

## THE IMPACT OF CREDIT STANDARDS ON THE QUALITY OF LENDING TO NON-FINANCIAL CORPORATIONS

The role that the over-indebtedness of the non-financial private sector played in triggering previous financial crises<sup>1</sup> has spurred the development of a broad set of macroprudential tools. Notable among these is the countercyclical capital buffer, which is a releasable capital requirement that strengthens the solvency of credit institutions in boom periods, enabling them to absorb potential losses in crisis situations. But there are also macroprudential tools that strengthen the solvency of the borrowers themselves and tighten credit standards for loans to these segments.

In this regard, the link between house prices and lending in the run-up to the global financial crisis has focused attention on mortgage debt as a key determinant of systemic vulnerabilities.<sup>2</sup> Previous research has revealed that the easing of mortgage lending standards significantly drove up mortgage volumes prior to the global financial crisis, leaving many households highly vulnerable, and that this easing was strongly associated with the severity of the crisis.<sup>3</sup>

In terms of prudential policies, borrower-based measures (BBMs) such as caps on credit standards are increasingly being used as macroprudential tools to mitigate systemic risk arising from mortgage lending. Recent literature has shown that mortgage BBMs can significantly reduce the probability of mortgage defaults<sup>4</sup> and contain unsustainable growth in credit and house prices.<sup>5</sup>

This box investigates the relationship between credit standards for lending to non-financial corporations (NFCs) and default risk. This issue has received less attention, which is particularly striking given the substantial imbalances observed in corporate credit before the global financial crisis and the high non-performing loan ratios in the corporate sector during the crisis.<sup>6</sup>

This new analysis also provides guidance on how BBMs could be used in the corporate sector, just as they are used in the mortgage market, to boost borrower resilience and mitigate cyclical vulnerabilities.<sup>7</sup>

### The relationship between credit standards at origination and defaults in NFC lending

The analysis<sup>8</sup> uses individual data on corporate credit granted in Spain in the period 2000-2020, that is, over more than one complete credit cycle. Specifically, the data cover almost 11 million loans in this period, combining data from the Central Credit Register (CCR) with balance sheet information for firms reporting to the Central Balance Sheet Data Office (CBSO), both of which are Banco de España databases.

New bank loans granted to NFCs are identified and monitored over time to check whether they enter into default during the period analysed. In addition, measures of firms' indebtedness at loan origination are built. The

- 
- 1 Moritz Schularick and Alan M. Taylor. (2012). "Credit Booms Gone Bust: Monetary Policy, Leverage Cycles, and Financial Crises, 1870-2008". *American Economic Review*, Vol. 102(2), pp. 1029-1061; Stijn Claessens, M. Ayhan Kose and Marco E. Terrones. (2012). "How do business and financial cycles interact?". *Journal of International Economics*, Vol. 87, pp. 178-190.
  - 2 Oscar Jordà, Moritz Schularick and Alan M. Taylor. (2016). "The great mortgaging: housing finance, crises and business cycles". *Economic Policy*, Vol. 31, pp. 107-152; Gerhard Rünstler and Marente Vlekke. (2017). "Business, housing, and credit cycles". *Journal of Applied Econometrics*, Vol. 33, pp. 212-226.
  - 3 John V. Duca, John Muellbauer and Anthony Murphy. (2010). "Housing markets and the financial crisis of 2007-2009: Lessons for the future". *Journal of Financial Stability*, Vol. 6, pp. 203-217; Thomas Schelkle. (2018). "Mortgage Default during the U.S. Mortgage Crisis". *Journal of Money, Credit and Banking*, Vol. 50, pp. 1101-1137.
  - 4 Jorge E. Galán and Matías Lamas. (2023). "Beyond the LTV Ratio: Lending Standards, Regulatory Arbitrage, and Mortgage Default". *Journal of Money, Credit and Banking*, 13041.
  - 5 Stijn Claessens, Swati R. Ghosh and Roxana Mihet. (2013). "Macro-prudential policies to mitigate financial system vulnerabilities". *Journal of International Money and Finance*, Vol. 39, pp. 153-185; Eugenio Cerutti, Stijn Claessens and Luc Laeven. (2017). "The use and effectiveness of macroprudential policies: New evidence". *Journal of Financial Stability*, Vol. 28, pp. 203-224.
  - 6 Ángel Estrada and Jesús Saurina. (2016). "Spanish boom-bust and macroprudential policy". *Financial Stability Review - Banco de España*, 30, pp. 35-61.
  - 7 For a discussion on this issue, see Eoin O'Brien and Ellen Ryan. (2017). "Motivating the Use of Different Macro-prudential Instruments: The Countercyclical Capital Buffer vs. Borrower-Based Measures". *Economic Letter Series*, No. 15. Central Bank of Ireland; Nicholas Apergis, Ahmet F. Aysan and Yassine Bakkar. (2022). "Borrower- and lender-based macroprudential policies: What works best against bank systemic risk?". *Journal of International Financial Markets, Institutions and Money*, Vol. 80, 101648.
  - 8 For more details, see Luis Fernández Lafuerza and Jorge E. Galán. (2024). "Should macroprudential policy target corporate lending? Evidence from credit standards and defaults". Documentos de Trabajo, 2413, Banco de España.

## THE IMPACT OF CREDIT STANDARDS ON THE QUALITY OF LENDING TO NON-FINANCIAL CORPORATIONS (cont'd)

Chart 1  
Impact of DTA ratio on probability of default

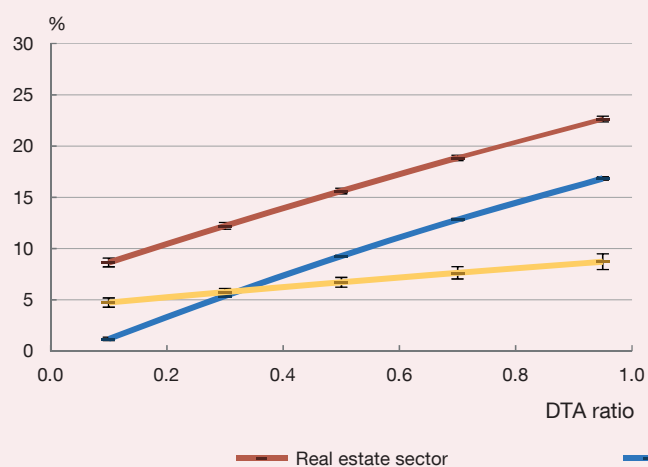
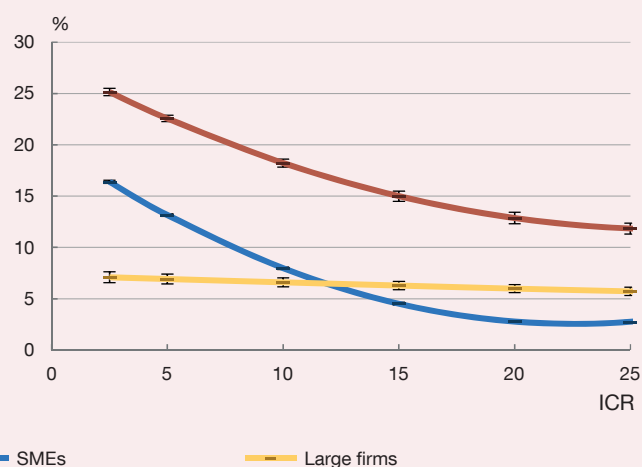


Chart 2  
Impact of ICR on probability of default



SOURCE: Banco de España.

a The models used to estimate the probability of default include a linear term and a quadratic term in the standard considered (DTA ratio or ICR), a variable for negative income in the case of the ICR, in addition to controls for firm size (the logarithm of the firm's assets), liquidity (liquid assets to liquid liabilities), profitability (ROE), age, firm-level average interest rate, indicators of loan collateral and of whether the firm belongs to a business group, as well as fixed effects for bank, postcode, year and business sector (two-digit Spanish National Classification of Economic Activities (CNAE) codes). The error bars, which are scarcely visible, denote two standard errors.

analysis focuses on the debt-to-assets (DTA) ratio, which measures the level of a firm's debt to its total assets, and the interest coverage ratio (ICR), which indicates how many times a firm's earnings (EBITDA) could cover the interest payments on its outstanding debt.<sup>9</sup> Foreseeably, the higher a firm's DTA ratio and the lower its ICR, the worse its credit quality.

Credit to NFCs is divided into three sub-sectors: construction and real estate companies (RE), small and medium-sized enterprises in other sectors (SMEs) and large firms in other sectors. This approach aligns with that of previous studies, which highlight the benefits of conducting separate analyses by firm size and key sub-sector.<sup>10</sup> The RE sector is one such

sector, having played a decisive role during the global financial crisis in Spain.

The relationship between credit standards at origination and defaults is assessed using a linear probability model,<sup>11</sup> which includes a range of firm and loan-level controls and fixed effects.

The results show that credit standards at origination are closely associated with future defaults, especially in the case of RE firms and SMEs (see Charts 1 and 2). In these results, it should be borne in mind that the estimated probabilities are relatively high given that defaults are monitored over an extensive period.

9 Debt is calculated as the sum of a firm's bank exposures in the CCR and its non-bank debt reported in the CBSO. The profit measure used is gross operating profit, as defined in Banco de España Circular 5/2021 of 22 December 2021. The effects of a firm's debt-to-income and financial costs-to-income ratios are also studied. The conclusions are similar to those obtained for the ICR ratio.

10 Kartsen Müller and Emil Verner. (2023). "Credit Allocation and Macroeconomic Fluctuations". *The Review of Economic Studies*, rdad112; Lara Cathcart, Alfonso Dufour, Ludovico Rossi and Simone Varotto. (2020). "The differential impact of leverage on the default risk of small and large firms". *Journal of Corporate Finance*, Vol. 60, 101541.

11 The models used to estimate the probability of default include as explanatory variables a linear term and a quadratic term in the standard considered, a variable for negative income in the case of the ICR, in addition to controls for firm size, liquidity, profitability, age, average interest rate, indicators of loan collateral and of whether the firm belongs to a business group, as well as fixed effects for bank, postcode, year and business sector (two-digit Spanish National Classification of Economic Activities (CNAE) codes).

**THE IMPACT OF CREDIT STANDARDS ON THE QUALITY OF LENDING TO NON-FINANCIAL CORPORATIONS (cont'd)**

In particular, highly leveraged RE firms have high probabilities of default, which can be as high as 23% for firms with a DTA ratio of 0.95. This is around 14 pp higher than the probability of default for RE firms with low leverage (DTA ratio = 0.1). The association between default and the ICR is also quite strong. RE firms with high interest coverage (ICR = 25) have a probability of default of around 12%, compared with 25% for firms with low coverage at loan origination (ICR = 2.5).

For SMEs, the estimated probabilities are somewhat lower than for RE firms. However, the sensitivity of default to a deterioration in credit standards is greater. Indeed, SMEs' probability of default increases from 1.2% for those with low DTA ratios (0.1) to around 17% for those with very high DTA ratios (0.95). Additionally, while for SMEs with a high ICR (25) at loan origination the probability of default is less than 3%, this probability rises to more than 16% for firms with a low ICR (2.5).

In the case of large firms, the probability of default associated with the different DTA ratio and ICR values is considerably lower than for other types of firms, although it is still significant given their size and the higher volume of credit granted per customer. The DTA ratio is a much more informative indicator of these firms' default risk than the ICR. Indeed, the default rate increases from 5% for firms with a low leverage ratio (DTA ratio = 0.1) to 9% for highly leveraged firms (DTA ratio = 0.95). Nonetheless, the relationship between the probability of default and the ICR is also negative and statistically significant.

**The age of the firm, the existence of previous banking relationships and the position in the financial cycle also have a bearing on the probability of default**

The study also finds that the relationship between credit standards at loan origination and default risk varies depending on whether or not there is a previous bank-firm relationship and the firm's age. In particular, it finds that the effect of credit standards is weaker for young firms. In other words, having worse credit standards (a higher DTA ratio or lower ICR) increases the risk of default less for young firms than for more mature ones.

There are several possible reasons for these findings. First, banks may apply stricter selection processes to these firms, which could mean that, at the time of loan origination, banks' assessments may have prioritised other risk factors not considered in the study over financial ratios. Moreover, the decision to finance younger firms may be more influenced by future growth prospects, another variable not covered in the study. The influence of age is particularly strong for SMEs and RE firms, but very weak for large ones. This suggests that the relevance of credit standards for predicting defaults is less age-sensitive in larger firms, possibly due to the higher average age of large firms and the lower range of variation in this variable among them.

As regards the bank-firm relationship, the results show that the association between credit standards and default risk is weaker in firms with new banking relationships. In particular, for firms establishing a new banking relationship, the association between the DTA ratio and the risk of default is weaker by around 45% for RE firms, 51% for SMEs and 54% for large firms. In the case of the ICR, this association is 54% lower for RE firms, 59% lower for SMEs and 28% lower for large firms. As in the case of age, one of the reasons behind these outcomes may be related to the stricter selection processes faced by firms establishing a new banking relationship.<sup>12</sup>

Regarding the financial cycle, the results indicate a stronger association between credit standards and default risk during periods of high credit growth than during periods of low or moderate growth. This suggests that, during phases of rapid credit expansion, easing credit standards may be related to banks' higher risk appetite, highlighting the importance of implementing limits on credit standards.

**Implications for macroprudential policy and the current situation**

The results described above support the use of BBMs as an effective tool to reduce corporate credit default risk and bolster financial stability during adverse events, similarly to the way they are used in lending to households.<sup>13</sup>

12 Allen N. Berger and Gregory F. Udell. (1995). "Relationship Lending and Lines of Credit in Small Firm Finance". *The Journal of Business*, Vol. 68, No 3, pp. 351-381.

13 Eugenio Cerutti, Stijn Claessens and Luc Laeven. (2017). "The use and effectiveness of macroprudential policies: New evidence". *Journal of Financial Stability*, Vol. 28, pp. 203-224; Ozge Akinci and Jane Olmstead-Rumsey. (2018). "How effective are macroprudential policies? An empirical investigation". *Journal of Financial Intermediation*, Vol. 33, pp. 33-57.

## THE IMPACT OF CREDIT STANDARDS ON THE QUALITY OF LENDING TO NON-FINANCIAL CORPORATIONS (cont'd)

Chart 3  
Share of loans with DTA ratio > 0.95 (a)

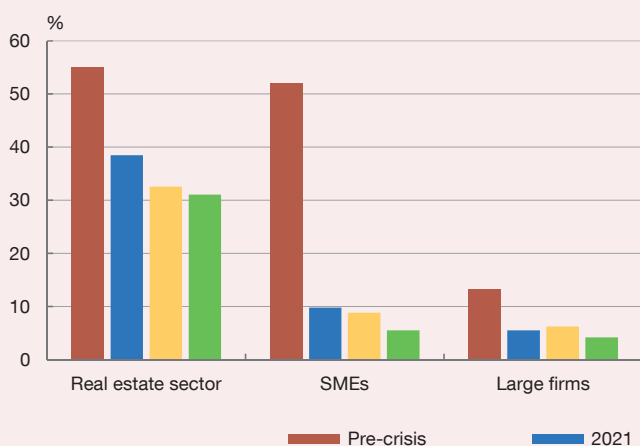
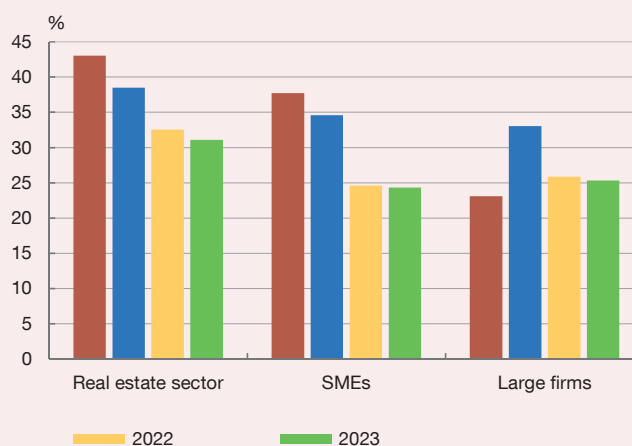


Chart 4  
Share of loans with ICR < 2.5 (b)



SOURCE: Banco de España.

- a Share of new loans with a DTA ratio at origination of more than 0.95. Assets are assessed at the end of the year prior to loan origination. Bank debt data from the CCR are linked with non-bank debt and assets data from the CBSO. The pre-crisis figure is the average of 2000-2008.
- b Share of new loans with an ICR at origination of less than 2.5. The ratio is assessed at the end of the year prior to loan origination. The ICR is calculated as gross operating profit divided by interest expense, based on CBSO data for the sample linked to the CCR. The pre-crisis figure is the average of 2000-2008.

However, these findings also suggest that the design of these tools should take into account the specificities of corporate credit. This includes identifying key systemic sectors, such as real estate activities, and distinguishing by firm size, age and new banking relationships. In addition, the position in the financial cycle and the health of firms play a critical role in the calibration of these policies, to prevent credit constraints from adversely affecting solvent firms whose liquidity has been squeezed during financial stress events.

From a regulatory perspective, it is important to note that Spain's macroprudential framework is more advanced than that of some other European countries. In particular, current legislation already allows, where

necessary, for the introduction of limits on credit standards for NFCs.<sup>14</sup>

In this respect, a comparison of recent credit standards with those in place before the global financial crisis (see Charts 3 and 4) shows that the share of loans with a very high DTA ratio and a very low ICR has remained relatively stable in recent years and very far removed from the figures observed before the global financial crisis. This is particularly noticeable in the RE sector and among SMEs, for which credit standards were excessively relaxed during those years.

While there is currently no noticeable decline in corporate credit standards, this new set of indicators is crucial for regularly monitoring and assessing banks' prudence in NFC lending.

<sup>14</sup> Banco de España *Circular 5/2021* of 22 December.