MACROPRUDENTIAL RECOMMENDATION ON NEW CREDIT AGREEMENTS FOR CONSUMERS – PROGRESS REPORT

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Executive summary

In its capacity as the macroprudential authority, the Banco de Portugal aims to mitigate the build-up of systemic risk within the financial system and thus contribute to preserve financial stability. This objective is pursued through its macroprudential policy strategy. To this end, in July 2018 a Recommendation was introduced, targeting new credit agreements concluded with consumers (hereinafter 'Recommendation'). This measure was implemented in the form of a recommendation targeting a number of credit standards that institutions must comply with in borrowers' creditworthiness assessments. The purpose of the Recommendation is to promote the adoption of prudent credit standards, strengthening institutions' resilience and borrowers' access to sustainable financing, thereby preventing arrears situations.

2020 was characterised by an acute shock associated with the COVID-19 pandemic. Therefore, in comparison with 2019, it was crucial: (i) to ensure that households had access to the necessary liquidity to prevent arrears situations in the short term, and (ii) to anchor medium-term credit standards. Hence, over the course of 2020 it was assessed whether the design and calibration of the Recommendation remained appropriate, and whether there was any interference with other measures taken at national and international level, particularly in the context of the pandemic. As a result of this analysis, the Banco de Portugal eased a number of credit standards temporarily. This amendment remained in force only until September 2020, given that the analysis of a sample of institutions representing around 95% of new credit to households showed that no new credit was granted under these eased standards.

In 2020 credit institutions continued to broadly comply with the limits set out in the Recommendation. Almost all new credit for the purchase of own and permanent residence had an LTV (loan-to-value) ratio below the 90% limit. Around 93% of all new credit for house purchase and consumer credit was granted to borrowers with a DSTI (debt service-to-income) ratio of 50% or less. In addition, only 5% of new business was associated with borrowers with a DSTI ratio between 50% and 60% (which is much lower than the exceptions provided for) and 2% of new credit was granted with a DSTI ratio of over 60% (within the 5% exception provided for).

The limits to the maximum maturity established in the Recommendation were generally complied with during 2020. However, the analysis carried out showed an increase in the average maturity of new credit for house purchase, which stood at 33 years in 2020, a figure similar to that recorded at the time of implementation of the Recommendation in July 2018. The Recommendation sets out a gradual convergence of the average maturity of new credit for house purchase towards 30 years by the end of 2022. In Portugal, the average maturity of new credit for house purchase remains longer than in a sample of European countries for which this information is available.

The average maturity of consumer credit decreased over the course of 2020, from 7.9 years in January to 7.4 years in December. This reflects the reduction of the limit to the maximum maturity of new personal credit from 10 to 7 years in April 2020, with the exception of personal credit for education, healthcare and renewable energy. Institutions implemented this change quickly and effectively, given that from April 2020 onwards, when the new limit entered into force, the share of new personal credit with a maturity of over 7 years became residual.

Finally, there was a high degree of compliance with the regular payments requirement during 2020, with only 2% of new business with households in the fourth quarter of 2020 not meeting this requirement.

This Report and its earlier issues[1] document an improvement in the borrowers' risk profile and a convergence of institutions towards the limits set out in the Recommendation. By improving the risk profile of the borrowers of new credit, the Recommendation has contributed to reducing their probability of default, thereby increasing the resilience of the financial system to adverse shocks. This conclusion is in line with the results presented in Chapter 3, obtained through an integrated micro-macro model. In particular, this analysis leads to the conclusion that the introduction of the Recommendation has increased the resilience of the banking system by lowering the probability of default of borrowers, by reducing the amount of credit losses to be borne by institutions in the event of default, with the consequent positive impact on the capital of financial institutions.

The analysis in this Report shows that the limits established in the Recommendation are appropriate and effective in complying with the objectives set. The Banco de Portugal, as macroprudential authority, will continue to monitor developments in household indebtedness, as well as credit standards, and will if necessary adopt any additional measures it deems appropriate.

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[1] Previous issues on the Banco de Portugal's website.

1 Framework for the macroprudential Recommendation in 2020

In its capacity as macroprudential authority, the Banco de Portugal issued in February 2018 a Recommendation on the credit standards applicable to credit for house purchase, other credit secured by a mortgage or equivalent guarantee, and consumer credit concluded by credit institutions and financial companies having their head office or branch in Portugal (hereinafter 'Recommendation'). By encouraging the adoption of prudent credit standards, the Recommendation aims to increase the resilience of households and the financial sector to adverse shocks and promote household access to sustainable financing, thereby preventing arrears situations. By acting on gross credit flows, the Recommendation also has a gradual impact on the stock of credit over the medium term.

The Recommendation has introduced four measures, in particular:

- Limits to the LTV ratio, i.e. the ratio of the credit amount to the minimum between the purchase price and the appraisal value of the immovable property pledged as collateral;
- Limits to the DSTI ratio, i.e. the ratio of the total amount of monthly instalments of a borrower's total debt to his/her net monthly income;
- Limits to the maturity of loans;
- Regular interest and principal payment requirements.

These four measures have been set out to mitigate the individual limitations of each instrument in order to enhance the overall effectiveness of the Recommendation. By restricting the monthly instalment associated with borrowers' debt servicing according to their income level, the limits to the DSTI ratio help to reduce the probability of default. On the other hand, for a given loan amount, extending the maturity would make it possible to reduce the related monthly costs. Hence, establishing a limit to maturity makes it possible to prevent limits to the DSTI ratio from being circumvented. The limits to the LTV ratio encourage borrowers to use their own capital more, thus contributing to a decrease in the probability of default. In addition, by setting out a minimum value of the immovable property pledged as collateral *vis-à-vis* the amount of credit established in the agreement, the limits to the LTV ratio make it possible to mitigate financial sector losses in arrears situations.

The Recommendation establishes that the Banco de Portugal monitors implementation of the standards set out at least once a year, as well as the evolution of credit excluded from the scope of the measure. In this sense, the Banco de Portugal has already published two annual progress reports aimed at ascertaining the degree of implementation of the Recommendation, this document being the third issue. In addition, the Banco de Portugal assesses whether the Recommendation in force remains appropriate at any time. One of the purposes of this analysis concerns the need to change the design or calibration of the Recommendation. To this end, two amendments were introduced over the course of 2020: a first with the aim of reducing the maturity of personal credit and a second, described in more detail in this Report, resulting from the abrupt shock associated with the COVID-19 pandemic.

In January 2020 the Banco de Portugal amended the Recommendation, reducing the maximum maturity of new personal credit to 7 years. This amendment was introduced due to the persisting increase in the average maturity and average amount of new personal credit between 2012 and end-2019, which might pose a risk to the financial system, for implying that borrowers would be exposed to fluctuations in the business cycle for longer periods. This amendment excludes credit for education, healthcare and renewable energy – which continued to have a maximum maturity of 10 years –, provided that the borrower provides evidence of these purposes. In addition, the goal was to contain potential unwanted effects from the introduction of an upper limit of 7 years to personal credit maturity on the level of the DSTI ratio, i.e. the ratio of the monthly instalment amount calculated with all the borrower's loans to his/her income. The exceptions provided for in the Recommendation for granting credit to borrowers with a DSTI ratio between 50% and 60% have been reduced from 20% to 10% of the total amount of new credit granted by each institution. In addition, the exception that allows for up to 5% of the total amount of credit granted by each institution and covered by the Recommendation to exceed the limits for the DSTI ratio is maintained, and thus institutions continue to be allowed to consider other important aspects for assessing borrowers' creditworthiness that are risk mitigating factors (Figure 1.1).

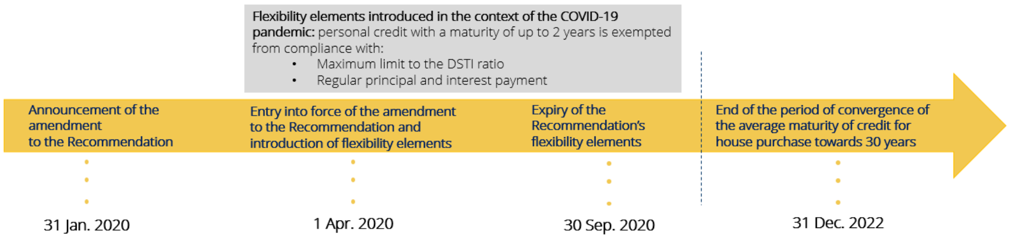
Figure 1.1 • Summary of the Recommendation on new credit agreements for consumers

Limits to the LTV [a]
- Up to 90% for own and permanent residence;
- Up to 80% for other purposes;
- Up to 100% for immovable property held by the institutions.

Limits to the DSTI [b]
- 50% or less, with the following exceptions:
  - Up to 10% of the total amount of credit may be granted with a DSTI ratio of up to 60%;
  - Up to 5% of the total amount of credit may exceed the limits to the DSTI.

Regular payments requirement
- New credit agreements should have regular principal and interest payments.

Limits to maturity:
- Maximum maturity of 40 years for credit for house purchase and gradual convergence of the average maturity towards 30 years by the end of 2022;
- Maximum maturity of 7 years for personal credit;
- Maximum maturity of 10 years for car credit and personal credit for healthcare, education and renewable energy.



Notes: (a) The LTV ratio is the ratio of the total amount of credit agreements secured by immovable property to the minimum between the purchase value and the appraisal value of the immovable property pledged as collateral. (b) The DSTI ratio is the ratio of the total amount of monthly instalments of a borrower's total debt to his/her monthly income less taxes and compulsory social security contributions. The calculation of the DSTI ratio should assume that the instalments of the new credit agreement are constant and consider the impact of an interest rate rise according to maturity in the case of variable and mixed interest rate agreements and a reduction in income in the case of a borrower aged 70 and over at the planned expiry of the agreement, except if at the time of the creditworthiness assessment the borrower is already retired. A shock on the interest rate of 1 p.p. should be considered for new business with a maturity of up to and including 5 years, of 2 p.p. for agreements with a maturity of 5 to 10 years and of 3 p.p. for agreements with a maturity of over 10 years. In the case of credit agreements at a mixed interest rate, the institution should consider the heavier instalment for the customer between that resulting from applying the increase in the index, taking into account the maturity of the agreement in the variable interest rate period, and that resulting from the fixed rate period.

> The COVID-19 pandemic has abruptly and significantly changed economic and financial conditions, leading to the temporary introduction of flexibility elements into the Recommendation

Policy measures in response to the COVID-19 pandemic at national and international level have played a key role in supporting the economy and mitigating risks to financial stability by promoting the financing of households and firms on favourable terms. These measures have also avoided the immediate materialisation of credit risk and the amplification of the shock triggered by the pandemic through the financial system.

The Banco de Portugal has assessed the suitability of the Recommendation in the context of the pandemic crisis. Given the nature of the shock, it was necessary to reconcile support for households' access to liquidity in the short term and the preservation of prudent credit standards in the medium term.

The Banco de Portugal considered that the design of the Recommendation already included flexibility elements that could be used in adverse situations. In particular, since its introduction the scope of the Recommendation excludes the following:

- credit intended to prevent or address arrears situations;
- credit agreements in the form of an overdraft facility and other credit with no defined repayment schedule (including credit cards and credit lines);
- credit agreements for an amount equal to or lower than the equivalent to tenfold the guaranteed monthly minimum wage (€6,350 in 2020).

These exclusions are added to the exceptions already existing to compliance with the DSTI ratio, which allow for 5% of the volume of new credit to be granted to borrowers with very low income, since under these circumstances the DSTI ratio will not have a limit. Also, the Recommendation is not an impediment to the application of credit moratoria.

Following this analysis, the Banco de Portugal has decided to nevertheless introduce additional and temporary exceptions to some of the upper limits to credit standards, in order to promote household access to liquidity in the short term. In particular, new personal credit concluded as of 1 April 2020 with a maturity of up to 2 years and duly identified as intended to mitigate households' temporary liquidity shortage situations was exempted from compliance with the DSTI ratio limit and from observing the recommendation of regular principal and interest payments. The first amendment to the 2020 Recommendation on the maturity of personal credit published on 31 January 2020 and entering into force on 1 April 2020, and described above, has been maintained, as it does not compromise the capacity to address households' temporary liquidity shortages.

On 30 September 2020 the suitability of introducing these additional flexibility elements was reassessed and it was decided that they would not be extended. This decision was based on evidence that no new credit had been granted under the additional exceptions established, from a sample of institutions representing around 95% of new personal credit business.

The Recommendation is in line with European Banking Authority Guidelines on loan origination and monitoring

At international level, the European Banking Authority (EBA) published on 29 May 2020 its Guidelines on loan origination and monitoring.[2] These Guidelines aim to improve the resilience of the EU banking system through arrangements, processes and mechanisms to ensure that institutions have robust and prudent standards for credit risk taking. It will thus be possible to reduce

[2] The Guidelines are available on the EBA's website.

the respective risk, contributing to ensure financial stability and also that the institutions' practices are aligned with consumer protection rules. These Guidelines enter into force on 30 June 2021.

EBA's Guidelines include considerations directly related to creditworthiness assessment and credit-granting criteria. In particular, institutions should carry out sensitivity analyses reflecting potential negative events in the future, including a reduction in income or an increase in interest rates in cases of variable rate loan agreements. In addition, when assessing creditworthiness institutions should consider that there are fixed costs to be borne by borrowers, such as monthly instalments associated with other credit agreements. The Recommendation is in line with these Guidelines, already envisaging that the calculation of the DSTI ratio will include the total amount of monthly instalments, calculated with a borrower's total debt, and that the impact of potential negative shocks such as a reduction in income or increases in the applicable interest rates will be taken into account.

2 Assessment of the degree of implementation of the Recommendation

During 2020 the Banco de Portugal continued to assess the Recommendation's degree of implementation through monthly reporting by 13 previously scrutinised institutions, representing around 95% of new household credit business. In addition, each institution is asked to present a self-assessment report on an annual basis, which is subject to the approval of the respective management board. The Banco de Portugal has also been assessing the measures taken by all institutions in view of the Recommendation, based on the data reported through the Central Credit Register.

As documented in the previous issues of this Report, the first few months after implementation of the Recommendation in July 2018 were affected by credit business for which the borrower's creditworthiness assessment was carried out prior to its entry into force. This was particularly evident in credit for house purchase, for which the period between the creditworthiness assessment and the release of funds is longer than for consumer credit. Therefore, data for July 2018 were used as a starting point to assess the evolution of the borrower's risk profile throughout the period under review. This Report analyses the period from July 2018 to December 2020, focusing on developments observed after April 2020, during which, on the one hand, the effects of the pandemic were felt more strongly and, on the other, the Recommendation was amended.

Institutions reinforced compliance with the limits set out in the Recommendation in the context of the COVID-19 pandemic

In 2020, following the pandemic-related shock, new credit to households initially fell, subsequently recovering, the most significant impact having been observed in new consumer credit (Chart 2.1). The amount of new credit for house purchase increased by 7.3% from 2019, highlighting the resilience of this type of credit. In the same period, the amount of new consumer credit business decreased by 17.6%. This decrease, which contrasts with developments in credit for house purchase, should be linked to the different impact of the pandemic by household income level.

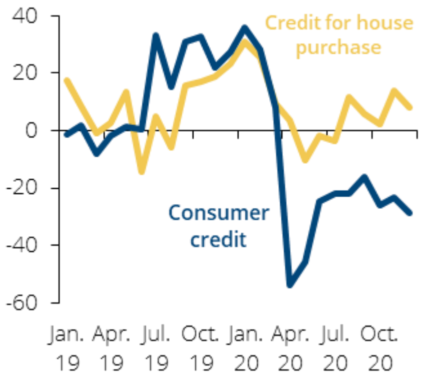
According to the *Bank Lending Survey*,[3] household demand for loans declined significantly during the second quarter of 2020, both in the segment of loans for house purchase and in consumer credit. In the third and fourth quarters of 2020 the two credit segments behaved differently, as demand for loans for house purchase recovered while demand for consumer credit remained broadly unchanged. Banks indicated lower consumer confidence as the main determinant of the evolution of credit demand by households in 2020, despite favourable lending conditions. Indeed,

[3] The *Bank Lending Survey* is conducted four times a year to a sample of banks operating in Portugal to obtain qualitative information on the supply and demand of loans to firms and households.

the average interest rate on new loans for house purchase declined from 1.1% in January to 0.8% in December 2020. During the same period, the interest rate on new consumer credit declined from 7.0% to 6.1%.

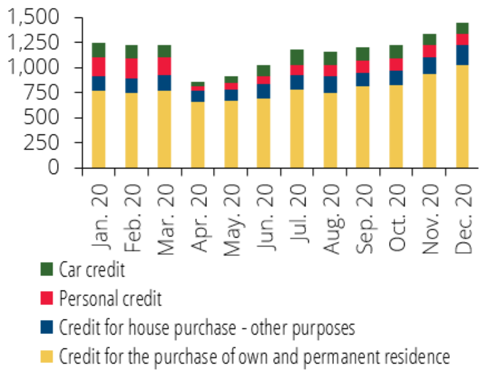
Notwithstanding a decline in the interest rate on new business, banks reported a tightening of credit standards (particularly in relation to the required collateral and the LTV ratio) during the second quarter of 2020. Such tightening was maintained during the second half of the year. This resulted in an increase in the proportion of rejected business, both in the segment of credit for house purchase and consumer credit. The change in risk perception with regard to the economic outlook and borrowers' creditworthiness was the main factor behind the tightening of credit standards. In addition, banks reported a lower risk tolerance in the consumer credit segment.

Chart 2.1 • Year-on-year rate of change in new credit for house purchase and new consumer credit | Per cent



Source: Banco de Portugal. | Notes: The latest observation is for December 2020.

Chart 2.2 • New credit for house purchase and new consumer credit | EUR millions



Source: Banco de Portugal. | Notes: Based on information reported by a sample of 13 institutions. The segment of credit for house purchase – other purposes includes credit for purchasing property held by the institutions and for property financial leasing agreements. The latest observation is for December 2020.

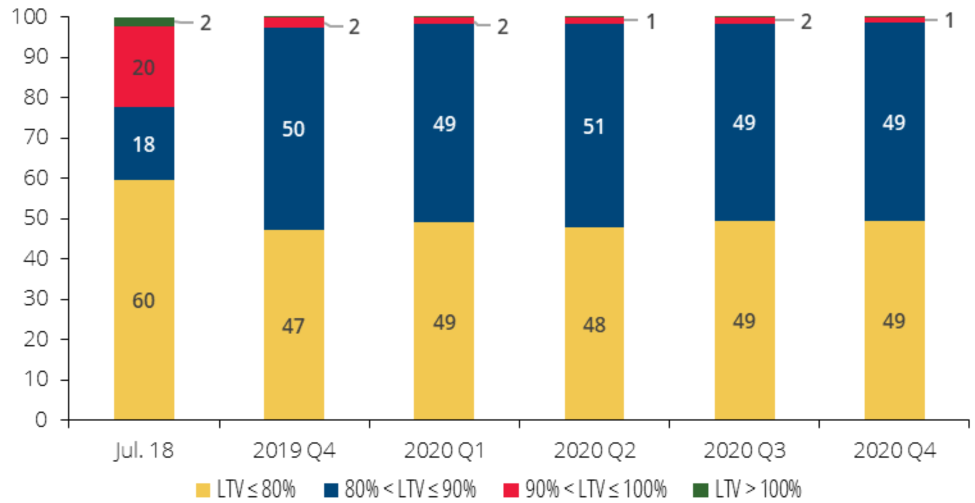
With regard to the different components of credit for house purchase and consumer credit, between March and April 2020 new credit business fell overall, subsequently recovering at different levels depending on the type of credit. In the consumer credit segment, personal credit followed a slightly sharper downward trend than car credit (71% and 67% decrease respectively). In the second half of 2020 car credit recovered, resuming values close to those seen at the beginning of the year, while the amount of new personal credit was still far from the values observed before the pandemic crisis. By contrast, the amount of new credit for house purchase at the end of 2020 exceeded the values observed before the outbreak of the pandemic.

Notwithstanding these different developments by segment, the distribution of new credit for house purchase by type remained relatively constant (Chart 2.2). Credit for the purchase of own and permanent residence continued to account for over 80% of total new credit for house purchase.

More than 90% of new credit agreements relating to house purchase recorded an LTV ratio below 90%

The year 2020 confirmed the previously observed trend of a high degree of compliance with the LTV ratio limits, highlighting that credit for house purchase with an LTV ratio above 90% was immaterial (in July 2018, 22% of new business had an LTV ratio above 90%, falling to 2% in the fourth quarter of 2019 and to 1% in the fourth quarter of 2020). Also, around 50% of new credit for house purchase had an LTV ratio below 80%, while the amount of new business with an LTV ratio above 100% was zero. In the fourth quarter of 2020, 58% of new credit for the purchase of own and permanent residence had an LTV ratio between 80% and 90%, although concentrating close to the 90% limit (Chart 2.3).

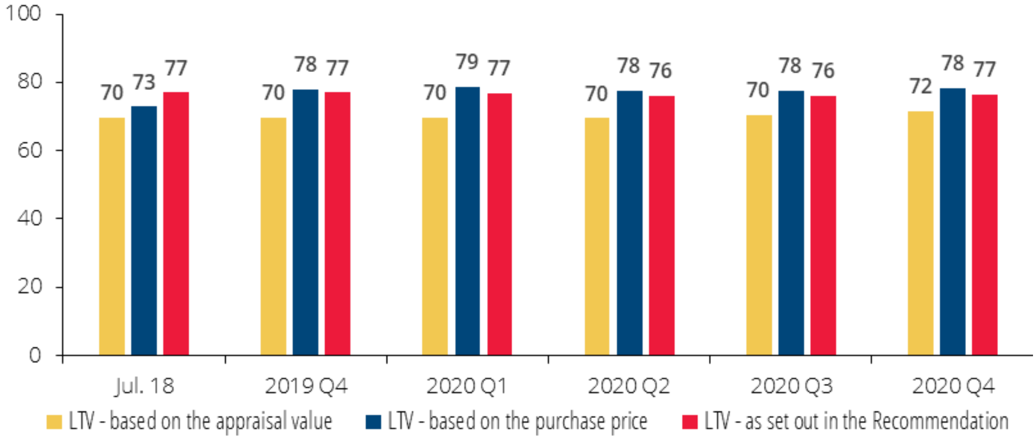
Chart 2.3 • Distribution of new credit for house purchase by LTV ratio | Per cent



Source: Banco de Portugal. | Notes: Based on information reported by a sample of 13 institutions. The latest observation is for the fourth quarter of 2020.

The Recommendation has contributed to the adoption of more prudent lending, given that it considers the minimum between the purchase price and the appraisal value of the immovable property as denominator of the LTV ratio. Since at least end-2018 the minimum between the property's purchase price and appraisal value moved closer, on average, to the purchase price than to the appraisal value (Chart 2.4).

Chart 2.4 • Evolution of the average LTV ratio of new credit for the purchase of own and permanent residence | Per cent



Source: Banco de Portugal. | Notes: Based on information reported by a sample of 13 institutions. In some periods the value of the average LTV ratio weighted by the credit amount is different from the minimum between the value of the average LTV ratio weighted by the credit amount based on the purchase price and on the appraisal value. This is due to the fact that in some cases the minimum is the purchase price and in others the appraisal value. The latest observation is for the fourth quarter of 2020.

More than 90% of new agreements relating to credit for house purchase and consumer credit were concluded with borrowers with a DSTI ratio below 50%

In accordance with the Recommendation, the DSTI ratio should not exceed 50%[4], and in April 2020 the volume of exceptions envisaged for borrowers with a DSTI ratio between 50% and 60% was reduced from 20% to 10% (Figure 1.1). Throughout 2020 a high degree of compliance with this limit continued to be observed. In fact, in the fourth quarter of 2020 around 94% of new credit to households was granted to borrowers with a DSTI ratio of 50% or less, compared to 77% in July 2018 and 92% in the fourth quarter of 2019. In the fourth quarter of 2020 this share was higher in credit for house purchase than in consumer credit, at 95% and 92% respectively (Chart 2.5).

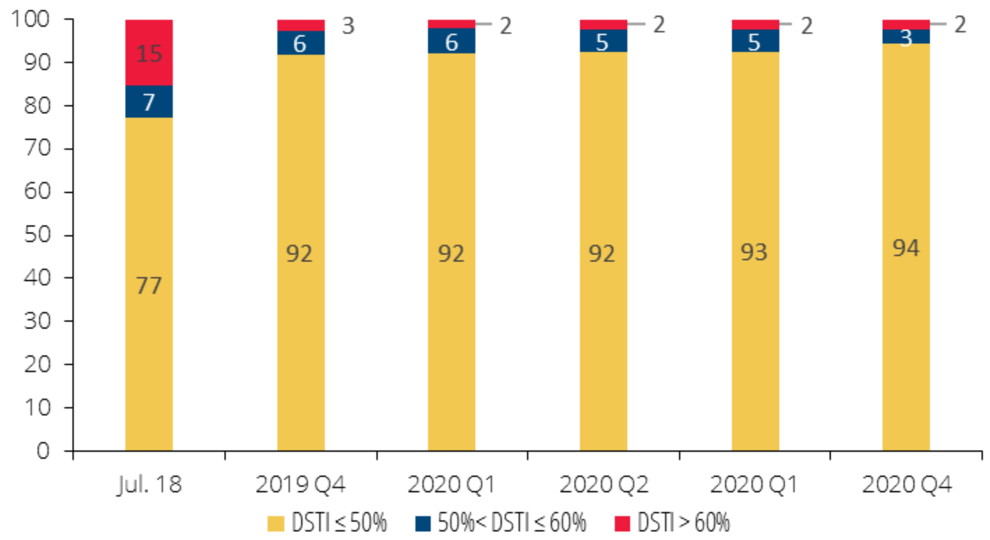
As a result, the share of new business regarding consumer credit and credit for house purchase with a DSTI ratio between 50% and 60% decreased significantly between July 2018 (7%) and the fourth quarter of 2019 (6%), to stand at 3% in the fourth quarter of 2020, i.e. below the 10% exception provided for in the Recommendation. New credit for house purchase and new consumer credit with a DSTI ratio of over 60% continued to follow a downward trend: in July 2018 it accounted for 15% of new business, in the last quarter of 2019 around 3%, and in the last quarter

[4] This limit is actually more restrictive, since it is calculated with shocks on both benefits and income, as mentioned in Figure 1.1. As an example, assuming a 35-year-old borrower, with a monthly income after tax and compulsory social security contributions of €1,500 and no other loans in the past, for a 40-year maturity loan agreement, variable interest rate, -0.25% reference rate and a fixed spread equal to 2.25 p.p., for the lifetime of the agreement, the DSTI ratio effectively supported by the borrower is 31%, equivalent to the DSTI ratio of 50%, taking into account an increase in the reference rate of 3 p.p. for agreements with a maturity of more than 10 years.

of 2020 around 2%, i.e. within the 5% exception established in the Recommendation (Chart 2.5). The share of new credit business with a DSTI ratio of over 60% is lower in credit for house purchase than in consumer credit (2% and 4% in 2020 respectively).

The cases where the DSTI ratio was exceeded were usually accounted for by the proven financial capacity of borrowers, the existence of other real collateral and the existence of a security or guarantee given by the borrowers' parents.

Chart 2.5 • Distribution of new credit for house purchase and new consumer credit by DSTI ratio | Per cent



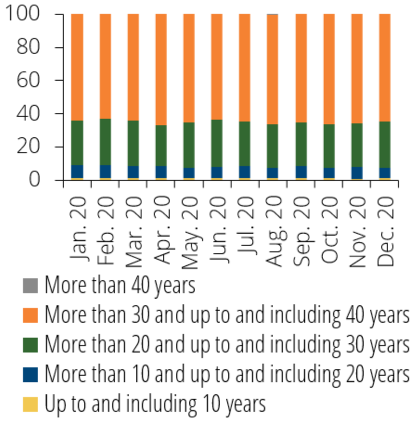
Source: Banco de Portugal. | Notes: Based on information reported by a sample of 13 institutions. The latest observation is for the last quarter of 2020.

Notwithstanding compliance with the upper limits to maturity of new credit to households in 2020, the average maturity of credit for house purchase increased

Limits to maturity were complied with in new credit for house purchase from October 2018 onwards and in consumer credit since the entry into force of the Recommendation.

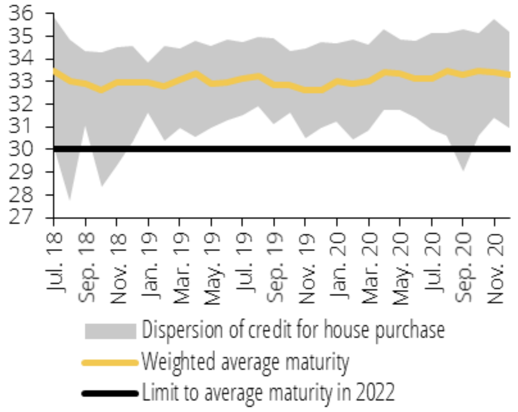
Taking into consideration the distribution of credit by maturity range, in December 2020 over 93% of new credit for house purchase had a maturity of 20 to 40 years, broken down between about 31% with a maturity of 20 to 30 years and about 69% between 30 and 40 years. Credit with a maturity of over 40 years was immaterial (Chart 2.6). The average maturity of new credit for house purchase, although decreasing from 33.5 to 32.6 years between July 2018 and December 2019, followed an upward trend in 2020. At the end of 2020 the average maturity stood at 33.2 years, i.e. higher than the 30-year threshold established for the end of 2022 (Chart 2.7).

Chart 2.6 • Distribution of new credit for house purchase by maturity range | Per cent



Source: Banco de Portugal. | Notes: Based on information reported by a sample of 13 institutions. The latest observation is for December 2020.

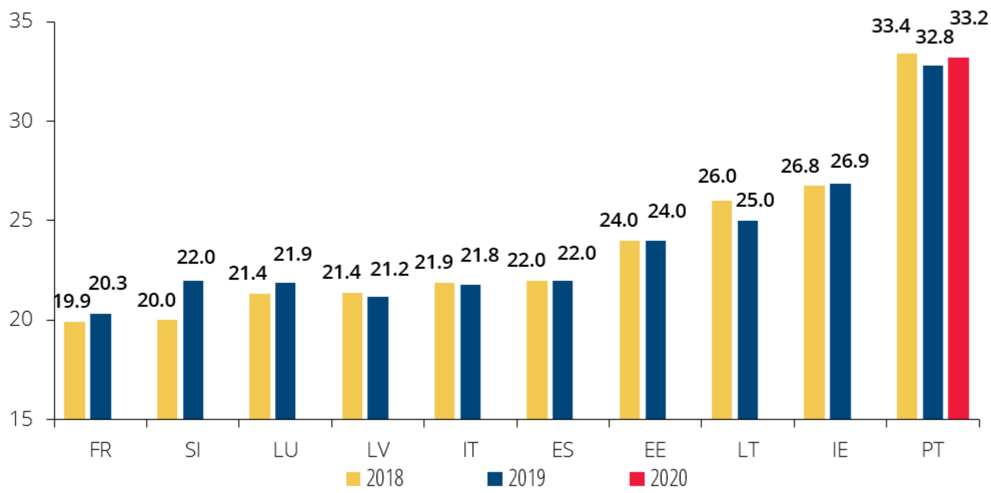
Chart 2.7 • Weighted average maturity of new credit for house purchase | In years



Source: Banco de Portugal. | Notes: Based on information reported by a sample of 13 institutions. The average maturity is weighted by the amount of credit granted. The latest observation is for December 2020. The dispersion range limits correspond to the minimum and maximum values observed in the sample.

Despite an increase in the average maturity of credit for house purchase in other European Union countries between 2018 and 2019, Portugal continued to stand out for having an average maturity of more than 30 years, while most of the other countries had an average maturity of 20 to 25 years (Chart 2.8). Maintaining the average maturity of new credit for house purchase at high levels involves increased risk for institutions as it implies that credit exposures will be vulnerable to fluctuations in the economic and financial cycle over a longer period. In addition, longer maturities tighten credit restructuring for borrowers in financial distress.

Chart 2.8 • Annual average maturity of new credit for house purchase by country | In years



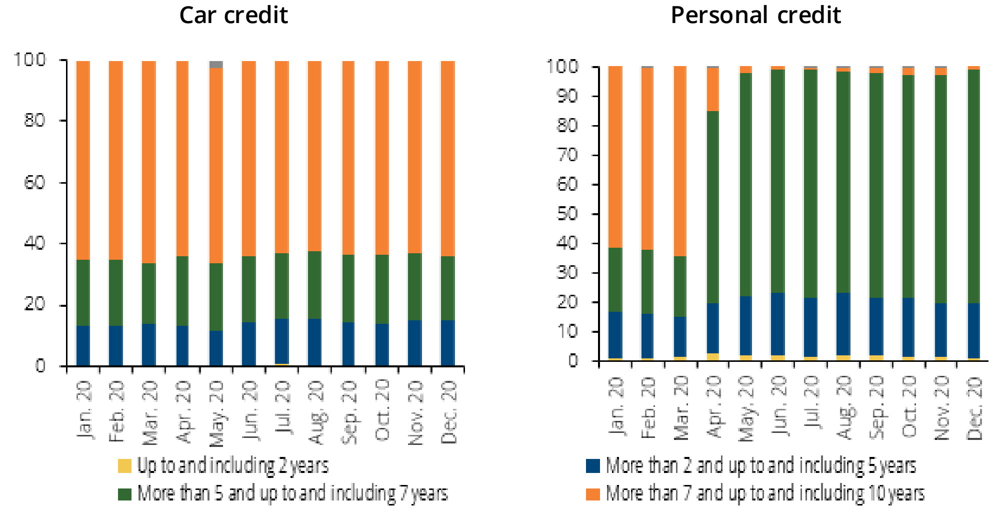
Source: Information published by the respective national authorities.

Following the first amendment to the Recommendation in 2020, the maturity of new personal credit declined

In 2020 the upward trend of consumer credit maturities was reversed. Consumer credit with a maturity of 5 to 10 years increased from 81% in July 2018 to 85% in December 2019, subsequently declining to 83% in December 2020. This is associated with the amendment to the Recommendation, announced in January 2020 and implemented in April 2020, as the upper limit for the personal credit maturity was reduced from 10 to 7 years. Institutions implemented this amendment quickly and effectively. In April 2020 the share of new personal credit with a maturity of over 7 years became residual.

The impact of this amendment is quite noticeable in Chart 2.9, given that from April 2020 onwards there was a significant change in the distribution of new personal credit by maturity bracket. The distribution of new car credit by maturity range remained relatively unchanged throughout 2020, and new credit with a maturity of 7 to 10 years continued to predominate.

Chart 2.9 • Distribution of new credit by maturity range | As a percentage of the segment's total credit

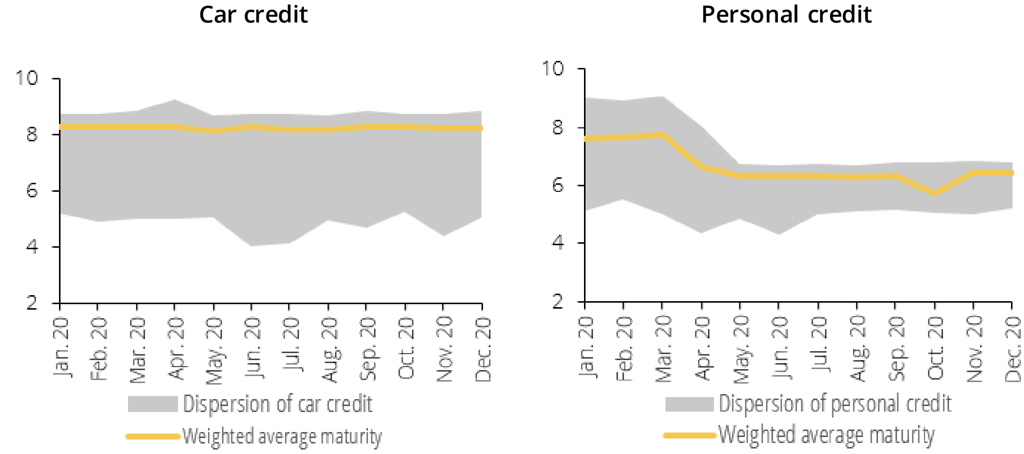


Source: Banco de Portugal. | Notes: Based on information reported by a sample of 13 institutions. The latest observation is for December 2020.

The average maturity of consumer credit increased from 7.7 years to 8 years between July 2018 and December 2019, and since then showed a downward trend, which became sharper in April 2020 following the amendment to the Recommendation, to stand at 7.4 years in December 2020.

In March 2020 the average maturity of personal credit was 7.6 years, decreasing to about 6.3 years after April 2020. This decrease was accompanied by a reduction in the dispersion of the average maturity. The average maturity of car credit remained relatively stable at around 8 years over the course of 2020 (Chart 2.10). Personal credit for healthcare, education and renewable energy, which maintained a maximum maturity of 10 years, continued to have a residual weight, accounting for around 3% of personal credit granted in 2020.

Chart 2.10 • Weighted average maturity of new car and personal credit | In years



Source: Banco de Portugal. | Notes: Based on information reported by a sample of 13 institutions. The latest observation is for December 2020.

Source: Banco de Portugal. | Notes: Based on information reported by a sample of 13 institutions. The latest observation is for December 2020.

Finally, a high degree of compliance with the Recommendation continued to be observed with regard to the regular payments requirement, given that in the last quarter of 2020 only around 2% of total new credit did not comply with this requirement. As in December 2019, most of the institutions' explanations for not complying with this requirement involved the granting of bridging loans (loans that only have a single capital payment, e.g. for down payments).

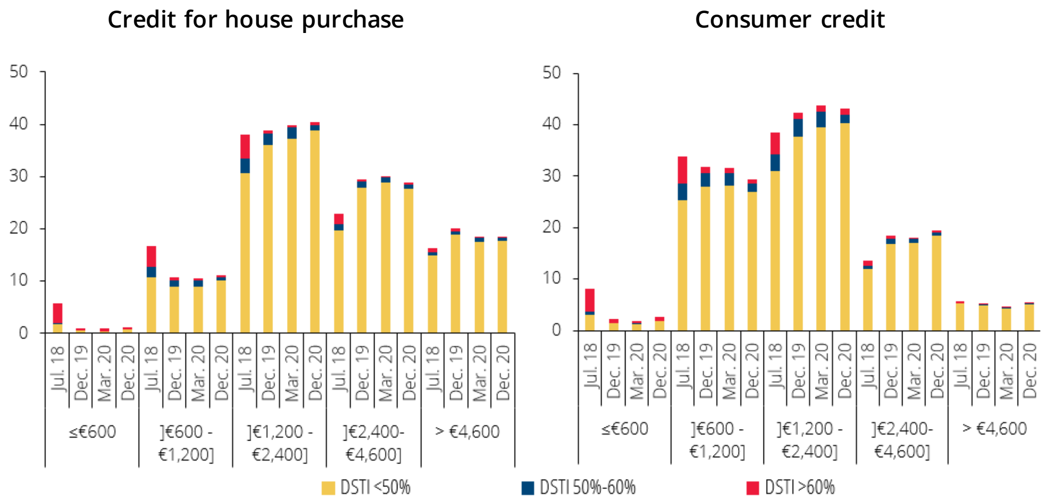
In 2020 the risk profile of borrowers in new credit to households continued to improve

The distribution of new credit by net monthly income range shows that the share of credit for house purchase is higher in the case of borrowers with higher net monthly income. In contrast, new consumer credit had a higher weight in credit granted to borrowers with lower net monthly income (Chart 2.11).

Between July 2018 and December 2020 there was a significant decrease in the share of new credit for house purchase and consumer credit granted to borrowers with a DSTI ratio above 50%. This change in structure was seen in all borrowers' net monthly income brackets, but more sharply in the lowest income levels, and largely mirrors a change in credit standards. In particular, there was a decrease in the share of credit granted to borrowers combining a DSTI ratio above 50% with relatively low net monthly income and a significant decrease in credit granted to borrowers with net monthly income of less than €600. In addition, there was an increase in credit granted to borrowers with an income of more than €1,200 and a DSTI ratio below 50%, meaning that there was a decrease in the risk of credit granted. In December 2020 the share of new credit for house purchase and new consumer credit associated with borrowers with a net monthly income of €600 or less and a DSTI ratio above 50% is immaterial, standing at 0.5% and 0.9% respectively (Chart 2.11). Overall, the share of credit by borrowers' net monthly income range remained broadly unchanged throughout 2020 and particularly in the months when the impact of the COVID-19 pandemic was more pronounced.

New consumer credit was chiefly granted to borrowers with net monthly income brackets between €600 and €2,400. Coupled with an improvement in the risk profile of business between July 2018 and December 2020, there was a downward trend in consumer credit granted to borrowers with net monthly income of less than €1,200, against an increase in credit to borrowers with income between €1,200 and €2,400. Over the course of 2020, new credit for house purchase was chiefly granted to borrowers with net monthly income of more than €1,200, thus consolidating the trends observed in previous years.

Chart 2.11 • New credit by interval of DSTI ratio and net monthly income of borrowers | Per cent

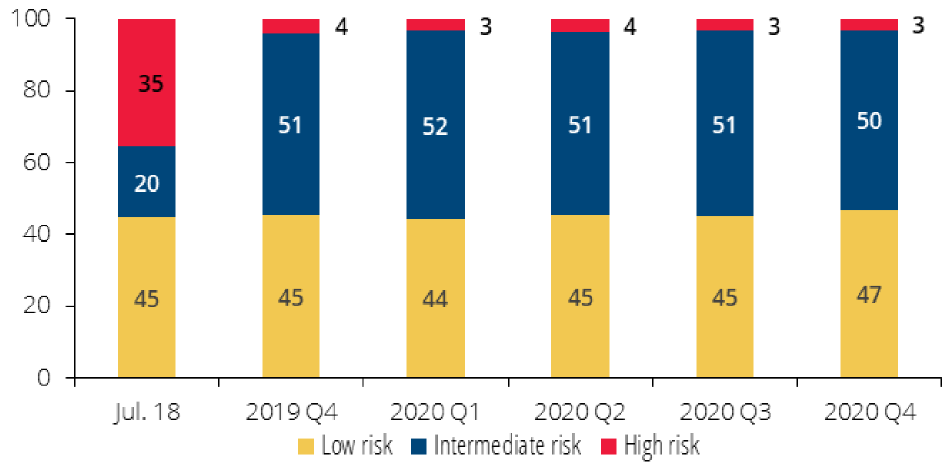


Source: Banco de Portugal. | Notes: Based on information reported by a sample of 13 institutions. The latest observation is for December 2020.

In 2020 there were still no significant changes in the distribution of new credit for house purchase by borrower age. Credit for house purchase continued overall to be granted to borrowers aged 30-40 and was residual in the age range below 20 and over 70 years.

The risk profile of borrowers of credit for house purchase continued to improve noticeably since the entry into force of the Recommendation, considering the combination of the DSTI and LTV ratios. This improvement is shown in the analysis of developments in the share of credit granted to higher-risk borrowers, which declined significantly since July 2018. In the same month, the share of loans with a high risk profile was 35%, dropping to 4% in the fourth quarter of 2019 and 3% a year later. This was accompanied by an increase in the share of credit for house purchase granted to borrowers with a low risk profile: from 45% in July 2018 and in the fourth quarter of 2019 to 47% in the fourth quarter of 2020. In turn, credit to borrowers with an intermediate risk profile rose significantly, from 20% in July 2018 to 51% in the fourth quarter of 2019, with virtually no changes in the fourth quarter of 2020. Thus, in new credit for house purchase granted during the pandemic crisis period the borrowers' risk profile remained stable (Chart 2.12).

Chart 2.12 • Borrowers' risk profile in new credit for house purchase | Per cent

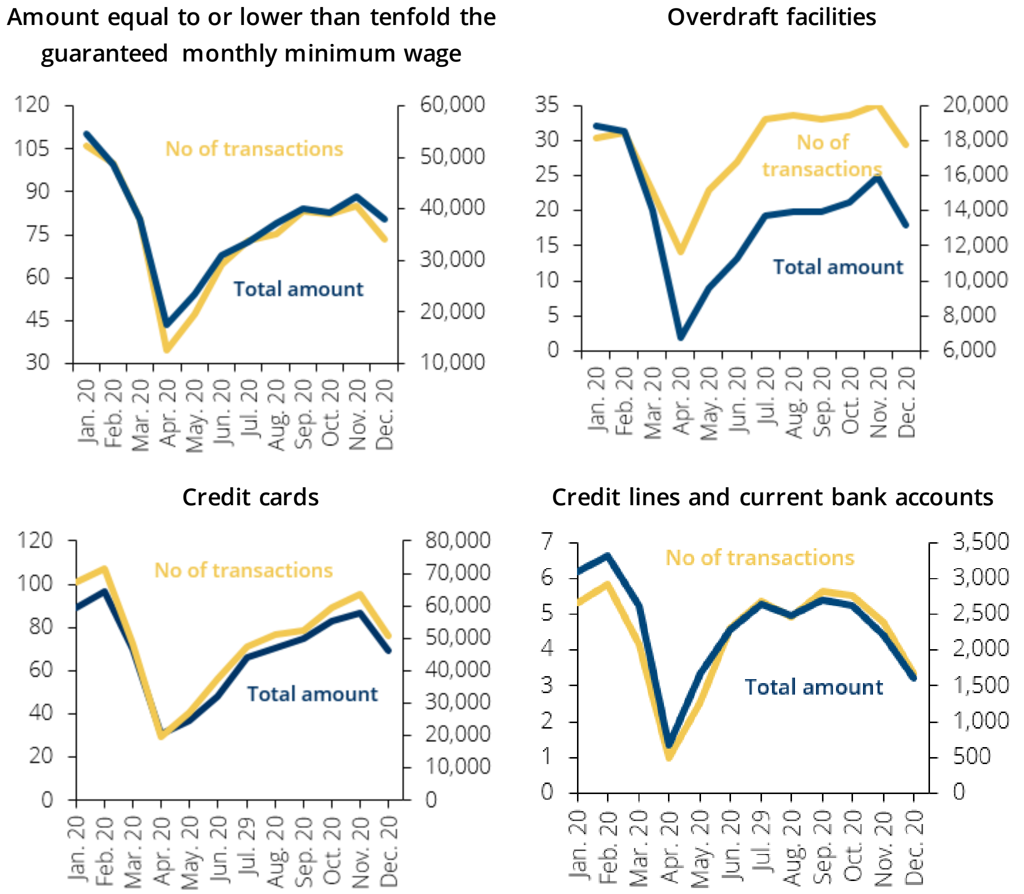


Source: Banco de Portugal. | Notes: Based on information reported by a sample of 13 institutions. Low risk: DSTI≤50% and LTV≤80%; High risk: DSTI> 60% and/or LTV>90%; Intermediate risk: other cases. The latest observation is for the fourth quarter of 2020.

Credit outside the scope of the Recommendation evolved similarly to consumer credit segments within the scope of the Recommendation

Credit for an amount equal to or lower than the equivalent to tenfold the guaranteed monthly minimum wage, credit in the form of credit cards, credit facilities and also credit in the form of credit lines and current bank accounts fell quite considerably in April 2020, associated with the shock on economic activity arising from the pandemic. However, there was a significant recovery in three of the four segments in the remainder of the year under review. New business for an amount equal to or lower than the equivalent to tenfold the guaranteed monthly minimum wage appeared to stabilise well below the values recorded prior to the pandemic crisis. The value recorded in December 2020 accounted for around 65% of that recorded in December 2019 (Chart 2.13). This evolution was similar to that of consumer credit within the scope of the Recommendation and, in particular, to that of personal credit, which at the end of 2020 did not resume the level observed before the pandemic crisis.

Chart 2.13 • New credit outside the scope of the Recommendation



Source: Banco de Portugal. | Notes: Based on information reported by a sample of 13 institutions. Committed amount for overdraft facilities, credit cards, credit lines and current accounts. The latest observation is for December 2020.

3 Assessing the efficacy of the macroprudential recommendation using an integrated micro-macro model

This chapter aims to assess the efficacy of the Recommendation, in particular the limits to the LTV ratio, the DSTI ratio and maturity. To this end, an assessment is undertaken of how the Recommendation's objective has been achieved and which other variables have been affected by the macroprudential measure.

This analysis takes into account the benefits of adopting the Recommendation, such as reducing borrowers' risk of default and the resilience of the financial system and households (first-order effects). On the other hand, short-term costs are assessed, namely the side effects on some macroeconomic variables, such as credit, the level of residential property prices and the level of unemployment. These two sets of impacts may trigger further effects, such as a lower debt servicing capacity of borrowers (increasing their probability of default), as well as a lower valuation of collateral (increasing loss given default) (second-order effects).

To this end, using data from the Portuguese Household Finance and Consumption Survey (*Inquérito à Situação Financeira das Famílias* – ISFF) with reference to 2017, a counterfactual analysis was carried out, substantiated in the estimation of the probability of default (PD) and loss given default (LGD) of borrowers (households), as well as the ensuing impact on the capital/resilience of credit institutions via credit-related potential losses recorded. Borrowers' risk parameters are estimated in a scenario in which the three limits are in place versus a scenario in which they are not, using an integrated micro-macro model, as developed by Gross and Población (2017).

As part of a typology of measures acting directly on the borrower (the so-called borrower-based measures – BBM), the Recommendation aims to improve the resilience of the financial system indirectly and over the medium term. The improvement in the borrowers' risk profile will tend to result in a decrease in expected losses associated with new credit via a decrease in PD and LGD.

The effectiveness of macroprudential measures, in particular BBM, has been the subject of a number of studies, ranging from those using more conceptual models, such as general equilibrium models (e.g. the Dynamic Stochastic General Equilibrium model - DSGE), to those using empirical methodologies. In general, these studies emphasise the benefits of implementing such measures, such as promoting social welfare, reducing borrowers' over-indebtedness and strengthening the resilience of credit institutions. A few side effects are also mentioned, such as a reduction in residential real estate prices and in the number of transactions, a decrease in credit growth, and some households moving to residential areas farther away from urban centres where housing prices are lower.

The data used for the above model stem mainly from the ISFF for household-level micro data and from macro databases such as those in the data warehouses of the European Central Bank (ECB) and the Organisation for Economic Co-operation and Development (OECD). Financial institutions' prudential and financial reporting data were also used.

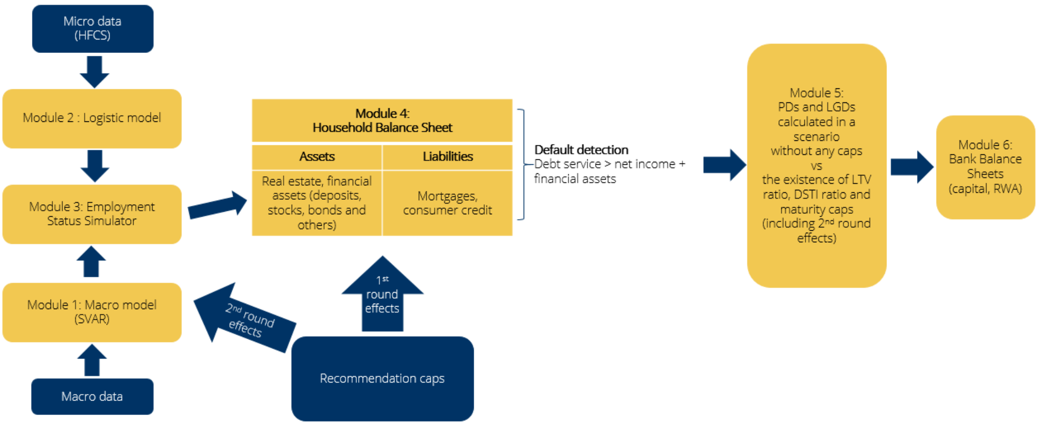
The ISFF provides data on the financial situation and level of current expenditure, both at aggregate household level and at household-member level, such as: income, debt level, real and financial assets held, employment status, age, gender, level of education, place of birth, marital status, among others. Based on these data, a balance sheet can be built for each household, consisting of assets (residential property, other real assets, deposits, bonds, stocks, units of investment funds, pension funds and the like, among others), liabilities (housing loans and/or consumer credit) and equity (resulting from the difference between assets and liabilities). Household labour income and household income from other assets, such as stocks, bonds, deposits and immovable property, as well as current expenses, are considered under some sort of 'Income Statement'.

The ISFF is held every three to four years (the first wave took place in 2010, the second in 2013 and the third in 2017). This analysis uses data from the latest wave (2017), i.e. before the implementation of the macroprudential measure under assessment. For further details of the characteristics of this survey and the main results of the 2017 wave, see Costa et al. (2020).

The ECB and OECD databases made it possible to build a quarterly series from the second quarter of 2009 (2009Q2) to the fourth quarter of 2017 (2017Q4) for the relevant macroeconomic and financial variables: unemployment rate, short-term (three-month) interest rate, stock index, compensation of employees, number of quarters an individual remains unemployed (duration of unemployment), housing prices, lending and deposit interest rates, and the volume of credit granted to the non-financial private sector (broken down into credit to households and credit to non-financial corporations). Finally, financial institutions' financial and prudential reports were used, as well as the Banco de Portugal's Central Credit Register, to obtain other types of data used in the model calibration, such as the default rate, LGD, capital ratios and the composition of domestic banks' portfolios.

In general, the model used in this analysis, which is composed of six modules, estimates two risk parameters for households (PD and LGD). These can be calculated with or without the implementation of limits to the LTV and DSTI ratios and to maturity, thus making it possible to measure the impact of their implementation. In a first stage, risk parameters calculated on the basis of micro data are affected by developments in macroeconomic and financial variables (unemployment rate, residential property prices, stock index, income per employee – including wages, premia, income in kind paid by employers to employees – and credit to the non-financial private sector). Macroeconomic and financial variables define the evolution of micro data from each household's balance sheet (assets and liabilities). In a second stage, the shock on credit demand, by imposing limits on credit standards, in turn influences macroeconomic and financial variables, which have a negative impact on the risk parameters calculated in the first stage. This results from the impact of a scenario in which the macroprudential measure has been implemented, against one where no limits on credit standards are in place, which allows the effectiveness of this measure to be measured (Figure 3.1).

Figure 3.1 • Integrated micro-macro model



This model comprises six modules. Module 1 aims to estimate the evolution of macroeconomic and financial variables, such as the unemployment rate, credit granted to the non-financial private sector, the three-month interest rate, residential real estate market prices, income per employee and the evolution of the stock index. For this purpose, an autoregressive model with a one-period lag is used, in which the evolution of each variable is explained by both its lags and the lags of the other variables. Based on the estimated model, which contains six equations, a stochastic model was used to generate a set of behaviour patterns (1,000) for each variable, for a horizon of 16 quarters.

Module 2 calculates the probability of an individual being unemployed/employed according to his/her socio-demographic characteristics, such as age, gender, marital status, level of education and place of birth, using a logit model.

In module 3 two adjustments are made. The first aims to calibrate the level of unemployment obtained from the micro model (module 2), so that is moves closer to the value of the unemployment rate recorded at macro level, changing the parameter associated with the constant resulting from the logit model. The second adjustment aims to match the duration of unemployment resulting from the micro model to the estimated duration at macro level that can be found in databases aggregated by country.

In module 4 households' PD and LGD are calculated. The criterion for a given household to enter into default is insufficient income and assets to meet the instalments associated with the respective indebtedness level. Income comprises all that originates in the employment relationship or the social benefit of unemployment. This depends on whether each of its members is employed or unemployed, the interest, dividends and valuation of assets such as bonds, stocks and investment fund units, as well as rents from real estate assets other than those intended for own and permanent residence, and interest from deposits. Income will evolve according to the projection for macroeconomic and financial variables resulting from the autoregressive model developed in module 1. A percentage for current expenditure is taken from the calculated income. If income is not sufficient to settle the instalments associated with household loans, assets may be used for this. A key aspect of the default rate of households is the probability of their members being unemployed (calculated at micro level in module 2 and adjusted to macro level through module 3), which results in a significant reduction in their incomes. In parallel, LGD is computed for households entering into default, taking into account the value of the loan collateral, which evolves according to developments estimated for residential real estate market prices and derives from module 1.

In module 5 the parameters estimated in module 4 (PD and LGD) are recalculated, this time under a scenario where there are limits to the LTV and DSTI ratios and to maturity, excluding credit that does not comply with these three limits taken together (first-order effects). In this scenario there is a reduction in credit to the non-financial private sector, which in turn will negatively influence developments in the unemployment rate at micro and macro level (modules 1 and 3), ultimately leading to a deterioration in the risk parameters of households (PD and LGD) (second-order effects). Thus, the net benefit of the macroprudential measure is a result of the direct effects from the reduction of credit to higher-risk borrowers on the reduction of PDs and LGDs (first-order effects), less indirect effects. These result from the potential increase in PDs and LGDs, caused by the impact of credit reduction on the other macroeconomic variables, in particular on the unemployment rate (PD) and on the evolution of prices in the residential real estate market (LGD) (second-order effects).

Finally, the impact on the banking system's average total capital ratio is estimated in module 6. It results from both the effect on the numerator (own funds), through the impact of credit losses, and the spillover on the denominator, through the impact on the amount of credit in default net of impairments, which has a higher risk weight than credit that is not in default. For this purpose it was necessary to take into account the proportion in the Portuguese case of the portfolio of credit for house purchase that is subject to the internal ratings method and the one whose minimum capital requirements are computed using the standard method.

In view of the original model developed by Gross and Población (2017), some adaptations were made, namely: (i) calculation of the DSTI ratio according to the macroprudential Recommendation, i.e. with a shock on the income of the borrower(s), considering a reduction in income in the case of a borrower aged 70 and over at the planned expiry of the agreement, and with a shock on the debt service, considering the impact of an interest rate rise in the case of variable and mixed interest rate agreements, and (ii) inclusion of limits to the maturity of loans granted for house purchase.

According to the integrated micro-macro model used in this study, the imposition of the macroprudential measure reduces PDs and LGDs by 0.15 p.p. and 19.5 p.p. respectively (Table 3.1). This result only took into account 2017, this year being the last of the 3rd wave of the ISFF and hence closest to the date of implementation of the macroprudential Recommendation (2018). As there is a reduction in PDs and LGDs, in the light of the scenario without a macroprudential measure there is evidence that the benefits of the measure (first-order effects) outweigh its second-order effects.

Table 3.1 • Impact of the macroprudential measure on PDs and LGDs | In percentage points

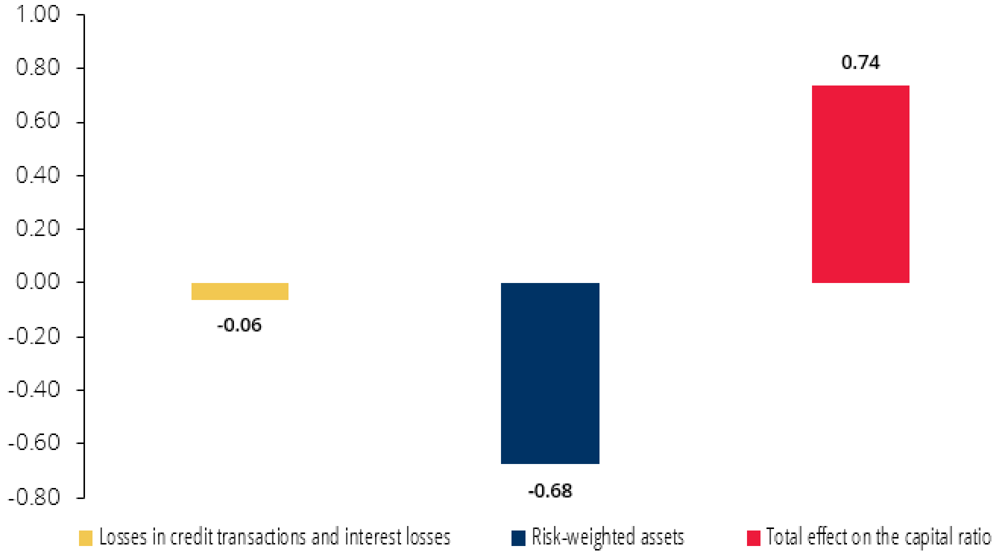
	Impact of the macroprudential measure
PD	-0.15
LGD	-19.5

Source: Banco de Portugal. | Notes: In this study the macroprudential Recommendation is calibrated as: (i) limit of 90% to the LTV ratio, (ii) limit of 50% to the DSTI ratio, with shocks on the numerator and the denominator and (iii) 40-year limit to the maturity of loans granted for house purchase.

The macroprudential measure had a positive impact on the banking system's capital ratio. More specifically, the integrated micro-macro model suggested a 0.74 p.p. increase in the banking system's capital ratio resulting from the measure (Chart 3.1). Both the numerator and the denominator contributed to this evolution of the capital ratio.

The introduction of the macroprudential measure led to a reduction in credit losses under the scenario with the measure in place, against the scenario with no measure. In addition, the introduction of the measure led to a reduction in risk weights for credit secured by residential immovable property and to a reduction in credit to higher-risk borrowers, given the tightening of credit standards.

Chart 3.1 • Three-year cumulative effect of the macroprudential measure on the banking system's capital ratio | In percentage points



Source: Banco de Portugal.

Hence, this analysis suggests that the macroprudential measure increases the resilience of households and the banking system, contributing to the reduction of borrowers' risk and the resilience of credit institutions, in line with the results obtained by Gross and Población (2017) and Pavol et al. (2020).

These results are also in line with the analysis by the European Systemic Risk Board published on 23 September 2019 within the scope of an EEA-wide assessment of medium-term risks and vulnerabilities in the residential real estate sector in all EU Member States, Liechtenstein, Iceland and Norway. The macroprudential Recommendation on new credit agreements for consumers adopted by the Banco de Portugal was deemed to be appropriate and sufficient to mitigate the risks identified.

Some caveats of the analysis concern the use of a survey with a limited number of observations, whose characteristics may not exactly match the credit business under review, and lacking some information to calculate the limits in accordance with the Recommendation. This relates in particular to the LTV ratio, for which only a value for the immovable property is available, there being no indication whether it is the appraisal value or the purchase price.

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