MACROPRUDENTIAL RECOMMENDATION ON NEW CREDIT AGREEMENTS FOR CONSUMERS – PROGRESS REPORT

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Data underlying the charts of the *Recommendation on new credit agreements for consumers – progress report* can be found in the attached file.

Data from some private sources are not released.

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Executive summary

In its capacity as the macroprudential authority, the Banco de Portugal issued a Recommendation in February 2018 on new credit agreements for consumers (hereinafter referred to as the "Recommendation"). The adoption of this measure took place at a relatively early stage of expansion of the financial cycle, in an environment conducive to an easing of credit standards by the financial sector. The purpose of the Recommendation was to promote the adoption of prudent credit standards, strengthening credit institutions' resilience and borrowers' access to sustainable financing.

The impact of the Recommendation on the macroprudential policy stance in Portugal suggests that, by targeting credit standards, it has strengthened the resilience of the financial system and that of borrowers to risks originating in the residential real estate sector (Special issue "Assessment of the impact of the macroprudential Recommendation on the macroprudential policy stance with regard to credit for house purchase").

In 2021 credit institutions continued to comply with the guidelines set forth in the Recommendation. Almost all new credit for house purchase had an LTV (loan-to-value) ratio below or equal to the 90% limit. The introduction of the limit to the LTV ratio for new loans for house purchase contributed to reducing indebtedness and improving borrowers' risk profile. On average, following the introduction of this limit, riskier borrowers purchased less expensive property and took out smaller loans (Special issue "The impact of the macroprudential Recommendation on borrower indebtedness and on the characteristics of credit agreements for house purchase").

Around 94% of new credit for house purchase and new consumer credit was granted to borrowers with a DSTI (debt service-to-income) ratio with a shock (i.e. considering an interest rate rise and a reduction in income) of 50% or less. Loans granted to borrowers with a DSTI ratio of between 50% and 60% and over 60% totalled 4% and 3% of new business respectively, below the limits of the exceptions provided for in the Recommendation.

In 2021 consumer credit with a maturity above the thresholds set in the Recommendation was very residual. In personal credit, only 1% of loans granted had a maturity of over the 7-year threshold set in the Recommendation. In car credit, the share of loans with a maturity of over the 10-year threshold was virtually nil. The average maturity of personal credit (6.5 years) and car credit (8.4 years) remained relatively stable throughout 2021.

Over the course of the past year there was a high degree of compliance with the regular payments requirement, with only 3% of new loans to households in the fourth quarter of 2021 not meeting this requirement.

When monitoring compliance with the Recommendation, the Banco de Portugal also continuously assesses the need for its recalibration. In this regard, in early 2022, and with effect from 1 April 2022, the Banco de Portugal amended the Recommendation, with the maximum maturity of new credit agreements for house purchase being dependent on the borrowers' age, so as to promote convergence of the average maturity of these loans towards 30 years by the end of 2022. Hence, the Banco de Portugal now recommends the following limits to the maximum maturity of new credit agreements for house purchase: 40 years for borrowers aged 30 or under; 37 years for borrowers aged over 30 and up to and including 35; and 35 years for borrowers aged over 35.

This amendment occurred amid low interest rates, an acceleration in credit for house purchase and in real estate prices, and a high concentration of new loans for house purchase in maturities of 35 to 40 years. In fact, notwithstanding compliance with the limits to the maximum maturity provided for in the Recommendation, the average maturity of new credit for house purchase, set in December 2021 at around 32.5 years, remained above 30 years, a threshold to be reached by the end of 2022. The Banco of Portugal will continue to monitor credit standards and compliance with the Recommendation and may adopt any additional measures it considers appropriate to achieve the purpose of convergence of the average maturity of new credit agreements for house purchase towards 30 years by the end of 2022.

The adoption of limits to the maturity of new loans for house purchase is aimed at preventing limits to the DSTI ratio from being circumvented by the extension of the loan maturity, easing the extension of the loan maturity in the event of borrowers' financial distress, and reducing the difference compared to other European Union (EU) countries, in a context where the average maturity of new credit agreements for house purchase in Portugal remains above the EU countries for which information on this variable has been collected. Furthermore, granting loans with very long maturities means that the expiry of loans often goes beyond the borrowers' working lives.

At the end of 2021, almost two-thirds of the stock of loans for house purchase was associated with debtors aged 70 and over at the expiry of the agreement and around one-quarter with debtors aged 75 and over. Most of these borrowers took out their loans when aged 27-40. Given the ageing of the Portuguese population and the significant reduction in borrowers' income upon transition from work into retirement, despite the decline in expenses that may occur, the high concentration of loans with borrowers aged 70 and over at the expiry of the loan may pose a risk to the financial system and the sustainability of these borrowers' indebtedness.

The importance of the Recommendation was clearly visible in the European Systemic Risk Board's (ESRB) latest assessment for 2021 of risks and vulnerabilities in European residential real estate markets. Therein, Portugal was assessed as medium risk, as in the previous assessment for 2019. However, Portugal was not the subject of any warning or recommendation, as the macroprudential policy adopted to address the risks identified continued to be considered appropriate and sufficient.

1 Framework

The Recommendation issued by the Banco de Portugal, as the national Macroprudential Authority, in February 2018, has been effective in promoting the adoption of prudent credit standards, strengthening the resilience of institutions and borrowers. As of 1 July 2018 the limits provided for in the Recommendation apply to new credit for house purchase, credit secured by a mortgage or equivalent guarantee, and consumer credit granted by credit institutions and financial companies having their head office or branch in Portugal. The adoption of this measure occurred at a relatively early stage of the financial cycle's expansion, in an environment conducive to the adoption of less tight credit standards by the financial sector.

The Recommendation imposed limits on four different variables, to enhance their overall effectiveness. At the same time, the Recommendation set maximum limits to the LTV and DSTI ratios, to the maturity of new loans, and established a regular principal and interest payments requirement. In addition to these limits, the Recommendation established that the weighted average maturity of the set of new credit agreements for house purchase of each institution should gradually converge towards 30 years by the end of 2022.

The limits to the LTV ratio encourage borrowers to use their own capital more, contributing to a decrease in their probability of default and in loss given default of credit institutions. Furthermore, the value of the property is calculated on the basis of the minimum between the appraisal value and the purchase price of the immovable property, thus preventing the limits set from being circumvented through an increase in the property's appraisal compared to the purchase price.

The limits to the DSTI ratio contribute to sustainable financing, by restricting the borrowers' regular debt servicing burden. The limits to this ratio were set assuming an interest rate rise in the case of variable 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. This method of calculation aims to promote a safety margin for borrowers to cope with an interest rate rise and/or a reduction in income, particularly at the end of their working life.

The Banco de Portugal continuously assesses whether the terms of the Recommendation in force remain appropriate. In addition to monitoring its compliance, the Banco de Portugal continuously assesses the need for its recalibration.

In 2020 two amendments were made to the Recommendation. The first, adopted before the onset of the pandemic crisis, was aimed at: reducing the maximum maturity of new personal credit to 7 years, with the exception of personal credit for education, healthcare and renewable energy; and reducing from 20% to 10% the exceptions provided for in the Recommendation for granting credit to borrowers with a DSTI ratio of between 50% and 60%, in a context of a persistent increase in the average maturity and amount of this type of credit. Following the pandemic shock, a second amendment involved the introduction of temporary exceptions to some thresholds set out in the Recommendation, so as to promote households' access to liquidity. This last amendment was discontinued as of September 2020, as new credit granted under the exceptions introduced was immaterial.

In 2022 the Banco de Portugal amended the Recommendation once again, reducing the maximum maturity of new credit agreements for house purchase, with a view to promoting convergence of the average maturity of these loans towards 30 years by the end of 2022, as foreseen since 2018. This amendment occurred amid low interest rates and an acceleration in credit for house purchase and real estate prices. Since 2020 the average maturity of new loans for house purchase has not undergone linear and gradual convergence towards 30 years, contrary to what was recommended. Given the high concentration of new loans for house purchase in maturities of 35 to 40 years, the maximum maturity had to be amended to promote a reduction in average maturity. This change also seeks to combat distortions of competition between institutions. Thus, with effect from 1 April 2022, the maximum maturity of new credit agreements for house purchase, previously set at 40 years for all borrowers, will depend on the borrower's age: (i) it will remain at 40 years for borrowers aged 30 or under; (ii) it will be reduced to 37 years for borrowers aged over 30 and up to and including 35; (iii) it will decline to 35 years for borrowers aged over 35[1] (Figure 1.1).

The adoption of limits to the maturity of new credit for house purchase is aimed at preventing limits to the DSTI ratio from being circumvented by the extension of the loan maturity, easing the extension of the loan maturity in the event of borrowers' financial distress, and reducing the difference compared to other EU countries. Lower maturities at credit origination make it easier to extend maturities and restructure loans in the event of subsequent financial difficulties for the borrower. In addition, and compared to other EU countries, the average maturity of credit for house purchase in Portugal remains high. In 2021 Portugal had an average maturity of around 33 years, compared to maturities of between 20 and 27 years for the European countries for which information on this variable was collected.

The European Systemic Risk Board considered the macroprudential policy adopted by Portugal to be appropriate and sufficient to mitigate the risks identified. The importance of the Recommendation was clearly visible in the latest ESRB assessment for 2021 of risks and vulnerabilities in residential real estate markets in the EU, Iceland, Liechtenstein and Norway. Portugal was assessed therein[2] as medium risk, as in the previous assessment for 2019. However, Portugal was not the subject of any warning or recommendation by the ESRB, in contrast to seven European countries, as the macroprudential policy adopted to address the risks identified continued to be appropriate and sufficient. The implementation of the Recommendation triggered a change in the macroprudential policy stance in Portugal, from 'accommodative' in the first half of 2018, meaning that it should become tighter to mitigate the risks identified, to 'neutral' from the third quarter of 2018 onwards, when the Recommendation was implemented (Special issue "Assessment of the impact of the macroprudential Recommendation on the macroprudential policy stance with regard to credit for house purchase").

[1] For further details, see the reference document published on the Banco de Portugal's website on 31 January 2022.

[2] The report is available on the ESRB's website.

Figure 1.1 • Summary of the recommendation on new consumer credit agreements

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 credit institutions.

Limits to the DSTI [(b)]

- 50% or less, with the following exceptions :
    - Up to 10% of the total amount of new credit may be granted with a DSTI ratio of up to 60% (this limit was 20%, before April 1, 2020)
    - Up to 5% of the total amount of new credit may exceed the limits of the DSTI.

Regular payment requirement

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

Housing maturity limits :

- Maximum maturity:
    - 40 years for borrowers aged 30 or under;
    - 37 years for borrowers aged over 30 and up to and including 35 (this limit was 40 years before April 1, 2022);
    - 35 years for borrowers aged over 35 (this limit was 40 years before April 1, 2022).
- Average maturity of new credit should gradually converge to 30 years until the end of 2022;

Consumer credit maturity limits:

- Maximum maturity of 7 years for personal credit (this limit was 10 years before April 1, 2020);
- Maximum maturity of 10 years for car credit and personal credit for healthcare, education or 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, as follows: Inc_DSTI = x1* Inc + x2* Inc * (1 - α), where: Inc = Current monthly net income of the borrower; x1 = number of years during the period of the agreement when the borrower is aged 70 or under divided by the number of years of the agreement; x2 = number of years during the period of the agreement when the borrower is aged over 70 divided by the number of years of the agreement; $\alpha \geq 0.2$ (as regards agreements with more than one borrower and in which information on aggregate income is only available for the group of borrowers, the age of the borrower with the earliest date of birth will be considered for the purpose of calculating the reduction in income). 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 benchmark, taking into account the maturity of the agreement in the variable interest rate period, and that resulting from the fixed rate period.

2 Assessing the degree of compliance

The Banco de Portugal continuously monitors compliance with the limits set in the Recommendation. In 2021 the Banco de Portugal continued to monitor compliance with the limits set out in the Recommendation in order to prevent actions undermining its effectiveness or possible distortions of competition between institutions. The Banco de Portugal's assessment was based on the monthly reporting of compliance with the Recommendation by 13 credit institutions, representing around 95% of new credit to households, and on data available in the Banco de Portugal's Central Credit Register (CCR). In addition, institutions are asked for a self-assessment report on an annual basis, signed by at least one member of their Board or branch management, where applicable.

This Report reviews the period from July 2018, the first month of application of the Recommendation, to December 2021, with a particular focus on 2021. Data for 2018 are used as a starting point to assess the evolution of the borrowers' risk profile throughout the period under review. However, in the first few months after implementation of the Recommendation, there was still some credit business for which the borrower's creditworthiness assessment was carried out before it entered into force. This is particularly noteworthy in credit for house purchase, since the period between the borrower's creditworthiness assessment and the release of funds is generally longer than for consumer credit.

In 2021 credit for house purchase and residential property prices remained on an upward trend, despite the pandemic crisis. In a context of low interest rates and labour market recovery, largely linked to the support measures put in place to mitigate the effects of the pandemic crisis, credit for house purchase remained on an upward trend. The annual rate of change in the stock of credit for house purchase increased from 2% at the end of 2020 to 4.1% in December 2021. Similar developments were observed in the annual rate of change of the stock of consumer credit, which rose from 0.6% in December 2020 to 2.7% at the end of 2021 (Table 2.1). House prices also continued to grow in 2021. The growth rate of house prices declined from 8.6% in the last quarter of 2020 to 5.2% in the first quarter of 2021. However, in the second and third quarters of 2021 it increased to 6.6% and 9.9% respectively, compared with the same period a year earlier.

The household indebtedness ratio increased slightly in 2021, despite remaining below the euro area average. The household indebtedness ratio as a percentage of disposable income increased from 94.7% at the end of 2020 to 95.3% in the third quarter of 2021. The euro area recorded similar developments, with the household indebtedness ratio increasing from 97.4% to 98.3% over the same period.

Credit for house purchase has not been one of the main factors behind developments in residential property prices. Housing demand from non-residents and for investment, in an environment of low interest rates, and the shortage of housing supply have contributed to the rise in residential property prices in Portugal. In fact, the share of residential property transactions financed by domestic credit has remained relatively stable at around 43% since 2017, i.e. significantly lower than in the period prior to the sovereign debt crisis (66% in 2009). In the current context, it is important to prevent a credit-price spiral in this market. Credit for house purchase should not become a determinant in residential property price developments.

Table 2.1 • Trend of credit for house purchase and consumer credit, house prices and the household indebtedness ratio | Per cent

	2019	2020				2021			
	Q4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
Consumer credit									
Arc in stock	8.3	7.6	4.6	2.7	0.6	-1.2	1.5	1.6	2.7
Y-o-y rc in the flow of new business	25.3	17.5	-46.0	-25.0	-31.2	-29.6	77.7	9.6	16.6
Credit for house purchase									
Arc in stock	0.1	0.4	0.9	1.4	2.0	2.6	3.3	3.9	4.1
Y-o-y rc in the flow of new business	19.8	21.3	-3.2	4.2	8.1	17.6	53.6	48.4	21.5
Trend of house prices									
Y-o-y rc in house prices	8.9	10.3	7.8	7.1	8.6	5.2	6.6	9.9	
Indebtedness ratio (% of disposable income)									
Households	92.0	91.9	93.1	93.8	94.7	95.1	94.9	95.3	

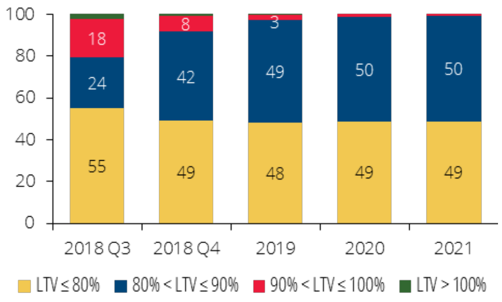
Sources: Banco de Portugal and Statistics Portugal. | Notes: Annual rate of change (arc) adjusted for securitisation operations, reclassifications, write-offs, price and exchange rate revaluations and, where relevant, for the effect of sales of credit portfolios. Annual rate of changes shown refer to the end of the quarter.

According to the 2021 issues of the *Bank Lending Survey*,[3] credit standards remained broadly unchanged and credit growth is likely to have been mainly associated with an increase in demand. In 2021 there were no significant changes in the share of rejected loan applications and in the terms and conditions of loans made. On the other hand, the banks surveyed reported an increase in household demand for credit, both for house purchase and consumption. Banks identified the increase in consumer confidence and the low level of interest rates as the main determinants of the rise in credit demand. In 2021 the nominal annual rate on new credit for house purchase reached a new historical low (0.8%), and the interest rate on new consumer credit also remained at historically low levels (7.3%). The annual percentage rate of charge (APRC), which, in addition to interest on loans (expressed by the nominal annual rate), also includes all other charges that customers will have to pay on credit, also stood at historically low levels in 2021, i.e. 2.4% and 9.6% for credit for house purchase and consumer credit respectively.

In 2021 almost all new credit for house purchase recorded an LTV ratio of 90% or less. The Recommendation set a limit of 90% on the LTV ratio for new credit for the purchase of own and permanent residence, a segment accounting for around 85% of total new credit for house purchase. In 2021, as in previous years, the share of new credit for house purchase with an LTV ratio above 90% was very residual (0.6%), and with an LTV ratio above 100% was nil. Around half of new credit for house purchase recorded an LTV ratio below 80% (Chart 2.1). The distribution of the LTV ratio of the Portuguese banks' credit portfolio for house purchase shows that in December 2021 around 92% of the stock of loans to households for house purchase had an LTV ratio of 80% or less (around 62% had an LTV of less than 60%), with a very residual share of loans having an LTV ratio above 100% (1%) (Chart 2.2).

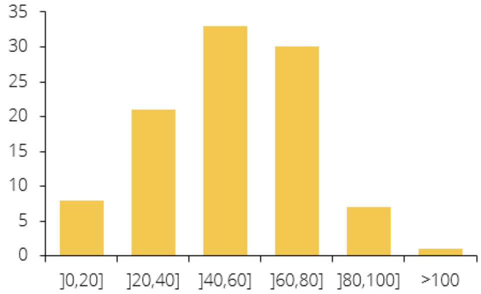
[3] The *Bank Lending Survey* is conducted four times a year to a sample of five banks operating in Portugal to obtain qualitative information on the supply and demand of loans to firms and households.

Chart 2.1 • Distribution of new credit for house purchase by LTV ratio | Per cent



Source: Banco de Portugal. | Note: Information reported by a sample of nine institutions.

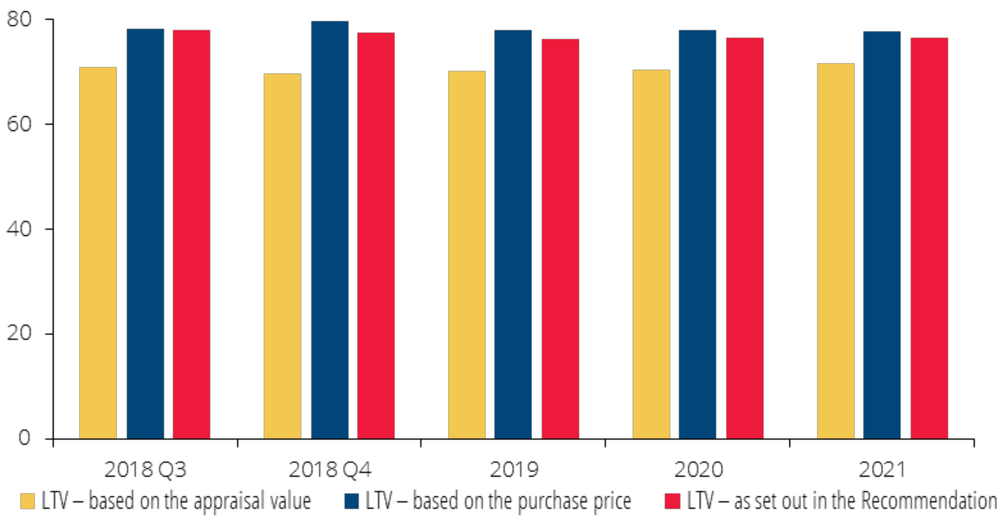
Chart 2.2 • Distribution of the stock of loans for house purchase by LTV ratio – December 2021 | Per cent



Source: Banco de Portugal. | Note: This distribution is based on data available in the CCR as at end-December 2021.

In 2021 the minimum between the property's purchase price and appraisal value remained, on average, closer to the property's purchase price. By considering as denominator of the LTV ratio the minimum between the property's appraisal value and purchase price, the Recommendation mitigates the risk of the limits set being circumvented by an artificial increase in the property's appraisal value. In recent years, the minimum between properties' purchase prices and appraisal values has been closer, on average, to the purchase price. Indeed, following a 10 p.p. difference in the fourth quarter of 2018, the difference between the two figures narrowed on average to 4 p.p. in 2021. The weighted average LTV ratio of new credit for the purchase of own and permanent residence was 76% in 2021, in line with previous years (Chart 2.3).

Chart 2.3 • Evolution of the weighted average LTV ratio of new credit for the purchase of own and permanent residence | Per cent

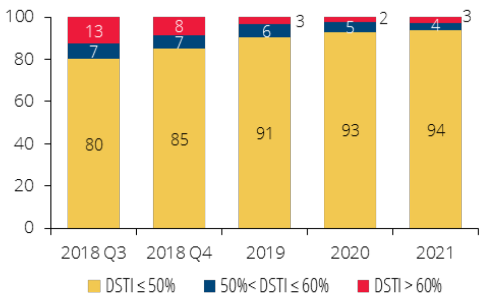


Source: Banco de Portugal. | Notes: Information reported by a sample of nine institutions. In some periods the value of the average LTV ratio weighted by the credit amount is different from the minimum between the value of the average LTV ratio weighted by the credit amount based on the purchase price 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.

In 2021 around 94% of new credit agreements for house purchase and consumer credit was granted to borrowers with a DSTI ratio of 50% or less, calculated according to the definition in the Recommendation. The Recommendation imposed a general limit of 50% on the DSTI ratio of new credit for house purchase, while two flexibility clauses were foreseen: institutions may grant (i) up to 10% of the credit volume to borrowers with a DSTI ratio of between 50% and 60% (before April 2020 this threshold stood at 20%); and (ii) up to 5% of the volume of credit to borrowers with a DSTI ratio above 60%. The use of both flexibility clauses requires that institutions provide adequate justification and the Banco de Portugal accepts it. In 2021 around 94% of new credit for house purchase and consumer credit was granted to borrowers with a DSTI ratio of 50% or less, i.e. slightly above the value recorded in 2020 (93%). This share was higher in credit for house purchase than in consumer credit, at 94% and 91% respectively. New credit granted to borrowers with a DSTI ratio between 50% and 60% has been decreasing since 2018, reaching 4% of total new business in 2021 (Chart 2.4). Only around 3% of the amount of new business in 2021 was associated with borrowers with a DSTI ratio above 60%. Financial institutions justified the use of flexibility clauses with the proven financial capacity of borrowers, the existence of other physical collateral, the fact that these were loans to consolidate other loans in other credit institutions, and the existence of a security or guarantees given by the borrowers' parents.

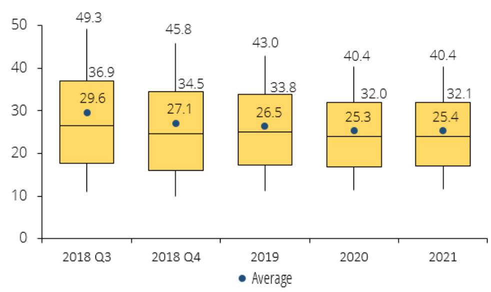
In 2021 around 75% of new credit to households was associated with borrowers with an actual DSTI ratio of 32% or less. In 2021 the average actual DSTI ratio, i.e. the DSTI ratio without taking into account the interest rate and income shocks set out in the Recommendation, stood at 25.4%, in line with the value recorded in 2020 (25.3%). With reference to the third quarter of 2018, corresponding to the start of the Recommendation, there was a decline of around 4 p.p. These developments reflect the combined effect of the introduction of the Recommendation and the decline in the overall level of interest rates and the spread on new loans. Between 2018 and 2021 there was a less disperse distribution of the DSTI ratio, mainly associated with a decrease in the higher percentiles. The 90th (75th) percentile decreased from 49.3% (36.9%) in the third quarter of 2018 to 40.4% (32.1%) in 2021 (Chart 2.5).

Chart 2.4 • 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 DSTI ratio was calculated in line with the Recommendation, assuming shocks to the interest rate and to the borrower's income.

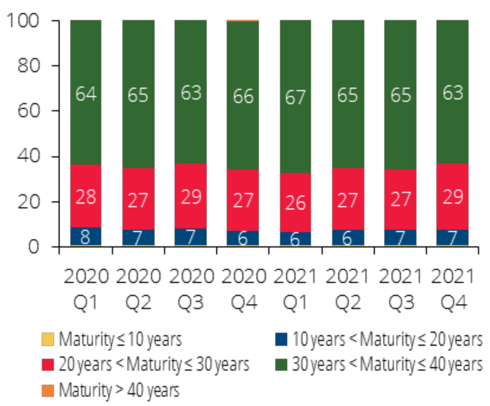
Chart 2.5 • Distribution of the actual DSTI ratio for new loans to households | Per cent



Source: Banco de Portugal. | Notes: The chart represents the quartile distribution of the actual DSTI ratio, i.e. without taking into account the shocks on the interest rate and on the borrower's income set out in the Recommendation. The lower and upper ends correspond to the 10th percentile and the 90th percentile, while the bottom and top of the boxes correspond to the 25th and 75th percentiles. These distributions are based on data available in the CCR.

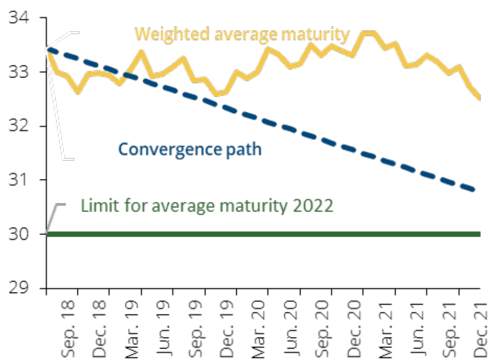
Although the maximum limit to the maturity of new business was met, the weighted average maturity of credit for house purchase started to diverge from 2020 onwards. In 2021 the amount of new credit for house purchase with a maturity of over 40 years was immaterial. In the last quarter of 2021, around 92% of new credit for house purchase had a maturity between 20 and 40 years, broken down into around 29% with a maturity between 20 and 30 years and around 63% between 30 and 40 years (Chart 2.6). The weighted average maturity of new credit for house purchase decreased by around one year (to 32.6 years) between July 2018 and December 2019. However, between December 2019 and January 2021 there was a further increase to 33.7 years. Despite the reduction recorded since then, in December 2021 the average maturity was over 30 years, i.e. the threshold to be reached by the end of 2022, in accordance with the Recommendation (Chart 2.7). Assuming a linear and gradual convergence trend between the start date of the Recommendation and the end of 2022, the average maturity of new credit for house purchase should have stood at 30.8 years in December 2021, corresponding to a difference of approximately one year and eight months from the actual value (32.5 years).

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



Source: Banco de Portugal. | Note: Based on information reported by a sample of nine institutions.

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 nine institutions. The average maturity is weighted by the amount of credit granted.

Approximately half of the new credit for house purchase had maturities between 35 and 40 years. Credit for house purchase granted during the fourth quarter of 2021 focused mainly on borrowers aged 30-45 (62%) and loans with a maturity between 35 and 40 (46%) (Table 2.2). Given the strong concentration of new credit for house purchase in maturities between 35 and 40 years, and the objective of promoting convergence of the weighted average maturity of new business to 30 years by the end of 2022, the Banco de Portugal adjusted the Recommendation, reducing the maximum maturity of new business on the basis of the age of borrowers.

Table 2.2 • Distribution of the amount of new credit for house purchase by maturity and borrowers' age group | Per cent

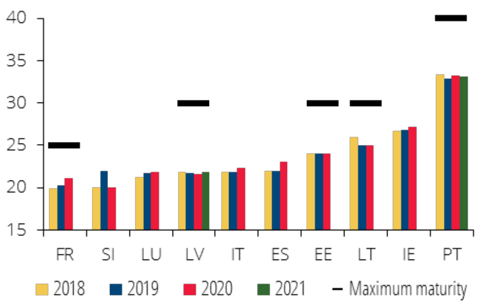
	Maturity					
Age	<=10 years	]10,20]	]20,30]	]30,35]	]35,40]	Total
≤30 years	0.0	0.2	0.9	1.2	13.9	**16.3**
]30,35]	0.1	0.2	1.4	1.9	16.8	**20.4**
]35,40]	0.0	0.2	2.1	5.7	13.9	**21.9**
]40,45]	0.0	0.3	5.6	11.8	1.6	**19.3**
]45,50]	0.1	0.6	11.0	1.0	0.0	**12.6**
Over 50 years	0.4	4.1	4.8	0.0	0.0	**9.3**
Total	**0.7**	**5.6**	**25.9**	**21.6**	**46.3**	100

Source: Banco de Portugal. | Notes: Based on information reported by a sample of nine institutions. Data refer to the fourth quarter of 2021. This distribution is based on data available in the CCR.

With regard to the maturities of new credit for house purchase, Portugal showed high values in the EU context. In 2021 the average maturity of new credit for house purchase in Portugal was around 33 years, above the EU countries for which information is available, whose average maturity ranged between 20 and 27 years. The limit to the maximum maturity of 40 years also corresponds to the highest value among countries for which information is available (Chart 2.8). Maintaining the average maturity of new credit for house purchase at high levels involves increased risk for credit institutions, since they are exposed to fluctuations in the economic and financial cycle over a longer period. In addition, longer maturities reduce the possibility of credit restructuring for borrowers in financial distress, and also make it easier for them to become indebted.

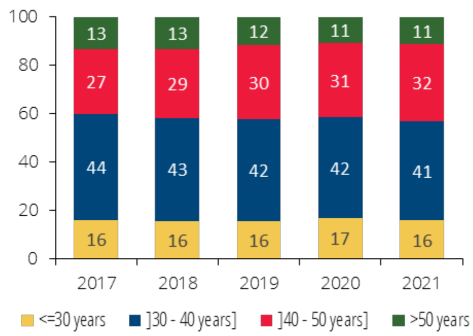
The Recommendation did not change the share of loans granted to borrowers aged 30 or under. In 2021, and as in previous years, new credit for house purchase was mainly granted to borrowers aged 30-40. However, the share of this age group declined from 44% in 2017 (the year before the start of the Recommendation) to 41% in 2021. By contrast, the share of debtors aged 40-50 increased (from 27% in 2017 to 32% in 2021). The proportion of the amount of loans granted to younger borrowers, i.e. aged 30 or under, has remained broadly unchanged since 2017, at around 16% (Chart 2.9).

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



Source: Information published by the respective national authorities. | Note: In addition to Portugal, up to early 2022 Malta is the only EU country which to date has adopted a maximum maturity of 40 years.

Chart 2.9 • Amount of new credit for house purchase by borrower age range | Per cent

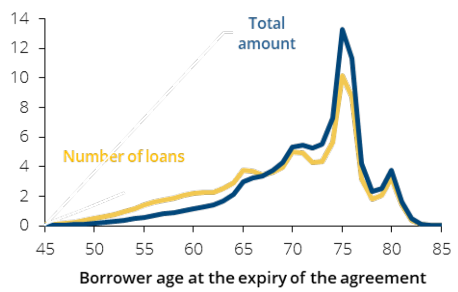


Source: Banco de Portugal. | Note: Based on information reported by a sample of nine institutions.

At the end of 2021 almost two-thirds of the stock of loans for house purchase was associated with borrowers aged 70 and over at the expiry of the agreement. The combination of long maturities of loans and the borrower age structure means that the expiry of the agreement often goes beyond the borrowers' working lives. At the end of 2021 the number of agreements and the stock of credit for house purchase related to borrowers aged 70 (75) and over at the end of the agreement amounted to 50% (21%) and 63% (27%) respectively (Chart 2.10). However, with reference to the agreements outstanding at the end of 2021, the mode of the distribution of borrowers' age when the loan was taken out is 30 years (Chart 2.11). In addition, around 61% of borrowers took out their loans when aged 27-40 and 25% of borrowers took out their loans after the age of 40.

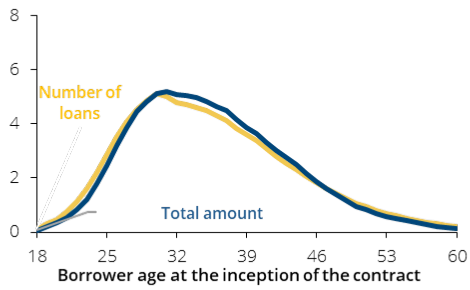
Given the ageing of the Portuguese population and the significant reduction in borrowers' income upon transition from work into retirement, despite the decline in expenses that may occur, the high concentration of loans with borrowers aged 70 and over at the expiry of the agreement may pose a risk to the financial system. As mentioned above, the reduction in the borrower's income by 20% when their age at the end of the agreement is 70 and over, was one factor considered when designing the Recommendation for calculating the DSTI.

Chart 2.10 • Breakdown of the number and amount of outstanding loans at the end of 2021 by borrower age at the expiry of the agreement | Per cent



Source: Banco de Portugal. | Note: This distribution is based on data available in the CCR.

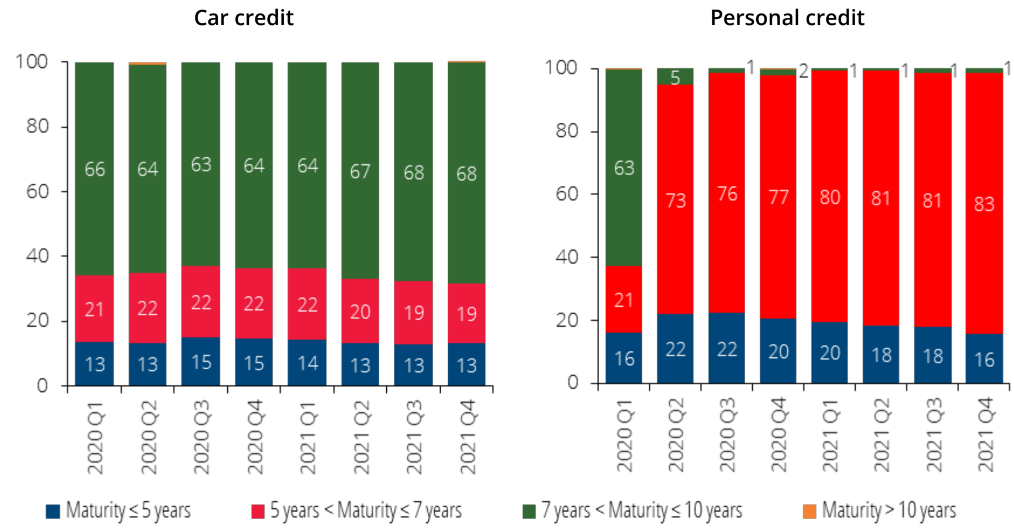
Chart 2.11 • Breakdown of the number and amount of outstanding loans at the end of 2021 by borrower age on the date of conclusion of the agreement | Per cent



Source: Banco de Portugal. | Note: This distribution is based on data available in the CCR.

In 2021 consumer credit with a maturity above the thresholds set out in the Recommendation was very residual. From the second quarter of 2020 onwards, following the reduction in the maximum maturity of personal credit from 10 to 7 years (with the exception of personal credit for education, healthcare and renewable energy, which will continue to have a maximum maturity of 10 years) the share of new personal credit with a maturity of over 7 years became relatively residual (Chart 2.12). In the fourth quarter of 2021, around 83% of new personal credit had a maturity between 5 and 7 years. In car credit, whose recommended maximum maturity is 10 years, new business in 2021 continued to be predominantly with a maturity between 7 and 10 years. In the fourth quarter of 2021 around 68% of the amount of new business fell within this range. The share of new car credit with a maturity above the 10-year threshold was virtually nil.

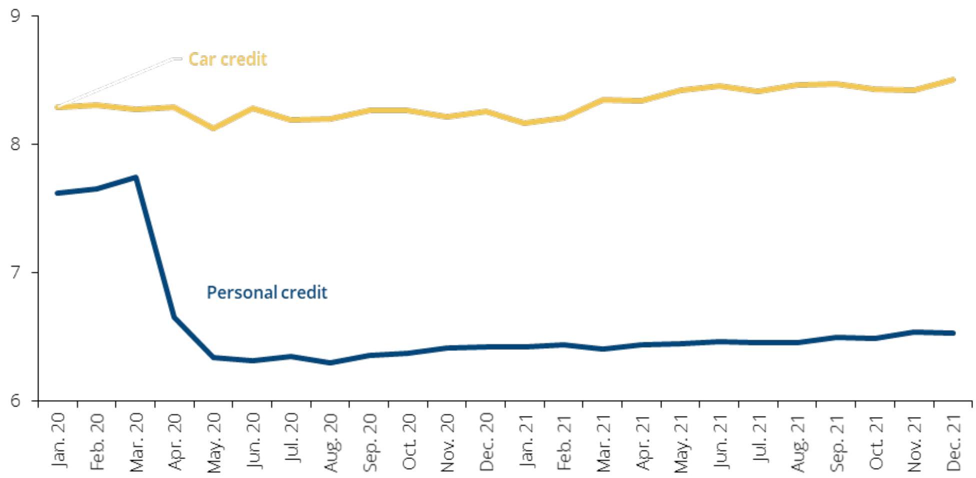
Chart 2.12 • Distribution of new consumer credit by maturity range | As a percentage of the segment's total credit



Source: Banco de Portugal. | Note: Based on information reported by a sample of 13 institutions.

The average maturity of consumer credit remained stable throughout 2021. As regards car credit, the average maturity remained relatively stable, at around 8.4 years throughout 2021, i.e. slightly higher than in 2020 (8.2 years). The average maturity of personal credit decreased markedly in April 2020, following the amendment to the Recommendation setting the maximum maturity of this type of credit at 7 years. Since then, it has remained stable at around 6.5 years (Chart 2.13). Personal credit for healthcare, education and renewable energy, whose maximum maturity remained at 10 years, continued to have a residual weight, accounting for around 3% of personal credit granted in 2021.

Chart 2.13 • Weighted average of the maturity of new car and personal credit | In years

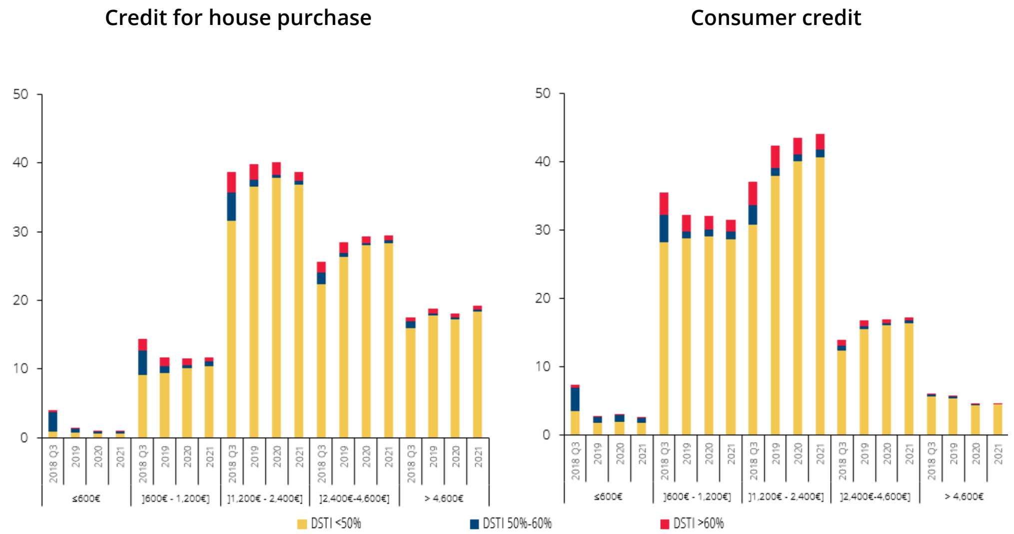


Source: Banco de Portugal. | Note: Based on information reported by a sample of 13 institutions.

New credit for house purchase was mainly granted to borrowers with net monthly income of more than €1,200. In 2021, and in line with previous years, credit for house purchase was mainly granted to borrowers with net monthly income of more than €1,200, while consumer credit was mainly to debtors with net monthly income between €600 and €2,400 (Chart 2.14). Between the third quarter of 2018 and 2021, credit for house purchase granted to borrowers with net monthly income of less than €1,200 followed a downward trend, against an increase in credit to borrowers with net monthly income of more than €2,400.

The share of new loans granted to borrowers with a DSTI ratio of more than 50%, calculated according to the Recommendation's definition, has been decreasing, particularly in lower income levels. Since 2018 there has been a decrease in the share of new loans granted to borrowers with a DSTI ratio of more than 50%. This change in structure was seen in all borrowers' net monthly income brackets, but more visibly in the lowest income levels, largely mirroring lower risk in credit granted. In 2021 the share of new credit for house purchase and new consumer credit associated with borrowers with net monthly income of €1,200 or less and a DSTI ratio above 50% was immaterial, i.e. 1.6% and 3.6% respectively (Chart 2.14).

Chart 2.14 • New credit by bucket of DSTI ratio and net monthly income of borrowers | Per cent

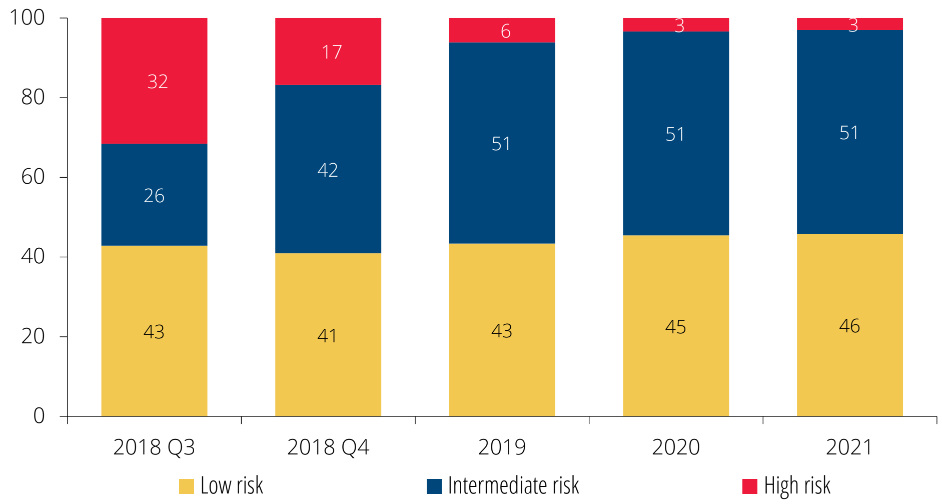


Source: Banco de Portugal. | Notes: DSTI as set out in the Recommendation. Based on information reported by a sample of 13 institutions.

The risk profile of borrowers of new credit for house purchase remained stable in 2021, following an improvement since the introduction of the Recommendation. Between the entry into force of the Recommendation and 2021 there was a continued improvement in the risk profile of borrowers of credit for house purchase. The share of credit granted to high-risk borrowers, i.e. debtors with a DSTI ratio of over 60% and/or an LTV ratio of over 90%, decreased from around 32% of the total amount of new credit for house purchase in the third quarter of 2018 to around 3% in 2021. This reduction was offset by an increase in the amount of credit granted to borrowers with a low risk profile (from 43% in the third quarter of 2018 to around 46% in 2021) and especially to borrowers with an intermediate risk profile, whose share in the total amount of new business increased from 26% to 51%. In 2021 the credit risk profile of borrowers remained broadly unchanged from the previous year (Chart 2.15). The introduction of the limit to the LTV ratio for new loans for house purchase in itself contributed to improving the borrowers' risk profile. Indeed, after the introduction of this limit, riskier borrowers purchased property at lower prices and took out smaller loans (Special issue "The impact of the macroprudential Recommendation on borrower indebtedness and on the characteristics of credit agreements for house purchase").

In 2021 the Recommendation's regular payments requirement was still complied with at a high rate. In the last quarter of 2021, only around 3% of total new credit failed to comply with the regular payments requirement. As in 2020, the explanations presented by institutions for not complying with this requirement were chiefly related with the granting of bridging loans (loans that only have a single capital payment, e.g. for down payments).

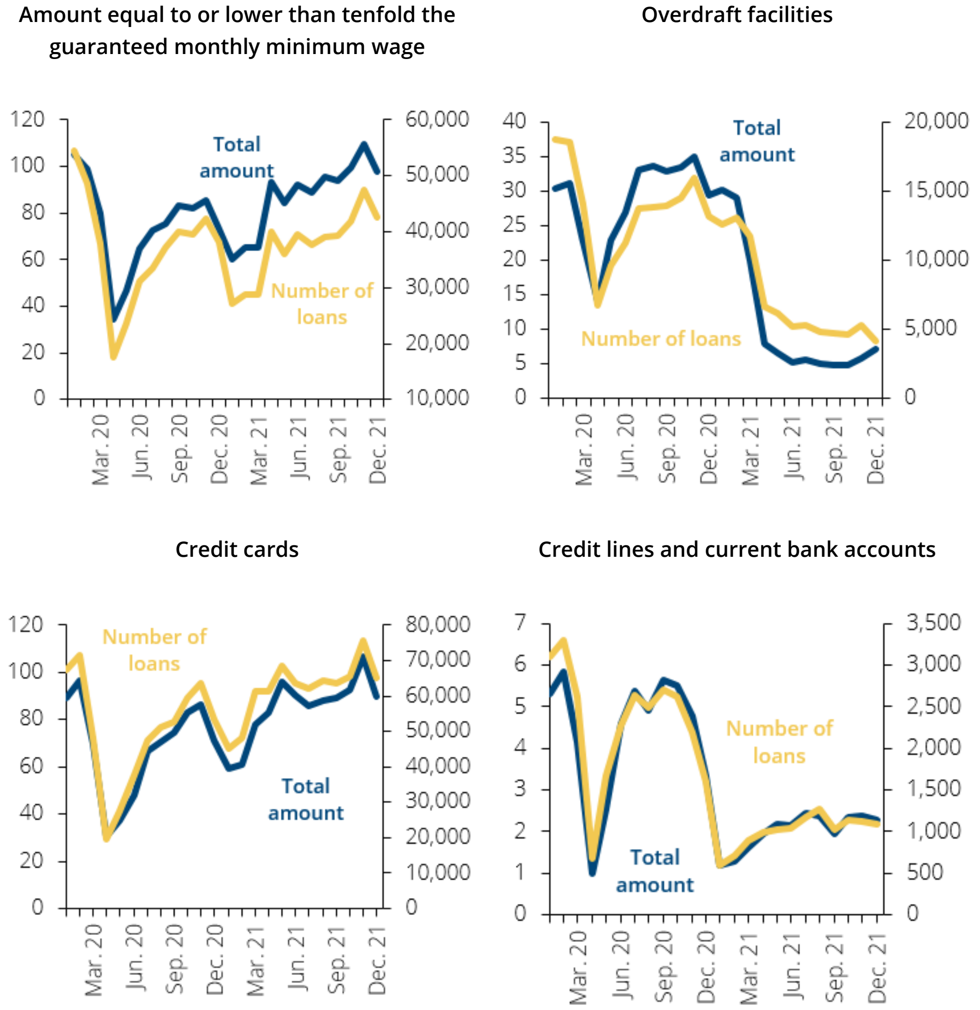
Chart 2.15 • Borrowers' risk profile in new credit for house purchase | Per cent



Source: Banco de Portugal. | Notes: Based on information reported by a sample of nine institutions. Low risk: DSTI≤50% and LTV≤80%; High risk: DSTI> 60% and/or LTV>90%; Intermediate risk: other cases.

On average, developments in credit outside the scope of the Recommendation between 2020 and 2021 were similar to those in consumer credit covered by 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, overdraft 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. These loans subsequently recovered up to the end of 2020, followed by a further drop associated with the second lockdown in early 2021. Throughout 2021 there was a further recovery, especially in two out of the four segments under analysis. New business for an amount equal to or lower than tenfold the guaranteed monthly minimum wage and credit cards appear to have stabilised at fairly similar values to those recorded before the pandemic crisis (Chart 2.16). 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 2021 returned to values close to those observed before the pandemic crisis. By contrast, new business associated with overdraft facilities, credit lines and current bank accounts at the end of 2021 remained at a much lower level than before the outbreak of the pandemic.

Chart 2.16 • New credit outside the scope of the Recommendation



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

Special issues

The impact of the macroprudential Recommendation on borrower indebtedness and on the characteristics of credit agreements for house purchase

Assessment of the impact of the macroprudential Recommendation on the macroprudential policy stance with regard to credit for house purchase

The impact of the macroprudential Recommendation on borrower indebtedness and on the characteristics of credit agreements for house purchase

This Special issue quantifies the impact on borrower indebtedness and on the characteristics of credit agreements for house purchase of the introduction of a 90% maximum limit to the LTV ratio for new credit for the purchase of own and permanent residence set out in the Recommendation. The analysis is carried out in two steps. Firstly, the adjustment of the LTV ratio associated with new credit for house purchase after the implementation of the Recommendation is analysed. Subsequently, the effects of the introduction of the LTV limit on the characteristics of new credit agreements for house purchase are reviewed in terms of borrowers subject to tighter LTV limits (hereinafter referred to as 'borrowers affected by the limit'). In particular, the impact on borrower indebtedness is examined (of amounts of loans taken out and the value of credit in relation to borrowers' income), as well as debt servicing costs (spreads, monthly instalment and the ratio of the monthly instalment to borrowers' income), and on borrowers' real estate market choices (prices of property purchased). The results presented are based on the Article by Abreu, D., Félix, S., Oliveira, V., and Silva, F. (2021).

In addition to the LTV ratio limits, the Recommendation sets out limits to the DSTI ratio and to the maturity of new credit, as well as a regular interest and principal payment requirement. The focus of the analysis on the impact of the LTV ratio limit is mainly due to three reasons. The LTV ratio limit led to a significant change in credit standards applied in Portugal, as the LTV ratio is calculated using the minimum between the property's appraisal value and purchase price. This is particularly important, since in the period prior to the introduction of the Recommendation it was common practice in the Portuguese banking sector to finance 80% to 90% of the property's appraisal value. As the appraisal value is generally higher than the purchase price, a substantial share of transactions was financed at 100% of the property's purchase price. In addition, banks generally already complied with the 40-year maximum limit to the maturity of credit for house purchase and, therefore, this limit did not seem to have been particularly tight. Finally, the exceptions to the DSTI ratio limit laid down in the Recommendation make it difficult to identify and quantify the impact of this limit on new business.

Data and methodology

This analysis used information from the Central Credit Register. This database gathers detailed information on the characteristics of new credit, the borrowers of each loan and the property used as collateral.

The sample considered includes credit for the purchase of own and permanent residence taken out between January 2017 and December 2019. It thus includes around one year and a half of observations before and after the date of implementation of the Recommendation (July 2018). The time period of the sample is deemed appropriate as it includes a significant number of observations for the period in which the measure is implemented, but at the same time sufficiently short to ensure that other aggregate shocks impacting on the credit market do not materially influence the analysis.

To analyse the impact of the adjustment to the LTV ratio on borrower indebtedness and housing choice after the introduction of the Recommendation, a difference-in-differences estimator was used according to the following model:

$$y_{lt} = \alpha_0 After_t + \alpha_1 Treated_h + \alpha_2 After_t * Treated_h + \boldsymbol{\theta}'\boldsymbol{X}_{ht} + \omega_r + \delta_b + \gamma_t + \varepsilon_{lt}\ , \quad (1)$$

where l corresponds to the loan granted to household h by bank b in the period t. The variable $After_t$ takes the value one for agreements concluded after the entry into force of the Recommendation and the value zero for agreements concluded before that date.

The variable $Treated_h$ takes the value one in the case of agreements with borrowers affected by the introduction of the limit to the LTV ratio, i.e. borrowers who without the introduction of a 90% LTV limit would be able to conclude the credit agreement for house purchase with an LTV ratio above 90%. It takes the value zero in the case of borrowers who have not been affected – the so-called control group – i.e. borrowers with an LTV of 90% or less.

The vector $\boldsymbol{X}_{ht}$ includes a set of control variables concerning the characteristics of borrowers: income, employment status and level of education. The terms ω_r, δ_b and γ_t correspond to fixed effects at the region, bank and time level respectively. Finally, ε_{lt} corresponds to an error term with zero average.

This specification was used to model a set of variables of interest, and therefore the independent variable y_{lt} corresponds to the LTV ratio, the amount of credit taken out, the LTI (loan-to income) ratio, used in this context as a measure of indebtedness, spread and LSTI (loan-service-to-income) ratio. The parameter of interest to the analysis is α_2, given that it allows for measuring the incremental effect of the introduction of the Recommendation on the borrowers affected by its introduction compared to those belonging to the control group.

The estimation of the model in equation (1) requires the classification of borrowers into a control group (not affected by the introduction of the measure) and a treatment group (affected by the introduction of the measure). In the run-up to the entry into force of the Recommendation it is possible to identify borrowers who took out a loan with an LTV ratio below the 90% threshold based on the minimum between the property's appraisal value and purchase price (control group) and those who took out a loan with a higher LTV ratio (treatment group). After the entry into force of the Recommendation, it is impossible to classify them directly because the credit agreements concluded are already subject to the 90% LTV limit.

To operationalise the analysis, a model for the LTV ratio was estimated using data for the period before the Recommendation entered into force. The model makes it possible to infer the value of the LTV ratio associated with borrowers who would sign an agreement after the entry into force of the Recommendation had the measure not been implemented. If this value exceeds the 90% limit the borrower will be assigned to the treatment group, otherwise they will be assigned to the control group. According to the estimates obtained, the treatment group includes around 28% of the borrowers in our sample.

Descriptive analysis

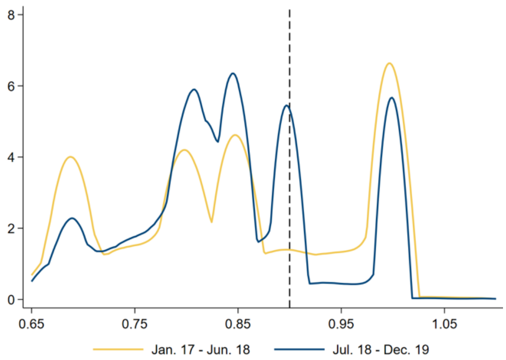
Following the entry into force of the Recommendation, the distribution of the LTV ratio shifted to lower values (Chart 1), with the median of the LTV ratio decreasing from 84% to 83%, suggesting that the new limit to the LTV ratio was tight for some borrowers. Between January 2017 and June 2018 there was a substantial concentration of credit in agreements with an LTV ratio of around 100%, i.e. loans for house purchase financed entirely through credit. Prior to the introduction of limits to the LTV ratio, approximately 32% of loans were granted with LTV ratios clearly above the

90% limit, with this value standing at 17% after the introduction of the limit to the LTV ratio (between July 2018 and December 2019).

Banks implemented the limits to the LTV ratio gradually, as new credit for house purchase was seen to have an LTV ratio above the 90% limit in the period following the introduction of the Recommendation. These agreements are concentrated in the first three months after the introduction of the Recommendation and reflect cases where the borrower creditworthiness assessment and the corresponding credit approval took place before the entry into force of the Recommendation, but the funds were released after the Recommendation entered into force.

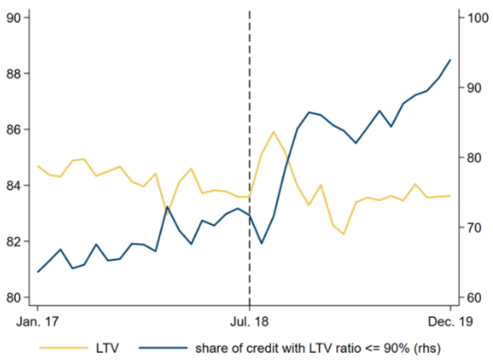
The share of loans granted with an LTV ratio of 100% or more decreased by 6 percentage points (p.p.) in the period after the introduction of the Recommendation (from approximately 18% to 12%). From July 2018 to December 2019 the share of new loans with an LTV ratio of 100% decreased substantially and there was a greater concentration of the LTV ratio around the 90% limit.

Chart 1 • Distribution of the amount of credit for house purchase by LTV ratio before and after the introduction of the macroprudential Recommendation | Density



Source: Banco de Portugal. | Notes: The dashed line corresponds to the 90% limit to the LTV ratio of new credit for the purchase of own and permanent residence. The macroprudential Recommendation entered into force in July 2018.

Chart 2 • Evolution of the average LTV ratio and the share of credit with LTV ratio <= 90% | Per cent

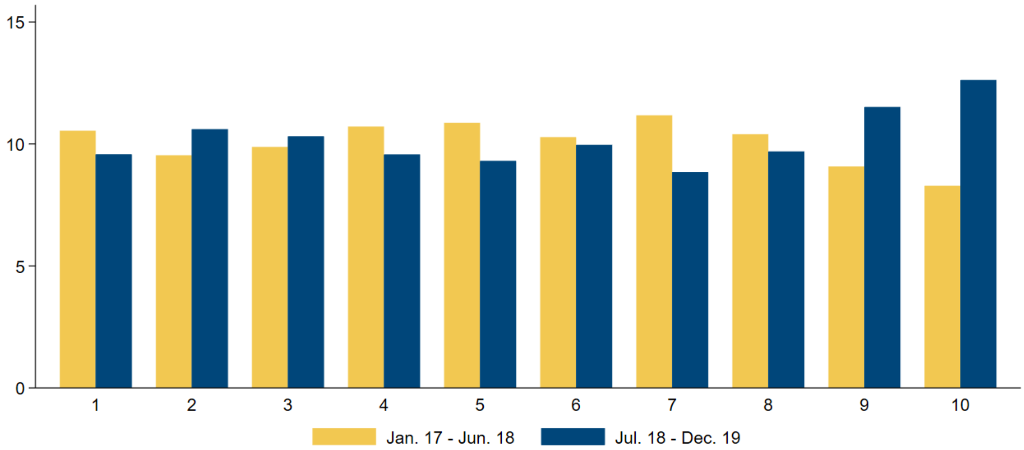


Source: Banco de Portugal. | Notes: The dashed line corresponds to the date of introduction of the macroprudential Recommendation. The average LTV ratio corresponds to the average of the LTV ratio of new credit for house purchase entered into in each month.

Chart 2 shows the evolution of the average LTV ratio over the time period considered, calculated in accordance with the Recommendation. The time series of the LTV ratio declined to a lower level after the introduction of the 90% limit in July 2018. The share of compliant loans, i.e. loans with an LTV ratio of 90% or less, increased significantly after the implementation of the Recommendation (from around 71% in July 2018 to 94% in December 2019).

Following the introduction of the Recommendation there was an improvement in the risk profile of borrowers associated with new loans for the purchase of own and permanent residence. On average, borrowers' income is higher and the LTV ratio of new credit for house purchase is lower (reflecting a higher share of borrowers' own capital). There was an increase in the share of new credit granted to borrowers in the two highest income deciles (Chart 3). By contrast, there were no significant changes in the share of new loans granted to borrowers in the other deciles of income distribution.

Chart 3 • Amount of credit for house purchase by borrower income decile before and after the introduction of the macroprudential Recommendation | Per cent



Source: Banco de Portugal. | Note: The macroprudential Recommendation entered into force in July 2018. In the case of agreements with more than one borrower, the sum of the borrowers' income is considered.

Following the introduction of the 90% limit to the LTV ratio in July 2018, there was not only a reduction in the average LTV ratio of new credit for house purchase, but also a shift in the distribution of the LTV ratio to lower values.

Empirical results

The adjustment of the LTV ratio documented in the previous section suggests that the limit set out by the Recommendation was tight for some borrowers. Thus, the subsequent topic addressed in this Special issue involves understanding whether the introduction of the limit to the LTV ratio led to a change in the characteristics of the credit agreement for house purchase of borrowers who were affected by the limit compared with those who were not. In particular, borrowers affected by the introduction of the limit to the LTV ratio may have reduced the loan amounts for house purchase and/or purchased property at a lower price.

To understand these possible effects, the model in equation (1) was estimated for the set of variables of interest indicated in the previous section. The estimation results are shown in Table 1.

Table 1 • Results of the difference-in-differences estimator

LTV ratio	Amount taken out	Purchase price of the property	LTI ratio	LSTI ratio	*Spread*	Monthly instalment
(1)	(2)	(3)	(4)	(5)	(6)	(7)
-0.0586***	-0.0688***	-0.0208***	-0.2841***	0.0191***	0.0336***	39.4100***
(0.0015)	(0.0071)	(0.0071)	(0.0373)	(0.0014)	(0.0078)	(2.4135)

Source: Abreu, D., Félix, S., Oliveira, V., and Silva, F. (2021) | Notes: The table reports the estimation results of coefficient α_2 of the model in equation (1) where the dependent variable corresponds to the variable indicated in each column. The sample covers new credit agreements for house purchase concluded between January 2017 and December 2019. Standard errors estimated by bootstrap (1,000 replications) reported in brackets.*** indicates statistical significance at the 1% level.

The results shown in column (1) for the LTV ratio suggest that borrowers in the treatment group have on average an LTV ratio 5.9 p.p. lower compared to borrowers in the control group.

The results also indicate that the adjustment of borrowers' LTV ratio in the treatment group was through a reduction in the amounts of loans taken out and the purchase of property at a lower price. In particular, borrowers affected by the limit to the LTV ratio are estimated to have taken out loans on average 6.9% lower than in a situation where the limit had not been introduced (column (2)). With regard to property prices, results suggest an average reduction of 2.1% in the prices of property purchased by borrowers affected by the limit to the LTV ratio, compared with borrowers in the control group (column (3)).

With regard to the household debt-to-income ratio, results suggest that the introduction of the limit to the LTV ratio resulted in a 0.28 p.p. decline, on average, in the indebtedness ratio as measured by the LTI, of borrowers in the treatment group (column (4)). This is consistent with the reduction in the amounts of credit taken out by these borrowers.

Borrowers estimated to have been affected by the imposition of the limit to the LTV ratio bore, on average, a 1.9 p.p. higher debt service than borrowers for whom the new limit was not tight (column (5)). To better understand this result, the adjustment in the spreads and monthly instalment associated with the credit agreement was estimated. The estimates obtained suggest that borrowers in the treatment group tend to bear, on average, a 0.03 p.p. higher spread and a €40 higher instalment than the control group (columns (6) and (7) respectively). The decrease in the LTV ratio contributes to a reduction in the risk associated with the loan through a decrease in loss given default. Hence, the estimated impact would be expected to indicate a narrowing of the spread. One explanation for the result is that borrowers affected by the limit to the LTV ratio have less bargaining power at the time the credit agreement is signed, translated into higher spreads compared to the control group. It can also be interpreted as evidence of a higher risk level associated with borrowers restrained by the limit to the LTV ratio.

In sum, results suggest that the introduction of the limit to the LTV ratio on new loans for house purchase contributed to lowering indebtedness and improving borrowers' risk profile by reducing the LTV ratio. This adjustment seems to be explained by a reduction in the amount of credit taken out by borrowers. In addition, borrowers most affected by the limit tend to purchase property at a lower price compared to those not affected by the limit. The analysis also suggests that borrowers affected by the limit bear on average a higher spread and monthly instalment than the control group.

References

Abreu, D., Félix, S., Oliveira, V., and Silva, F. (2021). "The impact of a macroprudential borrower based measure on households' leverage and housing choices." Banco de Portugal *Working papers* (No. w202116)

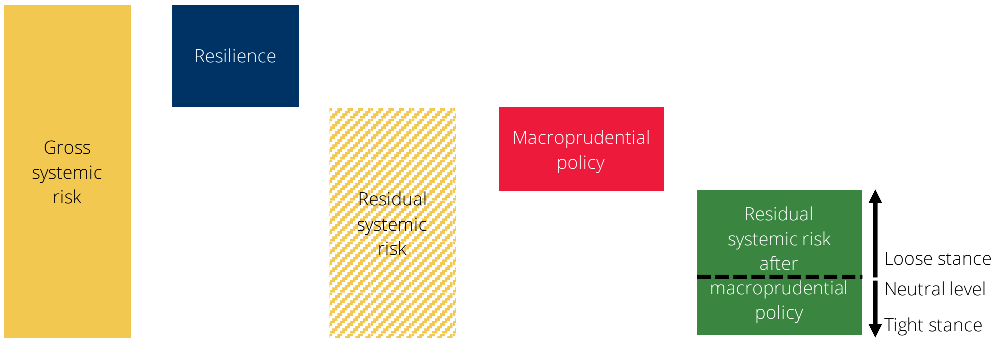
Assessment of the impact of the macroprudential Recommendation on the macroprudential policy stance with regard to credit for house purchase

This Special issue aims to assess the impact of the Recommendation – whose purpose is to strengthen institutions' resilience and promote borrowers' access to sustainable financing – on the macroprudential policy stance with regard to credit for house purchase. To this end, an approach based on the aggregation of risk and resilience indicators is used to exclusively assess the effectiveness of measures targeting credit standards in strengthening the resilience of the financial system and borrowers to risks originating in the residential real estate sector.

Conceptual approach to the macroprudential policy stance

The macroprudential policy stance establishes the relationship between the implementation of macroprudential policy and its objective, as is the case in the context of monetary policy. The objective of macroprudential policy is to promote the stability of the financial system by increasing institutions' resilience and/or mitigating systemic risk, contributing to sustainable economic growth. The assessment of the Recommendation's effectiveness in increasing the resilience of the financial system and promoting borrowers' access to sustainable finance in this Special issue uses the 'risk-resilience' approach presented in the report *Features of a macroprudential stance: initial considerations*, published by the ESRB in 2019. This approach compares the level of 'gross' systemic risk with the level of resilience in the financial system, the difference being referred to as residual systemic risk (Figure 1). To obtain the macroprudential policy stance, an assessment is made as to whether the macroprudential measures implemented are appropriate and sufficient to meet the objective of macroprudential policy, which is defined in terms of the neutral level of residual systemic risk. This neutral level is determined by the macroprudential authority. If the residual systemic risk after considering the effect of macroprudential policy exceeds the neutral level, as shown in Figure 1, the macroprudential policy stance is accommodative and there are indications that macroprudential policy should be tighter. Otherwise, there would be scope to accommodate more systemic risk without putting financial stability at stake, making macroprudential policy less tight.

Figure 1 • Risk-resilience approach for assessing the macroprudential policy stance



Source: Adapted from CERS (2019). | Note: Stylised example for illustration where the macroprudential policy stance is assessed as accommodative; if the residual systemic risk after macroprudential policy (green box) were to be lower than the neutral level determined by the macroprudential authority (black dashed line) the assessment of the macroprudential policy stance would be tight. The size of the boxes does not indicate the importance of each component in the risk-resilience approach.

Operationalising the macroprudential policy stance through a risk-resilience approach based on a composite indicator

The operationalisation of the risk-resilience approach is presented in the ESRB's *Report of the Expert Group on Macroprudential Stance – Phase II (implementation)* (ESRB, 2021) using three approaches. One of these focuses on the macroprudential policy stance associated with measures that act solely on credit standards for house purchase and are related to risks originating in the residential real estate sector. This is done by resorting to indicators often used to assess risk and resilience in this context. This assessment is divided into two segments: the amount of credit in relation to the value of the collateral (Value) and the amount of credit expenses in relation to the borrower's income (Income). The approach is therefore described through the following formula:

$$Stance_t = \sum_{i=Value,Income} w_{i,t}\,[(Gross\ Sistemic\ Risk_{i,t} - Resilience_{i,t})Systemic\ Importance_t - Macroprudential\ Policy_{i,t}] \quad (1)$$

where residual systemic risk in each of the segments is measured by the component $Gross\ Sistemic\ Risk_{i,t} - Resilience_{i,t}$ and the component $Systemic\ Importance_t$ reflects the potential contagion effects of developments in the residential real estate sector to the banking system and the economy. $Macroprudential\ Policy_{i,t}$ corresponds to the macroprudential measures already implemented and that are aimed at borrowers seeking to purchase a house. These measures can mitigate gross systemic risk and/or increase the resilience of the financial system. So as to aggregate the value of residual systemic risk after macroprudential policy of the two segments and obtain the stance, a weight is attributed to each segment, $w_{i,t}$. This weight varies depending on the classification into levels of residual systemic risk weighted by systemic importance where: $g_i\big[\big(Gross\ Sistemic\ Risk_{i,t} - Resilience_{i,t}\big)Importância\ Sistémica_t\big] > g_j\big[\big(Gross\ Sistemic\ Risk_{j,t} - Resilience_{j,t}\big)Systemic\ Importance_t\big]$ implies $w_{i,t} > w_{j,t}$ with $i \neq j$ and $g[.]$ the function that classifies into levels the residual risk weighted by the systemic importance of each segment.[1] The value obtained from equation (1), $Stance_t$, is compared with a numerical range reflecting the neutral level of residual systemic risk. Given the lack of evidence on the transmission

[1] The weight of each segment is defined through a scale ranging from 0.25 to 0.75. For further details see ESRB (2021) Table 8.

mechanisms and the effectiveness of macroprudential policy in risk and resilience, as it is still a relatively recent policy, this range was defined using informed discretion.

Table 1 presents the indicators used to gauge the various components of equation (1), following ESRB (2021). Systemic risk indicators related to collateral value (indicators V1 to V4) measure the risk of property price correction. A significant and negative correction implies the devaluation of assets pledged as collateral for a given loan. Indicators V1 and V2 reflect residential real estate price developments, both through the three-year annualised rate of change (V1) and against the long-term trend (V2), while indicators V3 and V4 make it possible to infer the overvaluation of prices relative to household income (V3) and rents (V4). The resilience indicator for this segment (V5) makes it possible to consider information on the share of the property's value that is, on average, financed by banks. The macroprudential policy indicator (P1) for this segment corresponds to the limit to the LTV ratio decided by the macroprudential authority that can act on resilience and/or risk. In fact, the tighter the limit to the LTV ratio imposed by the authority, the lower the share of the property's value that is financed by credit. For this reason, in the event of significant and unanticipated property price corrections, the part of the credit not covered by collateral will be smaller, and thus also the potential loss for banks. The limit to the LTV ratio also reduces the effect of a property price correction on borrowers' wealth net of loans, as it limits the share of the property's value that is financed by credit.

In terms of measures based on borrowers' income, risk indicators reflect mortgage credit growth (R1) and the household credit-to-GDP ratio (R2 and R3). The sharp growth of the household credit-to-GDP ratio may indicate that banks are granting too much credit, which, in the event of risk materialisation, contributes to higher credit default rates for the banking sector. Resilience indicators (R4 and R5) in this segment correspond to the DTI (debt-to-income) and DSTI ratios using aggregate values. These measure the total indebtedness level of households relative to their income and the weight of borrowers' debt service on income. The lower the value of these ratios, the more the effects of a significant reduction in income and/or an increase in the monthly instalment costs will tend to be mitigated, i.e. the greater the resilience. The macroprudential policy indicator (P2) in this segment is the limit imposed on the DSTI ratio for new mortgage credit, as the approach does not include consumer credit considerations. When the macroprudential authority sets a limit on another indicator related to the borrower's income, such as the DTI ratio, the latter is converted, under certain assumptions, into a limit to the DSTI ratio for new mortgage credit. Similarly, the imposition of a limit to the maximum maturity of a mortgage loan may be converted into a limit to the DSTI ratio, under certain assumptions, and therefore the limit to the maturity also has an impact on this analysis through the P2 indicator.

To take the importance of residual systemic risk in the residential real estate sector into account, it is weighted by indicators that quantify its relevance in the context of financial stability (*Systemic importance*). These indicators reflect domestic housing investment-to-GDP (S1), amplifying or reducing the contagion effect of residual systemic risk to the real economy, and the bank exposure to the residential real estate sector (S2) and construction (S3) in relation to capital, reflecting the sector's importance and the underlying risks to the banking sector.

Table 1 • Indicators used to assess the macroprudential policy stance

Collateral value	Borrower income	Systemic importance
V1 Three-year (annualised) rate of change in house prices	R1 Three-year (annualised) rate of change in mortgage credit	S1 Housing investment-to-GDP ratio
V2 Deviation of house prices from the long-term trend	R2 Mortgage credit-to-GDP ratio	S2 Bank exposure to RRE in relation to capital
V3 Deviation of the price-to-income ratio from the long-term trend	R3 Deviation of the mortgage credit-to-GDP ratio from the long-term trend	S3 Bank exposure to construction in relation to capital
V4 Deviation of the price-to-rent ratio from the long-term trend	R4 HH sector DTI	
V5 Average LTV new business (observed)	R5 HH sector DSTI	
P1 LTV (limit)	P2 DSTI (limit)	

Source: ESRB (2021). | Notes: Risk, resilience and policy indicators are broken down into two segments related to: the amount of credit in relation to the value of collateral and the amount of credit expenses in relation to the borrower's income. Blue denotes risk indicators, green denotes resilience indicators, red denotes risk amplification indicators and orange denotes macroprudential policy indicators. The (observed) average LTV ratio of new business represents the average value of the ratio of the total amount of new mortgage credit agreements secured by immovable property to the value of the property pledged as collateral. The DTI ratio is the ratio of the total amount of loans granted to households to their disposable income. The DSTI ratio is the ratio of household debt service to their disposable income and is obtained similarly to Drehmann, Illes, Juselius and Santos (2015). Limits to the LTV and DSTI ratios refer to limits imposed by macroprudential authorities and are set on the basis of new credit agreements. The LTV ratio is the ratio of the total amount of credit agreements secured by immovable property to the value of the property pledged as collateral, and the DSTI ratio is the ratio of the total amount of monthly instalments of a borrower's total debt to their monthly income. When the macroprudential authority imposes a limit on another indicator related to the borrower's income, such as the DTI ratio, the latter is converted, under certain assumptions, into a limit to the DSTI ratio for new mortgage credit.

Risk, resilience, macroprudential policy and systemic importance indicators are classified on scale of levels. In particular, risk, resilience and systemic importance indicators are clustered into four levels: low, medium, elevated or high risk; low, reduced, medium or high resilience, and limited, medium, elevated or high systemic importance. The higher levels correspond to a higher bucket score of risk, resilience and systemic importance respectively, as described in ESRB (2021). These were attributed considering (i) model-based evidence, (ii) the historical distribution of indicators and (iii) informed discretion, which is a frequent strategy in risk assessments of the residential real estate sector. Macroprudential policy indicators are classified into seven levels, with zero being assigned when no macroprudential measure is implemented. The other six levels of policy indicators, which reflect a tightening of macroprudential policy, are set out based on informed discretion, as this quantification is still a topic under research.

Impact of the Recommendation on the macroprudential policy stance with regard to risks in the residential real estate sector

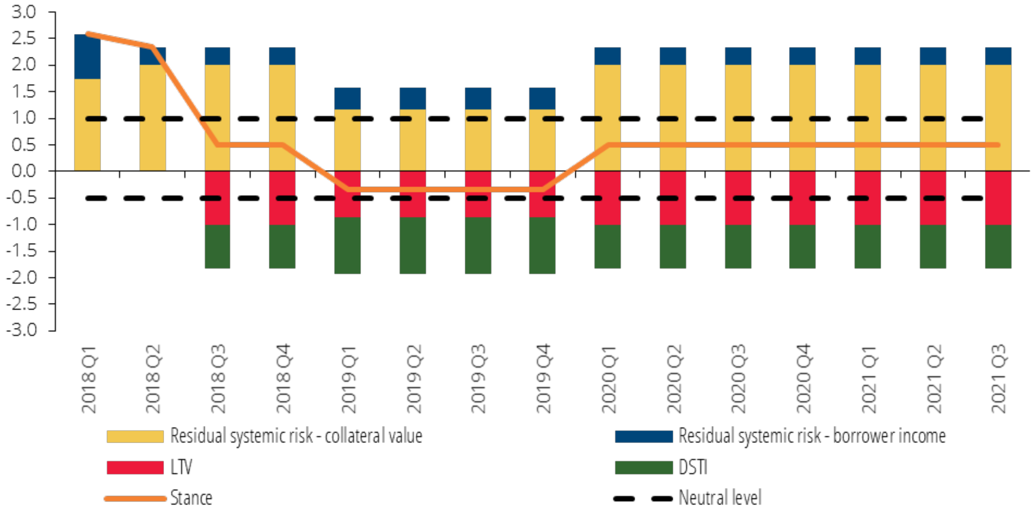
One contribution from this methodology is the introduction of the macroprudential policy effect into risk and resilience analyses, which allows for an assessment of the need to introduce new measures in addition to those already in place. In Portugal the Recommendation, applicable since July 2018, introduced a set of limits to several indicators with the purpose of increasing the resilience of the financial system and promoting borrowers' access to sustainable financing. In the context of the assessment of the macroprudential policy stance associated with measures targeting credit standards for house purchase, the following limits were considered for macroprudential policy indicators: 90% limit to the LTV ratio based on the minimum between the purchase value and the appraisal value of the immovable property pledged as collateral (credit for the purchase of own and permanent residence, a segment accounting for over 85% of total new credit for house purchase) and 50% limit to the DSTI ratio, which considers a shock to both the interest rate and income, where applicable. Since the indicator considered in the methodology presented above does not incorporate shocks into the interest rate and/or income in the calculation of the DSTI ratio, it was necessary to define a correspondence between the 50% limit and the limit to the DSTI ratio actually borne by the borrower. In addition, the DSTI ratio considered in the approach only considers credit for house purchase, which differs from the DSTI ratio in the Recommendation, covering the borrower's total debt. For this purpose, a standard credit agreement exclusively for house purchase with a 40-year maturity (corresponding to the maximum maturity limit set out in the Recommendation) and a variable interest rate was considered. This standard credit agreement also considers a reference rate of -0.3%, a fixed spread for the lifetime of the agreement equal to 2.3 p.p., which correspond to the values observed at the time of implementation of the Recommendation. An interest rate shock was also considered through a 3 p.p. increase in the reference rate (set out by the Recommendation for agreements with a maturity of over 10 years). The limit to the DSTI ratio actually borne by the borrower resulting from considering the 50% limit to the DSTI ratio of this standard credit is 31%, i.e. the value used in this methodology to obtain the policy indicator effect of the borrower's income segment.[2]

The effect of the implementation of the Recommendation triggered a change in the macroprudential policy stance from a classification of 'accommodative' in the first half of 2018 to 'neutral' from the third quarter of 2018 onwards (Chart 1). This effect is constant and occurs immediately after the introduction of the measure. It is also indicative of the impact of the Recommendation on neutralising residual systemic risk in the residential real estate sector. In addition, over the time period under review, residual systemic risk was always above the neutral level, confirming the need for a macroprudential policy measure. The collateral value segment contributed the most to a higher level of residual systemic risk than desirable to fulfil the objective of promoting financial stability (neutral level). This is due to the fact that house prices are growing at a faster pace than income and rent growth (indicating potential house price overvaluation). The contribution of the income-based segment was relatively small and mainly due to the impact of household indebtedness.

The change in the stance is comparable with the effect of the Recommendation on borrowers' risk profiles presented in Chart 2.13 of this Report, where the "high risk" profile went from 32% in the third quarter of 2018 to 17% in the fourth quarter of 2018, remaining constant at 3% since 2020. This impact on the improvement of the borrower's risk profile is evident in the distributions of the LTV and DSTI ratios for new loans to households (Charts 2.1 and 2.3 of this Report respectively) with the compression of the shares of credit granted with an LTV ratio above 90% and a DSTI ratio above 50% (with interest rate and income shocks). In particular, the improvement in the distribution of the actual DSTI ratio is seen in the reduction in the average value of the actual DSTI, from 29.6% in the third quarter of 2018 to 25.4% in 2021, as well as in the decline in the dispersion of the distribution with a major contribution from the reduction in the 90th percentile from 49.3% in the third quarter of 2018 to 40.4% in 2021 (Chart 2.4 of this Report).

2 Choosing this credit agreement to set out the limit to the actual DSTI ratio was based on the example presented in the Recommendation's communication document and illustrates the conditions prevailing at the date of implementation of the Recommendation. However, the actual DSTI ratio resulting from this standard credit agreement is not sensitive to the consideration of more recent values for the reference rate and spread.

Chart 1 • Macroprudential policy stance



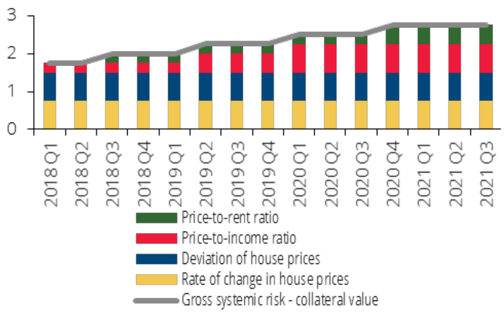
Sources: Banco de Portugal ,ECB, ESRB (2021) and OECD. | Note: Residual systemic risk in each segment (collateral value and borrower income) corresponds to the difference between gross systemic risk and resilience weighted by the share of each segment and already taking into account the effect of systemic importance. Neutral range corresponds to the neutral level of residual systemic risk as defined in ESRB (2021); residual systemic risk values after considering macroprudential policy above the neutral level imply an accommodative macroprudential policy stance, while values below the neutral level indicate a tight macroprudential policy stance. The LTV ratio represents the effect of the 90% limit imposed by the Recommendation to the ratio of the total amount of new credit agreements secured by immovable property to the minimum between the purchase value and the appraisal value of the immovable property pledged as collateral. The DSTI ratio represents the effect of the 50% limit imposed by the Recommendation to the ratio of the total amount of monthly instalments to the borrower's monthly income less taxes and compulsory social security contributions of a credit agreement exclusively for house purchase with a maturity of 40 years, a variable interest rate, -0.3% reference rate and fixed spread for the lifetime of the agreement at 2.3 p.p., calculated taking into account a 3 p.p. increase in the reference rate for agreements with a maturity of over 10 years.

The Special issue "The impact of the macroprudential Recommendation on borrower indebtedness and on the characteristics of credit agreements for house purchase" provides evidence that the introduction of the limit to the LTV ratio was effective in reducing the indebtedness of households constrained by the measure, given that it helped them borrow less (relative to their income), as well as purchase property at lower prices. According to this Special issue, following the introduction of the Recommendation, the 90% limit to the LTV ratio led to a 6 p.p. reduction in the share of credit for house purchase granted with an LTV ratio of 100% or more. The pandemic crisis, which began in the first quarter of 2020, did not change the assessment of the macroprudential policy stance, partly due to the positive contribution of support measures, namely the moratoria applied to loans and support for the maintenance of employment and income, which dampened risk materialisation. The effect of the Recommendation also contributed to the maintenance of the assessment of the macroprudential policy stance. This made it possible to mitigate, in the risk-resilience environment, the impact of the continued increase in house prices, which is reflected in the level of residual systemic risk of the collateral segment as early as the first quarter of 2020 and persists even in the pandemic crisis period. This increase and acceleration in house prices during a period of stress contrasts with previous crisis periods, when prices were corrected.

Developments in residual systemic risk in the collateral segment, before considering systemic importance, were always on the upside, with measures of property price overvaluation making an increasingly higher contribution (Chart 2). Between the first quarter of 2018 and the third quarter of 2021 both the indicator of changes in house prices and the indicator of the deviation of prices from their long-term trend are classified with the maximum risk value assigned by the approach, i.e. high risk. The indicator of overvaluation of prices compared to income indicates a moderate level of risk during 2018, elevated risk since the second quarter of 2019 and high risk since the first quarter of 2020, highlighting the persistence of house price growth compared to income growth. Among the risk indicators in this segment, only the indicator of overvaluation of house prices compared to rents remains at risk levels below high over the entire period, becoming elevated in the fourth quarter of 2020. This analysis is consistent with the information presented in the December 2021 *Financial Stability Report*, which signals some signs of overvaluation in the residential real estate market since 2018, in a context of low interest rates. The resilience of this segment, measured by the average LTV ratio observed in new business, is classified as low over the entire period, as it remained above 75%. This classification translates into a zero contribution to the mitigation of gross systemic risk, with residual systemic risk defined only by gross.

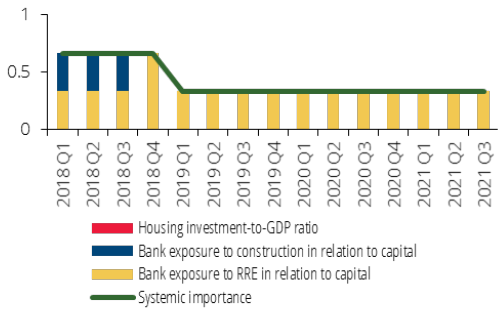
From 2019 onwards the systemic importance of the residential real estate sector decreased (Chart 3) owing to a reduction in bank exposure to construction in relation to capital. As noted above, systemic importance is considered by classifying three indicators using a scale of levels. This scale comprises the levels of limited, medium, elevated or high systemic importance, with the classification of 'limited systemic importance' implying that the amplification channel of systemic risk represented by that indicator is not relevant. The reduction in bank exposure to construction in relation to capital led this indicator to move from 'medium systemic importance' in the first three quarters of 2018 to 'limited systemic importance' from the fourth quarter of 2018 to the third quarter of 2021. This means that, according to this methodology, an increase in residual systemic risk in the residential real estate sector has a smaller impact on the financial system and the economy owing to the reduction in bank exposure to the construction sector. During the period under review, according to this approach, domestic investment in housing as a percentage of GDP did not contribute to the amplification of the Portuguese residential real estate market's residual systemic risk, remaining at the 'limited systemic importance' level. The temporary change in the classification of bank exposure to the residential real estate sector in relation to capital in the fourth quarter of 2018 from 'medium systemic importance' to 'high systemic importance' was due to a significant increase in loans for house purchase that put the indicator slightly above the threshold of the new classification. However, since then, it remains in the 'medium systemic importance' classification and is currently the only relevant channel of amplification of residual systemic risk in the residential real estate sector under this methodology.

Chart 2 • Breakdown of the gross systemic risk component based on collateral



Sources: Banco de Portugal, ECB,, ESRB (2021) and OECD. | Note: The values of each component correspond to the risk level assigned to each indicator multiplied by its weight in the gross systemic risk measure (simple average of the four indicators).

Chart 3 • Developments in the systemic importance of the residential real estate sector

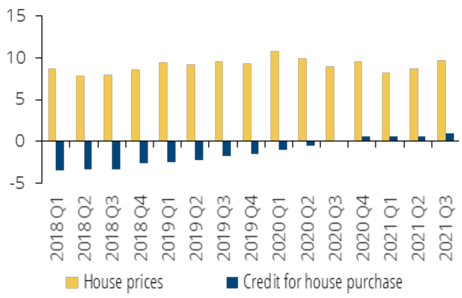


Sources: ECB and ESRB (2021). | Note: The values of each component correspond to the systemic importance level assigned to each indicator multiplied by its weight in the systemic important risk measure (simple average of the three indicators).

The persistent increase in real estate prices since the beginning of 2018 has taken place alongside a recovery in the granting of credit for house purchase, although the latter has had much lower rates of change than in house prices, which were progressively less negative between 2018 and early 2020 (Chart 4). Residential real estate prices increased and credit for house purchase recovered amid historically low interest rates and after a period of low construction activity that resulted in housing supply shortages (*Financial Stability Report*, December 2021). However, transactions for house purchase financed through credit granted in Portugal, affected by the limits imposed by the Recommendation, remained relatively constant since 2014 at around 40-45% (*Financial Stability Report*, December 2021). This implies that the recovery of credit granted in Portugal has not been the main driver of persistent house price growth.

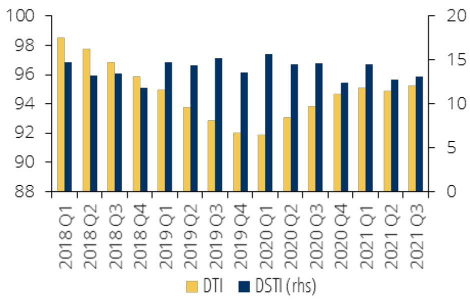
Chart 5 illustrates resilience in the borrower income segment, as measured by households' debt service and debt-to-disposable income ratios. In the context of the pandemic crisis, household debt increased and, at the same time, disposable income declined, resulting in the interruption of the deleveraging process observed since 2018. By contrast, the debt service ratio remained relatively constant throughout the whole period under review, as a result of the maintenance of interest rates at historically low levels.

Chart 4 • Three-year (annualised) rate of change in house prices and credit for house purchase | Per cent



Sources: Banco de Portugal and ECB.

Chart 5 • Resilience | Per cent



Sources: Banco de Portugal and ECB | Note: The DTI ratio is the ratio of the total amount of loans granted to households to their disposable income. The DSTI ratio is the ratio of household debt service to their disposable income and is obtained similarly to Drehmann, Illes, Juselius and Santos (2015).

Final considerations

This Special issue presented the concept of stance applied to macroprudential policy and analysed, using an indicator-based methodology, the contribution of the Recommendation to achieving the level of residual systemic risk that serves the objective of promoting financial stability.

In the period under review, residual systemic risk originating in the residential real estate sector was always above the neutral level set out by the macroprudential authority, confirming the need to implement a macroprudential policy measure. The implementation of the Recommendation in the third quarter of 2018 triggered a change in the macroprudential policy stance from accommodative to neutral.

According to this methodology, the introduction of the Recommendation is assessed to have been effective in promoting the resilience of the financial system and borrowers to risks originating in the residential real estate sector, by targeting credit standards, as residual risk – after its consideration – falls within the range set as the objective of financial stability.

However, the methodology has a number of limitations that are worth highlighting. First, it does not make it possible to consider other macroprudential measures, such as capital measures, which may also have an impact on the risk assessment of the residential real estate sector and the of the resilience of institutions. Second, for considering only two policy indicators, it disregards other complementary measures, such as introducing regular payment requirements or considering the borrower's total debt (housing and consumption) to set out the limit to the DSTI ratio, as is the case of the Recommendation in Portugal. Third, by classifying indicators into levels, it does not allow further developments within the thresholds to be mirrored in the risk-resilience assessment. For example, in Portugal risk indicators related to house price developments are already at the last level of risk since the start of the analysis, i.e. further increases are to be categorised at the same level of risk and not as a further increase in risk. Fourth, by considering only the average LTV ratio of new business, and not the distribution of the ratio, it does not make it possible to identify the different levels of resilience, specifically those associated with the distribution's tails. Finally, this methodology also reflects the inherent difficulties in quantifying the overvaluation/undervaluation of residential real estate prices, namely the role of non-residents.

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