Financial Stability Review 2014

National Bank OF BELGIUM
Eurosystem

Contents

Foreword

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For many years, the Bank has been issuing a yearly Financial Stability Review, like several other central banks that have published regular analyses of the resilience of their national financial sectors. Through such work, major progress has been made in the understanding of global systemic vulnerabilities which, apart from weaknesses specifically affecting individual institutions, can spread to the whole financial system. This lesson has been learned the hard way. The recent crisis has shown that, in a globalised world, interlinkages between institutions or even common exposure to the same category of risk can transcend national borders and extend to markets or products on which both the individual institutions themselves and their domestic supervisors sometimes do not have a good enough grip.

While these analyses of financial stability conditions can help to detect potential risks and vulnerabilities, this capacity to diagnose has to be matched by an effective power to implement corrective measures. To that end, regulatory authorities have deemed it necessary to complement their microprudential rules, which have been thoroughly reshuffled after the crisis, by a macroprudential policy. In the EU, they have entrusted the coordination of this new policy to a specific institution, the European Systemic Risk Board (ESRB) established in 2010. Although this institution has only been empowered to issue warnings and make recommendations, the use of these soft laws has triggered a wave of legislative initiatives. By now, all EU Member States have either legislation in force or are finalising laws to designate a single macroprudential authority which can either be a board or a stand-alone institution. In Belgium, the government has assigned this new responsibility to the Bank through the Law establishing the mechanisms of a macroprudential policy and setting out the specific tasks devolved to the Bank to contribute to the stability of the financial system.

In its new capacity as macroprudential policy authority, the Bank will organise, at least three times a year, a specific meeting of its Executive Board on macroprudential issues, to detect and to monitor the emergence of systemic risks. The Bank will rely on various instruments whose use will be guided by a set of indicators, alongside expert judgment. The new law provides for a broad range of tools to help the Bank to comply with its mission. Some of them were initially envisaged as microprudential requirements only but can also be mobilised in a macroprudential perspective. This includes the imposition of supplementary requirements regarding capital adequacy or liquidity, either in general or geared to certain exposures, as well as limits in relation to counterparties or certain activities. Other instruments have a more exclusive macroprudential character. They notably comprise measures concerning mortgage loans, such as loan-to-value ratios and debt service ratios for borrowers. These measures will have to be activated by the government upon the Bank's recommendation.

The Bank will not act in isolation. It will have to regularly consult the other national competent authorities at government level and the Financial Services and Markets Authority (FSMA), on any ongoing developments potentially detrimental to financial stability. The law authorises the Bank

to collect, directly or through these authorities, any useful information on institutions that could generate a macroprudential risk.

Macroprudential policy has a strong national dimension as it must consider cyclical or structural developments that could jeopardise financial stability in a given country. While this justifies keeping wide national autonomy, the close EU financial integration embedded in the Single Market and reinforced, in the euro area, by the monetary and the banking union, has for consequence that systemic risks are liable to extend cross-border and contagion effects to become widespread and virulent. While macroprudential policy should normally generate positive externalities, negative cross-border spillover effects may occasionally arise which will have to be carefully monitored and assessed at EU level.

This synchronisation will be a challenging task. First of all, the organisational frameworks put in place by the various EU countries are quite diverse, reflecting the institutional specificities of the different Member States. Secondly, several EU bodies will be involved in this coordination as the ESRB, the European Banking Authority, the ECB and the European Commission will all have a say in the design or implementation of macroprudential instruments in the Union. This complex setting should not lead to an inaction bias. True, compared to the pre-crisis period, the present environment is less pressing for the introduction of a wide range of macroprudential measures. Nevertheless, there are some sources of vulnerabilities or upcoming developments that justify the introduction of targeted actions, which will allow the authorities to gain experience in the conduct of this new policy.

In Belgium, two measures have recently been introduced. Considering the property price rises and economic uncertainty of the last few years that could impair borrowers' future payment capabilities, the Bank has decided to raise the risk-weighting coefficients for mortgage loans, which were substantially lower than those prevailing in most neighbouring countries. This additional requirement has been introduced under Article 458 of the EU Capital Requirements Regulation (CRR) setting out the conditions in which a Member State could introduce national measures to mitigate changes in the intensity of risk and concerning, among others, risk weights for targeting asset bubbles in the residential and commercial property sectors.

Also in the context of debate on the need for structural reforms in the banking sector, the Bank has decided to impose a capital surcharge on trading activities above a certain threshold. This targeted measure has been introduced pursuant to Article 103 of the Capital Requirements Directive (CRD) allowing the application of specific macroprudential supervisory measures to institutions with similar risk profiles.

The establishment of the single supervisory mechanism (SSM) will affect the environment in which the Bank will run its macroprudential policy. Indeed, many of the instruments that could be used in the conduct of this policy will also be mobilised by the ECB in its new supervisory role. Under the SSM Regulation, and subject to prior mutual notification, national authorities as well as the ECB may impose additional requirements for systemic purposes. The overarching principle is that the level of microprudential requirements may be raised, if appropriate, to prevent the emergence of systemic risks, but may not be lowered in order to prevent the implementation of macroprudential policy leading to a relaxation of prudential rules.

This coordinated exercise of the macroprudential mandate between the national prudential authorities and the ECB will have to be reconciled with the ECB's autonomy in its supervision of individual credit institutions, on the one hand, and the independence of monetary policy, on the other. At the same time, the Bank will have to be accountable in carrying out its new mission. This imposes transparency duties which will have practical consequences for this FSR. Starting from next year, the Financial Stability Review will become the yearly Report that, in accordance with the new Article 28 of its Organic Law, the Bank will have to send to the President of the

House of Representatives as part of the oversight of the Bank's contribution to the stability of the financial system.

Like the current publication, the future Financial Stability Report will include, as its main component, a thorough overview of the financial stability conditions in Belgium. It will address the main sources of risks and vulnerabilities in the banking and insurance sectors and monitor the resilience of the main payment and securities settlement infrastructures established in the country, which form an integral part of the global financial system.

At the same time, the new Report will become more policy-oriented. It will go through the main macroprudential activities and assess the adequacy of the macroprudential policy stance as well as the impact of the various measures taken, the first two of which – on real estate exposures and trading activities – will, by then, have been in force for more than a year. It will explain the strategy followed by the Bank, its intermediate objectives and the criteria used to select and implement its specific macroprudential instruments. If appropriate, these analyses could be presented under the form of thematic articles – already a regular feature of the present Financial Stability Review.

To foreshadow this increased focus on policy, several of the thematic articles in this year's publication are devoted to the rationale or conditions for using macroprudential instruments. One article presents the general framework for putting the macroprudential instruments and policy into practice, while another examines recent developments in structural banking reforms, which constitutes the background for the introduction of strict macroprudential restrictions on trading activities. Two other articles detail why and how macroprudential instruments have been applied to the real estate sector.

Another article examines the factors driving the differences in the risk parameters used by the major Belgian banks in their internal model for corporate loans. The two last articles are devoted, respectively, to the oversight of financial infrastructures and to recent developments in the post-trade services environment in Europe.

Brussels, May 2014

Executive summary

1. Financial Stability Overview

1.1 Operating environment

Notwithstanding a further improvement in global financial markets and a recovery of economic growth in the euro area during the period under review, the operating environment for the Belgian banking and insurance sector remains quite challenging, as growth remains fairly moderate and interest rates are close to historically low levels. Against this background, the Bank is devoting particular attention in its prudential supervision to the analysis of Belgian banks' and insurance companies' business models, in order to assess their readiness to deal with the challenges coming from the operating environment as well as the new or forthcoming stricter regulatory requirements in several important areas (Basel III, Solvency II, MiFID, structural banking reforms, etc.).

Activity in the euro area started to recover during 2013 after a protracted recession lasting six quarters, but the recovery remains fragile as the macroeconomic imbalances revealed by the crisis have not been fully removed. The dichotomy which had prevailed at the height of the euro area sovereign debt crisis between the core economies of the euro area and the peripheral economies is nevertheless gradually dissipating. Ireland returned to growth in 2013 on the back of a stabilisation of the property market, enabling the country to exit its € 85 billion financial assistance programme. Portugal and Spain also came out of recession last year, thanks to exports and the gradual improvement in domestic demand. Spain exited its financial assistance programme – focused on the domestic banking sector – in November 2013 and Portugal left its support programme in May.

The economic recovery, in combination with a strengthening of investors' appetite for risk, led to a significant decline in CDS premiums for euro area bank and sovereign debt, maintaining the trend which had started in mid-2012. This development was made possible by the important steps that were taken during the period under review to complete the European Monetary Union (EMU). As regards banking supervision, the single supervisory mechanism (SSM) was established, following which the European Central Bank will exercise direct supervision over the 130 or so largest banking groups in the euro area as from November 2014. Parallel to the preparations for the start of the SSM, steps were also taken to deepen the integration of financial crisis management mechanisms, with the approval by the European Parliament, in April 2014, of the Bank Recovery and Resolution Directive (BRRD), the establishment of a single resolution mechanism (SRM) and the agreement on the Deposit Guarantee Scheme Directive (DGSD).

The euro area banks continued to face market scepticism over the quality of their balance sheets, amidst high and rising non-performing loan ratios in a number of countries. To restore market confidence and prepare for its upcoming supervisory function, the ECB therefore launched a comprehensive assessment of the euro area's banking system. This in-depth assessment of the large euro area banks is ongoing, but has already contributed to action by individual banks that aimed to recognise more potential problem loans and provision for them and/or to strengthen their capital buffers.

While the institutional steps towards completing the EMU were instrumental in restoring market confidence in the irreversibility of the euro, the sharp decline in risk premiums since the summer of 2012 was also made possible by the ECB's programme of outright monetary transactions (OMTs) – decided in the second half of 2012 – that aimed

to assuage the doubts which had arisen. Since then, sovereign bond spreads in the euro area have narrowed significantly, allowing yields in several peripheral euro area countries to catch up with bond yields in core euro area countries, which had already dropped to historically low levels during the period under review. These developments in the euro area's government bond markets were also underpinned by the further progress achieved by several crisis countries in tackling the remaining imbalances in their economies and financial sectors.

The ECB provided further support for these adjustment processes in the euro area countries through a continuously accommodative monetary policy stance. Following the provision of forward guidance on interest rates from July onwards, the ECB's key interest rate was cut in November 2013 by an additional 25 basis points to 0.25 %. This monetary policy stance has helped contain the spillover effects on euro area financial markets of the gradual reduction in large-scale asset purchases by the US Federal Reserve.

When seen in a long-term perspective, ten-year government bond yields in the US, the UK and Germany remain at historically low levels. This low level of interest rates is fuelling an increasing search for yield by investors. A long period of very low interest rates could imply risks for financial stability if it were to lay the basis for new unsustainable credit developments or asset price bubbles. Low interest rates also affect the profitability of financial institutions and weaken the incentives for debt reduction. So far, signs of excessive credit developments in response to the exceptionally low rates are not pervasive in the euro area countries, as many national banking sectors remain in deleveraging mode and lending to non-financial sectors remains moderate. The search for yield is mostly evident in the rising financial asset prices and – in some countries – upward pressures on residential and/or commercial property prices.

In Belgium, the growth of bank loans to households and non-financial corporations has slowed down further in the period under review. Yet, in the case of loans to Belgian households, this follows a period of strong growth of bank lending, driven by mortgage loans, which has pushed the gross debt ratio of Belgian households up to 57.8 % of GDP. While it is still lower than in the euro area (64.5 % of GDP), the gap between the two has fallen from more than 15 percentage points in 2005 to less than 7 percentage points. In this connection, it should also be noted that high household debt levels in some of these euro area countries contributed to the major imbalances that triggered financial crises and that are currently being reduced through deleveraging.

Although the aggregate credit quality indicators for households do not so far point to any deterioration in default rates on recent mortgage loan vintages, the Bank and international institutions such as the ECB, the ESRB, the OECD and the IMF have drawn attention to potential risks associated with the Belgian housing and mortgage market, partly on the basis of criteria measuring the over- or undervaluation of property prices. In spite of the recent tightening of some credit standards for new mortgage loan production, a sizeable group of borrowers in recent years may indeed have stretched their mortgage maturities, loan sizes and/or debt service ratios to levels that could entail a higher risk of future credit losses for banks than in the past. In view of the relatively large share of domestic mortgage loans on Belgian credit institutions' balance sheets, the Bank considered it justified to take some prudential measures aimed at strengthening the banks' resilience and reducing the concentration risk. These measures – which are described in more detail in the abstract of the thematic article entitled "The Belgian mortgage market: recent developments and prudential measures" – consisted in: an add-on of 5 percentage points to regulatory risk weights for Belgian mortgage loans for banks using an internal risk model to calculate their capital minimum capital requirements for this portofolio; a horizontal analysis of these internal risk models; and a request for all credit institutions to make a self-assessment of their compliance with two recent EBA Opinions in the field of mortgage loans.

1.2 Banking sector

In spite of the still challenging operating environment, the Belgian banking sector managed to improve its profitability in 2013, with a rise in the return on equity to 5.9 %, up from 3.0 % in 2012. As accounting equity remained stable at around € 56 billion, this improvement reflected the twofold increase in the net result of the banking sector, from € 1.6 billion in 2012 to € 3.3 billion last year.

The main factor behind the improved profitability in 2013 was the increase in the Belgian banking sector's non-interest income as the strong performance of financial markets in 2013 enabled banks to realise capital gains on bonds as well as book positive results on exchange differences of just over € 2 billion. Net fee and commission income remained close to the levels recorded over the recent years. Net interest income, which is the principal source of operating income, declined for a second consecutive year, from € 13.6 billion in 2012 to € 13.3 billion in 2013. The principal factor explaining this pressure on net interest income is the volume effect, which since 2009

has been marked by a decline in the outstanding amount of interest-bearing assets and liabilities, mainly caused by the shrinking of the four major banks' balance sheets. Yet, the low interest rate environment is also weighing on net interest income, as low interest rates depress the structural margins that credit institutions traditionally gain from very cheap financing sources, such as sight deposits and to a lesser extent savings deposits. In a low interest rate context, the loans and securities reaching maturity are reinvested at yields that are significantly lower than the maturing contractual interest rates, leading to a gradual decline in the average yield of the loan and bond portfolios. This reinvestment risk in a low interest rate environment will probably continue for some time to come. And with client rates on sight and savings deposits already having reached very low levels, banks will face increasing difficulty to offset this again partly by lowering their cost of funding.

Faced with downward pressures on their main income sources and – more generally – a lower revenue base as a result of business restructuring, many Belgian banks have initiated cost-saving programmes aimed at better aligning the structure of costs to their new business models and the challenging operating environment. In 2013, the Belgian banking sector managed to reduce its cost-income ratio to 62.5 %. Yet, when compared to other European banking sectors, Belgian banks still have a relatively high cost-income ratio.

Another main source of costs for banks are credit losses on loans and other assets. Total impairments and provisions reached € 2.95 billion in 2013, an increase of € 0.3 billion on the year-earlier level. The bulk of these impairments and provisions (€ 2.3 billion) were for (potential) credit losses on the loan portfolio. The loan loss ratio, comparing the net flow of impairments on assets classified as loans and receivables to the stock of such loans, rose from 30 basis points in 2012 to 36 basis points in 2013, still more or less in line with the historical average for this indicator. In addition to a number of one-off operations related to new EBA technical standards on non-performing exposures and forbearance in anticipation of the ECB-led asset quality review, this development reflected persistent credit losses in Belgian and foreign portfolios due to the weak economic environment.

During the period under review, the Belgian banking sector's balance sheet total contracted again, declining from € 1049 billion at the end of 2012 to € 961 billion at the end of 2013. As in 2012, this resulted mainly from a drop in the volume of derivatives (measured at market value) on both the assets and liabilities side, due to a combination of the impact of interest rates on the market value of these positions and to one-off operations and underlying business developments lowering the total amount of such positions being booked in the consolidated accounts.

Apart from this, the composition of assets or liabilities did not change significantly during the period under review. The regulatory liquidity and solvency ratios thus also remained well above minimum regulatory requirements, with a liquidity stress test ratio of 76 % and a Tier I capital ratio of 16.4 %.

Banks using an internal risk model to calculate their minimum capital requirements for Belgian mortgage loans have to apply, as from the last quarter of 2013, a 5 percentage point add-on to their own risk weight calculations. These additional risk-weighted assets (RWAs) correspond to an increase in minimum capital requirements of around € 600 million. While the Belgian banking sector's aggregate RWAs came down in 2013 to € 339.4 from € 352.7 billion at the end of 2012, the average risk weight of assets, computed by dividing RWAs by total assets, increased in the fourth quarter as a direct consequence of the implementation of the above-mentioned add-on on Belgian mortgage loans. This increase was observed for the four largest credit institutions as well as for three other banks using internal ratings-based models subject to the add-on.

In its prudential supervision, the Bank is devoting particular attention to the analysis of the banks' business models, in order to assess their readiness to deal with the challenges coming from the operating environment as well as the (forthcoming) stricter regulatory requirements in several important areas (Basel III, MiFID, structural banking reforms, etc.). These challenges follow a period during which some of the largest financial institutions in Belgium had to radically restructure their activities and balance sheets in response to the vulnerabilities that were revealed by the global financial crisis more than five years ago, and often as part of the agreements reached with the European Commission on the remedial measures to be taken in return for the state aid received. This business model analysis offers the supervisory authority an instrument for determining at an early stage the situations and actions which could prejudice the institution's sustainability or general financial stability. By adopting a prospective and proactive approach, it is used to assess the impact of major developments in the operating or regulatory environment on the institutions' various activities and their profitability. The business model analysis also fits into wider reflections on the future structure of the Belgian banking market, given – on the one hand – potentially stronger competition owing to a number of large banks retreating to their home market and reverting

to traditional banking activities and – on the other hand – the reassessment by a number of foreign banks of their involvement in the Belgian market.

The transposition of the Capital Requirements Directive (CRD IV) into Belgian law through the Banking Law of 25 April 2014 was accompanied by the implementation of the various options that the Capital Requirements Regulation left to the discretion of the Member States and national competent authorities. This Banking Law also anticipates certain aspects of the EU Directive on the recovery and resolution of credit institutions and provides for a structural reform designed to contain risk-taking by banks through trading activities. These are complemented by provisions on governance and remuneration and by policies designed to increase the likelihood that balance sheet assets will be sufficient to cover the liabilities relating to deposits in the event of a bankruptcy, which will reduce the need for intervention by deposit guarantee systems or taxpayers. In that respect, a rule will give depositors priority in the creditor reimbursement ranking in the event of a bank failure. The new banking law also foresees the principle, subject to further implementation measures, that banks should maintain a minimum amount of own funds or liabilities eligible for a bail-in, so as to avoid having to use taxpayers' money in the event of a bank failure.

1.3 Insurance sector

In 2013, the Belgian insurance sector recorded a net profit of € 1.4 billion, down from € 2.4 billion in 2013. These two years of positive net profits followed several years of low profits or even losses, as a result of the global financial crisis. The decline in profitability in 2013 resulted from an equally strong decline of € 0.6 billion in the technical result on life insurance (from € 1.2 billion to € 0.6 billion in 2013) and in the non-technical result (to a deficit of € 0.4 billion). The technical result on non-life insurance rose from € 1.0 billion in 2012 to € 1.2 billion, on the back of a further increase in non-life insurance premiums (rising 2.6 % to € 11.1 billion) and a stabilisation of the combined ratio around 100 %. Non-life insurance business thus pursued the strong performance of recent years, as shown by the steady rise in profitability since 2008.

In sharp contrast to the further increase in non-life insurance premiums, life insurance premiums declined very strongly last year, dropping from € 20.7 billion in 2012 to € 15.8 billion in 2013. This strong decrease can be explained by the low interest rate environment and the increase, as of 1 January 2013, in the tax on new life insurance premiums from 1.1 % to 2 %. A persistence of the low interest environment could weigh structurally on the new volumes of life insurance products that Belgian insurance companies will be able to sell, and eventually on their profitability if cost structures are not adapted to the reduced business volume.

In accordance with the Solvency I prudential framework, the effect of lower interest rates on the discounted value of the insurance companies' liabilities towards policyholders is currently not taken into account in the calculation of the regulatory solvency margin. Under the future prudential framework, Solvency II, this will be different, as both assets and liabilities will be measured on a market-consistent valuation basis. In the case of long-term insurance contracts, such as life insurance or disability insurance, interest rate changes may then 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. By adopting a more comprehensive approach, centred on the economic value, for assessing insurance companies' capital adequacy, the Solvency II framework will try to better reflect the challenges for asset and liability valuation, and the potential effects on volatility of own funds.

While life and non-life insurance activities each face different challenges in their convergence to the Solvency II standards, their starting points in terms of regulatory solvency margins seem to be different. In non-life insurance, the required margin has been quite stable over the past 20 years, and available regulatory own funds have exceeded this margin by a factor of at least 2.5. In life insurance, the required margin widened considerably between 1995 and 2010, requiring a concurrent increase in regulatory own funds in order to keep the regulatory solvency margin stable. In 2008 and 2009, the recapitalisations of some Belgian insurance companies thus appear to have been used primarily to strengthen the regulatory own funds for the life insurance business. Yet this was not sufficient to arrest the overall negative trend in the regulatory solvency margin, as additional crisis-related losses in the period 2010-2011 and a further moderate increase in the required margin have kept the regulatory solvency margin below 200 % since 2010. A return to higher after tax profitability in the life insurance business may thus be needed in order to strengthen the capital buffers.

The outstanding amount 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 the interest rates on risk-free investments fall to very low levels, as has happened recently. 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 %. In the case of an exit from a supplementary pension plan, the current legislation requires companies to guarantee a minimum return of 3.25 % on employers' contributions and 3.75 % on personal contributions. While the profitability of insurance contracts guaranteeing such returns was eroded when long-term interest rates began to drop below those levels, the sector has gradually modified that adverse structure by marketing contracts offering guaranteed rates of return which are more in line with risk-free interest rates, and containing clauses which provide for a revision on the basis of changing market conditions. Moreover, some contracts specify that the guarantee is limited in time, and that, at the end of that period, the contract reserve (i.e. the amount of savings built up) is technically regarded as a new premium with a new guaranteed interest rate in line with prevailing market conditions. All these measures contributed to a reduction in the average guaranteed rate of return on class 21 contracts from 4.5 % at the end of 1999 to 3.22 % at the end of 2010, 3.17 % at the end 2011 and 3.12 % at the end of 2012.

Analysis of the data broken down by contract reveals that contracts concluded in the past and still offering a guaranteed return of more than 4.5 % amounted to € 30.2 billion, or around 18 % of the inventory reserves, at the end of 2012. Most of those contracts (worth a total of € 26.9 billion) offered a nominal return of 4.75 %, the legal maximum for that type of contract up to June 1999. With reserves of € 34.7 and € 10.2 billion, contracts offering a guaranteed return of respectively 3.25 % and 3.75 % also account for large life insurance liabilities with guaranteed rates of return. The liabilities in these two categories include most of the class 21 group insurance contracts, because insurance companies, spurred on by competition, tended to offer in these group insurance policies a guaranteed rate of return that was in line with the minimum rates that companies sponsoring group insurance policies have to guarantee on employer (3.25 %) and employee (3.75 %) contributions according to Belgian law on supplementary pension schemes (second pillar). This mainly explains why the group insurance inventory reserves corresponding to 3.25 % and 3.75 % group insurance contracts continued to increase between 2011 and 2012. Yet, in the case of individual insurance, the inventory reserves related to contracts with a guaranteed rate higher than 3 % fell by 8 % in favour of contracts offering a smaller rate of close to 2 %. In particular, the inventory reserves of individual contracts with a guaranteed rate of 4.75 % declined 17 % between 2011 and 2012 compared to the previous year, reaching € 15.1 billion at the end of 2012.

In order to protect themselves against the effects of low interest rates on the profitability of guaranteed-rate-of-return contracts, insurance companies have to form an additional provision for contracts offering a guaranteed rate of return 10 basis points higher than the so-called flashing-light rate, defined as 80 % of the average yield on ten-year government bonds on the secondary market over the past five years. Insurance companies can spread the amounts to be allocated to this provision over a maximum of ten years. The flashing light rate for this additional provision, which is calculated once per year by the supervisory authority, was 2.72 % at the end of 2013. At the end of 2012, the cumulative additional provisions that the Belgian insurance companies had constituted in this framework amounted to € 3 billion. Income from the assets corresponding to that provision is added to that generated by the covering assets representing the life insurance provision so as to guarantee the interest rate level promised in the contracts.

A Circular from September 2006 exempted insurance companies from forming that supplementary reserve for interest rate risk if they could show that the financial flows generated by their covering assets will cover the commitments given in their insurance contracts. Nevertheless, in line with an International Monetary Fund recommendation, the Bank suspended the application of that Circular in 2013 for two important reasons. The first concerns the current economic situation, which implies that the low level of interest rates will persist for a long time both on the Belgian capital market and on the euro swap market. The second reason is the need to establish a mechanism tailored more closely to the principles of the future supervision regime to be introduced on transposition of the Solvency II Directive.

2. Thematic articles

2.1 Macroprudential policy in the banking sector : framework and instruments

In the aftermath of the financial crisis, the regulatory framework of the financial system was radically reformed. These changes are designed to establish a structure which is more capable of safeguarding financial stability. As for microprudential regulation, the Basel III framework introduced new requirements with respect to solvency and liquidity standards for individual institutions aimed at improving the sector's loss-absorbing capacity. Furthermore,

a broad macroprudential policy covering the entire financial system was considered a prerequisite for containing systemic risk, i.e. the risk of disruptions to the provision of financial services that is caused by an impairment of all or parts of the financial system, which in turn can have serious negative consequences for the real economy.

Safeguarding financial stability includes two main tasks for macroprudential policy. First, in a cyclical dimension, it tries to contain the build-up of systemic vulnerabilities over time by building buffers that absorb the impact of aggregate systemic shocks and help maintain credit provisioning to the economy in a downturn. Second, it seeks to prevent and mitigate structural systemic risks arising through vulnerabilities such as interlinkages between financial intermediaries, concentration of institutions' exposures and the critical role they play in key markets, which can render them too important to fail. Effective macroprudential policies to perform these tasks require adequate macroprudential authorities with clearly defined objectives, powers and instruments.

This article provides an overview of the macroprudential framework in Europe (with the creation of the European Systemic Risk Board and the single supervisory mechanism) and in Belgium. The country's federal Parliament has conferred the macroprudential policy mandate on the National Bank of Belgium. Within this new institutional framework, the Bank – as part of its wider mission of contributing to the stability of the financial system – will be responsible for the detection, monitoring and follow-up of the emergence of systemic risks, including taking policy action when deemed appropriate. Current legislation explicitly gives the Bank macroprudential powers to obtain confidential information from the non-regulated sector, control over macroprudential instruments such as additional capital and liquidity requirements foreseen in European and national legislation, and the possibility to make "comply or explain" recommendations to the relevant authorities if required actions (such as imposing limits on loan-to-value or debt service-to-income ratios) are beyond the Bank's competences.

With all these new competences in mind, the Bank has developed a specific in-house organisational framework relying on different internal structures. The organisational structure ensures that risk analyses are discussed across different departments and at different levels, so that divergent views are taken into account. Furthermore, as this structure is parallel to the one established at the level of the single supervisory mechanism, it will ensure coherence and facilitate the coordination with European authorities, including the single supervisory mechanism and the European Systemic Risk Board.

2.2 Structural banking reforms

One of the unique features of the crisis which began in 2007-2008 was the central role played by complex financial products, often linked to banks' trading activities. The breadth and depth of the crisis, combined with massive bank bail-outs, led to a broad, international package of regulatory reforms. While these reforms will improve the resilience of banks and the financial system, several observers have argued that an additional step is necessary; namely, imposition of structural banking reforms, which can involve a wide range of measures, ranging 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.

Support 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. Yet, while trading activities are very risky, an important feature of these activities is their heterogeneity. Some trading activities are riskier than others and some activities, such as those linked to market making or client hedging services, are clearly beneficial to the real economy while others, such as proprietary trading, are not. Unfortunately, it can be challenging in practice to distinguish proprietary trading from other trading activities, and this difficulty has led to significantly different approaches across countries to structural banking reforms.

Several countries, including Belgium, have proposed structural reforms. This article compares the different countries' proposals. It discusses differences in the features of the various proposals, analyses their implications, and considers their potential costs and unintended consequences. The article also outlines the Belgian structural reform measures, which have been incorporated into the new banking law and have grown out of the policy recommendations put forth in two Bank reports: an interim report on structural banking reforms in Belgium, published in June 2012; and a final report, published in July 2013.

The objectives cited for 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 implementation challenges. The Belgian structural reform measures include 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 The Belgian mortgage market: recent developments and prudential measures

This article reviews recent developments in the Belgian mortgage market before presenting the three prudential measures that the Bank took at the end of last year to bolster the resilience of the market and those credit institutions with the largest exposures to Belgian mortgage loans.

A first section documents the development in credit standards applied to new mortgage loans, based on the same type of quantitative survey of 16 Belgian banks' domestic mortgage loan portfolios that was used for a similar thematic article in the 2012 Financial Stability Review. The main conclusion of that article was that more vigilance was required from banks and authorities alike to ensure the continuous application of sufficiently conservative credit standards and adequate risk-pricing in all new mortgage loans. It also called for a tightening of credit standards, where necessary, in order to maintain the current high asset quality of Belgian mortgage loan portfolios.

As a follow-up to this policy message from the 2012 article, the Bank conducted new stock-taking exercises in the second half of 2012 and 2013 on the 16 Belgian banks' mortgage loan portfolios, devoting particular attention to assessments of the way in which the potential risks associated with mortgage loans were taken into account in calculating the minimum capital requirements for credit risk under the Pillar 1 rules. This fact-finding exercise focused mainly on the banks relying on internal risk models to compute the minimum regulatory capital buffers required for these exposures, as these calculations result in risk weights (10 % on average) that are significantly lower than those applied under the Basel II standardised approach (35 %).

The risk weights calculated with these internal ratings based (IRB) models for Belgian mortgages are not only considerably lower than those determined by the standardised approach for calculating the minimum capital requirements for credit risk, but they also vary widely between institutions. More detailed analysis has confirmed that these differences between institutions are largely attributable to variations in the risk profile – and particularly the relative importance of the riskier subsegments – of different banks' mortgage loan portfolios in Belgium. It showed the heterogeneity among banks' credit standards and the importance of these standards in explaining the degree of subsequent defaults in the portfolios. In particular, banks that generally tend to have less conservative credit standards (loans granted to more risky borrowers, with higher debt service ratios) were found to be the ones with the relatively higher default rates. The study also showed that differences in individual banks' IRB risk weights and parameters for Belgian mortgage loans seemed to be broadly consistent with the ranking of bank portfolios' (relative) risk profile.

Another main conclusion of the fact-finding exercise was that these IRB risk weights for Belgian mortgages are generally relatively low, and, on average, lower than in other countries. Data collected by the European Banking Authority has shown that the average IRB risk weight for mortgage loans in Belgium was one of the lowest among all the sample countries, with Sweden having the lowest weights. However, the Swedish authorities have enacted a measure in the course of 2013 aimed at putting a 15 % floor on this risk weight and recently announced plans to raise the floor further to 25 %. Belgium's neighbours report average risk weights of over 10 % (up to 18 %). Echoing the developments in Sweden, Norway and Switzerland have also recently taken measures aimed at raising the average risk weight of IRB banks for domestic mortgage loans (up to 35 %, as in the SA approach).

Although the aggregate credit quality indicators for households do not so far point to any deterioration in default rates on recent mortgage loan vintages, the Bank and international institutions such as the ECB, the ESRB, the OECD and the IMF have drawn attention to potential risks associated with the Belgian housing and mortgage market, partly on the basis of criteria measuring the over- or undervaluation of property prices. If conditions in the Belgian housing market were to become less buoyant than they have been over the past 15 years, the riskier loan segments in the outstanding stock of mortgages could be the source of higher-than-expected credit losses for banks. In spite of the recent tightening of some credit standards for new mortgage loan production, a sizeable group of borrowers in recent years may indeed have stretched their mortgage loan maturities, loan sizes and/or debt service ratios to levels that could entail a higher risk of future credit losses for banks than in the past. Here, it should be noted that the internal risk models are calibrated on historical credit loss data, so that these low

risk weights can to some extent be explained by the absence of a major crisis on the Belgian housing market in the past and by the generally buoyant market conditions of the past 15 years. Risk weights as calculated by the IRB models could thus be too low for losses that may emerge in less favourable market circumstances and from the materialisation of risks embedded in certain sub-segments of banks' Belgian mortgage loan portfolios.

In this context, and in view of the relatively large share of domestic mortgage loans in the balance sheets of Belgian credit institutions, the Bank considered it justified to take some prudential measures aimed at strengthening the banks' resilience and reducing the concentration risk.

The first measure that was taken in the last quarter of 2013 was macroprudential in nature and provided for a flat-rate 5-percentage-point increase in the risk weights calculated by the banks themselves, but only for banks calculating their minimum regulatory capital requirements for Belgian mortgage loans according to an IRB model. That measure took effect with the Royal Decree of 8 December 2013. This add-on did not apply to banks using the standardised approach mentioned earlier to calculate their capital requirements. In practice, if a bank using the IRB approach calculates an internal risk weight of 10 % for Belgian mortgage loans, this measure requires the minimum capital requirements to be calculated on the basis of a 15 % risk weight. The average risk weight of the IRB banks effectively increased from around 10 % at the end of 2012 to about 15 % at the end of 2013, as a result of the introduction of the add-on. The relatively moderate size of the add-on seemed appropriate in view of the Belgian banks' generally rather conservative policy on mortgage lending in the past, and the historically low level of losses on such loans. However, in view of the cyclical character of this measure, the Bank will keep a close eye on market developments for the purpose of continuous assessment of the appropriate level of that add-on.

The other two measures adopted by the Bank at the end of 2013 were microprudential in nature.

One involved launching a horizontal assessment of the IRB models on the basis of the results of the back-testing to be conducted by the institutions, followed by any necessary adjustments to those approaches. The goal of this measure is to address potential weaknesses of the risk parameters used in the IRB approach. The Bank will in this respect evaluate the adequacy of the calibration of the PD and LGD models used in the regulatory capital calculation within the IRB approach. Banks with unsatisfactory calibrations will be required to adapt their Pillar 1 models.

The other microprudential measure consisted in requesting credit institutions to carry out a self-assessment of the degree to which each bank conforms to the EBA Opinion on Good Practices for Responsible Mortgage Lending and the EBA Opinion on Good Practices for the Treatment of Borrowers in Mortgage Payment Difficulties. These self-assessments by banks of the degree of conservatism of their credit standards for residential mortgage loans will be analysed by the Bank and if weaknesses are identified, banks will be asked to develop an action plan to redress these identified weaknesses. This measure applies to all 16 banks.

Through these three prudential measures, the Bank aims to bolster the resilience of the market and of those credit institutions with the largest exposures to Belgian mortgage loans against potentially higher-than-expected credit losses on Belgian mortgage loans if conditions in the Belgian housing market were to become less buoyant than they have been over the past 15 years. The measures also aimed to underscore once again the importance of maintaining sound credit standards at origination in mortgage lending, as these play an important role in the development of imbalances in residential property markets. As the experience of several other countries has shown, such imbalances may then lead to severe macroeconomic (and social) outcomes and losses for banks, in the event of a bubble bursting.

2.4 Evaluating early warning indicators for real estate related risks

Adverse developments in the real estate sector can be an important source of systemic risk and financial instability. Addressing systemic concerns in the real estate sector is one of the priorities on the European authorities' macroprudential agenda. The European Systemic Risk Board strongly encourages countries to develop sound macroprudential policy strategies to frame actions aimed at dampening systemic risk in real estate markets. Such strategies involve linking the ultimate objectives of macroprudential policy to instruments (for example, risk weights for real estate exposures, and limits to loan to value and debt service to income ratios) and indicators. The operationalisation of such instruments requires identifying sound leading indicators and associated thresholds, which could serve as a basis for guided discretion in the activation of macroprudential instruments.

This article presents a novel graphical methodology for identifying leading indicators of real estate related banking crises using information on 15 EU countries.

Accounting for the uncertainty surrounding the estimates of cross-country average levels of the indicator, the methodology provides a graphical tool for assessing the predictive power of an indicator for real estate related banking crises. The framework also enables identification of thresholds that determine zones, which correspond to different intensities of the signal issued by each indicator for a given prediction horizon. As such, the framework can be applied as a monitoring tool for systemic risks stemming from the real estate sector.

The article highlights the relevance of the results for systemic risks arising through the Belgian property markets. In particular, signals related to increasing levels of household indebtedness in combination with a potential overvaluation of housing prices suggest the need for close monitoring of developments in the Belgian real estate market and Belgian banks' mortgage loan portfolios.

The methodology described in this article serves as input into the Bank's general monitoring framework for housing and mortgage market developments. Signals obtained from early warning indicators and thresholds should not serve as automatic triggers for policy action. Uncertainty over threshold levels, country-specific factors driving developments in housing and mortgage markets, and heterogeneity in the risk profile of individual loans warrant caution in the policy application of such frameworks. Rather, they should be considered as input into the first stages of the systemic risk assessment process, indicating the potential need for further in-depth assessment and monitoring of possible risk sources and triggers.

2.5 The role of internal models in regulatory capital requirements: a comparison of Belgian banks' credit risk parameters

One of the essential features of the international bank regulatory framework is the use of risk-weighted assets (RWAs) for the determination of the minimum amount of capital that each bank must hold. In the Basel regulatory framework, minimum capital requirements are expressed as a percentage of risk-weighted assets, rather than of total assets. A key innovation that was introduced with the Basel II framework was to allow banks, under certain conditions, to replace standardised parameters used for estimating the risk weights of particular assets, such as loans, with parameters estimated directly by the banks, using their own internal models.

The use of internal models for the estimation of the risk parameters used in the calculation of risk-weighted assets, and hence of capital requirements, has the potential advantage of tailoring banks' minimum capital requirements to the true riskiness of their assets. Basing capital requirements on standardised risk weights that reflect sector-level averages, as was the case in the Basel I framework, can result in capital levels that are either too low or too high for a particular bank, given the asset composition of its portfolios.

At the same time, concerns have been expressed that banks' use of internal models may lead to differing estimates of risk across banks for similar assets. To the extent that this occurs, an unlevel playing field will be created, whereby banks with lower risk estimates for a given asset will be required to hold less capital than banks with higher risk estimates for the same or a similar asset.

Yet, banks' estimates of risk parameters for loans, such as the probability of default and loss given default, cannot explain the entire value of RWAs for loan portfolios. The volumes granted of loans of varying riskiness also plays a key role in the determination of RWA. Differences in RWAs across banks for similar types of loan portfolios may thus be due as much to differences in banks' lending practices as to differing risk parameter estimates by the banks for similar loans.

This article presents the results of an analysis conducted by the Bank to identify the factors driving differences in the RWAs for corporate and public sector entity loan portfolios of the four largest Belgian banks. As a result of the methodology used and the data obtained from these banks, we are able to separate the drivers of differences in observed RWA. The analysis reveals that banks' lending practices strongly reduce the impact of differences in risk parameter estimates. In terms of the risk parameters, differences in estimates of loss given default (LGD) are more important than are differences in banks' estimates of the probability of default. Moreover, differences in LGDs across banks appear to be linked to differences in banks' collateral practices, as well as to differences in modelling frameworks or assumptions.

2.6 Overview of the NBB's oversight and supervision of financial market infrastructures in 2013

The Bank is responsible for both oversight and prudential supervision of post-trade financial market infrastructures (FMIs). These FMIs often have an international dimension. As a result, the Bank is in charge of coordinating international cooperation for Belgian FMIs with an international dimension such as SWIFT, Euroclear, BNY Mellon SA/NV

and MasterCard Europe. Likewise, the Bank is also involved in cooperative frameworks for foreign FMIs (e.g. TARGET2, TARGET2-Securities, central counterparties in Europe having links with Belgium). In 2013, the cooperative arrangements where the Bank is lead overseer were extended: for Euroclear Bank, a multilateral cooperative framework with other central banks is being set up, while information regarding SWIFT has been shared with a wider group of central banks through the SWIFT Oversight Forum.

Besides the recurrent oversight and supervision work, the Bank has paid particular attention to certain themes in 2013. Cyber-security arrangements have been thoroughly analysed for Euroclear and SWIFT. The adaptation of Euroclear Belgium and NBB-SSS to TARGET2-Securities is being closely monitored, as is the adaptation of the Bancontact-MisterCash debit card scheme to comply with the Single Euro Payments Area (SEPA) principles. The NBB-SSS and MasterCard Europe have both undergone a comprehensive oversight assessment. In this context, it is interesting to note that CPSS and IOSCO have issued an Assessment methodology for the oversight expectations applicable to critical service providers, comparable to that already in place for SWIFT.

Specifically for Euroclear, the authorities are assessing the recovery plan. Oversight has been following up on Euroclear Bank's measures to further reduce liquidity risk and the plan to reduce credit risk linked to income and redemption payments that are currently advanced to participants.

Prudential supervision has monitored changes to the governance and risk management framework of BNY Mellon SA/NV – which is included in the European single supervisory mechanism – in order to ensure that it is commensurate with the extension of its activities after mergers with other group entities.

The Bank is also in charge of prudential supervision of payment institutions and electronic money institutions. The number of non-banks providing payment services and electronic money services in Belgium is growing.

The Centre for Exchange and Clearing (CEC), the Belgian automated clearing house which processes and clears retail payments between banks active in Belgium, has moved to a platform run by the French automated clearing house, which provided an opportunity to improve – as recommended by Oversight – the risk management of the system. Two major changes concerned the frequency of the settlement cycles, which was increased from one to five daily cycles, and the introduction of transaction messaging to the beneficiary's bank after final settlement takes place in TARGET2.

2.7 Developments in the post-trade services environment in Europe

The current European post-trade services environment, comprising clearing and settlement services, is characterised by fragmentation and by large numbers of bilateral over-the-counter (OTC) transactions. Such fragmentation gives rise to counterparty and operational risks and adds to the costs for cross-border transactions.

Given that the volumes involved are substantial and systemically relevant, the EU has taken regulatory initiatives. As regards the clearing of transactions, the EMIR Regulation lays down rules on the mandatory use of a central counterparty (CCP) for standardised OTC derivative transactions. It makes CCPs more robust and safe. Also, it requires exposures in non-standardised derivative products to be collateralised. As regards the settlement of transactions, the draft CSD Regulation aims to break down barriers in the Single Market and to boost competition via harmonisation, and to lay down the standards for the safe and efficient functioning of CSDs in the EU. In parallel with these two regulatory initiatives, the Eurosystem has started the TARGET2-Securities (T2S) project that is expected to be launched from June 2015. Its purpose is to reduce operational risks and inefficiencies linked to cross-border transactions in the euro area via the use of a single settlement platform.

These developments, while beneficial, have their own caveats. The wider use of CCPs also implies that risk is further concentrated in the hands of the CCPs themselves. Interoperability arrangements between CCPs might become more common practice, bringing its own risks. Further, CSDR will boost competition between CSDs and custodians, and CSD will move up the value chain and offer more complex services. Specifically, the combination of much wider demand for collateral, on the one hand, and the CSDs offering value-added services in collateral management, on the other, implies growing interdependence between the clearing and settlement layers as well. Finally, TARGET2-Securities will move settlement onto a single platform for participating CSDs. This also concentrates the operational dependence of EU CSDs on a single platform. So, these changes call for continued attention and appropriate monitoring of developments by the regulatory authorities.

Financial Stability Overview

1. Operating environment

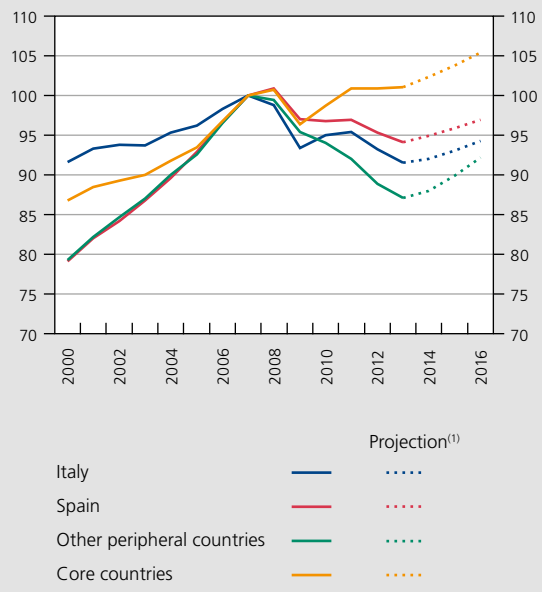
After a protracted recession lasting six quarters, activity in the euro area started to recover during the course of 2013. The recovery was attributable to the removal of factors which had previously put a strong brake on domestic demand, in particular in those countries where high levels of public and/or private debt undermined investor confidence in the sustainability of fiscal and private sector balances. The recovery in the euro area is nevertheless still fragile, as the macroeconomic imbalances revealed by the crisis have not been fully removed. High unemployment rates and uncertainties related to (geo-)political developments could also sap the strength of the recovery.

The pace of the recovery varies from one euro area country to another (Chart 1), with the relatively better GDP performances in certain core euro area economies. Among these, Belgium is one of the few countries where real GDP has regained its pre-crisis level. Yet, the dichotomy which had prevailed at the height of the euro area sovereign debt crisis between the core and peripheral economies is gradually dissipating. Ireland returned to growth in 2013 on the back of a stabilisation of the property market, enabling the country to exit its € 85 billion assistance programme. Portugal and Spain also came out of recession last year, thanks to exports and the gradual improvement in domestic demand. Spain exited its assistance programme – focused on the banking sector – in November 2013 and Portugal left its support programme in May.

The economic recovery, in combination with a strengthening of investors' appetite for risk, has led to a significant decline in bank and sovereign CDS, maintaining the trend which had started in the middle of 2012. At that time, financial market participants' perceptions of significant tail risks in the euro area – fuelled by fears of possible euro reversibility if a Member State were to leave the euro area – had led to strong capital outflows from peripheral

CHART 1 GDP AT CONSTANT PRICES

(indices 2007 = 100)

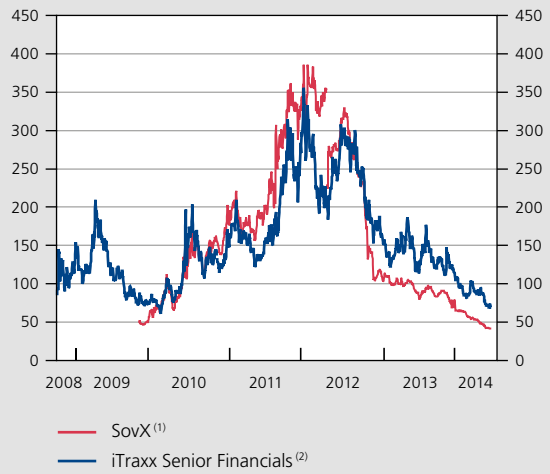


Source: IMF World Economic Outlook, April 2014.

(1) The assumptions underlying this projection are explained in the April 2014 edition of the IMF World Economic Outlook (pp ix-x).

CHART 2 CREDIT DEFAULT SWAP INDICES FOR EUROPEAN SOVEREIGN DEBT AND FOR THE SENIOR DEBT OF EUROPEAN FINANCIAL INSTITUTIONS

(daily data, basis points)



Sources: Bloomberg, Thomson Reuters Datastream.

(1) Index measuring the average level of five-year CDS premiums referencing the sovereign debt of western European countries.

(2) Index measuring the average level of five-year CDS premiums referencing the senior debt of large European financial institutions.

countries and a highly correlated surge in the default risk premiums for sovereign and bank debt (Chart 2). This close interaction between governments' and financial institutions' financing costs resulted in part from the substantial portfolios of government securities on banks' balance sheets, often dominated by exposures to the home country.

The severe financial tensions in the euro area in the middle of 2012 triggered additional policy measures that aimed to address the perceived tail risks and the adverse feedback loop between national sovereign and bank financing costs.

One of these policy responses was the commitment by European Heads of State or Government to take further steps to complete the monetary union, in particular the decision to create a banking union through the establishment of a single supervisory mechanism and harmonised or common frameworks for bank resolution and deposit guarantees. During the period under review, further crucial steps were taken to make this project concrete.

As regards banking supervision, under the newly established single supervisory mechanism (SSM), the ECB will exercise direct supervision over the 130 or so largest banking groups in the euro area as from November 2014. Yet, the euro area banks have continued to face market scepticism over the quality of their balance sheets, amidst high and rising non-performing loan ratios in a number of countries. To restore market confidence and prepare for its upcoming supervisory function, the ECB therefore launched a comprehensive assessment of the euro area's banking system. This in-depth assessment of the large euro area banks is ongoing and if that reveals structural weaknesses or inadequate capital, action must be taken, in the first place by the private sector but if necessary also via direct government support.

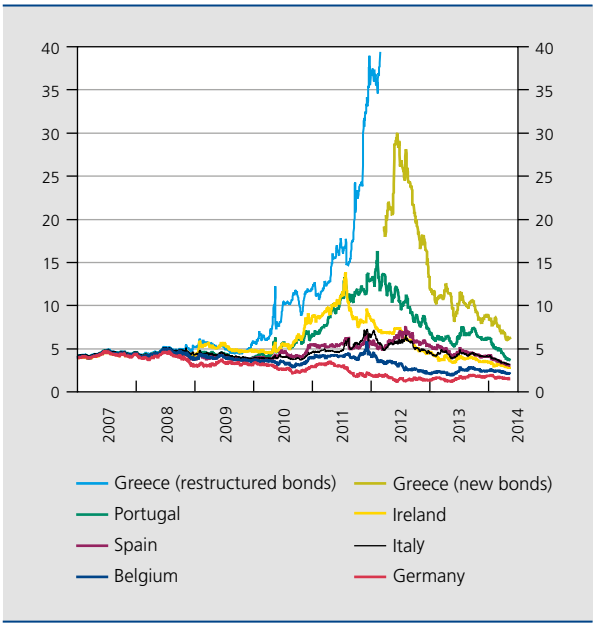
Parallel to the preparations for the start of the SSM, steps were taken to deepen the integration of financial crisis management mechanisms. In December 2013, the Council approved a proposal for a Regulation establishing a single resolution mechanism, intended to bring together the national resolution authorities at euro area level. The Council also endorsed the principle of a single resolution fund, financed by contributions from the banking sector and gradual pooling of the national compartments. On 15 April 2014, the European Parliament adopted the Bank Recovery and Resolution Directive (BRRD) which will provide common tools and powers for addressing a banking crisis pre-emptively and managing failures of credit institutions and investment firms in an orderly way. The establishment of a Single Resolution Mechanism (SRM) aims at setting up a unique system for resolution, with a Single Resolution Board and a Single Resolution Fund at its centre. The European Parliament also approved the agreement on the Deposit Guarantee Scheme Directive (DGSD), the third pillar of banking union consisting of an EU-wide system for deposit protection.

While these institutional steps towards completing Economic and Monetary Union were instrumental in restoring market confidence in the irreversibility of the euro, the sharp decline in spreads since the summer of 2012 was also made possible by the ECB's programme of outright monetary transactions (OMTs) – decided in the second half of 2012 – that aimed to assuage the doubts which had arisen on the markets. It led to a rapid and significant easing of financial tensions in 2012, particularly on the sovereign debt markets of the countries giving the greatest cause for concern (Chart 3). Since then, sovereign bond spreads in the euro area have gradually narrowed further, resulting in significant cumulative falls in sovereign spreads since the middle of 2012. Sovereign bond yields in several peripheral euro area countries hence caught up with bond yields in core euro area countries, which had already dropped to historically low levels during the period under review.

These developments in the euro area's government bond markets would not have been possible without the further

CHART 3 TEN-YEAR GOVERNMENT BOND YIELDS IN THE EURO AREA

(daily data, in %)



Source: Thomson Reuters Datastream.

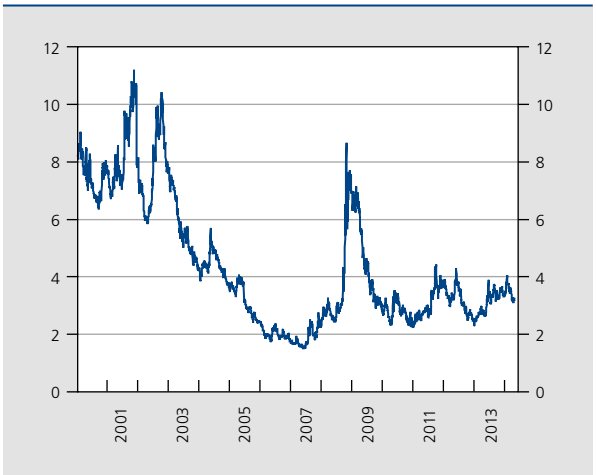
progress achieved by several countries in tackling the remaining imbalances in their economies and financial sectors. In general, this was most apparent in the countries where the situation was the most fragile, under adjustment programmes agreed by national governments with the IMF, the EC and the ECB. External imbalances were corrected to a significant degree, with Greece and Cyprus bringing their current account deficits down sharply and Spain and Portugal turning deficits of around 10 % of GDP into surpluses. In Portugal and Spain, the expansion of exports was a major factor in the correction of the trade balances. In those countries, as well as in Ireland, export growth benefited from restructuring measures that improved the external competitiveness of these countries. While the countries pursued their fiscal consolidation efforts, they also made progress, albeit less, in reducing excessive debt levels of the non-financial private sector. The latter continued to feed a high level of non-performing loans in the banking sectors. Yet, financial sector restructuring, in combination with narrower interest rate differentials on government bonds and diminishing financial fragmentation along national borders, allowed banks in the most stressed countries to regain access to market financing. That made the banks less dependent on liquidity provided by the Eurosystem, permitting early repayment of part of the liquidity previously taken up in the two three-year longer-term refinancing operations. However, the financial fragmentation has not disappeared, underlining the importance of completion of the banking union project. There are still considerable divergences in retail interest rates – especially on loans to non-financial corporations – and in the volume of lending, albeit partly on account of differences in debtor risk and in the size of the banks' capital buffers. SME financing in peripheral economies has suffered the most, because smaller companies have less access to alternative sources of funding than large firms. In November, in view of the persistent fragmentation, the ECB announced that fixed-rate tenders with full allotment would continue for all operations with a term of up to three months until at least mid-2015, well after the due date of the last three-year refinancing operation.

While maintaining ample liquidity for financial institutions, the ECB also provided further support for the adjustment processes and economic recoveries in the euro area countries through a continuously accommodative monetary policy stance. Following the provision of forward guidance on interest rates from July onwards, the ECB's key interest rate was cut in November 2013 by an additional 25 basis points to 0.25 %.

The ECB's accommodative monetary policy stance helped to contain the spillovers on euro area financial markets of the gradual reduction in the amount of large-scale asset purchases by the US Federal Reserve. The prospect that the Federal Reserve might start to slow down its large-scale asset purchases had already led to a sharp rise in the US ten-year government bond yield in 2013 – from 1.7 % at the beginning of May to almost 3 % in

CHART 4 EMERGING MARKET BOND SPREAD [1]

(in %)

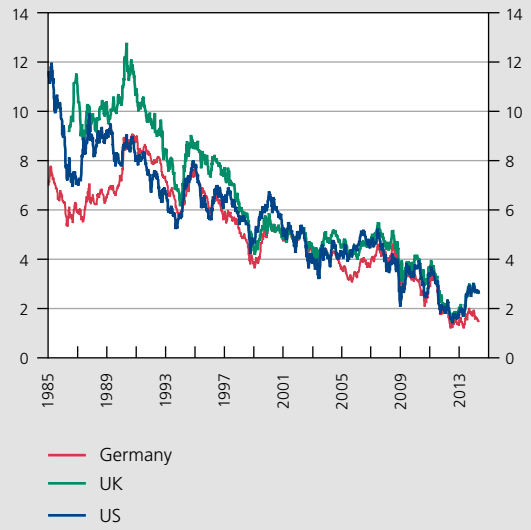


Sources: JP Morgan Chase, Thomson Reuters Datastream.

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

CHART 5 TEN-YEAR GOVERNMENT BOND YIELDS IN THE US, UK AND GERMANY

(daily data, in %)



Source: Thomson Reuters Datastream.

September – and was associated with temporary bouts of turbulence in global financial markets. Yet, it was not until the beginning of 2014 that the Federal Reserve actually started the gradual tapering of its securities purchase programme. The US central bank also made clear at the same time that the key monetary policy rate was likely to be held at low levels for a long time, even after this programme had ended.

The developments in the United States nevertheless had a clear impact on financial markets throughout the world, in particular in emerging markets. An abrupt outflow of capital and associated substantial tightening of financial conditions mainly affected the emerging markets with weaker fundamentals and a substantial need for external funding, such as Brazil, India, Indonesia, Turkey and South Africa. Yet, all in all, the increase in risk premiums on emerging market debt remained quite moderate in comparison with the repricing of risk that had occurred in 2008 or previous episodes of emerging market financial crises (Chart 4).

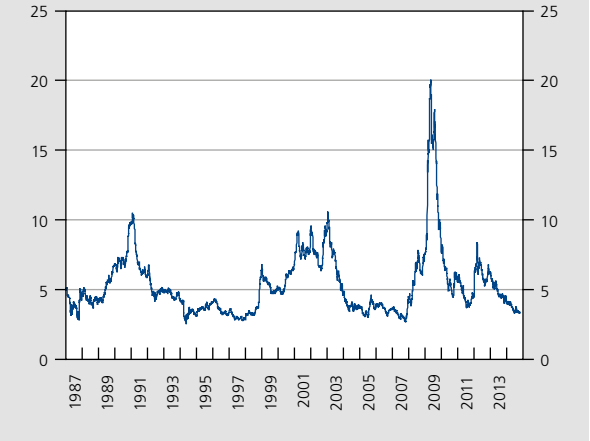
When seen in a long-term perspective, ten-year government bond yields in the US, the UK and Germany remain at historically low levels (Chart 5). This low level of interest rates is fuelling an increasing search for yield by investors. A long period of very low interest rates could imply risks for financial stability if it were to lay the basis for new unsustainable credit developments or asset price bubbles.

Low interest rates also affect the profitability of financial institutions and weaken the incentives for debt reduction. So far, signs of excessive credit developments in response to the low interest rate environment are not pervasive in the euro area countries, as many national banking sectors remain in deleveraging mode and lending to non-financial sectors remains moderate. The search for yield is mostly visible in the rise of financial asset prices and – in some countries – upward pressures on residential and/or commercial property prices.

Many financial markets have thus experienced a compression of risk premiums in recent months. Yet, this does not necessarily imply an indiscriminate search-for-yield behaviour among investors. Their risk appetite has also been strengthened in more fundamental ways, as signs of economic recovery in the advanced economies have multiplied and countries with economic imbalances have made progress in addressing them. The narrowing risk premium on high-yield corporate bonds in the US (Chart 6), for example, was underpinned by an expectation that current low default rates on these bonds would be maintained for the foreseeable future as the US economic recovery strengthens. High investor demand for high-yield bonds in turn eased refinancing risks for high-yield debtors and supported increased issuance of high-yield bonds, including subordinated debt and more exotic instruments, such as contingent convertible bonds (CoCos) issued by several euro area banks. Products offering a higher yield but lower protection for lenders (such as "covenant-lite" loans) have also attracted strong demand from buyers, especially in US markets. These are the market segments

CHART 6 US HIGH-YIELD BOND SPREAD (1)

(in %)

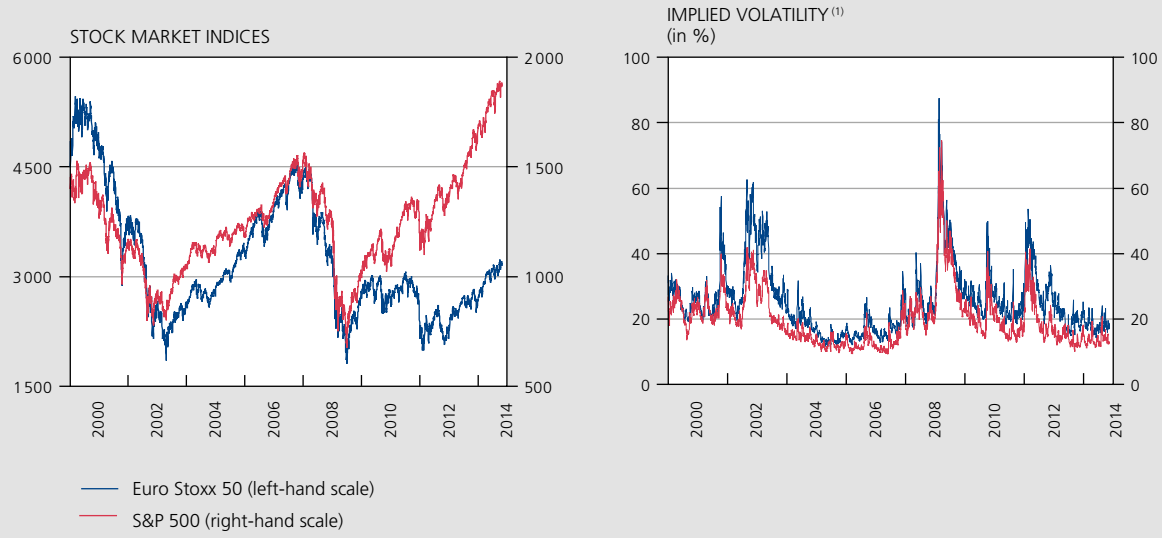


Source: Thomson Reuters Datastream.

(1) 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.

CHART 7 STOCK MARKETS

(daily data)



Source: Thomson Reuters Datastream.

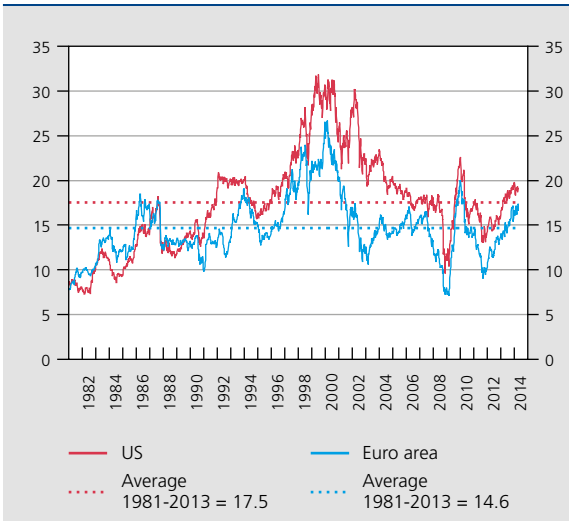
(1) Based on the implied volatility derived from options on the S&P 500 and Euro Stoxx 50 indices.

that would be most vulnerable to a potential repricing of risk if current ample liquidity conditions were to tighten (for example, in response to changing market expectations about US monetary policy).

The growing appetite for risk and abundant liquidity has pushed the stock market indices of the advanced economies higher, with major indices reaching multi-year or record high levels in recent months (Chart 7). Share prices also benefited from investors rebalancing their investment portfolios away from emerging markets towards advanced economies and from a rotating of investment capital from bond to equity funds. The strong increases in share prices were also backed by improved corporate earnings, keeping price-earnings ratios within a fairly limited range of their multi-year averages (Chart 8). Yet, assessing to what extent stock market prices are correctly valued on the basis of their so-called fundamentals is not an easy exercise, as generally a large number of factors have a bearing on the demand and supply for this financial asset and their inter-relations are not necessarily stable over time or immune to periods of excessively optimistic investor expectations about corporations' profitability.

Caveats related to assessments of the fundamental value of financial assets also apply to estimates concerning the over- or undervaluation of residential housing prices. The empirical literature records a number of methods for assessing property market valuation, which broadly fall into two groups, depending on the methodology used. The first group, known as traditional indicators, takes the form of simple ratios of macroeconomic variables. The second group is based on econometric techniques. Each

CHART 8 PRICE-EARNINGS RATIOS (1)



Source: Thomson Reuters Datastream.

(1) Stock market indices in local currency, calculated by Thomson Financial Datastream.

type has its own advantages, but also many shortcomings, which means that the findings must be interpreted with caution.

Among the traditional indicators, a first approach compares house prices to rents (price-to-rent ratio), to gauge how a person looking for a home decides between house purchase and rental. A second approach compares property prices to households' disposable income (price-to-income ratio), in order to measure the affordability of housing. These ratios are believed to revert to an equilibrium value in the long term, whereas in the shorter term they may deviate from that to a greater or lesser extent. Those deviations can then be considered as signals of under- or overvaluation of the property market. These two indicators are very often found at the heart of analyses by many institutions, such as the ECB, the OECD and the IMF, and generally point to very high overvaluation in Belgium, hovering on average between 50 and 60 %.

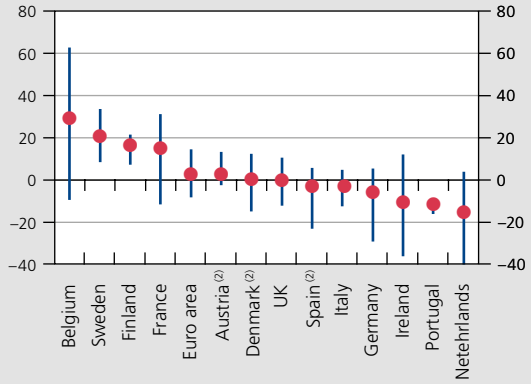
The advantage of these methods lies mainly in their ease of calculation. However, they also have their limitations. The theoretical concept of equilibrium underlying the method of valuing the property market is particularly difficult to assess empirically. The equilibrium value is therefore usually approximated as the long-term average of the indicators, implying the assumption that the equilibrium value is stable over time. However, that is a weighty assumption, since this equilibrium value may be influenced by changes in the fundamental determinants of property prices, such as demography, the preferences of economic agents, mortgage contract characteristics (loan-to-value ratio, maturity, etc.) and the taxation applicable, as well as the characteristics of the property.

Apart from these general considerations, each ratio has its own specific defects. In the case of the price-to-rent ratio, there is a key conceptual difference in that house prices (in the numerator) are based on new secondary market transactions and therefore reflect market conditions, while rents (in the denominator), which in Belgium correspond to the rent component of the consumer price index, usually reflect the rent fixed under existing leases rather than new leases. In addition, as rents in Belgium are subject to various legal rules restricting increases over time, such as (non-obligatory) annual indexation on the basis of the health index, the results obtained essentially reflect those index movements with smoothing and a certain time lag. Finally, the relatively small scale of the rental market also limits the relevance of the price-to-rent ratio for Belgium.

The price-to-income ratio assesses the affordability of housing. Since property purchases are generally financed by a mortgage loan, such an analysis has to take account

CHART 9 ESTIMATES OF THE OVER- AND/OR UNDERVALUATION OF RESIDENTIAL PROPERTY PRICES IN SELECTED EU COUNTRIES (1)

(Percentages, for the situation at end-September 2013, unless otherwise stated)



Sources: ECB, European Systemic Risk Board.

(1) Estimates based on four different valuation methods: price-to-rent ratio, price-to-income ratio and two model-based methods (i.e. log-linear regression and simplified static asset pricing framework). For each country, the solid blue line represents the range of the estimates calculated using the four methods to measure over/undervaluation of house prices, calculated as the interval between the minimum and maximum estimates. The red dot represents the average of the four methods. The wide ranges across the estimates for some countries (including Belgium) illustrate the uncertainties surrounding the assessment of property price over- and/or undervaluation. The estimates also do not take into account national specificities including the fiscal treatment and structural aspects of the housing market. For more details about the methods, see Box 3 in ECB Financial Stability Review, June 2011.

(2) For the situation as at end June 2013.

of the debt service burden incurred by the owner. For that purpose, the price-to-income ratio can be adjusted to take account of fluctuations in mortgage interest rates (interest-adjusted affordability), as the latter have a major influence on households' borrowing capacity. According to the indicator developed by the Bank and presented in Box 6 in the Bank's 2013 Annual Report, the debt service burden of a new purchase came to almost 22 % of a household's disposable income in 2013, exceeding the average of 15 % recorded in the first half of the 2000s.

The second approach for assessing property market valuation is based on econometric techniques, the aim being to use fundamental determinants to fix an equilibrium price which can then be taken as the benchmark for measuring deviations in recorded prices. One of the advantages of this method is that it can take account of many fundamental determinants of residential property prices, on both the supply and the demand side. However, for reasons of data availability and quality, empirical studies on the subject have been largely confined to demand factors, the main ones being household income, mortgage interest rates and demographics. In addition, this methodology does have its defects: it is possible that the econometrically estimated relationship is unstable and, instead of being

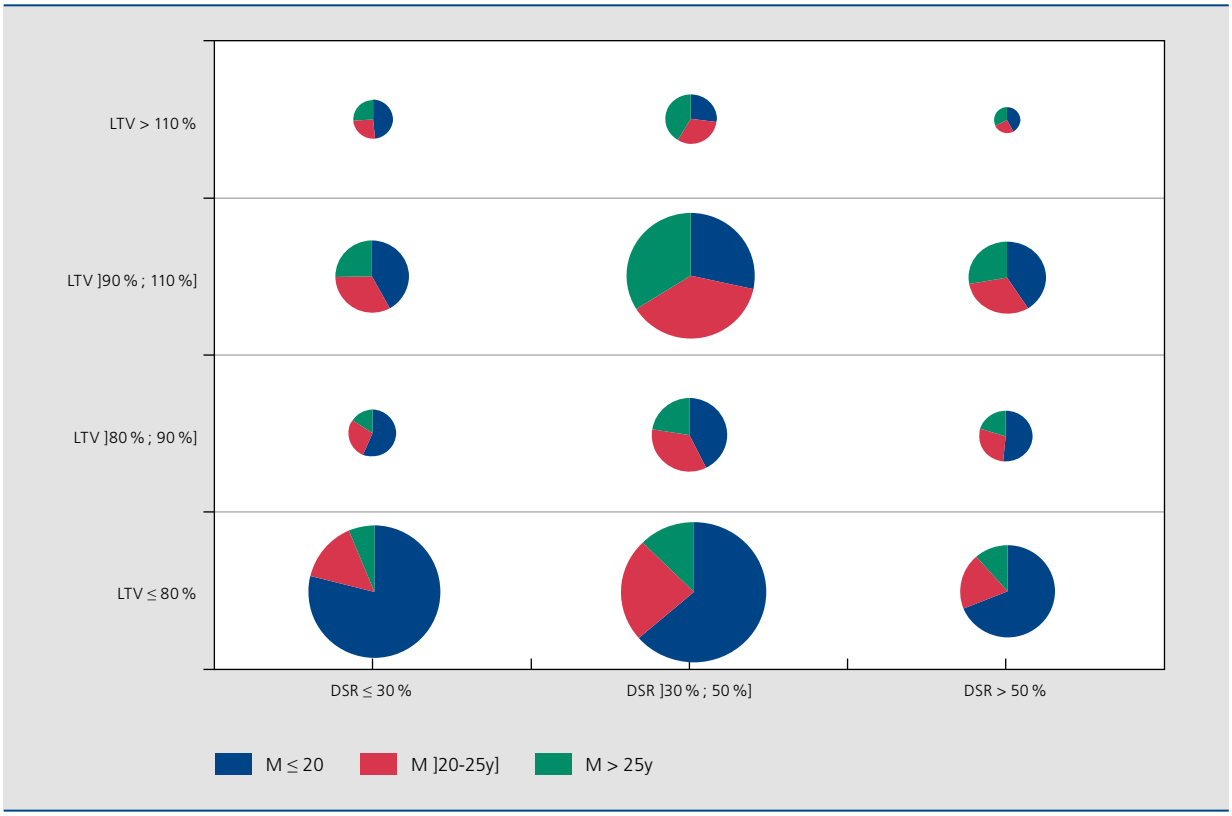
a measure of market valuation, the gap between recorded prices and the equilibrium price is due to the omission of one or more fundamental determinants. Moreover, even if that gap is zero, a latent imbalance may exist because the fundamental determinants are not at their long-term equilibrium value, as in the case of abnormally low mortgage interest rates.

To support their assessments of the residential property markets, a number of international institutions, including the ECB, have recently adopted this methodology. As shown in Chart 9, apart from the traditional approaches, namely the price-to-rent and price-to-income ratios, the ECB uses two indicators based on econometric models. More specifically, these indicators correspond to the residuals from the regression of the price-to-rent ratio on a measure of long-term interest rates, on the one hand, and that of real house prices on demand factors, on the other. The latter are per capita GDP, the number of residents, and short-term interest rates. The results obtained by the ECB are very disparate for Belgium, with the traditional ratios tending, as usual, towards a high degree of overvaluation of the Belgian property market, while the indicators based on econometric techniques point to a more moderate result which, depending on the specifications, fluctuates between slight over- and undervaluation.

While the assessment of the fundamental value of property thus remains a perilous exercise, the results in Chart 9, interpreted cautiously, tend to confirm some overvaluation of housing prices in Belgium. Moreover, the experiences of other countries are a reminder that the property market may suffer reversals which damage the economy. Against this background, and with an eye on the presence of important sub-segments in the outstanding portfolios of Belgian mortgage loans that combine high levels of risk parameters (Chart 10), the Bank decided at the end of 2013 to take three prudential measures aimed at strengthening the resilience of the Belgian mortgage market and of those credit institutions with the largest

CHART 10 BREAKDOWN OF THE PORTFOLIO OF MORTGAGE LOANS OF IRB BANKS BY LTV, DSR AND MATURITY AT ORIGINATION (1) (2)

(non-consolidated data, end-2013)



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.

exposures to Belgian mortgage loans. A more detailed description of these measures, together with a review of recent developments in the Belgian mortgage market, can be found in a separate thematic article in this FSR. This article also documents some of the recent changes in credit standards applied to new mortgage loans that have taken place and which should help maintain a sound situation on the Belgian housing and mortgage market.

A selective tightening of conditions for loans with a higher risk profile already seems to have helped curb the growth of the average amount of new mortgage loans for the purchase of an existing house in the recent quarters (Chart 11). This average size of new mortgage loans for the puchase of an existing house, which had risen from less than € 100 000 in 2004 to almost € 140 000 in the third quarter of 2012, declined to slightly more than € 134 500 in the course of 2013. Chart 11 also highlights the development of Belgian house prices since 1995, according to the index calculated by the Bank on the basis of data from FPS Economy. This index shows that the average house price increase moderated to 1.7 % last year, down from 2.5 % and 3.1 % in 2012 and 2011 respectively. The cumulative increases in the house price index over the past 10 and 15 years nevertheless remain quite considerable, at respectively 77 % and 139 %.

Mortgage loans have been the main driver of the growth of Belgian banks' loans to domestic households in recent years (Chart 12). These loans continued to grow in 2013, but their growth rate slowed down to 2.1 % on annual basis by the end of the year. While the above-mentioned tightening of credit standards for housing loans may have contributed to this slowdown, the more moderate growth of bank lending to households primarily reflected a weaker demand for loans from households, as they adopted a wait-and-see attitude in the context of weaker conditions on the labour market. Another possible reason for the more muted demand for credit might be uncertainty over the maintenance of the current tax allowance for the debt service of mortgage loans in the case of own homes (otherwise known as the "housing bonus"), following transfer of the corresponding powers to the Regions with effect from 1 July 2014.

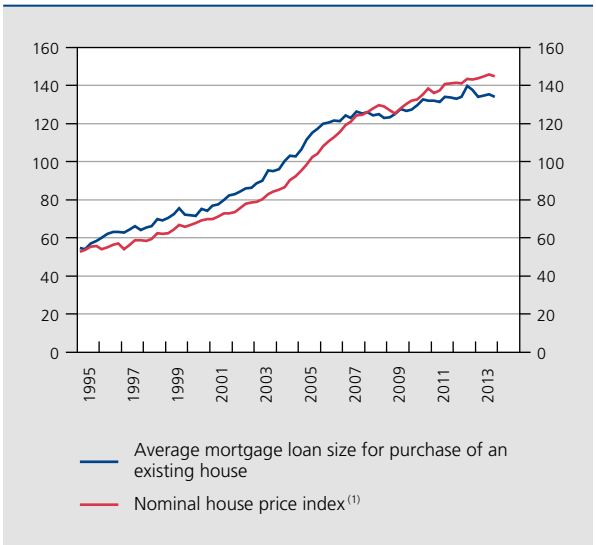
Over the last fifteen years, the overall debt ratio of Belgian households has followed developments in the growth of mortgage loans closely. Although more moderate in the most recent period, growth of mortgage liabilities thus pushed the gross debt ratio of Belgian households up to 57.8 % of GDP. While it is still lower than in the euro area (64.5 % of GDP), the gap between the two has narrowed from more than 15 percentage points in 2005 to less than 7 percentage points. In this connection, it should also be noted that high household debt levels in some of these euro area countries contributed to the major imbalances that triggered financial crises and that are currently being reduced as a result of deleveraging processes.

Bank loans to Belgian non-financial corporations stabilised in 2013 at end-2012 levels, against a background of economic uncertainty and a still fragile economic recovery that continued to curb corporate investment. The muted demand for bank credit also resulted in part from an increasing use of non-bank sources of finance by Belgian non-financial corporations. It is mainly large firms with a sound financial basis that can make use of the capital markets for meeting their external financing needs by issuing fixed-interest securities instead of contracting bank loans. Yet, apart from resorting to external funding, firms can also tap into their own resources to meet their investment and funding needs. Belgian non-financial corporations have substantial reserves of cash and deposit holdings, which, in net terms, amount to around 34 % of GDP, well above the average of 28 % seen since 1999.

At the end of 2013, the debt of the Belgian non-financial corporations amounted to 92.8 % of GDP. The debt concept used here concerns the consolidated debt, which is calculated by taking the non-consolidated debt of the non-financial corporate sector and deducting the financing provided by other entities within the domestic sector. The definition of debt according to the consolidated concept thus excludes financing by associated resident companies, but it still encompasses loans by foreign affiliates.

CHART 11 DEVELOPMENTS IN BELGIAN HOUSE PRICES AND AVERAGE AMOUNT OF NEW MORTGAGE LOANS

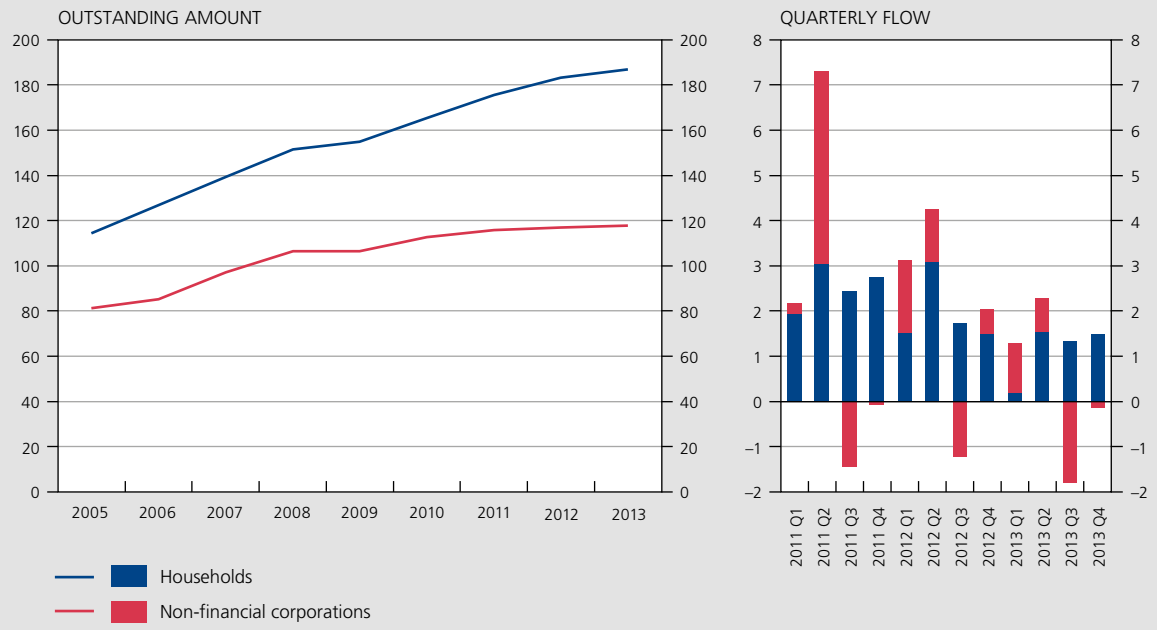
(in € thousand, unless otherwise stated)



Source : NBB.
(1) NBB calculations, on the basis of data from FPS Economy.

CHART 12 BELGIAN BANKS' LOANS TO DOMESTIC HOUSEHOLDS AND NON-FINANCIAL CORPORATIONS

(data corrected for securitisation operations, in € billion)



Source: NBB.

Those loans – which are mainly due to the optimisation of financial flows within a group, rather than a net external borrowing requirement – often have a major impact on the movement in the debt ratio of non-financial corporations. If this non-bank debt financing from abroad is excluded, the debt ratio of Belgian non-financial corporations was 50.5 % of GDP at the end of last year.

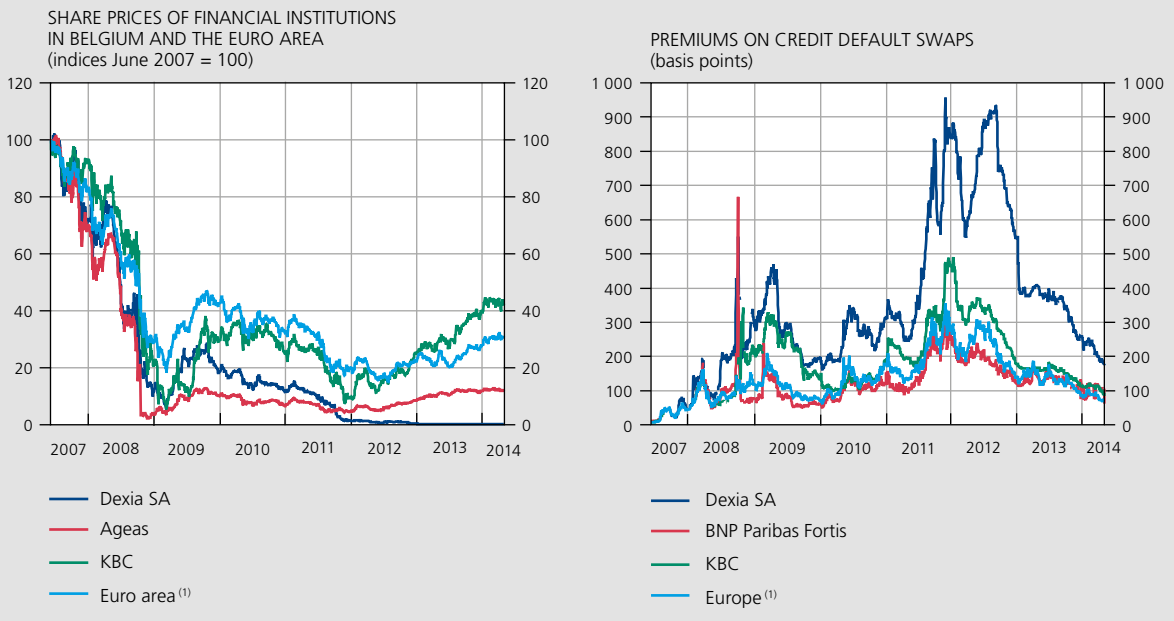
The slowdown in the growth of Belgian banks' loans to domestic households and non-financial corporations is one of the evident channels through which the general economic context influences the operating environment of the Belgian financial sector. Notwithstanding the further improvement in financial and economic conditions since the previous issue of the Financial Stability Review in June 2013, this operating environment for the Belgian banking and insurance sector should still be characterised as quite challenging, due to the combination of moderate economic growth with very low interest rates.

Against this background, the Bank is devoting particular attention in its prudential supervision to the analysis of the business models of the Belgian banks and insurance companies, in order to assess their readiness to deal with the challenges coming from the operating environment as well as the forthcoming stricter regulatory requirements in several important areas (Basel III, Solvency II, MiFID, structural banking reforms, etc.). These challenges also follow a period during which some of the largest financial institutions in Belgium had to undertake a radical restructuring of their activities and balance sheets in response to the vulnerabilities that were revealed by the global financial crisis more than five years ago, and often as part of the agreements reached with the European Commission on the remedial measures to be taken in return for the state aid received.

The business model analysis offers the supervisory authority an instrument for determining at an early stage the situations and actions which could prejudice the institution's sustainability or general financial stability. By adopting a prospective and proactive approach, it can also be used to assess the impact of major developments in the operating or regulatory environment on the institutions' various activities and their profitability. The business model analysis also fits into reflections on the future structure of the Belgian banking market, given – on the one hand – potentially stronger competition owing to a number of large banks retreating to their Belgian home market and reverting to traditional banking activities and – on the other hand – the reassessment by a number of foreign banks of their involvement in the Belgian banking market.

CHART 13 MARKET INDICATORS FOR BELGIAN AND EUROPEAN FINANCIAL INSTITUTIONS

(daily data)



Sources: Bloomberg, Thomson Reuters Datastream.

(1) Stock market index compiled by Thomson Reuters Datastream for the share prices of financial intermediaries, and iTraxx Senior Financials index for 5-year credit default swaps for a sample of 25 European financial institutions.

For Dexia SA, the "business model" is to execute, in run-off modus, an orderly resolution plan which was approved by the European Commission in December 2012. The plan involves the disposal of commercial entities considered viable in the long term – which had been largely completed in early 2014 – and the management in run-off of the bank's residual assets. To enable Dexia to successfully complete this orderly resolution, the Belgian and French States proceeded to a € 5.5 billion capital increase for Dexia in December 2012. Together with the Luxembourg State, they also provided Dexia Crédit Local with a € 85 billion funding guarantee. The implementation of this strategy has contributed to a sharp drop in the CDS premium for Dexia (Chart 13) and to a significant reduction in the size of Dexia's balance sheet (Table 1) from € 566.7 billion at the end of 2010 to € 223.4 at the end of 2013. The orderly run-down of the legacy assets has to take into account the long maturity profile of some of these assets and the fact that the portfolio is protected against interest rate movements, meaning that the sale of assets would cause the unwinding of the hedging operations which could in turn be costly. The orderly resolution plan thus sets out a trajectory for the asset portfolio to be gradually reduced to around € 91 billion by end 2020 and € 15 billion by 2038.

Chart 13 also shows developments in some other Belgian financial institutions' equity prices and CDS premiums. Since the previous issue of the Financial Stability Review, CDS premiums have narrowed for all institutions, in line with more general market developments. As shown in Table 1 – providing an overview of several key financial indicators for the main financial institutions operating in Belgium, together with the corresponding sector aggregates that will be used in the rest of the report – most Belgian banking groups continued to reduce the size of their balance sheet and of their risk-weighted assets during the period under review. In the case of Belfius, this reflected *inter alia* a further reduction in the exposure on its former parent company Dexia. In 2011, the Belgian State had acquired all shares held by Dexia SA in Dexia Bank Belgium (for a total of € 4 billion) and, since then, the exposure of Belfius on Dexia has fallen from € 55 billion in October 2011 to € 22 billion at the end of 2012 and less than € 15 billion at the end of 2013. Almost all of this amount is covered by State guarantees.

KBC's balance sheet also declined during the period under review as the bank completed its divestment plan agreed with the European Commission. After having repaid all the aid provided by the Belgian Federal Government

TABLE 1 KEY INDICATORS FOR THE MAIN FINANCIAL INSTITUTIONS, THE BANKING SECTOR AND THE INSURANCE SECTOR

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

	Fortis Holding SA / Ageas[1]	BNP Paribas Fortis[1]	Dexia SA[1]	Dexia Bank Belgium / Belfius[1]	KBC[1]	ING Belgium SA[1]	Banking sector[2][3]	Insurance sector[3][4]
Net profit								
2007	3.99		2.53	1.03	3.28	1.61	6.7	3.8
2008	–28.02	–20.56	–3.33	–0.57	–2.48	0.91	–21.2	–3.9
2009	1.19	–0.67	1.01	0.42	–2.47	1.24	–1.2	0.9
2010	0.22	1.91	0.72	0.68	1.86	1.05	5.6	1.4
2011	–0.58	0.10	–11.64	–1.37	0.01	0.86	0.4	–0.9
2012	0.74	0.31	–2.89	0.42	0.61	0.77	1.6	2.4
2013	0.57	0.64	–1.08	0.45	1.02	0.97	3.3	1.4[5]
Total assets								
2007	871.2		604.6	264.7	355.6	180.0	1 578.4	220.4
2008	92.9	586.8	651.0	263.1	355.3	175.9	1 422.1	223.8
2009	93.2	435.0	577.6	253.8	324.2	153.6	1 190.5	234.4
2010	99.2	348.0	566.7	247.9	320.8	155.6	1 151.1	248.6
2011	90.6	346.2	412.8	232.5	285.4	169.1	1 147.3	256.6
2012	97.1	272.3	357.2	212.9	256.9	168.2	1 048.7	264.5
2013	95.7	261.5	223.4	183.0	241.3	143.5	960.6	270.3[5]
Risk-weighted assets (banking)[6]								
2007		270.2	159.4	62.4	135.1	72.8	583.5	
2008		203.4	152.8	51.8	141.4	59.9	491.7	
2009		148.0	143.2	49.9	128.3	55.1	407.5	
2010		119.3	140.8	49.6	116.1	51.6	372.5	
2011		118.0	83.4	53.0	110.4	54.7	373.8	
2012		124.1	55.3	50.3	89.5	46.5	352.7	
2013		125.7	47.3	43.0	78.5	47.4	339.4	
Tier I ratio banking (in % of RWA)[6]								
2007		9.5	9.1	8.1	8.7	14.4	12.1	
2008		10.7	10.6	12.9	9.7	14.7	11.3	
2009		12.3	12.3	13.8	11.0	18.2	13.2	
2010		16.5	13.1	14.6	12.5	19.8	15.5	
2011		16.5	7.6	12.7	11.6	18.7	15.1	
2012		14.9	19.9	13.3	13.8	22.6	15.9	
2013		14.8	21.4	15.4	16.2	20.5	16.4	
Insurance solvency margin (in % of required margin)								
2007	235				265			223
2008	202				188			224
2009	231				260			229
2010	227				216			214
2011	206				201			193
2012	204				322			197
2013	207				281			212[5]

Sources: Quarterly, biannual and annual accounts of Fortis group, Ageas, BNP Paribas Fortis, Fortis Bank, Dexia SA, Dexia Bank Belgium / Belfius, KBC group and ING Belgium SA, NBB.

(1) Consolidated data, as published in the annual and quarterly accounts.

(2) Consolidated data, based on the prudential reporting scheme.

(3) The standardised supervisory reporting schemes are related to the legal structure of the financial groups and the home-host supervisory arrangements concluded for the sectoral and supplementary group supervision. As a consequence, these reporting schemes do not include data on all the bancassurance groups' subsidiaries.

(4) Unconsolidated data, based on the prudential reporting scheme.

(5) As reported in the quarterly accounts.

(6) Ratios for the year 2007 are calculated according to Basel I or Basel II, depending on the institutions. As from 2008 until 2003, all ratios are calculated according to Basel II.

in 2012 (€ 3.5 billion plus a 15 % penalty), it also paid back, in 2013, € 1.17 billion (and a 50 % penalty) of the remaining € 3.5 billion in aid received from the Flemish Regional Government. At the beginning of 2014, a further € 0.33 billion worth of aid was repaid to the Flemish Regional Government, along with a 50 % penalty. KBC intends to repay the outstanding balance of € 2 billion (plus penalties) in instalments by 2020 or sooner, subject to the approval of the supervisory authority. In the first quarter of 2014, this bank also issued € 1.4 billion of core capital in the form non-dilutive, CRD IV-compliant Additional Tier-1 securities.

As of 1 January 2014, banks' risk-weighted assets and regulatory capital buffers will be computed on the basis of the Basel III regulatory framework. The Basel Committee proposals were transposed into Community law through the publication (in June 2013) of CRD IV and CRR. In Belgium, this Directive has been transposed into Belgian law through the adoption of the new Banking Law of 25 April 2014, accompanied by the implementation of the various options that the CRR left to the discretion of the Member States and national competent authorities. The law also anticipates certain aspects of the EU Directive on the recovery and resolution of credit institutions.

The new banking law also provides for a structural reform in Belgium designed to contain risk-taking by the banks (see the separate thematic article in this FSR for more details). On the one hand, additional capital requirements will apply if a bank's trading activities exceed a certain threshold. Also, proprietary trading is prohibited in principle, except for a small margin to take account of the fact that certain positions are actually inherent in risk management or the bank's intermediation role in support of economic activity.

As CRD IV contains numerous provisions on governance, provisions were reclassified in order to bring together in the new Banking Law all the measures concerning governance. The new law also includes various additional modifications derived essentially from CRD IV, intended to regulate the pursuit of the business. This concerns in particular risk management and remuneration policy. A chapter devoted to specific operations (mergers and assignments, issuance of covered bonds, pursuit of activities abroad, etc.), groups together some subjects already covered by the previous regulations, with the addition of strategic decisions, originally introduced for systemically important institutions in the Bank's Organic Law. The remuneration policy requirements, which appeared mainly in the Regulation of 8 February 2011, were all enshrined in the new banking law. Another subject concerns depositor protection. Policies aimed at protecting depositors are designed to increase the likelihood that balance sheet assets will be sufficient to cover the liabilities relating to deposits in the event of a bankruptcy, thus reducing the need for intervention by deposit guarantee systems or taxpayers. In that respect, a rule will give depositors priority in the creditor reimbursement ranking in the event of a bank failure. The new banking law also foresees the principle, subject to further implementation measures, that banks should maintain a minimum amount of own funds or liabilities eligible for a bail-in, so as to avoid having to use taxpayers' money in the event of a bank failure.

2. Banking sector

2.1 Profitability

In spite of the still challenging operating environment, the Belgian banking sector managed to improve its profitability in 2013, with a rise in the return on equity to 5.9 %, up from 3.0 % in 2012. As accounting equity remained stable at around € 56 billion, this improvement reflected the two-fold increase in the net result of the banking sector, from € 1.6 billion in 2012 to € 3.3 billion in 2013.

As shown in Table 2, one of the main factors behind the improved profitability in 2013 was the increase in the banking sector's non-interest income, which rose from € 5.4 billion in 2012 to € 7.9 billion in 2013. Within this non-interest income, net fee and commission income rose slightly, remaining close to the levels recorded over the last few years. This source of non-interest income tends to be relatively stable, as it includes fees and commissions received in the context of trust and custody, brokerage, payment or asset management services. In 2013, it accounted for 28 % of the banks' total operating income. The other sources of non-interest income are much more volatile and even resulted in net losses during the crisis years 2008-2009, breaking even in 2012 and returning to a net positive contribution to operating income in 2013. The strong performance of financial markets in 2013 enabled banks to realise capital gains on bonds as well as book positive results on exchange differences of just over € 2 billion. As Belgian banks have reduced their capital market and trading activities as part of their restructuring programmes, this source of income should nevertheless remain a less important driving factor for the Belgian banking sector's net profit than it used to be before the financial crisis.

Given Belgian banks' transition towards more traditional business models, the share of non-interest income in total operating income is likely to remain structurally lower than the percentage typical for the pre-crisis years (around 50 %), making net interest income the principal source of operating income, even more so than in the past. This net interest income stems from the important role that banks play in the intermediation between depositors and borrowers, by offering short-term savings instruments to retail customers and extending long-term sources of finance to borrowers. The associated interest rate maturity mismatches between major categories of assets and liabilities are an important – and traditional – source of banking income, provided that the associated potential sources of unexpected losses due to unfavourable interest rate developments are managed prudently.

Yet, in recent years, the net interest income has come under pressure as a result of the deleveraging of balance sheets and the low interest rate environment. Having already fallen in 2012, it declined further from € 13.6 billion in 2012 to € 13.3 billion in 2013. This fall is the result of various factors.

The principal factor explaining the pressure on net interest income is the volume effect, which since 2009 has been characterised by a decline in the stock of interest-bearing assets and liabilities, mainly caused by the shrinking of the four major banks' balance sheets (Chart 14). It is important to keep in mind here that the deleveraging was concentrated on certain types of assets and liabilities (e.g. wholesale business), while not affecting other categories of assets and liabilities (e.g. loans to and deposits from Belgian households). The reduction of primarily low-margin activities (such as interbank exposures) may thus – through a composition effect – have contributed to the observed rise in the interest margin between 2007 and 2011 when the most important balance sheet deleveraging took place. Defined as the difference between the average yield on interest-bearing assets and liabilities respectively, the interest margin then rose, on a non-consolidated basis, from

TABLE 2 MAIN COMPONENTS OF THE INCOME STATEMENT

(consolidated data)

	In € billion							In % of operating income
	2007	2008	2009	2010	2011	2012	2013	
Net interest income	**13.30**	**14.48**	**14.89**	**13.77**	**13.99**	**13.57**	**13.29**	**62.6**
Non-interest income	**13.01**	**4.80**	**3.93**	**6.39**	**5.61**	**5.38**	**7.94**	**37.4**
Net fee and commission income (excluding commissions paid to bank agents)	7.35	6.76	5.66	5.15	5.24	5.37	5.87	27.7
(Un)realised gains or losses on financial instruments[1]	3.76	–3.83	–2.74	–0.04	–0.80	0.04	0.79	
Other non-interest income	1.91	1.86	1.01	1.28	1.17	–0.03	1.28	
Total operating income (bank product)	**26.31**	**19.28**	**18.82**	**20.15**	**19.60**	**18.94**	**21.23**	**100.0**
Total operating expenses (–)	**16.08**	**16.59**	**14.61**	**13.29**	**13.18**	**13.90**	**13.25**	**62.5**[2]
Staff expenses (including commissions paid to bank agents)	9.15	9.20	7.94	7.40	7.43	7.75	7.42	
General and administrative expenses (including depreciation)	6.93	7.39	6.67	5.90	5.75	6.15	5.83	
Total impairment and provisions (–)	**3.18**	**13.31**	**7.36**	**1.83**	**5.02**	**2.61**	**2.95**	
Impairments on loans and receivables	0.38	2.84	5.59	1.76	3.05	1.98	2.31	
Impairments on other financial assets	2.50	7.46	0.29	–0.09	1.37	–0.84	0.00	
Other impairments and provisions	0.30	3.01	2.06	0.16	0.60	1.46	0.64	
Other components of net operating income[3]	**0.66**	**–0.81**	**0.11**	**0.45**	**–0.37**	**0.25**	**0.32**	
Net operating income[4]	**7.71**	**–11.43**	**–3.04**	**5.48**	**1.02**	**2.68**	**5.35**	
Total profit or loss on discontinued operations	**0.00**	**–9.04**	**0.00**	**0.97**	**–0.31**	**0.00**	**0.00**	
p.m. Net profit or loss (bottom-line result)[4]	*6.66*	*–21.21*	*–1.22*	*5.56*	*0.36*	*1.59*	*3.28*	

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.

(4) The amounts of taxes and minority interests, which are items explaining the difference between net operating income and the net bottom-line result, are not broken down in this table, but can be found in Table 10 of the Statistical Annex.

less than 80 basis points in 2007 to 110 basis points in 2011. Since then, it has fluctuated between 105 and 110 basis points, with various factors driving its development in sometimes opposing directions.

The main factor having a negative impact on the interest margin is the low interest rate environment, which depresses the structural margins that credit institutions traditionally gain from cheap financing sources, such as sight deposits and to a lesser extent savings deposits. Even though Belgian banks have lowered the client rates on sight and savings accounts in response to the low interest rate environment, these reductions were not sufficient to fully offset the simultaneous drop in the yields generated by the corresponding reinvestment of these sight and savings deposits (as indicated by these deposits' replicating portfolios). In a low interest rate context, the loans and securities arriving at maturity are reinvested at yields that are significantly lower than the maturing contractual interest rates, leading to a gradual decline in the average yield of the loan and bond portfolios. This reinvestment risk in a low interest rate environment will probably continue for some time. And with client rates on sight and savings deposits already having reached very low levels, banks will

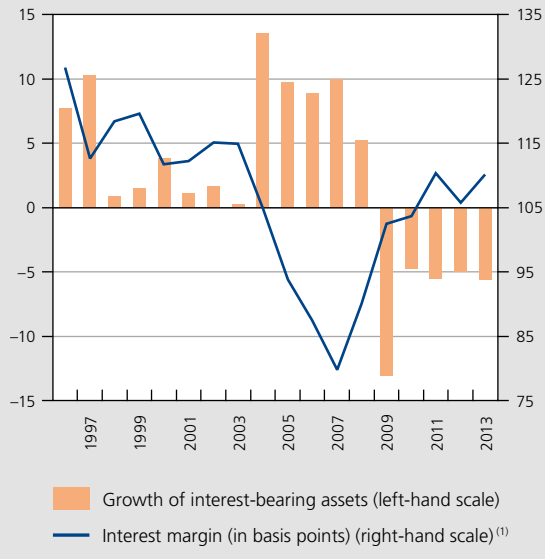
face increasing difficulty to offset this again partly by lowering their cost of funding.

The latent structural pressures on the interest margin as a result of the low interest rate environment were mitigated by three additional factors. First, in 2013, credit institutions continued to benefit from quite a steep yield curve, which is favourable to banks' traditional maturity transformation activities between the short-term liabilities and long-term assets. Second, Belgian banks were able to maintain their commercial margin on new loans to customers at the higher levels that have been witnessed in recent years, in spite of still strong competition in some market segments. To some extent, this also reflects better risk pricing, considering that credit and liquidity risk premiums in the pre-crisis period were set too low by banks. In the last two years, it has also become generally cheaper for banks to raise finance on the wholesale market, following the improvement in market sentiment regarding European and Belgian banks (which lowered the cost of unsecured financing). The introduction in 2012 of the Belgian covered bonds regime also increased the possibilities for issuing long-term debt.

When compared to other European banking sectors, Belgian banks have a relatively high cost-to-income ratio, amounting to 65.7 % on average for the last three and a half years (Chart 15). Faced with downward pressures on their main income sources and – more generally – a lower revenue base as a result of the restructuring of business activities, many Belgian banks have initiated cost-saving programmes aimed at better aligning the structure of costs to their new business models and the challenging operating environment. In order to keep strict control over operating expenses, all the main credit institutions have announced in recent quarters measures to rationalise their activities and use of resources. In 2013, the Belgian banking sector managed to reduce this cost-income ratio to 62.5 %, closer to the EU average. However, that fall is more a consequence of better results in the ratio's denominator than the numerator, even though operating expenses fell to € 13.3 billion, from € 13.9 billion in 2012. Both staff expenses and other general expenses went down during 2013, each by € 0.3 billion.

CHART 14 DETERMINANTS OF NET INTEREST INCOME

(non-consolidated data, percentage changes compared to previous year, unless otherwise stated)

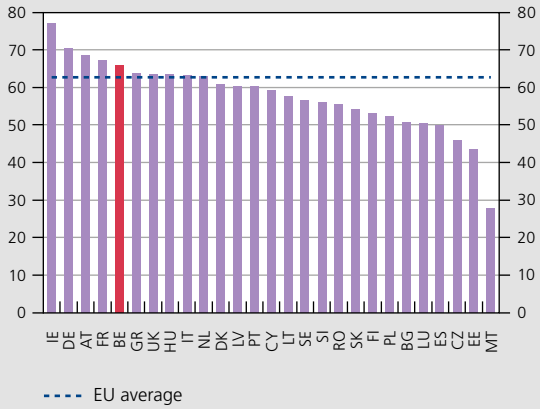


Source: NBB.

(1) The interest margin corresponds to the difference between the average implicit interest rate received and paid respectively on banks' average stock of interest-bearing assets and liabilities. The averages are calculated over a one-year period.

CHART 15 COST-TO-INCOME RATIO OF EUROPEAN BANKING SYSTEMS

(consolidated data; average for 2010, 2011, 2012 and H1 2013)



Source: ECB Consolidated Banking Data.

2.2 Credit quality

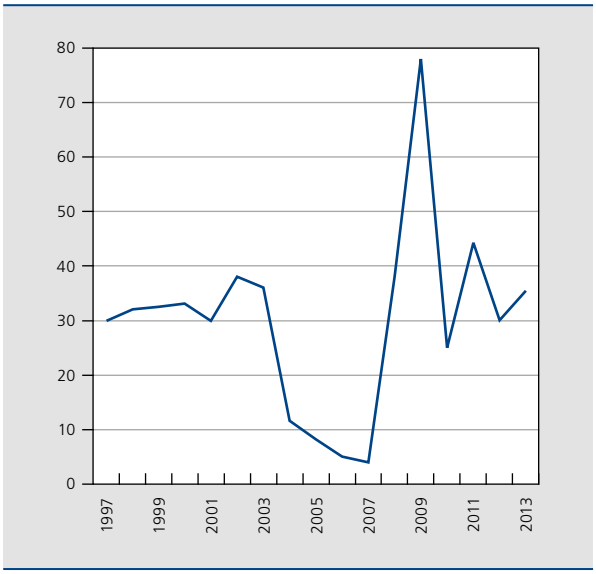
Another main source of costs for banks are credit losses on loans and other assets. Total impairments and provisions reached € 2.95 billion in 2013, an increase of € 0.3 billion compared to the year-earlier level. The bulk of these impairments and provisions (€ 2.3 billion) were for (potential) credit losses on the loan portfolio. Impairments on non-financial assets amounted to € 0.6 billion in 2013 and mainly related to one bank's stake in another financial entity.

The increase in impairments on assets classified as loans and receivables from € 1.9 billion in 2012 to € 2.3 billion in 2013 was mainly the result of higher provisions in KBC Bank's Irish portfolio. First, substantial provisions were taken as a result of the early application of the new EBA technical standards on non-performing exposures and forbearance. By adopting these standards at an early stage, the bank anticipated the potential requirement to increase provisions as a result of the ongoing asset quality review (AQR) led by the European Central Bank before the entry into force of the single supervisory mechanism. Second, the Irish central bank published a new set of "provisioning guidelines" in May 2013 leading to higher impairments by KBC for (some of) its Irish exposures. Most of these one-off increases in impairments on loans and receivables took place in the fourth quarter of the year.

The loan loss ratio, comparing the net flow of impairments on assets classified as loans and receivables to the stock of such loans, rose from 30 basis points in 2012 to 36 basis points in 2013, still generally in line with the historical average for this indicator (Chart 16). In 2014, the wider application of the new EBA standards and the outcome of the AQR will potentially lead to a further adjustment in provisions on loans and receivables. Also, it cannot be ruled out that – in spite of the economic recovery – there will be some further underlying deterioration in credit quality in the main loan portfolios, as credit risk tends to materialise with some delay following periods of weak economic activity. While remaining at a historically high level in the early months of 2014, the number of corporate bankruptcies in Belgium nevertheless seems to have reached its peak recently.

CHART 16 LOAN LOSS RATIO (1)

(consolidated data, in basis points)



Source: NBB.

(1) The loan loss ratio is the net flow of new impairments for credit losses, expressed as a percentage of the stock of total loans (one basis point is one hundredth of one percent). From 2006 onwards, the figures are the loan loss ratio for the IAS / IFRS category Loans and receivables.

In line with the increase in the loan loss ratio, the percentage of impaired claims rose again in 2013 to 4.3 %, up from 3.8 % at the end of 2012 (and 1.5 % at the end of 2007) (Table 3). This is also for a large part a direct consequence of the classification of additional loans as impaired in the fourth quarter of 2013 by KBC, as mentioned above. Hence, loans to retail counterparties, which were particularly affected by this change in methodology on foreign portfolios, showed the strongest increase in the ratio of impaired claims, rising to 4.8 % from 4.1 % at the end of 2012. Corporate exposures, including part of the SME portfolio, also saw an increase in this ratio from 7.0 % to 7.4 % during the same period, reflecting in this case weak economic conditions in the euro area, affecting the quality of assets. While claims on foreign counterparties still account for the majority of the defaults, exposures to Belgian counterparties (especially corporates and SMEs) were also affected.

The coverage ratio of impaired loans fell by 2 percentage points in 2013 to 39.5 %. This downward trend could be the result of a smaller average need for provisions for the newly recognised impaired loans. First, a significant part of them are mortgage loans which on average require lower provisions, as collateral in the form of real estate is securing these loans. Second, the stricter new EBA standards may have led to the inclusion, in the pool of impaired claims, of loans of a better quality than the previously recognised impaired loans.

Since the financial crisis, the composition of the loan portfolio (€ 636 billion) has been marked by an increasing share of retail loans (to 44 % of total loans at the end of 2013). Mortgage loans account for the bulk (67 %) of these exposures to retail counterparties. While foreign mortgage portfolios had already recorded significant provisions during the previous years and in the first three quarters of 2013, it is these portfolios which have been impacted in the fourth quarter of 2013 by the above-mentioned measures. On the contrary, no deterioration has been observed recently in the credit quality of Belgian mortgage loans. The recent vintage statistics for mortgages in fact show no clear deviation from historical default rates, as cumulative default rates broadly follow the same trajectory (Chart 17). For the 2012 vintage, for example, the cumulative default rate after 12 months was 0.5 %, an only slightly higher level than the comparable figure

TABLE 3 CREDIT QUALITY INDICATORS

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

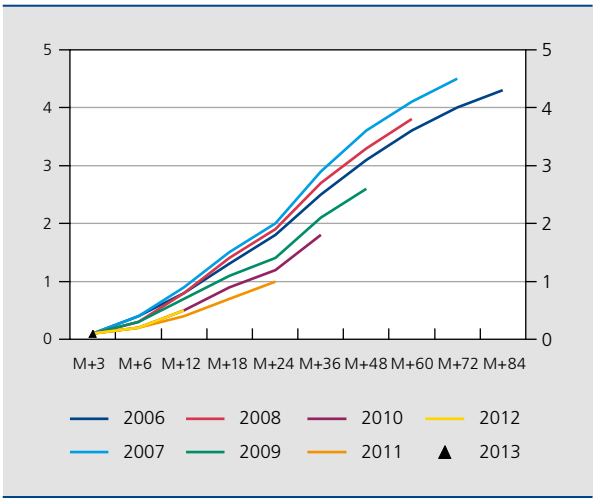
	Total loans	Percentage of impaired claims[1]				Coverage ratio[2]			
	2013	2007	2011	2012	2013	2007	2011	2012	2013
Credit institutions	**117.7**	0.0	0.3	0.3	0.3	59.0	60.2	53.8	64.4
Corporate[3]	**177.5**	2.3	5.9	7.0	7.4	37.2	42.7	42.7	45.6
Retail[4]	**282.8**	2.8	4.1	4.1	4.8	27.6	39.7	39.7	33.1
Non-credit institutions[5]	**48.2**	0.3	0.6	0.3	0.2	31.9	29.2	31.1	43.4
Total[6]	**635.8**	**1.5**	**3.3**	**3.8**	**4.3**	**32.3**	**41.5**	**41.4**	**39.5**

Source: NBB.
(1) Impaired claims (according to IAS 39 definition) as a percentage of total loans.
(2) Percentages of impaired claims covered by specific or general provisions.
(3) Exposures on non-financial corporations, plus some non-bank financial corporations.
(4) Including self-employed persons and some SMEs.
(5) Exposures on certain non-bank financial institutions and local authorities.
(6) Including small amounts of loans to central governments.

for the 2011 vintage (0.4 %) but markedly lower than for the vintages 2006 to 2010. Yet, in this connection, it should be remembered that the low trajectory of some recent vintages – 2009, 2010 and, in particular, 2011 – reflects to some extent the high number of so-called green mortgage loans originated during those years, creating an upward bias in the denominator of the ratio.

CHART 17 PROPORTION OF MORTGAGE LOANS TO BELGIAN HOUSEHOLDS WITH PAYMENT DEFAULTS[1], BY VINTAGE[2]

(in %)



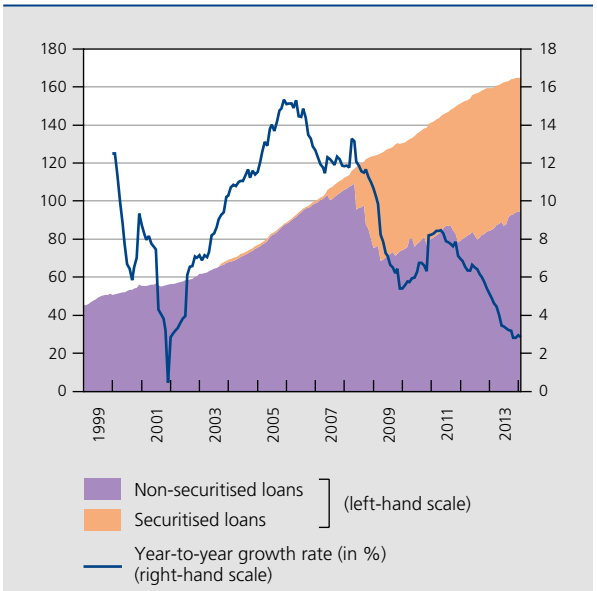
Source: NBB.
(1) A default is recorded when three instalments are not (fully) paid or when an instalment has not been (fully) paid after a period of three months.
(2) Vintages group together loans granted during the same year. The curves show, for each vintage, the number of defaulted loans as a percentage of total original loans after a certain number of months since the loans were granted. Possible loan regularisations are not taken into account.

Although the aggregate credit quality indicators for households do not so far point to any deterioration in default rates on recent mortgage loan vintages, another article in this Financial Stability Review – *The Belgian mortgage market: recent developments and prudential measures* – recalls that the Bank and international institutions such as the ECB, the ESRB, the OECD and the IMF have drawn attention to potential risks associated with the Belgian housing and mortgage market, partly on the basis of criteria measuring the over- or undervaluation of property prices. If conditions in the Belgian housing market were to become less buoyant than they have been over the past 15 years, the riskier loan segments in the outstanding stock of mortgages could be the source of higher-than-expected credit losses for banks. In spite of the recent tightening of some credit standards for new mortgage loan production, a sizeable group of borrowers in recent years may indeed have stretched their mortgage loan maturities, loan sizes and/or debt service ratios to levels that could entail a higher risk of future credit losses for banks than in the past. At the end of last year, the Bank therefore took three prudential measures aimed to bolster the resilience of the market and of credit institutions with the largest exposures to Belgian mortgage loans to such a potential increase in credit losses. More details about these measures can be found in the said article in this FSR.

As shown in Chart 18, the Belgian mortgage loan portfolio of the Belgian banks has grown very strongly over the last 10 years, rising from less than € 70 billion at the end of 2003 to around € 165 billion at the end of 2013. This robust growth also continued in the early years of

CHART 18 BELGIAN BANKS' DOMESTIC MORTGAGE LOANS AND RELATED SECURITISATIONS

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

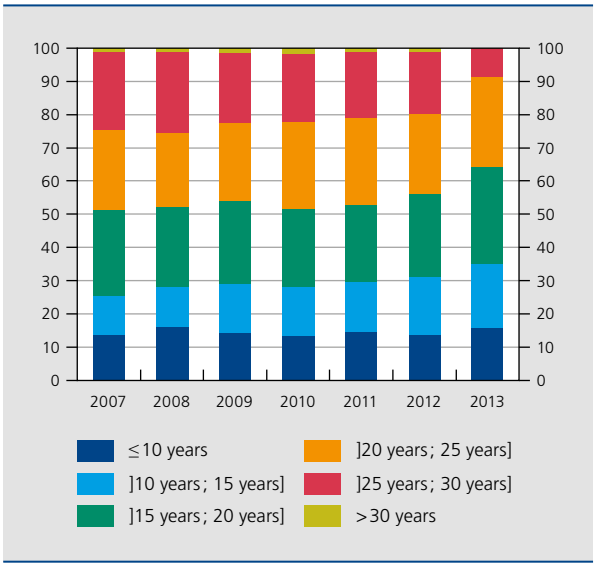


Source: NBB.

the global financial crisis, when Belgian banks reoriented their business models towards more traditional activities and domestic exposures. In recent quarters, the growth of exposures has slowed down however. At the end of 2013 the annual growth rate of the Belgian mortgage loans portfolio had decreased to 2.8 %, compared to 5.4 % at the end of 2012 and 9.5 % on average over the last 10 years. In part, this slowdown may also have been the result of a tightening of credit standards on new loans. As highlighted in Chart 19, one of the most visible areas where credit standards were tightened by banks concerned maturities of new mortgage loans. In the 2013 vintage of new loans, the share of loans with maturities above 25 years dropped to below 10 % compared to 20 % or more in the previous vintages. More details about the recent developments in credit standards for Belgian mortgage loans can be found in the previously cited thematic FSR article.

CHART 19 BREAKDOWN OF BELGIAN MORTGAGE LOANS' MATURITIES, BY VINTAGE

(in % of total loans granted during a particular vintage)



Source: NBB.

2.3 Deleveraging and asset restructuring

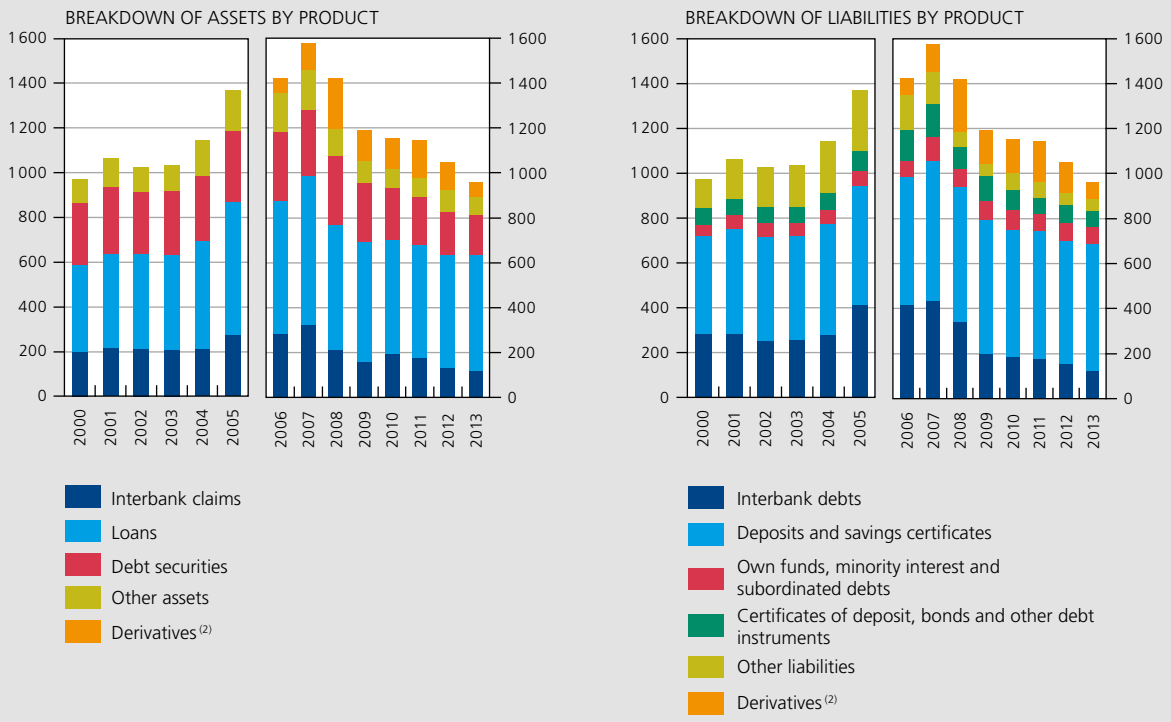
The strong growth of Belgian mortgage loans in the past decade and the rising share of Belgian counterparties in the Belgian banks' loan portfolios are two main outcomes of the important asset restructuring that the Belgian banking sector undertook in response to the financial crisis. This restructuring resulted in a marked reduction in total assets. Since the peak of almost € 1 600 billion in 2007, the balance sheet of the Belgian banking sector has thus come down by just over € 600 billion, putting Belgium in the group of countries where the total assets of credit institutions have been reduced the most in recent years. In 2013, there was a new contraction in the balance sheet total, with a decline from € 1 049 billion at the end of 2012 to € 961 billion at the end of 2013 (Chart 20).

The deleveraging in 2013 was again concentrated among the four largest credit institutions, whereas the assets of the other smaller Belgian banks continued to grow. While before the crisis the four main credit institutions accounted for almost 95 % of the sector in terms of balance sheet size, they now represent 81 % of the whole sector. The decline in the balance sheet total in 2013 is due partly to changes in the market value of derivatives as a result of the increase in long-term interest rates. Yet, the decline in 2012 and 2013 also reflected to an important extent one-off operations and underlying business developments within some of the major banks' balance sheets, which contributed to a sharp decline in the amount of derivatives booked in the consolidated accounts. Leaving aside the movements in derivatives, the balance sheet total remains almost at the same level as at the end of 2012.

While derivatives played the most important role in the contraction of Belgian banks' balance sheet over the

CHART 20 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) Derivatives are recorded at their market value including, from 2007, income receivable and expenses payable.

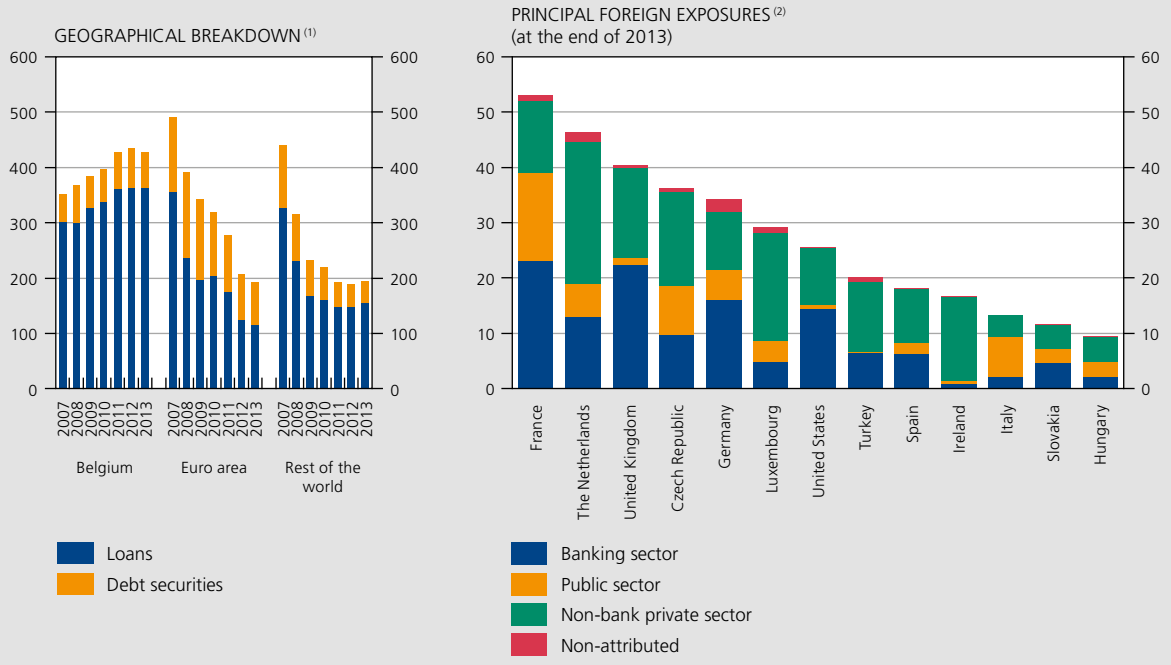
last few quarters, since the end of 2007, it has mainly been the result of a steady decline in loans and debt securities to foreign counterparties, which have been reduced by a cumulative € 543 billion, broken down as € 413 billion in the form of loans and € 130 billion in debt securities (Chart 21). Exposures to euro area counterparties and the rest of the world declined by € 297 billion and € 246 billion respectively over the same period. At the same time, loans to Belgian counterparties continued to grow, rising from € 303 billion at the end of 2007 to € 364 billion at the end of 2013. Throughout the financial crisis, the Belgian banking system thus continued to play its role of key credit provider to the Belgian private sector, even if the pace of growth of bank loans slowed down in 2012 and 2013 as a result of weaker credit demand from non-financial corporations and a moderation of growth in mortgage loans. Total claims on Belgian counterparties, including those in the form of debt securities, increased by € 76 billion between the end of 2007 and the end of 2013. Expressed as a percentage of total loans and advances and debt instruments, their share had risen from 27 % to 52 % over the same period.

The geographical breakdown of the Belgian banking sector's domestic and foreign claims shown in the right-hand panel of Chart 21 confirms that exposures to the foreign non-bank private sector still accounted for the majority (43 %) of total foreign exposures at the end of 2013. They are concentrated mainly in the Netherlands (€ 26 billion), Luxembourg (€ 20 billion), the Czech Republic (€ 17 billion), the United Kingdom (€ 16 billion), Ireland (€ 15 billion), France, Turkey and Germany. In Ireland, Turkey and several central and eastern European countries, the majority of these non-bank private sector claims takes the form of loans to corporates and retail counterparties granted by local subsidiaries of Belgian banks. For the other claims on the foreign non-bank private sector, the nature of these exposures is more diverse, including cross-border loans to corporates and holdings of fixed-income instruments, such as bonds and securitisations.

As for exposures to the public sector, Belgian banks reacted to the turbulence in the euro area sovereign bond markets in 2011 and 2012 by reconsidering the composition and the size of their sovereign bond portfolios

CHART 21 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. Excluding exposures consisting almost entirely of claims on the banking sector.

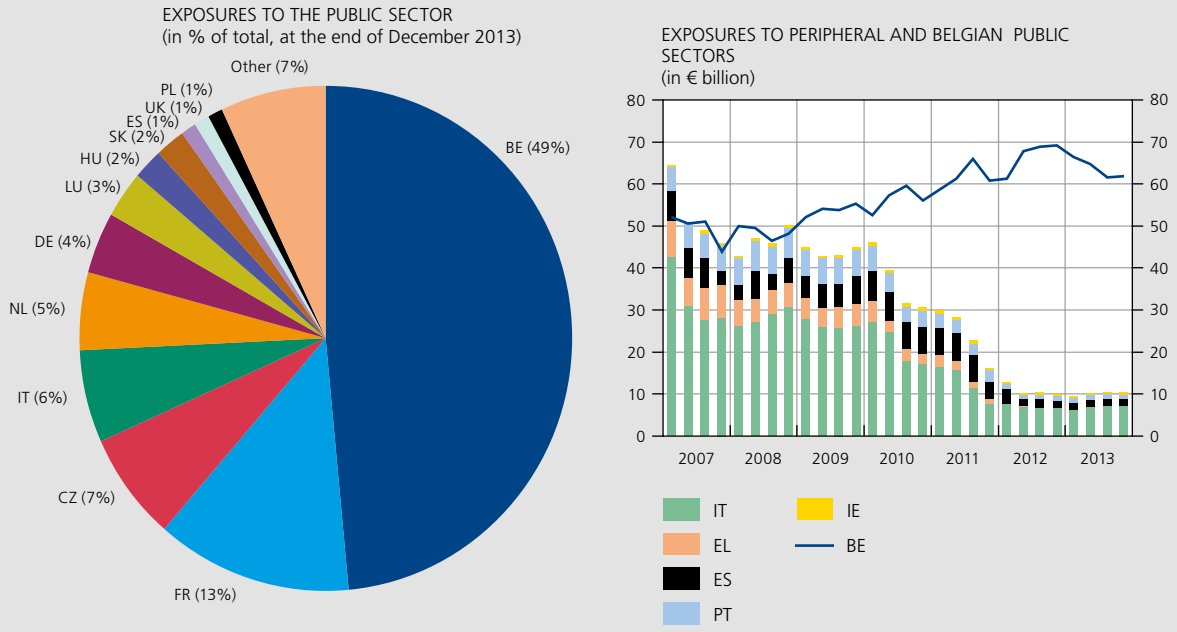
(Chart 22). In particular, they reduced their investments in the government bond markets of those countries subject to the strongest market pressures, leading to a sharp drop in exposures to sovereign debtors from peripheral countries. At the end of 2013, exposures to the latter had dropped to around € 10 billion, down from € 64 billion at the end of March 2007. Italian government bonds still form the major part of these residual peripheral public sector exposures, with an amount of € 7 billion. The counterpart of these reduced investments in peripheral government bonds was an increase of banks' holdings of Belgian government bonds. These reached a record level of € 69 billion at the end of 2012. During the year 2013, they were reduced to € 62 billion, but still accounted for 49 % of overall exposures to the public sector, up from 26 % at the end of 2007. The concentration of public sector exposures on Belgium thus remains high, implying a great sensitivity to any widening of the spreads on Belgian government bonds. Claims on central governments and local authorities in France (13 %), the Czech Republic (7 %), Italy (6 %), the Netherlands (5 %) and Germany (4 %) represent the main exposures to foreign public sector debtors.

As regards exposures to the foreign banking sector, a large part of the balance sheet deleveraging that has taken place since 2007 came through reducing claims on foreign banking institutions in the form of loans or debt securities. At the end of last year, Belgian banks' biggest exposures to the foreign banking sector were to France (€ 23 billion), the United Kingdom (€ 22 billion), Germany (€ 16 billion), the United States (€ 14 billion), the Netherlands (€ 13 billion) and the Czech Republic (€ 10 billion). These cross-border interbank exposures include both intragroup and non-intragroup claims, as some of the above-mentioned consolidated data capture intragroup interbank exposures, for example when Belgian consolidating credit institutions are part of a larger financial group, as in the case of BNP Paribas Fortis or ING Belgium.

Chart 23 looks more closely at the importance of this intragroup financing, using data compiled on a territorial basis, whereby intragroup flows between banking entities located in Belgium and those based abroad are distinguished from non-intragroup interbank transactions. The data reveal that Belgian banking entities are,

CHART 22 BELGIAN BANKS' EXPOSURES TO THE PUBLIC SECTOR[1]

(consolidated end-of-period data)



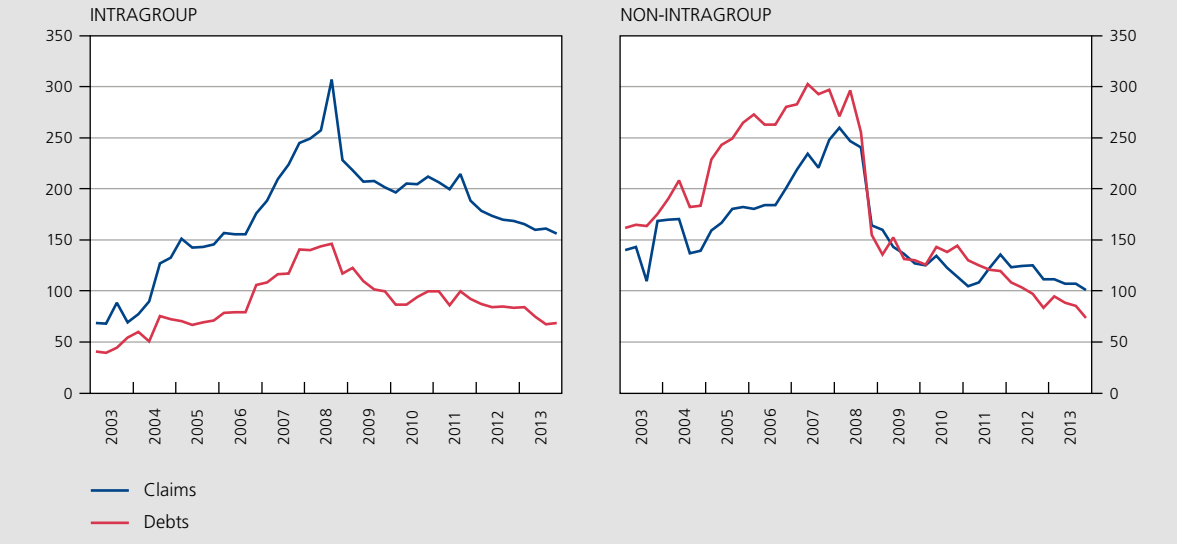
Source: NBB.

(1) Exposures to the public sector in the form of loans and debt instruments, except for Belgium, for which only central government bonds are included.

on aggregate, large net providers of liquidity to other entities of the banking groups to which they belong, as they provide significantly more intragroup financing than they receive. Whereas, in the third quarter of 2008, net

CHART 23 CROSS-BORDER INTERBANK INTRAGROUP AND NON-INTRAGROUP POSITIONS

(data on a territorial basis, in € billion)



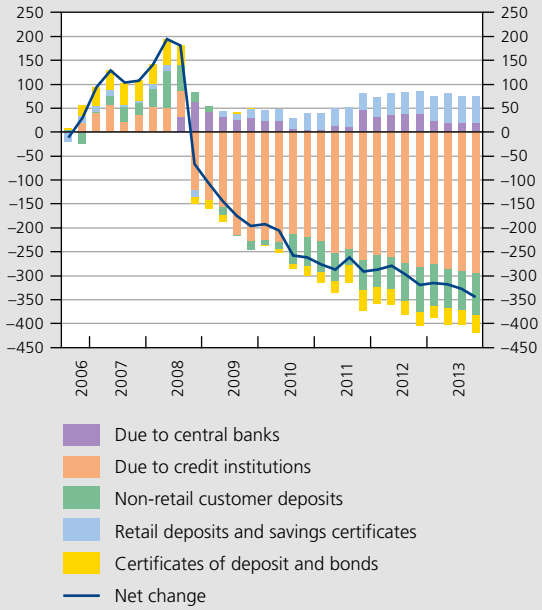
Source: NBB.

intragroup financing by Belgian counterparties amounted to € 161 billion, intragroup financing was then markedly reduced following the exit of Fortis Bank Nederland from the consolidation scope of Fortis Bank and the termination of the associated intragroup flows. After a relative stabilisation at around € 110 billion until the end of the third quarter of 2011, net intragroup interbank claims then dropped to reach € 87 billion at the end of December 2013. Following its takeover by the Belgian State, Belfius Bank no longer categorised its exposures to Dexia SA as intragroup financing as from the fourth quarter of 2011 but recorded them as non-intragroup financing. The drop in claims also stemmed from the Bank's regulation on the own funds of credit institutions and investment firms that entered into force on 31 December 2012 and which stipulated that unsecured exposures of Belgian subsidiaries in relation to their parent company or subsidiaries of their parent company based abroad may not exceed their regulatory capital. In 2012, some banks took steps in anticipation of the entry into force of these measures.

Since Belfius' categorisation of its remaining exposures on Dexia as non-intragoup funding, Belgian credit institutions also became net providers of funding for non-intragroup entities. At the end of last year, this net non-intragroup interbank funding amounted to € 27 billion.

CHART 24 CUMULATIVE CHANGES IN DEPOSITS COLLECTED AND SECURITIES ISSUED SINCE JUNE 2006

(consolidated data, in € billion)



Source: NBB.

2.4 Liabilities and funding structure

One of the main changes in Belgian banks' funding structure since 2007 is the sharp decline in funding through interbank transactions. Since the crisis, banks have reduced their reliance on wholesale funding sources significantly (Chart 24). This reorientation of the Belgian banks' funding structure towards more retail funding was part of banks' business model restructuring programmes and their refocusing on domestic and retail funding sources. If central bank funding is excluded, the share of funding sourced in Belgium thus jumped from 42.7 % to 59.6 % of total funding between the end of 2008 and the end of 2013.

Retail deposits and savings certificates are the only source of funding – together with central bank financing – to have increased (by € 56.5 billion) relative to the levels recorded at the end of June 2006. Expressed in terms of total funding, their share increased from 28 % at the end of 2008 to 48 % at the end of last year.

All the other non-central bank sources of financing, namely non-retail customer deposits, interbank debts and debt financing, have been further reduced as part of banks' strategies to shrink assets and lower reliance on wholesale financing. In 2013, global recourse to wholesale funding was further reduced from € 349 billion to € 326 billion.

Table 4 provides some additional data about the Belgian banking sector's funding structure. In line with total assets, total funding – defined as the sum of total deposits and total debt certificates issued (including bonds) – declined in absolute amounts to € 759 billion. Belgian banks continue to enjoy a large deposit base, and retail customer deposits expanded further from € 321 billion at the end of 2012 to € 334 billion at the end of 2013. With the addition of savings notes (sold to retail clients), retail customers' assets totalled € 360 billion.

Chart 25 provides more details about developments in Belgian banks' (retail and wholesale) customer deposits, on an unconsolidated basis. It shows that total customer deposits were stable around € 500 billion between 2007 and 2011, when in the course of 2012 they started to rise, reaching € 559 billion by February 2014. Within these total customer deposits, there have been some important changes in composition, with a sharp rise in the amount of savings deposits at the expense of term deposits. Savings deposits continued to rise sharply throughout the year 2013 by € 13 billion.

TABLE 4 FUNDING STRUCTURE, LIQUIDITY BUFFER AND REGULATORY LIQUIDITY RATIO

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

	2009	2010	2011	2012	2013
Total assets	1 190	1 151	1 147	1 049	961
of which:					
Unencumbered liquid assets	223	232	191	248	247
Total funding[1]	913	849	816	784	759
of which:					
Retail deposits	283	300	304	321	334
Short-term wholesale funding[2]	454	362	308	224	217
Unsecured	267	222	162	163	173
Secured	187	140	146	61	44
Regulatory liquidity ratio (in %)[3]	102	78	83	69	76
Customer loan-to-deposit ratio (in %)[4]	90	90	90	92	92

Source: NBB.

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

(2) Financing maturing within one year of the reporting date. This wholesale financing includes funding received from various counterparties, ranging from banks and institutional investors to public sector entities and larger corporates.

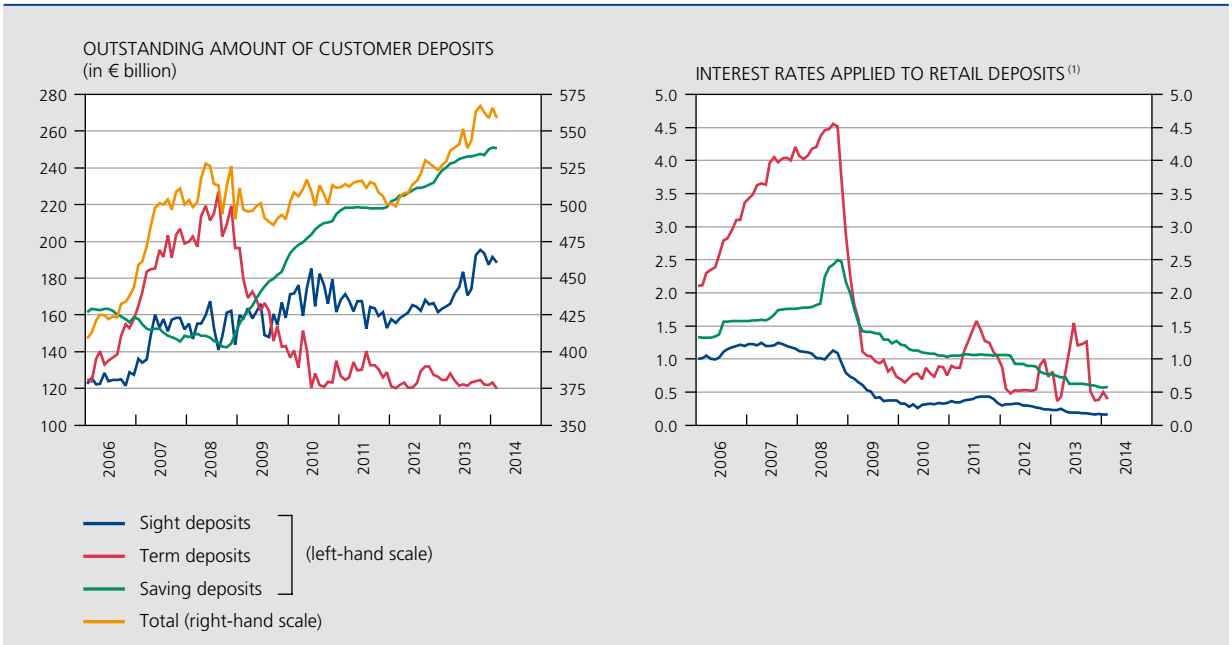
(3) Regulatory stress test ratio for the one-month horizon. It is a ratio between net cash outflows in a liquidity stress test scenario – simulated *inter alia* by applying stressed run-off rates to various sources of funding – and the available unencumbered liquidity buffer. The ratio should be 100 % or lower.

(4) Ratio between customer loans and customer deposits.

Belgian regulated savings deposits are exempt from the Belgian withholding tax for a first sizeable tranche of interest payments (equal to € 1 900 for interest income received in 2013).

CHART 25 CUSTOMER DEPOSITS: OUTSTANDING AMOUNTS AND RETAIL INTEREST RATES APPLIED

(unconsolidated data)



Source: NBB.

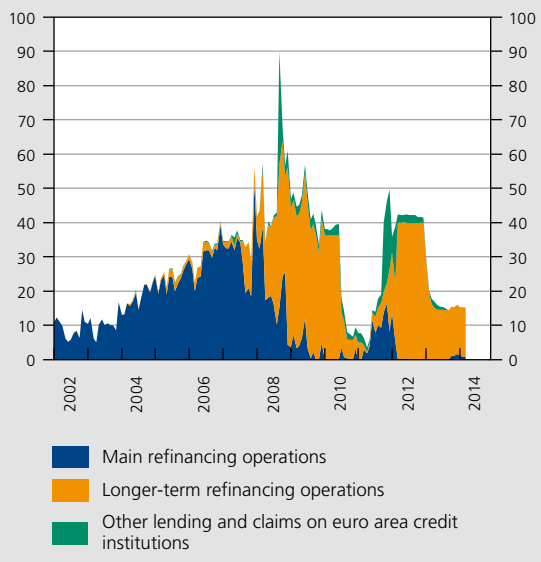
(1) Data from the monthly MIR survey in the case of new deposits. Deposits for a term of up to one year in the case of term deposits.

According to the data shown in Table 4, Belgian banks' deposits collected from customers were more than sufficient to finance the outstanding loans to those same counterparties, resulting in a stable customer loan-to-deposit ratio (on a consolidated basis) of 92 %. At the end of 2013, non-retail or wholesale funding maturing within one year amounted to € 217 billion, down slightly from the level recorded at the end 2012. Between 2009 and 2012, this source of short-term funding – consisting of unsecured and secured financing – had been sharply reduced. In 2013, Belgian banks turned more towards unsecured short-term wholesale funding, as they were able to obtain funding at a more favorable rate on those markets than what they could obtain under the refinancing operations offered by the Eurosystem. Unsecured short-term wholesale funding thus expanded from € 163 billion to € 173 billion between 2012 and 2013. In contrast, short-term secured wholesale funding, which includes the financing obtained from central banks maturing within one year, shrank further during 2013. Belgian banks also reduced their recourse to longer-term Eurosystem financing, as they repaid the financing received in the LTRO operations (Chart 26).

The Bank's claims on euro area credit institutions declined markedly in 2013 reflecting improved market conditions for bank financing. At the end of February 2012, large-scale participation in the Eurosystem's second three-year refinancing operation (longer-term refinancing operation or LTRO) had significantly bolstered the long-term borrowings from the Bank, which rose from € 18 billion at the end of 2011 to € 40 billion at the end of 2012. However, at the end of March 2014, those borrowings had dropped back to € 14 billion as a result of significant LTRO repayments. Short-term borrowings, which include in particular the main refinancing operations (MROs) and emergency liquidity assistance (ELA), declined from € 32 billion at the end of 2011 to € 1 billion at the end of March 2014.

CHART 26 NATIONAL BANK OF BELGIUM'S CLAIMS ON EURO AREA CREDIT INSTITUTIONS

(in € billion)



Source : NBB.

Table 4 also provides information on the pool of unencumbered liquid assets and the regulatory liquidity stress test ratio. To assess the liquidity of credit institutions, the Bank uses this regulatory ratio which requires banks to hold sufficient high-quality liquid assets – assets which can be mobilised in repo transactions on private markets or with central banks – in order to cope with a crisis which may hamper the refinancing options of those institutions for one month. The ratio's denominator shows the liquidity available to an institution in such exceptional circumstances compared to the liquidity required in one month under a stressed scenario, indicated in the numerator. To meet the requirements, this ratio should be 100 % or lower. The liquidity stress test ratio on a consolidated basis deteriorated from 69 % at the end of 2012 to 76 % at the end of 2013, *inter alia* following the Bank's publication of a list of frequently asked questions and answers. While the buffer of unencumbered liquid assets available to the Belgian banks remained stable (at € 247 billion), the liquidity required in one month increased, leading to a slightly higher stress test ratio. However, the sector continued to comply by a wide margin with the one-month liquidity ratio.

The Bank's liquidity ratio anticipates the implementation of the two ratios introduced by the new Basel III rules. The liquidity coverage ratio (LCR), which was finalised at the beginning of 2013 and aims to attenuate short-term liquidity risks, will be phased in from 2015, while the net stable funding ratio (NSFR), intended to improve the banks' structural liquidity position, is to enter into force in 2018. In methodological terms, the LCR is comparable to the Bank's regulatory ratio though it is based on different parameters, definitions and assumptions for the simulated liquidity crisis scenario. The liquidity buffers formed in the context of the Belgian regulatory liquidity ratio should enable the institutions concerned to meet the full 100 % LCR directly from 1 January 2015, as imposed by the Bank. Hence, the Bank uses the possibility foreseen in the Capital Requirements Regulation (CRR) to impose stricter requirements until the full introduction of the LCR in 2018.

2.5 Solvency

Besides the two new liquidity ratios, Basel III also comprises revised regulatory capital ratios which are being phased in as from 1 January 2014 in order to enable credit institutions to adjust their capital structure gradually by 2019. Until the end of 2013, Belgian banks were thus still applying the less stringent Basel 2.5 rules.

To calculate the Basel 2.5 capital requirements for credit risk, on-balance-sheet exposures and off-balance-sheet exposures – in the form of undrawn portions of credit lines or guarantees extended to third parties – are converted to exposures at default (EAD) via a process which was explained in more detail in the Financial Stability Review 2009 (pp. 44-49). In turn, these EAD are risk-weighted and translated into capital requirements, serving as buffers against unexpected credit losses. These calculations differ significantly between the standardised (SA) and internal ratings-based (IRB) approaches.

Under the SA approach, pre-defined risk weights vary according to the type of counterparty and, if available, its external rating, while risk weighting relies on internal models under the IRB approach. EAD covered by the SA approach declined from € 264 billion at the end of 2012 to € 252 billion at the end of 2013 as some entities shifted towards the IRB approach.

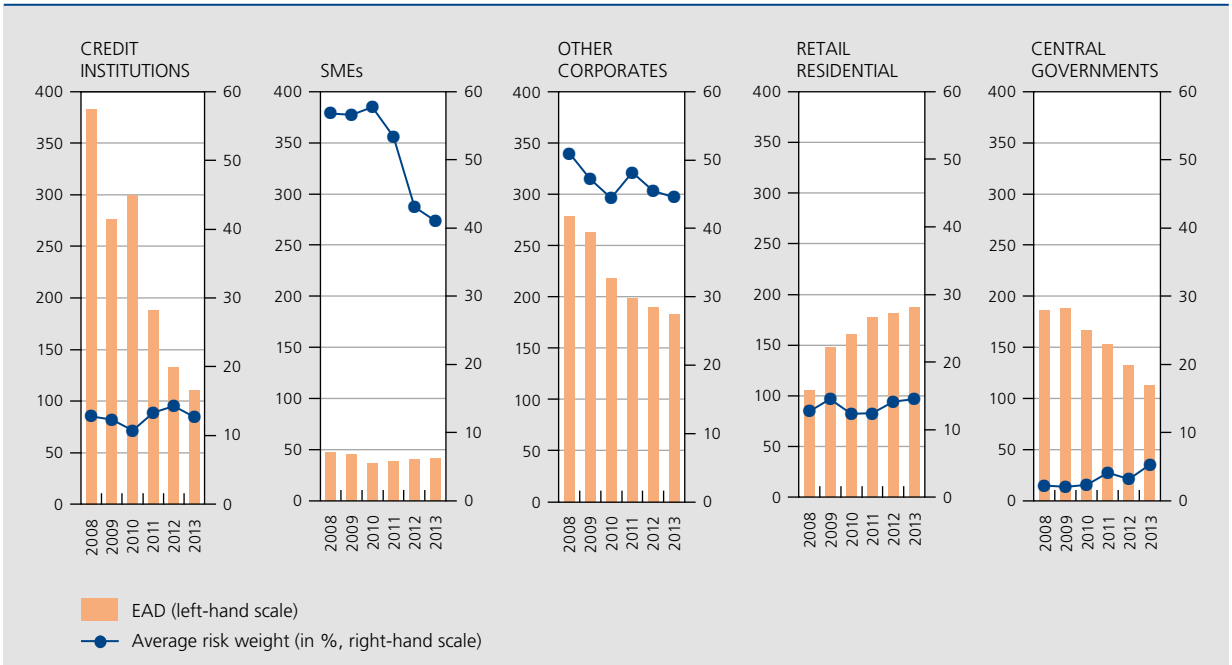
In the case of IRB portfolios, which covered EAD for an amount of € 729 billion at the end of 2013, down from € 771 billion at the end of 2012, the resulting average risk weight can be computed by dividing the risk-weighted assets (RWAs) relating to a certain counterparty by the associated EAD. The ratio varies significantly from one asset class to another, owing notably to differences in assessed probability of default (PD) or loss given default (LGD), which are two important variables in the computation of risk weights.

The resulting risk weights for SMEs and other corporates are the highest of all asset classes, even though they declined somewhat in 2013 (Chart 27). In 2011, the risk weight for SMEs markedly declined mainly as a result of an idiosyncratic change in methodology at one of the large credit institutions. The average risk weight of Belgian banks' sovereign bond portfolios increased slightly while it dropped for exposures to credit institutions.

The average risk weight for retail exposures secured by residential real estate increased slightly, to a still relatively low level of 15 %, as the downward revision of a penalty

CHART 27 EXPOSURES AT DEFAULT AND AVERAGE RISK WEIGHT FOR SOME ASSET CLASSES FALLING WITHIN THE IRB APPROACHES OF THE PILLAR I CAPITAL REQUIREMENTS FOR CREDIT RISK

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



Source : NBB.

on the risk parameters of one bank's portfolio was offset by the increase in another bank's average risk weight applied to some, partly foreign, portfolios. The lower risk weight applied to these loans reflects low PD levels and the lower LGD than for other asset classes (real estate being used as collateral) even though a regulatory floor of 10 % for LGD is applied when calculating minimum regulatory capital requirements.

When only mortgage loans secured by real estate located in Belgium are taken into account, thus excluding foreign mortgage loan portfolios, this average risk weight falls to around 10 %. One of the three prudential measures that the Bank took at the end of last year to bolster the resilience of credit institutions to a potential increase in credit losses on Belgian mortgages was to introduce a flat-rate 5-percentage-point add-on but only for banks calculating their minimum regulatory capital requirements according to an IRB-model. These banks cover a very large share of total Belgian mortgage loans granted by banks (92 % at the end of 2013) while the remainder is almost entirely booked by Belgian banks applying the standardised approach. Mortgage lending by Belgian branches of foreign banks and direct cross-border mortgage loans are only very marginal. This measure and the other two measures adopted by the Bank concerning loans secured by Belgian residential real estate are detailed in a separate article in this FSR. The additional RWAs that had to be booked as from the last quarter of 2013 for this IRB risk weight add-on were recorded by most banks under "other" (and not "credit risk") RWAs, which jumped from close to zero at the end of 2012 to € 7.6 billion at the end of 2013 (Table 5), corresponding to an increase in minimum capital requirements of around € 600 million.

Credit risk RWAs, which account for the bulk of total RWAs, declined by € 13 billion mainly as a result of a decrease in exposures (e.g. Belfius claims on Dexia Crédit Local and KBC's exposures to own shareholders). Market risk RWAs also fell by € 7 billion in 2013, mainly as a result of the reduction in the risk relating to a CDO portfolio by KBC Bank and sales of securities.

As shown in Table 5 and Chart 28, the Belgian banking sector's aggregate RWAs came down in 2013 to € 339.4 from € 352.7 billion at the end of 2012. The average risk weight of assets, computed by dividing RWAs by total assets, increased in the fourth quarter as a direct consequence of the implementation of the above-mentioned add-on on Belgian mortgage loans. This increase was observed for the four largest credit institutions as well as for the other banks which include three IRB banks subject to the add-on.

The Tier I ratio increased from 15.9 % at the end of 2012 to 16.4 % at the end of 2013, close to its record high reached at the end of September 2013 (16.5 %). The substantial

TABLE 5 BREAKDOWN OF TIER I CAPITAL AND RISK-WEIGHTED ASSETS

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

	2009	2010	2011	2012	2013
Tier I capital (1)	53.9	57.9	56.5	55.9	55.6
composed of:					
Core Tier I (2)	47.1	50.9	49.8	51.4	52.1
Hybrid capital	6.8	6.9	6.6	4.5	3.5
Risk-weighted assets	407.5	372.5	373.8	352.7	339.4
composed of:					
Credit risk	352.3	322.8	312.9	301.0	287.7
Market risk	16.1	10.7	21.9	16.6	9.9
Operational risk	38.8	35.1	35.2	35.0	34.2
Other	0.2	3.9	3.8	0.1	7.6
Tier I capital ratio (in %)	13.2	15.5	15.1	15.9	16.4
Tier I capital ratio with Basel I floor (in %)	12.3	14.2	13.8	14.2	14.2
Core Tier I capital ratio (in %)	11.6	13.7	13.3	14.6	15.3

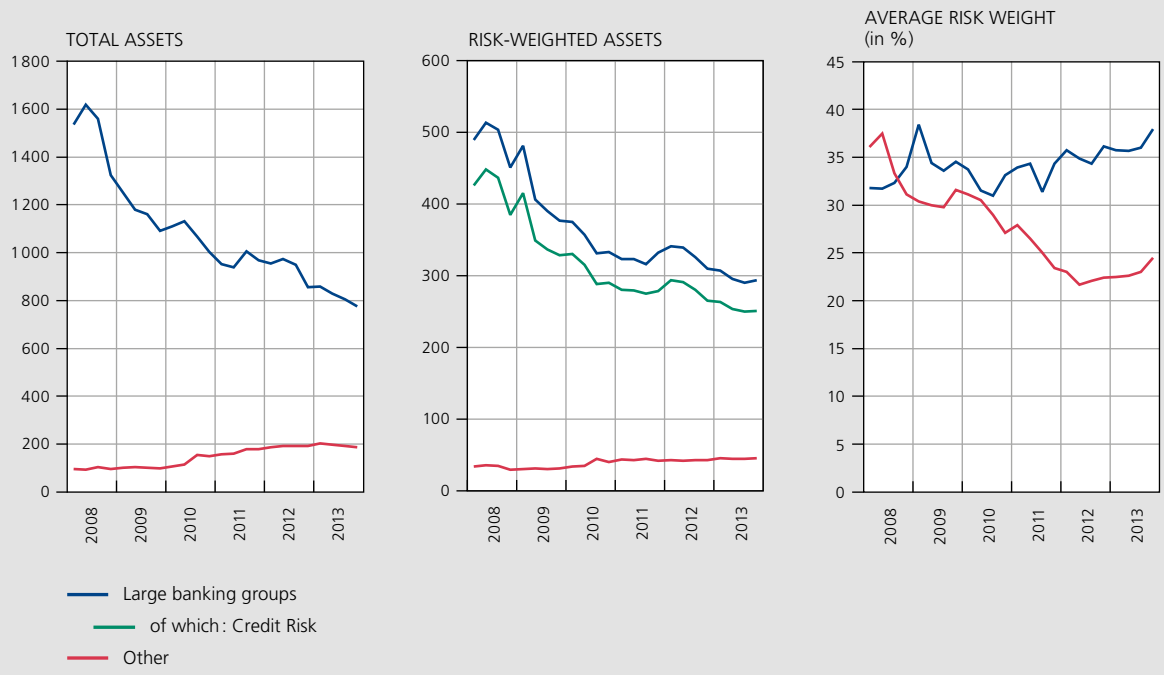
Source: NBB.

(1) Includes paid-up capital and share premiums, eligible reserves and income from the current year, revaluation reserves and associated prudential filters, hybrid capital instruments, third-party interests and deductions (e.g. intangible assets, participations).

(2) Defined as Tier I capital net of Tier I hybrid capital.

CHART 28 TOTAL ASSETS, RISK-WEIGHTED ASSETS AND AVERAGE RISK WEIGHT

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



Source : NBB.

decline in RWA more than offset the slight reduction in Tier I capital, down from € 55.9 billion at the end of 2012 to € 55.6 billion at the end of 2013. The Tier I capital and risk-weighted assets in Table 5 are calculated according to the current Basel 2.5 rules. In this connection, it must be recalled that a floor is imposed on risk-weighted assets calculated according to internal models in such a way that RWA cannot be lower than 80 % of the requirements obtained if these exposures had been risk-weighted according to the former Basel I framework. If this regulatory floor is taken into account, the sector's Tier I ratio falls to 14.2 %. The CRD IV Directive extended this floor until the end of 2017.

Although Belgian banks have a substantial capital surplus in relation to the Basel 2.5 minimum levels, that will be less the case under the Basel III rules. To meet these new regulatory targets, Belgian banks' strategy relies mainly on retained earnings as a way of bolstering common equity levels. The Belgian banks therefore face a challenge in having to sustain sufficiently high levels of income generation in a difficult environment. However, analyses have shown that Belgian credit institutions have generally made adequate preparations for the new requirements. The Bank has monitored this process closely and taken prudential measures where necessary.

In order to improve the quality of regulatory capital, Basel III imposes a much stricter definition so that common equity Tier I capital consists predominantly of ordinary shares and retained earnings. The capital will have to be adjusted to take account of the deduction of new elements, such as assets in the form of deferred tax assets and the available-for-sale reserve. Under the Belgian solvency rules applied until the end of 2013, banks could apply a prudential filter when calculating their regulatory own funds, eliminating the impact of positive or negative changes in the available-for-sale revaluation reserve. That reserve – which corresponds to the unrealised gains or losses on assets available for sale – was therefore only recorded under the accounting equity. At the end of December 2013, it represented a positive amount at sectoral level, for the first time since 2007, of € 0.1 billion, up from a negative amount of € 0.5 billion at the end of 2012. This renewed improvement was mainly the consequence of reduced spreads on some bond portfolios.

The minimum required regulatory capital ratios will also be significantly different under Basel III than under the current Basel 2.5 rules. The most striking change concerns the raising of the minimum requirements for common equity Tier I capital, from 2 to 4.5 % of the risk-weighted

assets, while the minimum level for Tier I capital will be raised from 4 to 6 % of the risk-weighted assets. To this could be added requirements in terms of the so-called capital conservation buffer, representing a fixed 2.5 % of the risk-weighted assets, and a counter-cyclical buffer, ranging between 0 and 2.5 % of the risk-weighted assets depending on the state of the credit cycle(s) in the different geographic markets to which the bank is exposed. Both these supplementary buffers must also be covered exclusively by common equity Tier I capital.

In future, the Basel III rules will also impose an increase in the risk weights to be applied to certain exposures, notably interbank positions and counterparty credit risks incurred in connection with derivatives business, but the capital charges for exposures to small and medium-sized enterprises (SMEs) will be reduced. Until the end of 2013, according to CRD III, IRB banks were allowed to apply to sovereign exposures the risk weight that would have been applied under the SA approach. As from 2014, even though CRD IV still foresees such as possibility, the Bank has decided to gradually withdraw this waiver, except if certain materiality thresholds are not reached, which should lead to an increase in the average risk weight applied to sovereign exposures, going forward. These measures affecting the risk weight of various asset classes will impact the level of risk-weighted assets; in recent years, their gradual decline has been the main reason for the increase in the solvency ratio according to Basel II.

The introduction of a harmonised leverage ratio, relating Tier I capital to the bank's total unweighted assets while taking account of off-balance-sheet exposures, will be analysed during an observation period and is intended to form an absolute minimum for the risk-weighted capital requirements.

3. Insurance sector

In 2013, the Belgian insurance sector recorded a net profit of € 1.4 billion, down from € 2.4 billion in 2013 (Chart 29). These two years of positive net profits followed several years of low net profits or even losses, as a result of the global financial crisis.

The decline in profitability in 2013 resulted from an equally sharp drop in the technical result of life insurance activities (from € 1.2 billion to € 0.6 billion in 2013) and in the non-technical result (to a deficit of € 0.4 billion). This non-technical result includes the investment income not imputed to life and non-life insurance activities, plus exceptional results and taxes, and has traditionally been quite a volatile element in the overall result of the Belgian insurance sector.

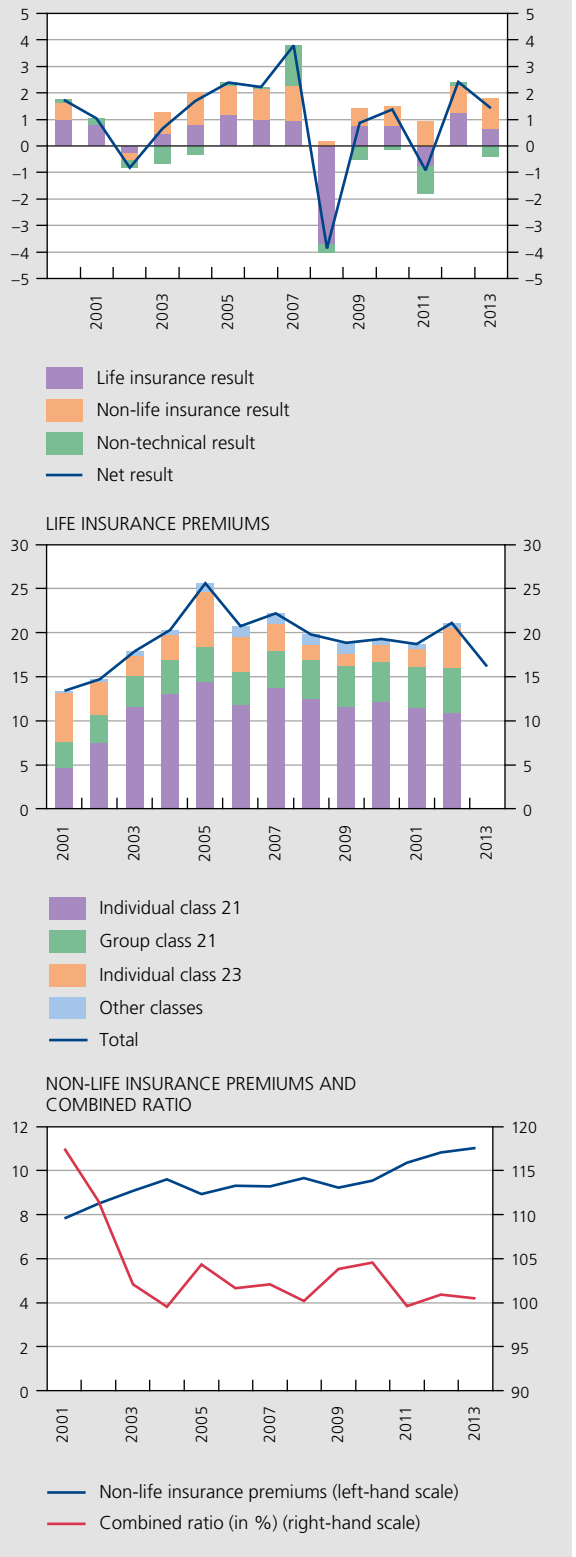
The technical result of the non-life insurance sector rose from € 1.0 billion in 2012 to € 1.2 billion, on the back of a further increase in non-life insurance premiums (rising 2.6 % to € 11.1 billion) and a stabilisation of the combined ratio at around 100 %. Non-life insurance activities have thus kept up their strong performance of recent years, as shown by the steady rise in profitability since 2008. This strong performance during crisis years was achieved thanks to companies' efforts to maintain a sound balance between insurance costs and premium income.

In sharp contrast to the further increase in non-life insurance premiums, total life insurance premiums declined very strongly last year, dropping from € 20.7 billion in 2012 to € 15.8 billion in 2013. This big reduction can be explained by the low interest rate environment and the increase, as of 1 January 2013, of the tax on new life insurance premiums from 1.1 % to 2 %. In 2012, households anticipated this tax increase on premiums paid for class 21 and class 23 contracts by paying additional premiums in the final months of 2012, and then reducing their payments in 2013. A similar development had taken place in 2005 and 2006 when the 1.1 % tax on premiums to be paid on individual life insurance contracts had been introduced for the first time. That tax, which is due regardless of the yield on the sums invested, applies to all premiums, whether they are paid under a new or existing contract, in Belgium or abroad. Although life insurance is concluded with a view to the long term, considerably reducing the impact of the tax rise, the effect of this measure was to make the tax system less favourable for life insurance in class 21 and 23.

The sharp drop in life insurance premiums, after the temporary recovery in 2012, seems to confirm a structural weakening of demand for life insurance products in recent years, mainly in the case of individual (rather than group) life insurance policies. This fall in demand was probably caused to a significant extent by the financial crisis, as households displayed a stronger preference for liquidity in their savings. The shift in demand away from insurance products may have been compounded by the predominance of the bancassurance business model in Belgium, as banks needing substantial liquidity may have channelled household savings into banking products rather than life insurance contracts. Another important factor weighing on demand for individual life insurance policies concerned the low yields offered by these medium- to long-term savings contracts as a result of the low interest rate environment. Class 21 contracts are essentially invested in bonds and therefore the yields offered on new class 21 contracts are comparable to savings accounts, so that households have no incentive to enter into long-term commitments. This also seems to be confirmed by the available, albeit partial, information on surrender rates, showing that in recent years there has been an increasing percentage of class 21 life insurance contracts that policy-holders have renewed only partially, if at all, when the policy matures. A persistence of the low interest environment may thus weigh on the new volumes of life insurance products

CHART 29 NET RESULTS, PREMIUM INCOME AND COMBINED RATIO [1]

(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.

that Belgian insurance companies will be able to sell, and eventually on their profitability if cost structures are not adapted to the reduced business volume. In response to this, some insurance companies also try to promote their unit-linked insurance business by introducing new unit-linked insurance products or mixed products, combining features of both class 21 and class 23 contracts.

While the structural decline in life insurance premiums thus raises questions over the underlying profitability of life insurance business in future, the sharp drop in insurance premiums in 2013 was not – in accounting terms – the main reason for the observed decline in the life insurance technical result over the last few years. Table 6 provides more details about the two main elements composing the life insurance technical result, which traditionally combines a negative result on pure insurance activities, counterbalanced by a positive result on investment activities. The negative result for pure insurance activities improved slightly in 2013 (to € –8.2 billion), as the sharp drop in life insurance premiums was compensated by a concurrent decline in the amount of claims and other technical expenses.

The decline in the overall life insurance technical result from € 1.2 billion to € 0.6 billion thus resulted entirely from a weakening of net investment income, down from € 9.5 billion to € 8.9 billion. This erosion of net investment income is, however, mainly due to value adjustments with class 23 contracts. Excluding these class-23-related value adjustments, the drop in net investment income was only from € 7.8 billion to € 7.6 billion. This figure of € 7.6 billion remained significantly higher than the average € 5.4 billion recorded in the period 2006-2011, when impairments on financial assets (€ 1.3 billion on average per year) weighed heavily on life insurance net investment income, with particularly high losses in 2008 (the Lehman Brothers default and subsequent market turbulence) and 2011 (losses on Greek and other peripheral government bonds). Net investment income in 2013 was nevertheless boosted by relatively high capital gain realisations, which increased to € 0.7 billion in 2013, from € –0.2 billion in 2012 and € –0.25 billion on average during the crisis years 2008-2011. These capital gain realisations thus masked a 6 % decline in the underlying net income on financial investments, which is made up of dividend income and interest payments – with pro rata adjustments of differences between book and face value for fixed-income instruments – but excludes capital gains. This underlying net income on financial investments declined from € 7.2 billion in 2012 to € 6.8 billion in 2013, mainly as a result of the low interest rate environment and the gradual materialisation of repricing risk in the bond portfolios (see below for more details on this issue).

TABLE 6 MAIN COMPONENTS OF THE PROFIT AND LOSS ACCOUNT OF BELGIAN INSURANCE COMPANIES

(non-consolidated data, in € billion)

	2008	2009	2010	2011	2012	2013 (1)
Life insurance technical result	–3.7	0.7	0.8	–0.7	1.2	0.6
Result of insurance activities	–0.3	–8.0	–7.1	–4.8	–8.3	–8.2
Net investment income	–3.4	8.8	7.8	4.1	9.5	8.9
Non-life insurance technical result	0.2	0.7	0.7	0.9	1.0	1.2
Result of insurance activities	0.0	–0.4	–0.4	0.1	–0.1	–0.1
Net investment income	0.2	1.0	1.2	0.8	1.1	1.2
Non-technical result (2)	–0.4	–0.5	–0.1	–1.1	0.1	–0.4
Net investment income	0.3	–0.7	0.2	–0.9	0.9	0.3
Other results	–0.6	0.2	–0.3	–0.2	–0.7	–0.7
Net result for the financial year	**–3.9**	**0.9**	**1.4**	**–0.9**	**2.4**	**1.4**

Source : NBB.

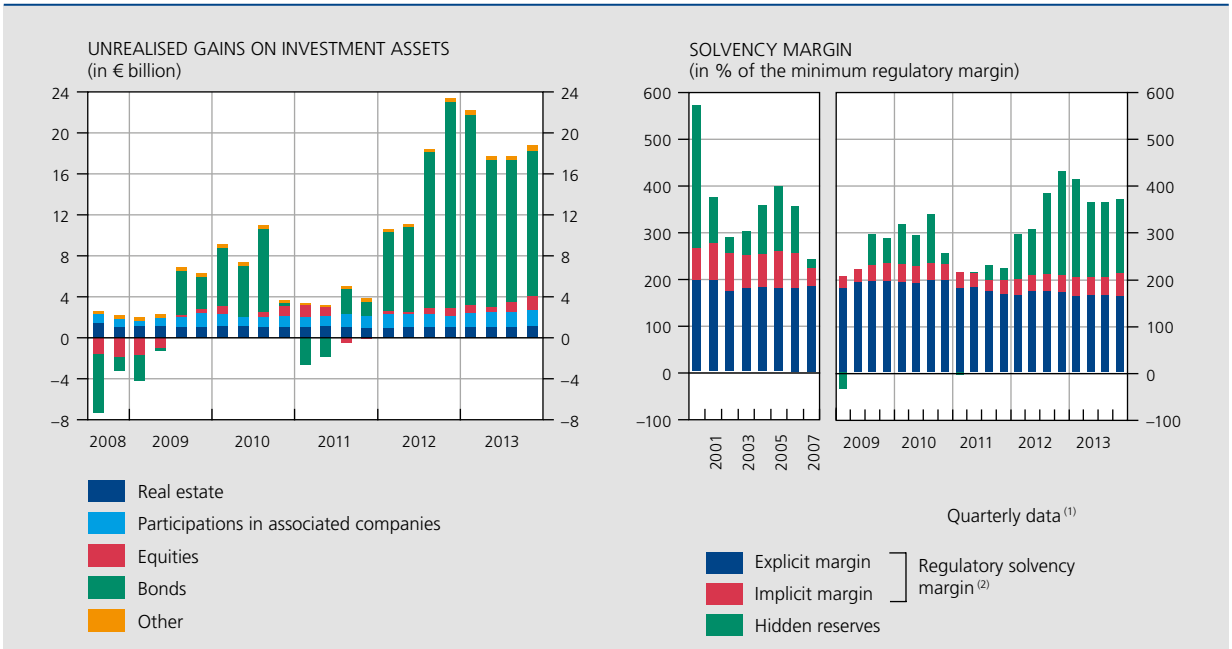
(1) Data from quarterly reporting.

(2) The non-technical result includes investment income not imputed to life and non-life insurance activities, and exceptional results and taxes.

Given the low interest rate environment, the bond portfolios have high unrealised capital gains (Chart 30). Some of these unrealised capital gains on the investment portfolio – which are not recorded in the income statement – can be included in the regulatory solvency margin, subject to the approval of the Bank. The solvency margin for

CHART 30 SOLVENCY MARGIN OF BELGIAN INSURANCE COMPANIES

(non-consolidated data, in % of the minimum required margin)



Source : NBB.

(1) The figures reported quarterly are not entirely comparable with the final figures reported annually. In particular, they take no account of any redistribution of profits to shareholders and policy-holders.

(2) This margin is composed of an explicit margin – including the own funds, subordinated debts and certain other balance sheet items – and an implicit margin which, subject to the approval of the Bank, comprises certain other specific elements, the principal one being a part of the unrealised gains on investment portfolios.

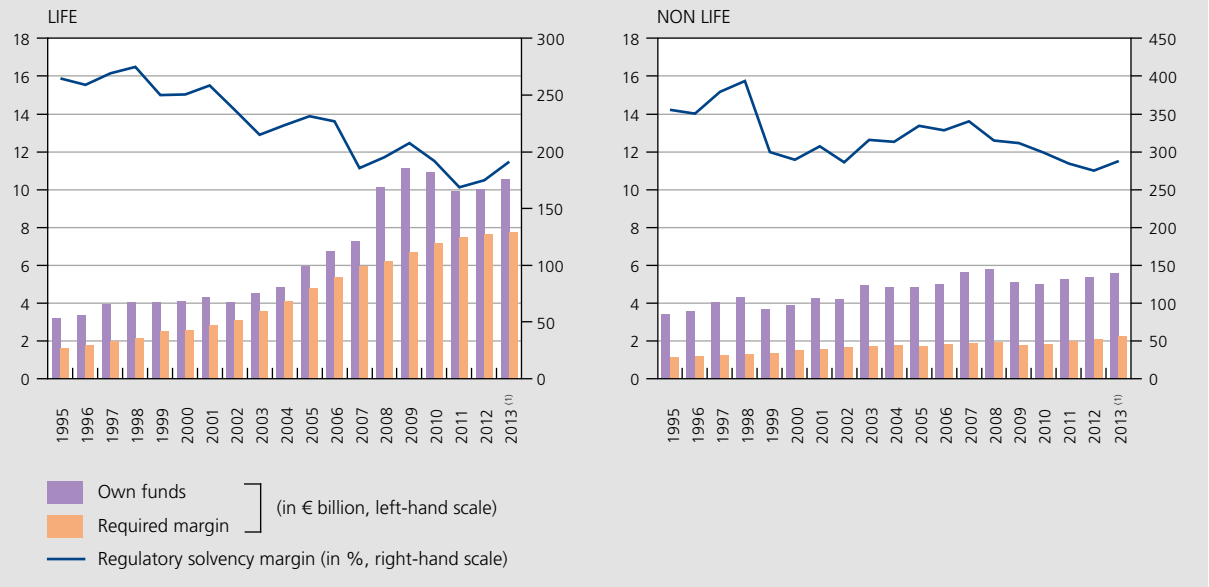
insurance companies consists of an explicit margin which includes own funds, subordinated debts and certain other balance sheet items, and an implicit margin which, subject to the approval of the Bank, essentially comprises part of the gross unrealised gains on investment portfolios. The explicit margin was strengthened in 2008 and in the first half of 2009 by the capital increases carried out by a number of insurers in the context of state support measures for Belgian financial institutions. Those capital increases, combined with retained profits in 2009 and 2010, enabled the sector to maintain an explicit solvency margin at least equal to 165 % of the required minimum for each quarter between the end of 2009 and 2012. In 2013, however, this explicit solvency margin dropped below 165 % and was down to 163 % at the end of 2013, on the basis of the quarterly figures. Yet, these quarterly figures underestimate the official explicit margin reported in the annual accounts, because they do not include the reserved profit or the "Fonds pour dotations futures" in the explicit margin, as in the case of the annual accounts. The total solvency margin, comprising both explicit and implicit elements, has remained above 195 % of the minimum required in each quarter since the end of 2007, and reached 212 % at the end of December 2013.

When account is taken of all unrealised gains or losses on the investment portfolio, including those not included in the implicit margin, an adjusted solvency can be calculated. This hidden reserve (or deficit) has been very volatile in recent years and reached € 18.9 billion at the end of 2013. This is mainly the result of higher unrealised capital gains on bonds in the investment portfolio, due to the sharp drop in secondary market yields for euro area government bonds and for other bonds in Belgian insurance companies' portfolios. However, the improved solvency position shown in Chart 30 as a result of the decline in interest rates should be interpreted cautiously, as it does not take into account the adverse impact of lower interest rates on the economic value of the liabilities. Indeed, in accordance with the Solvency I prudential framework, the effect of lower interest rates on the discounted value of insurance companies' liabilities towards policy-holders is currently not taken into account in the calculation of the regulatory solvency margin.

Under the future prudential framework, Solvency II, this will be different, as both assets and liabilities will be measured on a market-consistent valuation basis. In the case of long-term insurance contracts, such as life insurance or disability insurance, interest rate changes may 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. By adopting a more comprehensive approach, centred on the economic value, for assessing insurance companies' capital adequacy, the Solvency II framework

CHART 31 REGULATORY OWN FUNDS, REQUIRED MARGIN AND REGULATORY SOLVENCY MARGIN

(non-consolidated data, in % of the minimum required margin)



Source : NBB.
(1) Data from quarterly reporting.

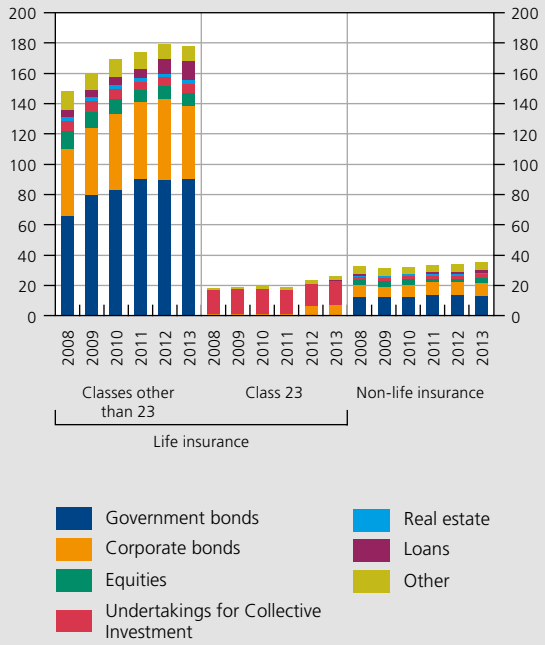
will try to better reflect the challenges relating to the valuation of their assets and liabilities, and the potential effects on the volatility of own funds. In the meantime, by taking partial account of unrealised capital gains on financial investments, but not adjusting the valuation of liabilities at current interest rates, the current Solvency I regulations may not accurately reflect the challenges that a low interest rate environment throws up for insurance companies.

While life and non-life insurance activities each face different challenges in their convergence to the Solvency II standards, their starting points in terms of regulatory solvency margins also seem to be different (Chart 31). In the non-life insurance business, the required margin has been quite stable over the past 20 years, and available regulatory own funds have exceeded this margin by a factor of at least 2.5. In life insurance, the required margin widened considerably between 1995 and 2010, requiring a concurrent increase in regulatory own funds in order to keep the regulatory solvency margin stable. In 2008 and 2009, the recapitalisation efforts made by some Belgian insurance companies thus appear to have been used primarily to strengthen the regulatory own funds for their life insurance business. Yet this was not sufficient to arrest the overall negative trend in the regulatory solvency margin, as additional crisis-related losses in the period 2010-2011 and a further moderate increase in the required margin has kept the regulatory solvency margin below 200 % since 2010. A return to higher after tax profitability in the life insurance business may thus be needed in order to strengthen the capital buffers again.

Due to the sometimes very long-term nature of some of their liabilities, (life) insurance companies have difficulty in finding enough corresponding assets with the same long maturities, even if the bulk of asset and liability cash-flow profiles are well matched. The remaining mismatches and the difference in duration between assets and liabilities make insurance companies' net economic value and profitability sensitive to a low interest rate environment, as some of the maturing assets have to be rolled over in new financial investment to match the cash-flow profile of all outstanding liabilities. This reinvestment risk is particularly relevant for life insurance activities, where some of the liabilities can be far in the future. This long-term character of many life insurance products can also be seen in the fact that premiums are generally collected under long-term contracts, unlike most non-life insurance premiums which are collected under contracts renewed annually. Investment of the life insurance premiums collected during the contract period explains why the investment portfolios built up to cover those future liabilities are much larger in the case of life insurance than non-life insurance.

CHART 32 COMPOSITION OF THE COVERING ASSETS PER INSURANCE ACTIVITY

(non-consolidated data, in € billion)



Source : NBB.

The covering assets shown in Chart 32 are the assets that insurance companies hold on their balance sheet in order to honour future liabilities towards life and non-life insurance policy-holders, as represented by the technical reserves on the liabilities' side of insurance companies' balance sheets. At the end of 2013, these covering assets totalled € 241 billion, or 89 % of the Belgian insurance sector's total balance sheet (equal to € 271 billion). The majority of the covering assets are composed of investment in public sector and corporate bonds, but also includes investment in other assets, such as real estate or mortgage loans.

The chart distinguishes between the covering assets of life insurance and non-life insurance activities, and, within the former, 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, are comparable to mutual investment funds, since the policy-holders/investors bear all the investment risks. The financial assets covering these class 23 insurance policies represent only

around 13 % of the total assets covering the life insurance liabilities and are mainly constituted of Undertakings for Collective Investment (UCIs).

Most life insurance contracts – predominantly class 21 policies – thus entail a market risk for the insurance companies, as they offer policy-holders a guaranteed rate of return, even if this is just a guarantee on the capital invested (i.e. when the minimum guaranteed rate of return is 0 %). To meet these guarantees, the life insurance companies must choose in their asset and liability management an asset mix that is the most appropriate for both the structure and the characteristics of the associated liabilities, while establishing a balance between the risks on the investment portfolio and the expected rates of return. According to the composition of the covering assets for life insurance activities excluding class 23 as at the end of 2013, they invest mainly in government and corporate bonds, accounting for respectively 51 % and 27 % of the total covering assets for the other classes of life insurance shown in Chart 32. In 2012, the share of corporate bonds amounted to 30 %, showing that life insurance companies cut back their investment in corporate bonds by around € 5 billion between end 2012 and end 2013. Holdings of mortgage loans by life insurers increased by 8 % to € 8.1 billion in 2013, accounting for 5 % of total covering assets. The covering assets relating to non-life insurance activities are a little less dominated by government bonds (38 %) and corporate bonds (24 %), in favour of a slightly larger proportion of equities and other types of assets, particularly short-term instruments and bank deposits. Holdings of mortgage loans by non-life insurers increased by 28 % to € 1.2 billion in 2013, and their share in total covering assets reached 3 %. These changes in asset allocation may result in a higher average yield on investment, but may present greater credit and liquidity risks for the companies.

The percentage of the investment portfolio of the various insurance activities composed of equities, including shares in associated or non-associated companies, declined from 8 % of the total covering assets at the end of 2008 to 5 % at the end of 2013.

The reason for the 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 counterparty default. In addition, government bonds are available in a wide range of maturity dates (from 1 year to 30 years and longer), increasing the possibilities to match the typically long-term liabilities in the life insurance business. Furthermore, as an exception, the prudential regulations regarding investment and concentration limits in covering assets do not apply to the government bond asset class. These bonds often also meet the preference of insurance companies for steady and regular sources of investment income. In line with this view of government bonds as a long-term investment, the accounting rules for the covering assets specify valuation at historical cost in the case of government bond holdings, as opposed to all the other financial assets in the covering assets, which have to be recorded at market value on the reporting date.

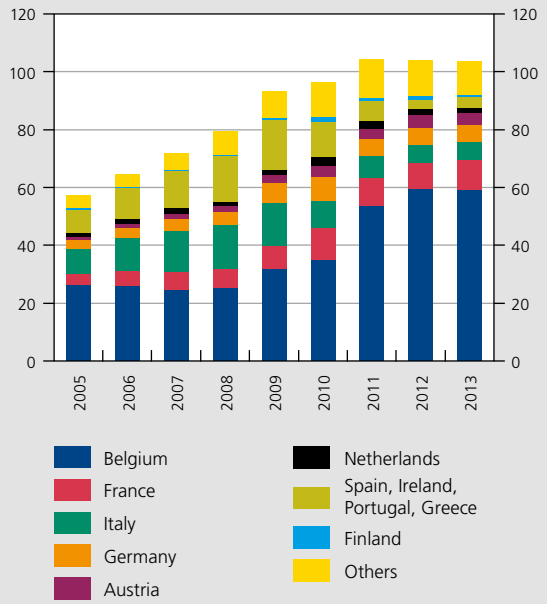
By the end of 2013, investment in fixed-income instruments issued by public sector entities, which include central and local government authorities, as well as international public institutions, amounted to € 114 billion, of which € 103 billion was assigned as covering assets, including for class 23 contracts. The difference between the total government bond portfolio and the bonds considered as covering assets is due to the free assets (€ 1.5 billion) and to specific lending/repurchase operations involving a temporary transfer of the ownership of the securities (€ 9.5 billion). These repo operations – 75 % of which concern Belgium government bonds – cannot be considered as covering assets for the duration of the repo transaction.

An article in last year's Financial Stability Review analysed in more detail the composition and main features, as at the end of 2012, of insurance companies' investment in fixed-income instruments issued by public sector entities. The analysis was 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 Bloomberg information system. By mapping the maturity profile and coupon rates of public sector bonds in the portfolio, it showed 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.

Charts 33 and 34 and Table 7 below provide an update of the main developments in the public sector bond portfolio of the insurance sector following the analysis presented in the 2012 FSR article. The breakdown of the public sector bonds according to the country of issuance (Chart 33), shows in this regard that the insurance sector maintained its high investment in Belgian government bonds in 2013, 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. Due to the euro area sovereign debt crisis, insurance companies reduced their exposures to these

CHART 33 GEOGRAPHICAL BREAKDOWN OF THE PUBLIC SECTOR BONDS IN THE COVERING ASSETS

(non-consolidated end-of-period data, at book value, in € billion)

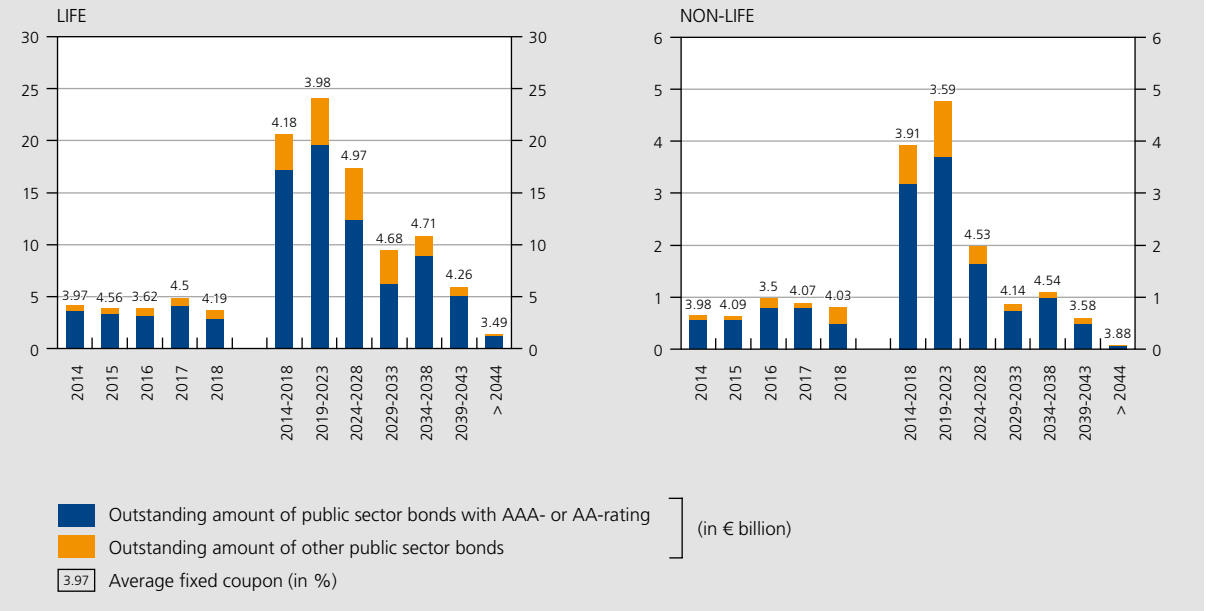


Source: NBB.

peripheral countries after June 2009, by realising part of their portfolio or writing down the book value of the securities. By December 2013, the exposure to the four peripheral countries had therefore declined to € 3.8 billion, with exposures on the public sector in Spain, Ireland and Portugal representing respectively € 2.2 billion, 1.2 billion, and 0.4 billion of this total (the exposure on Greece having fallen to a negligible amount). The proceeds from those bond sales were reinvested mainly in Belgian government bonds, resulting in quite a concentrated exposure on the domestic market. Between the end of 2010 and the end of 2011, investment in Belgian government bonds rose by around € 21 billion, € 19 billion of which constituted covering assets. This major reallocation of exposures towards Belgium in 2011 echoed developments in other countries, as insurance companies in many euro area countries showed an increased home bias as a result of the intensification of the euro area debt crisis. In the case of Belgium, this development occurred at a time of relatively high yields on Belgian government bonds (OLOs). Indeed, during that year, the ten-year OLO yield reached an average of 4.2 % (versus 3.4 % in 2010), even peaking at levels above 5 % in November. At the end of 2013, the Belgian government bonds accounted for € 59.5 billion in the insurers' covering assets, representing not less than 57 % of the total public sector bonds in the covering assets (up from 34 % in 2009). This concentration exposes the

CHART 34 BREAKDOWN OF PUBLIC SECTOR BONDS BY YEAR OF MATURITY AND AVERAGE FIXED COUPON RATE

(non-consolidated data at the end of 2013, book values, excluding class 23 contracts)



Sources: Bloomberg, NBB.

insurance sector to idiosyncratic shocks on the sovereign risk premium on Belgian government bonds.

Chart 34 maps the credit rating composition, maturity profile and average coupon rates of the public sector bonds included in the covering assets of both life and non-life insurance activities.

Between 2012 and 2013, the credit rating composition of the public sector bond portfolio in life insurance did not change significantly, with investment-grade ratings accounting for approximately 91 % of the total book value of public sector bonds in life insurance. The other 9 % is composed of either speculative-grade bonds (1.4 %) or bonds without a rating (7.8 %). Public sector bonds with an AAA rating amount to € 14 billion or 16 % of the total. This is largely the reflection of holdings of public sector bonds issued by Germany, Austria, the Netherlands and Finland, with a residual category including various types of AAA-rated instruments, including issues by international financial institutions. Bonds with an AA rating are the largest category of total public sector bonds in covering assets, accounting for € 56.8 billion or 63 % of total book value. This exposure is mainly the counterpart of the € 47.8 billion invested in Belgian AA-rated public sector bonds for the life insurance covering assets, but it also includes € 6.9 billion of AA-rated bonds issued by French public sector entities. Within the remaining investment-grade ratings of A and BBB, the main issuers behind the BBB-rated public sector bonds are Italy (€ 4.5 billion) and Spain (€ 1.8 billion).

As regards the coupon rates and repricing risks, the left- and right-hand charts show that, in coming years, Belgian life and non-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. Yet, these coupon rates are not necessarily a reliable indicator of the effective yield to maturity of these public sector bonds in the covering assets of Belgian insurance companies, as 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 would have to be considered in order to arrive at well-informed conclusions about the current investment yields and associated reinvestment risks – in a low interest rate environment – for the Belgian insurance sector. The information in Chart 34 nevertheless presents some orders of magnitude 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 given the current low yields available on AAA- and AA-rated public sector bonds.

For life insurance activities, the left-hand chart shows that within the next five years, around € 21 billion of public sector bonds will come to maturity, which accounts for 23 % of the total amount of public sector bonds in the covering assets. This € 21 billion includes € 17 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 chart shows that around € 3.9 billion of public sector bonds will come to maturity during the first five years, which represents 29 % of the total amount of public sector bonds in the covering assets. This € 3.9 billion includes € 3.2 billion of AAA- and AA-rated bonds. In contrast to life insurance, the credit rating composition of the public sector bond portfolio in non-life insurance activities changed somewhat between 2012 and 2013, with the share of BBB-rated bonds rising by almost 6 percentage points at the expense of investment in AAA/AA-rated bonds (minus 2 percentage points) and speculative-grade bonds (minus 4 percentage points).

While the predominance of public sector bonds with an AAA or AA rating has limited the spillovers of the euro area's sovereign debt crisis on the Belgian insurance sector, continuation of such an asset allocation may thus expose insurance companies to significant profitability pressures if maturing AAA and AA public sector bonds are rolled over in similar investments at the current historically low primary or secondary market yields on these public sector bonds. Yet, Chart 34 confirms in this connection that 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, it is only at the end of 2023 that half of the portfolio will have come to maturity, 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 2021, suggesting that the entire public sector bond portfolio of the non-life business is repriced, on average, every 16 years.

At the end of 2013, the average coupon on all the public sector bonds in the life insurance covering assets was 4.4 %, broadly unchanged from the end of 2012. As shown in Table 7, 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

TABLE 7 COUPON AND MATURITY BREAKDOWNS OF THE PUBLIC SECTOR BONDS IN COVERING ASSETS

(non-consolidated data at the end of 2013, book values, in € billion)

	Life				Non-life			
	Amount outstanding	Average age	Average remaining time to maturity[1]	Average maturity	Amount outstanding	Average age	Average remaining time to maturity[1]	Average maturity
Zero-coupon bonds	6.7	12.9	14.4	27.3	0.1	14.3	9.7	24.0
Variable-rate bonds	0.9	5.2	11.7	16.9	0.3	5.6	8.0	13.6
Fixed coupon]0 % – 3 %]	5.1	2.6	9.5	12.2	2.4	4.1	9.3	13.4
Fixed coupon]3 % – 4 %]	28.7	5.0	9.4	14.5	4.6	5.6	8.3	13.9
Fixed coupon]4 % – 5 %]	33.5	6.1	13.6	19.7	4.4	6.1	10.8	16.9
Fixed coupon]5 % – 6 %]	11.8	13.7	13.2	26.8	1.2	14.3	12.9	27.1
Fixed coupon]6 % – 11 %]	3.0	17.2	9.5	26.7	0.3	18.3	8.2	26.5
Total	**89.7**	**7.4**	**11.9**	**19.3**	**13.3**	**6.6**	**9.7**	**16.3**

Sources: Bloomberg, NBB.
(1) As at 31 December 2013.

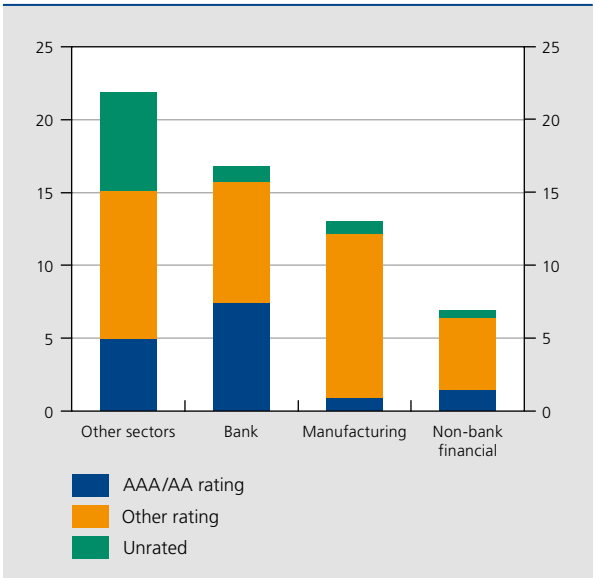
more than 9 years for bonds with fixed coupons between 3 % and 4 % and more than 13 years for bonds with fixed coupons between 4 % and 6 %. In non-life, a 6 percentage point reallocation of the portfolio composition from bonds carrying a coupon higher than 4 % to bonds with a coupon up to 3 % led to a decline in the average coupon of all the public sector bonds in the covering assets from 4.1 % end-2012 to 4.0 % end-2013.

As Belgian insurance companies may have to reinvest significant amounts of maturing AAA- and AA-rated bonds at lower yields than the maturing coupon rates if the current low interest rate environment were to persist, the large unrealised capital gains on their bond portfolio should be treated with caution and not be used to enhance short-term payouts to policy-holders or shareholders. They should rather be seen as a (high-coupon) buffer for the years ahead, should the current low interest rate environment continue over the medium term.

As mentioned before, Belgian insurance companies also hold a large portfolio of corporate bonds. At the end of 2013, these corporate bonds represented a total amount of respectively € 49 billion and € 9 billion in the covering assets of life and non-life at the end of 2013. Chart 35 provides a breakdown by sector of issuer of these corporate bonds in the covering assets, showing one of the main results of an analysis of corporate bonds that was undertaken along the lines of the one realised for public sector bonds last year. With a share of 29 %, corporate bonds issued by credit institutions dominate the Belgian insurance sector's corporate bond portfolio, followed by corporate bonds issued by manufacturing companies (22 %) and non-bank financial institutions (12 %). The remaining 37 % are spread over residual sectors gathered in the category "other sectors". The breakdown by credit rating shows that the bonds from the bank sector

CHART 35 BREAKDOWN OF THE CORPORATE BONDS BY SECTOR OF ISSUER

(non-consolidated data at the end of 2013, book values in € billion, excluding class 23 contracts)



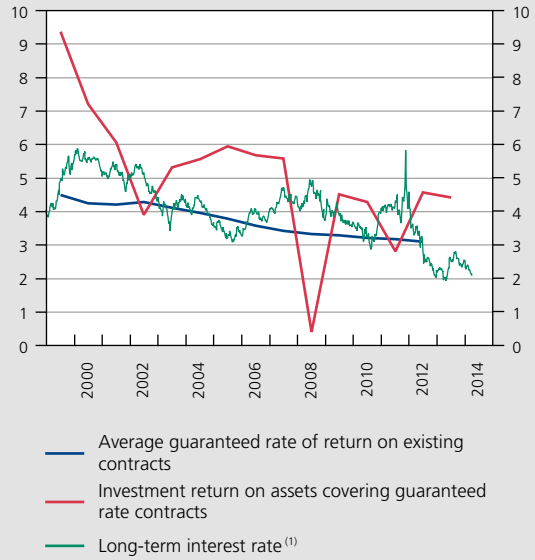
Sources: Bloomberg, NBB.

have the highest proportion (45 %) of high-rated bonds (AAA/AA), unlike the manufacturing sector where this proportion barely reaches 7 %. The high-rated bonds issued from the non-bank financial sector or from the other sectors account for respectively 22 % and 23 % of the total book value. When consolidating the corporate bonds according to the corporate group to which the individual bond issuer belongs, it turns out that the corporate bonds held by the Belgian insurance sector are not concentrated on any specific individual groups.

At the end of 2013, the average coupon on these corporate bonds amounted to 4.3 % in life and 4.1 % in non-life, slightly higher than the above-mentioned average coupon rates for the public sector bond portfolio.

Chart 36 compares the annual investment return on assets covering class 21 contracts with the average rate of return guaranteed to policy-holders on these contracts. Preliminary figures for the year 2013 show a stabilisation in the investment return in 2013 at around 4.5 %. In the period 1999-2012, the average net investment return amounted to 5.1 %. This period included three years during which the annual return on investment was lower than the prevailing average guaranteed rate of return on outstanding contracts. This occurred during years of severe financial market downturns in 2002 (equity markets), 2008 (Lehman Brothers) and 2011 (euro area debt crisis).

CHART 36 GUARANTEED RATE OF RETURN ON CLASS 21 CONTRACTS



Sources : Thomson Reuters Datastream, NBB.
(1) Yield on the secondary market in ten-year Belgian government loans (OLOs).

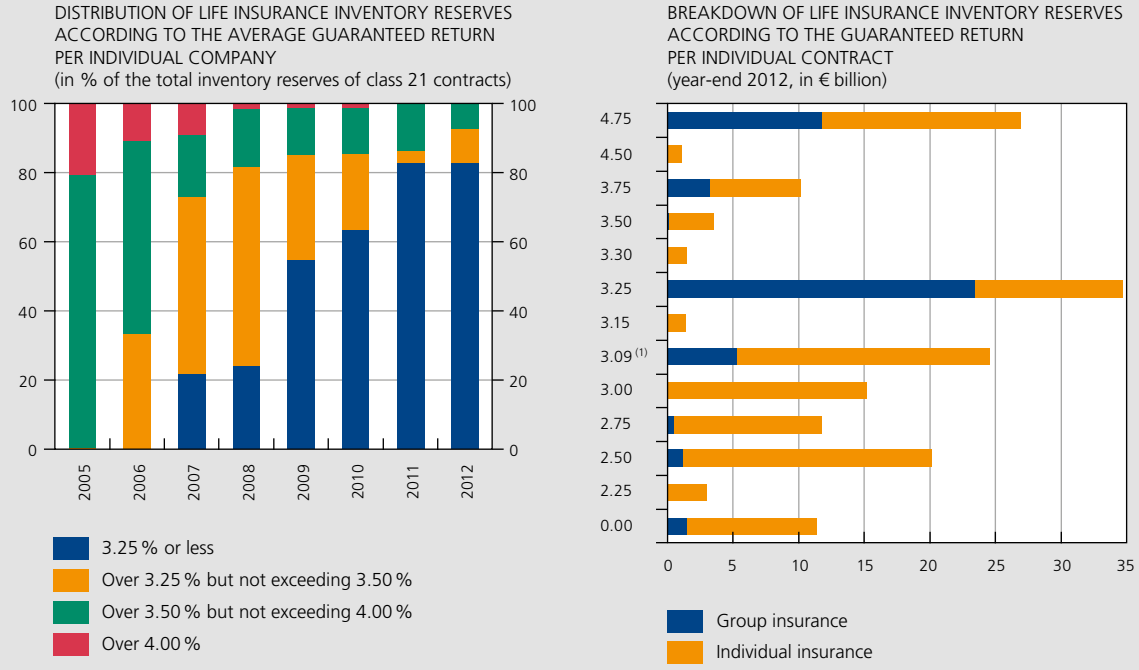
Yet, even if one disregards these exceptional years, the trend in investment returns is clearly downward, in line with the overall trend in Belgian government bond yields.

The outstanding amount 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 the interest rates on risk-free investment fall to very low levels, as has happened in the recent period. 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 %. In the case of an exit from a supplementary pension plan, the current legislation requires companies to guarantee a minimum return of 3.25 % on employers' contributions and 3.75 % on personal contributions. While the profitability of insurance contracts guaranteeing such returns was eroded when long-term interest rates began to drop below those levels, the sector has gradually modified that adverse structure by marketing contracts offering guaranteed rates of return which are more in line with risk-free interest rates, and containing clauses which provide for a revision on the basis of changing market conditions. Moreover, some contracts specify that the guarantee is limited in time, and that, at the end of that period, the contract reserve (i.e. the amount of savings built up) is technically regarded as a new premium with a new guaranteed interest rate in line with prevailing market conditions. All these measures contributed to a reduction in the average guaranteed rate of return on class 21 contracts from 4.5 % at the end of 1999 to 3.22 % at the end of 2010, 3.17 % at the end 2011 and 3.12 % at the end of 2012.

Chart 37 provides some more information on the structure of the guaranteed rates of return on life insurance policies, giving the situation at the end of 2012. At that time, the Belgian insurance sector still had large numbers of contracts offering high guaranteed rates of return for policyholders. 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. Analysis of the data broken down by contract in the right-hand chart reveals that contracts concluded in the past and still offering a guaranteed return of 4.75 %, the legal maximum for that type of contract up to June 1999, represented inventory reserves for an amount of € 26.9 billion at the end of 2012. Taking into account all contracts offering more than 4.5 % which are included in the residual item showing an average guaranteed rate of 3.09 %, this increases to an amount of € 30.2 billion, or around 18 % of the inventory reserves. With reserves of € 34.7 and € 10.2 billion, contracts offering a guaranteed

CHART 37 DISTRIBUTION OF CLASS 21 LIABILITIES WITH GUARANTEED RATES OF RETURN

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



Source : NBB.

(1) Outstanding amount of life insurance reserves guaranteeing a return different from the others shown in the chart ; the guaranteed return for all these contracts averaged 3.09 % at the end of December 2012.

return of respectively 3.25 % and 3.75 % also account for large proportions of life insurance liabilities with guaranteed rates of return. The liabilities in these two categories include most of the class 21 group insurance contracts, because insurance companies, spurred on by competition, tended to offer in these group insurance policies a guaranteed rate of return that was in line with the minimum rates that companies sponsoring group insurance policies have to guarantee on employer (3.25 %) and employee (3.75 %) contributions according to the law on the supplementary pension system (second pillar). This mainly explains why the group insurance inventory reserves, corresponding to 3.25 % and 3.75 % group insurance contracts, continued to increase between 2011 and 2012. Yet, in the case of individual insurance, the inventory reserves related to contracts with a guaranteed rate higher than 3 % fell by 8 % in favour of contracts offering a lower rate of close to 2 %. In particular, the inventory reserves of 4.75 % individual guaranteed rate contracts declined 17 % between 2011 and 2012 compared to the previous year, reaching € 15.1 billion at the end of 2012.

The left-hand chart 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 2012, around 83 % of the class 21 inventory reserves were held by insurance companies offering an average guaranteed return of 3.25 % or lower, whereas in 2005, nearly no company had an average guaranteed rate of return lower than 3.5 %.

Life insurance companies have succeeded in reducing their average guaranteed rate of return by reducing 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 the introduction of greater flexibility in the determination of 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. However, some of these contracts also offer policy-holders more flexibility, allowing them to terminate their policies more easily or to reduce them 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 reduction in their volume of business. In both cases, that would impair the profitability of class 21 life insurance policies.

In order to protect themselves against the effects of low interest rates on the profitability of guaranteed-rate-of-return contracts, insurance companies have to form an additional provision for contracts offering a guaranteed rate of return 10 basis points higher than the so-called flashing-light rate, defined as 80 % of the average yield on ten-year Belgian government bonds on the secondary market over the past five years. Insurance companies can spread the amounts to be allocated to this provision over a maximum of ten years. The flashing-light rate for this additional provision, which is calculated once a year by the supervisory authority, was 2.72 % at the end of 2013. At the end of 2012, the cumulative additional provisions that the Belgian insurance companies had constituted in this framework amounted to € 3 billion. Income from the assets corresponding to that provision is added to that generated by the covering assets representing the life insurance provision so as to guarantee the interest rate level promised in the contract.

A Circular from September 2006 exempts insurance companies from forming that supplementary reserve for interest rate risk if they can show that the financial flows generated by their covering assets will cover the commitments given in their insurance contracts. In line with an International Monetary Fund recommendation, the NBB suspended the application of that Circular in 2013 for two important reasons. The first concerns the current economic situation, which implies that the low level of interest rates could persist for a long time both on the Belgian capital market and on the euro-swap market. The second reason is the need to establish a mechanism tailored more closely to the principles of the future supervision regime to be introduced on transposition of the Solvency II Directive.

Statistical annex

List of tables

Tables relating to Belgian credit institutions

Tables relating to Belgian insurance companies

TABLE 1 NUMBER OF CREDIT INSTITUTIONS

	2006	2007	2008	2009	2010	2011	2012	2013
Credit institutions governed by Belgian law with Belgian majority shareholding	26	25	23	21	21	20	16	15
Credit institutions governed by Belgian law with foreign majority shareholding	25	27	28	27	27	27	26	24
EU Member States	20	21	21	19	20	20	19	18
Other States	5	6	7	8	7	7	7	6
Belgian branches of foreign credit institutions	54	58	56	56	59	61	62	65
EU Member States	46	49	47	47	50	52	53	55
Other States	8	9	9	9	9	9	9	10
Total	**105**	**110**	**107**	**104**	**107**	**108**	**104**	**104**

Source: NBB.

TABLE 2 KEY FIGURES

(consolidated end-of-period data)

	2002	2003	2004	2005	2006[1]	2007[1]	2008[1]	2009[1]	2010[1]	2011[1]	2012[1]	2013[1]
A. Large banking groups												
Balance sheet total (in € billion)	907.5	913.2	1 010.7	1 229.2	1 348.0	1 488.8	1 326.8	1 092.0	1 003.2	967.8	857.1	774.7
Customers' holdings (in € billion)	465.4	453.9	482.1	532.0	667.4	700.9	612.8	622.5	559.8	518.4	518.2	516.5
Loans and advances to customers (in € billion)	381.2	384.9	433.2	535.1	553.8	619.0	505.0	481.7	450.7	441.4	432.8	444.7
Risk asset ratio (in %)	12.8	12.4	12.6	11.1	11.2	10.8	16.2	17.0	19.2	18.2	17.9	18.5
Net after tax results (in € billion)	2.9	3.6	4.6	5.7	9.2	6.2	–20.9	–1.5	5.0	–0.1	1.2	2.6
Return on average assets (in %)	0.4	0.4	0.5	0.5	0.7	0.4	–1.4	–0.1	0.5	–0.0	0.1	0.3
Return on average equity (in %)	12.6	14.2	17.3	19.9	23.1	13.7	–40.8	–3.8	11.1	–0.1	2.7	5.6
Cost-income ratio (in %)	73.2	72.8	70.6	72.3	55.5	60.6	86.3	77.7	65.5	66.5	72.6	61.3
B. Total of Belgian credit institutions												
Balance sheet total (in € billion)	1 024.6	1 033.0	1 143.2	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
Customers' holdings (in € billion)	535.3	531.9	570.1	622.1	715.7	761.6	681.8	691.9	636.7	615.2	620.4	622.1
Loans and advances to customers (in € billion)	421.3	428.8	482.9	591.3	591.0	666.2	555.6	536.5	506.6	509.4	504.7	518.1
Risk asset ratio (in %)[2]	13.1	12.8	13.0	11.5	11.9	11.2	16.2	17.3	19.3	18.5	18.2	18.7
Net after tax results (in € billion)	3.2	4.0	5.2	6.6	9.7	6.7	–20.6	–1.2	5.6	0.4	1.6	3.3
Return on average assets (in %)	0.4	0.4	0.5	0.5	0.7	0.4	–1.3	–0.1	0.5	0.0	0.1	0.3
Return on average equity (in %)[2]	11.8	13.6	15.8	18.5	22.4	13.2	–36.5	–2.6	10.5	0.7	3.0	5.9
Cost-income ratio (in %)	74.7	73.9	72.0	72.6	55.7	61.1	85.0	77.5	65.9	67.3	73.3	62.5

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 MAIN BALANCE SHEET ITEMS BY ACCOUNTING CATEGORY/PORTFOLIO

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

	2007	2008	2009	2010	2011	2012	2013
Assets							
Financial assets held for trading	254.2	281.4	164.6	174.4	197.9	130.9	77.6
Financial assets designated at fair value through profit and loss	46.7	28.4	29.7	24.5	12.8	8.8	8.5
Available-for-sale financial assets	215.8	214.7	176.8	159.7	150.1	120.2	113.6
Loans and receivables (including finance leases)	925.3	772.3	718.3	698.9	687.3	658.0	651.3
Held-to-maturity investments	14.5	13.1	12.8	14.1	13.5	25.9	27.3
Derivatives used for hedging	5.6	4.4	4.6	5.5	8.5	11.2	8.4
Tangible assets	8.1	8.4	8.2	6.8	7.1	7.7	7.4
Goodwill and other intangible assets	3.9	4.7	4.1	2.9	2.9	2.6	2.6
Investments in associates, subsidiaries and joint ventures	29.8	1.6	2.5	6.4	5.4	5.3	4.9
Miscellaneous	74.5	93.2	69.0	58.1	62.0	78.1	58.9
Liabilities							
Financial liabilities held for trading	193.7	240.1	147.6	169.2	196.1	117.1	65.0
Financial liabilities designated at fair value through profit and loss	61.5	60.9	47.1	49.0	42.9	28.2	28.4
Financial liabilities measured at amortised cost	1 183.2	955.1	863.1	818.8	748.6	735.1	724.3
Financial liabilities associated to transferred assets	21.6	7.4	8.0	9.7	19.1	14.4	19.1
Derivatives used for hedging	4.1	10.1	11.1	12.5	19.8	24.7	18.2
Provisions	2.5	3.1	2.9	5.4	5.3	5.2	5.7
Miscellaneous	44.5	96.3	57.0	29.3	62.8	63.5	38.6
Total equity and minority interest	67.3	49.1	53.7	57.2	52.8	60.4	61.4
Balance sheet total	**1 578.4**	**1 422.1**	**1 190.5**	**1 151.1**	**1 147.3**	**1 048.7**	**960.6**

Source: NBB.

TABLE 4 MAIN BALANCE SHEET ITEMS BY PRODUCT

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

	2007	2008	2009	2010	2011	2012	2013
Assets							
Loans to credit institutions	320.8	213.2	156.1	195.8	174.3	130.4	117.7
Loans and advances to other than credit institutions	666.2	555.6	536.5	506.6	509.4	504.7	518.1
Debt instruments	296.2	298.8	264.7	231.9	212.0	193.3	181.9
Equity instruments	52.8	15.9	8.8	5.8	4.7	6.3	4.1
Derivatives (1)	120.5	223.1	135.1	133.2	167.0	120.3	64.9
Other assets	122.0	115.6	89.3	77.7	79.8	93.7	73.8
Liabilities							
Debts to credit institutions	431.7	276.2	167.6	177.2	128.5	115.0	103.0
Customers' holdings	761.6	681.8	691.9	636.7	615.2	620.4	622.1
Deposits (2)	582.4	557.4	541.8	511.4	513.9	508.9	525.4
Bank bonds and other debt securities	179.1	124.4	150.0	125.3	101.3	111.5	96.6
Derivatives (1) and short positions	186.3	247.6	157.0	151.6	187.1	133.2	74.9
Subordinated liabilities	36.0	37.0	30.2	29.4	26.4	20.3	17.8
Other liabilities	95.5	130.4	90.2	98.9	137.5	99.4	81.5
Total equity and minority interest	67.3	49.1	53.7	57.2	52.8	60.4	61.4
Balance sheet total	**1 578.4**	**1 422.1**	**1 190.5**	**1 151.1**	**1 147.3**	**1 048.7**	**960.6**

Source: NBB.

(1) Including accrued income and expenses.

(2) Deposits booked at amortised cost.

TABLE 5 LOANS AND ADVANCES TO CUSTOMERS[1]

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

	2007	2008	2009	2010	2011	2012	2013
Term loans	266.7	265.7	235.8	214.4	203.9	198.5	211.5
Mortgage loans	208.3	132.2	158.3	178.5	183.9	188.3	190.8
Current accounts	28.8	24.0	17.9	26.5	23.7	24.3	23.9
Consumer credit	17.1	16.9	16.9	23.7	23.2	23.9	26.9
Finance leases	21.4	21.7	19.1	8.0	11.2	23.7	22.5
Bills & own acceptances	2.9	1.7	0.8	0.2	0.3	0.2	0.8
Securitised loans (for capital and not accounting purposes)	4.0	19.1	30.1	20.3	23.5	22.5	19.5
Other	88.2	62.7	44.2	6.4	18.9	12.7	13.1
Total	**637.3**	**544.0**	**523.4**	**478.0**	**488.6**	**494.0**	**508.9**

Source: NBB.

(1) Loans included in the accounting portfolio "Loans and receivables" only.

TABLE 6 SECURITIES BY TYPE AND PORTFOLIO

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

	2007	2008	2009	2010	2011	2012	2013
Total long positions	**378.7**	**316.2**	**276.0**	**244.1**	**222.2**	**204.9**	**190.9**
Debt instruments	**296.2**	**298.8**	**264.7**	**231.9**	**212.0**	**193.3**	**181.9**
Held for trading	57.6	37.0	25.7	14.5	13.9	7.9	7.8
Designated at fair value through profit and loss	15.5	15.8	14.9	12.2	5.7	2.7	2.5
Available-for-sale	206.9	208.5	170.5	156.5	146.7	117.1	111.9
Loans & receivables	1.9	24.6	41.1	34.9	32.5	39.8	32.5
Held-to-maturity	14.2	12.8	12.5	13.8	13.2	25.9	27.3
p.m. Debt instruments involved in repo transactions excluding re-used debt instruments	*146.5*	*109.0*	*99.7*	*60.8*	*76.7*	*24.9*	*29.7*
Equity instruments	**52.8**	**15.9**	**8.8**	**5.8**	**4.7**	**6.3**	**4.1**
Quoted equity	36.5	9.4	4.8	3.0	1.5	3.7	2.2
Held for trading	28.9	7.3	2.2	1.8	0.6	2.2	1.6
Designated at fair value through profit and loss	2.6	0.2	0.9	0.3	0.2	0.1	0.2
Available-for-sale	4.9	1.9	1.7	0.9	0.7	1.4	0.3
Unquoted equity	16.3	6.5	4.0	2.8	3.2	2.5	2.0
Held for trading	12.9	4.3	1.7	1.2	0.8	0.2	0.0
Designated at fair value through profit and loss	0.9	0.8	0.1	0.6	0.6	0.6	0.5
Available-for-sale	2.5	1.3	2.2	1.1	1.8	1.7	1.4
p.m. Equity involved in repo transactions excluding re-used equity	*0.2*	*5.6*	*0.0*	*0.0*	*0.0*	*0.2*	*0.1*
Investments in associates, subsidiaries and joint ventures (non-consolidated entities)	**29.8**	**1.6**	**2.5**	**6.4**	**5.4**	**5.3**	**4.9**
Total short positions	**64.1**	**14.9**	**9.2**	**3.1**	**2.7**	**1.3**	**2.4**
Debt instruments	**14.1**	**14.3**	**8.6**	**2.9**	**2.0**	**1.3**	**2.3**
Equity instruments	**50.0**	**0.6**	**0.6**	**0.2**	**0.7**	**0.0**	**0.1**

Source: NBB.

TABLE 7 LIABILITIES TOWARDS CUSTOMERS

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

	2007	2008	2009	2010	2011	2012	2013
Retail deposits	280.9	259.1	283.3	299.7	304.2	321.4	334.1
of which :							
Sight deposits (1)	62.1	52.8	62.6	56.6	61.0	61.1	67.8
Savings deposits (1)	131.1	129.2	163.5	186.4	183.7	198.0	201.5
Term deposits (1)	64.1	60.0	32.8	28.1	34.1	33.6	33.6
Customer savings certificates	27.2	29.9	38.9	36.5	34.5	29.2	26.2
Deposits of corporates	257.7	256.8	202.3	164.7	149.4	135.3	142.4
Deposits of non-credit institutions	32.1	34.9	33.1	38.1	43.8	40.9	43.6
Other customer deposits	11.8	6.6	23.2	8.8	16.4	11.3	5.4
Certificates of deposits	81.2	37.7	53.6	25.9	10.0	16.3	11.0
Bonds and other debt certificates	70.7	56.8	57.5	62.9	56.6	66.0	59.4
Total	**761.6**	**681.8**	**691.9**	**636.7**	**615.1**	**620.4**	**622.1**

Source : NBB.

(1) Deposits booked by banks governed by Belgian law with consolidated accounts, at amortised cost only.

TABLE 8 DERIVATIVES AND OFF-BALANCE-SHEET COMMITMENTS

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

	Assets and liabilities						
	2007	2008	2009	2010	2011	2012	2013
Derivatives (notional amounts)							
Held for trading	8 763.9	10 913.0	8 573.2	7 621.9	6 729.7	4 947.3	3 980.3
Interest rate derivatives	6 749.7	9 198.5	7 332.3	6 662.4	5 795.2	4 175.6	3 325.8
Equity derivatives	340.8	214.8	151.9	132.5	156.8	129.4	136.5
Currency derivatives	1 265.5	1 085.4	737.9	710.1	682.4	562.5	460.5
Credit derivatives	365.7	311.5	300.3	94.9	75.9	61.6	41.4
Commodity derivatives	40.6	101.0	50.1	21.7	19.2	18.0	16.0
Other derivatives	1.6	1.8	0.6	0.3	0.3	0.1	0.1
Hedging derivatives	375.1	347.9	350.7	319.6	363.6	390.1	553.4
Micro-hedging	116.4	123.8	91.6	104.0	119.4	120.2	170.8
Portfolio-hedging	258.6	224.2	259.2	215.6	244.2	269.9	382.6
Total derivatives	**9 138.9**	**11 261.0**	**8 923.9**	**7 941.5**	**7 093.3**	**5 337.4**	**4 533.7**
Off-balance-sheet commitments							
Given							
Loan commitments	451.7	315.8	268.0	163.7	140.9	123.6	112.7
Guarantees	265.8	281	215.2	60.9	81.4	73.7	60.5
Other commitments	311.2	365.3	281.8	187.9	233.2	214.4	3 082.3
Received							
Loan commitments	23.8	33.9	31.0	63.0	5.3	16.0	14.4
Guarantees	1 107.3	581.5	564.5	385.5	295.7	283.4	306.9
Other commitments	313.4	229.2	213.1	181.9	201.9	266.9	3 143.2

Source: NBB.

TABLE 9 OWN FUNDS COMPONENTS OF CREDIT INSTITUTIONS GOVERNED BY BELGIAN LAW

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

	2007	2008	2009	2010	2011	2012	2013
Own funds sensu stricto ("tier 1 capital")[1]	67.5	55.7	53.9	57.8	56.5	55.9	55.6
of which hybrid instruments	7.8	7.8	6.8	6.9	6.6	4.5	3.5
Additional items of own funds for credit and market risks ("tier 2 capital")	22.6	24.6	17.3	15.2	13.5	12.1	10.5
of which upper tier 2[2]	5.9	9.3	3.4	3.2	3.6	2.5	2.8
of which lower tier 2[3]	16.7	16.6	15.8	15.0	12.8	9.6	7.7
Deduction of participations	–26.6	–1.0	–1.0	–1.3	–0.8	–0.9	–0.1
Total	*63.6*	*79.5*	*70.3*	*71.9*	*69.3*	*64.2*	*63.5*
Additional items of own funds for market risks only ("tier 3 capital")[4]	0.0	0.1	0.2	0.0	0.0	0.0	0.0
Risk asset ratio (in %)	**11.2**	**16.2**	**17.3**	**19.3**	**18.5**	**18.2**	**18.7**

Source: NBB.

(1) Includes i.a. paid-up capital, reserves, the fund for general banking risks and third-party interests. Positive consolidation differences have to be deducted.

(2) Includes the revaluation reserves, the internal security fund, the perpetuals and other instruments with a subordinated nature and for which the principal or interest payments may be suspended in case of losses.

(3) Includes long-term subordinated debts (minimum initial maturity of 5 years).

(4) Includes the trading portfolio's net result and short-term subordinated debts, after application of the regulatory limitations.

TABLE 10 INCOME AND EXPENSES

(consolidated data, in € billion)

	2012	2013
Interest income	49.5	37.2
Interest expenses (–)	35.9	23.9
Net interest income	13.6	13.3
Dividend income	0.1	0.2
Net fee income	5.4	5.9
Fees received	*7.3*	*8.0*
Fees paid (excluding the commissions paid to bank agents) (–)	*1.9*	*2.1*
Realised capital gains or losses (on financial assets and liabilities other than measured at fair value through profit and loss)	–0.2	0.4
Trading income (gains or losses on financial assets held for trading)	0.8	0.8
Other fair value accounting gains and losses	–0.6	–0.5
Gains and losses on financial assets and liabilities designated at fair value through profit and loss	*–0.5*	*–0.5*
Fair value adjustments in hedge accounting	*–0.1*	*0.0*
Other net operating income	–0.1	1.1
Non-interest income	5.4	7.9
Gross operating income (banking product)	18.9	21.2
Staff expenses (–)	6.9	6.5
Commissions paid to bank agents (–)	0.9	0.9
General and administrative expenses (–)	5.4	5.1
Depreciation (–)	0.7	0.7
Operating expenses (excluding impairment losses and provisions) (–)	13.9	13.3
Impairment losses on financial assets (–)	1.1	2.3
Impairment on property, investment properties, intangible assets, investments and associates and joint ventures accounted for using the equity method (–)	1.7	0.6
Provisions (–)	–0.3	0.1
Impairment losses and provisions (–)	2.6	3.0
Share of the profit or loss of associates, and joint ventures accounted for using the equity method	0.2	0.4
Negative goodwill immediately recognised in profit and loss	0.0	0.0
Total profit or loss from non-current assets and disposal groups classified as held for sale not qualifying as discontinued operations	0.0	–0.1
Net operating income	**2.7**	**5.3**
Total profit or loss after tax from discontinued operations	0.0	0.0
Total profit or loss before tax and minority interest	**2.7**	**5.3**
Tax expenses related to profit or loss from continuing operations (–)	0.7	1.6
Total profit or loss after tax and before minority interest	**1.9**	**3.7**
Minority interest (–)	0.4	0.4
Net profit or loss	**1.6**	**3.3**

Source: NBB.

TABLE 11 MAIN COMPONENTS OF THE INCOME STATEMENT OF CREDIT INSTITUTIONS GOVERNED BY BELGIAN LAW[1]

(consolidated data, in € billion)

	2006	2007	2008	2009	2010	2011	2012	2013
Net interest income	12.8	13.3	14.5	14.9	13.8	14.0	13.6	13.3
Non-interest income	13.9	13.0	4.8	3.9	6.4	5.6	5.4	7.9
Net fee income	6.7	7.4	6.8	5.7	5.2	5.2	5.4	5.9
(Non-)realised capital gains or losses on financial assets and liabilities	3.6	3.8	–3.8	–2.7	0.0	–0.8	0.0	0.8
Other non-interest income	3.6	1.9	1.9	1.0	1.3	1.2	0.0	1.3
Gross operating income (banking product)	26.6	26.3	19.3	18.8	20.2	19.6	18.9	21.2
Expenses	–14.8	–16.1	–16.6	–14.6	–13.3	–13.2	–13.9	–13.3
Staff expenses	–9.0	–9.2	–9.2	–7.9	–7.4	–6.6	–6.9	–6.5
Impairment losses and provisions	–0.4	–3.2	–13.3	–7.4	–1.8	–5.0	–2.6	–3.0
Tax expenses (-income) and other income	–1.7	–0.4	–10.6	1.9	0.5	–1.0	–0.8	–1.7
Net profit or loss	9.7	6.7	–21.2	–1.2	5.6	0.4	1.6	3.3

Source: NBB.

(1) Data based on Belgian accounting principles (Belgian GAAP) until 2005 and on IAS/IFRS-standards from 2006 onwards.

TABLE 12 NUMBER OF INSURANCE COMPANIES

	2006	2007	2008	2009	2010	2011	2012	2013
A. By the location of their registered office								
Belgium[1]	107	106	100	97	97	95	88	84
European Economic Area[2]	54	50	51	50	48	47	45	45
Rest of the world[3]	0	0	0	0	0	0	0	0
Total	**161**	**156**	**151**	**147**	**145**	**142**	**133**	**129**
Free service provision[4]	762	791	878	885	910	927	949	939
B. By specialisation[5]								
Life insurance	29	30	30	29	28	26	25	23
Non-life insurance	109	103	99	94	92	90	83	81
Life and non-life insurance	23	23	22	24	25	26	25	25
Total	**161**	**156**	**151**	**147**	**145**	**142**	**133**	**129**

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 13 MAIN COMPONENTS OF INSURANCE COMPANIES' ASSETS

(data on a company basis, in € billion)

	2006	2007	2008	2009	2010	2011	2012	2013
Investments	183.7	201.7	202.7	214.9	229.5	233.8	242.1	249.4
All activities with the exception of class 23	158.3	177.2	184.6	195.8	210.0	215.2	218.4	223.2
Shares[1]	18.8	19.8	13.4	11.4	12.0	9.6	9.3	11.6
Debt securities	115.2	130.0	136.6	151.5	165.9	172.0	173.3	171.8
Land and buildings	2.5	2.6	3.1	3.1	3.0	3.2	3.4	3.1
Mortgage loans	5.5	5.4	5.4	5.3	5.2	5.8	9.4	10.1
Investments in affiliated undertakings	11.0	14.2	15.7	16.9	16.8	15.5	15.7	16.5
Others	5.2	5.2	10.5	7.7	7.1	9.1	7.4	10.2
Class 23	25.5	24.6	18.1	19.1	19.5	18.6	23.7	26.2
Shares[1]	21.2	19.5	13.6	14.9	15.2	14.6	13.8	
Debt securities	3.8	4.6	4.2	3.9	4.1	3.6	9.1	
Others	0.4	0.5	0.3	0.3	0.2	0.4	0.8	
Reinsured part of technical provisions	4.9	4.8	7.0	6.6	6.8	7.2	7.4	6.1
Claims and other assets	13.2	13.8	14.1	12.9	12.2	15.6	15.1	15.1
Total	**201.9**	**220.4**	**223.8**	**234.4**	**248.5**	**256.6**	**264.5**	**270.5**

Source: NBB.

(1) Including shares in UCITS.

TABLE 14 MAIN COMPONENTS OF INSURANCE COMPANIES' LIABILITIES

(data on a company basis, in € billion)

	2006	2007	2008	2009	2010	2011	2012	2013
Own funds	10.7	11.9	14.2	14.5	14.6	13.7	13.7	14.1
Technical provisions	169.9	185.5	188.0	198.5	211.0	218.3	226.6	231.5
Life insurance (with the exception of class 23)	115.2	130.6	139.4	149.2	160.4	167.7	170.9	172.5
Class 23	25.7	24.7	18.2	19.2	19.6	18.7	23.7	26.2
Non-life insurance	23.3	24.0	24.8	24.2	24.9	25.9	25.4	25.8
Others	5.7	6.2	5.5	5.9	6.1	6.0	6.6	7.0
Reinsurance companies' deposits	2.6	2.7	4.8	4.7	4.9	5.1	5.3	4.3
Creditors' claims	16.5	17.6	14.5	14.3	15.5	16.7	16.3	18.2
Other liabilities	2.2	2.6	2.3	2.5	2.6	2.8	2.7	2.5
Total	**201.9**	**220.4**	**223.8**	**234.4**	**248.5**	**256.6**	**264.5**	**270.5**

Source: NBB.

TABLE 15 COMPONENTS OF THE INCOME STATEMENT OF INSURANCE COMPANIES

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

	2006	2007	2008	2009	2010	2011	2012	2013
A. Technical account in life insurance								
Net premiums written	20.4	21.9	19.5	18.6	19.0	18.4	20.7	15.8
Claims paid (–)	13.0	13.0	15.3	13.5	12.7	15.5	18.4	18.3
Change in the provisions for claims (–)	12.4	13.3	2.9	11.5	11.7	6.1	9.0	4.2
Premiums after insurance costs	**–5.0**	**–4.4**	**1.3**	**–6.5**	**–5.5**	**–3.2**	**–6.6**	**–6.6**
Net operating expenses (–)	1.4	1.6	1.6	1.6	1.6	1.6	1.7	1.7
Result before investment income	**–6.4**	**–6.0**	**–0.3**	**–8.0**	**–7.1**	**–4.8**	**–8.3**	**–8.2**
Net investment income	7.4	6.9	–3.4	8.8	7.8	4.1	9.5	8.9
Technical result life insurance	**1.0**	**1.0**	**–3.7**	**0.7**	**0.8**	**–0.7**	**1.2**	**0.6**
B. Technical account in non-life insurance								
Net premiums written	9.3	9.3	9.7	9.2	9.5	10.4	10.8	11.1
Claims paid (–)	5.9	6.3	6.5	6.6	6.8	7.2	7.2	7.3
Change in the provisions for claims (–)	0.8	0.5	0.4	0.4	0.4	0.1	0.6	0.7
Premiums after insurance costs	**2.6**	**2.5**	**2.8**	**2.2**	**2.3**	**3.1**	3.0	3.2
Net operating expenses (–)	2.8	2.7	2.8	2.6	2.7	3.0	3.1	3.2
Result before investment income	**–0.2**	**–0.2**	**0.0**	**–0.4**	**–0.4**	**0.1**	**–0.1**	**–0.1**
Net investment income	1.3	1.5	0.2	1.0	1.2	0.8	1.1	1.2
Technical result non-life insurance	**1.2**	**1.3**	**0.2**	**0.7**	**0.7**	**0.9**	**1.0**	**1.2**
C. Non-technical account								
Total technical result life and non-life insurance	2.2	2.2	–3.5	1.4	1.5	0.2	2.3	1.8
Residual net investment income	0.5	1.7	0.3	–0.7	0.2	–0.9	0.9	0.3
Other and exceptional results and taxes	–0.5	–0.1	–0.7	0.2	–0.3	–0.2	–0.7	–0.7
Net result	**2.2**	**3.8**	**–3.9**	**0.9**	**1.4**	**–0.9**	**2.4**	**1.4**
p.m. Return on equity (in %)	*20.8*	*31.7*	*–27.3*	*6.3*	*9.7*	*–6.7*	*17.8*	*10.0*

Source: NBB.

TABLE 16 LEVEL AND COMPOSITION OF INSURANCE COMPANIES' AVAILABLE SOLVENCY MARGIN

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

	2006	2007	2008	2009	2010	2011	2012	2013 (1)
Explicit margin	12 768	14 199	16 834	17 393	17 323	16 495	16 896	16 117
In % of required margin	*179*	*182*	*206*	*205*	*193*	*174*	*174*	*163*
Implicit margin	5 279	3 144	1 407	1 999	1 886	1 771	2 208	4 919
Future profits of life insurance activities	655	484	360	288	226	213	195	1 532
Unrealised capital gains	4 624	2 660	1 047	1 711	1 660	1 558	2 013	3 386
In % of required margin	*74*	*40*	*17*	*24*	*21*	*19*	*23*	*50*
Total margin	**18 047**	**17 343**	**18 241**	**19 392**	**19 209**	**18 266**	**19 104**	**21 036**
In % of required margin	***253***	***222***	***223***	***229***	***214***	***193***	***197***	***212***

Source: NBB.

(1) Data from quarterly reporting.

TABLE 17 COMPOSITION OF INSURANCE COMPANIES' COVERING ASSETS FOR ALL TYPES OF ACTIVITIES

(data on a company basis, in % of total covering assets, unless otherwise stated)

	2006	2007	2008	2009	2010	2011	2012	2013
Bonds	59.5	64.1	66.2	69.0	70.4	73.0	72.8	70.1
Equities	14.1	10.1	7.7	6.6	6.1	4.8	4.2	5.0
Real estate	2.1	1.4	1.6	1.7	1.7	1.7	1.7	1.5
Loans	2.3	2.3	2.8	2.6	2.7	3.3	4.7	6.0
UCITS	16.5	16.1	12.5	12.1	11.3	9.9	9.6	10.4
Others	5.5	5.9	9.2	8.0	7.8	7.3	7.0	7.0
Total (in € billion)	**182.7**	**193.1**	**196.5**	**210.8**	**221.3**	**225.5**	**236.8**	**240.5**

Source: NBB.

Thematic Articles

Macroprudential policy in the banking sector : framework and instruments

Marianne Collin
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Introduction

In the aftermath of the financial crisis, the regulatory framework of the financial system was radically reformed. These changes are designed to establish a structure which is more capable of safeguarding financial stability. As for microprudential regulation, the Basel III framework introduced new requirements with respect to solvency and liquidity standards for individual institutions aimed at improving the sector's resilience.

In view of the increasing interconnection of financial institutions as well as herd behaviour resulting in inherent procyclicality of the financial system, an individual approach to institutions was deemed insufficient to control the risk of increasing financial vulnerabilities. Indeed, a broad macroprudential policy covering the entire financial system was considered a prerequisite for containing systemic risk, i.e. the risk of disruptions to the provision of financial services that is caused by an impairment of all or parts of the financial system, which in turn can have serious negative consequences for the real economy (IMF/BIS/FSB, 2009).

The ultimate objective of macroprudential policy is to contribute to safeguarding the stability of the financial system as a whole, including by strengthening the resilience of the financial system and reducing the build-up of systemic risks, thereby ensuring a sustainable contribution of the financial sector to economic growth. Safeguarding financial stability includes two main tasks for macroprudential policy. First, in a cyclical dimension, it tries to contain the build-up of systemic vulnerabilities over time by building buffers that absorb the impact of aggregate systemic shocks and help maintain credit provisioning to the economy in a downturn. Second, it seeks to control structural systemic risks arising through vulnerabilities such as interlinkages between financial intermediaries, concentration of institutions' exposures and the critical role played by institutions in key markets, which can render them too important to fail.

A new architecture for prudential supervision in Europe was set up to provide for a framework in which the new prudential rules, micro and macro, could be developed, harmonised and implemented. For microprudential policy, the European System of Financial Supervision (ESFS) comprises three European supervisory authorities (ESAs). The ESAs are responsible for strengthening microprudential supervision in Europe in the three sectors comprising banking (European Banking Authority), insurance (European Insurance and Occupational Pensions Authority) and the securities markets (European Securities and Market Authority). The European authorities subsequently decided to create a banking union, which will consist of a single supervisory mechanism (SSM), common recovery and resolution procedures and a common deposit guarantee system.

The macroprudential responsibility of the ESFS is assigned to the European Systemic Risk Board (ESRB). Furthermore, the introduction of the SSM will give the European Central Bank (ECB) the ability to implement macroprudential measures for the countries participating in the SSM. A number of macroprudential policy instruments are embedded in the legislation transposing the Basel III

regulatory standards into EU law.[1] For reasons explained below, macroprudential policy largely remains a national competence and the ESRB has recommended that each Member State designates a national authority responsible for macroprudential supervision.

The remainder of this article is organised as follows. The institutional setting and powers of macroprudential policy will be further discussed in Section 1. Section 2 presents key macroprudential instruments for the banking sector. Finally, Section 3 discusses the institutional framework and toolkit of macroprudential policy for Belgium.

1. Institutional framework for effective macroprudential policy

Effective macroprudential policies, which enable the designated authority to take timely and effective preventive action against the emergence of systemic risks, require a sound and coherent institutional framework.

As highlighted by IMF (2011), for institutional frameworks to mitigate systemic risks effectively, they need to (i) support accurate identification of risks through access to information and relevant expertise, (ii) provide incentives for the timely and effective use of policy tools, and (iii) ensure cross-policy cooperation in a way that preserves the autonomy of established policy functions.

1.1 Institutional frameworks

While effective institutional arrangements are highly desirable, there is currently no consensus on an optimal framework for macroprudential policies. There is no "one size fits all"; different models might be effective depending on the country specifics. Some key attributes are nevertheless essential to ensure effective and efficient macroprudential policies.

Sound macroprudential policies require thorough expertise and analysis of systemic developments in the whole financial system and their interactions with the wider economy. Given their expertise in these areas and their position at the heart of the financial system, central banks are well placed to play a leading role in macroprudential policies.

Different models might prevail ranging from the central bank as designated macroprudential authority (centralised model) to a committee outside the central bank with the monetary authorities represented in the macroprudential committee (decentralised model) (see Table 1). In other words, macroprudential policy can be pursued by either a single institution or a committee composed by several representatives, although some variations might be observed.

The choice among the different models is mostly influenced by traditions, current institutional frameworks for other policies and political economy considerations. For instance, the centralised model is mostly observed in countries where the central bank is in charge of microprudential supervision.

Each of the models has its specific strengths and weaknesses. In particular, the centralised model tends to increase the willingness to act by clearly defining mandate

(1) The CRD IV 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 the CRR 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.

TABLE 1 INSTITUTIONAL FRAMEWORK FOR MACROPRUDENTIAL POLICY

	Model 1: centralised model	Model 2: decentralised model
Model	The macroprudential mandate is assigned to the central bank, with macroprudential decisions or recommendations made by its Board.	The macroprudential mandate is assigned to a committee outside the central bank, with the central bank and other institutions participating in the macroprudential committee. In general, the microprudential supervisor, the financial market authority and the Ministry of Finance are represented in this committee.
National experience	Belgium, Ireland, Portugal, United Kingdom	Austria, Denmark, France, Netherlands, Germany, Italy, Spain, United States

Sources: IMF, NBB.

and responsibilities. Relatedly, it might also reduce political pressures. This would be extremely valuable to ensure that decisions are taken rapidly and without undue delay. It also greatly enhances synergies and coordination between monetary, microprudential and macroprudential policies, which might enhance and facilitate the decision-making process by internalising the potential trade-off among those policies. However, failures in macroprudential policies could significantly affect the credibility of monetary policy-makers or microprudential supervisors, especially in the absence of clearly separate accountability frameworks for monetary and prudential actions. In addition, coordination with authorities in areas that do not fall under the centralised macroprudential authority's competences may be more difficult in the centralised model.

The decentralised model has as a relative advantage that discussions on macroprudential policy among those different authorities takes place within a committee and that decisions taken by the macroprudential authority are (in principle) backed by an agreement among the different parties around the table. This at the same time may result in the main drawback of the decentralised model, namely the risks of inaction bias and the need for making compromises among the authorities which might reduce the effectiveness of any action taken.

While all models present various strengths and risks for effective conduct of macroprudential supervision, mechanisms might be designed to mitigate somewhat some of the drawbacks of these institutional arrangements. In general, such mechanisms include strong accountability and governance frameworks. Beside the existence of separate accountability frameworks for monetary and prudential actions, this includes the publication of a policy strategy and regular public communication related to the assessment of systemic risks made by the macroprudential authority and the accompanying action. Given the importance of macroprudential policies and the potential impact on the economy of inadequate policies, regular reporting to Parliament might also help to enhance legitimacy.

Other mechanisms are specifically targeted at dealing with the drawbacks of either one of the models. For instance, collaboration agreements and regular exchange of information with other relevant authorities might help mitigate some of the drawbacks of the centralised model. Governance arrangements such as a "comply or explain" mechanism (see next section) and a decisive vote for the central bank in case of disagreement might mitigate the risks of inaction bias in the decentralised model.

1.2 Macroprudential powers and instruments

Timely and effective macroprudential policy action requires adequate powers and instruments. Macroprudential authorities might have a wide range of powers and instruments at their disposal, generally depending on the institutional models used.

In the centralised model, authorities have mostly direct control over specific macroprudential tools and their calibration. This direct power tends to enhance prompt action by the authorities and mitigate the risks of inaction bias. In a decentralised model, however, powers are usually limited to formal recommendations which might be coupled with a "comply or explain" mechanism. In this case, instruments need to be activated by another institution than the designated authority. Although recommendations might seem less effective, this mechanism might be useful to influence a wide range of regulatory actions. As highlighted by IMF (2013), the (public) "comply or explain" mechanism is important for the effectiveness of recommendations, as it makes compliance more likely and ensures transparency and public accountability regarding cooperation with other agencies.

The authorities also need to develop adequate indicators and methods that can help detect potential sources of systemic risk. In this context, wide access by the macroprudential authority to all relevant information is crucial for detecting threats to the financial system and conducting effective macroprudential policy. This includes not only information from supervised institutions but also from entities outside the supervisory perimeter. For instance, information related to unregulated sectors, such as the shadow banking sector, might be extremely valuable in the context of the recent strengthening of the banks' regulatory framework, as vulnerabilities might be building up in other parts of the financial sector.

Closing information gaps and improvement in the frequency, quality and timeliness of existing statistics is also particularly important to mitigate risks of inadequate assessment. It is also crucial to ensure homogeneity and comparability of data as macroprudential policies might have cross-border spillovers and require coordinated action in the context of globalised financial markets.

1.3 Recent experience in Europe

In Europe, the development of a macroprudential policy framework has received a strong impetus through the establishment of the ESRB in 2011. This new institution is responsible for the macroprudential oversight of the

whole financial system in the European Union (EU) and contributes to the prevention or mitigation of systemic risks to financial stability. The ESRB's institutional structure could be regarded as a decentralised model, with the participation of a wide range of policy-makers, including representatives from the national central banks, from the national supervisory authorities – including financial market authorities –, the ECB, the European Commission and the ESFS.

ESRB oversight of the financial sector has a large scope, as it goes beyond the banking sector. Its scope of action is nevertheless limited to issuing recommendations, coupled with a "comply or explain" mechanism, which makes these recommendations considerably more effective. So far, the ESRB has made six recommendations. Four of them concern specific topics, namely lending in foreign currency, funding of credit institutions in dollars, monetary undertakings for collective investment, and funding risk assessment and follow-up.

The two other recommendations concern the establishment of appropriate structures for exercising macroprudential policy. While the ESRB plays a key role in setting up macroprudential policy in Europe, it also greatly contributes to the development of an adequate operational framework for national macroprudential policy, notably with the recommendation on the establishment of national macroprudential authorities. In response to ESRB recommendations, all EU Member States have set up, or are in the process of setting up, national macroprudential authorities. This illustrates the effectiveness of "soft law" by the ESRB.

National frameworks complementing the European framework are important since responsibility for adoption of the measures necessary to maintain financial stability lies first with national authorities.

As explained in Section 3, the Belgian Parliament has recently decided to designate the NBB as macroprudential authority in Belgium. This choice for a centralised model is in line with the reform of the financial architecture introduced in April 2011, which has transferred microprudential responsibilities to the central bank, thereby promoting synergies between macro- and microprudential supervision. The current framework is compliant with the ESRB recommendation[1] and its guiding principles calling on Member States to establish a national macroprudential authority.

With the introduction of the SSM, the ECB will be entrusted with new macroprudential competences for the banking sector going beyond its responsibilities in the area of microprudential supervision. The ECB will have the possibility, in collaboration with SSM members, to make use of macroprudential instruments to mitigate systemic risk. The role of the ECB, however, will be limited to the imposition of additional requirements on the instruments foreseen in the EU laws and in particular, those laid down by the new prudential rules for the EU banking system (CRD IV/CRR). These macroprudential competences of the ECB aim at reducing the risks of potential inaction bias or "lax" macroprudential policy stance by the national authorities which could in particular lead to systemic risks in the SSM area in the context of integrated European financial markets.

These new institutional structures will require strong coordination mechanisms to ensure coherent and effective macroprudential policy conduct.

These new developments in Europe have taken into account two major imperatives. Macroprudential policies must be coordinated within economic regions where there is close financial integration and a common monetary policy, as in the euro area, because spillover effects are likely to be particularly virulent in such an environment. At the same time, it is evident that financial instability may also occur within a particular market as a result of cyclical developments specific to one country. That is an argument for leaving some national autonomy. Despite the creation of a single resolution mechanism, the domestic authorities will still bear primary responsibility for the financial implications of a systemic crisis affecting their economy. The introduction of the bail-in from 2016 onwards is expected to mitigate somewhat the cost of failed banks for the taxpayers. Also, those authorities will be more in need to use their freedom of action in relation to macroprudential policy if other policies that affect financial stability such as monetary and microprudential policy, are increasingly beyond their direct control.

1.4 Interaction and cooperation with other policies

Financial stability is not affected by macroprudential policy solely, but by a range of other policies as well. Macroprudential policy may therefore interact with several other policies (Chart 1).

First, strong coordination is required between micro- and macroprudential policy. Conflicting interests can cause tension between macro- and microprudential policies as they use the same policy instruments but do not share

(1) Recommendation of the European Systemic Risk Board of 22 December 2011 on the macroprudential mandate of national authorities (ESRB/2011/3).

the same objectives. The microprudential supervisor tries to safeguard individual banks from risks, while the goal of the macroprudential supervisor is to preserve the stability of the banking sector as a whole. As such, the former tends to take procyclical policy measures, while the latter would take countercyclical measures. In bad times, for instance, macroprudential policy may call for a relaxation of regulatory requirements in order to stimulate credit provisioning to the economy, while microprudential authorities may want to tighten up these requirements to protect depositors. These potential conflicts call for a preventive build-up of precautionary macroprudential buffers in buoyant times, when they are not strictly needed for purely microprudential purposes, to be in a position to reduce them in bad times.

There are also strong interactions and complementarities with monetary policy. For instance, price stability-oriented monetary policy can under certain circumstances have undesirable side effects for financial stability, as business cycles and financial cycles are not always aligned. As long as these side effects only show up in specific markets, monetary policy would be too blunt an instrument to address them, while macroprudential policy is more appropriate given its targeted nature. That argument is even stronger in the euro area, as macroprudential policy can address idiosyncrasies at national level, while monetary policy cannot. However, monetary policy is also well advised to take the financial stability implications of its own action into account as it may produce more generalised effects which eventually will have implications for future price stability. At the same time, it is also true that macroprudential policies may affect the monetary policy transmission mechanism. Indeed, for a given policy rate, these policies alter the conditions at which credit is granted to the wider economy. On a more positive tone, by safeguarding financial stability, strong macroprudential policy can create room for manoeuvre for monetary authorities to pursue price stability and reduce the burden of dealing with adverse financial developments. Such complementarities arise when, for instance, macroprudential policy has created buffers that, when released, reduce the constraints faced by monetary policy confronted with the zero lower bound problem. Positive spillovers also exist in the other direction, as monetary policy can mitigate adverse macro scenarios which would have serious implications for financial stability. All in all, these strong interactions generally speak in favour of fully exploiting the synergies between the two policy domains, which tends to be easier in the centralised model described in Section 1.1.

Well-designed fiscal and structural policies can reduce the likelihood of macroeconomic shocks and as such reduce

CHART 1 INTERFERENCE OF MACROPRUDENTIAL POLICY WITH OTHER POLICIES

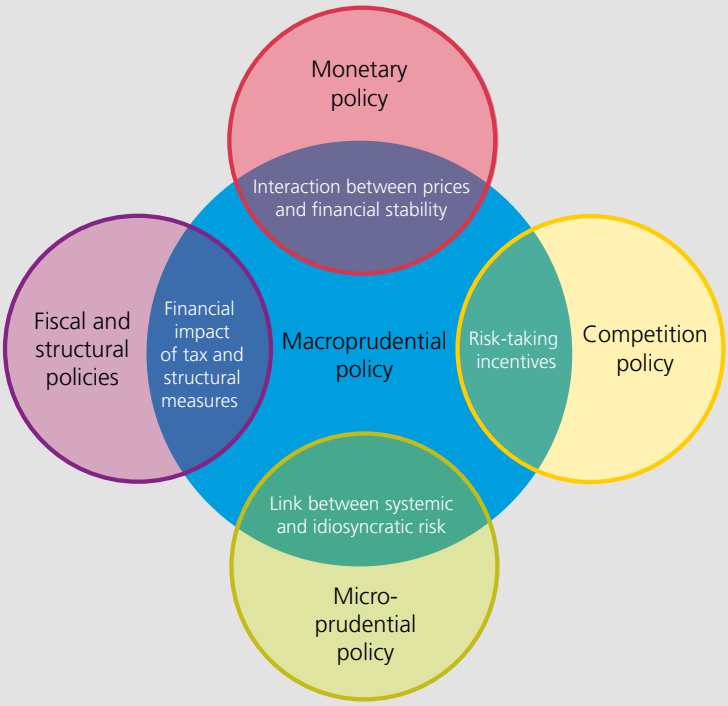
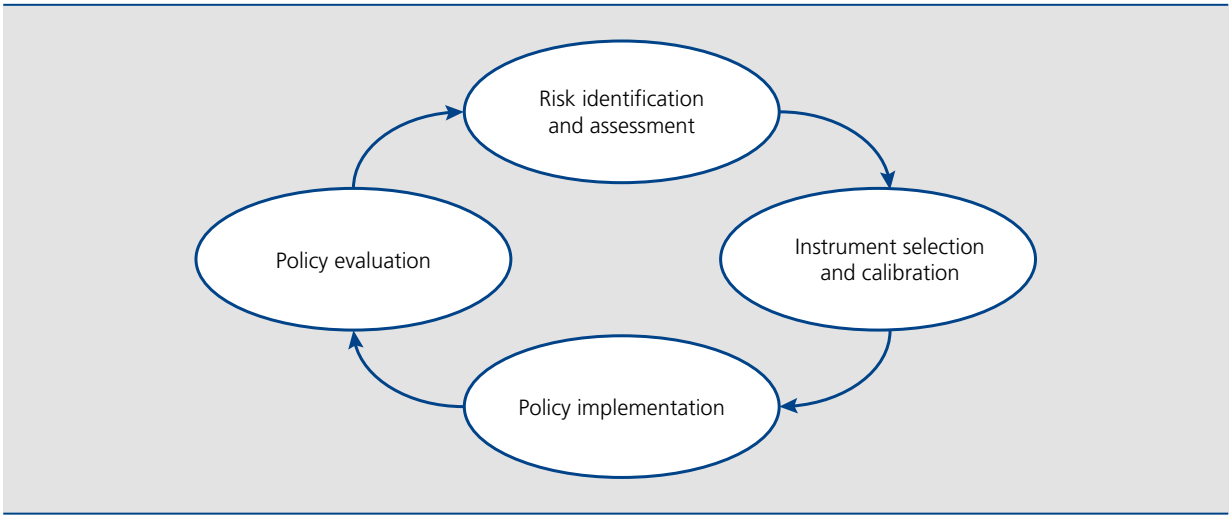


CHART 2 MACROPRUDENTIAL POLICY CYCLE



Source : ESRB (2014a).

the build-up of systemic risk. The experience of the sovereign debt crisis showed that prudent fiscal policy is essential to maintain confidence in public finances and to avoid feedback loops between sovereign risk and the financial system. On the contrary, tax policies can create biases that contribute to systemic risk. For example, favourable tax treatment of mortgage interest payments can encourage over-indebtedness and, so, increase vulnerabilities of households to house price shocks.

Competitive pressures in the financial sector can create incentives for excessive risk-taking. For example, new entries in the market caused by a relaxation of licensing restrictions can entail aggressive competition for market shares, reducing margins and creating strong incentives to take too much risk. Competition policy may therefore adversely affect financial stability. On the other hand, it may impose constraints on consolidation in the banking sector, thereby limiting concentration and, to some extent, the presence of institutions that are too big to fail, or that are too large and complex to resolve.

2. Macroprudential policy instruments

A precondition for macroprudential policies to be effective is that authorities in charge of these policies have clearly defined objectives and powers. In particular, macroprudential authorities should have at their disposal a set of instruments that can be applied to target systemic risk.

Box 1 – Intermediate objectives and instruments of macroprudential policy in the banking sector

The ultimate objective of macroprudential policy is to contribute to safeguarding the stability of the financial system as a whole. This includes strengthening the resilience of the financial system and reducing the build-up of systemic risks, in order to ensure a sustainable contribution of the financial sector to economic growth. In contrast to microprudential supervision, macroprudential policy considers (endogenous) interactions between financial institutions, markets, infrastructures and the wider economy.

In its Recommendation on intermediate objectives and instruments of macroprudential policy (ESRB/2013/1), the ESRB has identified a number of intermediate objectives, which act as operational specifications to the ultimate

objective of macroprudential policy and provide an economic basis for the selection of instruments. Intermediate objectives of macroprudential policy in the banking sector are to:

- mitigate and prevent excessive credit growth and leverage (credit);
- mitigate and prevent excessive maturity mismatch and market illiquidity (liquidity);
- limit direct and indirect exposure concentration (concentration);
- limit the systemic impact of misaligned incentives with a view to reducing moral hazard (impact).

Table 2 provides an overview of the key instruments discussed in the main text. It summarises the main transmission mechanism per category of instruments and links the individual instruments to the four intermediate objectives related to the banking sector proposed in the ESRB recommendation.

The table only lists the main intermediate objective(s) targeted by a particular instrument. The application of instruments may nevertheless also (indirectly) affect other intermediate objectives. A number of the instruments (e.g. sectorial capital requirements, systemic risk buffer) can in fact explicitly be used to target multiple intermediate objectives.

TABLE 2 INTERMEDIATE OBJECTIVES AND INSTRUMENTS OF MACROPRUDENTIAL POLICY

Category	Transmission	Instruments	Intermediate objective
Capital-based	Increased loss-absorbing capacity (resilience), reduction of exposures (deleveraging)	Countercyclical capital buffer	Credit
		Sectorial capital requirements (real estate, intra-financial)	Credit, concentration
		Global systemically important institutions buffer	Impact
		Other systemically important institutions buffer	Impact
		Systemic risk buffer	Credit, concentration, impact
		Leverage ratio	Credit
Liquidity-based	Increased stability of funding base, increased liquid asset holdings to cover outflow, potentially lower credit provision	Net stable funding ratio	Liquidity
		Other stable funding requirements	Liquidity
		Liquidity coverage ratio	Liquidity
		Other liquid assets buffers	Liquidity
		Liquidity charge	Liquidity
Lending limits	Direct restrictions on credit quantities, lower risk of borrower default and loss given default	Loan-to-value cap, loan-to-income cap, debt service-to-income cap	Credit
		Large exposure restrictions	Concentration

Sources: ESRB, NBB.

Macroprudential instruments are often microprudential tools which could be used for the conduct of macroprudential policy. Macroprudential instruments generally aim at strengthening the resilience of the financial system as a whole by increasing institutions' capacity to withstand institution-specific or sector-wide shocks. In addition, they may also be used to deliberately curb the upswing of the financial cycle through their effects on credit supply and/or asset prices (often referred to as "leaning against the wind").

As discussed below, macroprudential authorities may have a broad set of instruments available. Selection of the appropriate instrument requires linking instruments to objectives of macroprudential policy (see Box 1) and underlying risks. Once systemic risks are identified and assessed, authorities may select the appropriate instrument on the basis of the nature of the identified risk and the objective and intended transmission mechanism of the instruments in their macroprudential toolkit (Chart 2).

Key macroprudential instruments in this toolkit can be classified according to the following categories: capital-based instruments, liquidity-based instruments and lending limits.[1] For each category of instruments, we present the main intended transmission channels as well as the key instruments within the category. This information is summarised in Table 2 in Box 1.

2.1 Capital-based measures

Capital-based instruments aim at increasing banks' resilience to credit losses by increasing their loss-absorbing capacity. If the higher cost of funding resulting from higher capital requirements is passed on to credit markets, this may also contribute to smoothing out the upswing in the credit cycle.

While having mostly a microprudential focus, the new prudential rules for the EU banking system also envisage a set of capital-based macroprudential instruments. These instruments should allow flexibility in a context of national specificities with respect to banking sector structure and credit cycles, for instance. At the same time, however, they ensure that the use of those tools is not only transparent and consistent, but also subject to appropriate control so as not to harm the function of the Internal Market.

One of the key capital-based macroprudential instruments is the **countercyclical capital buffer (CCB)**. The buffer is specifically designed to deal with cyclical systemic risks stemming from excessive credit growth and leverage in the domestic economy. Capital buffers between 0 and 2.5 % of risk-weighted assets, which can be higher when justified by the underlying risk, should be built up in times of excessive credit developments and released when systemic risks materialise or abate. The CCB is a broad-based buffer applying to all institutions with relevant exposures in the Member State. It can be applied from 2014 and becomes mandatory from 1 January 2016.

When vulnerabilities are building up at sectorial rather than economy-wide level, the new prudential rules for the EU banking system foresee more targeted capital based tools. In particular, more stringent **sectorial capital requirements** can be applied to the **real estate** sector (through higher risk weights or loss given default (LGD) floors on exposures secured by mortgages on immovable property) and on **intra-financial** exposures. Such sector-specific capital requirements can be used to mitigate both cyclical (e.g. strong growth in real estate prices and mortgage credit provision, excessive growth in interbank credit provision) and structural (e.g. excessive levels of household indebtedness, risks of intra-financial contagion stemming from high levels of intra-financial exposures) systemic risks.

A capital-based instrument specifically designed to deal with long-term non-cyclical risks is the **systemic risk buffer (SRB)**. Up to a level of 3 % of risk-weighted assets, the SRB provides Member States with a substantial degree of flexibility in setting higher capital requirements for the entire banking sector or a sub-set of institutions, with the aim of covering a broad set of structural systemic risks stemming from the size, structure and/or activities of the domestic banking sector (e.g. common exposures to particular macro risks, intra-financial interconnectedness). Above this level, procedures that depend on the level of the SRB and the geographic exposures to which it applies may limit Member States' discretion in applying the SRB (e.g. imposing an SRB above 5 % of risk-weighted assets will require authorisation of the European Commission). The SRB can be applied from 2014 onwards.

The new prudential rules for the EU banking system provide two instruments for dealing with risks stemming from systemically important financial institutions. The **global systemically important institutions (G-SII) buffer** is a mandatory capital buffer for banks identified as being of global systemic importance. The surcharge will be between 1 % and 3.5 % of risk-weighted assets and will be gradually phased in between 1 January 2016 and 1 January 2019. The **other systemically important**

(1) Instruments may also be classified and discussed according other taxonomies, including for example by systemic risk dimension (cyclical versus structural, see IMF, 2013), legal base (ESRB, 2014a) and intermediate objective (ESRB, 2014b, also see Box 1).

institutions (O-SII) buffer enables authorities to impose capital charges on domestically important institutions. A notification procedure and a 2 % upper limit are imposed. The O-SII buffer can be applied from 1 January 2016. Before this date, the **SRB** can already be applied to deal with the risks stemming from systemically important financial institutions.

Finally, another key capital-based macroprudential instrument is the **leverage ratio**, defined as the ratio of banks' total (non-risk adjusted) assets to equity. Imposing a leverage ratio cap may limit procyclicality in the banking industry. Since it is not based on risk-adjusted assets, it provides a simple and transparent backstop to safeguard against model and measurement error in the risk-based capital requirements. In contrast to the other capital-based instruments, the leverage ratio has its legal basis in national law, as it is not yet included in EU legislation.

2.2 Liquidity-based measures

Liquidity-based instruments aim at increasing banks' resilience to liquidity shocks. Stable funding requirements reduce banks' reliance on short-term funding sources and therefore the risk of sudden funding outflows. Liquidity buffer requirements increase banks' ability to cope with such outflows should they nonetheless occur. Liquidity-based instruments may also affect credit provision, as they may result in banks shifting from illiquid (e.g. long-term loans to the private sector) to liquid asset holdings. Furthermore, they may have a limiting effect on excessive credit growth fuelled by less stable funding sources.

A microprudential stable funding measure scheduled to enter into force in EU legislation in 2018 is the **net stable funding ratio (NSFR)**. The NSFR aims at enhancing the stability of banks' funding bases by imposing a minimum level of stable funding that depends on the individual bank's asset structure. The scope for macroprudential use of the NSFR will depend on the exact specification of the measure introduced in microprudential rules.

Under national law, macroprudential authorities may also impose simpler stable funding ratios, such as a minimum **long-term stable funding (LTSF) ratio** (stable funding over total assets) or a cap on the **loan-to-deposit (LTD)** ratio. These simple variants could also serve as a backstop to the NSFR, akin to the way the leverage ratio serves as a backstop for risk-weighted capital requirements.

Liquidity buffer requirements increase banks' ability to cope with funding outflows should they nonetheless occur. The **liquidity coverage ratio (LCR)** is expected to be endorsed under EU legislation in 2015. It requires banks to hold sufficient liquid assets to cover stressed funding outflows over a 30-day period. As for the NSFR, the scope for macroprudential use of the LCR will depend on the exact specification of the microprudential measure.

Simpler liquidity buffer requirements, such as a ratio of **liquid assets to total assets** may be considered as a backstop to the LCR. The legal base of such simpler ratios would be national legislation.

Finally, resilience to systemic liquidity risks may also be increased through imposing **liquidity charges**. Compared to the above ratios, which are quantity-based, liquidity charges are a price-based instrument. One example could be a levy on wholesale funding.

2.3 Lending limits

Lending limits impose direct restrictions on credit quantities. As such, they have the potential to affect the credit cycle. In addition, they generally increase borrowers' resilience by lowering their probability of default and/or increase banks' resilience by lowering the loss given counterparty default.

Two important borrower-based lending limits are extensively discussed by macroprudential policy-makers. **Loan-to-value (LTV)** caps restrict the amount of credit in relation to the value of the underlying real estate collateral. **Loan-to-income (LTI)** and **debt service-to-income (DSTI) caps** limit the amount of credit in relation to the borrower's income. Borrower-based lending limits mainly aim at dealing with cyclical systemic risks, especially as they are most likely to be applied only to the flow of new credit. No provision is made for either type of instrument in the new prudential rules for the EU banking system, so they are therefore based on national law.

Large exposure restrictions are lending limits targeted at banks, as the exposure to an individual or a group of counterparties may not exceed a certain percentage of the bank's own funds. Large exposure restrictions may be tightened for macroprudential reasons (e.g. on intra-financial exposures to limit contagion risks) by up to 15 % compared to the microprudential requirements. More stringent tightening is subject to a heavy procedure with approval of the EU Council of Ministers.

3. Macroprudential policy in Belgium

3.1 Institutional framework

In line with the ESRB recommendation, the Belgian federal Parliament has conferred the mandate on macroprudential policy to the NBB. Furthermore, the specific tasks devolved to the NBB in connection with its task of contributing to the stability of the financial system have been spelled out.[1] The provisions foreseen in the law comply with the ESRB recommendations.

Within this new institutional framework, the NBB – as part of its wider mission of contributing to the stability of the financial system – will be responsible for the detection, monitoring and follow-up of the emergence of systemic risks, including taking policy action when deemed appropriate. This will require the development of a clear macroprudential strategy and operational framework, which will include adequate tools for systemic risk identification and assessment, and instruments for targeting identified systemic risks.

Adequate accountability arrangements have been set out in the new banking law. The NBB will have to report back to Parliament on its mission. From 2015 onwards, the Financial Stability Review will become the report foreseen by the law. This will require some changes to account for the new mandate of the NBB. The Governor might also be auditioned at the request of the Parliament or on his own initiative. In addition, to enhance transparency and accountability, recommendations made by the NBB will be made public, except in cases where they might create potential risks for financial stability.

Coordination and collaboration mechanisms have been foreseen with all relevant authorities. This is essential in the context of the new macroprudential competences of the SSM and the current mandate of the ESRB. In addition, the NBB will be responsible for follow-up of the recommendations made by other European institutions (ESRB, ECB, etc.) concerning potential risks for financial stability.

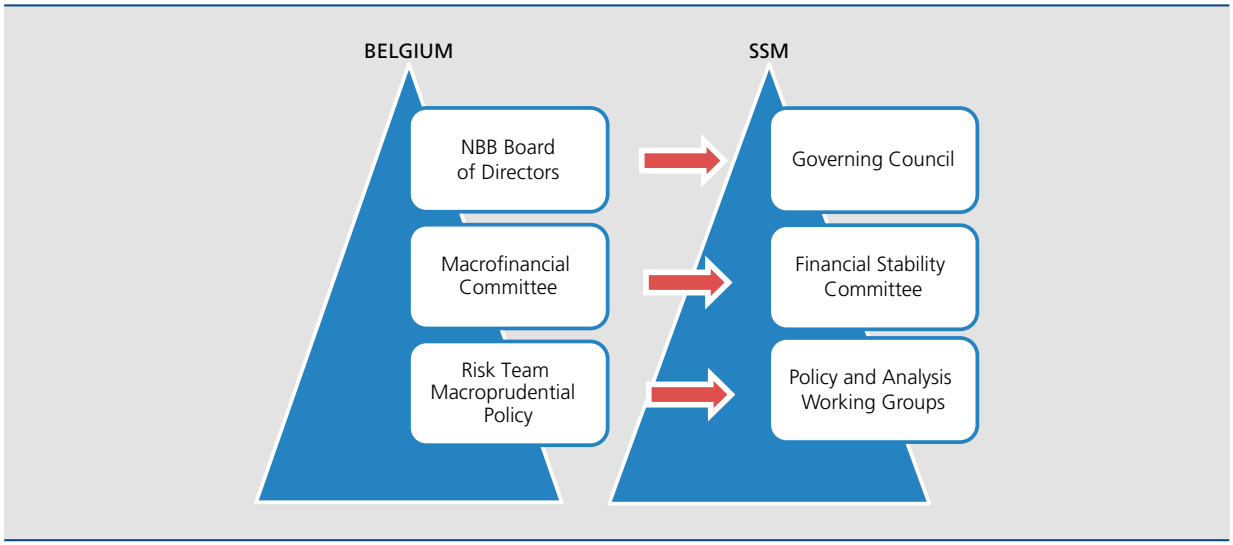
With all these new competences in mind, the NBB has developed a specific in-house organisational framework relying on different internal structures (Chart 3). Macroprudential issues will be monitored in the Risk Team Macroprudential Policy (RT MPP), in which all the relevant NBB departments are represented. The RT MPP will have two main objectives: to detect the emergence of systemic risks and assess the activation of different instruments, including their calibration.

The Macrofinancial Committee (MFC), in place since 2011, will discuss any assessment made by the RT MPP and propose policy actions as well as proposals for communication to the NBB Board of Directors.[2] In this context, the MFC will be responsible for preparing the meetings of the Board in its macroprudential capacity.

The cross-departmental composition of the RT MPP and MFC ensures that risk analyses are extensively discussed

(1) Law establishing the mechanisms of macroprudential policy and specific tasks devolved to the NBB in connection with its task of contributing to the stability of the financial system, 25 April 2014.
(2) For more details on the MFC, see the NBB Annual Report 2011.

CHART 3 INTERNAL ORGANISATION OF MACROPRUDENTIAL POLICY IN BELGIUM AND IN THE SSM



and that divergent views are taken into account. At the same time, this broad composition allows to benefit to a maximal extent from the synergies between the different policy areas in the central bank and to take full advantage of its knowledge of the wider macro context of the Belgian economy.

At the SSM level, a similar structure is currently being developed (Chart 3), with the Financial Stability Committee and Policy and Analysis Working Groups as counterparts of the MFC and RT MPP respectively. These two organs will be composed by national competent authorities' representatives and ECB members. This parallel structure will ensure coherence and facilitate the coordination with the SSM level as most macroprudential actions taken at national level need to be notified to the ECB for non-objection before being submitted to the ESRB.

3.2 Macroprudential powers and instruments

Current legislation explicitly gives the NBB macroprudential powers. These powers relate to obtaining confidential information from the non-regulated sector, and two types of instruments that may be applied in the event of emergence of systemic risks.

First, while the NBB can rely on supervisory data or other relevant in-house data available such as credit evolution, the new macroprudential law(1) also gives the NBB the possibility to request from any entity or person in Belgium any information that is relevant for its missions, including entities that it does not oversee itself, such as shadow-banking institutions. This information may be requested directly from the relevant entities if the institution responsible for supervising these entities does not have the required information.

Second, as the designated authority for macroprudential instruments for which the new prudential rules for the EU banking system require such a designation, the NBB has under its direct control a number of macroprudential instruments. These include the countercyclical buffer, buffers for G-SII and O-SII, the systemic risk buffer and other instruments foreseen for instance in article 458 of the CRR. Furthermore, the macroprudential law and the new Belgian banking law(2) also include instruments to reduce maturity mismatches and to impose additional disclosure requirements, limits on concentration risks, limitation of dividend payment and different valuations of collateral.

As a competent authority, the NBB may also make use of the macroprudential dimension of Pillar 2, which provides a broad set of supervisory instruments that can also be used to tackle systemic risks, including systemic liquidity risks. It allows competent authorities to tighten up prudential requirements when the risk assessment shows that a specific bank (or group of banks) is contributing to systemic risk. To ensure a holistic approach to mitigating systemic risk, close collaboration is needed between microprudential and macroprudential authorities. With the SSM, close coordination between the national competent authorities and the ECB will be necessary when the national designated authority has used Pillar 2 as macroprudential basis.

Third, the NBB has the power to make "comply or explain" recommendations to the relevant authorities if required actions are beyond its competences. In the event of non-compliance with recommendations, the targeted authority will have to state the reasons for this non-compliance.

Recommendations might be related to specific measures, such as caps on LTVs or DTIs. These instruments are part of the responsibilities of the federal Government, given their impact on other economic or social policies. However, the NBB can make recommendations to the government on the use of these instruments, if some specific risks emerge for instance in the real estate sector. More generally, NBB macroprudential recommendations may also concern for instance changes in fiscal regime, additional regulatory requirements and proposals to adapt or enlarge the regulatory perimeter to currently unregulated entities. The existence of a "comply or explain" mechanism is expected to mitigate the risk of inaction by the targeted authorities. Risks of inaction bias might also be reduced by regular contacts between the NBB and the concerned authorities in the context of cooperation agreements if systemic risks emerge in their field of competences.

However, the NBB did not wait for the formal introduction of the new macroprudential law and banking law before implementing measures to prevent the emergence of systemic risks. While the previous legislation had not designated an authority responsible for macroprudential policy as such, the Bank's Organic Law had included among the Bank's tasks contributing to financial stability. This role of the Bank was greatly extended in April 2011 with the implementation of the "twin peaks" model, incorporating the macroprudential and microprudential dimensions of financial supervision and giving the Bank special powers in relation to systemic institutions.

Against this backdrop, the NBB introduced two adjustments to its regulations on own funds at the end of

(1) Law establishing the mechanisms of macroprudential policy and specific tasks devolved to the NBB in connection with its task of contributing to the stability of the financial system, 25 April 2014.
(2) Law on the legal status and supervision of credit institutions, 25 April 2014.

2013. In view of the recent property price rises and the economic uncertainty that could impair borrowers' future repayment capabilities it raised, as part of a comprehensive package, the mortgage loan risk weights, the levels of which were considerably lower than those prevailing in most neighboring countries (see the article on recent developments and prudential measures in the Belgian mortgage market in this Financial Stability Review). Also, when considering the need for structural reform of the Belgian banking sector, the Bank decided to impose a capital surcharge on trading activities above a certain threshold, in order to reduce the scale of credit institutions' high-risk activities (see the article on structural reforms in this Financial Stability Review) through the use of Pillar 2.

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Structural Banking Reforms

Janet Mitchell

Introduction

The financial crisis which began in 2007-2008 exposed significant weaknesses in the financial system, at both the micro-prudential and macro-prudential levels. One of the unique features of this crisis relative to previous banking crises was the central role played by complex financial products – in this case involving exposures to US subprime real estate mortgage securitizations – whose risks were not well understood. 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 which governments felt compelled to undertake when faced with the threat to the financial system of the failure of large banks, led to a broad, international agenda of regulatory reforms. These reforms have 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 macro-prudential policies, and development of frameworks to allow resolution of failed banks without the use of taxpayer funds.

While these reforms should significantly improve the resilience of banks and the financial system, several observers have nevertheless argued that an additional step is necessary; namely, imposition of structural banking reforms. The term structural reforms can cover a wide range of measures, running from the complete prohibition of certain activities by banks, to imposition of limits on certain activities, to the separation of particular activities in different legal structures.

Support 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, which can make orderly resolution of a failed bank more difficult. The focus on structural reforms has been motivated by the role of banks' trading activities in the recent crisis, as the complex financial products that were at the heart of the crisis were often held by banks for trading purposes. In many cases, the large losses resulting from trading in complex securities caused contagion to the entire bank.

Yet, while trading activities are very risky, an important feature of these activities is their heterogeneity. Some trading activities are riskier than others and some are more beneficial to the real economy than others. Activities classified in the category of trading can include: proprietary trading, or trading purely for the bank's own profit; intermediation services provided to clients where the bank serves as a counterparty for positions, such as derivatives, that a client wishes to sell or buy for hedging purposes; provision of market making services, often in debt markets, where the intermediary's participation ensures sufficient liquidity for the market to be active; and securities underwriting. Trading activities other than proprietary trading are sometimes broadly referred to as market making activities. Whereas many of these activities are clearly beneficial to the real economy, proprietary trading activities are not. Unfortunately, it can be challenging in practice to distinguish proprietary trading from market making activities. This helps to explain many of the differences across existing structural banking reform proposals.

Structural banking reforms have indeed been proposed by several countries. Leading in this initiative were the US, via the Volcker rule named for the former Chairman of the Federal Reserve who proposed the measure, and the UK,

with the Vickers reforms, proposed by the Independent Commission on Banking chaired by Sir John Vickers. The Volcker rule prohibits banks from engaging in proprietary trading, while the Vickers reform requires separation of most trading activities from deposit-taking banks into a legally separate trading entity, which can remain within the financial group.

Following the Volcker and Vickers proposals, the Belgian government requested that the National Bank of Belgium (NBB) analyse the desirability and feasibility of introducing structural reforms in Belgium. In response to this request, the NBB published an interim report in June 2012, and its final report appeared in July 2013.

The NBB interim report argued that neither the Volcker rule nor the Vickers proposal was well suited for unilateral implementation by a small country in Europe with a significant presence of foreign banks. In particular, an individual country that implements Vickers-type structural reforms cannot require the ring-fencing of foreign branches of EU banks operating in the country. Hence, if EU foreign branches operate on a large enough scale, an unlevel playing field will be created, since the foreign branches will not be restricted in the activities they undertake. Moreover, foreign subsidiaries of EU banks operating in the country could decide to convert to branches in order to circumvent the structural reforms. Rather than advocating either the Vickers or the Volcker proposals, the NBB interim report put forth a series of policy recommendations adapted to the specific features of the Belgian banking system and corresponding to four policy categories covered by the UK Vickers reforms: recovery and resolution plans; capital surcharges on particular institutions; intra-group exposures; and bank activities. One of these recommendations was to impose a capital surcharge on trading activities above a threshold. The NBB final report developed and finalized the recommendations from the interim report, and it added a recommendation to separate banks' proprietary trading activities above some threshold. Most of the policies proposed in the final report have now been incorporated in the new Belgian banking law, which will take effect in January 2015.

In October 2012 a high-level expert group appointed by the European Commission to examine the question of structural banking reforms for Europe, and headed by Governor Liikanen of the Bank of Finland, published its report. The Liikanen group took account of specific characteristics of the European banking system when formulating its recommendations, which included separation from deposit-taking banks of a subset of trading activities above some threshold, where the set of activities to be separated was narrower than those to be separated from deposit-taking banks in the UK Vickers proposal. France and Germany followed with their own structural reform proposals, which require separation of an even narrower set of activities (primarily, proprietary trading) than those proposed by the Liikanen group. Most recently, the European Commission has published a proposal for a European regulation on structural reforms. This proposed regulation draws on aspects of the Liikanen recommendations and of the Volcker rule.

This article examines the existing structural reform proposals, discussing differences in their features and analysing their implications. It also considers the potential costs and unintended consequences of the various proposals. Finally, it motivates the need for a broad approach to structural reform policies and outlines the structural reform measures put forth in Belgium.

The remainder of the article is organised as follows. Section 1 analyses the key differences among existing structural reform proposals. Section 2 considers the different proposals in light of commonly cited objectives for structural reforms and of potential costs. Section 3 discusses the structural reform measures in Belgium relating to trading activities. Section 4 concludes.

1. Key features of bank structural reform proposals

As noted above, the starting point for proposals of structural reform is the argument that combining commercial banking and certain types of investment banking activities can increase risk and make bank resolvability more difficult. While there is no unanimous agreement as to whether universal banks are safer or riskier than "pure" commercial banks, it is fairly well acknowledged that combining income from investment banking and commercial banking can increase income volatility.[1]

It is also worth noting that the idea of separating investment and commercial banking activities is not new. Structural banking reforms were introduced in the 1930s in both the US and in Belgium. In the US, the Glass-Steagall Act, which took effect in 1932, prohibited commercial banks from undertaking any investment banking activities. Belgian structural banking reforms were implemented in 1934-1935 and forbade banks from holding shares in nonfinancial firms. In both the US and Belgium, however, the motivation for the structural reforms was

(1) See, for example, Stiroh (2004, 2006), who shows for US banks that noninterest income is more volatile than interest income, and the correlation between the two types of income has increased over time, thereby suggesting declining diversification benefits. A high share of trading income is not associated with higher bank profitability, but it does appear to increase bank risk.

to avoid conflicts of interest faced by commercial banks that also performed investment banking activities. In both countries the reforms were weakened over time and eventually removed: the Belgian structural reform legislation was fully abolished in 1993, while the US Glass-Steagall Act was repealed in 1999.[1]

Structural reform proposals often require that certain securities market activities be removed from deposit-taking banks and thus undertaken by "trading" entities that do not accept retail deposits. In fact, most of the key differences between structural reform proposals can be characterized along two dimensions: (1) which activities must be removed from deposit-taking banks; and (2) whether the "trading entities" that undertake the activities separated from the deposit-taking banks can be located in the same group as the banks. These two dimensions capture the main distinctions between the current proposals. As a point of comparison, note that the US Glass-Steagall Act separated all investment banking activities from commercial banks and prohibited the investment banking activities from being undertaken within the banking group.

The table in the Appendix characterizes the current structural reform proposals along the two dimensions. As this table demonstrates, each of the current proposals is less extreme than Glass-Steagall along at least one of the two dimensions.

As can be seen from the table, the US Volcker rule proposes the narrowest separation of activities. Namely, it requires separation of only proprietary trading activities and ownership of hedge funds and private equity. On the other hand, it does not allow the separated activities to be performed within the banking group. At the other end of the spectrum is the UK Vickers proposal, which separates most securities related activities from deposit-taking ("ring-fenced") banks. All dealing in investments as principal, and all commodity trading must be separated from ring-fenced banks, with the exception of transactions that are linked to the bank's hedging needs or to liquidity management. Similarly, ring-fenced banks are not allowed to undertake derivatives transactions except those needed for hedging or liquidity management, and except for limited amounts of simple derivatives for offering hedging services to clients. In contrast to the US Volcker rule, the Vickers proposal allows the separated activities to be performed by another entity within the group.

The Liikanen structural reform recommendations and the draft EU regulation lie in between the Volcker rule and the Vickers reforms. The Liikanen proposal, and likely the EU regulation, separate a broader set of activities than Volcker but a narrower set than Vickers. The Liikanen proposal separates proprietary trading and market making activities above some threshold. It also allows the separated activities to be performed within the group. The draft EU regulation foresees separation of some subset (to be determined) of trading activities above some threshold. It also forbids banks from engaging in "open" proprietary trading; i.e., trading by units or individuals specifically designated for proprietary trading. The recent French and German proposals resemble Volcker in terms of the activities to be separated, and they resemble Liikanen and Vickers in allowing the separated activities to be undertaken within the group.

With respect to structural reform proposals that permit the separated activities to be performed by a "trading" entity within the group, the question then arises as to the requirements for ensuring a sufficient degree of separation between the deposit-taking bank and the trading entity. The third column of the table in the Appendix provides an indication of the requirements of the different proposals in this regard. It can be observed that all of the reform proposals that allow the separated activities to be performed within the group apply restrictions on the exposures between the deposit-taking bank and the trading entity. For all proposals, intra-group exposures must be conducted on a third-party basis and are subject to standard third-party large exposure limits.[2] The draft EU regulation also allows for an additional restriction: authorities may set stricter limits on aggregate large exposures of deposit-taking banks to all financial institutions.

All of the proposals allowing the separated activities to be conducted within the group also foresee legal and economic separation of the trading entity from the deposit bank. None of the proposals allows the bank to own the trading entity, and all proposals foresee application of prudential requirements on a solo basis.

Interestingly, while the other proposals specify that the trading entity must be legally economically separate, the Vickers reforms require the ring-fenced, deposit-taking bank to be legally, economically, and operationally autonomous from the other entities in the group. This seems to be more than a semantic distinction. As the main objectives of the Vickers reforms are to make retail banks safer and to protect taxpayers from bearing the costs of bank failure, the Vickers reform package also involves imposing an extra capital buffer on the retail, ring-fenced banks, while applying the Basel 3 capital requirements to the legally separate trading entities. In the words of

(1) For more detail see Appendix 1 of the NBB Interim report: Structural banking reforms in Belgium.

(2) These restrictions amount to imposing limits on intra-group exposures that resemble the limits imposed on between deposit-taking banks' exposures to investment banks when the Glass-Steagall rule was in effect.

the Vickers report, such an arrangement makes UK retail banking safer than the international standard while at the same time sustaining the UK's position as a pre-eminent international financial centre. Such a distinction is much less important in a country like Belgium, whose financial system is composed mostly of retail banks and which does not have a large investment banking segment.

2. Objectives and potential costs of structural reforms

What are the potential advantages and disadvantages of each of the structural reform proposals? The advantages can be evaluated in terms of the intended objectives of structural reforms. We can cite at least five objectives for structural reforms, which are emphasized to greater or lesser degrees across the different countries that have put forth proposals:

Objectives of structural reforms

(1) *Eliminate the deposit guarantee subsidy for investment banking activities*
(2) *Improve bank resolvability by reducing complexity*
(3) *Reduce contagion from risky activities to retail banking*
(4) *Reduce bank risk taking*
(5) *Reduce potential risk to taxpayers of bank failure*

Potential social costs or unintended consequences of structural reforms include the following:

Costs and unintended consequences of structural reforms

(1) *Reduction of diversification benefits*
(2) *Reduction of financial services to firms/SMEs*
(3) *Incomplete separation of activities because the deposit-taking bank is able to surreptitiously continue undertaking prohibited activities*

Several general observations can be made in relation to the costs and benefits of different structural reform proposals. First, the broader is the set of trading activities removed from deposit-taking banks, the greater is the potential for reduction in complexity and improvement in the resolvability of deposit-taking banks. The Vickers reform separates the broadest set of trading activities, allowing retail banks to retain only a limited amount trading activities for the purpose of hedging and risk management. In contrast, the Volcker rule separates only proprietary trading activities, leaving market-making activities on deposit banks' balance sheets. As is discussed below, market-making transactions often have similar risk characteristics as proprietary trading activities; therefore, removing only proprietary trading from deposit banks may not significantly reduce complexity.

Similar arguments can be made with respect to contagion from risky trading activities to traditional banking. One would expect that the Vickers reform and the Liikanen proposal would be more effective in this regard than the Volcker rule, since the Volcker rule leaves market making activities on banks' balance sheets.[1]

Another issue, however, is that contagion and resolvability are also a function of the interconnectedness between financial institutions. Hence, for proposals such as Vickers and Liikanen that separate a broader set of activities but that allow the separated activities to be undertaken by another entity within the group, the nature and complexity of intra-group exposures and the degree of operational independence of the deposit-taking bank will be crucial for determining the extent to which resolvability is improved and contagion is reduced. In the absence of strict intra-group exposure limits and true operational autonomy of the trading entity and the deposit-taking bank, these objectives may not be achieved.

A final consideration relating to contagion is that for proposals that allow the separated activities to stay within the group, even in the absence of significant intra-group exposures between the deposit bank and the trading entity, contagion may occur between entities of the same group through reputation channels. Structural reforms that do not allow the separated activities to be performed within the group are not vulnerable to this form of contagion.[2]

A related observation is that proposals that prohibit the separated activities from being undertaken within the group will be more likely to succeed in eliminating the implicit deposit guarantee subsidy for securities market activities, as deposit funding cannot be used even indirectly through intra-group transfers to finance the trading activities. However, these proposals may also be more likely to reduce diversification benefits and to negatively impact SMEs, since SMEs may find it more difficult than larger firms to access the services of independent investment banks. This latter concern exists to some extent even when the trading activities are still allowed to be performed by a separate entity within the group, and it explains the

(1) The scope of the trading activities to be separated through the current EU draft regulation is not yet known.
(2) In a July 2013 editorial, the Financial Times expressed another worry about separation: that it cannot fully prevent the investment banking culture from contaminating the retail bank. This editorial recommended a return to the Glass-Steagall form of separation of investment and retail banking.

Liikanen commission's recommendation to separate trading activities only above a certain threshold value. The idea is to set the threshold high enough so that deposit-taking banks can continue to undertake a level of trading activity that is necessary for providing financial services to SMEs.

Each of the structural reform proposals involves major implementation challenges, although the particular challenges differ across the proposals. For the Volcker rule (and the French and German proposals), the main challenge will be to accurately distinguish between proprietary trading and market making activities. These two types of activities often generate similar risk profiles, and the distinction between the two comes down to the intention of the trader. For example, the provision of market making services often requires the market maker to assume the role of counterparty, which requires the market maker to hold the position as "inventory" on its balance sheet until the transaction is completed. Hence, proprietary trading and market-making activities may have quite similar characteristics; namely that the banking entity acts as principal in trading the underlying position, the bank holds the position for a short period of time, and the bank may earn profit or losses from price variation in the position over the time in which it is held.

Accurately distinguishing between activities such as market making and proprietary trading requires authorities to develop a specialized reporting and monitoring framework, incorporating a range of qualitative and quantitative restrictions and limits. Formulating simple rules that sufficiently delineate these activities without creating significant loopholes poses a challenge in practice. Indeed, the Liikanen group cited the practical difficulty of distinguishing between proprietary trading and marketing making activities as the principle motivation for its recommendation to separate from banks both market making and proprietary trading activities (without trying to distinguish between them) when trading activities exceed some threshold.

Interestingly, and as noted above, the EU draft regulation, which appears to reflect much of the spirit of the Liikanen report, does prohibit a form of proprietary trading that can be considered as "open" proprietary trading; in other words, proprietary trading that is costless to identify, since it represents trading activities that the bank has openly designated as proprietary trading. Adding such a ban to the "Liikanen-like" activity separation that is also foreseen in the draft EU regulation does not generate the implementation difficulties discussed above with respect to a separation requirement involving only proprietary trading.

For Vickers, Liikanen, and the EU regulation, all of which allow the separated activities to be performed within the group, a major implementation challenge will be to ensure that the deposit taking bank is sufficiently independent from the trading entity, so that contagion from risky trading activities to deposit-taking banks is indeed reduced and bank resolvability enhanced. For example, the bank will need to be able to continue in operation even if the trading entity becomes insolvent. It is also unclear how significant a role reputation may play in practice and, consequently, whether failure of the trading entity would nevertheless lead to failure of the bank, in the absence of intervention by authorities.

Finally, a challenge faced by all of the structural reform proposals will be to ensure that deposit-taking banks do not undertake "hidden" proprietary trading activities, or proprietary trading under the guise of hedging or risk management operations. Preventing "hidden" proprietary trading will require a system of supervisory monitoring that detects transactions that deviate from the Treasury function. Interestingly, the $ 6.2 bn trading loss reported by JPMorgan in 2012 occurred in its Chief Investment Office, a unit that was designated to perform Treasury functions for the institution.

3. Structural reforms in Belgium

As in other countries, banks in Belgium have reduced their trading activities, including proprietary trading, since the crisis. As an illustration of this development, Chart 1 shows the evolution of "trading" income as a proportion of total income for the four largest Belgian banks from 2007-2013. "Trading" income in this figure contains all components of bank income that derive from investment banking or trading activities; i.e., that are not directly linked to traditional commercial banking activities.[1] The curve in the figure represents the average share of trading income of the four largest banks, and the bars illustrate the range in these values across the four banks. As shown in the graph, the average share of trading income in total operating income for the largest four Belgian banks declined from over 40 % in 2007 to around 20 % in more recent years.[2]

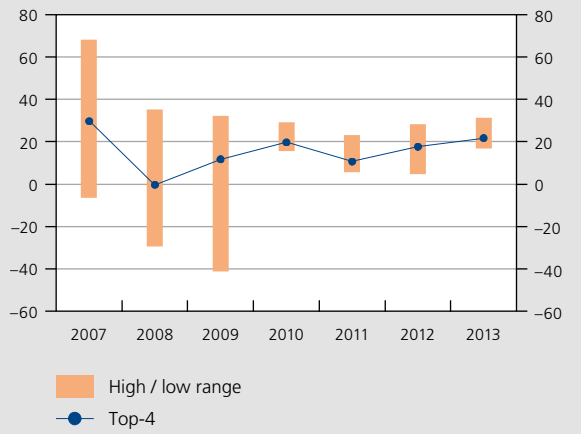
While it is apparent from Chart 1 that banks' have reduced their trading activities since the crisis, it is also clear from the figure that, at least for some banks, trading activities were quite significant, and probably excessive, in the

(1) Note, however, that trading income excludes income from hedging, since hedging can undertaken for commercial banking or trading activities.

(2) It is important to note that the distinction between "trading" and "non-trading" income implied in Chart 1 does not correspond to the distinction between net interest income and noninterest income that is often used in the academic and policy literature. Because of the level of detail available in supervisory reporting data, we are able to go beyond the broad distinction between interest and non-interest income and identify elements of bank income that are associated with commercial banking activities versus other activities.

CHART 1 SHARE OF FOUR LARGEST BELGIAN BANKS' "TRADING" INCOME [1] IN TOTAL OPERATING INCOME

(Q4 2007 – Q4 2013)



Source: NBB.

(1) "Trading " income contains the following components: net interest, dividend, and capital gain income and charges corresponding to assets and liabilities held-for-trading; fee and commission income from security issuance and transfer orders, clearing and settlement, trust and fiduciary, and structured finance transactions.

build-up to the crisis. A key motivation underlying the structural reforms put in place in Belgium is to prevent banks from returning to the levels of trading observed prior to the crisis.

As has been noted above, the intended objectives of structural banking reforms are multiple, and challenging to achieve. Each of the existing structural reform proposals gives rise to specific implementation difficulties, thereby creating some uncertainty as to the ultimate effectiveness. This suggests the need for a broad policy approach, containing "multiple lines of defence".

Belgium has adopted such a broad approach, combining elements of the Liikanen recommendations with aspects of the Volcker rule. First, a capital surcharge will be applied to banks' trading activities above some threshold, in order to discourage banks from undertaking excessive amounts of trading. Second, banks are forbidden from engaging in proprietary trading. In addition, trading activities that cannot be clearly allocated into the categories of "allowed" trading activities and which exceed a threshold must be separated into a legally distinct trading entity. We discuss each of these measures below.

3.1 Capital surcharge on trading activities

The NBB interim report on structural banking reforms in Belgium recommended a capital surcharge on trading activities exceeding some threshold. This recommendation was further developed in the NBB final report, and its objective is to deter banks from engaging in an undesirable level of trading activity, or from returning to levels such as those observed prior to the recent financial crisis. Two indicators will be used for the determination of the surcharge: a non-risked-based indicator, which is in line with the spirit of the Liikanen recommendations, and a risk-based indicator, based on market risk capital requirements. Box 1 describes each of these indicators.

If a capital surcharge on trading is triggered by the non-risked based indicator, the amount of the surcharge will equal the volume of trading activity that exceeds the threshold value of the indicator. If the capital surcharge is triggered by the risk-based indicator, the surcharge will equal three times the amount by which the capital requirements for market risk exceed the threshold value of the indicator. If both surcharge indicators are triggered, the amount of the surcharge will equal the maximum of the surcharges implied by each of the two indicators.

Box 1 – Indicators and threshold values for determining the capital surcharge on trading

Non-risk-based indicator

The non-risk based indicator of trading activities uses as a starting point the activities classified by banks in the IFRS accounting category of Held for trading (HFT). Non-derivative assets in the HFT category, together with short positions in HFT liabilities, can safely be assumed to be linked with banks' trading activities. We define the measure "Pure trading assets" (PTA), as follows:

PTA = HFT Assets – HFT Derivatives assets + HFT Liabilities short positions

While some of the derivatives in the HFT category are linked to banks' trading activity, some of these derivatives are associated with banks' hedging activities but must be classified in the accounting category of HFT because they do not satisfy the criteria for classification in the category of derivatives for hedge accounting. Given that the above PTA measure includes no derivatives, it represents an underestimate of trading activities. We therefore include a proportion of HFT derivatives in our final indicator of trading activities.

We first define "HFT Derivatives" as follows:

HFT Derivatives = (HFT Derivatives assets + HFT Derivatives liabilities)/2

By taking the average market value of the HFT derivatives on the assets and liabilities sides of balance sheet, we avoid any distortions due to changes in market price movements causing a shift of large quantities of HFT derivatives from the asset to the liabilities side of the balance sheet or vice versa.

We can now define the final measure of trading activities:

"Trading activities" = (PTA + 80 % of HFT Derivatives)

The threshold condition for the non-risk based indicator is given by:

Indicator: "Trading activities"/Total Assets > 15 % of Total Assets.

This condition implies that if Trading activities exceed 15 % of total assets, the bank will be subject to a capital surcharge, which will equal the amount by which the trading activities exceed the 15 % threshold.

This indicator implicitly assumes that 80 % of HFT derivatives are linked to banks' trading activities, or equivalently, that 20 % of its HFT derivatives are linked to hedging of its banking book exposures. If a bank can adequately demonstrate that some percentage $X < 80\,\%$ of its derivatives is associated with trading (or equivalently, that $(1–X) > 20\,\%$ of its derivatives are used for the hedging of its banking book exposures, or for market making in EU government debt), then the proportion X will be substituted for 80 % in the condition for Indicator 1.

Risk-based indicator

This indicator will be based upon the level of capital requirements for market risk as a proportion of total capital requirements. Whereas capital requirements for market risk apply to positions in a bank's trading book and, therefore, serve as a good risk-based indicator for trading exposures, market risk capital requirements must also be calculated for all foreign exchange risk, even if this risk is incurred as a result of a bank hedging exposures in its banking book. Given that in practice a significant proportion of foreign exchange positions represent hedging of banking book exposures, we subtract from our risk-based indicator the portion of the market risk capital requirements due to foreign exchange positions. The measure of market risk capital requirements used for Indicator 2 is thus given by:

"Adjusted capital requirements for market risk" = Total capital requirements for market risk – Market risk capital requirements for foreign exchange risk.

The condition for triggering a capital surcharge according to the risk-based indicator is given by:

Indicator 2: "*Adjusted capital requirements for market risk" > 10 % of Total capital requirements*

The capital surcharge triggered by Indicator 2 will equal three times the amount by which capital requirements for market risk exceed the threshold. One of the concerns that may arise with this indicator is that some banks use internal models for the calculation of their market risk capital requirements while others use the Basel standardized approach. The differences in models and approaches can lead to differences in market risk capital requirements for similar exposures and thus reduce the degree of comparability across banks. Ideally, one should use an identical approach, such as the Basel standardized approach, for all banks. Along these lines, one of the ongoing developments in the Basel regulatory framework relating to the trading book is to begin collecting from all banks the data that would be necessary to compute market risk capital requirements using the standardized approach.

The table below reports the average values of Indicator 1 and Indicator 2 over time for the four largest Belgian banks. As can be seen from this table, in 2008 the average value of both indicators would have exceeded the thresholds, although there was considerable variation in the individual values across banks. This table also shows that the values of both indicators have declined over time, reflecting the decline in the banks' trading activities following the crisis.

VALUES OF INDICATORS FOR THE FOUR LARGEST BANKS
(in %)

	End-2013	End-2012	End-2010	Q1 2008
Indicator 1:				
[(HFT assets) – (HFT derivatives assets) + Short positions + 80 % × (HFT derivatives)] as % of total assets	8.4	12.3	15.3	21.4
Indicator 2:				
Capital requirements for market risk as % of total capital requirements	3.0	5.2	8.8 (1)	13.9 (1)

Source: NBB.
(1) Estimated to reflect Basel 2.5 rules for capital requirements for market risk.

The amount of the capital surcharge is intended to dissuade banks from actually exceeding the threshold values of the indicators. As such, it is expected that the banks' trading activities will remain below these thresholds. Hence, the capital surcharge will have a similar effect as the activity separation requirement recommended by the Liikanen group and incorporated in the draft European regulation on structural reforms. Interestingly, the idea of a capital surcharge appealed to some of the members of the Liikanen group, and there appears to have been a difference of views among the members regarding the most appropriate policy instrument. Rather than the mandatory activity separation ultimately recommended in the group's report, some members argued for the imposition of a non-risk-weighted capital surcharge for trading activities, combined with supervisory discretion regarding activity separation on the basis of the bank's recovery and resolution plan. Along these lines, Belgian authorities indeed consider the capital surcharge to be a good substitute for an activity separation requirement.

3.2 Proprietary trading

In addition to the recommendation of a capital surcharge on trading activities above a threshold, the NBB final report on structural reforms contained a recommendation to separate proprietary trading activities whose value exceeds some (low) threshold of the banks' own funds. This recommendation, together with the capital surcharge, has been further developed and included in the Belgian banking law. Like the Volcker rule, the Belgian banking law forbids banks from undertaking proprietary trading activities. The Belgian law also forbids banks from

engaging in certain trading activities judged to be particularly risky, such as securitisations containing tranches of other securitisations, and the granting of unsecured loans to hedge funds. Trading activities allowed by the Belgian law include hedging and liquidity management, transactions undertaken at the request of clients and the associated hedging of those transactions, and market making. Although these categories of activities are indeed permitted, the level of activities in each category must conform to quantitative risk limits for that category and to aggregate limits relating to total market risk capital requirements. The implementation framework also contains important qualitative requirements linked to governance, risk management, and compliance.

Taken together, the quantitative and qualitative requirements are designed to ensure that the trading activities performed by banks actually correspond to the allowed categories. It is nevertheless likely that questions will arise with respect to certain activities, which may not unambiguously correspond to the allowed categories while also not being clearly identifiable as proprietary trading. If the capital requirements associated with such "questionable" activities exceed 0.25 % of own funds, authorities may require separation of these activities into a legally separate trading unit.

3.3 Combined structural reform measures

The combination of the capital surcharge on banks' trading activities, which resembles the Liikanen recommendations, with a ban on proprietary trading and an accompanying supervisory framework for identifying "hidden" proprietary trading, similar to that for the US Volcker rule, is innovative. Belgium will be the first country to combine structural reform measures in this way. Belgian authorities view the two policies as complementary, thereby helping to achieve the multiple objectives of structural reforms. On the one hand, given that trading activities in general are particularly risky, the surcharge should dissuade banks from engaging in excessive amounts of trading. On the other hand, proprietary trading or activities that might be suspected of being proprietary trading, should not be allowed to account for a significant proportion of banks' trading activities.

In addition, as each of the existing structural reform proposals entails implementation difficulties, combining policies can be seen as offering multiple lines of defence in the face of the obstacles. For example, whereas a policy of separation or a capital surcharge on trading activities exceeding a threshold cannot prevent banks from undertaking proprietary trading in amounts below the threshold value, the ban on proprietary trading and the associated implementation framework can help to ensure that this does not occur. Conversely, the difficulty of distinguishing proprietary trading from other trading activities such as market making implies that a ban of proprietary trading alone may not succeed in preventing banks from engaging in excessive, risky trading. Adding a dissuasive capital surcharge can help to ensure that excessive trading does not occur.

Conclusion

This article examines different countries' recent proposals for structural reforms of the banking sector and outlines the structural measures that have been put in place in Belgium. Structural reform proposals are distinguished along key two dimensions : which activities must be separated from deposit-taking banks, and whether the separated activities are allowed to be performed by another entity within the group. The article then takes account of these features in analysing the reform proposals in terms of the intended objectives of structural reforms, the potential costs of such reforms and the implementation challenges.

The various structural reform proposals differ in the degree to which they may be expected to satisfy particular objectives or give rise to certain costs. At the same time, each of the proposals can be expected to face significant implementation difficulties, although the specific obstacles differ across the proposals. These implementation challenges, together with the multiple objectives cited for structural bank reforms, suggest that it may be desirable to implement an array of policies, in order to minimize the risk that the objectives of structural reforms are not achieved. Belgium has indeed put in place a broad set of policies, which draw on features of structural reform proposals in several countries.

In addition to the recommendations relating to trading activities, the NBB final report on structural banking reforms contained recommendations relating to recovery and resolution, depositor protection, and fiscal advantages of savings instruments. Most of these recommendations have already been implemented or are incorporated into the new Belgian banking law. The resulting policy mix should help to guarantee the success of structural banking reforms and, consequently, a strengthening of financial stability in Belgium.

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Appendix

FEATURES OF STRUCTURAL REFORM PROPOSALS

	Activities that must be separated from deposit/retail banks to trading entities	Can separated activities/trading entities be in same group as deposit bank?	If trading entity can remain in group, what limits exist between retail bank and trading entity?	Other measures
US Volcker rule	Proprietary trading; ownership of hedge funds, private equity Trading in US government debt excluded from proprietary trading ban	No	–	
UK Vickers	All dealing in investments as principal and trading of commodities; all derivatives contracts except for liquidity management and hedging; Retail banks not allowed to have exposures to non-ring-fenced financial institutions except for hedging, provision of trade finance, or payments services Retail banks can provide limited amounts of simple derivatives for risk management needs of customers Retail bank can provide services to other ring-fenced banks Separation of activities for banks above a threshold size	Yes	Third-party large exposure limits on intra-group exposures Ring-fenced bank must be legally and operationally independent of other entities in group Ring-fenced bank cannot own a subsidiary that performs activities that are prohibited for ring-fenced banks Capital and liquidity requirements imposed on a solo basis	Ring-fenced banks have extra capital requirements
Liikanen	Proprietary trading and market making activities; exposures to hedge funds, SIVs, private equity Separation occurs only for level of activities above some threshold Supervisors can require broader activity separation, if necessary for recovery and resolution plans	Yes	Exposures by deposit bank to trading entity must be on market terms and subject to interbank large exposure limits Trading entity cannot own or be owned by a bank Transfers of risks or funds from retail to trading bank limited to those which maintain capital adequacy of retail bank Capital and liquidity regulations applied on a solo basis	Bail-in instruments should be used in top management remuneration Review of new trading book capital requirements to determine sufficient capital charge LTV and LTI ratios should be added to macro-prudential toolkit

FEATURES OF STRUCTURAL REFORM PROPOSALS (continued 1)

	Activities that must be separated from deposit/retail banks to trading entities	Can separated activities/trading entities be in same group as deposit bank?	If trading entity can remain in group, what limits exist between retail bank and trading entity?	Other measures
EU draft regulation	"Open" proprietary trading; i.e., activities of units or individuals specifically designated as proprietary traders Certain (to be determined) trading activities exceeding thresholds of particular metrics Trading in EU government debt excluded from separation requirements and proprietary trading ban Regulation applies to banks above a threshold size	No for "open" proprietary trading Yes for other separated activities	Trading entity must be legally, economically, and operationally separate from bank Bank has to be able to carry on its activities in event of insolvency of trading entity Capital and liquidity requirements applied on a solo basis Bank cannot own the trading entity Transactions between the bank and trading entity must be on third-party terms An additional large exposure limit applies to the deposit-taking banks' total exposures to financial institutions outside the group	
Belgium	Proprietary trading; unsecured loans to hedge funds; other highly risky activities Trading activities in a "gray zone"; i.e., that are not clearly proprietary trading but that are "questionable", above a threshold Application of dissuasive capital surcharge on non-proprietary trading activities above a threshold instead of a separation requirement	No for proprietary trading, unsecured loans to hedge funds, and highly risky activities Yes, for "gray zone" activities	Bank cannot own trading entity Impose third-party large exposure limits on intra-group Capital and liquidity requirements applied on a solo basis	Aggregate risk limit applied to banks' allowed trading activities
France	Proprietary trading; unsecured transactions with leveraged funds High frequency trading; trading in agricultural commodities Regulation applies to banks with trading above a threshold	No for high frequency trading and trading in agricultural commodities Yes for other activities	Trading entity must be legally and operationally independent Capital and liquidity requirements applied on a solo basis	

FEATURES OF STRUCTURAL REFORM PROPOSALS (continued 2)

	Activities that must be separated from deposit/retail banks to trading entities	Can separated activities/trading entities be in same group as deposit bank?	If trading entity can remain in group, what limits exist between retail bank and trading entity?	Other measures
Germany	Proprietary trading Activities judged risky by the supervisor Regulation applies to banks above a threshold size	Yes	Trading entity must be legally and economically independent Trading entity must be able to refinance itself independently without guarantees from the parent company Intra-group transactions with trading entity must be conducted on a third-party basis Capital and requirements applied on a solo basis	

The Belgian mortgage market : recent developments and prudential measures

Introduction

This article reviews recent developments in the Belgian mortgage market (section 1) before presenting the three prudential measures that the Bank took at the end of last year to bolster the resilience of the market and those credit institutions with the largest exposures to Belgian mortgage loans (section 2).

1. Review of recent market developments and credit standards at origination

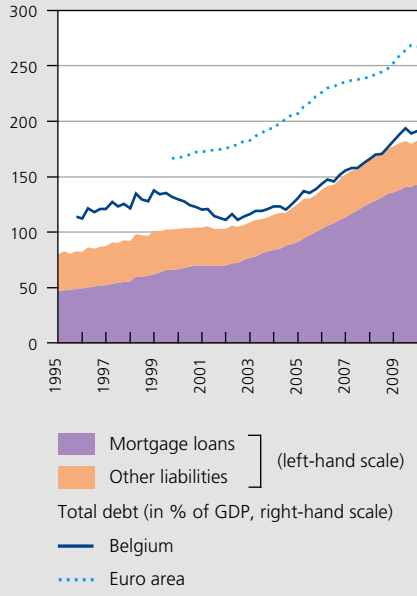
The Bank's 2012 Financial Stability Review included a thematic article that reviewed the developments in the Belgian mortgage loan market. Its main conclusion was that more vigilance was required from banks and authorities alike to ensure the continuous application of sufficiently conservative credit standards and adequate risk-pricing in all new mortgage loans. It also called for a tightening of credit standards, where necessary, in order to maintain the current high asset quality of Belgian mortgage loan portfolios.

This first section will document the development in credit standards applied to new mortgage loans since the 2012 FSR article, based in part on the same type of quantitative survey of 16 Belgian banks' domestic mortgage loan portfolios that was used for the 2012 analysis. The Bank has decided to repeat this collection of information on Belgian mortgage loans at regular intervals in future, with banks having to report data on outstanding totals and new business volumes for various portfolio characteristics every six months (for the situation as at end-June and end-December) and data on the corresponding minimum regulatory capital requirements once per year (for the year-end position). The latest available data used in this article pertain to the situation as at the end of 2013.

Over the last fifteen years, the Belgian household sector's mortgage debt has increased strongly, rising from € 60.6 billion at the end of 1998 to € 177.8 billion at the end of September 2013 (Chart 1). Although the pace of growth has slowed down in recent quarters (to an annual rate of around 4 % in the first nine months of 2013),

CHART 1 BELGIAN HOUSEHOLD DEBT

(in € billion, unless otherwise stated)



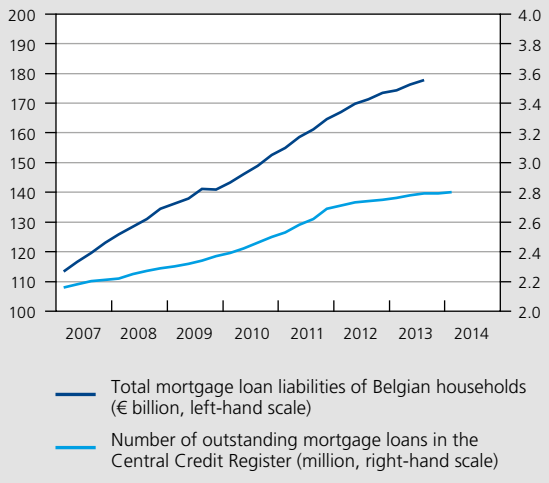
Sources : ECB, NBB.

this strong growth of mortgage liabilities has pushed the overall debt ratio of Belgian households up to 57.8 % of GDP. While it is still lower than in the euro area (64.5 % of GDP), the gap between the two has fallen from more than 15 percentage points in 2005 to less than 7 percentage points in the course of 2013. In this connection, it should also be noted that high household debt levels in some of these euro area countries were part of the major imbalances that triggered financial crises and that are currently being reduced as a result of deleveraging processes.

As explained in the 2012 FSR article, this growth of mortgage debt over the past 15 years resulted from a rise in the number of mortgage loans outstanding (also due to a change in the fiscal regime for home loans in 2005 and to fiscal incentives for energy-saving investment between 2009 and 2011), an increase in the average amount of new mortgage loans and a decline in the rate of amortisation of the outstanding stock (due *inter alia* to rising average loan maturities).

The data held in the Central Credit Register – which has information on all outstanding household loans in Belgium since the beginning of 2007 – shows that the number of mortgage loans in Belgium has risen from less than 2.2 million contracts in 2007 to almost 2.8 million since early 2013 (Chart 2). In part, this development resulted from a surge in the number of mortgages taken out for renovation between 2009 and 2011, when the use of such loans was boosted by the fiscal incentives for energy-saving investment financed with green loans.

CHART 2 OUTSTANDING NUMBER AND AMOUNT OF MORTGAGE LOANS



Source : NBB.

These green loans carried an interest subsidy of 1.5 percentage points, paid for by the federal government, and proved very successful, as the number of new loans for renovation purposes surged from an annual average of 36 000 in the period 2000-2008 to 100 000 in the years from 2009 to 2011. Although the average size of these loans was limited to around € 30 000, the large number of loans in these three years resulted in new production totalling € 8.7 billion. After the expiry of the tax incentives for green loans at the end of 2011, the number and total amounts of new mortgage loans for renovation declined strongly, contributing to the slower rate of growth in the number of mortgage loans recorded in the Central Credit Register.

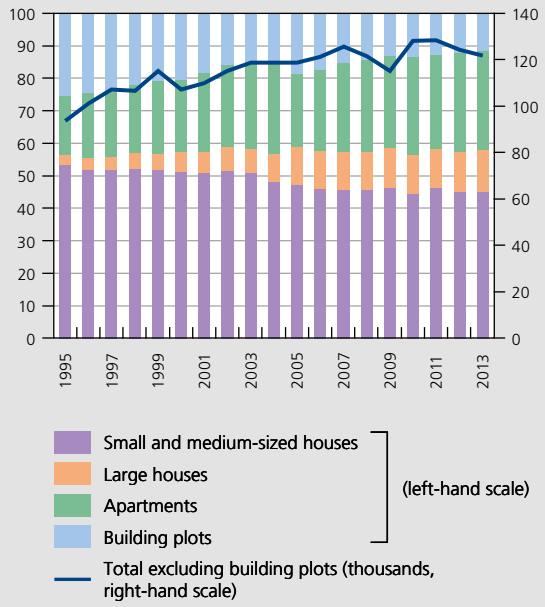
In 2013, total new mortgage loan volumes declined further from the peak reached in 2011. In the case of mortgages for the purchase of an existing house, the new production volume in 2013 was almost 7 % lower than in 2012, dropping to an annual volume of € 15.7 billion. While this decline slightly exceeded the 4 % drop in the total number of secondary housing market transactions last year (Chart 3), the total number of new mortgage loans for the purchase of existing houses remained quite close to the total number of secondary housing market transactions in 2013 (116 000 versus 121 800). The share of housing transactions financed with mortgages thus remained close to 100 %, as it has been since the introduction of a new tax regime for mortgage loans in 2005 (to be compared with a ratio around 80 % in the period 1995-2004).

The second consecutive decline in the number of secondary housing market transactions in 2013 follows a period during which the number of existing home sales had followed an upward trend, with some fluctuations, since 1995. In 2010 and 2011, the number of transactions per annum peaked close to 127 500. This high number of housing market transactions was another aspect of the dynamic market conditions that characterised the Belgian mortgage and housing markets in the past 15 years. As in many other countries, the Belgian residential property and mortgage market saw strong growth of both housing prices and mortgage debt in the period up to the start of the global financial crisis in 2007. However, in contrast to most other countries, a marginal correction of Belgian housing prices and a temporary slowdown in mortgage loan growth in 2009 was followed by new increases in housing prices and mortgage debt, in spite of the still challenging macroeconomic circumstances during the euro area sovereign debt crisis.

Looking more closely at the breakdown of the number of existing home sales in Chart 3, the most notable

CHART 3 BREAKDOWN OF THE TOTAL NUMBER OF RESIDENTIAL REAL ESTATE TRANSACTIONS

(% of total, unless otherwise stated)



Source: FPS Economy.

development is the structural increase in the number of apartment sales and a decline – in both absolute and relative terms – in the number of building plot transactions. The share of houses (whether small, medium-sized or large) in total secondary market transactions has remained quite stable (55 % to 60 %) since 1995. The increased scarcity of building plots undoubtedly contributed to lower land sales. These tighter space constraints and the rising price of land are in turn also likely to have boosted the appetite for apartments, on both the demand and supply side. In this connection, (anticipation of) population ageing is also an important factor, as the baby-boom generation is reaching an age when downsizing to smaller housing (apartments) is in demand.

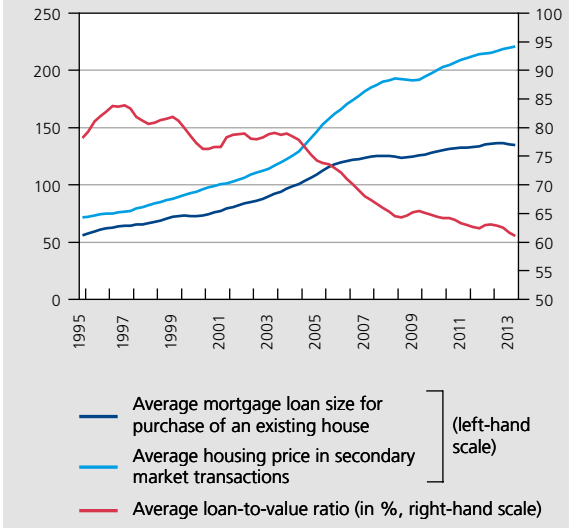
The strong demand for apartments is likely to have been driven as well in part by the growing attractiveness of real estate as an investment asset. In this connection, the 2012 FSR article highlighted the tax regularisation measures that favoured reinvestment of repatriated capital in some types of assets (including Belgian real estate), as well as the fact that the financial crisis and associated heavy losses on financial investments seem to have enhanced the relative attraction of real estate (projects) as an investment asset in households' asset portfolios. The extra flexibility and lower tax rate for gifts and donations have probably also stimulated additional intergenerational transfers of financial resources in the context of home purchases.

This reorientation of investment funds to Belgian residential real estate assets is one explanation for the growing divergence between the average size of new mortgages that are used to finance the purchase of an existing house or apartment and the average composite housing price, calculated as the volume-weighted average of the selling prices of small and medium-sized houses, large houses and apartments (Chart 4).

Aggregate statistics can be used to calculate the average size of new mortgage loans that are used to finance the purchase of an existing house or apartment – excluding mortgages used for renovation or construction purposes – by dividing the volume of new mortgages by the number of new home loans. These calculations show an average mortgage size of € 60 000 in 1996 which had doubled to € 120 000 by the end of 2006. During this period, the average composite housing price and the average mortgage loan size followed a fairly similar pattern, resulting in a loan-to-value ratio (the ratio between the two) of around 80 %. Since 2006, however, the two aggregates have increasingly diverged. Between end-2006 and end-2013, the average mortgage increased by an additional 12 % to € 135 000, while the composite house price rose

CHART 4 DEVELOPMENTS IN THE AVERAGE AMOUNT OF NEW MORTGAGE LOANS AND AGGREGATE LTV RATIO

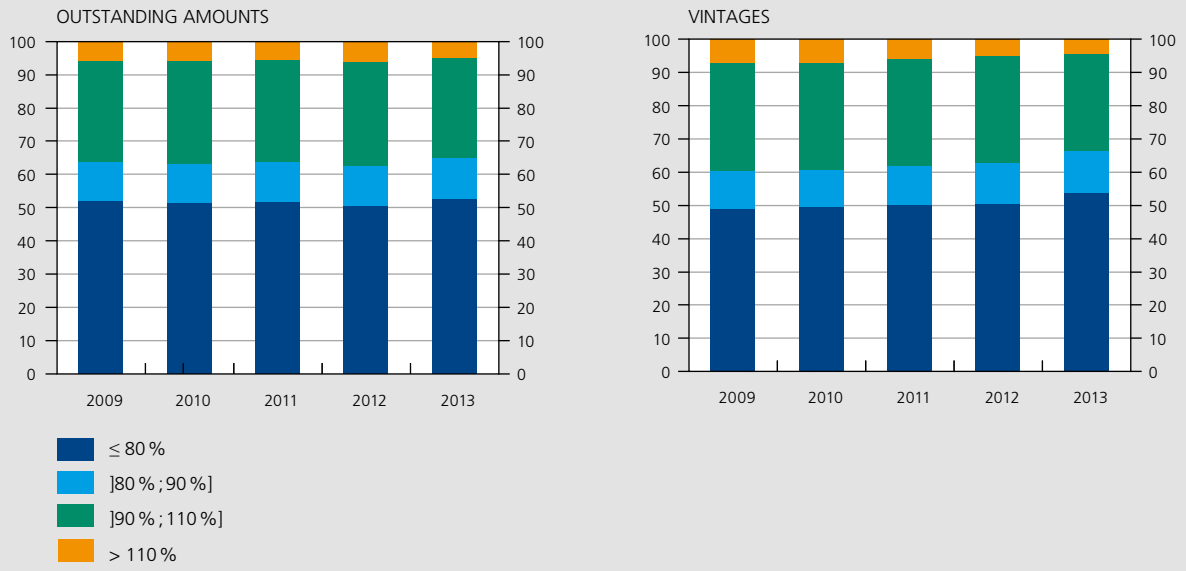
(in € thousand, unless otherwise stated)



Source: NBB.

CHART 5 LOAN-TO-VALUE RATIOS AT ORIGINATION

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



Source : NBB.

by 30 % to € 220 000. As a result, the associated loan-to-value ratio dropped to 65 % (and even below that) in the years 2007-2013.

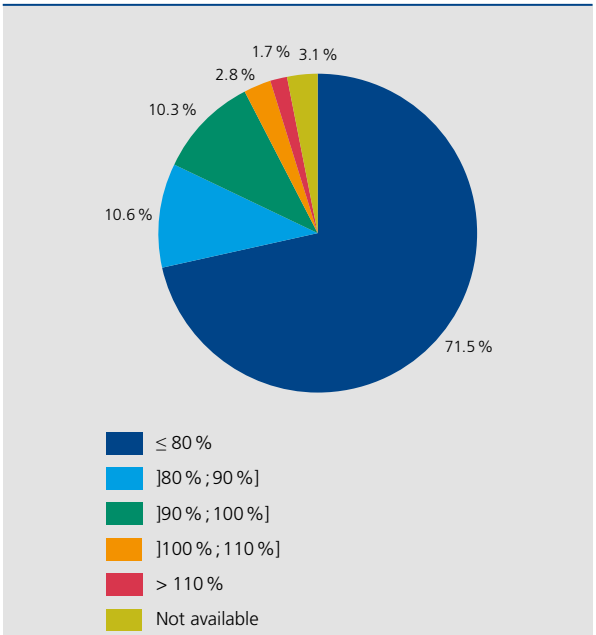
This average has to be interpreted with caution, however, as the data collected from the 16 credit institutions (Chart 5) confirm that it is the result of a very wide distribution of loan-to-value ratios at origination, with significant new production volumes being associated with ratios above 80 %, and even over 100 %. As a matter of fact, although credit institutions appear to have tightened their policies for new mortgage loans with the highest LTV ratios somewhat, around one-third of new production volumes in 2013 still had an LTV ratio of more than 90 %. On the other hand, slightly more than half of new production had an LTV ratio at origination of no more than 80 %. In this connection, the 2012 FSR article noted that the increase in the share of secondary market transactions financed with a mortgage could mainly stem from households or investors taking out a home loan for tax reasons, rather than for financial constraint reasons (increasing the relative weight of new mortgage loans with a quite low loan-to-value ratio in new production relative to the period before 2006). Due to the corresponding large share of mortgages with a low loan-to-value ratio in the overall stock of home loans, the aggregate average LTV at origination, as shown in Chart 4, remained quite moderate in recent years. The large number of green loans originated in 2009, 2010 and (particularly) 2011 was probably also associated with a rather low LTV ratio.

For households with limited own funds, access to the property market – which has seen sharp increases in house prices over the past 15 years – was only possible by having recourse to mortgage loans with high LTV ratios, explaining the sizeable segments in new production with LTV ratios of 90 % or more. As highlighted in Chart 6, this sub-segment of high LTV loans has contributed to a large amount of outstanding loans that are associated with indexed loan-to-value ratios close to, or above, 100 %. At the end of 2013, around 15 % of the outstanding amount of loans had an indexed LTV ratio of more than 90 %.

Chart 7 provides the breakdown of the stock and vintages according to the original maturity of the mortgage loan. The data show that the share of loans with an original maturity of more than 20 years in the outstanding stock surged from 33.5 % in 2007 to around 45 % in 2011, while the share of loans with an original maturity of more than 25 years at origination increased from less than 12 % to almost 20 %. Since 2011, these shares seem to have stabilised. As highlighted in the right-hand chart, this stabilisation in the relative share of mortgage loans with maturities of over 20 years is the result of a declining share of these loans in new production since 2012. This reduced prevalence of longer maturities in new mortgage

CHART 6 BREAKDOWN OF THE OUTSTANDING MORTGAGE LOAN STOCK ACCORDING TO INDEXED LOAN-TO-VALUE RATIOS (1)

(in % of total loans at the end of 2013)



Source : NBB.

(1) Indexed LTV ratios are calculated as the ratio between the amount of the mortgage loan outstanding at reporting date (taking repayments of capital into account) and the assessed market value of the property.

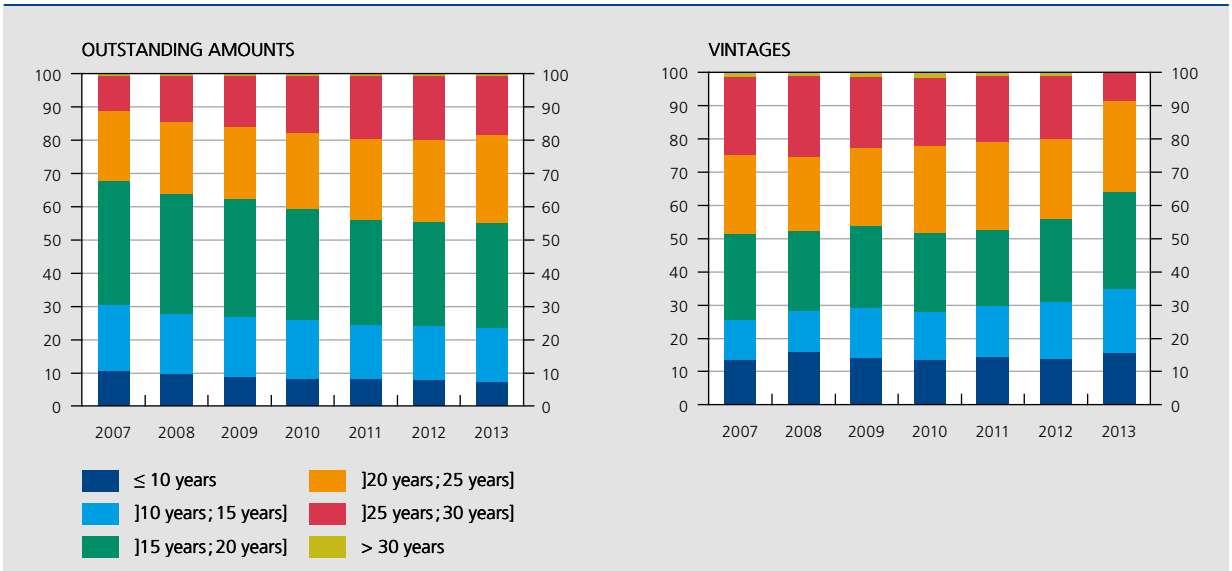
loan production is the most visible sign of Belgian banks tightening the credit standards applied in their mortgage credit policies since 2012.

The available data do not suggest that the lower availability of longer mortgage loan maturities contributed to concurrent upward pressure on the debt-service-to-income ratios for borrowers at the time of the origination of their mortgages. This confirms the anecdotal evidence suggesting that banks have actually become more selective in their credit origination policies since 2012. Yet, while the data shown in Chart 8 should be interpreted with caution, due to the various definitions banks use for the denominator of this ratio (such as disposable income), the distributions of the debt-service-to-income ratios for the outstanding stock and new volumes include large sub-segments where borrowers have to reserve 50 % or more of their disposable income for paying interest and repaying capital on their mortgage loan (as assessed at the time of origination).

Changes in debt service levels after origination can be the result of revisions of mortgage interest rates in those contracts for which the rate has not been fixed for the whole maturity of the contract. Chart 9 shows that the mortgage loan portfolios of the 16 banks surveyed are dominated by mortgage loans for which the interest rate is fixed for the whole term of the contract. At the end of 2013, these represented 60 % of the outstanding stock.

CHART 7 MATURITIES AT ORIGINATION

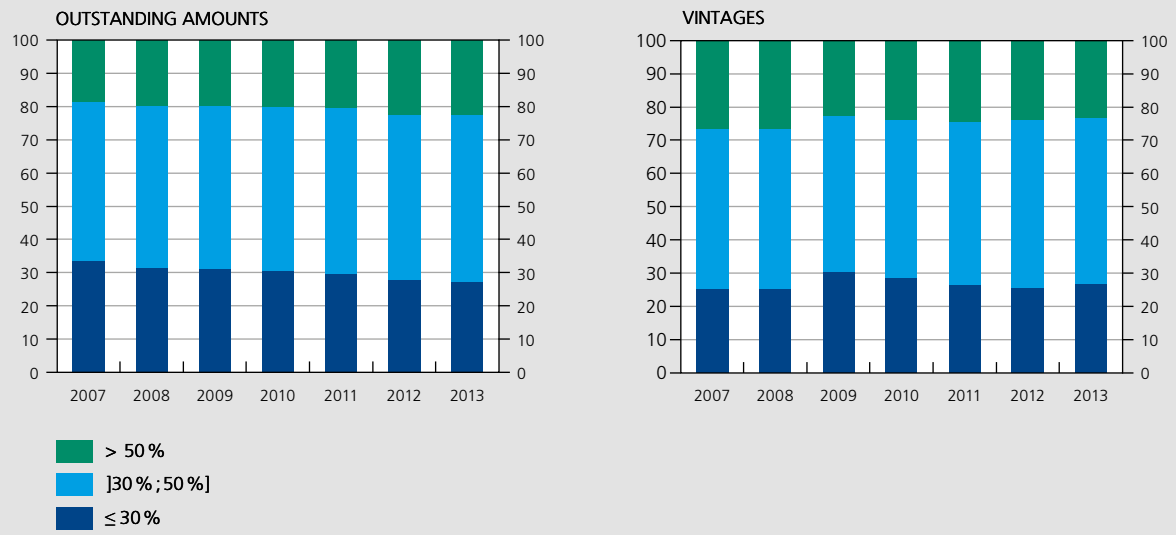
(in % of total loans at the end of the year or total loans granted during a particular vintage)



Source : NBB.

CHART 8 DEBT-SERVICE-TO-INCOME RATIOS AT ORIGINATION

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

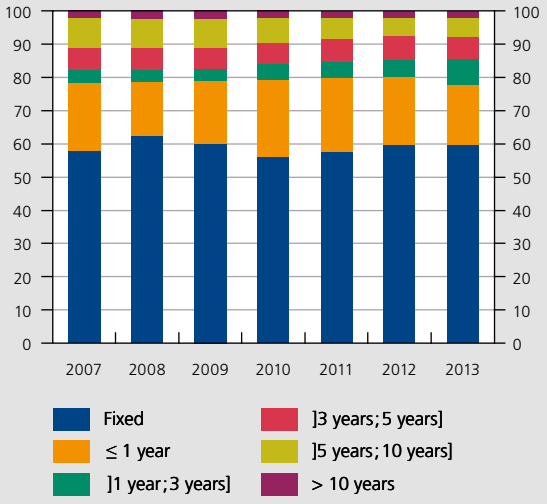


Source: NBB.

Of the mortgage loans having some form of interest rate variability, slightly less than 20 % of the stock at the end of 2013 was scheduled to be repriced in the course of 2014. As regards loans for which the interest rate variability is one year or less, it must be remembered that in practice that period is actually one year, because the Belgian mortgage loan regulations forbid mortgage loans for which the interest rate would be fixed for less than 1 year.

CHART 9 INTEREST RATE VARIABILITY: TIME TO NEXT REPRICING DATE

(in % of total loans at the end of the year)



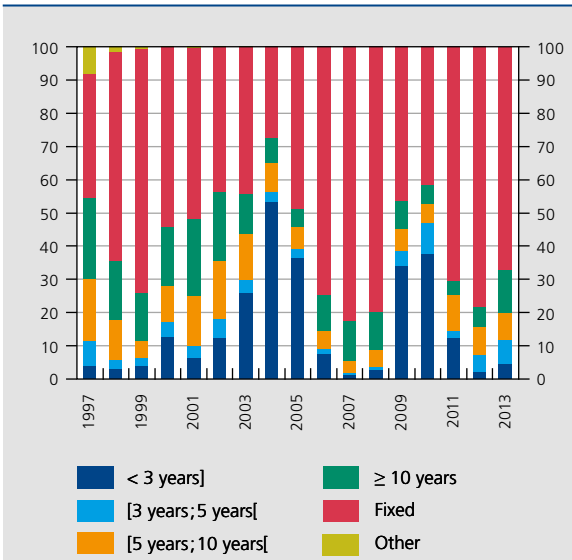
Source: NBB.

As highlighted in Chart 10, the relative weights of mortgages with fixed or variable interest rates can vary quite considerably from one year to another. While Belgian households continue to have a strong preference for fixed-rate contracts, in periods when the interest rate gap between fixed and variable rates widens substantially, variable-rate contracts take a significant share of new production. In 2009 and 2010, for example, mortgage loans with an interest rate fixed for a period of less than three years accounted for more than one-third of the new annual volume. In 2013, their share remained very low, with borrowers preferring mortgage loans with rates fixed for an initial period of at least 5 years.

Borrowers opting for such variable-rate loans run the risk of higher debt service levels in the future if interest rates rise. However, this risk is not open-ended in Belgium, as the mortgage credit law imposes strict limits on the maximum interest rate variability that lenders are allowed to pass on to mortgage borrowers. The rate charged to borrowers may never exceed a level that is twice the initial rate. Moreover, the law and the banks' commercial policies have resulted in a standard practice for variable-rate mortgage loans to have a cumulative cap of 1, 2 and 3 % respectively on the upward or downward adjustment that can take place in the first, second and subsequent years of the loan.

CHART 10 INITIAL FIXED INTEREST RATE PERIOD, BY VINTAGE

(in % of total loans granted during a particular year)

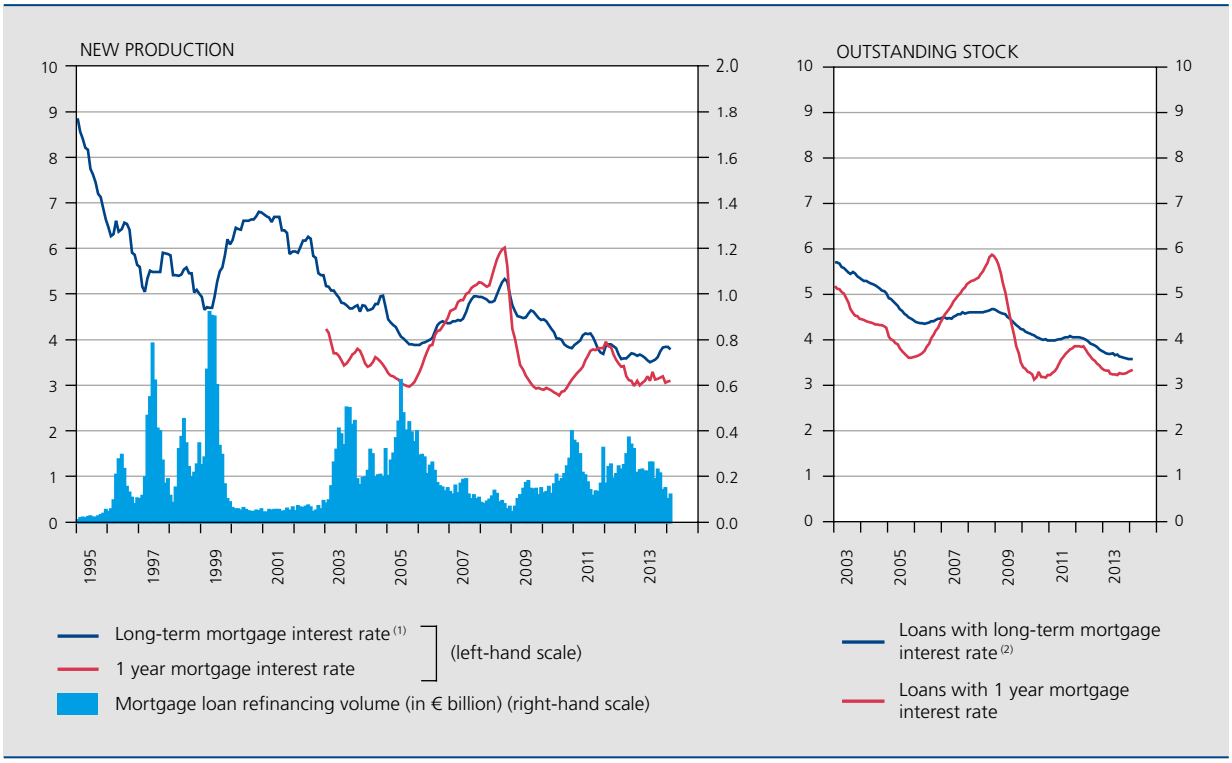


Source: BVK/UPC.

The reference rates for reviewing mortgage interest rates are based on monthly average yields on Belgian government bonds. However, mortgage rates for new loans are linked to banks' internal transfer prices, adjusted for a commercial margin. The left-hand panel in Chart 11 provides information on the average mortgage rates in new production over the period 1995-2013. While short-term rates stabilised at the historically low level of 3 % in the course of 2013, long-term rates bottomed out in the third quarter of that year, but remained at historically low levels at the end of 2013. The average interest rates on the outstanding stock of mortgage loans – shown in the right-hand panel of Chart 11 – are also close to historically low levels. Here, it must be remembered that the Belgian mortgage loan regulations stipulate that the maximum financial penalty for early redemption by borrowers is three months' interest due on the remaining capital outstanding. This quite cheap early redemption option is regularly used for the purpose of refinancing loans at lower interest rates when rates on new mortgages fall below the yield on historical contracts. As shown in the left-hand panel of the chart, monthly mortgage refinancing volumes are therefore very sensitive to the level of interest rates on

CHART 11 MORTGAGE LOAN INTEREST RATES

(in %, unless otherwise stated)



Source: NBB.

(1) Initial rate fixed for at least 10 years.

(2) Rate fixed for more than five years.

new mortgages. As this remortgaging depresses the profitability of mortgage loan portfolios, it is an option-type source of interest rate risk for the Belgian banks. These interest rate risks and related hedging costs, together with an appropriate funding cost for an asset portfolio with sometimes very long-term assets, have to be included by the banks in the commercial margins taken on mortgage loans. Since the global financial crisis, these commercial margins have been raised from very low levels to an average of around 100 basis points relative to swap rates.

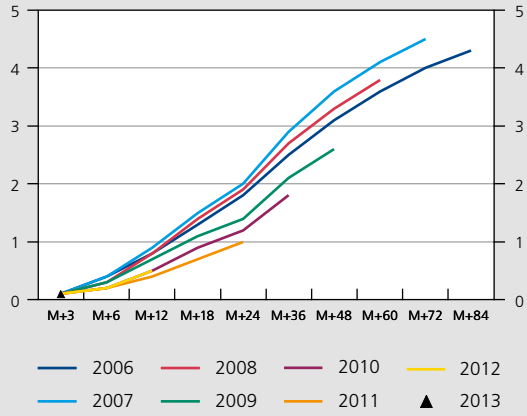
2. Credit quality and prudential measures taken in 2013

While the Bank has closely monitored developments in the Belgian residential real estate and mortgage loan markets since a number of years, in 2013, particular attention was devoted to an analysis of the way in which the potential risks associated with mortgage loans were taken into account in calculating the minimum capital requirements for credit risk under the Pillar 1 rules. As a follow-up to the above-mentioned policy message from the 2012 FSR article, the Bank thus conducted a new stock-taking exercise in the second half of 2012 and 2013 on the 16 Belgian banks' mortgage loan portfolios that assessed the overall risk profile and quality of the residential mortgage portfolios of the main credit institutions together with the related Basel II risk parameters and risk weights. The fact-finding exercise focused mainly on the banks relying on internal risk models to compute the minimum regulatory capital buffers required for these exposures, as these calculations result in risk weights (10 % on average) that are significantly lower than those applied in the framework of the standardised approach (35 %) of the Basel II framework. Generally speaking, the Basel Accord foresees two potential methods for calculating minimum capital requirements for mortgage loans granted to retail clients. The first approach, called the standardised approach (SA), applies a risk weight of 35 % to the outstanding amount of mortgage loans – that meet certain criteria —, which is then multiplied by 8 % in order to arrive at the amount of capital that the banks have to hold for this portfolio under the Pillar I capital requirements for credit risk. This SA approach is used by the smaller Belgian credit institutions, and covers only a small part of the total Belgian banking sector's mortgage loan portfolio. The second approach, the internal ratings-based (IRB) approach, relies on banks' internal risk models to calculate important risk drivers such as the probability of default (PD) and loss given default (LGD) – i.e. the estimated loss over the total exposure if the borrower defaults. These parameters then serve as important inputs for the Basel risk weight function, which calculates the average risk weight to be applied to the IRB bank's mortgage loan exposures.

The risk weights calculated with these internal risk models for Belgian mortgage loans are not only considerably lower than those determined by the standard approach for calculating the minimum capital requirements for credit risk, but they also vary widely between institutions. More detailed analysis has confirmed that these differences between institutions are largely attributable to variations in the risk profile – and particularly the relative importance of the riskier sub-segments – of different banks' mortgage loan portfolios in Belgium. This analysis confirmed the heterogeneity among banks' credit standards and the importance of these standards in explaining the degree of subsequent defaults in the portfolios. In particular, banks that generally tend to have less conservative credit standards (loans granted to more risky borrowers, with higher debt-to-service ratios) were found to be the ones with the relatively higher default rates. The study also showed that differences in individual banks' IRB risk weights and parameters for Belgian mortgage loans seemed to be broadly consistent with the ranking of bank portfolios' (relative) risk profile.

Another main conclusion of the fact-finding exercise was that these IRB risk weights for Belgian mortgage loans are generally relatively low, and, on average, lower than in other countries. Data collected by the European Banking Authority has shown that the average IRB-risk

CHART 12 MORTGAGE LOANS WITH PAYMENT DEFAULTS[1], BY VINTAGE[2]



Source : NBB.

(1) As recorded in the Central Credit Register.

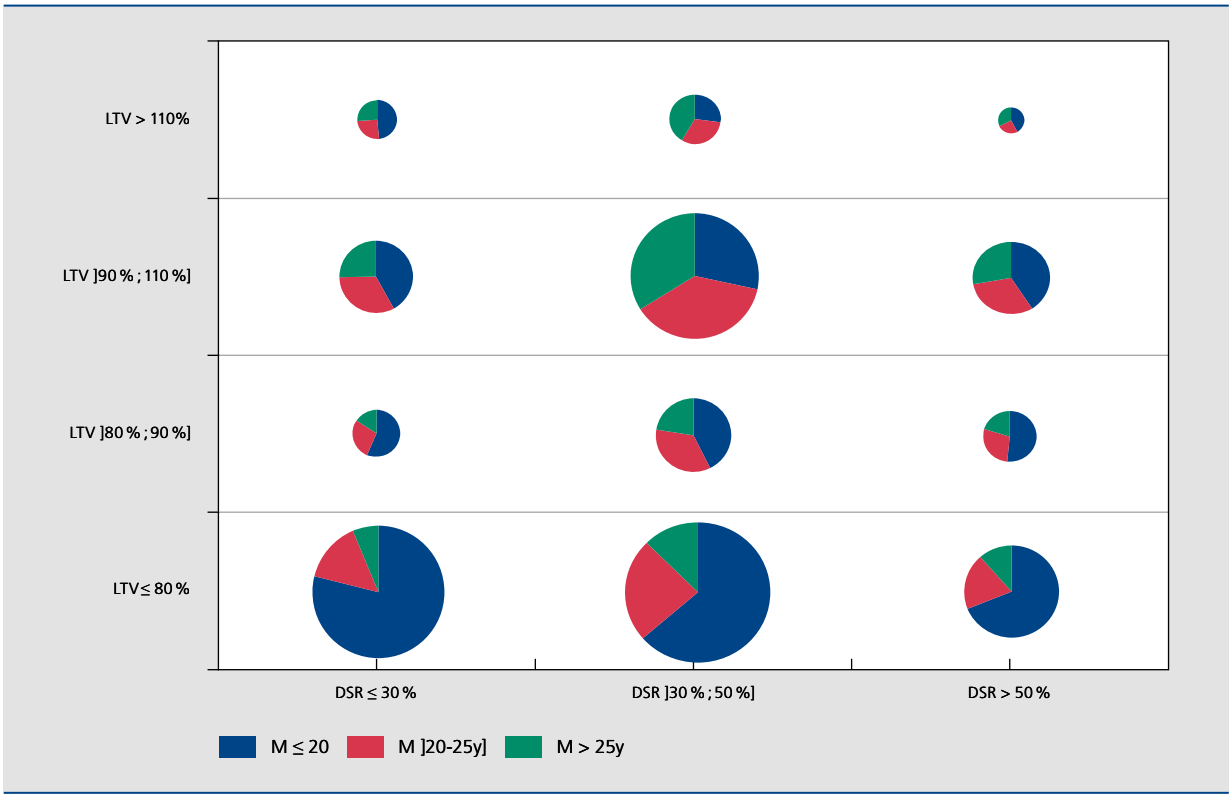
(2) Vintages group together loans granted during the same year. The curves show, for each vintage, the number of defaulted loans as a percentage of total original loans after a certain number of months since the loans were granted. Possible regularisations of loans are not taken into account.

weight for mortgage loans in Belgium was one of the lowest among all the sample countries, with Sweden having the lowest weights (see figure 13 in EBA's *Third interim report on the consistency of risk-weighted assets, SME and residential mortgages*). However, the Swedish authorities have enacted a measure in the course of 2013 aimed at putting a 15 % floor on this risk weight and recently announced plans to raise the floor further up to 25 %. Belgium's neighbours report average risk weights of over 10 % (up to 18 %). Echoing the developments in Sweden, Norway and Switzerland have also recently taken measures aimed at raising the average risk weight of IRB-banks for domestic mortgage loans (up to 35 %, as in the SA approach).

Although the aggregate credit quality indicators for households do not so far point to any deterioration in default rates on recent mortgage loan vintages (Chart 12), the Bank and international institutions such as the ECB, ESRB, the OECD and the IMF have drawn attention to potential risks associated with the Belgian housing and mortgage market, partly on the basis of criteria measuring the over- or undervaluation of property prices. If conditions in the Belgian housing market were to become less buoyant than they have been over the past 15 years, the riskier loan segments in the outstanding stock of mortgages (Chart 13) could be the source of higher-than-expected credit losses for banks. In spite of the recent tightening of some credit standards for new mortgage loan production, a sizeable group of borrowers in recent years may indeed have stretched their mortgage loan maturities, loan sizes and/or debt service ratios to levels that could entail a higher risk of future credit losses for banks than in the past. Here, it should be noted that the internal risk models are calibrated on historical credit loss data, so that these low risk weights can to some extent be explained by the absence of a major crisis on the Belgian housing market in the past and by the generally buoyant market conditions of the past 15 years. Risk weights as calculated by the IRB models could thus be too low for losses that may emerge in less favourable market circumstances and from the materialisation of risks embedded in certain sub-segments of banks' Belgian mortgage loan portfolios.

CHART 13 BREAKDOWN OF THE PORTFOLIO OF MORTGAGE LOANS OF IRB BANKS BY LTV, DSR AND MATURITY AT ORIGINATION (1) (2)

(non-consolidated data, end-2013)



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.

In this context, and in view of the relatively large share of domestic mortgage loans in the balance sheets of Belgian credit institutions, the NBB considered it justified to take some prudential measures aimed at strengthening the banks' resilience and reducing the concentration risk.

The first measure that was taken in the last quarter of 2013 was macroprudential in nature and provided for a flat-rate 5-percentage-point add-on to the risk weightings calculated by the banks themselves, but only for banks calculating their minimum regulatory capital requirements for Belgian mortgage loans according to an IRB model. That measure took effect with the Royal Decree of 8 December 2013[(1)]. This add-on did not apply to banks using the standard approach mentioned earlier to calculate their capital requirements. In practice, if a bank using the IRB approach calculates an internal risk weighting of 10 % for Belgian mortgage loans, this measure requires the minimum capital requirements to be calculated on the basis of a 15 % risk weighting. The average risk weight of the IRB banks effectively increased from around 10 % at the end of 2012 to about 15 % at the end of 2013, as a result of the introduction of the add-on.

The relatively moderate size of the add-on seemed appropriate in view of the Belgian banks' generally rather conservative policy on mortgage lending in the past, and the historically low level of losses on such loans. However, in view of the cyclical character of this measure, the Bank will keep a close eye on market developments for the purpose of continuous assessment of the appropriate level of that add-on.

From 2014, the new capital requirements for Belgian mortgage loans will be maintained pursuant to European rules permitting the EU Member States to impose specific requirements to tackle macroprudential risks. To this effect, the Bank notified the relevant European authorities of its intention to use CRR Article 458 to maintain the add-on with due regard for the new EU Directives applicable from 1 January 2014.

The other two measures adopted by the Bank at the end of 2013 were microprudential in nature.

One involved launching a horizontal assessment of the IRB models on the basis of the results of the back-testing to be conducted by the institutions, followed by any necessary adjustments to those approaches. The goal of this measure is to address potential weaknesses of the risk parameters used in the IRB approach. The Bank will in this respect evaluate the adequacy of the calibration of the PD and LGD models used in the regulatory capital calculation within the IRB approach. Their results will be analysed in accordance with regulatory requirements and best practices so as to assess the performance of these models over the longest possible time horizon. The back-testing results will be analysed horizontally in order to detect any possible outliers. Banks with unsatisfactory calibrations will be required to adapt their Pillar 1 models.

The other microprudential measure consisted in requesting credit institutions to carry out a self-assessment of the degree to which each bank conforms to the EBA Opinion on Good Practices for Responsible Mortgage Lending and the EBA Opinion on Good Practices for the Treatment of Borrowers in Mortgage Payment Difficulties. Credit standards at origination play an important role in the development of imbalances in the residential real estate markets which may then lead, in the event of a bursting of a bubble, to severe macroeconomic (and social) outcomes and losses for banks. In this context, the banks' self-assessment of the degree of conservatism of their credit standards for residential mortgage loans will be analysed by the Bank and if weaknesses are identified, banks will be asked to develop an action plan to redress these identified weaknesses. This measure applies to all 16 banks.

Through these prudential measures, the Bank aims to bolster the resilience of the market and credit institutions against potentially higher-than-expected credit losses on Belgian mortgage loans if conditions in the Belgian housing market were to become less buoyant than they have been over the past 15 years. The measures also aim to underscore the importance of sound credit standards at origination, as these play an important role in the development of imbalances in the residential property markets.

The Bank will continue to monitor developments in the Belgian housing and mortgage market very closely and reassess, at regular intervals, the appropriateness and the level of the 5-percentage-point add-on for banks with an IRB-model. This monitoring will take into account general market developments as well as changes in the credit standards applied by banks in their origination of new mortgage loans.

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

Evaluating early warning indicators for real estate related risks

Stijn Ferrari
Mara Pirovano

Introduction

Adverse developments in the real estate sector can be an important source of systemic risk and financial instability. Addressing systemic concerns related to the real estate sector is one of the priorities on the macroprudential agenda of European authorities. A number of member states, including Belgium, are taking action to dampen systemic risk in real estate markets.

The European Systemic Risk Board (ESRB) strongly encourages countries to develop sound macroprudential policy strategies to frame such actions. Macroprudential policy strategies involve linking the ultimate objectives of macroprudential policy to indicators and instruments. Instruments targeting systemic risk stemming from real estate markets include risk weights for real estate exposures, and limits to loan to value and debt service to income ratios. The operationalisation of such instruments requires identifying sound leading indicators and associated thresholds, which could serve as a basis for guided discretion in the activation of macroprudential instruments.

Steps towards the identification of early warning indicators signalling excessive developments (e.g., in credit and leverage) and imbalances in the run-up to a banking crisis have been undertaken by policy makers as well as in the academic literature. Such early warning exercises assess the performance of indicators in predicting banking crises over a particular horizon. In addition, thresholds above which the indicators signal the potential occurrence of a banking crisis over a given horizon are computed.

A usual first step in such early warning exercises is a graphical analysis of the behaviour of a set of potential indicators in a relevant window around crisis events. Such graphical presentation provides a first assessment of the ability of variables to signal the occurrence of excessive developments or imbalances in the run-up to a crisis.

Applications of early warning models to banking crises related to developments in the real estate sector are relatively scarcer. Under the auspices of the ESRB Instruments Working Group (IWG), the early warning properties of a subset of indicators for European Union (EU) countries have been assessed. On the basis of a graphical analysis, variables related to the build-up of credit as well as volume- and price-based real estate related indicators have been identified as potential early warning indicators for real estate related banking crises.

This article builds on the IWG work and presents a novel graphical methodology to identify leading indicators of real estate related banking crises. Using information for 15 EU countries, the methodology compares the cross-country average behaviour of indicators in a relevant time window around crisis events for countries experiencing a real estate related banking crisis to countries that did not experience a crisis in these periods and to observations in tranquil times (outside periods around real estate related banking crises).

Accounting for the uncertainty surrounding the estimates of cross-country average levels of indicators, the methodology provides a graphical tool for assessing the power of indicators in predicting real estate related

banking crises. The framework also allows identification of thresholds that determine zones, which correspond to different intensities of the signal issued by each indicator for a given prediction horizon. As such, the framework can be applied as a monitoring tool for systemic risks stemming from the real estate sector.

The article highlights the relevance of the results for systemic risks stemming from the Belgian real estate sector. In particular, signals related to increasing levels of household indebtedness in combination with a potential overvaluation of housing prices suggest the need for close monitoring of developments in the Belgian real estate market and Belgian banks' mortgage loan portfolios. As described in the article on recent developments and prudential measures in the Belgian mortgage market in this Financial Stability Review, such in-depth analysis of banks' mortgage loan portfolios has resulted in recent actions undertaken to mitigate systemic risk stemming from the Belgian real estate sector.

The remainder of the article is organised as follows. Section 1 outlines the novel graphical early warning methodology. In Section 2, we apply the monitoring framework to Belgium. The final section concludes.

(1) The Babecky et al. (2012) database can be freely downloaded at http://ies.fsv.cuni.cz/cs/node/372 (March 2014).

(2) The choice of the interval is dictated by two considerations. First, we aim at capturing extreme developments in the real estate market occurring before the onset of a banking crisis, to consider the potential role of real estate related events in triggering the crisis. Second, we extend the time period up to two years after the start of the crisis to account for potential delays in the dynamics of house prices in reflecting problems originating in the real estate sector and resulting in banks' distress.

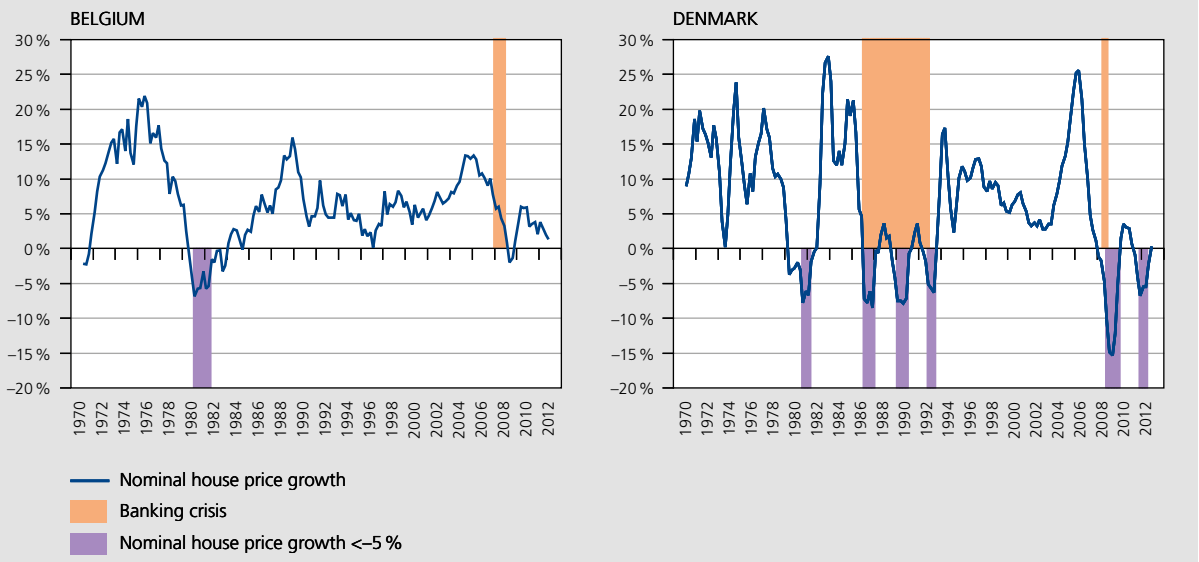
1. Methodology

1.1 Identification of real estate related crises

To construct an indicator of real estate related banking crises, we complement banking crisis data for the EU with data relating to real estate prices. The information on banking crises comes from a database compiled by Babecky et al. (2012), which provides quarterly data on the occurrence of banking crises in the EU from 1970 to 2012. The dataset is based on information on the timing of banking crises gathered from various sources: influential papers, the authors' own survey and country experts' opinions (mostly from national central banks). (1)

In order to isolate banking crises related to developments in the real estate sector, we complement this information with data on nominal house price growth. Specifically, we consider that banking crises are related to real estate only if they are accompanied by a decrease in nominal house price growth of at least 5 % in at least one quarter in the period ranging from 4 quarters before to 8 quarters after their onset. (2)

CHART 1 CONSTRUCTING THE REAL ESTATE CRISIS DUMMY VARIABLE: BELGIUM VS. DENMARK



Source: Babecky et al. (2012), NBB Calculations.

For illustrative purposes, Chart 1 presents the results of this procedure for Belgium and Denmark. For Belgium, periods in which nominal house price growth is below –5 % (the purple shaded areas) are never observed in the period from 4 quarters before to 8 quarters after the onset of a banking crisis (the orange shaded areas in the chart). Hence, we do not identify any real estate related banking crisis for this country. In contrast, in Denmark there are two cases in which the purple shaded area is situated in the period from 4 quarters before to 8 quarters after the start of an orange shaded area. Therefore, we consider these two intervals identified by Babecky et al. (2012) as real estate related banking crises.

This methodology leads us to identify 11 real estate related banking crisis episodes involving 9 countries out of the 15 EU countries of our sample. Annex 1 provides a detailed overview of the periods of real estate related banking crises identified for all 15 EU countries in the sample.

1.2 Potential early warning indicators

We consider a broad set of macrofinancial and real estate specific variables as potential leading indicators of real estate related banking crises, at a quarterly frequency and ranging from 1970Q1 to 2013Q1 for the series with the longest coverage. Data are collected from various sources, among which the ECB, OECD, BIS and Eurostat databases. For the purpose of this article we focus on four variables that have been identified as promising leading indicators for (real estate related) banking crises, both on conceptual grounds and on the basis of the existing literature on early warning indicators (see Box 1 for a brief overview of the literature). Annex 1 provides an overview of these variables' time coverage for each country.

First, we consider measures of credit granted to the household sector. We rely on data provided by the BIS on credit to households (including non-profit institutions serving households), adjusted for structural breaks and denominated in euro. We consider both the level of household credit to GDP and the deviation of household credit to GDP from its long-term trend up to that point (i.e., the household credit to GDP gap).[1] While the deviation of household credit to GDP from its long-term trend captures cyclical developments, the level of household credit to GDP represents a structural indicator, capturing the level of indebtedness of the household sector.

Second, we consider developments in real estate prices. We again consider both a cyclical and a structural indicator. Nominal house price growth is obtained on the basis

(1) The trend is calculated by means of a recursive one-sided HP filter with a smoothing parameter λ = 400000. See Ravn and Uhlig (2002) and Borio et al. (2010) for details.

Box 1 – Literature Review

A great body of literature has been produced aiming at identifying useful early warning indicators for the occurrence of crises. While the pioneering studies focused on leading indicators of currency crises in emerging economies (e.g., Frankel and Rose, 1996; Kaminsky et al., 1998), later studies encompassed developing as well as developed countries and considered a wider spectrum of events, including banking crises and boom/bust cycles in asset prices.

From a methodological standpoint, studies on early warning indicators rely heavily on threshold-based approaches such as univariate and multivariate signalling (e.g., Kaminsky and Reinhart, 1999; Borio and Lowe, 2002; Borio and Drehmann, 2009; Drehmann et al., 2010, 2011; Alessi and Detken, 2011; Drehmann and Juselius, 2013; Detken et al., 2014) and discrete choice models (e.g., Demirgüç-Kunt and Detragiache, 1998; Babecky et al., 2012; Schularick and Taylor, 2012; Behn et al., 2013; Detken et al., 2014). The idea behind the signalling approach is that a signal is issued whenever one or more indicators exceed a threshold. Discrete choice models such as logit and probit map a set of explanatory variables into the probability of a crisis occurring. Signals are then issued when the estimated probability exceeds a predetermined threshold. Methods to evaluate the performance of such models and identify thresholds are discussed in Box 2.

In recent years, special attention has been devoted to early warning models as starting point for the operationalisation of macroprudential policies such as the countercyclical capital buffer (e.g., Drehmann et al., 2010, 2011; Behn

et al., 2013; Drehmann and Juselius, 2013; Detken et al., 2014) and macroprudential instruments targeting real estate related risks (ESRB, 2014).

A number of variables have been identified as useful early warning indicators of banking crises. First of all, indicators related to the supply of credit such as the deviation of credit to GDP from its long-term trend (e.g., Drehmann et al., 2010, 2011; Babecky et al., 2012; Behn et al., 2013; Drehmann and Juselius, 2013; Detken et al., 2014), credit growth (e.g., Schularick and Taylor, 2012; Behn et al., 2013; Drehmann and Juselius, 2013; Detken et al., 2014) and the debt service ratio (Drehmann and Juselius, 2013; Detken et al., 2014). Developments in other macrofinancial variables such as GDP growth, money growth, equity price growth, interest rates, current account balance, and banking sector profitability and capitalisation have also been found to influence the probability of banking sector distress (e.g., Demirgüç-Kunt and Detragiache, 1998; Babecky et al., 2012; Behn et al., 2013; Detken et al., 2014). Furthermore, studies affirm the importance of global developments in association with the occurrence of banking crises (e.g., Babecky et al., 2012; Behn et al., 2013), and of variables related to developments in the real estate sector (e.g., Drehmann et al., 2010, 2011; Behn et al., 2013; Drehmann and Juselius, 2013; Detken et al., 2014).

Studies on crises related to the real estate market are relatively scarce and mainly focus on identifying the determinants of booms and busts in asset and/or real estate prices. A number of potential early warning indicators for boom/busts are identified, including interest rates and money and credit developments (e.g., Agnello and Schuknecht, 2011; Alessi and Detken, 2011; Borgy et al., 2011; Gerdesmeier et al., 2012). Agnello and Schuknecht (2011) and Alessi and Detken (2011) emphasise the role of global liquidity and credit. The importance of credit is confirmed by Claessens et al. (2011), who uncover a strong connection between credit and housing market cycles (also see Drehmann et al., 2012). Finally, real estate price developments are also found to be associated to credit conditions such as loan-to-value ratios (e.g., Crowe et al. 2011).

of a dataset compiled by the BIS and provides insight into the cyclical developments on the real estate market. Price to income ratios, which are constructed on the basis of BIS and OECD data, are useful indicators of overvaluation of real estate prices.

1.3 A novel graphical early warning methodology

CONTEXT

The operationalisation of macroprudential instruments requires developing a decision framework in which quantitative signals are mapped into policy decisions. This requires identifying robust leading indicators and their associated threshold values, which could serve as a basis for guided discretion in the activation of macroprudential instruments.

The identification and operationalisation of such an indicator framework typically involves two steps. First, it is necessary to identify a set of indicators with good and timely predictive power for events related to the materialisation of the targeted systemic risks (e.g., real estate related banking crises). Second, one may identify thresholds above which the indicator issues a "warning" or a signal on the potential materialisation of the targeted risk over a pre-specified horizon.

This article presents a novel graphical methodology for the identification of early warning indicators. The framework also allows identification of thresholds that determine zones, which correspond to different intensities of the signal issued by each indicator for a given prediction horizon. As such, the framework can be applied as a monitoring tool for systemic risks stemming from the real estate sector.

GRAPHICAL EVALUATION OF PREDICTIVE POWER

Early warning tests provide a statistical evaluation of an indicator or model's predictive power for events related to the materialisation of the targeted systemic risk (see Box 2). A usual first step in such exercises is a graphical analysis of the behaviour of a set of potential indicators around crisis events. Such graphical presentation of the evolution of an indicator for crisis countries in a window around crisis events gives a first indication on whether the indicator accurately signals the occurrence of excessive developments or imbalances in the run-up to a crisis.

For example, if an indicator, on average, shows a clear upsurge before relevant crisis events, it can be considered a potential useful indicator for predicting upcoming crises.

At the same time, a necessary condition for this indicator to be a useful early warning indicator is that the observed upward evolution before crisis events differs significantly from the level and behaviour of the indicator in "normal" situations. Such normal situations include times outside the relevant window around crisis events. For example, Kaminsky and Reinhart (1999) report the cross-country average behaviour of indicators around crisis events, expressed relative to "tranquil times". Drehmann and Juselius (2013) plot the cross-country median indicator value outside the relevant window around crisis events, in addition to the cross-country median evolution of the indicator in the window around crisis events.

A useful early warning indicator should not only signal crises in a consistent and timely manner, but it should also not issue too many false alarms. Suppose an indicator has good signalling properties when considered only for crisis countries around their crisis events, but its behaviour is not different from that observed for countries not experiencing crises around the crisis countries' crisis events. Then the indicator is likely to issue many false alarms, as it would signal the potential occurrence of a crisis over a particular horizon both in crisis and non-crisis countries.

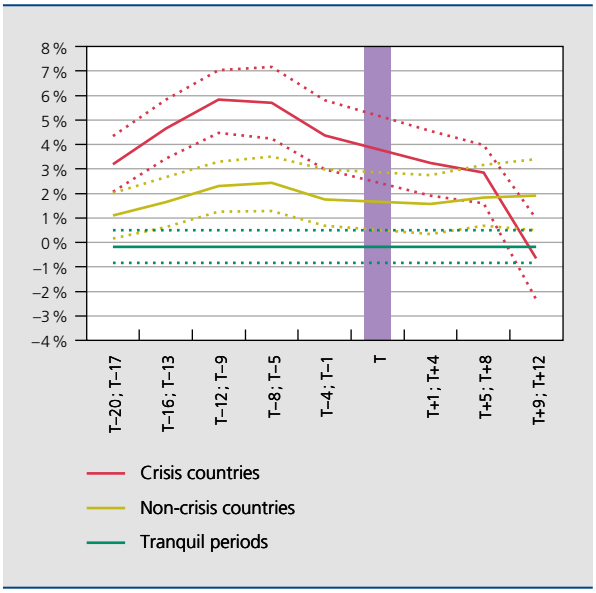
Our methodology extends the existing graphical analysis underpinning existing early warning exercises. Using information for 15 EU countries, the methodology makes two types of comparisons: (1) the average behaviour of indicators around crisis events for countries experiencing a real estate related banking crisis compared to the average behaviour of the indicator in the windows around these crisis events for countries that do not experience a real estate related banking crisis at those points in time; (2) the average behaviour of indicators around crisis events for countries experiencing a real estate related banking crisis compared to the average level of the indicator in tranquil periods (i.e., outside the relevant window around any real estate related banking crisis event in the sample).

In our graphical evaluation of predictive power we also explicitly account for the uncertainty surrounding the cross-country averages, stemming from the dispersion of the indicator values across countries. In particular, we compute bootstrapped 95 % confidence bounds around the cross-country averages. An indicator is considered to have good signalling properties if, in a given period, its confidence interval for crisis countries lies above the confidence interval for non-crisis countries and above the overall average in tranquil periods.

Chart 2 illustrates our methodology for the household credit to GDP gap (see Annex 2 for the equivalent charts for the other indicators). For our three subsamples of observations (crisis countries, non-crisis countries during crisis periods in another country, all countries in tranquil periods[1]) the average household credit to GDP gap is plotted for a window of 20 quarters before to 12 quarters after the start of real estate related banking crises (i.e., a horizon [T–20;T+12] with T denoting the start of the crisis).[2] The solid lines correspond to cross-country averages, whereas dashed lines provide the corresponding bootstrapped 95 % confidence bounds.

Specifically, the red solid line represents the average household credit to GDP gap in crisis countries around their own real estate related banking crises (denoted "crisis countries"). The light green solid line depicts the average behaviour of the indicator in the windows around these crisis events for countries that do not experience a real estate related banking crisis at those points in time (denoted "non-crisis countries"). Finally, the dark green line represents the overall average household credit to GDP gap outside the relevant window around any real estate related banking crisis event in the sample (denoted "tranquil periods").

CHART 2 CROSS-COUNTRY AVERAGE HOUSEHOLD CREDIT TO GDP GAP AROUND CRISES



Source: NBB Calculations.

(1) See Annex 3 for an example of how observations of a given indicator for a given country are classified as relevant for "crisis countries", "non-crisis countries" or "tranquil periods".

(2) We could in principle compute the cross-country average household credit to GDP gap for each individual quarter in the relevant window [T–20;T+12]. Given the relatively small size of our dataset, we instead compute cross-country averages for the yearly windows [T–20;T–17], [T–16;T–13], …, [T+9;T+12].

Chart 2 reveals that for horizons [T–16 ; T–13], [T–12 ; T–9] and [T–8 ; T–5] the 95 % confidence interval for the cross-country average level of the indicator in crisis countries is situated above the 95 % confidence interval of both the average household credit to GDP gap observed in the same period in non-crisis countries and the average

Box 2 – Statistical evaluation of predictive power and threshold identification

Evaluation of predictive power

The predictive power of potential early warning indicators is evaluated on the basis of the likelihood that the indicator considered is able to correctly predict upcoming crisis events, while at the same time not issuing too many false alarms. The so-called "Confusion Matrix" classifies the four possible outcomes. After a signal has been issued (i.e., the indicator breached the threshold), it is classified as correct if a crisis follows within the relevant horizon (A) ; if a crisis does not follow, then the signal resulted in a false alarm (B). A non-issued signal (i.e., the indicator has not breached the threshold) is correct when a crisis does not follow (D) and it is incorrect when a crisis occurs (C).

CONFUSION MATRIX

	Crisis	No crisis
Signal is issued	A	B
Signal is not issued	C	D

On the basis of the Confusion Matrix, a number of key ratios can be calculated. The true positive rate (TPR) is the fraction of correctly predicted crises ($\frac{A}{A+C}$). The ratio ($\frac{C}{A+C}$) or 1–TPR is denoted as the Type I error rate, which represents the fraction of missed crises. The noise or false positive ratio (FPR) represents the fraction of false alarms, i.e., signals wrongly issued ($\frac{B}{B+D}$). The FPR is also referred to as the Type II error rate.

From these quantities, the predictive power of an indicator can be assessed through different metrics, such as the noise to signal ratio ($\frac{FPR}{TPR}$) and a policy maker's loss function $L = \Theta \left(\frac{C}{A+C}\right) + (1-\Theta) \left(\frac{B}{B+D}\right)$, where parameter θ represents the policy maker's relative importance attached to missing crises (Type I error) versus issuing false alarms (Type II error). Finally, the relative usefulness of an indicator expresses the policy maker's gain from using the model for predicting crises compared to disregarding the model and always issuing a signal or never issuing a signal : $RU = \frac{\min[\Theta,(1-\Theta)]-L}{\min[\Theta,(1-\Theta)]}$.

The above metrics are all calculated for a given threshold, above which the indicator issues a signal. Recent early warning applications have evaluated the predictive power of indicators on the basis of the indicators' AUROC (Area Under the Receiver Operating Characteristic). The ROC (Receiver Operating Characteristic)-curve plots the indicator's TPR against the FPR for every possible value of the threshold. The area under the ROC-curve or AUROC ranges from 0 to 1 : a value larger than 0.5 indicates that an indicator issues informative signals, while for a fully informative indicator the AUROC is 1.

Threshold identification

The metrics discussed above permit calculation of the optimal threshold for an indicator. In particular, the threshold that minimises the noise to signal ratio (potentially conditional on the TPR exceeding a sufficiently large number) or the policy maker's loss function (which for a given indicator is equivalent to maximising the relative usefulness) is selected. Indicator identification involves a trade-off between missing crises (Type I error) and issuing false alarms (Type II error) : a lower threshold decreases the Type I error rate but at the same time increases the Type II error rate.

level observed in tranquil periods. This indicates that the household credit to GDP gap can be considered as a good leading indicator for real estate related banking crises for these prediction horizons.

THRESHOLD IDENTIFICATION

A threshold value provides a quantitative benchmark to assess whether the current value of an indicator constitutes a "warning" or a signal. When the value of an indicator exceeds the threshold, this can signal the potential materialisation of the targeted risk over a pre-specified horizon and may serve as a trigger for more in-depth assessment and monitoring of the risk or potential policy actions. Typical techniques for identifying indicator threshold values include using the statistical distribution of the indicator (e.g., a percentile of the variable's distribution), or estimation of values that minimise a policy maker's "loss function", in which the loss arising from missing crises and issuing false alarms are traded off (see Box 2).

This article proposes an alternative approach, in which the confidence intervals in Chart 2 serve as the basis for determining zones which indicate the severity of the signal for a particular time horizon. We consider as the "normal zone" the area in Chart 2 situated below the maximum of the upper confidence bounds for "non-crisis countries" and "tranquil periods". We consider as the "danger zone" the area in Chart 2 situated above the lower confidence bound for "crisis countries". Depending on whether or not the "normal zone" and the "danger zone" overlap, 4 zones can be identified, as summarised in Table 1.

TABLE 1 COLOUR CODING OF SIGNALLING ZONES

	Not in danger zone	In danger zone
In normal zone	Safe	Danger, but false alarms
Not in normal zone	Warning, but not danger	Danger

Source : NBB.

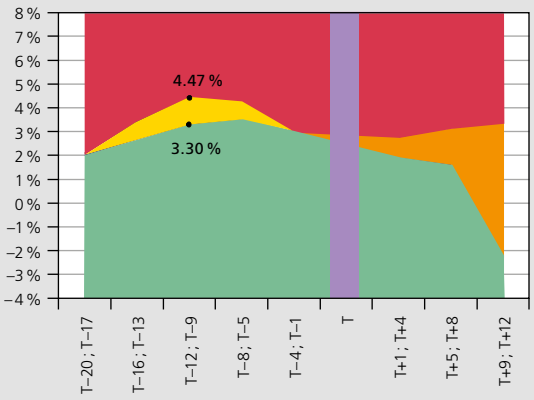
Indicator levels in the green zone (i.e., *below* the lower confidence bound for "crisis countries" and *below* the maximum of the upper confidence bounds for "non-crisis countries" and "tranquil periods") can be considered as "safe", as the indicator value is situated in the "normal zone" and not in the "danger zone". No signal is issued.

The indicator is in the red zone when its value is *above* the lower confidence bound for "crisis countries" and *above* the maximum of the upper confidence bounds for "non-crisis countries" and "tranquil periods". Here, the indicator assumes values consistent with being in the "danger zone" and at the same time not in the "normal zone". A strong signal is issued.

Two zones are identified in which an intermediate signal is issued. An indicator is in the yellow zone when its level is *above* the maximum of the upper confidence bounds for "non-crisis countries" and "tranquil periods" but still *below* the lower confidence bound for "crisis countries". The orange zone corresponds to a situation in which the indicator level is *above* the lower confidence bound for "crisis countries" and *below* the maximum of the upper confidence bounds for "non-crisis countries" and "tranquil periods". In the yellow zone, a warning is issued, as the value of the indicator is no longer in the "normal zone", but it is not in the "danger zone" either. In the orange zone, the indicator is in the "danger zone", but the risk of false alarms is likely to be high, as the indicator value is also still situated in the "normal zone".

For illustrative purposes, Chart 3 maps the confidence bounds in Chart 2 into the colour coding of signalling zones. The chart shows that, in contrast to the existing methodologies described in Box 2, the methodology does

CHART 3 SIGNALLING ZONES FOR HOUSEHOLD CREDIT TO GDP GAP



Source : NBB Calculations.

not result in a single threshold for a given prediction horizon, but rather multiple thresholds that determine zones with increasing likelihood of a crisis to be expected over the relevant prediction horizon. A further advantage is that these thresholds are based on the statistical distribution of the indicator across countries and over time ; no assumption on an objective function is needed to obtain them.

As an example, consider the prediction horizon [T–12 ;T–9] in Chart 3. No signal is issued for values of the household credit to GDP gap below 3.30 %. Values of the household credit to GDP gap between 3.30 % and 4.47 % would result in an intermediate signal (yellow zone) for a real estate related banking crisis to occur within 2 to 3 years. Finally, values above 4.47 % would result in a strong signal (red zone) of expecting a real estate related banking crisis over the prediction horizon.

2. Application of the monitoring framework to Belgium

In this section the graphical early warning methodology is applied to four potential early warning indicators of real estate related banking crises : measures of credit granted to the household sector (the level of household credit to GDP and the household credit to GDP gap) and developments in real estate prices (nominal house price growth and the price to income ratio). The indicator thresholds are obtained for a prediction horizon [T–12 ;T–5], i.e., indicators would signal the potential occurrence of a real estate related banking crisis 1 to 3 years in advance.

2.1 Results

Chart 4 plots the historical pattern of the four variables in Belgium (up to 2013Q3) against the background of the zones resulting from the graphical methodology. The presence of the yellow zone reveals that the "normal zone" and the "danger zone" do not overlap for any of the four indicators, implying that they have good predictive power for the given prediction horizon (see Box 3 for a statistical evaluation of the indicators' predictive power).

In addition to the zones derived from our novel graphical methodology, Chart 4 also plots optimal statistical thresholds (see Box 2 for the underlying methodology) obtained from minimising the noise to signal ratio conditional on predicting at least two thirds of the crises (the dashed horizontal line) and a policy maker's loss function with equal weight given to Type I and Type II errors (the full horizontal line).

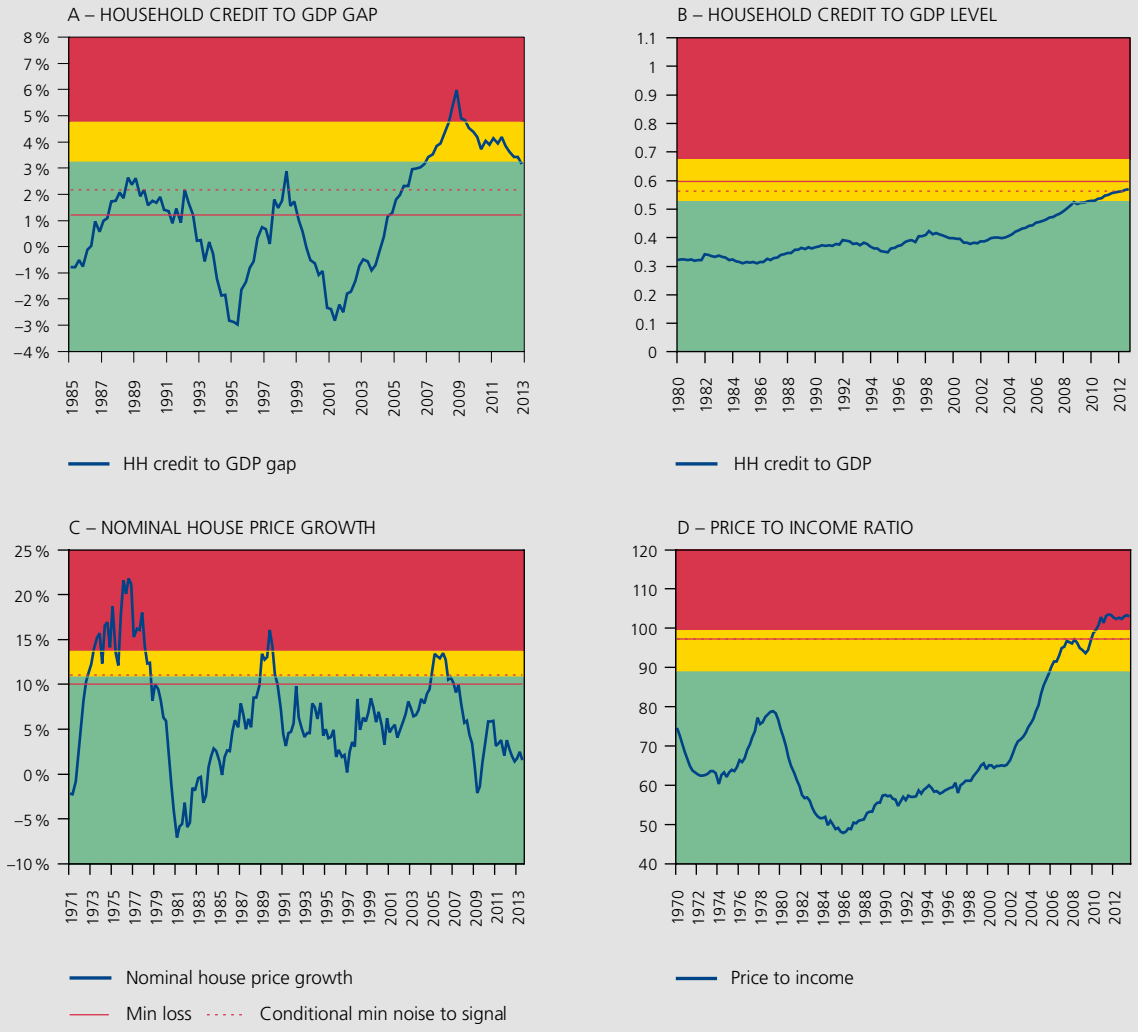
For 3 out of 4 indicators, one or more statistical thresholds are situated in the yellow area between the "normal zone" and the "danger zone". For the household credit to GDP gap, statistical methods would issue warnings starting from levels still in the "normal zone". Overall, the graphical methodology results in thresholds that are rather similar in magnitude to the statistical thresholds (see Box 3 for a discussion).

The top panels of Chart 4 present the historical evolution of the measures of credit granted to the household sector in Belgium. Panel A shows that the household credit to GDP gap reached levels that were no longer consistent with the "safe" zone in 2007Q4. The gap between household credit and its long-term trend continued to increase and entered the "danger zone" in 2009Q1. The gap peaked two quarters later and returned to levels below the "danger zone" in 2010Q2, though it remained above the "normal zone" until 2013Q2. If the household credit to GDP gap is compared with the statistical thresholds, the indicator already started issuing warnings from 2005-2006 onwards.

Panel B of Chart 4 reveals that the strong expansion of household credit resulted in an increasing level of household indebtedness. In particular, the level of household credit to GDP approached the upper bound of the "normal" zone towards the end of 2009 and continued moving further into the yellow zone. While still below the "danger zone" and (slightly) below the statistical warning thresholds, this increase in household indebtedness is considered as worrisome.

The bottom panels of Chart 4 show the historical developments in real estate prices in Belgium. Panel C reveals that

CHART 4 HISTORICAL APPLICATION OF THE MONITORING FRAMEWORK TO BELGIUM



Source: NBB Calculations.

nominal house price growth started accelerating from early 2002 onwards. This resulted in growth rates no longer consistent with the "normal zone" in the period from 2005Q1 to 2006Q2, during which statistical thresholds were breached as well. Since then, nominal house price growth has returned to "safe" territory.

While nominal house price growth never entered the "danger zone", accumulated strong house price growth in combination with the absence of a major correction (nominal house price growth turned slightly negative in 2009Q2-2009Q3) resulted in a potential overvaluation of the Belgian housing market. Panel D of Chart 4 indeed shows that the price to income ratio is no longer consistent with the "normal zone" from 2006Q1 onwards and entered the "danger zone" in 2010Q2. Statistical thresholds started issuing signals one quarter earlier.

Box 3 – Predictive power of the indicators for identified thresholds

Table 2 provides an overview of the predictive power of the indicators for the thresholds presented in Section 2. A review of the concepts used in Table 2 is presented in Box 2.

TABLE 2 SUMMARY OF EVALUATION MEASURES FOR SELECTED EARLY WARNING INDICATORS

	AUROC	Threshold	TPR	Type I error (1-TPR)	Type II error (FPR)	Noise to signal	Loss	Relative usefulness
Not in green zone								
HH credit to GDP gap	0.80	3.22 (1)	0.61	0.39	0.24	0.39	0.32	0.37
HH credit to GDP level	0.77	0.52	0.67	0.33	0.33	0.50	0.33	0.33
Nominal house price growth	0.75	10.79 (1)	0.74	0.26	0.30	0.41	0.28	0.44
Price to income	0.79	88.90	0.77	0.23	0.36	0.47	0.29	0.41
In red zone								
HH credit to GDP gap	0.80	4.75 (1)	0.49	0.51	0.18	0.38	0.35	0.31
HH credit to GDP level	0.77	0.67	0.54	0.46	0.17	0.33	0.31	0.38
Nominal house price growth	0.75	13.69 (1)	0.53	0.47	0.20	0.37	0.33	0.33
Price to income	0.79	99.25	0.63	0.38	0.20	0.32	0.29	0.42
Conditional minimum noise to signal								
HH credit to GDP gap	0.80	2.17 (1)	0.80	0.20	0.31	0.38	0.25	0.49
HH credit to GDP level	0.77	0.56	0.67	0.33	0.26	0.40	0.30	0.40
Nominal house price growth	0.75	11.01 (1)	0.68	0.32	0.27	0.40	0.29	0.41
Price to income	0.79	97.23	0.68	0.32	0.22	0.32	0.27	0.46
Minimum Loss								
HH credit to GDP gap	0.80	1.21 (1)	0.97	0.03	0.41	0.42	0.22	0.56
HH credit to GDP level	0.77	0.59	0.64	0.36	0.24	0.37	0.30	0.40
Nominal house price growth	0.75	10.01 (1)	0.74	0.26	0.30	0.41	0.28	0.44
Price to income	0.79	97.23	0.68	0.32	0.22	0.32	0.27	0.46

Source: NBB calculations.
(1) In %.

The first column of Table 2 presents the indicators' AUROC values over the prediction horizon [T–12;T–5]. These values, which are the same across the four parts of the table, show that all four indicators have good predictive power, with AUROCs well (and significantly) above 0.5.(1) The other columns of Table 2 provide an evaluation of the indicators' signalling power for each of the thresholds derived in the four parts of the table.

The upper part of Table 2 presents the results based on the thresholds for the zones obtained on the basis of our novel graphical methodology. Specifically, "not in green zone" refers to a situation in which an indicator lies

(1) See Annex 4 for the dynamic movement in indicators' AUROCs around crisis events.

above the green area, thereby assuming values not in line with normal times. Depending on the indicator level, an intermediate or a strong signal is issued. "In red zone" reflects a situation in which the indicator is in the "danger zone" and not in the "normal zone" and therefore a strong signal is issued.

The bottom part of Table 2 presents the indicators' signalling performance for optimal statistical thresholds derived on the basis of two objective functions: the minimum noise to signal ratio conditional on predicting two thirds of the crises, and a policy maker's loss function with equal weight given to Type I and Type II errors.

Overall, the analysis shows that the red zone identified by our graphical methodology is characterised by both the lowest TPRs (0.49-0.63) but also the lowest FPRs (around 0.20). The methodology only issues a strong signal when the risk of false alarms (Type II error) is limited. If intermediate signals ("not in green zone") are also considered, that increases the fraction of crises correctly predicted (0.61-0.77) at the cost of issuing more false alarms (about one third of the time). Optimal statistical thresholds in most cases tend to be situated somewhere in between. They improve model performance, but the difference in relative usefulness is nevertheless limited in a number of cases.

2.2 Policy conclusions

The signals related to increasing levels of household indebtedness in combination with a potential overvaluation of housing prices suggest the need for close monitoring of developments in the Belgian real estate market and Belgian banks' mortgage loan portfolios.

Indeed, the Bank has closely monitored developments in the Belgian housing and mortgage market over the last years. In addition, it started in 2011 with a periodical quantitative survey of 16 Belgian banks, in order to assess and monitor the overall risk profile and quality of their residential mortgage loan portfolios. The Bank's Financial Stability Review of 2012 concluded that increased vigilance was required from banks and authorities to ensure the continuous application of sufficiently conservative credit standards and adequate risk pricing in all new mortgage loans. It also called for a tightening of credit standards, where necessary, in order to maintain high asset quality of the Belgian mortgage loan portfolios.

Further analysis over 2012 and 2013 suggests that if conditions in the Belgian housing market were to become less buoyant than they have been over the past 15 years, the riskier mortgage loan segments (in terms of maturities, loan size and/or debt service ratios) in the outstanding stock of mortgage loans could be the source of higher than expected credit losses for banks. Against the background of a potential overvaluation of property prices in Belgium, as acknowledged by both the Bank and international institutions such as the ESRB, the OECD and the IMF, this is considered to be a potential systemic risk.

As described in detail in the article on recent developments and prudential measures in the Belgian mortgage market in this Financial Stability Review, the Bank has therefore undertaken actions to mitigate systemic risk stemming from the Belgian real estate sector. These actions comprise a flat-rate 5 percentage point add-on to the risk weights applied by banks, under Belgian law, that use the internal ratings based approach to mortgage loans covered by residential real estate located in Belgium. In view of the cyclical character of this measure, the Bank will keep a close eye on market developments for the purpose of continuous assessment of the appropriate level of that add-on.

The graphical methodology described in this article serves as input into the Bank's general monitoring framework for housing and mortgage market developments. Signals received from the proposed early warning methodology facilitate the detection of possible excessive developments. It should be noted, however, that such signals should not serve as automatic triggers for policy action.

In particular, uncertainty over both threshold levels and the validity of cross-country results for individual countries warrants caution in the policy application of such frameworks. Particular developments in housing and mortgage markets may be driven by country-specific factors such as the fiscal treatment of mortgage debt and demographic trends. Furthermore, there may be substantial heterogeneity in the risk profile of individual loans underlying aggregate mortgage market developments. These country specificities and heterogeneities should be taken into account in in-depth systemic risk assessments. The role of the early warning methodology developed in this article is

exactly to indicate the potential need for such further in-depth assessment and monitoring of possible risk sources and triggers.

Conclusions

This article presents a novel graphical methodology for identifying leading indicators of real estate related banking crises. The framework also allows identification of thresholds that determine zones, which correspond to different intensities of the signal issued by the indicator for a given prediction horizon. As such, the framework can be applied as a monitoring tool for systemic risks stemming from the real estate sector.

The analysis could be applied to early warning indicators for other types of crises as well. For example, applying the methodology to banking crises stemming from excessive leverage and credit growth would result in a monitoring framework for guiding decisions on macroprudential instruments such as the countercyclical capital buffer.

It should be noted, however, that signals obtained from early warning indicators and thresholds should not serve as automatic triggers for policy action. Uncertainty over both threshold levels and the validity of cross-country results for individual countries warrants caution in the policy application of such frameworks. Rather, they should be considered as input into the first stages of the systemic risk assessment process, indicating the potential need for further in-depth assessment and monitoring of possible risk sources and triggers.

The article highlights the relevance of the results for systemic risks stemming from the Belgian real estate sector. In particular, signals related to increasing levels of household indebtedness in combination with a potential overvaluation of housing prices suggest the need for close monitoring of developments in the Belgian real estate market and Belgian banks' mortgage loan portfolios. Such in-depth analysis of Belgian banks' mortgage loan portfolios has resulted in recent actions undertaken to mitigate systemic risk stemming from the Belgian real estate sector.

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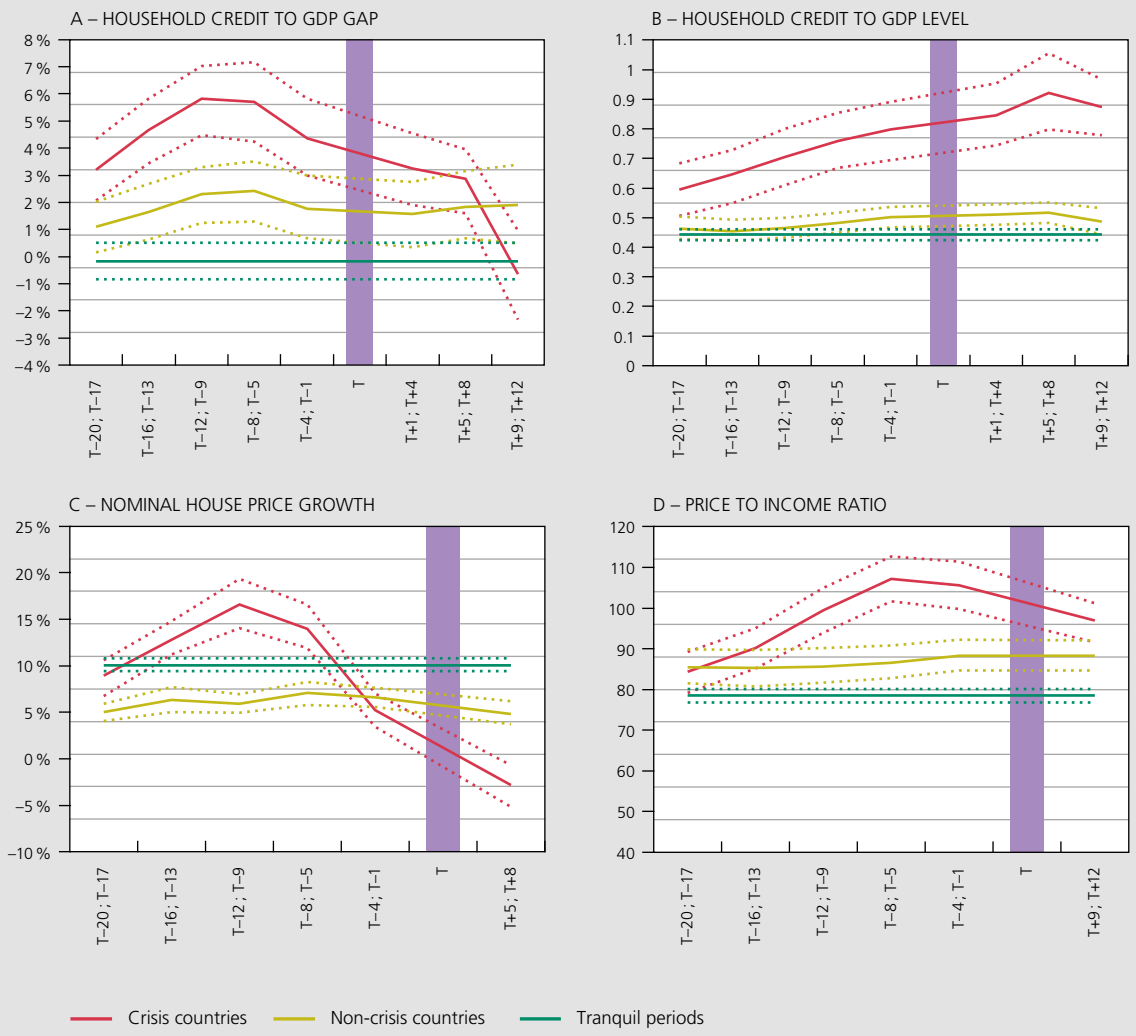
Annex 1 : Identified crises and data coverage

	Real estate related banking crisis	HH credit to GDP level	HH credit to GDP gap	Nominal house price growth	Price to income ratio
Austria	–	1995Q4–2013Q1	2000Q4–2013Q1	2001Q1–2012Q4	2000Q1–2012Q4
Belgium	–	1980Q4–2013Q1	1985Q4–2013Q1	1971Q1–2012Q4	1970Q1–2012Q4
Denmark	1987Q1–1992Q3 2008Q3–2008Q4	1994Q4–2013Q1	1999Q4–2013Q1	1971Q1–2012Q4	1981Q1–2012Q4
Finland	1991Q1–1995Q4	1970Q4–2013Q1	1981Q1–2013Q1	1971Q1–2013Q1	1975Q1–2013Q1
France	2008Q1–2008Q4	1977Q4–2013Q1	1983Q4–2013Q1	1971Q1–2013Q1	1978Q1–2013Q1
Germany	–	1970Q4–2013Q1	1996Q4–2013Q1	1971Q1–2013Q1	1980Q1–2013Q1
Greece	2008Q1–2008Q4	2000Q4–2011Q1	2005Q4–2011Q1	1998Q1–2013Q1	1997Q1–2013Q1
Ireland	2008Q1–2008Q4	2002Q1–2013Q1	2007Q1–2013Q1	1971Q1–2013Q1	1977Q1–2013Q1
Italy	–	1970Q4–2013Q1	1995Q4–2013Q1	1971Q1–2012Q4	1970Q1–2012Q4
Luxembourg	–	2005Q1–2013Q1	2010Q1–2013Q1	2008Q1–2012Q4	2007Q1–2012Q4
The Netherlands	2008Q1–2008Q4	1990Q4–2013Q1	1995Q4–2013Q1	1971Q1–2013Q1	1970Q1–2013Q1
Portugal	–	1979Q4–2013Q1	2000Q4–2013Q1	1989Q1–2013Q1	1995Q1–2013Q1
Spain	2008Q1–2008Q4	1980Q4–2013Q1	1985Q4–2013Q1	1972Q1–2013Q1	1971Q1–2013Q1
Sweden	1991Q1–1994Q4	1980Q4–2013Q1	1998Q1–2013Q1	1971Q1–2013Q1	1970Q1–2013Q1
United Kingdom	1991Q1–1991Q4 2007Q1–2007Q4	1970Q4–2013Q1	1975Q1–2013Q1	1971Q1–2013Q1	1975Q1–2013Q1

Notes: The Babecky et al. (2012) database reports crisis periods distinguishing whether "at least one source" or "at least two sources" confirmed the occurrence of a crisis. We combine this information and consider that all episodes confirmed by at least one source are potentially real estate related banking crises. However, whenever the crisis period was confirmed by at least two sources, we consider the latter information to mark the start of banking crises. For the purpose of our analysis, the length of the crisis period does not matter (see Annex 3). What is important is to identify the start of a real estate related banking crisis.

Annex 2 : Pattern of selected early warning indicators around crises

PATTERN OF SELECTED EARLY WARNING INDICATORS AROUND CRISES



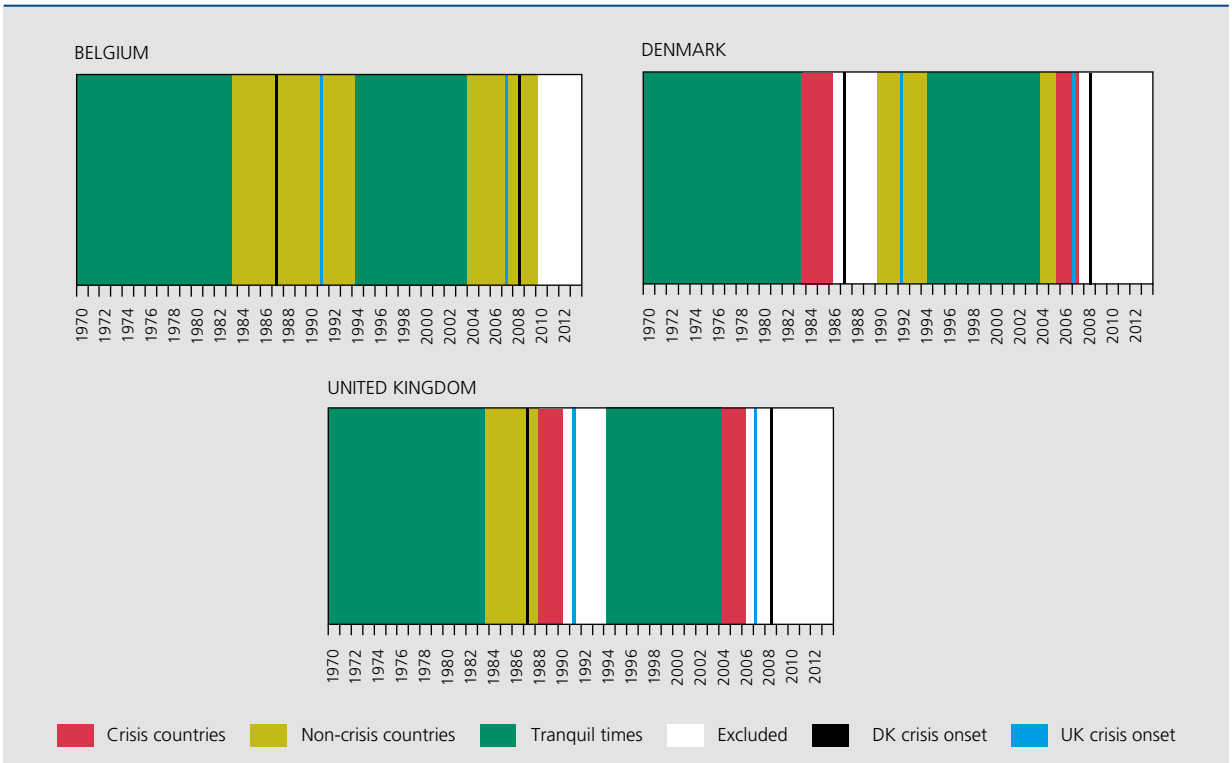
Source : NBB Calculations.

Annex 3 : Three-country example of data classification

We classify three subsets of observations and calculate cross-country averages across the relevant observations :
- observations in crisis countries around their own real estate related banking crises (denoted "crisis countries"),
- observations in the windows around these crisis events for countries that do not experience a real estate related banking crisis at those points in time (denoted "non-crisis countries"),
- observations outside the relevant window around any real estate related banking crisis event in the sample (denoted "tranquil periods").

In a three-country sample consisting of Belgium, Denmark and the United Kingdom, observations for the different countries would be classified as follows.
- Observations for which none of the three countries is in the relevant window [T–12 ;T+12] around a crisis are classified as "tranquil times". These are indicated by the dark green areas in the chart below.
- Observations for which a given country is in the window [T–12 ;T–5] around the onset of its own crises are classified as "crisis countries" and indicated by the red areas.
- Observations for which a given country is not in the window [T–12 ;T+12] around its own crises and at the same time another country is in the window [T–12 ;T–5] around its own crises, are classified as "non-crisis countries" and indicated by the light green areas.
- Finally, white areas indicate observations that are excluded from the evaluation. Excluded observations are those for crisis countries in the window [T–4 ;T+12] around their own crises.[1]

THREE-COUNTRY EXAMPLE OF DATA CLASSIFICATION



Source : NBB.

(1) In addition, the last three years of the sample are also excluded, as it is impossible to know whether or not these observations count as pre-crisis observations.

Annex 4 : AUROC curves for selected early warning indicators

AUROC CURVES FOR SELECTED EARLY WARNING INDICATORS

Source : NBB Calculations.

The role of internal models in regulatory capital requirements : a comparison of Belgian banks' credit risk parameters

Eric Gustin
Patrick Van Roy

One of the essential features of the international bank regulatory framework that has been developed by the Basel Committee on Banking Supervision (BCBS) is the use of risk-weighted assets (RWAs) for the determination of the minimum amount of capital that each bank must hold. In the Basel framework, minimum capital requirements are expressed as a percentage of risk-weighted assets, rather than of total assets. A key innovation that was introduced in the second version of the Basel framework (i.e., Basel 2) was to allow banks, under certain conditions, to replace standardized parameters used for estimating the risk weights of particular assets, such as loans, with parameters estimated directly by the banks, using their own internal models. Under this Internal Rating Based (IRB) approach, each bank is required to calibrate and test its model estimates using the bank's own data on the historical performance of its assets.

The use of internal models for the estimation of the risk parameters entering into the calculation of risk-weighted assets, and hence of capital requirements, has the potential advantage of tailoring banks' minimum capital requirements to the true riskiness of their assets. Basing capital requirements on standardized risk weights that reflect sector-level averages, as was the case in the Basel 1 framework, can result in capital levels that are either too low or too high for a particular bank, given the composition of assets in its portfolios. A mismatch between the regulatory capital requirements and the true risk of the assets can then lead to unintended consequences. One potential unintended consequence of Basel 1 that was often cited was a situation whereby banks increase the riskiness of their loan portfolios in order to align the true risk of the underlying loans with the capital requirements for the portfolio.

At the same time, concerns have been expressed, by observers and authorities both, that banks' use of internal models may lead to differing estimates of risk across banks for similar assets. To the extent that this occurs, an unlevel playing field will be created, whereby banks with lower risk estimates for a given asset will be required to hold less capital than banks with higher risk estimates for the same or a similar asset. Moreover, undue differences in RWAs across banks may undermine the effectiveness of RWAs as a metric for reporting, supervision, or bank decision making. As a result of these concerns, debate is currently ongoing within the regulatory community regarding the comparability of the risk metrics calculated via banks' internal models, as well as concerning the ultimate role that risk-sensitive capital requirements should play in bank regulation.

For banks using the advanced version of the IRB approach (i.e., AIRB), estimates of the value of risk-weighted assets of a loan portfolio depend upon the estimated probabilities of default (PD) of the loans in the portfolio as well as on the estimates of loss given default (LGD) of the loans. At the same time, these risk parameters alone will not explain the entire value of RWAs for the portfolio : the amounts granted of loans of varying riskiness also plays a key role in the determination of RWA. Differences in RWAs across banks for similar types of loan portfolios may thus be due as much to differences in banks' lending

practices (reflected in their portfolio composition) as to differing risk parameter estimates by the banks for similar loans. It is important to clearly separate these two factors in order to accurately gauge the impact of banks' use of internal models in the calculation of minimum capital requirements.

Several recent studies, including publications by the Basel Committee on Banking Supervision (2013a) and the European Banking Authority (2013a, b and c), appear to confirm that RWAs for credit risk do indeed vary significantly across banks. The main objective of these recent exercises, as suggested above, has been to identify and quantify the factors leading to the observed differences of RWAs between banks for comparable types of portfolios.

This article presents the results of a similar exercise conducted by the NBB on the corporate and public sector entity loan portfolios for the four largest Belgian banks. The analysis is based on detailed data on risk parameters obtained through an ad hoc survey administered to these banks. Thanks to the specific methodology used in collecting and analysing the data, we are able to largely disentangle the two main drivers explaining differences in observed RWA; namely, the risk parameters estimated through the banks' internal models and the distribution of loans in the portfolio. We find that differences in LGDs are more important determinants of differences in RWAs than are PDs. The differences in LGDs across banks appear to be linked to differences in both collateral practices and in modelling frameworks or assumptions. To the extent that the use of internal models contributes to differences in RWAs, the modelling of LGDs appears to be significantly more important than that of probability of default.

The remainder of the article is organized as follows. Section 1 describes the notion of RWAs in more detail and discusses some of the practical difficulties involved in analysing differences in RWAs across banks. Section 2 describes the NBB survey and the data. Section 3 presents the results of the analysis. Section 4 concludes.

1. Banks' internal models and variations in RWAs

The risk-weighted assets of a portfolio are computed by calculating a "risk-weight function" for each asset class, which is intended to reflect the bank's exposure to potential losses associated with that class of assets. As is described in Box 1, the risk-weight functions for banks using the IRB approach use the following variables as inputs: probability of default (PD), loss given default (LGD), exposure at default (EAD), and maturity (M).

Box 1 – The Standardised versus the IRB approach under Basel 2

The Basel 2 framework allows credit institutions to calculate risk-weighted assets exposures taking into account either internal or external assessments of creditworthiness. This is an important difference as compared to the Basel I approach, which did not allow banks to treat differently obligors of differing creditworthiness within the same asset class.

For portfolios for which banks use the internal ratings-based approach (IRB) to calculate their RWAs, Basel 2 details the treatment of both expected and unexpected credit losses. The amount of provisions to be set aside against expected losses and the amount of capital to be held against unexpected losses are determined as a function of the following risk parameters:

- Exposure at default (EAD), which indicates the maximum potential loss at the time of default [1]
- Probability of default (PD)
- Loss given default (LGD); i.e., the percentage amount that a party expects to lose if a creditor defaults on a certain type of contract [2]

(1) A default is considered to have occurred when either the bank considers that the obligor is unlikely to pay its credit obligations to the banking group in full, or when the obligor is more than 90 days overdue on any material credit obligation to the banking group. For retail exposures, the definition of default can be applied at the level of a particular facility, rather than at the level of the obligor.

(2) The Basel 2 accord stipulates that a bank must estimate a LGD that aims to reflect economic downturn conditions where necessary to capture the relevant risks. This LGD cannot be less than the long-run default-weighted average loss rate for that type of facility. In addition, a bank must take into account the potential for the LGD to be higher than the default-weighted average during a period when credit losses are substantially higher than average. For this purpose, banks may use averages of loss severities observed during periods of high credit losses, forecasts based on appropriately conservative assumptions, or other similar methods. LGD estimates must be grounded in historical recovery rates and, when applicable, must not be based solely on the collateral's estimated market value

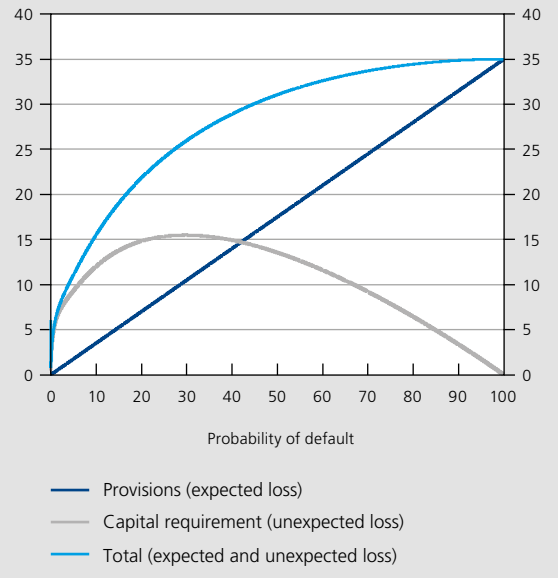
– Maturity (M), or the period over which the loan is repaid
– Size (S) of the firm
– Correlation (R) in credit defaults

Provisions should cover expected losses, which are calculated as the product of EAD, LGD and PD. Capital should be sufficient to cover unexpected losses of at least 8 % of the product of the EAD and the risk-weights, which are the outputs of certain risk-weight functions. These risk-weight functions, supplied by the Basel 2 accord, use the above-mentioned risk parameters as inputs. The possible outcomes of such a risk-weighting process are shown in the left-hand chart below, which expresses the Basel 2 minimum provision and capital requirements (as a percentage of EAD) according to different levels of the probability of default for the case of a large corporate exposure with an estimated LGD of 35 % and a maturity of 2.5 years. In this example, a shift in PD from 1 % to 2 % results in a shift in the minimum required provision for expected loss (EL) from 0.35 % to 0.7 % of EAD and a shift in the minimum capital requirement for unexpected loss (UL) from 5.7 % to 7.1 % of EAD.

Changes in the risk parameters other than the probability of default can also affect the level of the minimum provision and capital requirements. The right-hand chart illustrates the effect of two different levels for the parameter LGD. The chart shows that a higher LGD tilts upwards both the linear expected loss curve and the non-linear unexpected loss curve. Further exploring our previous example, for an LGD of 50 % instead of 35 %, the minimum provision and capital requirements are higher at respectively 0.5 % and 8.2 % (versus 0.35 % and 5.7 % in the case of an LGD of 0.35 %). An increase in the probability of default from 1 % to 2 % now results in a shift in provisions from 0.5 % to 1.0 % and a shift in regulatory capital requirements from 8.2 % to 10.2 %.

CHART A MINIMUM PROVISION AND CAPITAL REQUIREMENTS IN FUNCTION OF THE PROBABILITY OF DEFAULT

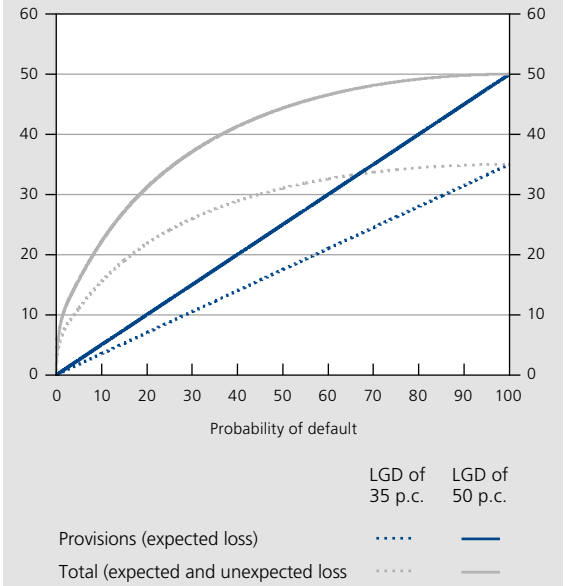
(percentages of exposure at default, example for corporate claim with loss given default of 35 p.c.)



Source : NBB.

CHART B MINIMUM PROVISION AND CAPITAL REQUIREMENTS IN FUNCTION OF THE PROBABILITY OF DEFAULT FOR TWO DIFFERENT LEVELS OF LOSS GIVEN DEFAULT

(percentages of exposure at default, example for corporate claim)



Source : NBB.

To counteract potential cyclical effects in the calculation of capital requirements, credit risk parameters must be conservative, based on economic or market conditions that are relevant to current and foreseeable conditions, and must be "through-the-cycle" estimates instead of "point-in-time estimates" (e.g. PDs should be long-run averages of one-year default rates). This implies that we should only see an upwards revision of current PDs and LGDs in so far as the current market conditions deviate from the expected "through the cycle" market conditions when these parameters were established for the relevant exposures. Another important assumption is that portfolios are well-diversified with a high granularity (otherwise, defaults will be more correlated than assumed by the risk-weight function, leading to a minimum capital requirement that is too low for the portfolio concerned).

Conditional on supervisory approval and subject to continuous monitoring, banks using IRB models are allowed to estimate one or more risk parameters. Banks that qualify for the Foundation IRB (FIRB) approach can only estimate PDs internally. Banks qualifying for the Advanced IRB (AIRB) approach can also estimate LGD, EAD and M. Credit risk mitigation, either through guarantees, credit derivatives or collateral, is incorporated in the calculations through modifications to inputs of the risk-weight function (for instance PD or LGD).

Studies undertaken by the BCBS have attempted to target the primary drivers of RWA variations by considering two levels of aggregation (see BCBS, 2013a). Some analyses have been performed at portfolio level, while another analysis has been undertaken at counterparty (obligor) level, but only on the basis of hypothetical portfolios (e.g., of sovereign, bank and corporate exposures). Clearly, the latter type of exercise can only identify differences in risk estimates, without shedding any light on banks' lending practices or on the actual composition of the portfolios. Studies by the European Banking Authority (EBA), which have been conducted at portfolio level, have had a similar objective. These studies have resulted in several interim reports covering many types of exposures (from high to low-default portfolios) and identifying many potential drivers of differences in banks' RWA levels (see EBA, 2013a, b and c).

Taken together, these studies highlight three main sources of discrepancies in RWAs related to credit risk.

– First, it appears that an important part of the variation is explained by the risk profiles of the banks' portfolios (i.e. differences across banks in the relative shares of different asset classes and differences in asset composition within asset classes);

– Second, it appears that the remaining differences can partially be explained by banks' internal practices, and decisions taken with respect to the implementation and monitoring of the IRB framework. For example, the level of conservatism embedded in the models may vary significantly across institutions. As an illustration, banks are recommended to calculate 'Downturn LGD' (Downturn Loss Given Default), which reflects the losses occurring during a 'Downturn' in a business cycle for regulatory purposes. This calculation based on micro and macro-economic factors may vary significantly between institutions.

– Third, a less important source of RWA differences is to be found in areas of national discretion in implementing the Basel standards and in local supervisory practices. For example, the definition of "default" may differ from one jurisdiction to another, due to differences in the materiality threshold for this concept. A 90 day past-due amount of 25 euros may not be considered as default in some jurisdictions, while the default trigger would be activated in other jurisdictions.

In a nutshell, the BCBS and EBA studies, while not being able to make estimates on the basis of actual obligor-level data, conclude that the risk composition of banks' portfolios plays a substantial role in explaining differences in parameters (or RWA) for the portfolios considered. More specifically, while the BCBS reports that three quarters of differences in RWA are explained by differences in risk composition of banks' portfolios (the remaining quarter coming from practice-based drivers, with supervisory practices explaining only 5 % of the differences), the EBA concludes that the risk composition of banks' portfolios plays a significant role but to a lesser extent.

The objective of the NBB exercise is similar to the above-mentioned studies; however, because of the level of detail that the NBB has been able to collect, we are able to shed further light, at least for the four largest Belgian banks, on differences in RWA and variations in the underlying risk

parameters. Unlike the previous obligor-level studies that rely on purely hypothetical portfolios, our analysis is performed on actual loan data. Specifically, data for each of the RWA components are obtained at the level of obligor credit facilities.

Obviously, focusing on banks in a single regulatory jurisdiction implies a more restricted perimeter than that of the international studies. At the same time, the focus on a single jurisdiction allows us to eliminate any impact of local supervisory practices as a possible source of variation in banks' RWAs.

2. The NBB survey

Against this background, the NBB conducted an ad hoc survey to collect credit risk data. The focus was mainly on corporate credit risk, as this is most often the dominant driver of a bank's capital requirements.

With a view to assessing differences in estimated risk parameters across banks, the NBB first selected Corporate and Public Sector Entities (PSE) counterparties[1] having an exposure towards at least three of the four largest Belgian banks: Belfius, BNPP Fortis, ING Belgium and KBC (all using the AIRB approach for the selected portfolios). Identification of these common counterparties was undertaken on the basis of data contained in NBB's local Credit Register. Next, each bank received a list of counterparty individual codes (VAT IDs) and was requested to provide for each code the complete set of risk parameters entering into the calculation of RWA: PD, secured and unsecured LGD, loan maturity and size adjustment, as of June 30th 2013. Unlike a "typical" transversal benchmarking analysis, this information was requested at credit facility level rather than at obligor level. By collecting such granular data, the NBB was also able to obtain a view on the level of each bank's range of products.

Based on the data provided, we performed an important exercise of data quality control. A first step in this exercise consisted of a univariate analysis targeting each risk parameter. This permitted identification of outliers and erroneous or missing values that might have invalidated the final results. Once this step was completed, we recomputed RWA for each record at credit-facility level. This step allowed us to identify additional errors in the data reporting and to resolve any outstanding issues, which resulted in a final data set that was accurate and robust.

(1) Corporate includes exposures treated as Corporates and SMEs treated as Corporate in the Basel 2 formula. PSEs include state-owned enterprises and local authorities such as municipalities.

TABLE 1 RATIO OF EXPOSURES AT DEFAULT (EAD) IN NBB AD HOC SURVEY COMPARED TO "TERRITORIAL STATISTICS"

(in %, unless otherwise stated)

	Corporates	PSEs	Total EAD (in billion of €)
Bank 1	37.7	76.8	19.1
Bank 2	33.3	100.0	11.0
Bank 3	59.2	100.0	18.7
Bank 4	51.9	100.0	13.0

Source: NBB.

The distribution of credit facilities is very similar across banks in the sample: 95 % of these facilities consist of term loans and credits with mixed uses, as defined in NBB's Credit Register. In addition, Table 1 shows that the NBB ad hoc survey data are representative of the Belgian corporate and PSE portfolios, as reflected in the territorial statistics, which concern banking entities located in Belgium taking into account only the transactions of their Belgian offices; i.e. excluding the foreign branches and subsidiaries of these entities.

3. Results of the survey

By analysing a data sample which is both 'local' (namely, specific to a single jurisdiction) and granular (namely, targeting credit risk parameters at the credit facility level for each obligor), one can focus on the major drivers of RWA variations; that is, on the banks' practices relating to credit policies and to the use of internal models (i.e., the IRB framework). In terms of variation in banks' credit policies, our preliminary analysis suggests that there is considerable similarity in the distribution of the various types of loans across the four large Belgian banks. This should significantly reduce the impact of differences in portfolio product composition as a determinant of the differences in RWAs across the banks.

3.1 Risk parameters and exposure weights

One of the clear conclusions that can be drawn from our analysis is that the outcome of comparisons of estimated risk parameters across banks depends significantly on the particular risk parameter under consideration, as well as upon whether the calculation of the average value of that parameter across obligors for the bank is computed without taking into account the amounts of loan exposures

TABLE 2 AVERAGE (UNWEIGHTED) VALUES OF AIRB RISK PARAMETERS FOR COMMON COUNTERPARTIES

(in %)

	Corporates		PSEs	
	Average PD	Average LGD	Average PD	Average LGD
Bank 1	4.5	57.5	0.3	5.3
Bank 2	3.2	31.6	0.5	12.0
Bank 3	1.7	29.1	0.4	27.6
Bank 4	2.2	19.4	0.2	21.4
Max – Min	2.8	38.1	0.3	22.3

Source: NBB.

to each borrower; i.e., whether a weighted average is computed using the exposures (EADs) as weights. In order to illustrate the differences in these two methods, we first report in Table 2 the average unweighted values of the risk parameters for the loans of the four banks under review. We then compare these values with the weighted average values, which are reported in Table 3.

Two observations emerge from the comparison of these tables. First, and in line with international studies, the dispersion across the banks in the values of the non-weighted risk parameters (summarized here by the max/min difference) appears to be large. However, this spread decreases when considering EAD-weighted risk parameters. This effect is particularly observable for the corporate portfolio, where the dispersion almost disappears for PDs and is reduced by one-third for LGDs. In the section below, we explore the differences in LGDs in more detail.

TABLE 3 AVERAGE VALUES OF AIRB RISK PARAMETERS WEIGHTED BY EADS FOR COMMON COUNTERPARTIES

(in %)

	Corporates		PSEs	
	Average PD	Average LGD	Average PD	Average LGD
Bank 1	1.0	50.8	0.1	4.3
Bank 2	1.3	27.5	0.2	8.7
Bank 3	1.2	28.1	0.4	24.3
Bank 4	1.2	24.4	0.1	21.7
Max – Min	0.3	26.4	0.3	20.0

Source: NBB.

A second observation from Tables 2 and 3 is that the average values of the risk parameters using the EAD weights are lower than the averages computed on a non-weighted basis (with the exception of the average LGD of Bank 4). This clearly demonstrates that firms with lower estimated risk parameters tend to be granted, on average, larger loan amounts. This conclusion also appears consistent with the so-called "Basel 2 Use Test Requirement", which requires that banks actually make use of their IRB risk parameter estimates for internal risk management purposes, such as for the purposes of credit approval and loan portfolio management.

3.2 Linking PD and LGD to RWA

As noted in Box 1, the formula for computing regulatory capital charges uses PD and LGD parameters as inputs. Yet, the question arises regarding the extent to which variations in estimated PDs and LGDs affect the value of RWA. As can be seen in Box 1, the risk-weight formula implies that the capital charge coefficient increases with rising PD – at least up to a point[1]. Concerning the LGD, a linear dependence holds; that is, the capital charge coefficient is proportional to the LGD.

For reporting purposes, capital requirements are most often presented and analysed at portfolio level, although the calculations of these requirements are made at a more granular level (client or facility). This distinction needs to be taken into consideration when analysing banks' RWAs. On one hand, simple reporting of a single measure of risk, as for instance the "average RWA", does not provide sufficient information for outsiders to form a view on the mix of PDs and LGDs in the underlying assets that generate the RWA value at the portfolio level. On the other hand, systematic reporting of the parameters characterizing the shape of the underlying PD and LGD distribution would increase the burden and complexity of risk reporting, without necessarily providing more information relevant for the purposes of decision making. Consequently, a compromise between these two levels of detail needs to be achieved.

The next step in our analysis is to analyse more closely the link between RWA and the underlying risk parameters, PD and LGD. Having discussed above the differences in the information conveyed by non-exposure-weighted and exposure-weighted average values of risk parameters, we now focus on a more aggregate measure: that of risk

(1) From this point, the capital charges decrease with the PD, because it is assumed that at this level of risk, the losses are absorbed by the Expected Loss (which is reflected in the level of provisions) rather than by the Unexpected Loss (reflected in capital). Hence, the provisioning level should increase as the capital charges decrease. This effect is not discussed further in this article, as we do not have a representative sample of such cases.

TABLE 4 EAD WEIGHTED AVERAGE AIRB RISK PARAMETERS AND RISK DENSITY (RWA/EAD) FOR COMMON COUNTERPARTIES

(in %)

	Corporates			PSEs		
	PD	LGD	RWA/EAD	PD	LGD	RWA/EAD
Bank 1	1.0	50.8	69.3	0.1	4.3	4.1
Bank 2	1.3	27.5	39.1	0.2	8.7	8.4
Bank 3	1.2	28.1	39.4	0.4	24.3	22.4
Bank 4	1.2	24.4	34.7	0.1	21.7	14.0

Source: NBB.

density, defined as the RWA for a portfolio as a percentage of total exposures in the portfolio; i.e., RWA/EAD. Risk density is commonly viewed as a relevant indicator of the credit-riskiness of a bank or of a portfolio. Table illustrates how the risk density can be linked to PDs and LGDs (averaged using EAD-weighting).This table reports the average EAD-weighted PDs, the average EAD-weighted LGDs and the risk density for the corporate and PSE portfolios of each of the four banks.

As revealed in the table, the dispersion of risk densities across the banks appears to be largely explained by the dispersion of EAD-weighted LGDs. For instance, looking at the corporate portfolio, Bank 1 has a risk density and an EAD-weighted LGD that are twice as a high as the values of Bank 4. This result is due to the fact that these two banks' EAD-weighted PDs have the same magnitude, in contrast to their unweighted PDs, as is reported in Table 2. This observation suggests that differences in unweighted PDs appear to be unrelated to the observed differences in the risk densities reported in Table 4. We can thus conclude that, at least for the banks and the portfolios under consideration, differences in non-weighted or EAD-weighted PDs do not explain differences in risk densities. In other words, the banks' relative capital charges, as reflected by the risk density measure, do not appear to be significantly driven by differences across banks in PD estimates for the same obligor.

In order to test the robustness of this conclusion and to take further advantage of our granular data, we have recomputed the RWA of each credit facility of a given bank using the average PD for the corresponding obligor computed across all banks in the sample. This approach allows us to examine the extent to which a bank's RWA level will be impacted if the PDs of the other banks were used in the RWA calculation.

Table 5 reports the risk densities resulting from this "switch of PD" approach. Comparison of the values "Before" and "After" confirms that the impact of the change in PD is relatively small compared to the initial risk density level[1]. This is consistent with our conclusion that the PD

(1) An exception is the PSE portfolio of Bank 4, which has a very low average PD before switching.

TABLE 5 RISK DENSITY (RWA/EAD) BEFORE AND AFTER CALCULATION USING THE AVERAGE OF BANK'S PDS FOR COMMON COUNTERPARTIES

(in %)

	Corporates			PSEs		
	Before	After	Difference	Before	After	Difference
Bank 1	69.3	74.9	5.6	4.1	3.5	–0.6
Bank 2	39.1	37.7	–1.4	8.4	7.1	–1.3
Bank 3	39.4	46.1	6.7	22.4	21.1	–1.3
Bank 4	34.7	37.3	2.6	14.0	24.3	10.3

Source: NBB.

parameter is considerably less important in determining the level of RWA than is the LGD parameter. Interestingly, the BCBS (2013a) also concludes that LGD estimation appears to be a significant source of cross-bank differences in RWAs among banks using the advanced IRB approach for the calculation of capital requirements.

3.3 LGD as the main driver of RWA differences

We use our data to further examine the question of the differences across banks in the average LGDs as a key driver of variation in RWAs. The similarity across banks in loan types would not lead us to believe that the differences in portfolio compositions between the four banks could explain the significant differences in LGDs across banks. Rather, the variation in LGDs across banks seems to reflect, at least to a certain extent, differences in collateralization rates. Table 6 presents the ratio of Basel 2 eligible collateral to EAD ("collateralization rate") for the corporate segment.

Table 6 shows, as might be expected, that the higher is the rate of collateralization, the lower is the bank's average LGD. At the same time, there are some apparent inconsistencies. For example, Banks 2 and 3 have similar average exposure-weighted LGDs, yet their collateralization rates are quite different. In order to better understand the differences between these two banks, we examine the relationship between collateralization and LGD, as illustrated in Figure 1. This figure shows significantly greater dispersion for Bank 2 between these two variables.

TABLE 6 EAD WEIGHTED LGD AND COLLATERALIZATION RATE – CORPORATE SEGMENT

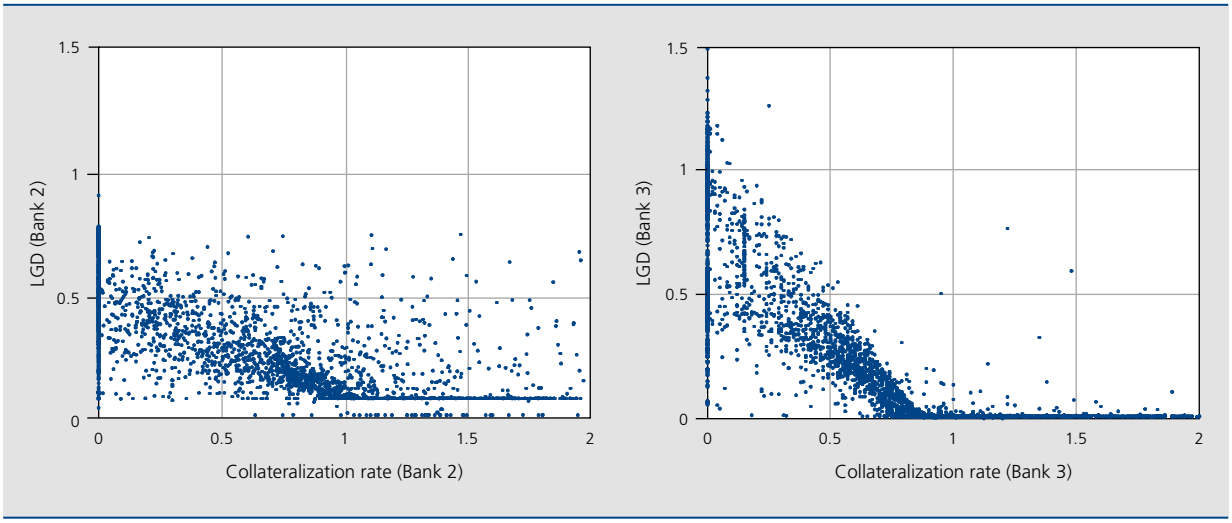
(in %)

	LGD	Collateral/EAD	RWA/EAD
Bank 1	50.8	6.9	69.3
Bank 2	27.5	72.3	39.1
Bank 3	28.1	47.3	39.4
Bank 4	24.4	48.2	34.7

Source: NBB.

The explanations for the greater dispersion for Bank 2 appear to be related both to the bank's collateral practices and to its approaches in the modelling of LGDs. First, the degree of conservatism in collateral management – e.g., the method of collateral valuation and inclusion in the model for estimating LGD – appears to differ across the two banks. Second, there are important differences between the two banks in their modelling approaches. The vertical bars at collateral rates of zero illustrate the variation in bank's LGD estimates. This range of LGD estimates then leads to the horizontal bars at LGDs close to zero, as a wide range of collateral is needed to bring various borrowers' LGDs to zero. Some of the differences in modelling LGDs are a natural outcome of the generality of international regulatory requirements concerning modelling; e.g., no specific regulatory guidance is provided to banks as to how to transform

FIGURE 1 ILLUSTRATION OF COLLATERALIZATION RATE VERSUS LGD DISPERSION AT THE FACILITY LEVEL – CORPORATE SEGMENT



Source: NBB

their average estimated LGD into a 'downturn' LGD estimate. This naturally leads to the development of different approaches across banks, and to associated differences in the results. Other potential issues relating to modelling differences across banks can concern data quality, model performance, or model assumptions.

3.4 Uses of RWA data

Our analysis of differences in banks' RWAs for similar types of loan portfolios illustrates the value of the data collected via the NBB ad hoc survey. As Box 2 illustrates, such data can also be valuable for other types of exercises, such as stress tests.

Box 2 – Potential use of NBB ad hoc survey data for stress testing

Credit stress tests assess the impact of a stressed macroeconomic scenario on the quality of banks' credit exposures. This approach essentially consists of three steps: (i) forecast values of macroeconomic variables under a given pre-specified (stressed) scenario over a given horizon, (ii) estimate the impact of the stressed macroeconomic variables on the banks' point in time credit risk parameters (typically PD and LGD) and the impact of the latter on the banks' P&L and (iii) estimate the impact of the stressed macroeconomic variables on the potential rating migration and IRB regulatory parameters to evaluate the impact of the stress scenario on the banks' RWA.

While supervisors can fairly easily challenge the P&L impact of the credit stress test reported by the banks via an expected loss calculation, they can usually less easily challenge its RWA impact due to the absence of data at the facility level on the Basel 2 risk parameters. Such granular data are needed since average values of risk parameters for a given portfolio only give a very crude approximation of the associated RWA once entered into the Basel 2 formula.

The NBB ad hoc survey, which has collected data on the Basel 2 credit risk parameters (PD, LGD, maturity, and size adjustment) of corporate exposures at the facility level, solves this issue. As an illustration of the potential usefulness of this data in the stress test context, the table below shows the relative increase in the corporate RWA of one of our sample banks following a combined increase in its regulatory PDs and LGD (the impact on RWA has been calculated for each credit facility using the Basel 2 formula and then aggregated at the portfolio level). Such a table can be useful to challenge the RWA impact reported by the bank in the stress test if the impact of the stressed macro variables on its IRB parameters is known. For instance, if the stress test is known to result in a combined increase of the bank's regulatory PD and LGD by 40 %, the NBB ad hoc survey data would suggest that its corresponding RWA should increase by 61.1 %. Such information can thus be used by supervisors in the quality assurance process of the stress test.

RELATIVE INCREASE IN RWA FOLLOWING A COMBINED INCREASE IN REGULATORY PD AND LGD – CORPORATE SEGMENT
(in %)

PD times …	LGD times …					
	1.0	1.2	1.4	1.6	1.8	2.0
1.0	0.0	20.0	40.0	60.0	80.0	100.0
1.2	8.0	29.6	51.2	72.8	94.4	116.0
1.4	15.1	38.1	61.1	84.1	107.1	130.1
1.6	21.4	45.6	69.9	94.2	118.5	142.7
1.8	27.1	52.5	77.9	103.3	128.7	154.1
2.0	32.3	58.7	85.2	111.6	138.1	164.5

Source: NBB.

Conclusion

In this article we report results of an analysis of differences across banks in risk-weighted assets for similar loan portfolios. Unlike previous international studies, we are able to use a unique, highly granular data set, which allows us to more clearly distinguish the importance of risk parameter estimates versus lending policies in explaining observed differences across banks in the values of their risk-weighted assets. Such an analysis can offer critical insight in the current debate concerning the costs and benefits of allowing banks to use internal models for estimating the risk parameters that enter into the calculation of regulatory capital requirements.

Consistent with concerns that have been voiced regarding the possibility that banks may produce different risk estimates for the same or similar assets, we find significant dispersion among the four large Belgian banks in the average non-weighted estimates of PDs and LGDs for similar obligors. However, the differences in average PD estimates almost entirely disappear when we compute average PDs that are weighted by actual loan exposures. This leads us to conclude that the relative levels of capital requirements, as reflected by banks' risk densities (RWA/EAD), do not appear to be significantly driven by the PD estimates, but rather by differences in estimated LGDs.

In a final stage of the analysis, we examine the LGD differences and show that at least a part of the variation across banks in LGDs derives from differences in collateral valuation and management, and in the ways in which collateral is integrated into internal models used to estimate LGD. Finally, banks' modelling choices, such as the methodology for estimating downturn LGDs, also appear to drive some of the differences in LGDs.

In summary, our results suggest that actual lending practices should be taken into account when assessing the impact of the use of internal models for the calculation of regulatory requirements; otherwise, mistaken conclusions may be drawn. Our results nevertheless suggest that differences in the modelling and estimation of loss given default are potentially important in explaining differences across banks in their risk-weighted assets for similar loan portfolios. To the extent that some of the differences in LGD estimates may reflect unintended consequences of regulatory guidance that is too general, it might be beneficial to consider adapting the guidance, in order to increase harmonization across banks in their modelling techniques. This is precisely the approach followed by the Basel Committee, which has recently initiated a reflection on the topic of balancing risk sensitivity, simplicity and comparability within the Basel capital standards (BCBS, 2013b).

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Overview of the NBB's oversight and supervision of financial market infrastructures in 2013

The Bank is responsible not only for the oversight but also for the prudential supervision of post-trade financial market infrastructures (FMIs). The central bank's oversight promotes the safety and efficiency of the payment and settlement infrastructures, and ultimately of the financial system as a whole. The prudential supervision ensures the robustness of the market infrastructures' operator at micro-level, thus helping to maintain the confidence of the institution's counterparties. Within the Bank, the two functions are performed by the same entity.

Table 1 contains an overview of the (cooperative) oversight and/or supervision of FMIs in which the NBB is involved. Many of the infrastructures that are overseen and/or supervised by the NBB have an international dimension; some of them limit their operations to the euro area, others operate worldwide. In line with the principles for cooperative oversight and supervision, the NBB performs the role of lead overseer/supervisor for international infrastructures established in Belgium, such as SWIFT and Euroclear. As a corollary, and under the leadership of the relevant national central bank/supervisor, the NBB plays a role in cooperative oversight and supervision for international infrastructures established outside Belgium, but providing services to Belgium.

1. Oversight and supervision of securities settlement systems and operators

The Bank acts as the overseer of securities settlement systems, and as a prudential supervisor of their operator, with respect to three Euroclear group entities. In addition, it acts as the overseer of NBB-SSS (Securities Settlement System), operated by the NBB itself. Finally, the Bank has oversight and/or prudential supervision competencies in relation to the Bank of New York Mellon (BNYM) Group entities established in Belgium.

1.1 Oversight and supervision of Euroclear group

The Bank acts as an overseer and as a prudential supervisor of three Euroclear group entities: Euroclear SA/NV (ESA), Euroclear Bank (EB) and Euroclear Belgium.

ESA

ESA is the Euroclear group's parent company. It owns and manages the IT infrastructure and offers common support services to the (international) central securities depositories – (I)CSDs of the group. A framework has been set up organising co-ordination and cooperation between the twelve authorities of the countries of which an (I)CSD is consolidated into the Euroclear group. The Bank acts as coordinator for the purpose of this multilateral arrangement which organises the exchange of information and the coordinated assessment of the ESA common services. It encompasses issues relating inter alia to operational reliability, governance, and organisation of the audit and risk management functions, as well as the group's strategy.

In the past year specific attention was devoted to issues concerning cyber-defence and to the ESA recovery plan that will be further assessed in the light of the CPSS-IOSCO Guidance for Recovery of Financial Market

TABLE 1 FINANCIAL MARKET INFRASTRUCTURES SUBJECT TO THE BANK'S SUPERVISION AND OVERSIGHT

	Institutions / Systems covered		
	International supervisory college / Cooperative oversight arrangement		NBB solo authority
	NBB lead authority	NBB takes part, other authority is lead	
Prudential supervision	Bank of New York Mellon SA (BNYM)[3]		BNYM Brussels branch
			25 Payment & electronic money institutions
Prudential supervision & Oversight	Euroclear Belgium (formerly CIK) (ESES)	8 EU CCP colleges[4]	
	Euroclear SA/NV (ESA) Euroclear Bank – ICSD[1]		
			Bank of New York Mellon CSD
Oversight	SWIFT	Target2Securities (T2S)[2]	NBB-SSS
		Target2 (T2)[2]	Bancontact/Mister Cash[2]
		CLS	UCV/CEC[2]
			MasterCard Europe[2]

Securities clearing, settlement & custody
Payments and card schemes
Critical service providers to the financial infrastructure

(1) The NBB cooperates bilaterally with other relevant central banks (ECB, CBL, CBoI, BoJ) on an ad hoc basis. A multilateral MOU is under discussion.
(2) Peer review in Eurosystem/ESCB.
(3) Pre SSM situation – BNYM SA is the European Headquarter of the BNYM group. The NBB is lead authority of the college of European Supervisors and participates in the US College of the group supervisors, as well as in the FSB BNYM Crisis management group.
(4) LCH.Clearnet Ltd, LCH.Clearnet SA, Eurex Clearing AG, EuroCCP, KDPW_CCP, Keler CCP, CC&G, ICE Clear Europe.

Infrastructures which is to be issued in 2014. These recovery plans should enable ESA and each individual (I)CSD to cope with threats to their viability and financial strength and to continue to provide their critical services by relying on a variety of tools, depending on the potential stress scenario.

EUROCLEAR BANK

As an international central securities depository (ICSD), Euroclear Bank (EB) provides settlement and custody services for international securities (eurobonds), domestic bonds, equities and fund instruments. It has established

a network of more than 40 links with domestic markets worldwide and provides its services to more than 1 400 participants.

As the lead overseer of EB, the Bank monitored the measures taken by EB to further reduce the liquidity risk which is basically of an intraday nature and originates from the credit extended by EB to its participants to support and facilitate the settlement process. Even if fully collateralised, such credit operations could typically expose EB to liquidity pressure, should the participant with the largest exposure default. Structural measures have been further implemented by EB in order, on the one hand, to reduce the level of its credit activity and, on the other, to enlarge its access to committed liquidity sources in contingency situations. In March 2013, EB implemented system changes to optimise the settlement of short-term triparty repo roll-overs. Thanks to the synchronisation of triparty initiations and closings, the provision of intraday credit by EB has declined significantly. Further initiatives are under review to reduce the intraday credit activities, inter alia by further optimising the current settlement processes. Overall, the liquidity risk management framework has been significantly enhanced in recent years. The new challenges that could arise from strategic developments in the Euroclear business model and in its environment will continue to be monitored by the NBB in order to ensure that such changes do not affect EB's overall liquidity risk profile.

The credit risk arising from its settlement processes is fully mitigated by EB through full collateralisation of exposures to participants. Regarding the asset servicing activities, EB was requested to adapt its current procedures and applicable credit risk management framework. According to the new procedure that will be implemented in the course of 2014, income and redemption proceeds will no longer be paid in advance to the participants before the related payment is received from the issuer. This will allow EB to comply fully with the applicable CPSS-IOSCO Principles.

In addition, the Bank reviewed EB's access criteria in order to take better account of the variety of profiles of its participants and to mitigate potential additional risks resulting from their participation in the system. Besides the standard access conditions applicable to participants that are credit institutions, investment firms or financial institutions supervised in the Union, specific requirements have been developed for participants that are supervised financial institutions established outside the Union and for non-regulated legal entities. These requirements cover financial resources, operational readiness, and legal capacity, as well as internal control and risk management. This review was initiated in conformity with the Belgian finality law, as updated in January 2013.

The new CPSS-IOSCO framework also outlines the general responsibilities of the relevant authorities for Financial Market Infrastructures in implementing the standards. Responsibility E, in particular, requires them to cooperate both domestically and internationally to support each other in fulfilling their respective mandates. For the oversight of EB, a multicurrency critical Financial Market Infrastructure, the Bank had already developed cooperative arrangements with national and foreign authorities, including the FSMA and the ECB. The Bank is currently discussing setting up bilateral and multilateral cooperative oversight arrangements with other central banks. In the context of the EU FSAP on pan-European critical market infrastructures, the IMF also recommended formalising and enhancing the existing cooperation between the Belgian and Luxembourg authorities regarding the link between EB and Clearstream Luxembourg, and involving the ECB in the updated arrangements. This aims at ensuring a level playing field in the effective and parallel implementation of the CPSS-IOSCO Principles by the two ICSDs.

From a banking supervisory perspective, specific attention was given to capital requirements issues and to compliance with the prudential requirements regarding the Large Exposure Regime and the concentration risk. Any adjustments to the strategy and business model are monitored by the Bank in order to reflect potential risk profile changes in the Supervisory Review and Evaluation Process and/or compliance with regulatory norms. Other actions concerned the assessment of significant model changes and compliance with European rules regarding remuneration policy.

From an event-driven and risk-based supervision perspective, the main actions concerned the monitoring of potential risk profile modifications of the Euroclear SA subsidiaries and Euroclear Bank branches resulting from the implementation of new technical and business projects, new activities and related organisational changes. That monitoring feeds into the ICAAP-SREP process and aims at ensuring that adequate risk management, functional and organisational changes and the adaptation of Internal Control Systems are implemented in order to ensure that the framework remains fit for purpose and effective on a continuous basis.

Finally, due attention was paid to on-going strategic developments and the responses provided by Euroclear Bank to changes concerning the market and regulation (e.g. CRD IV, EMIR, AIFMD, CSDR, CPSS-IOSCO Principles).

EUROCLEAR BELGIUM

Euroclear Belgium mainly holds Belgian securities, in particular Belgian equities. It settles participant transactions on the same platform "ESES" (Euroclear Settlement for Euronext zone Securities) as Euroclear France and Euroclear Nederland. The Bank continued its regular monitoring of the Euroclear Belgium CSD's functioning, including the development by Euroclear Belgium of new services for issuers. For common ESES aspects, there is coordinated supervision and oversight. The Bank – together with its Dutch and French equivalents and the securities commissions of the ESES countries – monitored the ESES CSDs' ongoing implementation of the T2S project.

1.2 Oversight of NBB-SSS

A complete assessment of NBB-SSS against the CPSS-IOSCO Principles for Financial Market Infrastructures (published in April 2012) has begun. The transition to a new platform ("Ramses") in preparation for TARGET2-Securities is also being monitored from an oversight perspective. In 2014, the monitoring of the testing phase will be one of the priorities.

1.3 Supervision and oversight of the Bank of New York Mellon group

PRUDENTIAL SUPERVISION OF THE BANK OF NEW YORK MELLON SA/NV (BNYM SA/NV)

After several years of mergers of the various BNYM group's European legal entities within BNYM SA/NV in order to transform these entities into branches as part of the strategic move towards a single European banking structure, 2013 brought further consolidation of the resulting structure of the SA.

The Bank closely monitored changes to BNYM SA/NV's governance and risk management framework in order to ensure that developments in these domains were commensurate with the geographical extension and enlargement of the activities of BNYM SA/NV.

The inclusion of new activities in the activity mix of BNYM SA/NV was also closely followed due to the specific constraints applicable, in that field, to "equivalent settlement institutions", a Belgian regulatory status for institutions providing services of significant importance to CSDs.

Similarly, the collaboration with the main regulators of the group was further strengthened through the organisation of the EEA College and participation in International Colleges (the BNYM FSB College and the Crisis Management group), as well as through bilateral cooperation.

BNYM SA/NV is one of the 130 Significant Banks included in the Single Supervisory Mechanism. Accordingly, the Bank has begun to prepare the transfer of supervisory responsibility for BNYM SA/NV to the ECB in line with the SSM methodology and planning. Those preparations will continue throughout 2014.

BNY MELLON CSD SA/NV

The Belgian-based BNY Mellon CSD SA/NV (a non-bank subsidiary of the BNYM Corporation) is overseen and supervised by the Bank.

In the course of 2013, BNYM CSD was officially notified as a system under the Settlement Finality Directive and its operational readiness was assessed. The gradual roll-out of its services will be reviewed by the Bank as prudential supervisor and overseer, in accordance with the applicable regulatory requirements.

2. Oversight and supervision of retail payment services

2.1 Contribution to standard setting : European Forum on the security of retail payment services

The European Forum on the Security of Retail Payment Services, under the aegis of the Eurosystem and the ESCB, brings together representatives of the EU authorities in charge of oversight and prudential supervision. It aims to facilitate common knowledge and understanding, between the authorities concerned, of the security issues linked to electronic/mobile retail payment instruments and other internet-based payment services offered within the EU.

In January 2013, the Forum published its first report devoted to the security of internet payments, and containing a set of recommendations for providers of services covered by the Payments Services Directive (PSD), and for payment scheme governance authorities that are responsible for the overall functioning of of the payment scheme.

The Forum also focused its activities on finalising its recommendations regarding the security of payment account access services (account information services and payment initiation services). The Forum was well supported, mainly by banking and payment associations, which participated in the public consultation from February to mid April 2013. The most crucial conclusion of this work stream, from a security point of view, relates to the necessity for third party providers (TPPs)[1] to ensure that customers are appropriately authenticated by relying on strong customer authentication, with no sharing with the TPP of the credentials granted to the customer by the account servicing payment service providers, i.e. the bank holding the customer's payment account.

Another main work stream of the Forum resulted in a proposal for "recommendations for the security of mobile payments" which was published for a public consultation that ran from November 2013 to January 2014. Three categories of mobile payments are distinguished, namely contactless payments (Bluetooth, NFC, etc.,) payments using a mobile payment application ("app"), and payments through mobile network operators' channels (sms, voice technology) without a specific "app" downloaded onto the mobile device.

The intended addressees of the recommendations, the mobile payment solution providers, include all payment service providers pertaining to the PSD perimeter when offering mobile payment services, as well as the governance authorities of payment instrument schemes which provide mobile payment services.

The final set of "recommendations for the security of mobile payments", as amended following the public consultation, is expected in the second half of 2014.

2.2 Prudential supervision of payment institutions and electronic money institutions

At the end of 2012 the second Electronic Money Directive was transposed into Belgian law. The new law also introduced conditions under which both e-money institutions and payment institutions could provide services under exemption waiver so that they are only subject to a "light" regime.

These "light" regimes enable smaller payment service and electronic money providers with a business volume below certain thresholds as defined in the law (for payment institutions: yearly turnover of € 36 million in payment services, for e-money institutions: an outstanding amount of € 5 million in e-money) to enter the market and to provide regulated services. In general, these institutions are exempted from most of the existing regulatory and reporting requirements. However, they remain subject to the legal obligation to appoint an external auditor to check their (limited) reporting requirements and compliance with the threshold, and to the obligation to submit a yearly anti money laundering report.

In 2013, the NBB granted authorisation to three payment institutions and three institutions for electronic money. Three service providers were licensed to start providing activities with waiver conditions as prescribed by law.

The number of non-banks providing payment services and electronic money services in Belgium is growing. By the end of 2013, 25 institutions were offering services, against 18 institutions at the end of 2012. Seven of those institutions are operating under waiver conditions (light regime) and two are branches of payment institutions located in other Member States of the European Union.

In 2013 the NBB started the assessment of the procedures in place at the payment institutions and e-money institutions to prevent money laundering and combat fraud and terrorist financing.

2.3 Oversight of retail payment systems

Since the end of March 2013, the Centre for Exchange and Clearing (CEC), the Belgian automated clearing house which processes and clears retail payments between banks active in Belgium, has been using the technical platform "CORE" of the French automated clearing house, the Systèmes Technologiques d'Echange et de Traitement. This migration was the occasion to improve the risk management of the system. Two major changes concerned the frequency of the settlement cycles, which was increased from one to five daily cycles, and the introduction of transaction messaging to the beneficiary's bank after final settlement takes place in the settlement system, Target2. These changes were made on the basis of the NBB's oversight recommendations.

Although the CEC uses the same technical infrastructure as its French equivalent, it remains a separate, legal Belgian entity. In the framework of its oversight activities,

(1) A third-party provider (TPP) accesses the payment account of a customer making a purchase on the internet or provides information about one or more accounts with one or more account servicing payment service providers.

the NBB paid specific attention to the preparation and implementation of the migration, which went off smoothly without any operational incident or service disruption.

2.4 Oversight of card payment schemes (CPS)

A comprehensive oversight assessment on MasterCard Europe (MCE) was concluded by the end of 2012. It was conducted by the Eurosystem assessment group and coordinated by the Bank; the assessment report was compiled in the first half of 2013. This initiated the follow-up phase, encompassing, among other things, possible implementation of adequate mitigation measures to comply with the recommendations.

A Eurosystem public report providing a comprehensive view of the trends in the Card Payment Schemes sector is being prepared and is expected around mid-2014.

In May 2013, in the spirit of the prevailing international standards in the field of oversight, the Bank signed a memorandum of understanding with the Central Bank of Russia and MasterCard Europe determining the details surrounding the exchanges of information between the two authorities in the context of the Central Bank of Russia's competences vis-à-vis the MasterCard Europe subsidiary established in Russia.

The Bancontact-MisterCash debit card scheme continued its adaptation to comply with the Single Euro Payments Area (SEPA) principles. These principles imply that card schemes will become open for all issuers and acquirers throughout Europe, and that security for cards and terminals is based on internationally accepted standards (EMV)[1]. The necessary update of the scheme's infrastructure was completed in 2013. As the overseer of the scheme, the Bank monitored these developments, focusing on the financial risk management and on the scheme's new projects, including the Bancontact-MisterCash mobile payment application for which a one-year pilot phase was launched at the beginning of 2013.

3. Oversight of SWIFT

The Society for Worldwide Interbank Financial Telecommunication (SWIFT) is a critical service provider used to exchange standardised financial messages worldwide. Central bank oversight of SWIFT is justified because SWIFT provides these messaging services for correspondent banking activities and for critical Financial Market Infrastructures such as payment and securities settlement systems. SWIFT's security and availability are of crucial importance for the safety and efficiency of these Financial Market Infrastructures.

The NBB acts as lead overseer of SWIFT[2]. At SWIFT, the major risk category under review is operational risk. The oversight is performed in cooperation with the G10 central banks. Since 2012, information has been shared with a wider group of central banks, as the country representation in the SWIFT oversight arrangements was expanded with the establishment of the SWIFT Oversight Forum. In the Forum, senior representatives of the G10 and ten other central banks conduct joint discussions on the SWIFT oversight policy and results. The first meetings of the SWIFT Oversight Forum were held in 2012 and the cooperation and exchange of information with the SWIFT Oversight Forum central banks were further intensified in 2013.

In order to structure their oversight activities vis-à-vis SWIFT, the overseers translated their focus on SWIFT's management of operational risks into the drafting of five High Level Expectations (HLEs). The HLEs centre around security measured in terms of confidentiality, integrity, availability and system resilience. There are five HLEs that formulate expectations in the areas of Risk Identification and Management, Information Security, Reliability and Resilience, Technology Planning and the Communication with Users. The HLEs constitute the framework for reviewing SWIFT activities that fall within the scope of the oversight. The overseeing central banks address their common security and resilience expectations *directly* to SWIFT.

In 2013, SWIFT provided its overseers with an updated self-assessment report regarding its compliance with the HLEs. SWIFT's demonstration of compliance with the HLEs does not reflect the overseers' opinion, but SWIFT's own assessment of how it lives up to the HLEs.

To avoid the risk that different overseers may use different oversight/assessment frameworks to assess the functioning of critical service providers, thereby creating an unlevel playing field, CPSS and IOSCO in their Principles for Financial Market Infrastructures added "*Annex F: Oversight expectations applicable to critical service providers*", which suggests an oversight approach for other critical service providers that is similar to what the overseers of SWIFT aim to achieve with the HLEs. In December 2013, CPSS and IOSCO issued an *Assessment methodology for the oversight expectations applicable to*

(1) EMV: Europay MasterCard Visa is the international standardised protocol for Chip and PIN security for card payment transactions.

(2) A detailed description of the set-up of the international co-operative oversight of SWIFT was provided in the 2013 issue of the NBB's Financial Stability Review, pp. 120-122.

critical service providers. CPSS and IOSCO invited industry comments on this consultative report. This CPSS-IOSCO assessment provides guidance for authorities in assessing an FMI's critical service providers against the oversight expectations in Annex F, and at the same time provides guidance for critical service providers on compliance with the oversight expectations.

Two major SWIFT projects reviewed by the overseers in 2013 were "Distributed Architecture" and "FIN Renewal". Both projects are multi-year platform investments that help to increase the security, resilience and reliability of the services provided. The Distributed Architecture set up a multi-zonal messaging architecture, allocating countries to either the European or the Trans-Atlantic zone. As opposed to the processing of messages that are being sent between customers in different zones, messages between customers within the same zone are only processed in that zone. The Distributed Architecture project added a SWIFT operating centre for the European zone as well as an additional command and control capability in Asia, enabling operations to be controlled from either Asia, Europe or the US. Operational improvements are made at every SWIFT operational site, and include the renovation of computer rooms and the power and cooling infrastructures. The latest major initiative was the construction of a new state-of-the-art operating centre that replaces one of those currently in use. Operations were successfully transferred to the new operating centre in 2013. Monitoring the progress of this building project was a major focus of overseers in 2013. Some final project deliverables are scheduled for 2014.

The second major SWIFT project reviewed by overseers is the FIN renewal project. The underlying technology platform of FIN, SWIFT's core application for messaging, is being renewed to address long-term technology needs (e.g. to avoid technology obsolescence or increase flexibility in line with technological progress) while aiming to significantly reduce ongoing operating costs. The scope of this project is only to adapt the central FIN application, not the FIN interfaces and SWIFT network connections at the customers' end. The first components of the renewed application were successfully launched in 2013. The second and third stages of the FIN renewal project extend into the years to come. Aspects reviewed include risk management, project management including the monitoring of project milestones, test strategies, and transparency of communication in relation to vendors and customers.

Overseers in 2013 further increased their monitoring of cyber security initiatives at SWIFT. The logical security protection of the SWIFT operations is continuously reassessed and drives management decisions to strengthen protection, in line with the industry-wide observations that cyber security threats are on the rise.

Standing topics for review by overseers include IT audit reports, technology and information, security risk management, and the development of an enterprise-wide risk management framework. Furthermore, overseers continue to monitor closely SWIFT's financial position, as well as trends in its messaging volumes. SWIFT's FIN messaging traffic is the major contributor to the company's revenue and increased above budget in 2013. SWIFT's Chief Risk Officer (CRO) in 2013 continued the development of an integrated Enterprise Risk Management framework throughout SWIFT. In 2013, overseers conducted a major review of the set-up and functioning of SWIFT's governance arrangements. Governance is the set of relationships between SWIFT's cooperative shareholders, board of directors, management, and other relevant parties, including its users, authorities, and other stakeholders (such as users' customers, interdependent FMIs, and the broader market). Governance provides the processes through which the organisation sets its objectives, determines the means for achieving those objectives, and monitors performance against those objectives. Good governance provides the proper incentives for an FMI's board and management to pursue objectives that are in the interest of its stakeholders and that support relevant public interest considerations. As the conclusions of the SWIFT governance review were positive, any new review of SWIFT governance arrangements by overseers would be triggered by changed requirements based on evolving international best practices, governance changes made by SWIFT, issues revealed under the current arrangements, or the need to update the current assessment from time to time.

Developments in the post-trade services environment in Europe

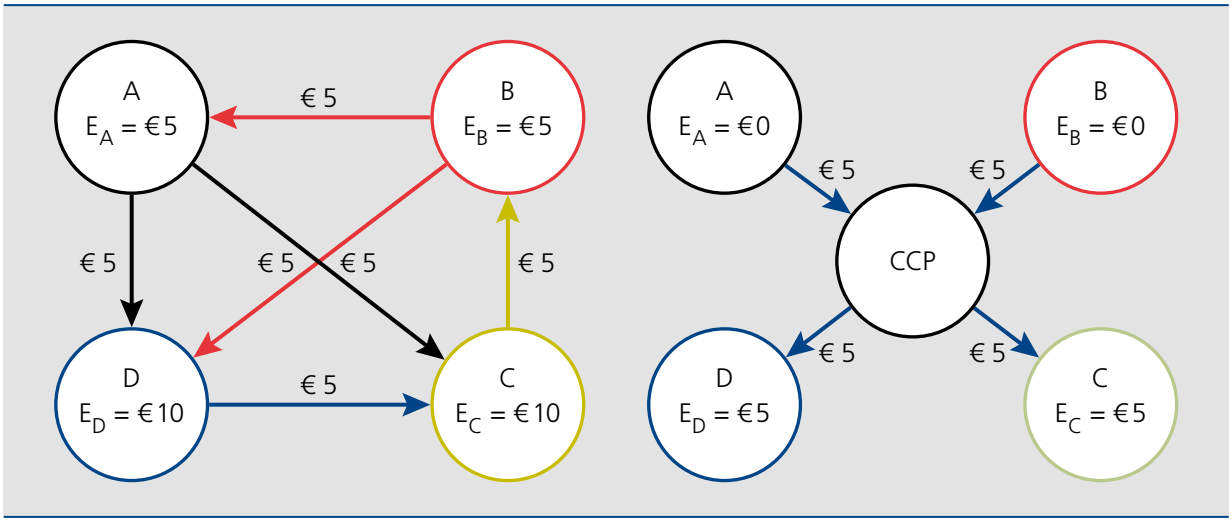
Introduction

This article first looks at the current situation and the associated risks in the post-trade services environment, which is characterised by fragmentation and by large values of bilateral over-the-counter (OTC) transactions. We will then describe the regulatory initiatives to address these risks and their potential impact on the post-trade environment.

1. The current post-trade services environment

Post-trade services refer to the activities after a trade has been concluded. This can take place off-exchange (over the counter, i.e. OTC), or on-exchange. If it has been concluded on a stock exchange, the trade is typically cleared by a central counterparty (CCP). A central counterparty interposes between the buyer and the seller by replacing their original bilateral contract with two new contracts between the buyer and the CCP on the one hand and the CCP and the seller on the other hand (a process called novation). The two original counterparties no longer have a counterparty risk on each other, but

CHART 1 BILATERAL NETTING VERSUS MULTILATERAL



The arrows represent obligations from one party towards the other. An arrow from A to D means that A has the obligation to pay or deliver € 5 to D. Therefore, D has an exposure of € 5 on A (incoming arrow for D).

CHART 2 THE EUROPEAN POST-TRADE SERVICES MARKET – OVERVIEW

Legend

Outside background colors indicate FMI belonging to the same group

- Bolsas y Mercados Espanoles (BME) Group
- Deutsche Börse Group
- VP Securities
- Intercontinental Exchange (ICE) Group
- Helex Group
- Malta Stock Exchange
- Oslo Børs VPS Holding
- SIX Group

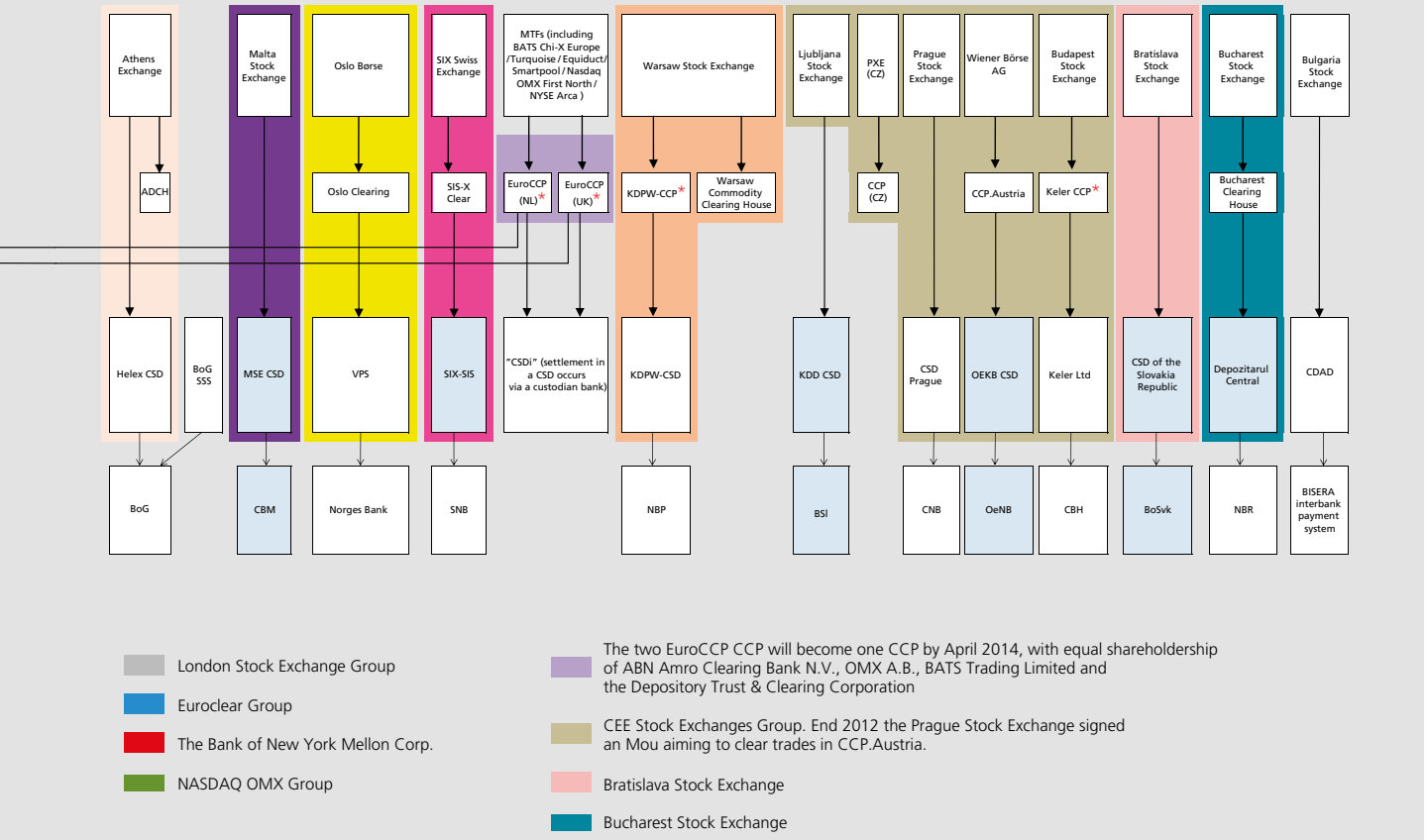
Arrows represent the flow of clearing instructions from exchanges to CCP, or the flow of settlement instructions from CCP to SSS.
Multilateral Trading Facilities (MTFs) are usually not represented. Links between CCP or links between SSS are not represented.
A light-blue inside background color indicates the CSDs and NCBs that will join T2S.
An asterix (*) indicates that the NBB participates in the CCP's supervisory college.

both now have a counterparty risk on the CCP. As the CCP has taken over the counterparty risk, it needs to protect itself adequately from this risk by requesting high-quality assets as collateral (called margin) from the original counterparties. In order to protect the market players from a CCP default, central counterparties need to comply with strict requirements to ensure their robustness as explained later in this article. Another benefit of using a CCP is the multilateral netting, which actually reduces counterparty risk as shown in chart 1. In the situation without a CCP (left-hand side of the diagram), the maximum exposure (E) for parties C and D is € 10. After the CCP intervenes through novation (right-hand diagram), the maximum exposure of C and D has been reduced to € 5, and parties A and B no longer have any exposure thanks to multilateral netting.

Chart 2 provides a stylised overview of the European post-trade landscape. The first layer represents the main stock exchanges. Clearing by CCPs is depicted by the second layer. On the day when the buyers and sellers have to settle their obligations, assets (cash or securities) are exchanged. Securities are settled in central securities depositories (CSDs) represented by the third layer in chart 2. Cash settlement (fourth layer) takes place in central bank accounts for CSDs, but not for the international CSDs (ICSDs) Euroclear Bank (EB) and Clearstream Banking Luxembourg, where it is done in the books of the ICSD itself.

As can be seen in chart 2, the current market structure in Europe is fragmented. Almost every European country has one (or several) CSDs, generally serving their local market. This is in contrast with the US, where securities markets are underpinned by only two CSDs (DTC [1] and Fedwire Securities). In addition, market practices often differ across European countries. Such fragmentation gives rise

(1) Depository Trust Company, a subsidiary of DTCC, the Depository Trust & Clearing Corporation



to operational risks and adds to the costs for cross-border transactions. As European securities are not held in any one central securities depository, but in a range of CSDS in different countries, investors will rely on additional intermediaries to access European markets. Since it is often not practical nor possible to open accounts in each European CSD, investors will go through ICSDs, global custodians or local custodians that have the necessary expertise about local market practices. These additional intermediaries make the instruction chain longer and thus increase operational risks and costs.

Divergent market practices across Europe alone may lead to inefficiencies. Market practices such as the settlement cycle currently differ by country. On-exchange equity trades settle on T+3 (i.e. three days after the trade has been concluded) in most markets but not in Germany where they settle on T+2. Different settlement cycles for cross-border transactions have disadvantages, such as additional operational risk, increased funding costs for investors buying securities in a T+2 market and financing this by selling securities in a T+3 market. Penalty regimes (i.e. fees to be paid by parties that fail to deliver securities on the agreed settlement date) currently apply in some markets but not in all.

Business on financial markets, be it on organised exchanges or bilaterally (OTC) for derivatives or securities markets, has grown to such systemic size across the globe that the efficient and safe functioning of post-trade infrastructures has become of paramount importance for financial stability (see box 1).

Box 1 – Key figures for post-trade market infrastructures

The following data give an idea of the amounts involved in the post-trade environment.

On-exchange traded derivatives are always cleared via a CCP. Table 1 provides an overview of the trading volumes in the main European exchanges for individual and index derivatives on stocks and bonds (interest rate) under the form of options or futures over 2013. The yearly turnovers are considerable as they range from € 14 trillion for options on stocks to € 780 trillion for interest rate futures.

TABLE 1 EUROPEAN SECURITIES DERIVATIVES TRADING IN MAIN EUROPEAN EXCHANGES
(notional turnover in € million in 2013)

	Stock		Bonds	
	Options	Futures	Options	Futures
EUREX	10 937 828	14 643 451	66 494 632	443 072 416
Euronext.Liffe	2 739 350	5 073 302	132 466 264	333 834 496
NASDAQ OMX Nordic	153 680	435 055	673 339	2 692 910
Spanish Exchanges (BME)	69 051	516 170		1 069
Total	**13 899 909**	**20 667 978**	**199 634 235**	**779 600 891**

Source: FESE Statistics December 2013.

Over-the-counter (OTC) derivatives are not traded on exchanges. As a consequence, data on turnover are not available and the only existing statistics are collected under the form of surveys on outstanding derivatives contracts (stocks) held at a certain moment in time. They represent considerable amounts as shown in table 2 that gives the OTC derivative volumes outstanding worldwide at the end of June 2013. Of the 561 trillion USD of OTC interest derivatives outstanding worldwide, 227 trillion were denominated in euro. Further, of the 6.8 trillion OTC equity derivatives, 2,9 trillion consisted of contracts on European equities.

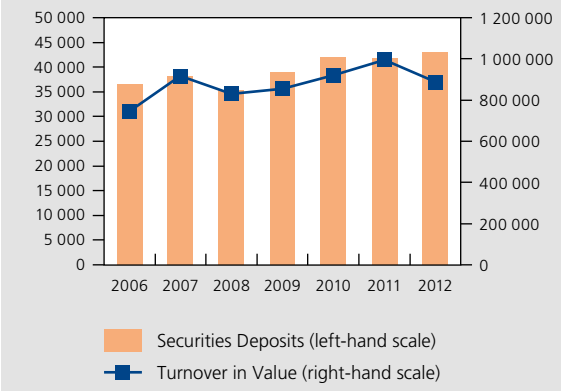
TABLE 2 GLOBAL OTC DERIVATIVES MARKETS
(amounts outstanding end June 2013, in $ trillion)

Instrument	Notional amounts outstanding	Gross market values
FX	73.1	2.4
Interest	561.3	15.2
Equity	6.8	0.7
Commodity	2.5	0.4
CDS	24.3	0.7
Total	**692.9**	**20.2**

Source: BIS Quarterly Review, March 2014.

Turning from derivatives to securities, the total amount of securities deposited in EU CSDs represented almost € 43 trillion in 2012, as can be seen from the bars in the graph below. In 2012, turnover in value for all EU CSDs totalled € 887 trillion, as shown by the blue line in the graph.

AMOUNTS HELD AND SETTLED IN CSDs IN EUROPE.



The considerable fragmentation of the European post-trade environment leads to increased risks, while the amounts involved have a systemic impact. Therefore, the EU has taken initiatives –including regulatory – to

- ensure that financial market infrastructures (FMIs) such as CCPs and CSDs, whose importance for the financial markets is crucial and still growing, are robust by imposing additional regulatory requirements in the CSDR and EMIR.
- reduce the risks from fragmentation via the CSD Regulation (CSDR) and T2S project;
- move clearing of standardised OTC derivatives to CCPs via EMIR;

The second part of this article provides more details on these initiatives and their likely impact for the post-trade services environment.

2. Regulatory and public sector initiatives

Although FMIs had successfully withstood the recent global financial crisis, new regulations introduced in the aftermath of that crisis also focused on FMIs because any disorderly failure of such infrastructures could lead to severe systemic disruption. In particular, CPSS and IOSCO issued their new Principles for Financial Market Infrastructures[1] in April 2012. With the aim of reducing systemic risk, these Principles strengthen the risk management principles for FMIs. The Principles are now being implemented worldwide, and in Europe via EMIR and the forthcoming CSD Regulation.

In parallel with these two regulatory initiatives, which not only include requirements for FMIs to ensure they remain robust but also lay down rules to tackle the current fragmentation, the Eurosystem has started a project to build a single securities settlement engine for Europe, called TARGET2-Securities (T2S) that is expected to be launched from June 2015 onwards. T2S will integrate into a single IT platform both market participants' securities accounts, held with either one or multiple CSDs, and their dedicated central bank cash accounts, held with the respective national central bank. T2S will therefore facilitate cross-border settlement in central bank money, and will in a way replicate a single settlement platform

(1) More information on these Principles can be found in Box 1 of the NBB's FSR 2013 on page 129.

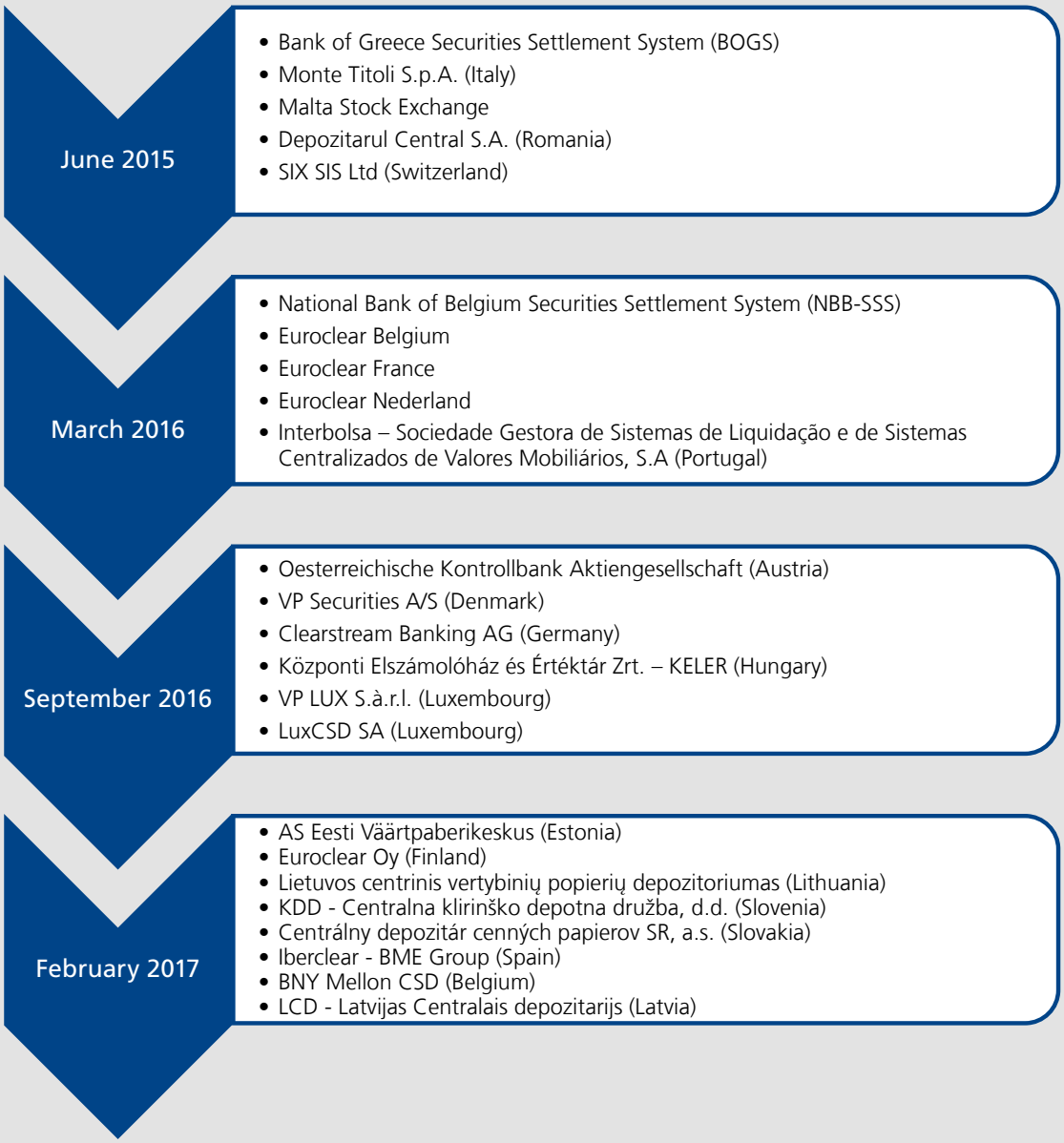
for the euro area. Together with this project, Europe has started a harmonisation process for market practices, which is a prerequisite for the implementation of a single platform such as T2S.

2.1 T2S – Making the single securities market operationally possible

While the legislation and harmonisation efforts mentioned in the following paragraphs by themselves enhance the Single Market, the Eurosystem has gone one step further and is building a single settlement engine for Europe. The first wave of CSDs will migrate to T2S as of June 2015 as is shown in chart 3.

TARGET2-Securities will have a profound impact on European CSDs. CSDs will lose an income stream as T2S will handle the settlement part, meaning that they will have to compete on the basis of value-added services, such as asset servicing or collateral management, that are currently also provided by custodians which may have

CHART 3 THE T2S MIGRATION WAVES



Source: European Central Bank.

direct access to T2S themselves. Developing such high-quality services may require considerable investment, while at the same time there will be clear pressure on costs. Taking into account the economies of scale for market infrastructures, one may expect to see a consolidation of CSDs in the EU.

2.2 EMIR – More secure over-the-counter (otc) derivatives clearing and ccps, but greater need for collateral

Back in 2009, with the overall aim of reducing systemic risk, the G20 leaders agreed to promote security and transparency in the OTC derivatives markets through a significant regulatory initiative. The G20 agreed that, where appropriate, *standardised OTC derivative contracts* should be traded on exchanges or electronic trading platforms, and should be cleared through central counterparties. *All OTC derivative contracts* should be reported to trade repositories. *Non-centrally cleared (i.e. non-standardised)* contracts should be subject to higher capital requirements and to bilateral margining requirements.

As a result of the G20 decision, regulatory and legislative changes were introduced worldwide and are now in the process of being implemented. In the US, the Dodd-Frank Act was promulgated. In the European Union, the EMIR Regulation was adopted. EMIR aims to impose a general clearing obligation for OTC products – and to regulate credit, liquidity, business and operational risks related to central counterparties (CCPs).

EMIR lays down rules on the mandatory use of a CCP for standardised over-the-counter (OTC) derivative transactions. The classes of derivative products which will be subject to the clearing obligation will be decided via a Regulation based on a proposal from the ESMA. The expectation is that plain vanilla interest rate swaps (IRS) and certain credit default swaps (CDS) indices, will be the first products subject to this clearing obligation in the EU, probably from end-2014-beginning 2015.

Non-standardised derivative products cannot be centrally cleared via a CCP. EMIR establishes a framework of risk-management requirements for such non-CCP cleared products. So as to deleverage the amount of outstanding positions and as not to discourage CCP clearing, EMIR requires both parties to provide each other with sufficient collateral ("margin") to secure the counterparty risk. This collateral has to be kept in a bankruptcy-remote way, with a ban on reuse of this collateral (meaning that the receiving party may not transfer these securities to someone else to collateralise exposures to this other party).

Particular attention has been paid to the liquidity impact of the margin requirements. Therefore, a universal initial margin[(1)] threshold of € 50 million has been set, below which a firm is not obliged to collect initial margin, and a broad array of eligible collateral is proposed. The initial margin requirement will be phased in over a four-year period, starting in December 2015 with the largest derivatives market participants.

Nevertheless, both the clearing obligation (which moves standardised OTC derivatives clearing to CCPs that require collateral) and the requirement to collateralise non-CCP cleared derivatives trades will increase the need for (high-quality) collateral. This presents opportunities for market players such as custodians and (I)CSDs that offer collateral management services, as is further explained in paragraph 2.3.

Imposing a clearing obligation for OTC derivatives makes it absolutely crucial to strictly regulate and supervise CCPs that are, by definition, systemically relevant financial market infrastructures and in which risk will now be even more highly concentrated.

To ensure the CCP's robust risk management, EMIR requires – among other obligations – the CCP to set its margins and haircuts in a sufficiently conservative way. Attention is paid to the potential disruptive effect that additional intraday margin calls may have in a stressed market environment, e.g. in the event of a member default. To avoid pro-cyclical effects, disruptive changes of margin height should be avoided. This in turn implies that initial margins are set conservatively enough, taking into account the most volatile market periods. Collateral is also required to be highly liquid. To be readily available, securities collateral should in principle be held with a CSD.

To protect both the clearing members and investors in the event of a clearing member defaulting, positions and related collateral held by a CCP should be segregated adequately. This implies that the positions and collateral of the clearing member and its clients are held in the books of the CCP in separate accounts, either for all the clients together (omnibus account) or per individual client. In the event of a clearing member default, client positions and collateral should be portable, in other words, the positions and the related collateral should be transferred to a surviving clearing member, provided the clients request this and the new clearing member agrees to take over

(1) Two types of margin can be distinguished : initial margin and variation margin. Variation margin is paid or received to reflect current exposures resulting from actual changes in the market price (of the derivative that is traded). Initial margin is the collateral that is collected to cover potential changes in the value of the counterparty's position over the appropriate liquidation period in the event of the counterparty's default.

such positions. This requirement is quite relevant, as there is often potential for concentration of activity and services within a limited number of clearing intermediaries.

Although EMIR intends to avoid a default of a CCP (e.g. by imposing strict risk management arrangements and capital requirements) and limits the losses caused by such default (e.g. by imposing segregation of assets), authorities are working on guidelines for recovery and resolution plans for CCPs and other FMIs (CPSS-IOSCO issued a consultative report on recovery of FMIs in August 2013). Recovery plans, which detail the actions to be taken by the FMI in order to recover from an extreme event, should be set up by FMIs. The resolution authority of the FMI should establish a resolution plan in order to wind down the FMI with the least possible negative impact in case recovery is no longer possible.

Finally, interoperability arrangements between CCPs – whereby CCPs become each others' mutual counterparties – also require regulatory attention. While such an arrangement could overcome fragmentation and increases the multilateral netting possibilities and is thus beneficial from a stability point of view, it also brings along its own risk, as it implies that there is a contagion risk between both interoperable CCPs in case one of them encounters a problem. While EMIR does not extensively regulate interoperability arrangements between CCPs, ESMA issued guidelines containing high-level qualitative principles that regulate CCP interoperability arrangements[1].

The clearing obligation for OTC derivatives implies that CCPs collectively are granted a monopoly position. Therefore, EMIR grants access rights between trading level, clearing level, and settlement level. This provision also is meant to tackle fragmentation and the continuation of national silos. The concept of national silos refers to a situation where a company (or group of related companies) owns infrastructures covering all three layers (trading – clearing – settlement). Such situations are quite common in Europe, as represented by the coloured backgrounds in Chart 2 : e.g. the BME Group (BME, BME Clearing, Iberclear), the Deutsche Börse Group (Deutsche Börse, Eurex Clearing, Clearstream), etc.

2.3 CSD regulation – removing barriers and fragmentation in the single market and regulating CSDS

Unlike EMIR, the CSD Regulation (CSDR) is not a result of the G20 agenda but rather a piece of EU-specific legislation. One of the aims of the CSDR is to break down barriers in the Single Market and to boost competition via harmonisation, which is also necessary for the successful implementation of TARGET2-Securities (T2S).

Another major aim of the CSDR is to lay down the standards for the safe and efficient functioning of CSDs in the EU. To that end, the CSDR basically transposes the CPSS-IOSCO Principles for FMIs with respect to CSDs into EU legislation.

In order to achieve the above goals, the current CSDR proposal harmonises the settlement cycle to T+2 (i.e. a reduction of one day for counterparty risk for markets that currently settle on T+3, which is possible thanks to increased automation) and introduces a harmonised settlement fails regime.

The CSDR also harmonises CSD regulatory requirements. CSDs will have to comply with a harmonised set of minimum organisational, business and other prudential requirements. CSDs will be authorised and supervised by their national competent authorities. Authorised CSDs will be granted an EU passport allowing them to provide services in other EU countries.

The CSDR will also give issuers of securities the freedom to choose in which CSD to issue their securities and ensures fair and open access for EU CSDs to any other EU CSD or other market infrastructure (trading venue or CCP) regardless of the country where they are based.

Both the CSDR and T2S will have an impact on CSDs, and their effects will reinforce each other.

While the CSDR will make it legally possible for the CSDs to offer services outside their country, T2S will make it technically easier to do so. CSDs will therefore come into direct competition with each other. Today, national CSDs have a national monopoly, which means that French companies for example have to issue their shares in the French CSD, while German companies have to issue their shares in the German CSD. The national CSDs therefore do not compete with each other for these services. When issuers have the choice where to issue, German companies for example may decide to issue their shares in the French CSD. The French and German CSD (and all other European CSDs) will have to compete to attract clients in the future.

(1) ESMA Guidelines and Recommendations for establishing consistent, efficient and effective assessments of interoperability arrangements, of 10 June 2013.

As pure settlement will be "commoditised" by T2S, competition will occur on the basis of value-added services. CSDs will compete for market share on the basis of services to both issuers, who will have the choice where to issue their securities, in order to attract new issues as an "issuer CSD", and to investors via an "investor CSD" approach. CSDs will not only compete with each other but also with custodians. Some CSDs will offer custodian-like services, while some international custodians, such as The Bank of New York Mellon, have opted to establish a CSD in Europe. Although CSDs and custodians may offer similar services, they remain distinct from a regulatory perspective[1]. CSDs are subject to the CSDR requirements. On the one hand, these additional requirements, together with the protection provided by settlement finality in CSDs, provide safety for their participants. On the other hand, rules such as the penalty regime for settlement fails may be an incentive to avoid CSDs and move settlement to custodians.

One specific impact is that T2S will reduce some of the advantages for market participants of using an international CSD (ICSD). In the current fragmented European market-place, investors can access many markets in Europe and beyond via just one account in an ICSD instead of opening accounts in each national depository. Issuers that wish to reach investors from different countries can now do so by issuing Eurobonds in the ICSDs. With the arrival of the CSDR and T2S, the current national CSDs may well become "international" – or at least European – CSDs where issuers from different countries can issue and where investors can have access to securities from different countries on the T2S platform.

This will also affect global custodians offering access to various markets via one account. Since access to various European markets will be possible via T2S, global custodians will also have to focus on offering value-added services in order to retain or attract clients.

On the one hand, T2S and the CSDR will take an income stream away from CSDs while increasing competition among them. On the other hand, EMIR will give them – or at least the (I)CSDs and custodians offering collateral management services – an opportunity as it has significantly increased the need for collateral (services).

Although collateral does not seem to be really scarce, its fragmentation across different holding locations makes it difficult to track, access and mobilise. Such fragmentation is due to differences in regulations and eligibility criteria (in particular with central banks and CCPs) as well as to the absence of efficient interconnections between collateral givers and takers as no real global infrastructure is currently serving as a backbone.

In order to tap these fragmented pools of collateral to meet the extra demand for collateral, various collateral management services, including collateral transformation services, have emerged. One of these service offerings is Euroclear's Collateral Highway, which is explained in more detail in Box 2.

(1) CSDs are the top of the pyramid and offer, besides a securities settlement system, a "notary function". Custodians are participants of a CSD and offer, amongst others, securities accounts to their clients.

Box 2 – An example of Collateral management services: Euroclear's "Collateral Highway"

The main purpose of Euroclear's Collateral Highway is to provide a solution to source collateral easily and use it efficiently.

As the Collateral Highway is based on an open architecture, users are able to source collateral in the Collateral Highway from multiple entry points both from within Euroclear (I)CSDs or from other partners (for example, assets held at CSDs located in any time zone, at ICSDs or with agent banks) and to redeploy these assets to wherever they may be needed as collateral, whether to provide margin to a CCP, to access liquidity from a central bank, or to collateralise a securities lending transaction or a bilateral OTC derivatives trade.

Custodians, agent banks and CSDs without a collateral management service offering are also able to use the Collateral Highway as their own for their domestic clients.

Given the regulatory drive to extend CCP clearing for an expanding range of OTC and exchange-traded instruments, Euroclear has been negotiating with CCPs to become active on the Collateral Highway. At the beginning of 2014, eight CCPs were active on the Highway. This will enable market participants to use Euroclear's infrastructure in order to mobilise collateral from their global inventories in order to cover their exposures at CCPs.

Euroclear is also in talks with the Depository Trust & Clearing Corporation (DTCC) to offer collateral services for their clients.

The Collateral Highway not only allows participants to have access to their assets no matter where they are held, but also to borrow eligible collateral when needed. This latter service of borrowing assets that are eligible as collateral for their counterparty against other collateral, called "collateral transformation", is offered through the Global Collateral Access (GC Access) service.

The average daily collateral outstanding on the Collateral Highway, launched in July 2012, increased from € 700 billion at the end of 2012 to € 787 billion at the end of 2013.

3. Conclusion : reducing risks and changing the market structure

Due to major regulatory, legal and operational changes, the sound, safe and efficient functioning of both CCPs and CSDs is becoming even more crucial to the provision of post-trade services.

EMIR is moving OTC derivatives transaction clearing to CCPs in order to reduce credit, liquidity and operational risks for counterparties on transactions of this kind. While the wider use of CCP implies that counterparties have a claim on a safe financial market infrastructure that acts as a counterparty, it also implies that risk is further concentrated in the hands of the CCPs. Concentration of risk on a major CCP may become one of the future attention points of regulators.

In cases where CCPs clear different markets, they also constitute a new common interdependence for these markets and for their participants. Interoperability arrangements between CCPs might become a more common practice, bringing its own risks, as it might lead to contagion between the CCPs. This not only results in an increase in the interdependence between markets, but also adds to the complexity of such interdependence. This clearly requires the risk management of CCPs to be strictly harmonised, regulated and supervised, given its systemic relevance. Where the CPSS-IOSCO Principles for financial market Infrastructures and EMIR have increased the CCPs' risk management requirements, both interoperability arrangements between CCP and recovery and resolution mechanisms for CCP are domains where further legislation might be appropriate.

TARGET2-Securities will move settlement to a single platform for participating CSDs in order to reduce operational risks and inefficiencies linked to cross-border transactions. This, however, concentrates the operational dependence of EU CSDs on a single platform. It increases concentration and leads to even more interdependence and complexity.

Finally, the combination, on the one hand, of much wider demand for collateral coming from EMIR (and other regulations), and, on the other hand, of the CSDs' offering of value-added services in collateral management implies growing interdependence between the clearing and settlement layers, as well.

These changes in the post-trade layers' market structure, with growing concentration risk, interdependence and competitive pressure, call for proper attention and appropriate monitoring of future developments by the regulatory authorities.

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