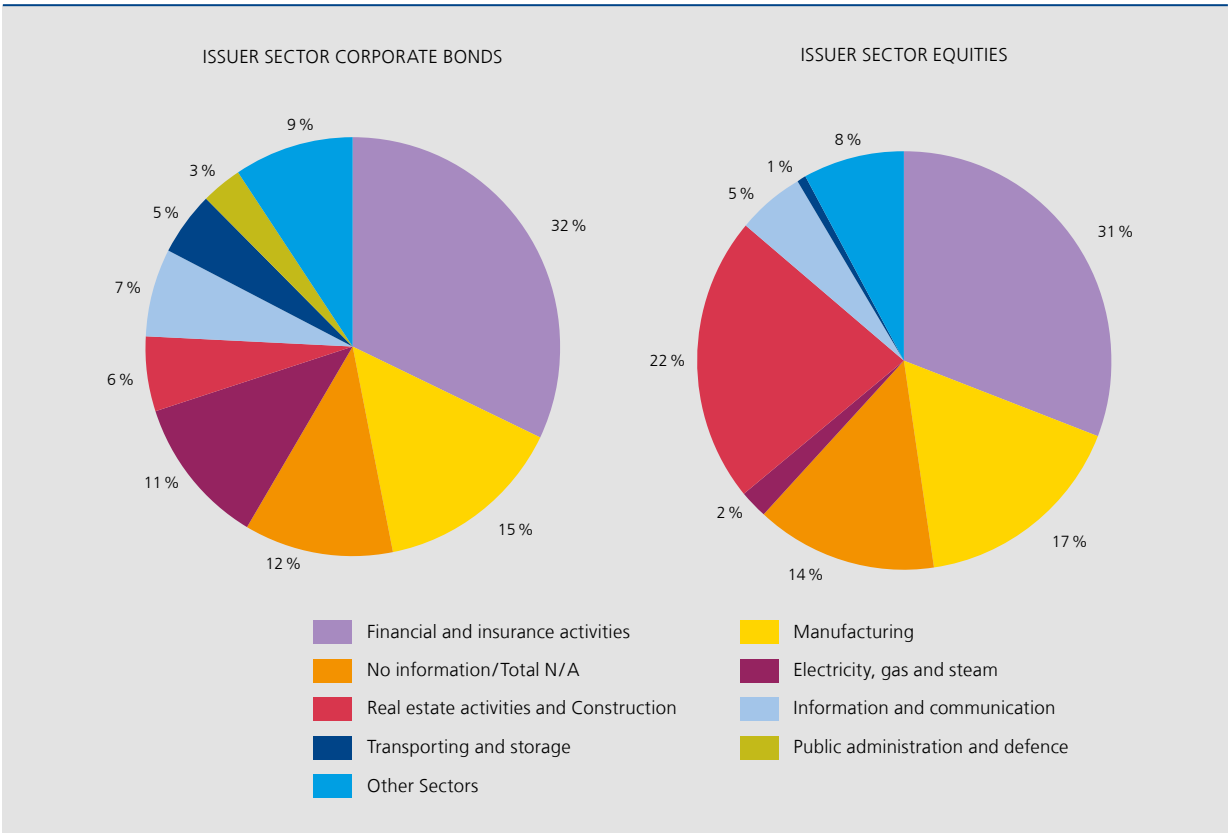
(non-consolidated data at the end of 2016, market values, in € billion)

	Life				Non-life			
	Amount outstanding	Average age	Average remaining time to maturity	Average maturity	Amount outstanding	Average age	Average remaining time to maturity	Average maturity
Zero-coupon bonds	10.3	14.9	12.9	27.7	0.1	14.3	9.1	23.4
Variable-rate bonds	2.2	7.6	10.7	18.3	1.9	8.7	10.3	19.0
Fixed coupon]0 % – 3 %]	11.7	2.5	14.4	16.9	2.4	3.0	9.8	12.7
Fixed coupon]3 % – 4 %]	28.4	7.1	10.5	17.7	4.1	7.7	7.6	15.3
Fixed coupon]4 % – 5 %]	43.8	8.8	14.2	23.0	4.8	8.5	9.6	18.0
Fixed coupon]5 % – 6 %]	17.2	17.1	11.0	28.1	1.9	17.4	10.0	27.3
Fixed coupon]6 % – 11 %]	2.5	19.4	9.7	29.1	0.2	21.3	9.5	30.8
No coupon info	0.2	4.7	12.5	7.8	0.0	3.8	3.4	4.1
Total	**116.2**	**9.7**	**12.6**	**22.3**	**15.4**	**8.7**	**9.2**	**17.9**

Sources: CSDB, NBB.

CHART 20 BREAKDOWN OF CORPORATE BOND AND EQUITY HOLDINGS BY CORPORATE SUB-SECTOR [1]

(non-consolidated data for the end of 2016, in % of total)



Source: NBB.

Belgian insurance companies also hold a large portfolio of corporate, structured and collateralised bonds. At the end of 2016, these bonds accounted for a total of € 65.4 billion of which € 46.7 billion and € 9.7 billion respectively in the life and non-life covering assets, excluding class 23. At the end of 2016, the average coupon on these corporate bonds was 3.4 % in life and 3.1 % in non-life insurance, lower than the above-mentioned average coupon rates for the public sector bond portfolio.

Concerning the sectoral breakdown of investment in corporate bonds and equity instruments, insurance companies are particularly exposed to financial and insurance activities as they represent respectively 32 % and 31 % of the outstanding amounts (chart 20). This carries an important risk, in terms of financial sector interconnectedness. In the case of illiquidity and losses in financial sector, the initial shock could be amplified through the combined exposures of insurance companies and banks between themselves. This mechanism was in part responsible for the scale of the crisis in 2008. These exposures are monitored carefully, especially on the class of bonds. Indeed, from our analysis, it emerged that around 80 % of the subordinated bonds, which have a lower priority than other bonds of the issuer in the event of liquidation, which insurance companies hold as investments, are issued by the financial sector. Even if this kind of instrument represents only a small share of insurance companies' investments (at around 8.5 % of corporate bonds), it needs an active monitoring due to its potential systemic risk. Insurance companies also invest considerable amounts in real-estate-related activities in the form of several asset categories (i.e. direct investment in property, property investment funds, bonds issued by companies involved in real estate activities etc.). In total, the investment in commercial real estate business amounts to approximately € 22 billion, supplemented with another € 12.7 billion worth of investment in mortgage loans.

3.4 EIOPA stress test results for Belgian insurance companies

The current macroeconomic conditions, and especially the very low interest rate environment, were it to be prolonged, pose a major challenge for the Belgian insurance market, and specifically for life insurance undertakings. Against that background, the results of the 2016 EIOPA stress tests shed light on the resilience of the Belgian insurance sector to adverse scenarios, including a "low-for-long" and a "double-hit" scenario.

Taking account of the efforts required on account of the entry into force of the Solvency II regulations in 2016, EIOPA opted for a targeted stress test, focusing on the most relevant risks for insurers, namely market risks, excluding technical underwriting risks. The stress test consisted of two quantitative scenarios both supplemented by a short qualitative questionnaire:

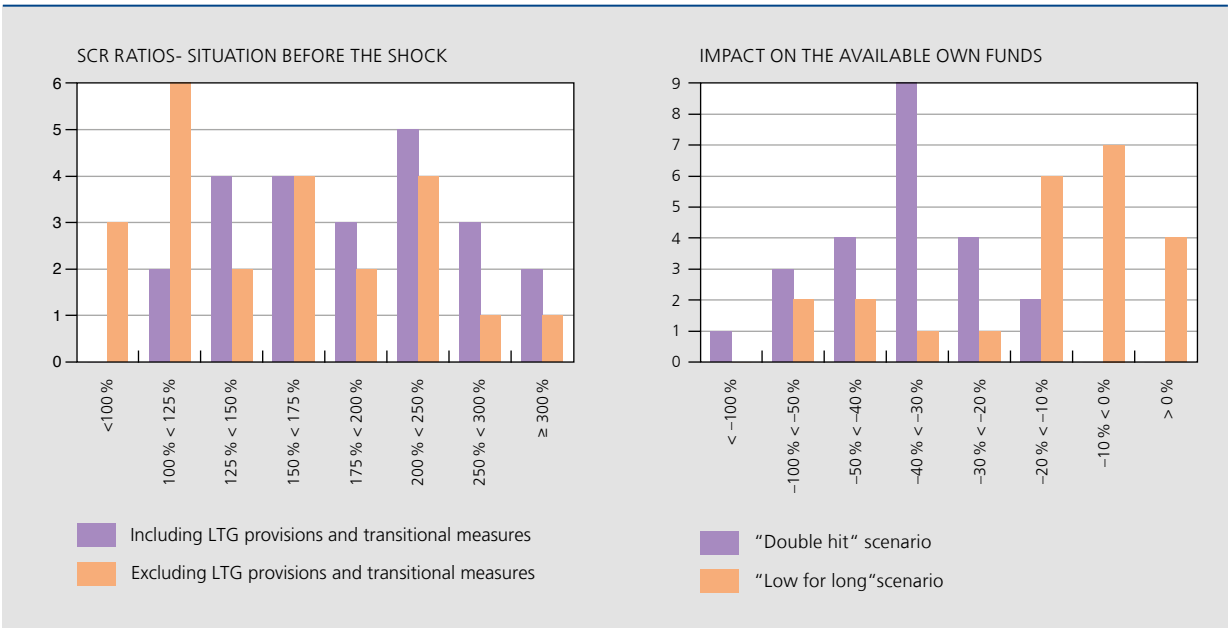
The "double-hit" scenario is a hypothetical scenario developed by EIOPA jointly with the ESRB. It reflects the

- ESRB's assessment of the main risks for the European financial system, namely persistently low interest rates and an increase in risk premiums. The scenario affects both the assets and the liabilities of the undertakings by simulating an environment that combines a fall in the risk-free yield curves with significant shocks to key asset categories in the investment portfolio (government and corporate bonds, (mortgage) loans, equities, property, etc.).
- The "low-for-long" scenario simulates a structural stagnation situation in which a scarcity of profitable long-term investment and persistently weak growth (and low growth expectations) cause a further decline in the risk-free yield curve, particularly over longer maturities. The stress curve is based on swap rates as at 20 April 2015, the date when – for the first time – they recorded a low level for most long-term interest rates. This swap rate was then subjected to the EIOPA extrapolation methodology in which the "ultimate forward rate" is an interest rate of just 2 %, instead of the normal 4.2 %. This last assumption is meant to characterise the prolonged period of weak growth.

The starting position for the exercise is the situation on 1 January 2016. That means that the participants can only use long-term guarantee (LTG) measures, transitional measures, company-specific parameters and (partial) internal models approved by the Bank as at 1 January 2016. Most undertakings (19) use the volatility adjustment (VA), and just one uses the transitional measure for technical provisions. In analysing the results, the main focus was on the impact of the two scenarios on the balance sheet and own funds available to cover the solvency capital requirement. The impact on the actual capital requirements was not calculated. The results for the Belgian market are summarised in Chart 21.

We begin by examining the distribution of the 23 participants' solvency capital ratios (SCR) before application of the shocks. The average SCR ratio is 196 % before the shocks, suggesting a comfortable starting position. All the undertakings respect the regulatory SCR ratio (100 %) and three-quarters of them have an SCR ratio of more than 150 %. The impact of the use of the LTG provisions and transitional measures, especially the VA, is clearly apparent on examination of the distribution of the SCR ratios which take no account of these measures. The average SCR ratio then falls by between 55 % and 141 %. In addition, three undertakings would no longer meet the regulatory requirements: fewer than half of the participants would achieve an SCR ratio of more than 150 %. After taking account of the shock, there is a further substantial increase in the impact of the LTG provisions and transitional measures. In view of the significant impact of these measures on the undertakings' solvency, the Bank will continue to pay attention to the supplementary conditions and the regulatory requirements that they have to respect.

CHART 21 STRESS TEST RESULTS FOR BELGIAN INSURERS



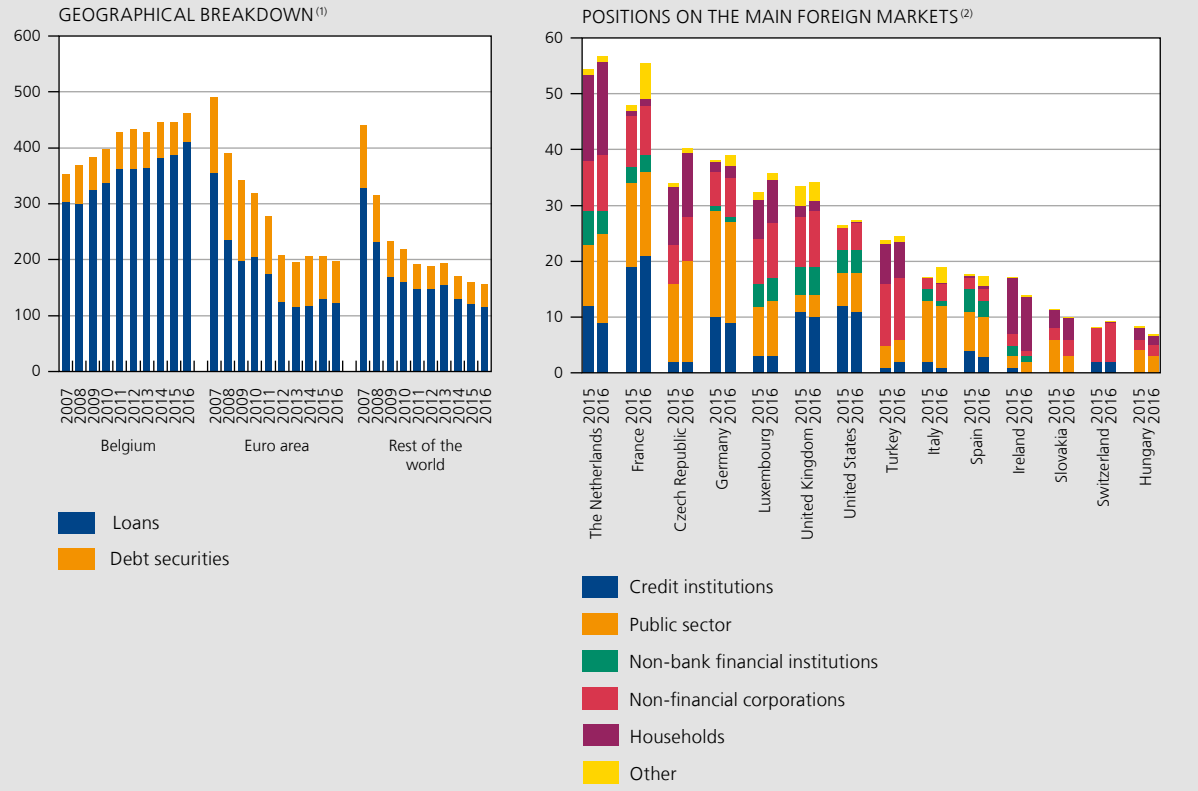
Source: NBB.

The "double-hit" scenario is the one which has the biggest impact on insurance undertakings' own funds, causing a 35 % fall, on average. In view of the severity of this scenario, the examination focused less on the impact on the own funds and more on the underlying factors explaining the impact, and on variations between undertakings. The results indicated vulnerabilities in some undertakings which will be examined more closely case by case, and will be included on the agenda of future stress test exercises.

The "low-for-long" scenario results in a weighted average reduction in the own funds of 14 % (with a median of 11.6 %). Two undertakings suffer a very severe impact (between –100 % and –50 %) on their own resources, and in the case of two undertakings that loss totals between 40 % and 50 %. The ultimate impact on the undertaking's solvency depends on its initial situation: excess solvency, if any, can absorb part of the shock. The results of this scenario confirm an earlier finding – made in the context of the interest rate risk analysis – namely that some insurance undertakings are vulnerable in a persistently low interest rate environment. The Bank will continue to examine how the most vulnerable undertakings can further reduce their interest rate exposure and/or build up additional own funds or provisions (the "flashing-light" reserve).

CHART 22 GEOGRAPHICAL BREAKDOWN OF ASSETS HELD BY BELGIAN CREDIT INSTITUTIONS IN THE FORM OF LOANS AND DEBT SECURITIES

(consolidated end-of-period data, in € billion)



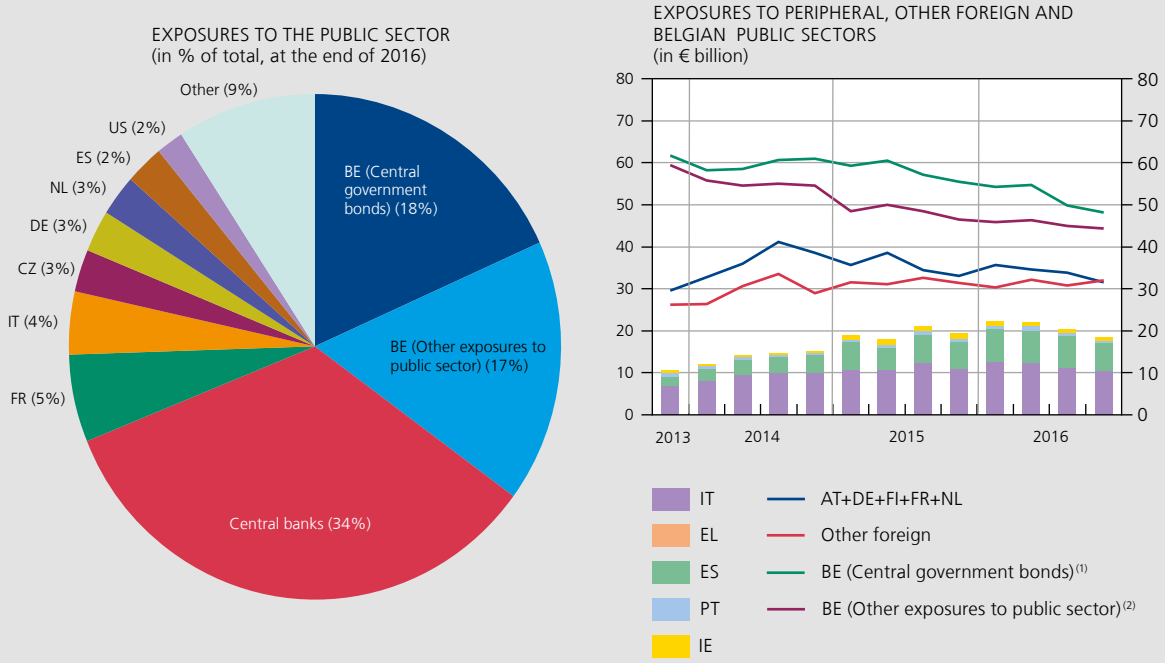
Source: NBB.

(1) Data obtained from the consolidated reporting of Belgian credit institutions. Distribution in accordance with the FINREP prudential reporting.

(2) Data obtained from the consolidated reporting of international banking statistics. The assets are classified according to the ultimate risk, i.e. after risk transfer.

CHART 23 BELGIAN BANKS' EXPOSURES TO THE PUBLIC SECTOR

(consolidated end-of-period data)

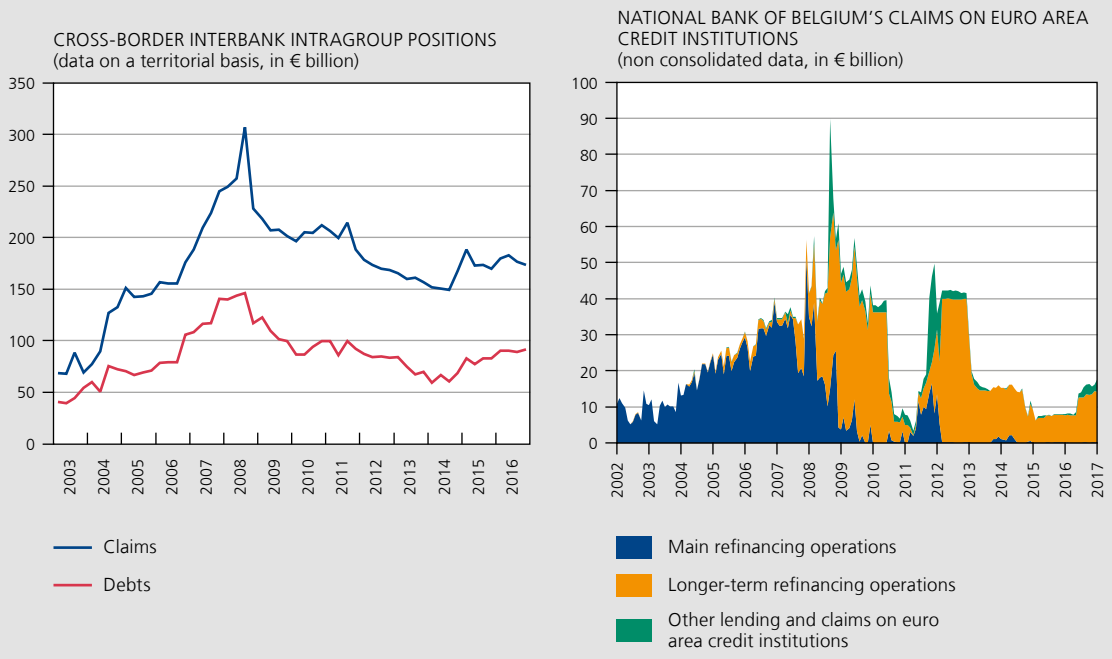


Source: NBB.

(1) Exposures to central government until June 2014 and exposures to public authorities in the form of debt securities since September 2014.

(2) Other exposures to the Belgian public sector include all direct or indirect exposures to the exception of the direct exposure to the central government resulting from the holding of bonds.

CHART 24 CROSS-BORDER INTERBANK INTRAGROUP POSITIONS AND CENTRAL BANK FUNDING



Source: NBB.

TABLE 6 OVERVIEW OF BELGIAN BANKS' FUNDING STRUCTURE AND LIQUIDITY RATIOS OVER TIME [1]

(consolidated end-of-period data, in € billion, unless otherwise mentioned)

	2010	2011	2012	2013	2014	2015	2016
Total liabilities	1 151	1 147	1 049	961	996	970	1 022
Total funding [1]	849	816	784	759	783	786	816
of which:							
Retail deposits	300	304	321	334	334	340	364
Covered bonds [2]					17	21	24
Asset-backed securities [2]					5	6	2
Regulatory liquidity ratio (in %) [3]	78	83	69	73	80	–	–
Liquidity coverage ratio (in %) [4]	–	–	–	–	–	137	140
Customer loan-to-deposit ratio (in %)	90	90	92	92	93	91	95

Source: NBB.

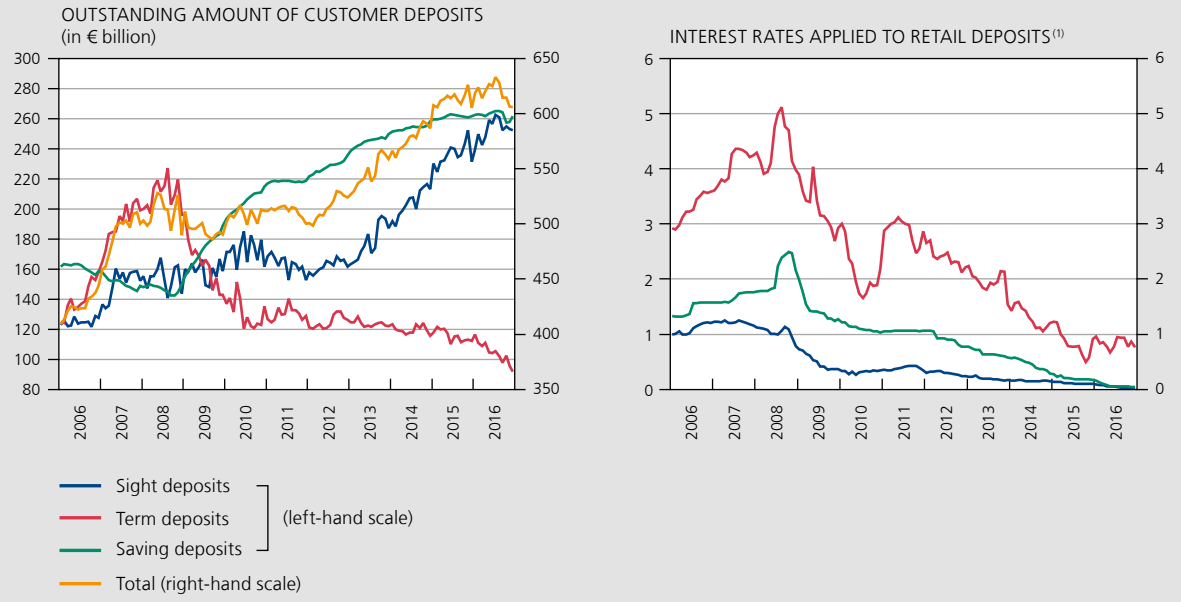
(1) Defined as the sum of total deposits and total debt securities issued (including bonds).

(2) These data are available in the regulatory reporting since Q3 2014.

(3) The Bank's regulatory stress test ratio for the one month horizon, which has been replaced by the liquidity coverage ratio as from October 2015. It is a ratio between the net cash outflows in a liquidity stress test scenario – simulated inter alia by applying stressed run-off rates to various sources of funding – and the available unencumbered liquidity buffer. The ratio should be 100 % or lower.

(4) Basel's Liquidity coverage ratio, implemented in Belgium as from October 2015, is defined as the ratio between a bank's stock of high-quality liquid assets (HQLA) and its net cash outflows in a 30-day stress scenario.

CHART 25 CUSTOMER DEPOSITS



Source: NBB.
(1) Data from the monthly MIR survey in the case of new deposits. Deposits for a term of more than two years in the case of term deposits.

TABLE 7 CREDIT QUALITY INDICATORS OF EXPOSURES IN THE FORM OF LOANS

(consolidated end-of-period data)

	2009	2010	2011	2012	2013	2014	2015	2016
Percentage of impaired claims(1)	2.9	2.8	3.3	3.8	4.3	3.9	3.6	3.4
Coverage ratio(2)	43.0	42.8	41.5	41.4	39.5	43.3	44.1	44.9

Source: NBB.
(1) Impaired claims (according to IAS 39 definition) as a percentage of total loans.
(2) Percentage of impaired claims covered by specific provisions.

Thematic Article

Ten Years after the Financial Crisis : Regulatory Reforms and the Belgian Banking Sector

Janet Mitchell
Patrick Van Roy
Cristina Vespro

Introduction

Much has been written about the 2007-2008 financial crisis in the ten years since it occurred. This crisis began in 2007 with widespread losses on securitisation transactions containing US subprime mortgages and reached full-blown proportions with the failure of Lehman Brothers in September 2008. Several factors have been cited as having played a role in the massive build-up of risk prior to the crisis and the enormous losses suffered by banks during the crisis. Low interest rates, combined with macroeconomic imbalances, had given rise to a widespread "search for yield" by investors. Complex financial products, involving exposure to US subprime mortgages and whose risks were not well understood by rating agencies or investors, helped to satisfy this demand for yield. Banks took on high degrees of leverage, all the while reporting strong regulatory capital ratios, which were achieved in part by actions such as booking exposures in their trading books where regulatory capital requirements were low, increasing funding with significant maturity mismatches, and creating off-balance-sheet vehicles requiring only minimal or no regulatory capital charges. In addition, weak risk management and governance systems in financial institutions meant that senior managers did not always understand the risks the institutions were taking, nor that many of these risks were excessive.

All of these factors resulted in a crisis that was truly systemic and global. Markets for virtually all assets dropped sharply. Sudden dry-ups of liquidity paralyzed markets such as those for asset-backed commercial paper or short-term interbank loans, which had previously been considered safe. Banks around the world were forced to take large losses on traded assets, and they experienced funding difficulties that threatened their survival. Governments, faced with the threat to the financial system of failures of large, systemically important financial institutions, felt they had no choice but to bail them out.

Clearly, one of the unique features of this crisis relative to previous banking crises was the central role played by complex financial products. The sale of these products to financial institutions around the world in the years preceding the crisis meant that the boom and subsequent bust of one segment (subprime) of the real-estate market in one country (the US) had a global impact.

The breadth and depth of the crisis, combined with the massive bank bail-outs, led to a broad, international agenda of regulatory reforms. These reforms included increases in minimum regulatory capital requirements for banks, an increase in the quality of capital held by banks, broadening of the risks for which bank capital requirements are imposed, introduction of liquidity regulation for banks, introduction of macroprudential policies, and development of frameworks to facilitate resolution of failed banks without the use of taxpayer funds.

In this article we discuss some key regulatory reforms that have been put in place as a result of the crisis and the changes that have occurred in the Belgian financial sector. Section 1 first reviews the experience of the largest Belgian banks during the crisis. Section 2 then highlights regulatory reforms that have been implemented since the crisis at the international, European, and Belgian levels. In light of these regulatory reforms, Section 3 analyses the significant changes since the crisis in the balance sheets and activities of Belgian banks. Section 4 offers some concluding remarks.

1. The crisis experience of large Belgian banks

The crisis resulted in the provision of support by the Belgian government to three of the four largest Belgian banks: Fortis, Dexia, and KBC. As background for our analysis, this section describes the problems suffered by each of these banks and that led to the government interventions.

1.1 Fortis

Part of the difficulty that Fortis Bank faced in the fall of 2008 was undoubtedly due to its holdings of € 42 billion of complex, structured finance products. At the same time, much of its vulnerability had arisen from earlier doubts in the market about the group's financial health following the October 2007 acquisition of ABN AMRO, which Fortis had undertaken together with the Royal Bank of Scotland (RBS) and Santander. This purchase, which was the culmination of a complicated takeover process, had been made in the name of RFS Holdings B.V., an entity specially created for the purpose and jointly owned by the three groups in proportion to their respective financial commitments, which in Fortis' case amounted to € 24 billion. Fortis had obtained approval for the acquisition of ABN AMRO from the European Commission, which was the relevant competition authority, under the provision that Fortis would undertake a series of divestments of specific parts of the Dutch division of ABN AMRO, in order to resolve certain competition problems in the Dutch banking sector created by the acquisition.

Since most of the transfers of these portions of ABN AMRO to Fortis were scheduled to take place between the end of 2008 and the end of 2009, Fortis was assumed to have time to take adequate measures to enable it to meet its solvency targets. However, in June 2008, as a result of deteriorating market conditions and the prospect of losses from the forced sale of certain Dutch commercial banking activities, Fortis announced that it would be modifying and accelerating its solvency plan. The announced plan, which amounted to € 8.3 billion, included a capital increase, an issuance of non-diluting capital instruments, disposals of non-strategic assets, and a proposal to pay 2008 dividends in the form of shares. The announcement of these measures triggered a significant fall in Fortis' share price.

Following the collapse of Lehman Brothers in September 2008, serious counterparty concerns relating to Fortis began to emerge. Fortis faced a fall in its share price and difficulty renewing short-term financing on wholesale markets. The premiums on its credit default swaps (CDS) exceeded 500 basis points, and withdrawals of deposits by professional counterparties began occurring. The Belgian government decided to undertake an emergency rescue operation, involving capital support for the banking subsidiaries of the group and emergency liquidity assistance provided by the National Bank of Belgium.

During the last weekend of September, the Dutch, Belgian and Luxembourg governments mounted a rescue operation, which ultimately initiated a long process involving the forced sale of the Dutch activities (including the participation of Fortis in ABN AMRO) to the Dutch government, the take-over of Fortis Bank Belgium by the Belgian government, and the subsequent conclusion of an agreement with the French bank BNP Paribas to acquire a majority stake in Fortis Bank Belgium.

1.2 Dexia

2008

The Dexia Group found itself in need of emergency intervention from authorities at the end of September 2008, as a result of refinancing problems in the aftermath of the Lehman Brothers failure. Up to that point, Dexia had relied heavily on wholesale funding, as the group collected retail deposits only in Belgium and Luxembourg. To supplement its retail funding sources, Dexia had mobilized large portions of its substantial portfolio of highly-rated debt securities

for the purpose of borrowing in secured wholesale funding markets. When these markets suffered significant dislocations in the days following the collapse of Lehman Brothers, Dexia experienced a severe liquidity shock.

In addition to suffering from distressed market prices for many of its highly-rated bonds as a result of generalized increases in liquidity risk premia, Dexia also became the focus of serious market concerns regarding the group's large exposure to US assets and to complex structured finance instruments. These exposures were associated primarily with the activities of Financial Security Assurance (FSA), a US subsidiary of Dexia Crédit Local de France. The core business of FSA, one of the world's five leading monoline bond guarantors, consisted of selling credit insurance to bond investors. This credit insurance, introduced in 1971, was initially used only on the US municipal bond market; however, over time the monolines had extended the business to include insuring US mortgage securitisation and, in the run-up to the crisis, complex structured finance instruments containing exposures to US mortgage securitisations. As a consequence, the monoline insurance sector was heavily hit by the US subprime crisis.

While FSA had refrained from insuring the riskiest mortgage-backed securities, it was nevertheless unable to escape the rapid spread of losses to all types of mortgage-backed securities once the crisis struck. Although those securities accounted for only a small portion of the insurance guarantees granted by FSA, they represented a significant source of potential losses and contributed to important valuation losses on the $ 16.5 billion portfolio of asset-backed securities which FSA held in its Asset Management entity. In July 2008, Moody's placed FSA's AAA rating on review for possible downgrade. This prompted Dexia to announce a € 300 million recapitalisation of FSA and the provision of a $ 5 billion unsecured liquidity line for FSA's Asset Management subsidiary. The purpose of the credit line was to ensure repayment of the liabilities of this subsidiary and to avoid having to realize the losses which would have resulted from a premature sale of assets from that subsidiary's portfolio.

In response to continued decline in the funding situation for Dexia, the governments of Belgium, France and Luxembourg issued a joint guarantee in October 2008, in order to cover many of Dexia's funding sources. This guarantee amounted to € 150 billion and covered Dexia's liabilities towards credit institutions and institutional counterparties.

2011

Following the state aid in 2008, Dexia was required to submit a restructuring plan to the European Commission, aimed at radically reducing the group's risk profile and its leverage. Under this plan, Dexia agreed to refocus its activities on traditional financial intermediation by selling off non-strategic operating entities and financial assets and by terminating its proprietary trading activities. Between December 2008 and June 2011, implementation of the plan enabled the group to cut its balance sheet size by twenty percent, which amounted to € 130 billion, and to reduce its short-term funding needs by € 160 billion.

Nevertheless, despite these improvements, Dexia's financial position began to deteriorate when its short-term rating was placed on watch by Standard and Poor's in May 2011, leading to a reduction of € 22 billion in its unsecured funding. The escalating sovereign debt crisis, with the associated sharp fall in the value of numerous countries' government bonds, had an even more serious impact on the group's borrowing terms, since it was accompanied by a fall in the long-term interest rate. These two factors resulted in a substantial increase in the collateral that Dexia needed to provide to cover the third-party risks associated with its interest rate swaps. In addition, a large number of securities that had been issued by the group under the 2008 State guarantee matured in 2011, rendering the financial institution even more vulnerable.

Events came to a head in October when Moody's placed Dexia's rating on negative watch, rendering the group's liquidity position particularly precarious. Following that announcement, the group lost almost € 9 billion in unsecured short-term funding as well as € 7 billion in customer deposits.

Given these events, Dexia was obliged to turn once again to the government for support, which resulted in a comprehensive restructuring plan involving the total dismantling of the Dexia Group in late October 2011. The most significant elements of this plan included the acquisition by the Belgian government of all shares held by the Dexia Group in its subsidiary Dexia Bank Belgium, which later became Belfius Bank, and the introduction of a new funding guarantee mechanism by the Belgian, French and Luxembourg governments for a maximum of € 90 billion for Dexia SA and its subsidiary Dexia Crédit Local.

1.3 KBC

Although KBC Group did not experience institution-specific funding liquidity problems in the aftermath of the Lehman Brothers failure beyond the general tightening of financial conditions in the wholesale markets, its CDS premium nevertheless spiked in October 2008. This development followed Moody's announcement of downgrades of ratings on a series of collateralized debt obligations (CDOs) that had been structured and issued by KBC Financial Products. The KBC Group, whose uninsured exposure to these structured finance instruments amounted to € 16 billion at the end of June 2008, was required to report a substantial loss on these investments in its third-quarter accounts. Given that this development occurred during a period in which many European governments had announced plans to help credit institutions bolster their capital buffers in order to insure against future losses, the Belgian government decided to subscribe to KBC's October 27 issue of € 3.5 billion of hybrid core capital securities.

In January 2009, KBC's capital base was further strengthened by a similar transaction with the Flemish regional government. This second intervention followed a period of sharp declines in KBC's share price related to the announcement at the end of 2008 by Moody's of a revision of the assumptions underlying its ratings for corporate synthetic CDOs, as well as heightened market concerns over the economic prospects in a number of countries where KBC operated significant subsidiaries, including in Central and Eastern Europe, where it had developed a second home market.

In May 2009, KBC reported significant losses on a portfolio of CDOs for which it had obtained credit insurance from the monoline insurance company MBIA and for which the amount of insured assets was € 14 billion. The value of the credit protection that KBC had bought from MBIA had declined significantly after MBIA announced a restructuring which included the spin-off of assets from the unit that was KBC's counterparty. The losses on the CDO portfolio contributed to a total net loss for KBC of € 3.6 billion for the first quarter of 2009. As a result, the Belgian government decided to grant KBC a guarantee on its structured credit instruments.

The extension of state aid to KBC required KBC to pay an annual return to the government of eight percent on the aid. In addition, if KBC distributed any dividends, then either the government was to receive an annual return of fifteen percent or fifty percent of the capital upon reimubursement.

2. Regulatory reforms following the crisis

The global nature and severity of the 2008 crisis revealed a number of structural weaknesses in the financial system. As suggested above, these included inadequate risk management and governance within financial institutions, insufficient exercise of market discipline by stakeholders, deficiencies in crisis resolution frameworks, and inadequacies in regulation and supervision, at both the micro and macro levels. The experience made clear the necessity of an internationally coordinated approach to regulatory reform, in order to avoid a similar crisis in the future. Indeed, an ambitious reform agenda was formulated by the G20 leaders and spearheaded by the Financial Stability Board (FSB). Several reforms were also put in place at the European, as well as the Belgian, level. In this section we review the key elements of the reforms at the international, European, and Belgian levels[1].

2.1 Banking reforms at the international level: the Basel framework

The response of the Basel Committee on Banking Supervision (BCBS) to the crisis was to formulate a package of wide-ranging reforms to the Basel framework of bank regulation. These reforms have been implemented over a period of years.

2.1.1 Basel 2.5 and capital requirements for trading book[2]

In July 2009, as an initial response to the financial crisis, the BCBS formulated several proposals, now known as Basel 2.5, intended to strengthen the capital requirements relating to securitisations and the market risks of exposures held in

(1) This section provides an overview of major regulatory changes, without being exhaustive. In particular, it focuses on those reforms that might have been expected to have an impact on banks' activities or balance sheets during the past ten years.

(2) Banking regulation distinguishes between the trading and banking books of banks. The trading book consists of positions which are actively traded at high frequencies or positions which are held to hedge banking book positions. Typical positions in the trading book include tradable securities, such as bonds and equities, securitization exposures, and derivatives, such as swaps and futures.

the trading book[1]. With regard to the rules on securitisation, new risk weights were introduced for re-securitisations, which are complex financial instruments that contain securitisation exposures. The re-securitisation risk weights were higher than those for traditional securitisations, due to the higher risk of re-securitisations.

Other changes introduced with respect to the trading book included higher risk weights for default risk and downgrade (migration) risk of trading book exposures, as well qualitative and quantitative requirements applicable to the internal models that banks use for assessing the risks of exposures. Regarding the use of internal models, institutions were required to begin calculating an additional capital requirement, based on the Value-at-Risk (VaR) in periods of financial market stress.

These additional capital requirements for exposures in banks' trading books were intended to help eliminate differences in regulatory capital requirements across banks' banking books and trading books, which had previously provided incentives for banks to undertake regulatory arbitrage.

2.1.2 Basel 3: increase in capital requirements; liquidity requirements; countercyclical capital buffers; surcharges for systemically important banks

In addition to the changes to regulatory capital requirements comprising Basel 2.5, the BCBS instituted a broader package of reforms to the Basel framework. These reforms, referred to as Basel 3, included not only a general increase in minimum regulatory capital requirements but also an increase in the amount of capital that must be held in the form of common equity, the instrument which offers the greatest capacity for absorption of losses[2]. The Basel 3 framework also broadened the coverage of risk, through the introduction of liquidity ratios and a leverage ratio, and it introduced new macroprudential instruments. The new regulatory requirements embodied in Basel 3 represent a key step towards strengthening the soundness of the banking sector[3][4].

Basel 3 improved the quality of capital by raising the minimum required level of common equity to 4.5 % of risk-weighted assets from its previous level of 2 %. In addition, a "capital conservation buffer" of 2.5 % of risk-weighted assets, which must be met entirely with common equity, was added to the minimum capital requirement. This effectively means that banks must hold common equity in the amount of 7 % of risk-weighted assets.

With respect to liquidity requirements, a liquidity coverage ratio (LCR) requires banks to hold a quantity of high-quality liquid assets, i.e., assets capable of being used for repo transactions on the money market or with central banks in order to weather a shock which would seriously impede refinancing capacity for a period of one month. The LCR is supplemented by the net stable funding ratio (NSFR), which is intended to ensure that banks have sufficient amounts of stable funding of illiquid assets and off-balance-sheet liabilities. The objective is to improve the structural liquidity positions of banks, preventing the use of short-term funding for long-term, illiquid assets.

A leverage ratio requirement, of a ratio of Tier 1 capital to total assets of 3 %, has also been introduced in Basel 3, in part to constrain the commonly observed build-ups of leverage by banks in favourable periods followed by de-stabilizing deleveraging in stress periods. In addition, because the leverage ratio is a non-risk-weighted measure (of capital as a ratio of total assets), it serves as a safeguard against regulatory arbitrage and against model risk associated with banks' use of internal models for the calculation of their risk-weighted regulatory capital requirements.

Importantly, the Basel reforms were not limited to the microprudential dimension. One element of macroprudential supervision included in the reforms relates to the potential build-up of systemic risk over time, as a result of generalized, pro-cyclical behaviour among financial institutions. In order to address the instability that such behaviour can create and the negative impact on the real economy, the BCBS introduced the instrument of countercyclical capital buffers, which will

(1) These proposals were then incorporated in European Directive 2010/76/EU (Capital Requirements Directive or CRD III) which was transposed into national law by the EU Member States by the end of 2011.

(2) The Basel 3 proposals are contained in several documents published by the BCBS (2011, 2013, 2014a, and 2014b).

(3) The proposals contained in the Basel 3 framework were incorporated into the European Directive CRD IV, published in July 2013.

(4) In terms of timing of the Basel 3 reforms, the Basel regulation specifies that phasing in of increased capital ratios, which began in 2013, will be completed by 2019. The capital conservation buffer and the G-SIB surcharge began phase-in in 2016, with completion in 2019. The liquidity coverage ratio was introduced in 2015, with full phase-in by 2019. The net stable funding ratio will become a requirement in 2018. Banks have been required to disclose the value of their leverage ratio since 2015, and the requirement will take effect in 2018.

be determined at national level for all credit exposures to counterparts in that country. In the event that national authorities judge credit growth in their jurisdiction to be excessive, they may activate a countercyclical capital buffer requirement, composed of common equity, of up to 2.5 % of risk-weighted assets, and which can then be "released" in downturns.

The crisis also brought to the fore the problem of systemically important financial institutions which, by definition, are institutions whose failure could have a significant impact on the financial system or economy, thereby transmitting distress to many other financial institutions. On the one hand, failure of these institutions would generate large costs that the institutions themselves do not internalize. On the other hand, belief that these institutions are too big to fail creates a moral hazard problem, weakening market discipline and providing the institutions with an incentive to take excessive risk.

In this context, the BCBS developed a methodology for identifying globally systemically important banks (G-SIBs), which must now hold extra capital, ranging from 1 % to 2.5 % of risk-weighted assets and composed of common equity. The BCBS also published a set of principles underlying the identification of domestic systemically important banks (D-SIBs)[1].

2.2 Reforms at the European level

2.2.1 European supervisory architecture

In 2009, at the request of the President of the European Commission, a report was published by a high-level group on financial supervision in the European Union, headed by Jacques de Larosière[2]. The recommendations in this report led to the creation of a new European supervisory architecture, consisting of the European Systemic Risk Board (ESRB) and of the European System of Financial Supervision (ESFS). The ESRB, which was established in 2010, undertakes macroprudential oversight, while the ESFS, composed of the European Banking Authority (EBA), the European Insurance and Occupational Pensions Authority (EIOPA), and the European Securities and Markets Authority (ESMA), which were established in 2011, have binding powers with respect to a series of microprudential supervisory principles and practices.

A decision was also taken to create a European banking union, consisting of a single European banking supervisor, a single European resolution authority and a European deposit insurance scheme. In 2014 the Single Supervisory Mechanism (SSM) was established, and in 2015 a Single Resolution Mechanism came into being. The SSM is comprised of the ECB and the national authorities in the participating countries. The ECB directly supervises 125 banks deemed "significant institutions", and the national supervisory authorities directly supervise the remaining banks, with the ECB exercising indirect supervision. The objectives of the SSM are to ensure the safety and soundness of the European banking system, to increase financial integration and stability, and to ensure consistent application of regulations and supervisory policies.

The Single Resolution Mechanism consists of a Single Resolution Board (SRB) and national resolution authorities and functions similarly to the SSM. The key mission of the SRB is to ensure an orderly resolution of failing banks with minimum impact on the real economy.

2.2.2 European resolution frameworks and recovery and resolution plans

The crisis revealed numerous obstacles to the resolution of cross-border financial institutions, giving rise to a broadly acknowledged need to improve resolution regimes. This would imply, among other things, increasing the options available to authorities to resolve a crisis, so as to minimize any recourse to public funds and to avoid government bail-outs.

In May 2015 the European Commission published the Banking Recovery and Resolution Directive (BRRD), which establishes a framework for the recovery and resolution of credit institutions and investment firms[3]. The verarching

(1) BCBS (2012).
(2) De Larosiere Report (2009).
(3) Directive 2014/59/EU of the European Parliament and of the Council of 15 May 2014 establishing a framework for the recovery and resolution of credit institutions and investment firms and amending Council Directive 82/891/EEC, and Directives 2001/24/EC, 2002/47/EC, 2004/25/EC, 2005/56/EC, 2007/36/EC, 2011/35/EU, 2012/30/EU and 2013/36/EU, and Regulations (EU) No 1093/2010 and (EU) No 648/2012, of the European Parliament and of the Council Text with EEA relevance.

goal of the BRRD is to provide authorities with sufficient preventative and curative tools to allow them to avoid disorderly bank resolutions. In other words, resolution authorities must be sufficiently equipped in the case of a crisis or bank insolvency to be able to avoid a discontinuation of the critical economic functions that the institutions perform.

The BRRD contributes to the harmonization of crisis management powers of authorities across Europe, covering crisis preparation which includes the drafting of recovery and resolution plans for financial institutions early intervention measures which can be undertaken by supervisors, and resolution tools that are used by resolution authorities. The BRRD also confers upon authorities the power to apply "bail-in"; i.e., to write down the debt of a bank in resolution or to convert its debt to equity. In addition, the BRRD foresees the implementation of a pre-funded resolution fund, so as to facilitate financing of crisis management and resolution in the future. The BRRD nevertheless stipulates that authorities must bail in shareholders and creditors for a minimum amount of 8% of total liabilities before any funds from the Single Resolution Fund may be used for a bank in resolution.

The BRRD requires the drafting of recovery and resolution plans for all banks. Recovery plans, which are developed by banks, outline the options that can be taken in response to a severe shock to liquidity or solvency. The bank must analyse the impacts and effectiveness of the options which should not involve any presumption of extraordinary state support or central bank intervention in light of a number of potential crisis scenarios.

Bank resolution plans are developed by resolution authorities. A resolution plan identifies the bank's critical economic functions and analyses options for cases in which the recovery plan of the institution has failed to maintain the institution's solvency. The options in the resolution plan are designed to permit an orderly resolution of the financial institution, ensuring continuity of its critical functions while minimizing the impact on the financial system.

Resolution authorities must also conduct resolvability assessments for each financial institution. If significant obstacles to orderly resolution are identified, the authorities have the power to require the bank to make changes; e.g., to its activities, business lines, or even legal structure.

2.2.3 Identification of domestic systemically important banks

Article 131 of the European Directive 2013/36/EU (CRD IV) requires Member States to identify banks that are systemically important at the domestic level (labelled "other systemically important institutions", or O-SIIs) and mandates the EBA to issue guidelines to specify the methodology for O-SII identification. In December 2014 EBA published guidelines with its methodology for identification of O-SIIs[1]. While Member States must apply the EBA methodology to identify O-SIIs, it is left up to each Member State to determine the capital surcharges to impose on the banks designated as O-SIIs.

2.3 Belgian regulatory measures

In this section we highlight some specific Belgian regulatory measures that have been undertaken since the crisis, in the form either of domestic regulatory requirements or of macroprudential measures implemented in the context of the new macroprudential toolkit foreseen in European legislation.

2.3.1 Structural banking reforms

As noted above, one of the unique features of the crisis was the central role played by complex financial products, which were often linked to banks' trading activities. In light of this fact, several observers have argued that while the international regulatory reforms improve the resilience of banks and the financial system, an additional step is also necessary; namely, imposition of structural banking reforms, which can be associated with a range of measures, from the complete prohibition of certain activities by banks, to imposition of limits on the amounts of certain activities, to the separation of particular activities in different legal structures. The motivation for structural reforms derives from the argument that allowing banks to combine commercial and investment banking activities can increase bank riskiness, as well as complexity.

(1) EBA (2014).

Yet, whereas banks' trading activities are very risky, they are also quite heterogeneous. Some trading activities are riskier than others. In addition, some activities, such as those linked to market making or client hedging services, are clearly beneficial to the real economy, but other activities, such as proprietary trading, are not. Unfortunately, it can be challenging in practice to distinguish proprietary trading from other trading activities. This difficulty has led to significantly different approaches across countries to structural banking reforms.

Several countries, including Belgium, have chosen to implement structural reforms. The Belgian structural reform measures were incorporated into the 2014 Banking Law and grew out of the policy recommendations put forth in two NBB reports: an interim report on structural banking reforms in Belgium, published in June 2012; and a final report, published in July 2013.

The objectives of structural reforms are multiple, including eliminating the deposit guarantee subsidy for investment banking activities, improving bank resolvability by reducing complexity, reducing contagion from risky trading activities to retail banking, reducing bank risk taking, and reducing potential risk to taxpayers of bank failure. Consequently, a broad approach to structural reform measures has been adopted in Belgium, in order to help ensure that the objectives of structural reforms are achieved and to offer multiple lines of defence in relation to the policy implementation challenges. The Belgian structural reform measures include the following: a capital surcharge on banks' trading activities above a threshold; a ban on proprietary trading by banks; and a requirement for banks to reduce or to transfer to a separate trading entity a set of trading activities that could be suspected of being related to proprietary trading.

2.3.2 Identification of domestic systemically important banks

In 2011 the National Bank of Belgium developed a methodology for identifying financial institutions that are systemically important at the domestic level. This methodology, which was modelled after the framework developed by the BCBS for identification of globally systemically important banks (G-SIBs), made use of indicators relating to size, substitutability, and interconnectedness of institutions within the Belgian financial system.

Following the publication in December 2014 by the EBA of its guidelines specifying the methodology for identifying domestically systemically important banks (O-SIIs), the Belgian methodology was modified to conform to the guidelines. Eight Belgian banks have been designated as O-SIIs. With respect to the capital surcharges (O-SII buffers) imposed, the Belgian O-SIIs have been allocated into two systemic risk buckets, with surcharges of 0.75 % and 1.5 % of risk-weighted assets for the lower and higher-risk buckets, respectively. The surcharges are being phased in from 2016-2019 [(1)].

2.3.3 Macroprudential measures imposed on Belgian residential real estate exposures

In 2013, following an analysis of the potential overvaluation of residential property prices, the NBB imposed a macroprudential measure related to residential real estate exposures. This measure consisted of a required 5 percentage point increase in the risk weights on Belgian residential real estate exposures used by banks that calculate their regulatory capital requirements through internal models (i.e., the internal ratings-based (IRB) approach). The measure was imposed via a Bank regulation approved by Royal Decree in December 2013 and was then implemented in 2014 under Article 458 of the CRR. The measure resulted in an increase of the average risk weight of banks adopting the IRB approach from around 10 % at the end of 2012 to almost 15 % at the end of 2014.

(1) See NBB (2016).

3. Observed changes in Belgian banks since 2008

Since the 2007-2008 crisis, the Belgian banking sector has changed considerably. Among the observed changes are the following[1]:

- The size of banks, and of the banking sector, has diminished;
- Leverage has decreased;
- Banks appear to have returned to their core businesses, concentrating on domestic lending;
- Holdings of government debt as a proportion of total assets has increased;
- Trading activities have been reduced;
- Banks have reduced their dependence on wholesale funding;
- Profitability has recovered.

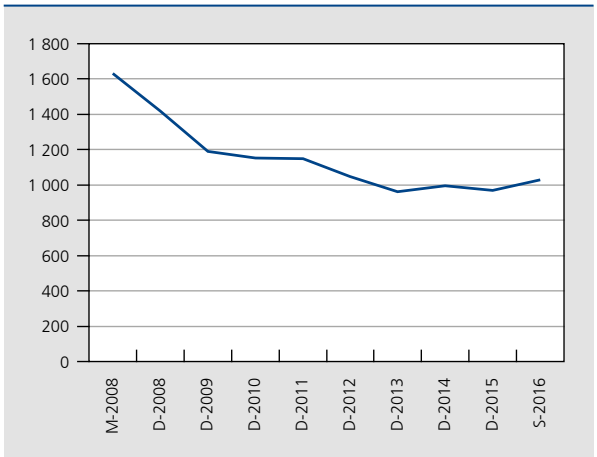
Several of these changes translate into an enhanced resilience of the banking sector.

3.1 Size of the Belgian banking sector

At the end of Q1 2008, a few months before the bankruptcy of Lehman Brothers, the total assets of the Belgian banking sector amounted to € 1629 billion. Since then a major deleveraging has taken place, bringing total assets close to € 1000 billion from 2013 onwards (Chart 1). Expressed as percentage of total GDP, the size of the Belgian banking sector has followed a very similar trend, falling from 470 % at the start of the crisis to about 250 % since 2013.

Compared to their European peers, the large Belgian banks began deleveraging earlier and more extensively, often as a result of agreements with the European Commission following receipt of state aid. The deleveraging of the Belgian banking sector has been concentrated among the four largest credit institutions, while the assets of the other smaller Belgian banks have remained stable or continued to grow. Before the crisis, the four main credit institutions accounted for almost 95 % of the sector in terms of balance sheet size, whereas they now represent 82 % of the total. This deleveraging trend may now have come to an end, with total assets growing again by 6 % to € 1029 billion during the first three quarters of 2016.

CHART 1 TOTAL ASSETS (EUR BN)



Source: NBB, Supervisory Reporting Scheme, consolidated data.

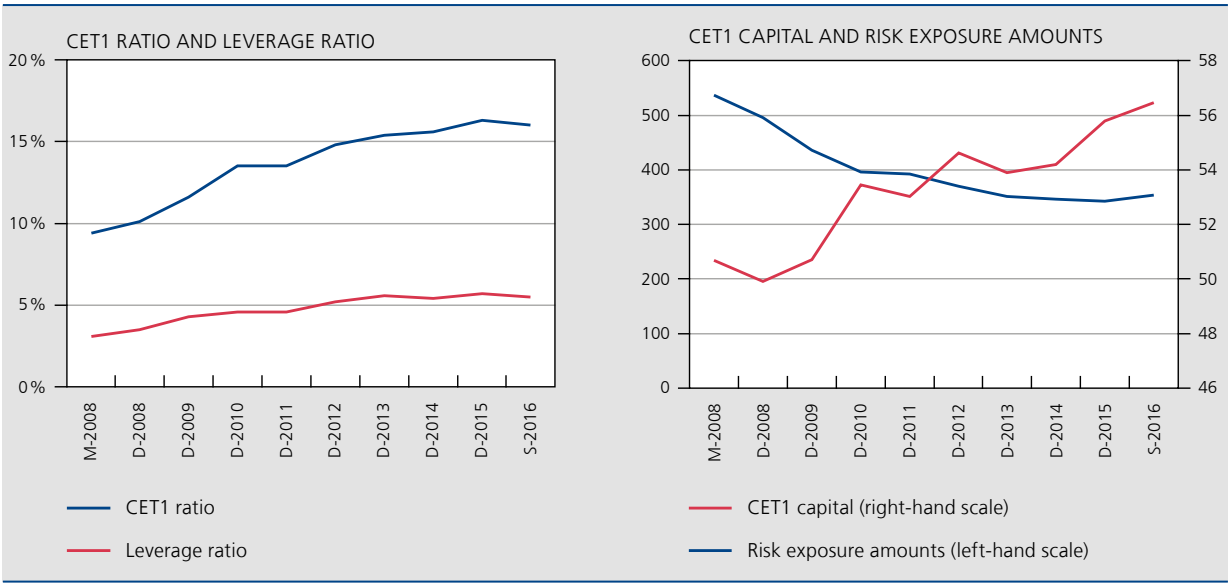
(1) While the data presented in this section are analysed over a period of ten years, discussions of similar data on a yearly basis or for shorter time periods appear in the annual publications of the NBB Financial Stability Report.

3.2 Leverage and risk-taking of Belgian banks

As shown in Chart 2 (left), the leverage ratio (common equity Tier 1 capital/total assets) of Belgian banks gradually increased from 3.2 % in Q1 2008 to 5.5 % in Q3 2016. This increase was driven by a contraction in total assets as well as by an increase in the CET1 capital stock (Chart 2, right). The increase in CET1 capital, from € 50.7 billion in Q1 2008 to € 56.5 billion in Q3 2016 is particularly significant considering that the new solvency rules (Basel 2.5 and Basel 3) have tightened the regulatory capital definition as well as the requirements.

As Chart 2 further indicates, the CET1 ratio (CET1 capital/risk exposure amounts)[1] of Belgian banks has followed a trend similar to the leverage ratio, rising from 9.4 % in Q1 2008 to 16.0 % in Q3 2016. Interestingly, the risk density (i.e., the ratio risk exposure amounts/total assets) of Belgian banks has been quite stable since the beginning of the crisis, at a level around 35 % (not reported). Given that reforms to regulatory requirements have raised the risk weighting coefficients of various asset categories in addition to increasing capital requirements, this stability in risk density likely reflects the disposal by Belgian banks of some of their riskier assets since 2008. Indeed, as is discussed below, banks have significantly reduced their trading activities as well as their holdings of government bonds for certain peripheral European countries.

CHART 2 LEVERAGE AND RISK-TAKING OF BELGIAN BANKS



Source: NBB, Supervisory Reporting Scheme, consolidated data.

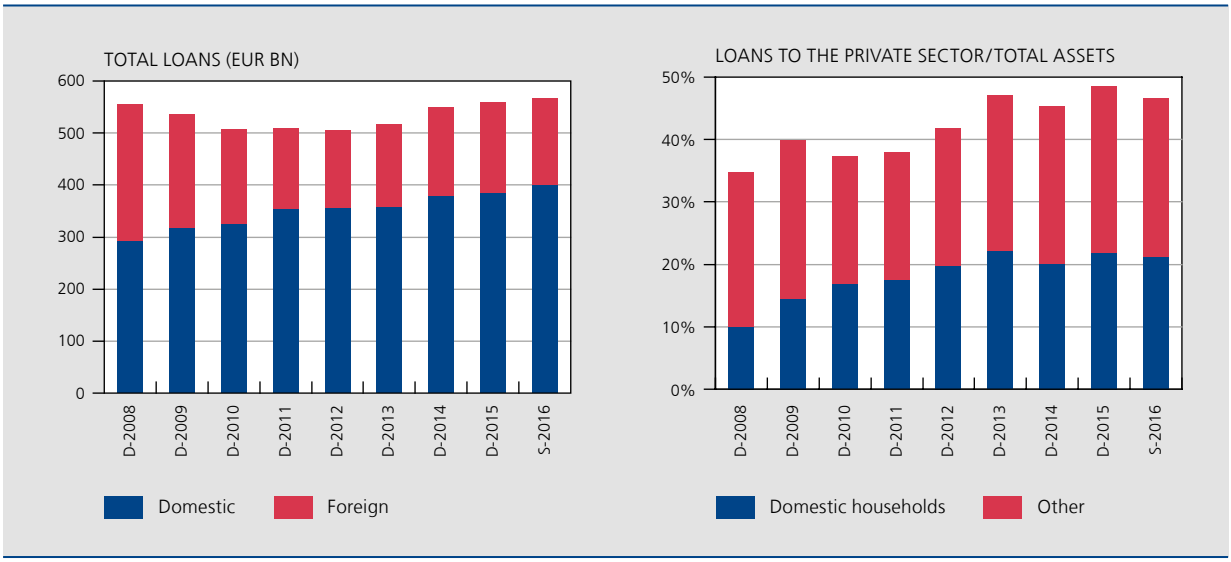
3.3 From foreign to domestic focus in lending

Much of the reduction in Belgian banks' assets documented in Chart 1 has come through a reduction in foreign activities (either cross-border or through local presence in foreign "home" markets), which were quite substantial in 2008. By 2016, many of these foreign activities had been halted, sold or placed in run-off, so that around 70 percent of banks' total loans are now related to activities conducted in Belgium (see Chart 3, left).

Belgian banks' exposures to the private sector (non-financial corporations and households), which account for slightly more than two-thirds of total loans, rose from 34.6 % of total assets in Q4 2008 to 46.7 % in Q3 2016 (Chart 3, right). In line with the refocusing of Belgian banks towards home markets and more traditional activities, most of the increase which took place has come from the higher share of loans to domestic households[2]. In recent years, prevailing low interest rates have served as a direct boost to the portfolio of loans to domestic households.

(1) The term "risk exposure amounts" has recently replaced the term "risk-weighted assets", which had previously been employed in the Basel framework.
(2) Note that Chart 3 (right) actually underestimates the proportion of lending to domestic households, since banks have securitized significant amounts of domestic mortgages, which have been held on balance sheet but which are classified as securities rather than loans.

CHART 3 FROM FOREIGN TO DOMESTIC FOCUS IN LENDING



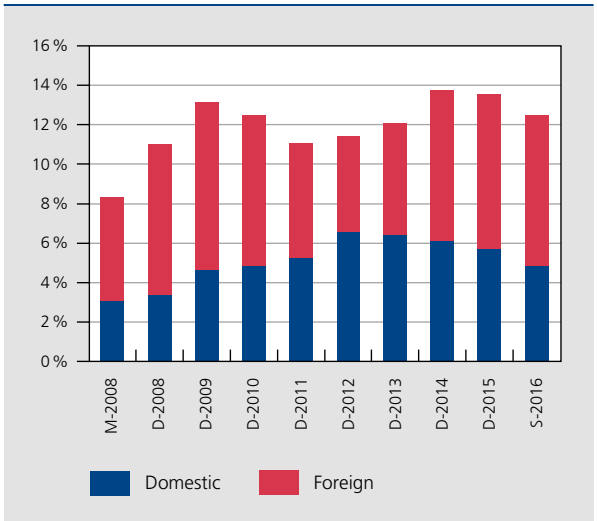
Sources: NBB, Supervisory Reporting Scheme, consolidated data.

3.4 Holdings of government securities

The share of government bonds on banks' balance sheets increased from 8.3 % in Q1 2008 to 12.5 % in Q3 2016 (see Chart 4). As liquidity requirements were imposed on banks during this period, the increase observed since the crisis is likely explained in part by the build-up larger liquid asset buffers by Belgian banks.

With regard to changes in government bond portfolios over time, Belgian banks reacted to the turbulence in Euro Area sovereign bond markets in 2011 and 2012 by reducing their exposures to sovereign debtors facing stress and replacing those exposures with Belgian government bonds. Beginning in 2013, banks began to gradually increase again their exposures to Euro area countries, including some peripheral countries.

CHART 4 GOVERNMENT DEBT SECURITIES/TOTAL ASSETS



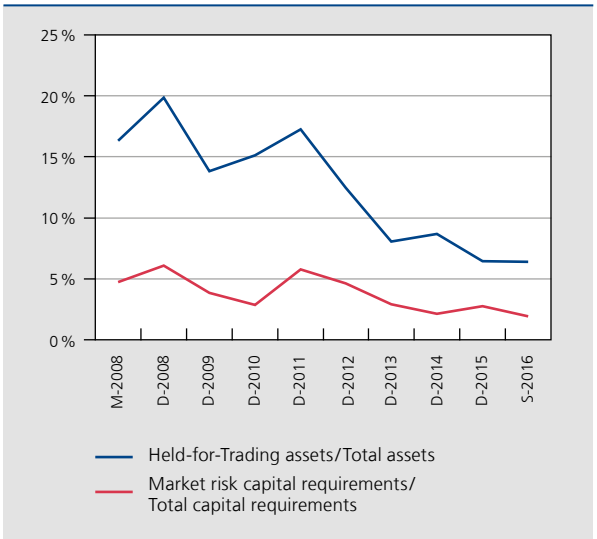
Source: NBB, Supervisory Reporting Scheme, consolidated data.

Whereas Chart 4 suggests that exposures to foreign governments represent more than half of Belgian banks' public sector exposures, the picture changes somewhat when other types of public sector exposures are taken into account. When considering all public sector exposures, Belgian banks' exposures to the domestic public sector still account for half of the total. Hence, although the domestic concentration of public sector exposures is decreasing, it nevertheless remains high, implying substantial sensitivity by banks to any widening of the spreads on Belgian government bonds.

3.5 Trading activities

As shown in Chart 5, and consistent with the increase in capital requirements for trading activities as well as implementation of structural banking reforms in Belgium, the importance of Belgian banks' trading activities has been drastically reduced since the 2008 crisis. With respect to trading volumes, assets classified in the Held-for-Trading category as a proportion of total assets have fallen from an average of 16.3 % in Q1 2008 to 6.4 % in Q3 2016. In terms of regulatory capital requirements for market risk, which can be interpreted as a measure of the risk associated with banks' trading activities, the average capital requirement for market risk as a proportion of total capital requirements has declined from 4.8 % to 1.9 % over the same time period despite an increase in capital requirements.

CHART 5 IMPORTANCE OF TRADING-RELATED ACTIVITIES

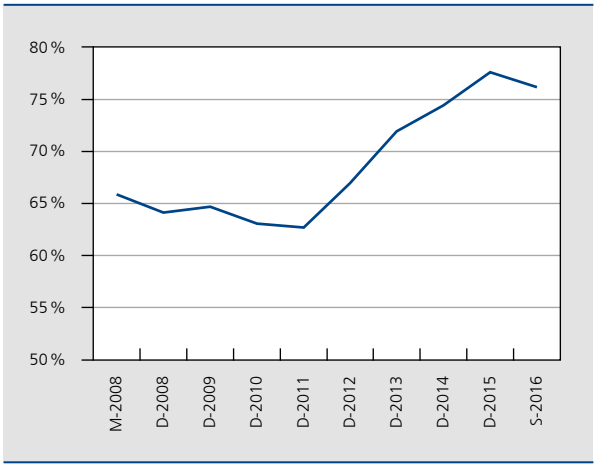


Source: NBB, Supervisory Reporting Scheme, consolidated data.

3.6 Deposit funding

As shown on Chart 6, the share of deposits in total assets has increased from 65.9 % in Q1 2008 to 76.2 % in Q3 2016, due principally to the rise in customer deposits (i.e., deposits of households and nonfinancial firms). This development is consistent with the objective underlying the imposition of liquidity requirements, which are designed to reduce banks' dependence on short-term wholesale funding. The development is also consistent with the refocusing by Belgian banks on more traditional activities, as customer deposits are often a key source of funding for banks that are involved in financing the real economy. The increase in the share of deposit funding, when taken together with the increase in bank capital, imply that Belgian banks have also reduced their reliance on wholesale funding since the 2008 crisis.

CHART 6 TOTAL DEPOSITS/TOTAL LIABILITIES

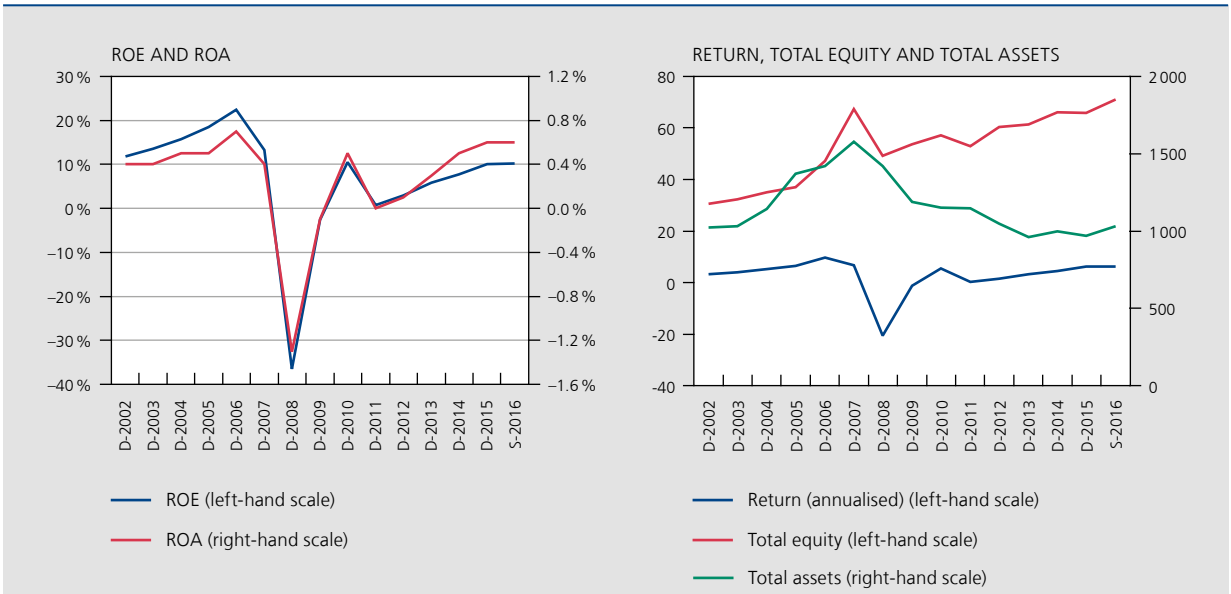


Source: NBB, Supervisory Reporting Scheme, consolidated data.

3.7 Profitability

The profitability of Belgian banks has followed the general global pattern for banks, with high values of return on equity (ROE) in the years leading up to the crisis, sharp drops during the crisis, and then recovery afterwards (see Chart 7, left). The ROE for the four largest banks reached a level of 23 % in 2006 and then fell to –41 % in 2008, due to the combined losses of these banks of € 21 billion. Both return on assets (ROA) and ROE have recovered somewhat since the crisis, with ROA in 2015 reaching a level similar to that observed in 2006. The proportion of total operating income accounted for by net interest income has risen from 51 % in 2007 to almost 68 % in 2015 (not reported).

CHART 7 PROFITABILITY



Sources: NBB, Supervisory Reporting Scheme, consolidated data.

4. Conclusion

In this article we have examined the regulatory responses to the 2007-2008 crisis and the resulting changes that have been observed in the Belgian banking sector. Many of these changes, including increased solvency, decreased leverage, and reduced trading suggest substantial improvements in bank resilience and risk, which should help to avoid a crisis of similar magnitude in the future. In addition, the downsizing of Belgian banks does not appear to have come at the expense of the domestic economy. Whereas banks' total loans and receivables have remained stable or increased slightly over time, the amount of domestic loans has risen substantially.

At the same time, since the crisis many observers have expressed concern that the post-crisis strengthening of prudential regulatory requirements will result in a transfer of intermediation activity from traditional banks to "shadow banks" which, according to the definition of the Financial Stability Board, include entities involved in credit intermediation that are fully or partially outside the regular banking system but which have features that make them susceptible to runs. As shadow banks face less regulation than traditional banks, the concern has been that a significant transfer of intermediation activity to shadow banks may correspond to a transfer of systemic risk that is not being detected or fully monitored. Internationally coordinated efforts are currently under way to identify and map the size of countries' shadow banking sectors and to include shadow banks in macroprudential monitoring. Recommendations for regulation of shadow banks are also being formulated.

While the transfer of intermediation activity to shadow banks is indeed a possibility that should not be discounted, there appears to be no strong evidence in Belgium of any significant disintermediation from banks to shadow banks in the ten years since the crisis. Belgian banks still appear to play a predominant role in the financing of the economy. As an illustration, the proportion of total credit to Belgian counterparts granted by Belgian banks has decreased only slightly, from 65 % in 2007 to 61 % in 2016.

On the other hand, investment funds are moving onto the macroprudential radar screen. Whereas the existence of investment funds provides social benefits by expanding the range of savings and investment products available to investors, such funds may also present potential risks, such as risks associated with interconnectedness between funds and their parent banks often referred to as "step-in" risk. These risks represent a current focus of the BCBS.

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Statistical annex

List of tables

Tables relating to Belgian credit institutions

Tables relating to Belgian insurance companies

TABLE 1 NUMBER OF CREDIT INSTITUTIONS

	2009	2010	2011	2012	2013	2014	2015	2016
Credit institutions governed by Belgian law with Belgian majority shareholding	21	21	20	16	15	15	17	15
Credit institutions governed by Belgian law with foreign majority shareholding	27	27	27	26	24	22	20	19
EU Member States	19	20	20	19	18	16	12	11
Other States	8	7	7	7	6	6	8	8
Belgian branches of foreign credit institutions	56	59	61	62	65	66	62	56
EU Member States	47	50	52	53	55	56	52	48
Other States	9	9	9	9	10	10	10	8
Total	**104**	**107**	**108**	**106**	**104**	**103**	**99**	**90**

Source: NBB.

TABLE 2 KEY FIGURES

(consolidated end-of-period data)

	2005	2006[1]	2007[1]	2008[1]	2009[1]	2010[1]	2011[1]	2012[1]	2013[1]	2014[1]	2015[1]	2016[1]
A. Large banking groups												
Balance sheet total (in € billion)	1 229.2	1 348.0	1 488.8	1 326.8	1 092.0	1 003.2	967.8	857.1	774.7	815.6	802.7	849.7
Customers' holdings (in € billion)	532.0	667.4	700.9	612.8	622.5	559.8	518.4	518.2	516.5	544.0	559.2	575.7
Loans and advances to customers (in € billion)	535.1	553.8	619.0	505.0	481.7	450.7	441.4	432.8	444.7	463.1	476.1	485.9
Risk asset ratio (in %)	11.1	11.2	10.8	16.2	17.0	19.2	18.2	17.9	18.5	16.9	17.8	17.5
Net after tax results (in € billion)	5.7	9.2	6.2	–20.9	–1.5	5.0	–0.1	1.2	2.6	3.9	5.2	4.8
Return on average assets (in %)	0.5	0.7	0.4	–1.4	–0.1	0.5	–0.0	0.1	0.3	0.5	0.6	0.6
Return on average equity (in %)	19.9	23.1	13.7	–40.8	–3.8	11.1	–0.1	2.7	5.6	7.8	10.3	9.4
Cost-income ratio (in %)	72.3	54.1	59.8	87.1	77.1	64.2	65.2	71.5	60.0	60.9	58.3	56.5
B. Total of Belgian credit institutions												
Balance sheet total (in € billion)	1 369.3	1 422.0	1 578.4	1 422.1	1 190.5	1 151.1	1 147.3	1 048.7	960.6	996.3	970.3	1 021.9
Customers' holdings (in € billion)	622.1	715.7	761.6	681.8	691.9	636.7	615.2	620.4	622.1	659.1	676.0	686.6
Loans and advances to customers (in € billion)	591.3	591.0	666.2	555.6	536.5	506.6	509.4	504.7	518.1	540.2	547.2	565.8
Risk asset ratio (in %)[2]	11.5	11.9	11.2	16.2	17.3	19.3	18.5	18.2	18.7	17.6	18.7	18.8
Net after tax results (in € billion)	6.6	9.7	6.7	–20.6	–1.2	5.6	0.4	1.6	3.3	4.5	6.1	5.7
Return on average assets (in %)	0.5	0.7	0.4	–1.3	–0.1	0.5	0.0	0.1	0.3	0.5	0.6	0.6
Return on average equity (in %)[2]	18.5	22.4	13.2	–36.5	–2.6	10.5	0.7	3.0	5.9	7.7	10.1	9.1
Cost-income ratio (in %)	72.6	54.4	60.2	85.6	76.9	64.5	65.8	72.1	60.8	61.2	58.6	58.4

Source: NBB.

(1) Since 2006, the data are based on the new IAS/IFRS prudential reporting scheme. This has led to a methodological break in the time series shown in this table, affecting in particular the level of the cost-income ratio (due to a reclassification of commission expenses), the average yield on assets, the average cost of funding and the interest margin.

(2) Only for credit institutions governed by Belgian law.

TABLE 3 NUMBER OF INSURANCE COMPANIES

	2009	2010	2011	2012	2013	2014	2015	2016
A. By the location of their registered office								
Belgium[1]	97	97	95	88	84	81	80	73
European Economic Area[2]	50	48	47	45	45	46	43	45
Rest of the world[3]	0	0	0	0	0	0	0	0
Total	**147**	**145**	**142**	**133**	**129**	**127**	**123**	**118**
Free service provision[4]	885	910	927	949	939	950	964	999
B. By specialisation[5]								
Life insurance	29	28	26	25	23	23	23	22
Non-life insurance	94	92	90	83	81	79	73	71
Life and non-life insurance	24	25	26	25	25	25	27	25
Total	**147**	**145**	**142**	**133**	**129**	**127**	**123**	**118**

Source: NBB.
(1) Companies with their registered office in Belgium comprise the Belgian subsidiaries of foreign companies.
(2) Belgian branches of companies with their registered office in another E.E.A. country.
(3) Belgian branches of companies with their registered office outside the E.E.A.
(4) Provision of insurance services without an establishment in Belgium.
(5) Including the Belgian branches of foreign insurance companies.

TABLE 4 MAIN COMPONENTS OF INSURANCE COMPANIES' ASSETS

(data on a company basis, in € billion)

	2009	2010	2011	2012	2013	2014	2015	2016
Investments	214.9	229.5	233.8	242.1	249.6	258.3	259.7	260.1
All activities with the exception of class 23	195.8	210.0	215.2	218.4	223.5	229.6	229.2	228.3
Shares (1)	11.4	12.0	9.6	9.3	11.6	12.6	13.3	13.5
Debt securities	151.5	165.9	172.0	173.3	171.7	173.8	171.1	170.9
Land and buildings	3.1	3.0	3.2	3.4	3.2	3.1	3.0	2.9
Mortgage loans	5.3	5.2	5.8	9.4	10.1	10.4	10.8	10.9
Investments in affiliated undertakings	16.9	16.8	15.5	15.7	16.6	18.3	18.6	17.2
Others	7.7	7.1	9.1	7.4	10.2	11.3	12.5	12.9
Class 23	19.1	19.5	18.6	23.7	26.2	28.7	30.4	31.8
Shares (1)	14.9	15.2	14.6	13.8	14.7	16.3	18.5	19.9
Debt securities	3.9	4.1	3.6	9.1	10.7	11.6	10.9	10.9
Others	0.3	0.2	0.4	0.8	0.7	0.9	1.0	1.0
Reinsured part of technical provisions	6.6	6.8	7.2	7.4	6.1	6.9	9.4	7.2
Claims and other assets	12.9	12.2	15.6	15.1	15.0	15.6	17.1	16.2
Total	**234.4**	**248.5**	**256.6**	**264.5**	**270.7**	**280.8**	**286.1**	**283.5**

Source: NBB.
(1) Including shares in UCITS.

TABLE 5 MAIN COMPONENTS OF INSURANCE COMPANIES' LIABILITIES

(data on a company basis, in € billion)

	2009	2010	2011	2012	2013	2014	2015	2016
Own funds	14.5	14.6	13.7	13.7	13.7	14.9	14.4	13.5
Technical provisions	198.5	211.0	218.3	226.6	231.6	240.1	242.6	242.2
Life insurance (with the exception of class 23)	149.2	160.4	167.7	170.9	172.6	175.4	175.3	172.4
Class 23	19.2	19.6	18.7	23.7	26.2	28.7	30.5	31.8
Non-life insurance	24.2	24.9	25.9	25.4	25.8	28.1	28.5	29.3
Others	5.9	6.1	6.0	6.6	7.0	7.9	8.3	8.7
Reinsurance companies' deposits	4.7	4.9	5.1	5.3	4.3	3.9	6.4	4.2
Creditors' claims	14.3	15.5	16.7	16.3	18.6	19.0	20.3	20.1
Other liabilities	2.5	2.6	2.8	2.7	2.5	2.9	2.6	3.5
Total	**234.4**	**248.5**	**256.6**	**264.5**	**270.7**	**280.8**	**286.1**	**283.5**

Source: NBB.

TABLE 6 COMPONENTS OF THE INCOME STATEMENT OF INSURANCE COMPANIES

(data on a company basis, in € billion, unless otherwise stated)

	2009	2010	2011	2012	2013	2014	2015	2016
A. Technical account in life insurance								
Net premiums written	18.6	19.0	18.4	20.7	15.9	16.0	15.1	14.4
Claims paid (–)	13.5	12.7	15.5	18.4	18.3	18.1	19.7	18.7
Change in the provisions for claims (–)	11.5	11.7	6.1	9.0	4.2	5.6	2.0	1.4
Premiums after insurance costs	**–6.5**	**–5.5**	**–3.2**	**–6.6**	**–6.6**	–7.7	–6.6	–5.7
Net operating expenses (–)	1.6	1.6	1.6	1.7	1.7	1.6	1.7	1.6
Result before investment income	**–8.0**	**–7.1**	**–4.8**	**–8.3**	**–8.2**	–9.3	–8.3	–7.3
Net investment income	8.8	7.8	4.0	9.5	8.9	10.0	8.5	8.3
Technical result life insurance	**0.7**	**0.8**	**–0.7**	**1.2**	**0.6**	0.7	0.2	1.1
B. Technical account in non-life insurance								
Net premiums written	9.2	9.5	10.4	10.8	11.1	12.3	12.7	12.7
Claims paid (–)	6.6	6.8	7.2	7.2	7.3	8.1	8.0	8.2
Change in the provisions for claims (–)	0.4	0.4	0.1	0.6	0.7	0.5	0.7	0.5
Premiums after insurance costs	**2.2**	**2.3**	**3.1**	**3.0**	**3.2**	3.8	4.0	4.0
Net operating expenses (–)	2.6	2.7	3.0	3.1	3.2	3.6	3.7	3.8
Result before investment income	**–0.4**	**–0.4**	**0.1**	**–0.1**	**–0.1**	0.2	0.3	0.2
Net investment income	1.0	1.2	0.8	1.1	1.2	1.3	1.3	1.2
Technical result non-life insurance	**0.7**	**0.7**	**0.9**	**1.0**	**1.2**	1.5	1.6	1.4
C. Non-technical account								
Total technical result life and non-life insurance	1.4	1.5	0.2	2.3	1.8	2.1	1.8	2.5
Residual net investment income	–0.7	0.2	–0.9	0.9	0.3	0.4	0.3	–0.2
Other and exceptional results and taxes	0.2	–0.3	–0.2	–0.7	–0.7	–1.2	–0.9	–1.0
Net result	**0.9**	**1.4**	**–0.9**	**2.4**	**1.4**	**1.3**	**1.2**	**1.3**
p.m. Return on equity (in %)	*6.3*	*9.7*	*–6.7*	*17.8*	*10.2*	*8.8*	*8.2*	*9.8*

Source: NBB.

National Bank of Belgium
Limited liability company
RLP Brussels – Company number: 0203.201.340
Registered office: boulevard de Berlaimont 14 – BE-1000 Brussels
www.nbb.be

Publisher

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Cover and layout: NBB AG – Prepress & Image

Published in June 2017