

Review and assessment of recent developments in the Belgian mortgage market

Introduction

This article reviews and assesses recent developments in the Belgian mortgage market, providing an update of similar analyses that appeared in the Financial Stability Reviews 2012 and 2014.

The first section describes the most recent developments in the household sector's mortgage debt and in banks' credit standards. The analysis is in part based on data from a quantitative survey of 14 Belgian banks' domestic mortgage loan portfolios that was also used for the 2012 and 2014 analyses. In this semi-annual collection of information, banks have to report figures with end-June and end-December reference dates for various portfolio characteristics, in terms of both their outstanding stock of Belgian mortgage loans and their new business volumes. Moreover, banks have to report data on the corresponding minimum regulatory capital requirements once a year for their year-end position. This article includes the latest available information from this survey, which pertains to the situation as at the end of 2015.

The second section focuses on credit quality and on Belgian banks' capital buffers for domestic mortgage loans and concludes with a summary of the Bank's risk assessment and policy stance. In this connection, it can be reminded that the 2012 FSR article had already concluded 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. This was followed by the Bank's decision, at the end of 2013, to implement three prudential measures. The objective of these measures was to strengthen banks' resilience and to reduce the concentration risks associated with regulatory capital risk weights that could be too low for losses that may emerge in less favourable market circumstances from the materialisation of risks in certain sub-segments of banks' Belgian mortgage loan portfolios. These three measures were presented in detail in the 2014 FSR article and are revisited in section 2 of this article.

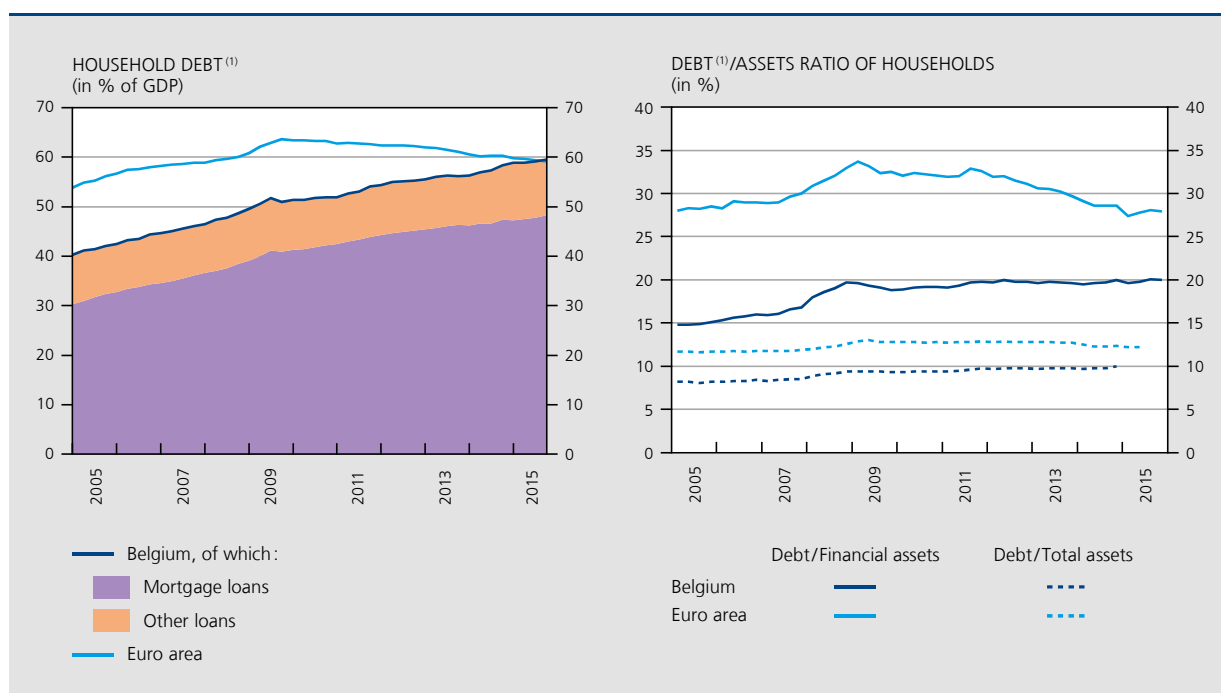
1. Review of recent market developments and credit standards at origination

Over the last fifteen years, the Belgian household sector's mortgage debt has almost tripled, rising from € 68.4 billion at the end of 2000 to € 197.9 billion at the end of 2015. Being mainly attributable to mortgage loans, the household gross debt ratio shows an almost uninterrupted upward trend over these years reaching 59.5 % of GDP at the end of 2015, as shown in the left-hand panel of Chart 1. This trend differs from the (slight) deleveraging observed for the average euro area household debt ratio, which has brought it down gradually from 63.6 % of GDP in 2010 to 59.1 % of GDP in 2015. In some euro area countries, high household debt levels were part of the major imbalances that triggered financial crises in these countries and these are now being reduced. The gap between the ratios for Belgium and the euro area

has thus been narrowing steadily over the past few years and the Belgian household gross debt ratio has recently, for the very first time, even slightly exceeded the euro area ratio.

When debt levels are compared to assets owned, Belgian households show an overall better financial position than their euro area peers as their debt is better covered by their total assets as well as their financial assets (right-hand panel of Chart 1). Moreover, the growth of wealth among Belgian households seems to have paralleled their rising debt level, which has resulted in a fairly stable debt-to-assets ratio of around 20% over the past few years. However, due to the rising debt levels in Belgium, gaps between Belgian and euro area households are becoming smaller here as well.

CHART 1 HOUSEHOLD DEBT AND DEBT-TO-ASSETS RATIOS

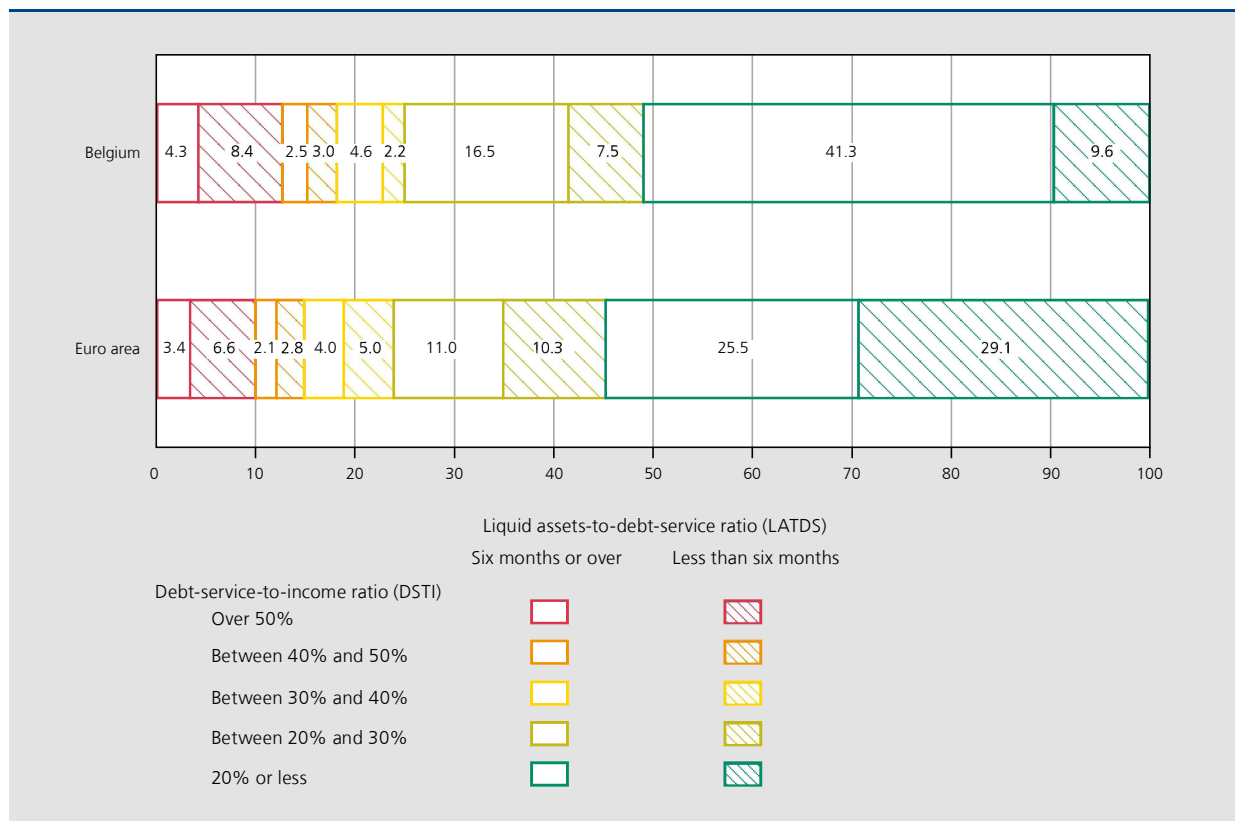


Sources: ECB, NBB.

(1) Gross debt defined as the total of outstanding loans.

Based on 2010 data provided by the Eurosystem's Household Finance and Consumption Survey (HFCS), it is possible to analyse the distribution of (mortgage) debt and assets between households in more detail (Chart 2). The chart provides information on two variables to measure the ability of households to service their mortgage debt. First, the debt-service-to-income ratio (DSTI) is calculated to reflect the proportion of a household's monthly income needed to meet the scheduled mortgage loan repayment for that month. In addition, the liquid-assets-to-debt-service ratio (LATDS) links this monthly mortgage debt servicing to households' liquid financial assets, indicating how many months of its scheduled mortgage loan repayments a household could finance from those financial assets. Breaking down Belgian mortgage debt into different parts according to these two dimensions leads to the conclusion that mortgage debt and liquid financial assets are unequally distributed within the population. Of those households that can continue to meet their debt commitments for more than six months relying on their liquid financial assets only (for instance, having suddenly lost their income), a large majority has to reserve only a small fraction of their monthly income for mortgage repayment. On the contrary, households with high DSTI ratios (> 40%) seem to have a less favourable wealth position, given that their LATDS ratio is more often less than six months. It would therefore appear that liquid assets in Belgium are mostly held by households without mortgages and by those indebted households that have relatively little trouble repaying their debt from their household income, while a significant proportion of mortgaged households spend a large part of their household income on repayments and have few liquid financial reserves to make up for any temporary loss of income.

CHART 2 DISTRIBUTION OF OUTSTANDING HOUSEHOLD MORTGAGE DEBT BY DEBT-SERVICE-TO-INCOME RATIO (DSTI)⁽¹⁾ AND LIQUID-ASSETS-TO-DEBT-SERVICE RATIO (LATDS)⁽²⁾
(in % of total outstanding mortgage debt of households; HFCS data for the year 2010)



Sources: ECB, NBB (HFCS).

(1) Monthly mortgage payments divided by a household's gross income.

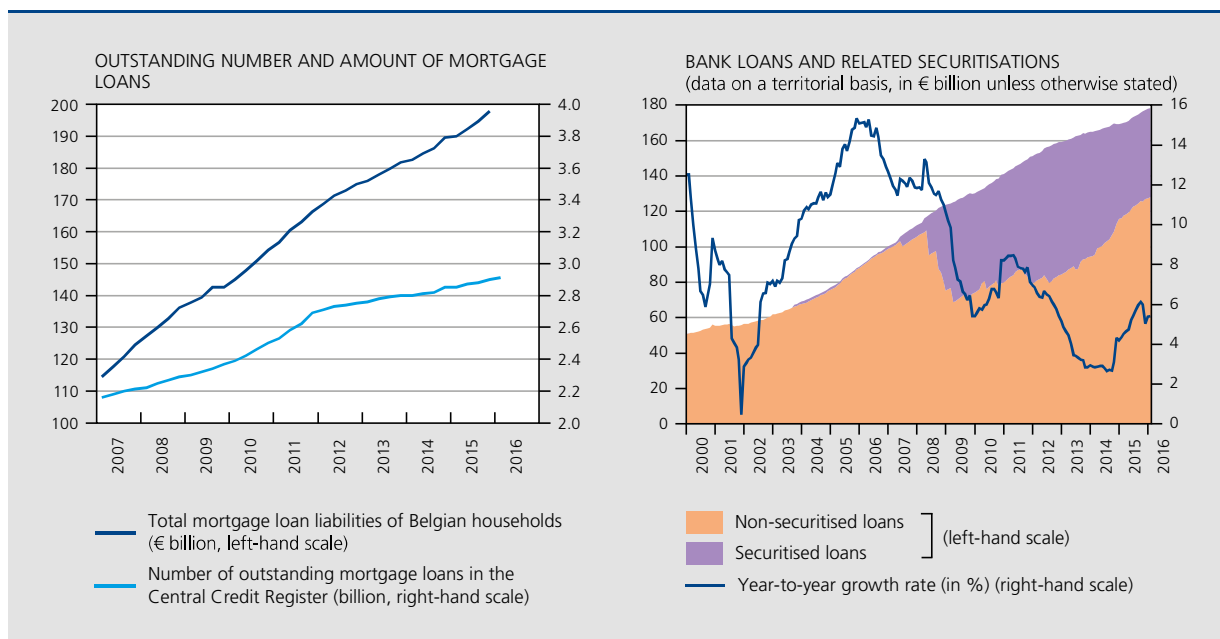
(2) The value of a household's liquid financial assets (deposits, bonds and savings certificates, listed shares and mutual funds) divided by monthly mortgage repayments.

The HFCS data also enable a comparison with corresponding data for the euro area countries taken together. Judged by income-related debt ratios, Belgium's most vulnerable categories account for a larger share of the total mortgage debt stock, with 18.2 % of debt being concentrated among households that spend over 40 % of their income on debt repayments. The comparable figure for the euro area is 14.9 %. This relatively weaker position of Belgian households could be due to some structural features of the Belgian housing market, where households typically take out their first mortgages at a relatively young age when their income still has growth potential, and mortgages tend to have short(er) maturities as well as (full) capital amortisation instead of interest-only repayments. On the other hand, regarding the amount of liquid assets, Belgian households seem comparatively better placed than their euro area peers. In Chart 2, it can be seen that 30.8 % of mortgage debt in Belgium is owed by households with liquid assets that are insufficient to finance six months of debt service, while this percentage is running at 53.8 % in the euro area. Moreover, 14.9 % of total Belgian outstanding mortgage debt is completely covered by liquid assets, whereas the figure is only 8.9 % for the euro area. Though the latter indicates the overall sustainability of household debt in Belgium, the large mismatch between indebted households and those holding financial assets could entail financial vulnerabilities for specific groups of Belgian households, constituting so-called "pockets of risk".

The past 15 years have been characterised by strong growth of the Belgian household sector's mortgage debt (Chart 3). This has followed from a rise in the number of mortgage loans as well as from an increase in the average amount of new mortgage loans and from a decline in the rate of amortisation of the outstanding stock (due inter alia to rising average loan maturities).

The Central Credit Register – which has information on all outstanding household loans in Belgium back to the beginning of 2007 – shows that the number of mortgage loans in Belgium has risen from less than 2.2 million contracts in 2007

CHART 3 OUTSTANDING NUMBER AND TOTAL AMOUNT OF MORTGAGE LOANS



Source: NBB.

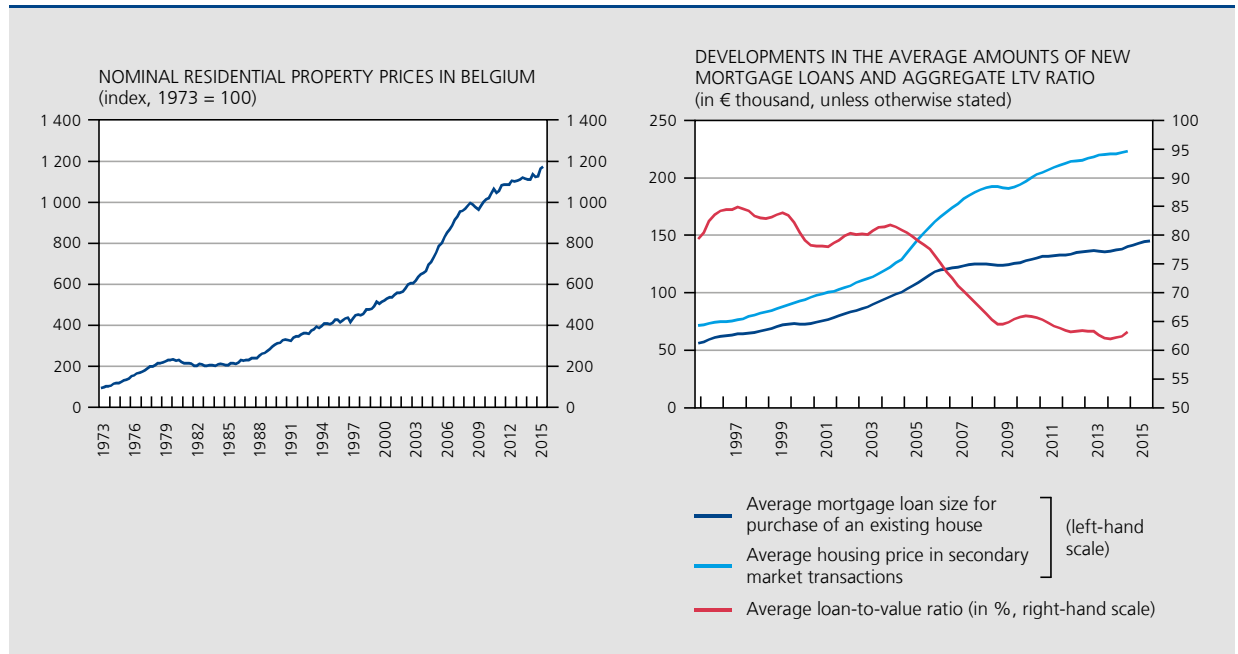
to almost 2.9 million since the last quarter of 2015 (left-hand panel of Chart 3). This continuous increase in the number of mortgage loans is closely related to the rising number of housing sales in recent years, which reached historically high levels in 2014 and 2015. The sharp increase in the number of transactions in the last quarter of 2014 – owing to anticipation of the tax regime change in Flanders, curbing mortgage tax relief from 1 January 2015 – does appear to have spilled over to the following year due to the low interest rate environment that has continued to boost the number of property transactions. Borrowers anticipating stricter conditions for reduced VAT rates on house renovation (as from 2016) as well as impending changes to the tax treatment of mortgage loans in the Walloon (2016) and Brussels (2017) Regions may also have brought forward a number of planned real estate transactions to 2015 (and 2016). Notwithstanding an already high level in 2014, Belgian notaries thus recorded again very high levels of real estate transactions in 2015 and the first quarter of 2016.

The very dynamic housing market also contributed to a further increase in the stock of banks' mortgage loans measured in billion euros (right-hand panel of Chart 3). Since the final quarter of 2014, the year-to-year growth rate of this portfolio has amounted to around 5%, up from less than 3% in the first half of 2014. The stock of mortgage loans granted by Belgian banks to Belgian households thus grew from € 167.3 billion at the beginning of the last quarter of 2014 to € 178.3 billion by the end of February 2016. During this period, a great number of Belgian households also decided to refinance their mortgage loans (see below for more details).

The strong expansion of mortgage debt over the past 15 years occurred during a period of sharp house price rises. In Belgium, nominal property prices have more than doubled since the beginning of the century, continuing an upward movement without any sharp correction that has characterised developments since 1970 (left-hand panel of Chart 4). In fact, compared to other euro area countries, nominal property prices in Belgium suffered smaller and less persistent declines during the financial crisis, even though their growth slowed down to a very moderate pace in 2014 (0.6%). While the tax reform in the Flemish Region was expected to keep a lid on price developments in 2015 – given the big cut in the tax abatement and the share of this Region in the number of transactions in the secondary market –, the available 2015 data point to a new pick-up in growth, with house prices rising by around 4% on average during the year. It is not clear to what extent this further increase in the average house price in secondary market transactions could be related to the growing attractiveness of real estate as an investment asset in the current very low interest rate environment. Heavy losses on financial assets during the financial crisis and tax regularisation measures that favoured reinvestment of

repatriated capital in some types of assets (including Belgian real estate) had already enhanced the relative attraction of real estate as an investment asset for households a few years ago.

CHART 4 NOMINAL RESIDENTIAL PROPERTY PRICES AND AGGREGATE AVERAGE LTV RATIO



Sources: FPS Economy, NBB.

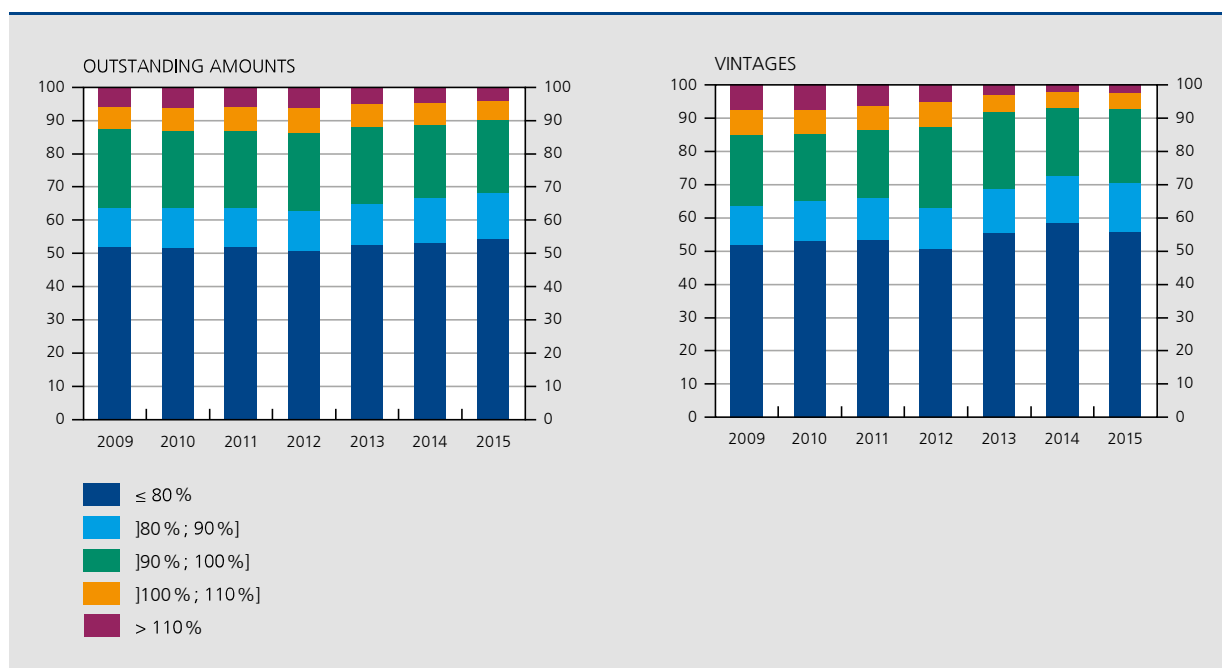
A wider shift of households' financial savings to Belgian residential real estate assets is one explanation for the growing divergence between, on the one hand, the average size of new mortgages that are used to finance the purchase of an existing house or apartment and, on the other hand, the average composite housing price, calculated as the volume-weighted average of the sales prices of small and medium-sized houses, large houses and apartments (right-hand panel of Chart 4). Indeed, this shift of investment money tends to push up property prices while bringing down the average mortgage loan size as such properties are to a greater extent financed from own funds. In similar vein, the extra flexibility and lower tax rate for gifts and donations probably also stimulated additional inter-generational transfers of financial resources in the context of home purchases, lowering the average loan-to-value ratio, all other things being equal. Between 1996 and 2006, 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 as the average mortgage increased by an additional 15 % to € 140 000 in 2014, while the composite house price has risen by 30 % to € 223 000. As a result, the associated loan-to-value ratio dropped to 65 % (and even below that) in the years 2007-2014.

This average loan-to-value ratio nevertheless has to be interpreted with caution, as the data collected from the 14 participating credit institutions confirm that it is the result of a very wide distribution of loan-to-value ratios at origination. As shown in the right-hand panel of Chart 5, banks are actually still granting significant volumes of new mortgage loans with high LTV ratios. In part, this relates to the increase in house prices on the Belgian property market, which forced households with limited own funds to have recourse to high(er)-LTV loans to access the residential property market. More recently, it might also be due to households feeling encouraged to take out relatively larger loans in a low interest rate environment. Yet, the important share of high-LTV loans is also a reflection of banks' lending policies, which could be tightened to discourage the production of such loans. For the 2015 vintage, 30 % of the volume of new mortgage loans was still made up of loans with an LTV ratio above 90 %.

There has been a gradual reduction in the share of new loans carrying the highest LTV ratios (> 100 %) over the past 7 years, but it should be recalled that the large volume of refinanced loans in recent years has positively affected these

LTV vintage figures, given that remortgages are often classified as new loans by banks with their LTV levels being updated. The loan amount or the ratio numerator of such refinanced loans is typically lower than the original amount since most Belgian mortgage loans have capital repayments over the duration of the contract, while at the same time the collateral value or denominator of the ratio often turns out higher than at the time the loan was granted keeping in mind the persistent increase of property prices in Belgium. Partial data collected from banks where loans used for refinancing are excluded from the vintage figures shown in the right-hand panel of Chart 5 thus tend to show even higher shares in new production of loans with an LTV of more than 90 %. These data without refinanced loans also suggest no further improvement in LTV standards during the year under review as compared to 2014. This slowdown in the reduction of high-LTV loans in new production is a point of particular interest given the still sizeable market share of loans with an original LTV of more than 90 % in new production.

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)



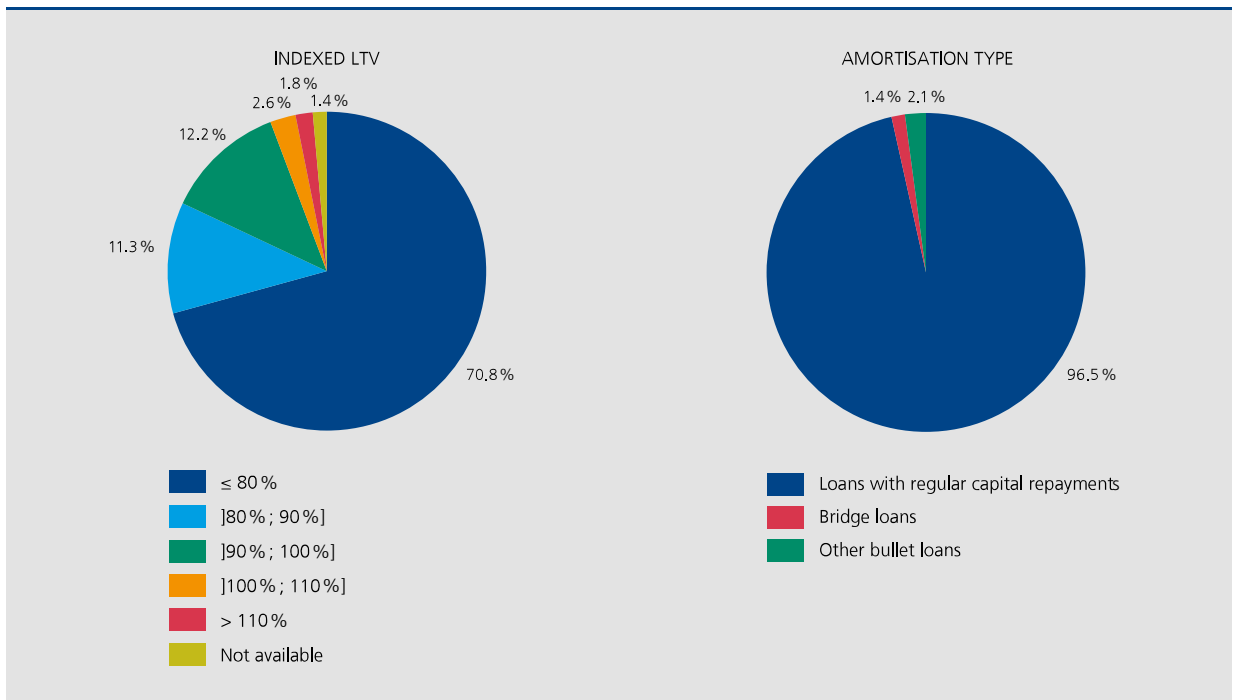
Source : NBB.

While refinancing transactions distort the statistics on LTV at origination, the indexed loan-to-value ratio – that takes into account loan amortisations and developments in collateral value for all loans – could offer a cleaner picture of the LTV-related riskiness of Belgian banks’ domestic mortgage loan portfolios. Loans with an indexed LTV higher than 90 % accounted for 16.5 % (or € 28.8 billion) of the total outstanding stock at the end of 2015. At the end of 2014, the share of these loans came to 15.3 %. Loans with an indexed LTV above 100 % account for 4.4 % of the total, meaning that almost 8 billion of mortgage debt is currently not entirely covered by the current (market) value of the collateral provided (left-hand panel of Chart 6). Assessing this, one should bear in mind that the amount of mortgage debt used to calculate indexed LTV captures the amount of capital that still needs to be repaid (thus not including the capital already repaid since origination). In Belgium, to a greater extent than in some other euro area countries, mortgage loans are characterised by both interest and capital repayments (typically in the form of annuities with monthly reimbursement of capital) over their maturity. At the end of 2015, such loans accounted for 97 % of the total outstanding stock (right-hand panel of Chart 6). Loans that have no capital repayments before their final maturity (so-called “bullet” loans) account for a very small share of the stock (only € 6 billion of Belgian mortgage debt, of which € 2.3 billion are bridge loans).

Chart 7 provides a breakdown of the stock and vintages according to the original maturity of the mortgage loan. It can be seen from the figures that, since 2007, banks have continued to tighten customers’ access to mortgage loans with long maturities. The percentage of loans granted with a maturity of more than 25 years has plummeted from 23 %

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

(in % of total loan stock, at the end of 2015)

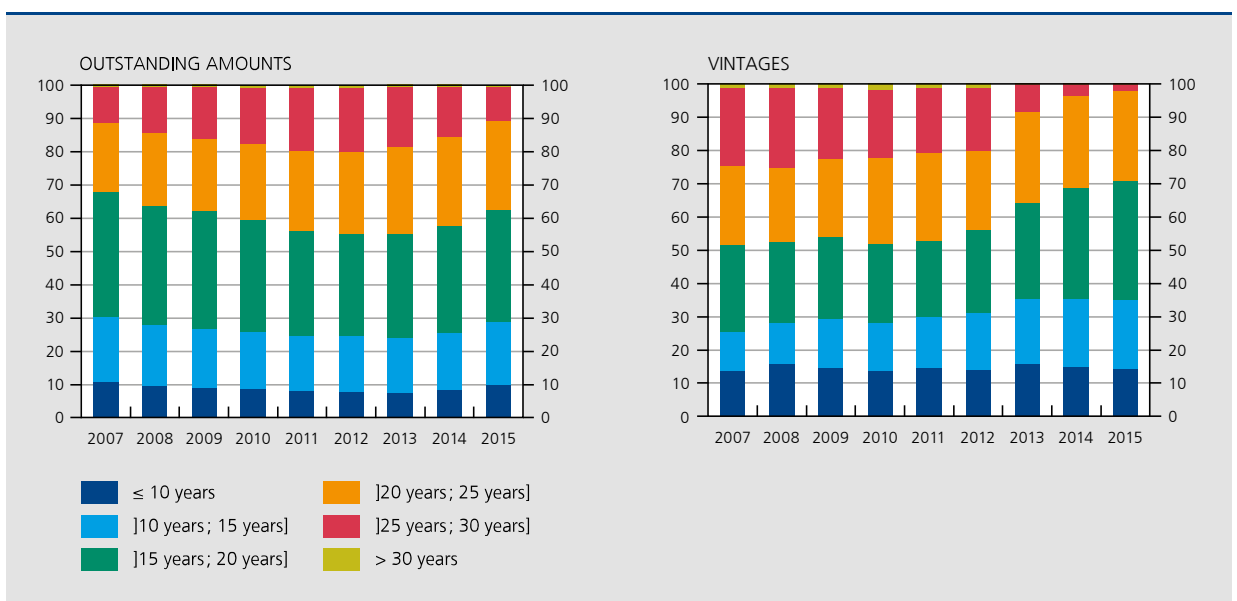


Source : NBB.

(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.

CHART 7 MATURITIES AT ORIGINATION

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



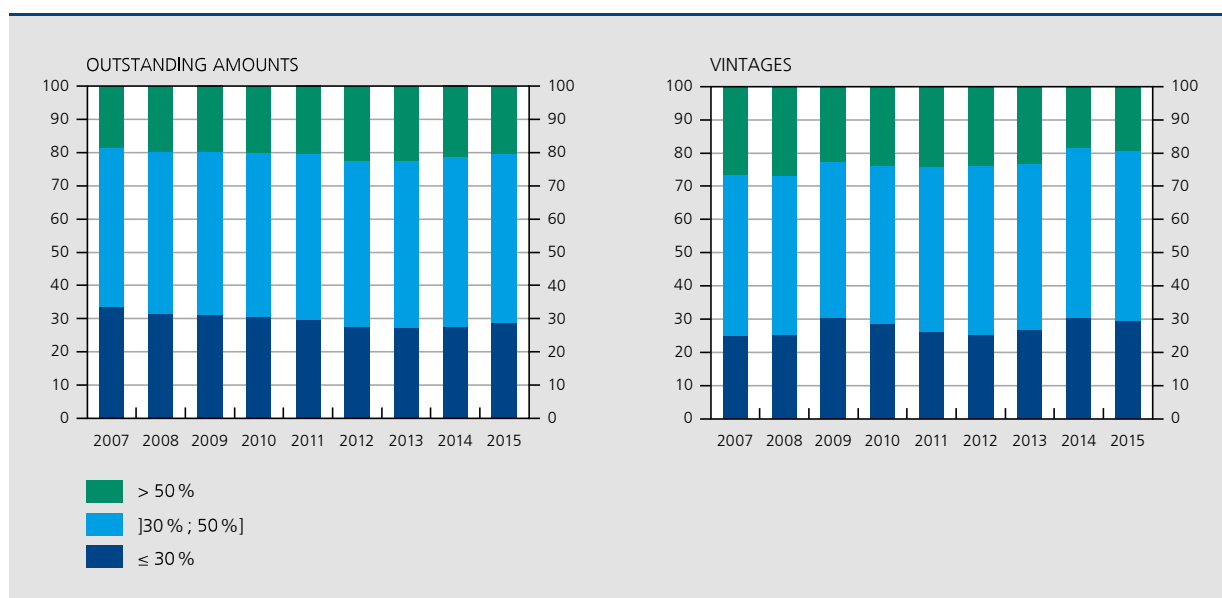
Source : NBB.

in 2007 production volumes to only 2 % in 2015. At the same time, the share of loans with a maturity between 20 and 25 years in mortgage loan vintages remained relatively stable while the share of loans with a maturity between 15 and 20 years clearly increased. These trends seem to have influenced the average maturity level of total outstanding stock as from 2013; by the end of 2015, 11 % was associated with initial maturities above 25 years, down from 20 % in 2012. Yet, here again, refinanced loans tend to positively bias results since their maturity is often updated at the time of refinancing and is therefore smaller than the maturity of the original loan. This is especially true for the 2014 and 2015 vintages, when there was a huge volume of loan refinancing.

As the average duration of mortgage contracts shortens, higher debt-service-to-income ratios might be expected since it can be argued that, on average, capital amounts will have to be reimbursed within a shorter time span. However, the available data do not suggest that the lower availability of longer mortgage loan maturities, especially from 2012 on, contributed to concurrent upward pressure on the debt-service-to-income ratios for borrowers at the time of the origination of their mortgages (Chart 8). This suggests that banks have become more selective in their credit origination policies since 2012. Yet, the most recent vintage figures have to be interpreted with caution in this regard, as the 2014 and 2015 data for new production volumes include large amounts of refinanced loans. All other things being equal, this inclusion of remortgages should generally improve the reported distribution for DSTI levels, as the loans replacing the refinanced loans should have lower monthly debt payments (because of the reduced interest rate) and possibly higher debtor incomes (which on average increase over time) as well. For the real new loans of the vintage, the further decline in mortgage loan rates in 2015 should also have had a positive impact on the recorded DSTI levels.

Notwithstanding these elements that could have influenced positively the mortgage loan DSTIs included in the 2014 and 2015 vintages, the reported data show that Belgian banks continued to produce a high amount of new loans 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). In both vintages, the share of these loans in new production amounted to around 20 %, and no further improvement was recorded in 2015.

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.

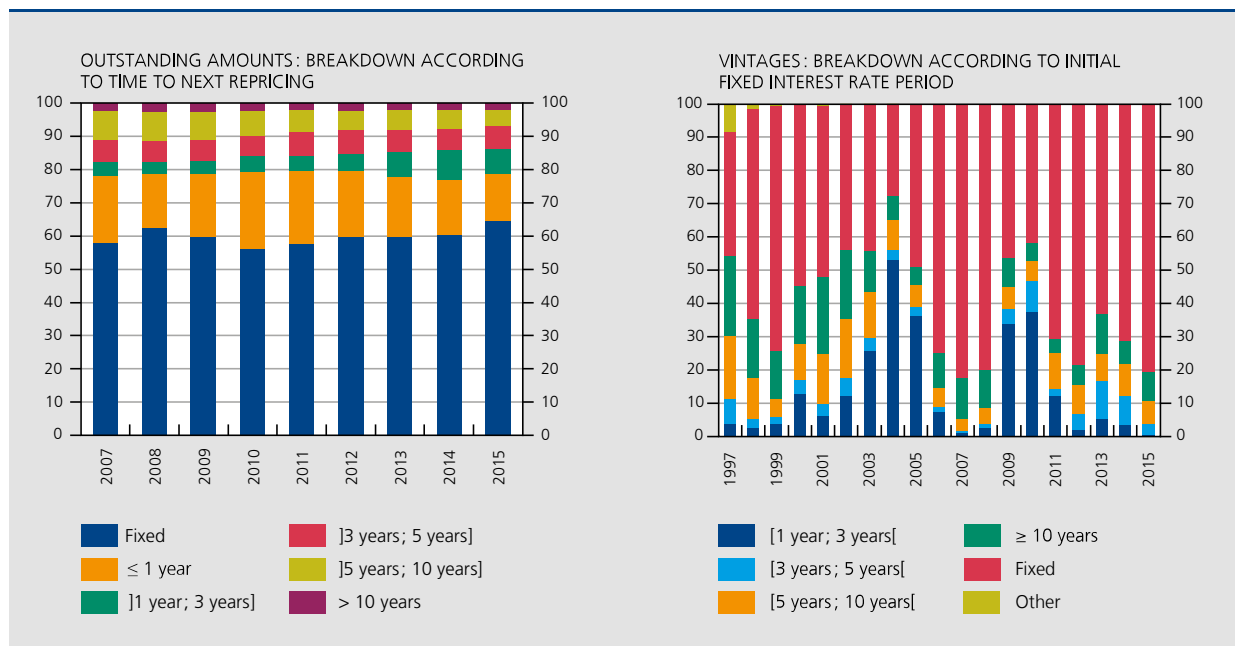
Changes in debt service levels after origination can be the result of revisions of mortgage interest rates in those contracts for which the rate has not been fixed for the whole maturity of the contract. Indeed, borrowers who have chosen variable-rate contracts see their DSTI levels decline when interest rates fall and, conversely, are confronted with upward pressures on their monthly debt burden when interest rates rise. Yet, Belgian 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, reviewed on the basis of the monthly average yields on Belgian government bonds, may never exceed a level that is twice the initial client 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.

The share of variable-rate contracts within the stock of Belgian mortgage debt has been falling for several years now, as a result of the low interest rate environment encouraging borrowers to opt for fixed-rate contracts in their desire to lock in the current low rates. By the end of 2015, 65 % of the total Belgian mortgage loan pool had an interest rate fixed for the whole maturity of the contract (left-hand panel of Chart 9), which was not only the result of a growing share of new loans carrying fixed interest rates, but also of *refinanced* loans in which customers given the current environment typically prefer a new fixed rate for the remaining maturity of their loan. This development affected large parts of the stock, especially from the second half of 2014. As a consequence, of the newly granted loans – which also include refinanced loans that are classified as new loans – respectively 76 % and 83 % of the 2014 and 2015 vintages consisted of fixed-rate contracts (right-hand panel of Chart 9).

Of the falling share of mortgage loans having some form of interest rate variability, slightly more than 14 % of the stock at the end of 2015 is scheduled to be repriced in the course of 2016 (left-hand panel of Chart 9). In this connection, it should be recalled that the Belgian mortgage loan regulations forbid mortgage loans for which the interest rate is fixed for less than 1 year.

CHART 9 INTEREST RATE VARIABILITY
(in % of total loans)

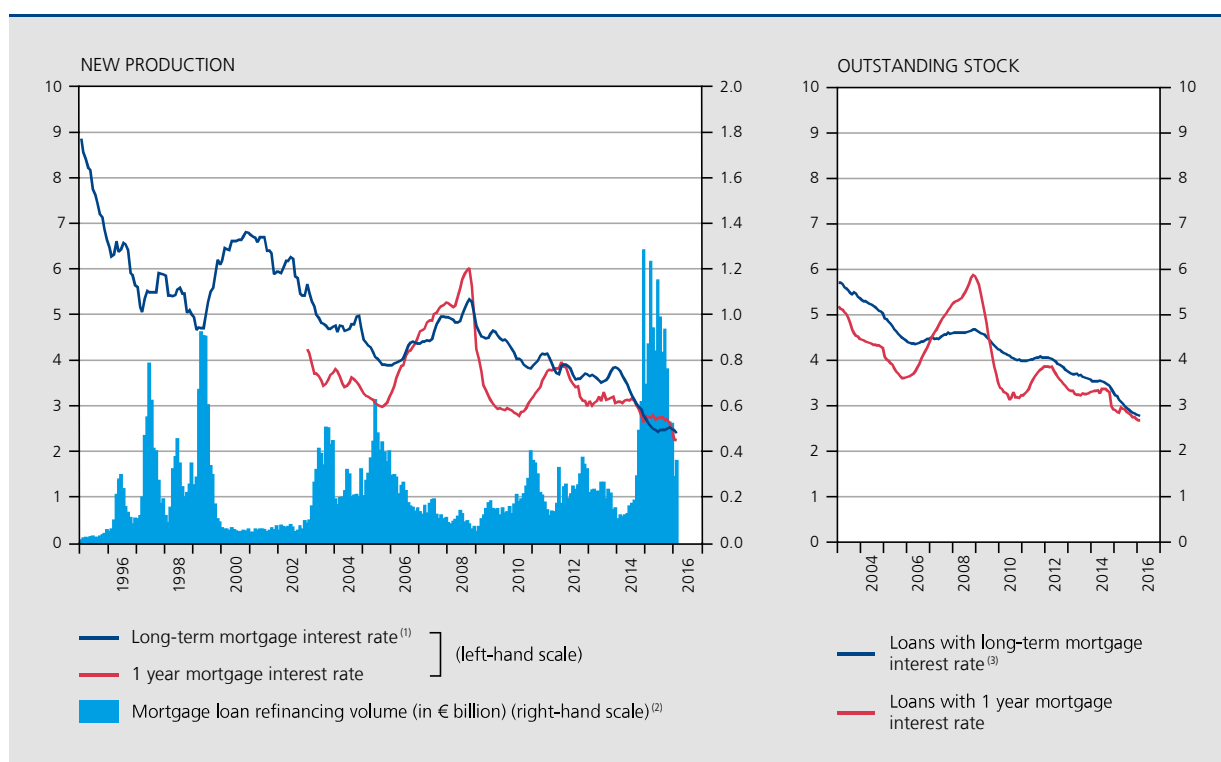


Sources: BVK/UPC, NBB.

Client rates for new mortgage loans reached historically low levels in 2015 and early 2016, with long- and short-term rates dropping from respectively 3.8 % and 3.1 % at the beginning of 2014 to 2.4 % and 2.2 % in February 2016 (left-hand panel of Chart 10). This chart also includes an indication of the volume of loan refinancing that has taken place in recent years, albeit only for the mortgage loans refinanced externally. Estimates including as well the amount of internally refinanced loans indicate that, overall, no less than one-third of the total stock of mortgage loans was refinanced between the second half of 2014 and the end of 2015. 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.

Therefore, borrowers often opt for early redemption for the purpose of refinancing their loans at lower interest rates when rates on new mortgages fall below the yield on historical contracts. Consequently monthly mortgage refinancing volumes are very sensitive to the level of interest rates on new mortgages, as attested again by the developments in 2014 and 2015. The low interest rates on new mortgage contracts also clearly affect the average interest rates on the outstanding stock of mortgage loans, which are shown in the right-hand panel of Chart 10. Falling below 3% as from the end of 2014, the long- and short-term interest rates on Belgian banks' domestic mortgage loans are at historically low levels. Data from the semi-annual survey on Belgian banks' mortgage loan portfolios suggest that, within the outstanding stock, there has been a major shift towards loans within the interest rate bucket of between 2% and 3%, reducing the share of loans in the higher buckets.

CHART 10 MORTGAGE LOAN INTEREST RATES
(in %, unless otherwise stated)



Source: NBB.

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

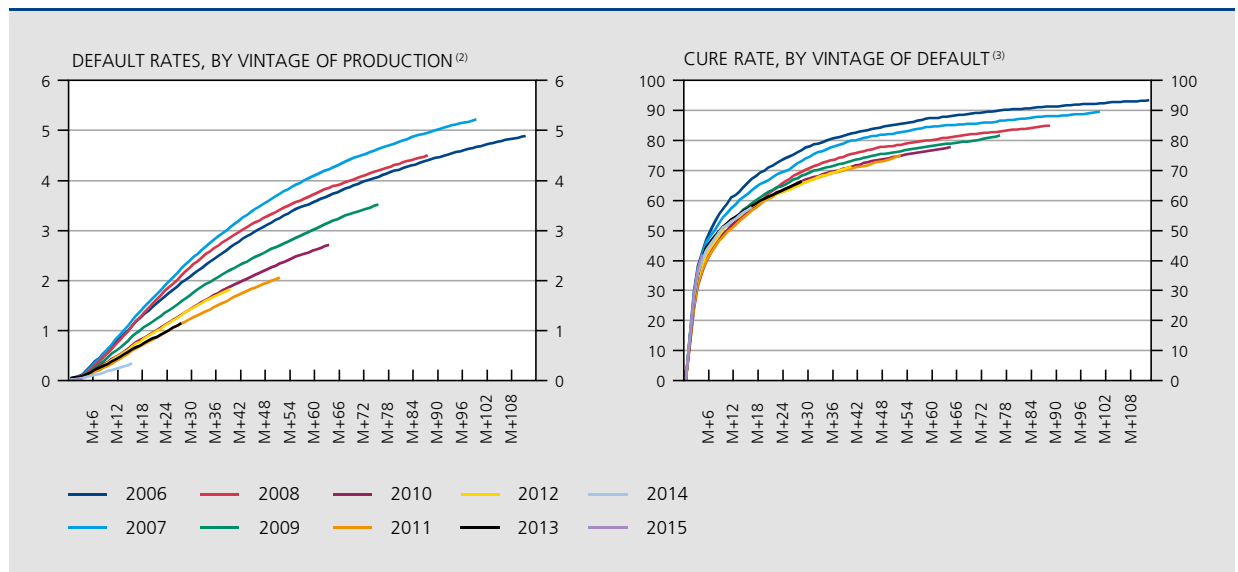
(2) Only for loans refinanced externally.

(3) Rate fixed for more than five years.

2. Credit quality, Basel parameters and prudential measures

So far, aggregate indicators do not point to any worsening of Belgian households' mortgage credit quality. In the left-hand panel of Chart 11, it can be seen that mortgage credit quality has in fact been generally improving since 2007, since the share of loans defaulting within a certain time period after origination is, in most cases, smaller for loans that are granted in later vintages. For example, the share of loans granted in 2007 which defaulted within 2 years (M+24) after origination, amounts to 2%, while that default rate is only 1% for loans originated in 2013. It could be concluded from this development that there has been no sign of any deterioration in households' credit quality so far. However, it should be noted that defaulted loans seem to take more time to cure or are more difficult to cure for the most recent default vintages (right-hand panel of Chart 11). Whereas, as an example, around 42% of defaulted loans in 2007 had regularised payments by the third month after default, this percentage was down to 37% for loans from the 2010 and 2011 default vintages. As regards loans that defaulted in 2015, the cure rate of loans defaulted 3 months earlier was at 42% again, indicating that cure rates might be starting to improve again.

CHART 11 MORTGAGE LOANS WITH PAYMENT DEFAULTS⁽¹⁾, BY VINTAGE
(in %)



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 (cures) of loans are not taken into account.

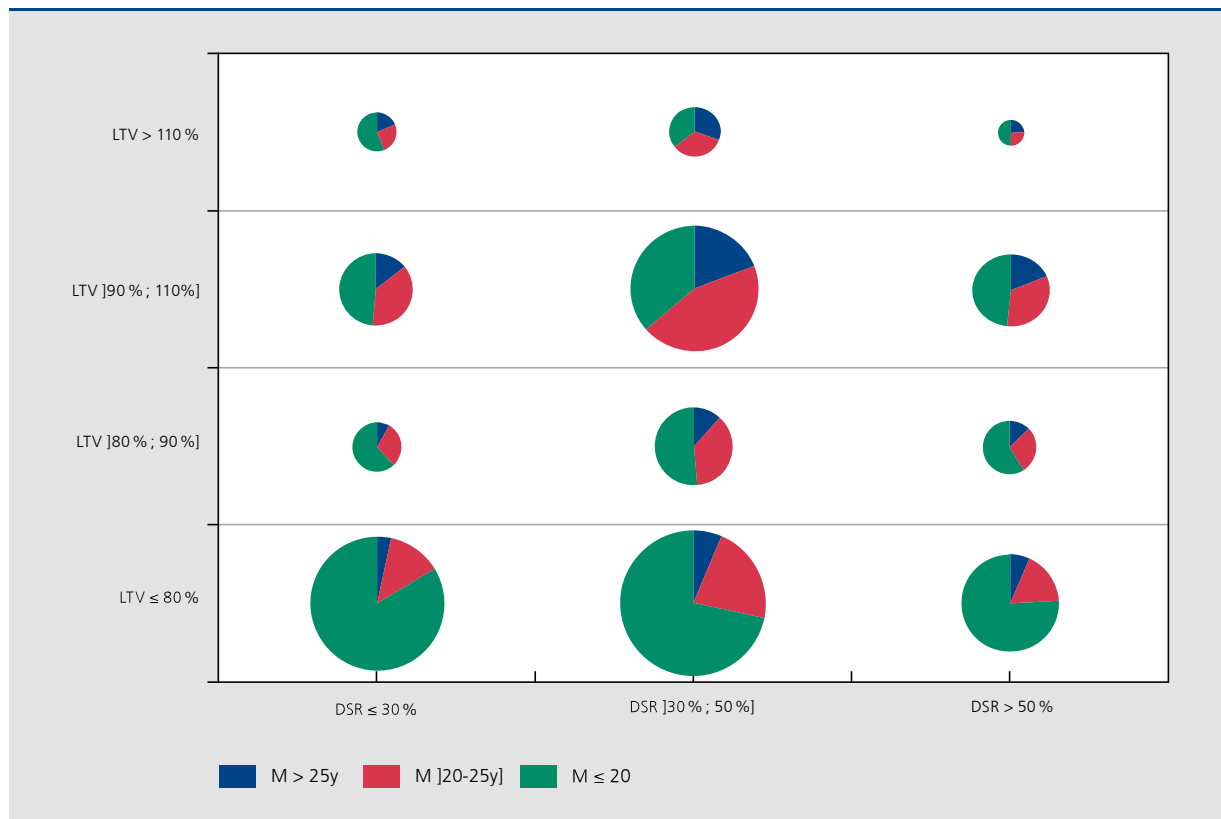
(3) Vintages group together loans that defaulted during the same year. The curves show, for each vintage, the number of cured loans as a percentage of total defaulted loans after a certain number of months since the loans went into default.

In order to maintain the high asset quality of Belgian mortgage loans, it will be important to prevent the further build-up of loan segments that are vulnerable in the case of a major downturn in the real estate market and/or an economic shock affecting the debt repayment capacity of mortgage debtors. For a number of years, the Bank has therefore been closely monitoring the developments in the Belgian residential real estate and mortgage loan market. The assessment of the related risks pointed up the presence of certain sub-segments within the outstanding stock of Belgian banks' domestic mortgage loan portfolios that combine high levels of risk parameters, such as high loan-to-value ratios, long loan maturities and/or high debt service ratios (Chart 12). Those loan segments could be the source of higher-than-expected credit losses for banks if conditions in the Belgian housing market were to become less buoyant than they have been over the past 15 years.

As part of the Bank's monitoring framework for risks related to the residential real estate market, particular attention has therefore been devoted to the way in which potential risks associated with mortgage loans were taken into account in calculating the minimum capital requirements for credit risk under the Basel Pillar 1 rules. For this purpose, the data collection on Belgian banks' mortgage portfolios includes information on the overall risk profile and quality of the residential mortgage portfolios together with the related Basel II risk parameters and risk weights, which is requested each year for the year-end positions. Two methods can be used 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) for the calculation of the risk-weighted assets (RWA) for credit risk. The second approach, the internal ratings-based (IRB) approach, relies on banks' internal risk models to calculate the average risk weight to be applied to the mortgage exposures concerned in order to calculate RWA, and is based on 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).

Since IRB models tend to be used by the larger institutions while smaller banks generally opt for the SA approach, the capital requirements for the bulk of the total outstanding Belgian mortgage debt (i.e. more than 90 %) is calculated on the basis of the risk weights in banks' own internal models. In order to compute these risk weights, Belgian banks calibrate their models on historical credit loss data. These data do not include a crisis period for the historic time span

CHART 12 BREAKDOWN OF THE PORTFOLIO OF MORTGAGE LOANS OF IRB BANKS BY LTV, DSR AND MATURITY AT ORIGINATION ⁽¹⁾⁽²⁾
(non-consolidated data, at the end of 2015)



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.

considered. Quite on the contrary, as evidenced by an almost continuous rise in prices and mortgage lending, the Belgian residential real estate market enjoyed rather buoyant market conditions during that time. Therefore, the risk weights calculated within those internal risk models are considerably lower than those determined by the SA approach (35 %), with an average IRB risk weight of only 10 %. As the EU average is 16 %, the Belgian average rate is also lower than in most other countries. Nevertheless, institution-specific data show that those risk weights vary widely between the nine Belgian credit institutions using an IRB approach for credit risk. Detailed analysis of those differences prove they are largely attributable to variations in the banks' risk profiles; the larger the banks' relative importance of the riskier sub-segments in their domestic mortgage loan portfolio, the higher the amount of defaults in that portfolio, and the higher the risk weights that are calibrated via those banks' internal models.

In this context, and in view of the relatively large share of domestic mortgage loans in Belgian credit institutions' balance sheets, the Bank considered it justified to take a prudential measure aimed at strengthening the banks' resilience and reducing the concentration risk. At the end of 2013, the Bank opted for a flat-rate 5-percentage-point add-on to the risk weights calculated by the banks using an IRB model for the determination of their minimum capital requirement under Pillar 1 for credit risk. This measure took effect with the Royal Decree of 8 December 2013, and, in practice, requires a bank calculating its minimum capital requirement on the basis of, say, a risk weight of 9 %, to increase that weight to 14 %. As such, by adding a fixed percentage to the risk weight calculated by the bank itself – instead of imposing the same minimum fixed risk weight floor for all banks –, banks' incentives to maintain sound credit standards in loan origination are not affected by this macroprudential measure. As a result of the introduction of the add-on, the average risk weight of the IRB banks for Belgian mortgage loans effectively went up from around 10 % at the end of 2012 to about 15 % at the end of 2013 and in the years thereafter. Including this add-on (equivalent to around € 600 million

of additional capital), the total buffer to cover potential losses on Belgian mortgage loans amounts to € 2.8 billion, composed of an unexpected loss buffer of € 2.3 billion (for both IRB and STA banks) and an IRB expected loss buffer of € 0.5 billion. This buffer is a very large multiple of the current loss rate on Belgian mortgage loans, estimated at between € 150 and € 200 million per year.

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 necessary adjustments to those approaches. The other microprudential measure involved 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.

In 2015, the Bank concluded that the macroprudential 5-percentage-point add-on for IRB banks' risk weights for mortgage loans still provided an adequate but necessary capital buffer in view of the risks identified. In the final quarter of the year under review, it therefore initiated the necessary procedure for continuing the measure in 2016 and 2017. That extension required the agreement of the competent European institutions in accordance with Article 458 of the Capital Requirements Regulation (CRR), which was obtained in the first quarter of 2016.

Going forward, the Bank will continue to assess how potential vulnerabilities – related to growth rates for house prices and mortgage loans, trends in household debt or banks' mortgage credit standards – develop and, based on this assessment, regularly evaluate the appropriate level of the macroprudential add-on as well as the potential need for additional measures. As regards the banks' credit standards, section 1 of this article has shown that banks have tightened up their credit policies since 2012 for the most risky sub-segments of the mortgage loan portfolio, but the data also highlight that they are still producing large volumes of mortgage loans with very high loan-to-value or debt-service ratios. The pockets of risk in the stock of Belgian mortgage loans thus continue to grow. Moreover, the available data on the credit standards applied by banks in new mortgage loan production in 2015 suggest that the tightening of credit standards for the most risky loans may have slowed down (or come to an end) in the course of the year under review if no account is taken of the loans used to refinance a previous loan. Against this background, the Bank stands ready to envisage additional measures to target these high-risk loans should the further reduction in these loans in new production not proceed as strongly and rapidly as might be desired in view of the vulnerabilities that have already accumulated in the existing stock and the earlier recommendations and policy measures announced by the Bank. The Bank's policy stance on Belgian mortgage loans will also take into account the results of peer analyses being conducted at the level of the European Central Bank and the European Systemic Risk Board for countries with identified potential residential real estate vulnerabilities, including Belgium.