CORPORATE CREDIT QUALITY DURING THE HEALTH CRISIS AND THE RECENT MONETARY TIGHTENING CYCLE

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Abstract

This article analyses corporate credit quality in Spain at the sectoral level during two key episodes: the health crisis triggered by the COVID-19 pandemic and the monetary tightening that began in summer 2022 in the euro area. During the health crisis, stage 2 loans increased significantly. A small part of that rise later eased as interest rates began to climb. The impact of the health crisis on non-performing loans was much lower, partly because of the measures implemented to mitigate its effect, particularly loans backed by the Official Credit Institute. It can be seen that sectoral activity is closely correlated with credit quality. This relationship was more relevant during the health crisis than during the monetary tightening period. Indeed, the decline in sales was a key factor behind the deterioration in corporate credit quality (especially in the case of stage 2 loans) during the pandemic. However, during the subsequent recovery other factors played a larger role.

Keywords: credit quality, lending to non-financial corporations, health crisis, monetary tightening, sectors of activity.

1 Introduction

In recent years, the Spanish economy (and, in particular, its business sector) has faced considerable challenges. It first had to contend with the fallout from the health crisis triggered by the COVID-19 pandemic in 2020, followed by a sharp tightening of the European Central Bank's (ECB) monetary policy for the Eurosystem from mid-2022 onward (which was prompted by a surge in inflation that began in 2021 and became particularly acute with the energy crisis of 2022). Although these are two distinct episodes, they are both characterised by a combination of significant supply and demand shocks. However, they were both accompanied by extensive economic support measures to mitigate their effects. This article analyses sectoral developments in corporate credit quality during both episodes (the health crisis and the monetary tightening period), focusing on the ratios of the two main types of troubled loans: stage 2 loans[1] and non-performing loans (NPLs).[2]

First, the health crisis led to the adoption of extraordinary measures (a lockdown followed by social distancing rules) which significantly affected turnover in certain sectors. Subsequently,

1 In accordance with Annex 9 of Banco de España Circular 4/2017, a loan is classified as stage 2 if its credit risk has increased significantly since initial recognition, but it is not in default. The increase in these loans' credit risk demands closer monitoring by banks.

2 In accordance with Annex 9 of Banco de España Circular 4/2017, a loan is classified as non-performing if it is in default and its recovery is highly uncertain. This includes amounts past-due by more than 90 days, as well as those for which it is considered unlikely that the debtor will be able to meet its obligations without resorting to the collateral.

the episode of monetary tightening drove up costs for a broad set of sectors to varying degrees, not only via the debt burden, but also through higher energy prices, which contributed to the inflationary episode and the associated rise in interest rates. Whether through lower revenues or rising costs, both episodes affected firms' ability to repay loans, potentially leading to a deterioration in the credit quality of such loans. For the pandemic period, although the state of alert was declared on 14 March 2020, the consequences of the health crisis in terms of the classification of corporate loans as NPLs or stage 2 were felt with a certain time lag, due to accounting policies. In fact, in June 2020 NPL and stage 2 ratios were lower than in March. Thus, the period considered for the first episode is the two years from June 2020 to June 2022. Similarly, in the monetary tightening episode June 2022 is chosen as the starting point for the two-year period (which runs until June 2024), even though market rates had already been reflecting policy rate hike expectations since the start of the year. Again, it is considered that a certain period of time was needed for these increases to affect loan classification.

Thus, as analysed in recent *Financial Stability Reports,*[3] the health crisis and the support measures implemented had a very significant impact on the aggregate quality of corporate credit, significantly increasing credit classified as stage 2 (by over 90% between June 2020 and June 2022), but not that classified as non-performing, which, in fact, continued to decline, albeit less sharply than in previous years (-13% in that period). Meanwhile, developments during the monetary tightening episode aimed at curbing the inflationary pick-up differed: while stage 2 credit fell by 18% between June 2022 and June 2024, once the post-pandemic economic recovery took hold, the downward trajectory of NPLs moderated once again (-7% in that period).

This article builds on that analysis, breaking down lending to non-financial corporations (NFCs) by sector. To this end, it uses individual loan data from the Banco de España's Central Credit Register (CCR) and matches them with sector-level data from the tax authorities.[4] This results in a database with credit information (performing, stage 2 and non-performing) by bank and sector.

The first part of the article describes the relative importance of the various corporate sectors, together with lending and troubled loan developments by sector during both episodes. Based on this analysis, in both the health crisis and the monetary tightening episode there are indications of a close relationship between developments in sectoral activity, as measured by sales, and credit quality. This hypothesis is cross-checked in the second part of this article through an econometric analysis.

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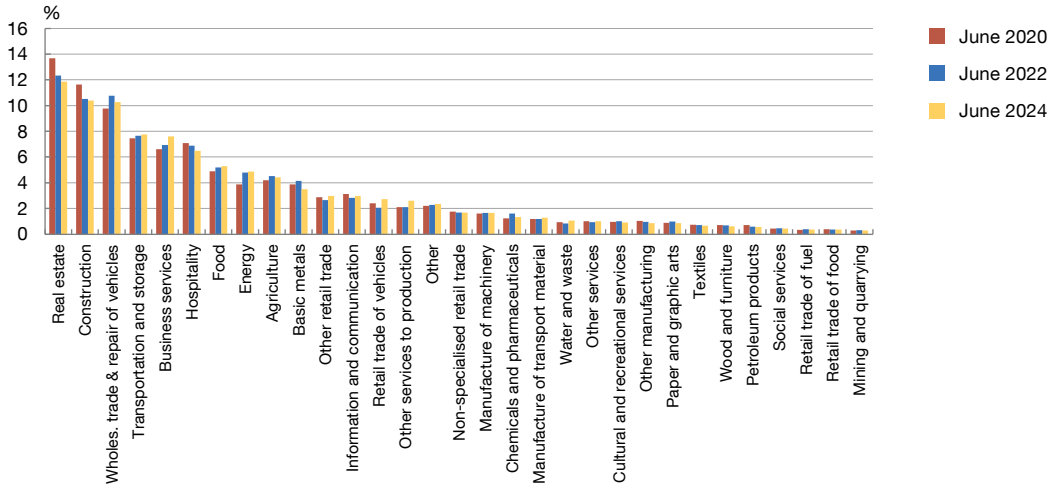
3 See, for example, Chart 2.3 of the Autumn 2021 *Financial Stability Report,* Chart 2.3 of the Autumn 2022 *Financial Stability Report,* Chart 2.4 of the Spring 2023 *Financial Stability Report* or Chart 2.3 of the Autumn 2024 *Financial Stability Report.*

4 To provide a more comprehensive picture, in the first charts the 29 sectors from the tax authorities' data are supplemented by two more (energy and other) for which the CCR provides information, totalling 31 sectors. However, given that there is no information for those two additional sectors in the tax authorities' data, most of the article focuses on the original 29 sectors.

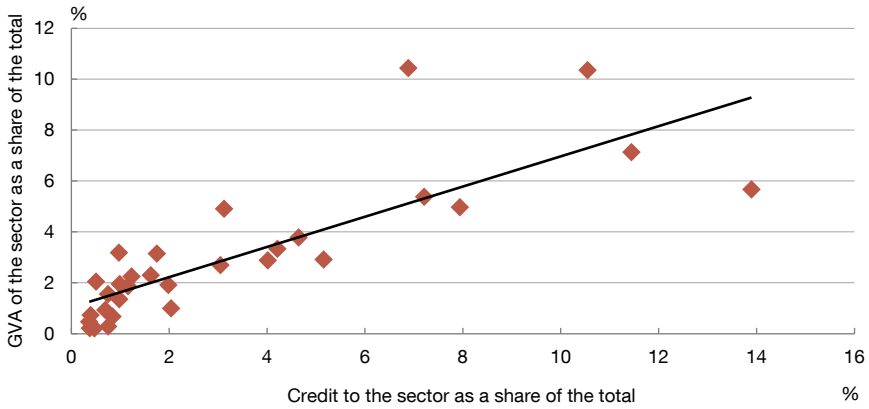
Chart 1

The relative importance of the various sectors in terms of their share in total credit to non-financial corporations did not change significantly during the health crisis or the monetary tightening period

1.a Credit share by sector



1.b Relationship between sectoral credit and GVA as a share of their respective totals (a)



SOURCES: Banco de España and INE.

a The GVA and credit share data refer to December 2021, the latest date for which the National Statistics Institute provides GVA data with the sectoral breakdown used in this article. In any event, the same relationship can be seen for earlier dates.

2 Sector-by-sector analysis of the volume and quality of corporate credit

The 31 non-financial business sectors that this article focuses on are defined based on the tax authorities' sectoral sales information.[5] A breakdown of the volume of credit to each sector provides an initial overview of the sectoral composition of the business sector in Spain in June 2024. First, credit is concentrated in a small number of sectors (Chart 1.a).[6] Despite their

5 This information can be found here.

6 In any event, it should be borne in mind that the scope of each sector and its share in total lending is ultimately determined by the tax authorities' definition of the sectors. Therefore, it cannot be concluded that this sectoral credit concentration implies a high concentration of risk by sector.

significant decline since the global financial crisis, the real estate and construction sectors account for more than 22% of total lending to NFCs. If wholesale trade and repair of vehicles, transportation and storage, business services and hospitality are added, these six sectors account for 54.3% of total lending to NFCs. The following nine sectors represent 31.7%, meaning that the remaining 16 sectors account for only 14% of lending.

As Chart 1.a shows, the relative importance of the sectors did not change significantly during the health crisis or the episode of monetary tightening in response to higher inflation. The biggest change is the aforementioned decline in the shares accounted for by the first two sectors (real estate and construction), due to the correction of the considerable over-indebtedness accumulated by these sectors before the global financial crisis. Their combined decrease between June 2020 and June 2024 was 3 percentage points (pp), which were picked up by several sectors, most notably business services and energy. It was precisely the latter sector that triggered the inflationary spike in 2021 through the surge in energy prices. However, higher energy prices are a cross-cutting factor affecting a broad set of corporate sectors to varying degrees. This shock came on top of the higher debt burden caused by rising interest rates, leading to a deterioration in firms' financial position during this period.

Chart 1.b shows that, for most sectors, credit and gross value added (GVA) as a share of their respective totals are highly correlated. However, certain sectors (such as real estate activities, construction, transportation and storage, food and hospitality) account for a smaller share of GVA than of credit. Conversely, the opposite is true for some sectors (mostly tertiary sectors linked to services, such as business, social or other services): they account for a greater share of GVA than of credit.

Once the various sectors' relative importance in terms of bank lending has been established, Chart 2 shows how troubled loans have changed during the health crisis and monetary policy tightening episodes. The pandemic had a significant impact on the stage 2 ratio, which increased between June 2020 and June 2022 across all sectors except energy (Chart 2, left-hand panel). And this was not a small rise: it averaged 5.7 pp, with a median increase of 5.1 pp. The stage 2 ratio rose by over 20 pp in the hospitality sector and by over 15 pp in the cultural and recreational services and textile sectors.

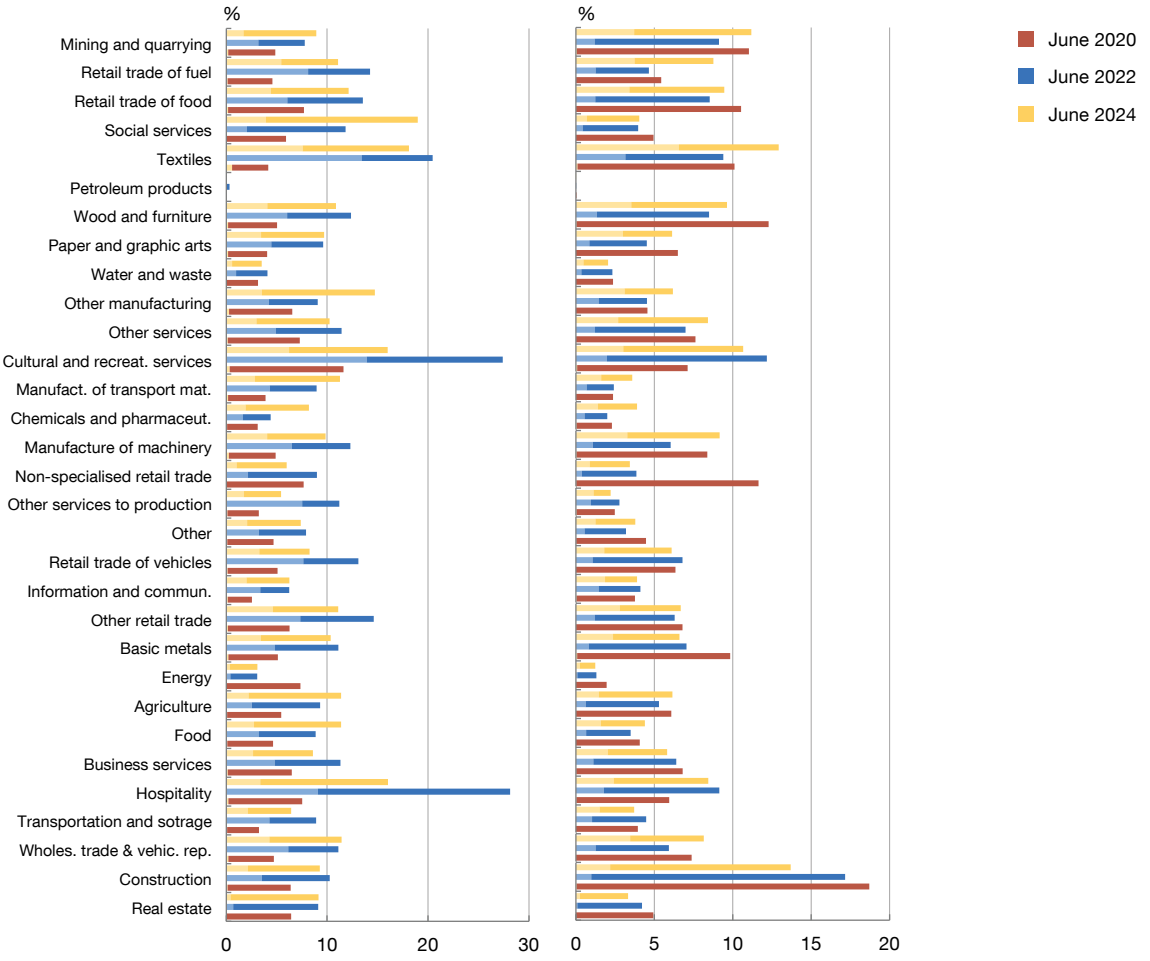
Some of this increase was corrected in the following two years, coinciding with the period of rising interest rates. Thus, the stage 2 ratio declined between June 2022 and June 2024 for 19 of the 31 sectors, although by markedly less than it had previously risen, with an average decrease of 1.2 pp and a median decrease of 0.8 pp. The largest declines were seen in the hospitality and cultural and recreational sectors, where the ratio fell by over 12 pp and 11 pp respectively.

The impact of the health crisis on non-financial corporations' NPL ratio was much smaller. This ratio had been steadily declining from its peak in late 2013. With the outbreak of the pandemic, the decline did not come to a halt, although it slowed down. By sector, the NPL ratio fell during the health crisis for 24 of the 31 sectors and increased by less than 1 pp for

Chart 2

Stage 2 ratios increased notably during the health crisis, although these rises have partially reversed in recent years. By contrast, NPL ratios continued to decline in general, although they increased for some of the sectors most affected by the health crisis

2.a Stage 2 ratio (left-hand panel) and NPL ratio (right-hand panel), by sector (a)



SOURCE: Banco de España.

a For each date, the contribution of ICO-backed loans to each sector's ratio is shown in a lighter shade. The stage 2 and NPL ratios of the petroleum sector are positive but very low (below 0.4%, which is too low to be seen clearly in the chart).

five of them, but it rose considerably in the hospitality sector (by more than 3 pp) and the cultural and recreational services sector (by more than 5 pp) (Chart 2, right-hand panel).

During the monetary tightening episode, although the NPL ratio continued to decline for NFCs overall, the evidence by sector is more heterogeneous. Indeed, the ratio increased for 17 sectors and decreased for the other 14. A certain pattern emerges from the chart: the ratio decreased in the sectors accounting for a larger share of credit and increased in those accounting for a smaller share. Thus, the ratio declined for five of the six main sectors (which account for more than 54% of lending), while it increased for 12 of the 16 smallest sectors in

terms of lending (which account for just 14% of the total). As for the nine intermediate sectors, the ratio increased for four and decreased for five.

One of the key objectives of the measures implemented during the health crisis was to prevent firms from being forced to shut down or permanently reduce their workforce where, in the absence of the pandemic, they would be viable in the medium term. To this end, several State guarantee facilities were approved for firms and the self-employed (loans backed by the Official Credit Institute, ICO by its Spanish acronym)[7] so that they could access financing to cover the liquidity needs stemming from the restrictions on activity and mobility adopted to combat the pandemic.

Thus, Chart 2 also shows the contribution of ICO-backed loans[8] to the stage 2 and NPL ratios. In all three periods, the two sectors with the highest percentage of stage 2 and non-performing ICO-backed loans are the cultural and recreational services and textile sectors. As shown below, these two sectors are among those most affected by the health crisis in terms of activity. Behind these two sectors, hospitality (a sector significantly affected by the health crisis) is that with the highest stage 2 and non-performing ratios for its ICO-backed loans.

It should be noted that ICO-backed loans were not the only measure implemented by the economic authorities, which responded to the health crisis with a wide range of monetary and fiscal policy instruments. First, since the early stages of the pandemic, the ECB adopted a very accommodative monetary policy, accompanied by a number of expansionary measures, including new longer-term refinancing operations (LTROs) and a special asset purchase programme aimed at providing sufficient liquidity to the financial system and preventing a tightening of the economy's financing conditions.[9]

The fiscal policy response focused on strengthening the healthcare system, protecting employment and supporting vulnerable households, and providing liquidity to firms. The support measures for both employment and income in the case of vulnerable households included greater flexibility in temporary layoffs and short-time work arrangements and a waiver of the corresponding social security contributions, a special unemployment subsidy for temporary workers and domestic help and easier access to benefits for cessation of activity by the self-employed. Lastly, a moratorium on corporate tax debts and several credit moratoria for households were approved.[10]

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7 Royal Decree-Law 8/2020 of 17 March 2020 approved a State guarantee facility of up to €100 billion, while Royal Decree-Law 25/2020 of 3 July 2020 activated a second guarantee facility, essentially to cover investment-related financing needs for a maximum amount of €40 billion. See, for example, Box 2.1 of Banco de España (2021a).

8 For an analysis of the effectiveness of ICO-backed loans in Spain during the pandemic, see Jiménez, Laeven, Martínez-Miera and Peydró (2023) or Martín, Mayordomo and Vanasco (2025).

9 The package approved at the regular meeting of the Governing Council of 12 March was based on three measures: additional longer-term refinancing operations (LTROs), the application of more favourable terms to targeted longer-term refinancing operations (TLTRO III), and additional net asset purchases under the asset purchase programme of €120 billion until the end of the year. Meanwhile, the extraordinary measures adopted by the Governing Council on 18 March included a new asset purchase programme (the pandemic emergency purchase programme) targeting both private and public-sector securities with a very large overall envelope, of €750 billion. For more details, see, for example, Box 1.1 of Banco de España (2020b).

10 For more details, see, for example, Section 5 of Banco de España (2020a).

Most European countries adopted similar fiscal policies, enacting fiscal packages with many common elements.[11] According to the ECB's *Financial Stability Review,*[12] Spain rolled out the largest package among EU countries as a percentage of GDP, amounting to 14.5%, a percentage slightly higher than those for France (14.2%), Italy (13.7%) and the Netherlands (13.2%), and clearly above the figure for Germany (8.2%).

To analyse the impact of the health crisis on the Spanish business sector, firms were divided into three groups based on their fall in turnover in 2020. This classification has been used in various Banco de España publications (such as the *Financial Stability Report).*[13] Based on this classification,[14] Chart 3.a shows stage 2 loan and total credit developments (i.e. the numerator and denominator, respectively, of the stage 2 ratio) for the three sector groups.

First, it shows the notable impact of the pandemic on the volume of stage 2 loans, which grew across every single sector. It also highlights that the extent of the impact varies according to the above-mentioned classification. The sectors most affected by the pandemic (i.e. those with a sales decline exceeding 15% in 2020), shown in red, saw the highest increases in stage 2 loans, which more than doubled during the pandemic period across all these sectors, with increases exceeding 100%. These sectors are followed by the moderately affected sectors (i.e. those which saw a fall in sales of between 8% and 15%), shown in blue. Lastly, the least affected sectors (i.e. those with a sales decline of less than 8%), shown in yellow, experienced the smallest increases. Meanwhile, developments in the denominator of the ratio (credit) were mixed, as increases were recorded for 13 sectors and decreases for the remaining 16 sectors. In any event, even in sectors where the denominator increased, this increase was not sufficient to avoid an increase in the stage 2 ratio.

In the following period (the interest rate hike period), the situation was partially reversed. Stage 2 loans decreased across most sectors (21), although this drop was much smaller than the increase during the pandemic. With the exception of non-specialised retail trade, the sectors recording the highest reductions as the health situation improved were those most affected by the pandemic, reflecting the time elapsed since the lifting of the mobility restrictions. These were followed by the moderately affected sectors and, behind them, the least affected sectors, seven of which saw an increase in stage 2 loans in the last two years. As will be analysed in detail below, this sectoral improvement in stage 2 loans is closely related to the

11 See, for example, Alonso, Buesa, Moreno, Párraga and Viani (2021) or Cuadro-Sáez, López-Vicente, Párraga Rodríguez and Viani (2020).

12 See the special feature in the November 2020 *Financial Stability Review.*

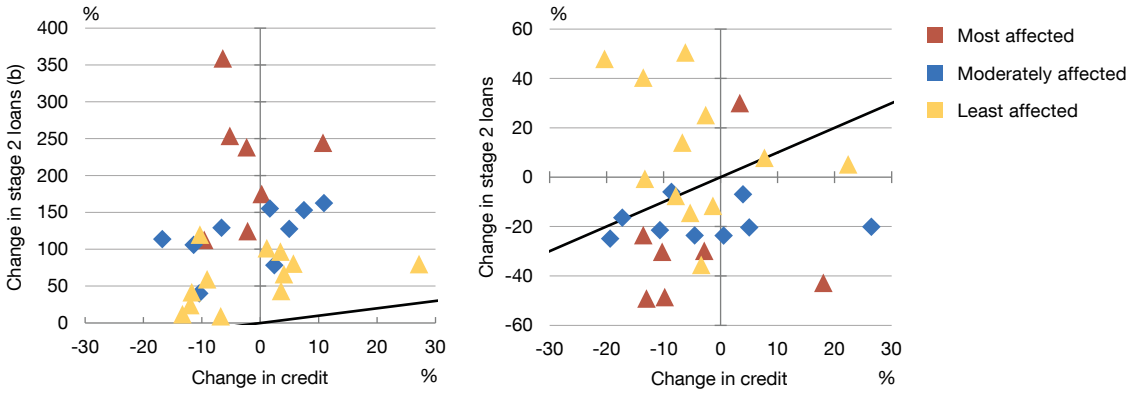
13 See, for example, Chart 1.7 of Banco de España (2021b).

14 The most affected sectors are those whose sales fell by 15% or more in 2020 (transportation and storage, hospitality, other services to production, manufacture of transport equipment, cultural and recreational services, manufacture of textiles, petroleum products and retail trade of automotive fuel); the moderately affected sectors are those that recorded a fall of between 8% and 15% (wholesale trade and repair of motor vehicles, business services, basic metals, other retail trade, retail trade of vehicles, manufacture of machinery, other services, paper and graphic arts and wood and furniture) and the least affected are those recording a fall of less than 8% (real estate activities, manufacture of foods, beverages and tobacco, agriculture, forestry and fishing, information and communication, non-specialised retail trade, chemicals and pharmaceuticals, water supply and waste management, other manufacturing industries and social services). The tax authorities do not have sales data for the energy sector or for the sector defined as "other". Therefore, in Chart 3 the number of sectors is reduced from 31 to 29.

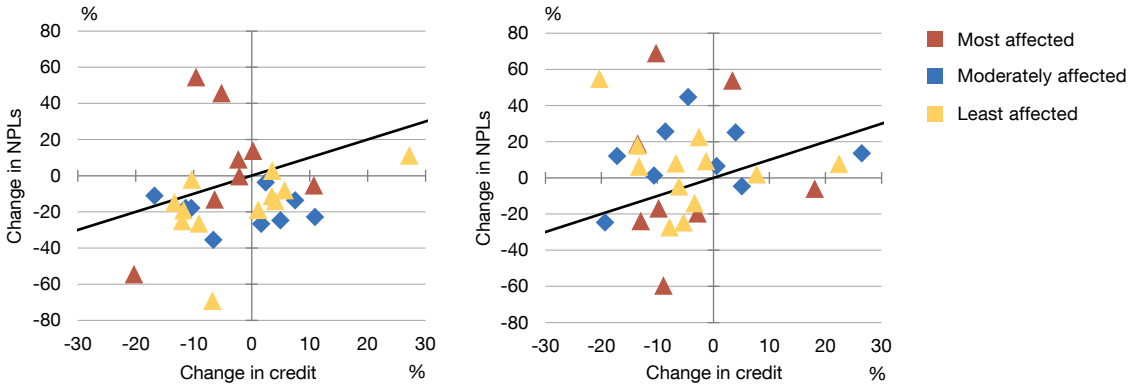
Chart 3

The sectors most affected by the pandemic in terms of sales decline were those whose credit quality worsened the most, with a particularly sharp increase in the proportion of stage 2 loans. This relationship is not as strong for NPLs

3.a Relationship between the change in credit and the change in stage 2 loans (2020-22, left-hand panel, and 2022-24, right-hand panel) (a)



3.b Relationship between the change in credit and the change in NPLs (2020-22, left-hand panel, and 2022-24, right-hand panel) (c)



SOURCES: AEAT and Banco de España.

a A dot above the diagonal line indicates that stage 2 loan increases (decreases) during the period were higher (lower) than total credit increases (decreases), meaning that the stage 2 rate increased in the period considered. The opposite is true for dots below the diagonal line.
b For improved readability, the exceptionally high growth in stage 2 credit to the petroleum sector during the pandemic (of over 700%) has been excluded from the chart. It should be noted that stage 2 credit for this sector at the outset was very low, helping to explain such a high growth rate. Meanwhile, NPLs for this sector fell by over 50%, indicating that reclassifications from NPLs to stage 2 loans also explain the increase in the latter category.
c A dot above the diagonal line indicates that NPL increases (decreases) during the period were higher (lower) than total credit increases (decreases), meaning that the NPL ratio increased in the period considered. The opposite is true for dots below the diagonal line.

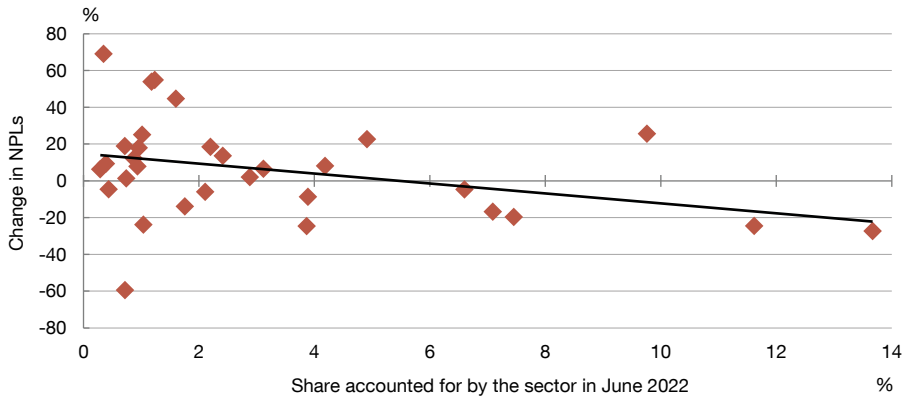
recovery of sales in the different sectors. Total credit declined for most sectors, pushing up stage 2 ratios in those sectors where stage 2 loans increased most.

Chart 3.b shows that the pandemic had a milder impact on NPLs, although it should be noted that the previous widespread declines in this variable slowed down. NPLs rose in only six sectors, with the largest increases occurring – unsurprisingly – in those most affected by the pandemic-related sales drop. There was little difference between the moderately and least affected sectors, with NPLs decreasing in both cases.

Chart 4

For the monetary tightening period, sector size and NPL developments are somewhat correlated

4.a Relationship between sector size (a) and change in the NPL ratio. Monetary tightening period



SOURCE: Banco de España.

a As in the subsequent econometric analysis, size is measured by the logarithm of aggregate credit to the sector.

During the subsequent period of rising interest rates, total credit fell for most sectors, as mentioned above, while NPL developments were mixed, with some sectors recording increases and others decreases. In this second period, the classification according to the impact of the pandemic on sales proves less useful, given that the sectors most affected, moderately affected and least affected by the pandemic saw both NPL increases and decreases, with no specific pattern. Conversely, NPL developments seem to be related to the size of the sector, given that NPLs declined in the larger sectors, but increased in the smaller ones (see Chart 4). As shown in Chart 1, the sectors accounting for the largest share of Spanish banks' portfolios are the services, real estate and construction sectors. These sectors are therefore particularly sensitive to the lifting of restrictions in the post-pandemic period, which helped improve their NPL ratio to a greater extent.

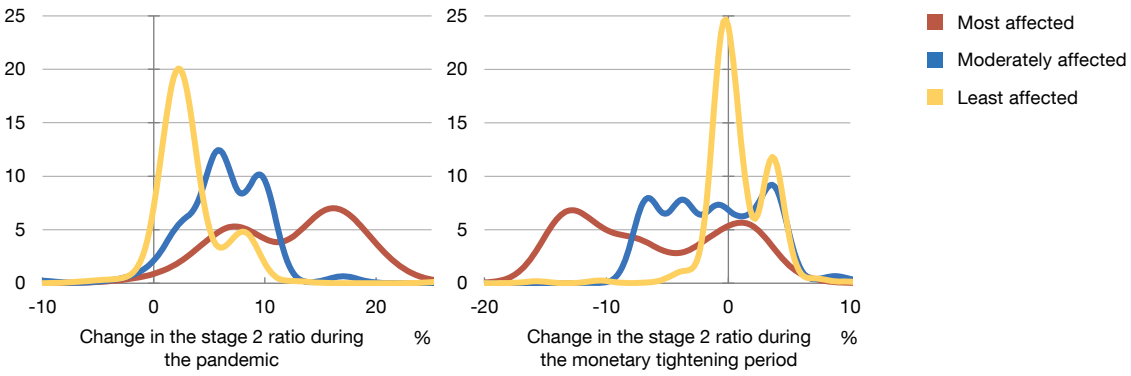
It is also important to analyse the degree of heterogeneity in the cross-bank distribution of the change in the stage 2 and NPL ratios for exposures to the sectors most and least affected by the pandemic. Chart 5.a shows that the increase in the stage 2 ratio during the pandemic was more homogeneous across banks for the least affected sectors, a little less for the moderately affected sectors and more heterogeneous for the most affected sectors, which have a higher dispersion and two more defined peaks around two different ratio change values. The reduction of the stage 2 ratio in the subsequent period follows a similar pattern: the change was more heterogeneous for the most affected sectors, with less affected sectors experiencing a smaller drop in the ratio.

These differences in the distribution among banks of the changes in the stage 2 ratio are not mirrored in the NPL ratio, i.e. during the health crisis, both the increase in NPLs in the most

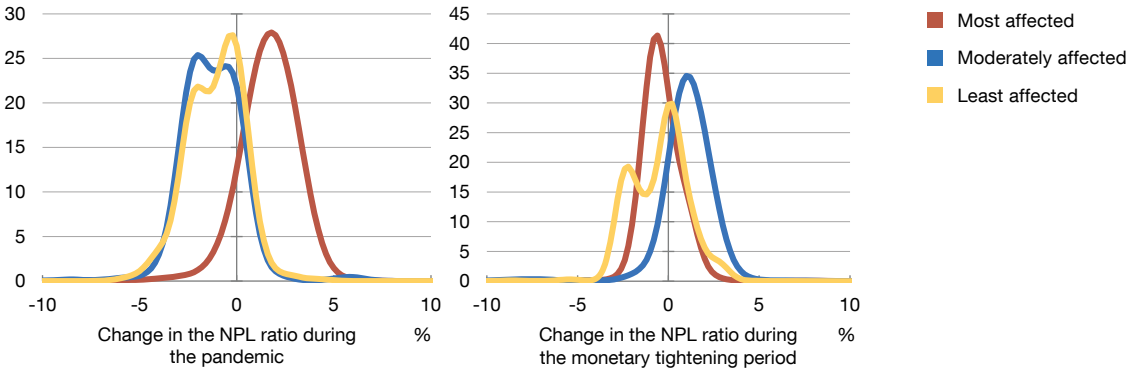
Chart 5

Broadly speaking, the bigger the impact of the pandemic on the sector's sales, the more heterogeneous the stage 2 ratio increase and subsequent decrease in recent years across banks

5.a Distribution of the change in the stage 2 ratio, by bank



5.b Distribution of the change in the NPL ratio, by bank



SOURCES: AEAT and Banco de España.

affected sectors and the decrease in the other sectors were relatively evenly shared across banks. The same is true in the subsequent period of interest rate hikes in terms of rises and falls in the NPL ratio (Chart 5.b). The variation across banks in developments in their stage 2 and NPL ratios (and their correlation with the banks' characteristics) is examined in greater detail in the econometric analysis in the following section.

Lastly, the annex includes two charts summarising this section of the article. These charts not only illustrate the increases in the stage 2 ratio across all sectors during the health crisis and their subsequent partial return to pre-pandemic levels in most sectors, but also how changes in sectoral sales are a common factor that can explain the response of sectoral credit quality in both periods. The following section seeks to examine the observed relationship between changes in sales and sectoral credit quality by using an econometric model that controls for possible additional constraints.

3 Link between sectoral activity developments and credit quality during the health crisis and the monetary tightening period[15]

Using a database constructed by combining individual loan data from the CCR with sectoral sales data from the Spanish tax authorities, it is possible to examine the hypothesised relationship between sectoral activity and sectoral credit quality. Observations of credit quality for sector i in the portfolio of each bank j are used, along with additional controls for each bank j, sector i and the exposure of bank j to sector i. Given the different nature of the two periods being analysed (2020-22 for the pandemic-related health crisis and 2022-24 for the rate hikes owing to inflationary pressures), the following regression is performed for each period (in addition, the regression is conducted for a pre-pandemic period from June 2017 to June 2019 as a control).

$$\Delta y_{ij} = \alpha + \beta \times \text{Change in sales}_i + \gamma \times \text{Bank controls}_j + \delta \times \text{Sector controls}_i + \\ + \theta \times \text{Sectoral}_i \text{ bank}_j \text{ exposure controls} + \varepsilon_{ij}$$

The analysis is conducted for the ten significant institutions, which represent approximately 87% of loans to NFCs in Spain[16] (and which are also the ten largest banks in the sector by asset volume). There are 29 sectors, which means that there are 290 observations for each regression. Summary statistics of the variables used are shown in Table 1. The two dependent variables are the change in the stage 2 ratio and the change in the NPL ratio. Regarding the controls used, the variables are calculated at the beginning of each period analysed to study the potential effect of sector or bank characteristics at the outset of each episode on how the troubled loan ratios perform throughout it. Thus, the analyses of both periods (the health crisis and the monetary tightening episode) are interconnected, as the values of the variables at the outset of the second period reflect the consequences of the first.

Sector controls include the logarithm of lending to the sector as a measure of its size and the debt-to-sales ratio as an approximate indicator of each sector's level of indebtedness. This latter variable would likely also, albeit imperfectly, provide insight into the varying sectoral sensitivity to interest rate rises. Bank controls include return on assets (ROA) and capital and liquidity ratios. In both bank and sector controls, in addition to the change in each bank's lending to each sector,[17] two variables are defined (concentration and specialisation) which could affect troubled loan ratios either directly or via interaction with sales. A bank's concentration in a sector is defined as its share of lending to the sector divided by total loans

15 There have been many attempts to explain banks' credit quality and credit risk in terms of macroeconomic determinants, bank-specific idiosyncratic factors or banking sector-specific characteristics. See Beck, Jakubik and Piloiu (2015), Boyd and Nicoló (2005), Louzis, Vouldis and Metaxas (2012) and Us (2017), among others.

16 86.9% during the health crisis and 86.8% during the monetary tightening period, to be exact.

17 The change in lending also refers to the start of the period, insofar as it includes the accumulation of risks over the previous two years, i.e. the change between June 2018 and June 2020 for the health crisis and between June 2020 and June 2022 for the rate hiking episode.

Table 1
Summary statistics (a)

	Health crisis		Monetary tightening period	
	Average	Standard deviation	Average	Standard deviation
Change in the stage 2 ratio	7.31	7.79	-1.59	7.21
Change in the NPL ratio	-0.93	3.44	0.77	2.65
Change in sales	-12.33	12.40	21.42	14.21
Sector controls				
Logarithm of lending (size)	22.71	1.09	22.68	1.09
Debt-to-sales ratio	0.37	0.38	0.35	0.28
Bank controls				
ROA	0.43	0.15	0.49	0.40
CET1 ratio	13.01	1.54	13.42	1.53
LCR	231.42	71.49	249.79	79.86
Bank and sector controls				
Change in lending to the sector	16.83	56.53	2.49	51.88
Concentration	10.00	9.60	10.00	9.40
Specialisation	3.45	4.36	3.45	4.28

SOURCE: Banco de España.

a The stage 2 ratio is defined as the ratio of loans classified as stage 2 to total lending to the sector. The NPL ratio is defined as the ratio of loans classified as nonperforming to total lending to the sector. ROA is defined as the ratio of net profit to average total assets. The CET1 ratio is defined as the ratio of CET1 capital to riskweighted assets. The debt-to-sales ratio is defined as the ratio of total bank lending to sectoral sales. The LCR is defined as the ratio of a bank's unencumbered liquid assets to potential net liquidity outflows during a 30 calendar-day stress period.

to the sector. A bank's specialisation in a sector is defined as its share of lending to that sector divided by its total loans to NFCs.[18]

The main results of this analysis are shown in Table 2. The change in sales is a significant variable at 1% with the expected economic effect: an increase (decrease) in sales is associated with a decrease (increase) in troubled loan ratios, even when controlling for the other variables regarding sector and bank characteristics. The effect is greater during the health crisis and rate hiking episode than in the control period, indicating that credit quality is more sensitive to the pace of sales growth during periods of instability (health crisis) or sizeable shifts in macro-financial conditions (monetary tightening). Thus, for the health crisis, a decrease (increase) of 1 pp in sales is associated with an increase (decrease) of around 0.4 pp in the stage 2 ratio, while this effect is reduced to 0.3 pp for the NPL ratio in the same period and to just over 0.3 pp for the stage 2 ratio during the monetary tightening episode. These effects are all greater than the impact of a 0.2 pp change in the NPL ratio in the control period. Moreover, it is worth noting that, in the absence of the support measures mentioned in the previous section (especially ICO-backed loans), credit quality would probably have shown greater sensitivity to sales during the health crisis.

18 Using these definitions, the average concentration in both periods is 10%, analysing the ten significant institutions, and the average specialisation is 3.45%, analysing the 29 sectors.

Table 2
Result of the regressions (a)

	Control period (Jun-17 to Jun-19)		Health crisis (Jun-20 to Jun-22)		Monetary tightening period (Jun-22 to Jun-24)	
	Stage 2	NPLs	Stage 2	NPLs	Stage 2	NPLs
Change in sales	-0.061	-0.202***	-0.431***	-0.294***	-0.337***	-0.034
	(0.055)	(0.048)	(0.081)	(0.067)	(0.061)	(0.062)
Change in sales x Concentration	0.032	0.076*	0.037	-0.114	0.028	-0.030
	(0.057)	(0.044)	(0.090)	(0.076)	(0.061)	(0.055)
Change in sales x Specialisation	0.013	-0.228***	-0.154*	-0.001	-0.130	0.008
	(0.025)	(0.037)	(0.091)	(0.075)	(0.086)	(0.088)
Change in sales x CET1 ratio	0.051	0.065	0.069	-0.099	0.039	0.005
	(0.046)	(0.050)	(0.079)	(0.117)	(0.055)	(0.048)
Bank controls						
ROA	-0.133	-0.172***	-0.078	-0.103	-0.011	-0.133***
	(0.097)	(0.041)	(0.055)	(0.081)	(0.043)	(0.048)
CET1 ratio	-0.094*	-0.099	0.099	0.072	-0.171**	-0.213***
	(0.050)	(0.065)	(0.071)	(0.090)	(0.071)	(0.070)
LCR	0.012	-0.295***	0.176**	0.011	-0.150**	0.033
	(0.045)	(0.063)	(0.072)	(0.062)	(0.059)	(0.056)
Bank and sector controls						
Change in lending to the sector	-0.124*	0.133***	-0.052	0.230***	0.078	-0.018
	(0.073)	(0.049)	(0.055)	(0.058)	(0.060)	(0.056)
Concentration	-0.051	-0.048	0.180**	0.119*	-0.036	-0.044
	(0.070)	(0.068)	(0.071)	(0.061)	(0.061)	(0.063)
Specialisation	0.016	0.122	-0.157	-0.067	0.334***	0.150
	(0.069)	(0.097)	(0.096)	(0.086)	(0.092)	(0.115)
Sector controls						
Logarithm of lending (size)	0.061	-0.146	0.179**	0.096	-0.416***	-0.322***
	(0.070)	(0.089)	(0.085)	(0.111)	(0.096)	(0.104)
Debt-to-sales ratio	-0.027	-0.278***	0.087	0.126***	-0.022	-0.091*
	(0.063)	(0.048)	(0.053)	(0.047)	(0.043)	(0.050)
Constant	-0.001	0.027	0.014	—	-0.014	0.001
	(0.058)	(0.048)	(0.052)	(0.054)	(0.055)	(0.057)
Observations	290	290	290	290	290	290
R-squared	0.052	0.357	0.276	0.203	0.195	0.109

SOURCE: Banco de España.

a A single asterisk indicates a level of significance of 10%, two asterisks 5%, and three asterisks 1%. The estimation has been made using the ordinary least squares method and standard errors are robust to heteroscedasticity.

Conversely, sales ceases to be a significant variable for the NPL ratio during the period of monetary tightening, since, although sector sales constitute a relevant factor and a potential indicator of sectoral credit quality, they do not explain everything. In other words, sales revenues, which were highly significant (in particular, their decline) during the health crisis, are less useful as an explanatory factor in the subsequent period of interest rate hikes.

Furthermore, it was verified whether the effect of sales could be intensified or tempered by certain characteristics of banks within each sector (particularly specialisation, concentration and solvency) and, generally speaking, no evidence was found that these characteristics play an amplifying or mitigating role in this effect on credit quality in either of the two periods of interest.[19]

From a theoretical perspective, the relationship between concentration and specialisation is ambiguous: both can be raised at the cost of exposure to a wider range of credit quality among borrowers, but that also offers market power and greater insight, which allows for improved judgement. The regressions conducted in this paper show that concentration proves to be a significant variable during the health crisis, as greater concentration seems to be associated with higher stage 2 and NPL ratios, which would indicate that banks that have captured a larger share of a sector tend to lend to riskier borrowers on average, ultimately resulting in higher stage 2 and NPL ratios. Meanwhile, specialisation has a significant effect during the monetary tightening period in a similar way to concentration, suggesting that banks that are more specialised in a sector also lend to lower quality borrowers within it. In other words, the empirical results of the sample studied do not offer overly conclusive proof, as consistently significant effects are not found for all ratios in all periods. Nonetheless, all significant effects found in terms of specialisation or concentration point either to a greater sensitivity of credit quality to sectoral sales turnover or a deterioration in credit quality, suggesting that such strategies are of limited value in reducing credit risk. This observation should be taken with caution given the limitations of the econometric approach taken.

Another key finding from the econometric analysis is that it confirms the relationship observed between a sector's size and NPL developments during the rate hiking period (Chart 4). This relationship was negative – larger sectors experienced greater reductions in NPLs, while smaller sectors saw larger increases. The same relationship between sector size and developments in credit quality during the monetary tightening episode can be observed for both the NPL and stage 2 ratios. During the health crisis, the opposite was seen for the stage 2 ratio, with a larger increase. As noted above in the descriptive section, the sectors that account for the largest share of Spanish banks' portfolios are those focused on services and real estate and construction activities. Therefore, this size variable, along with changes in sales, is useful in identifying sectors particularly sensitive to the introduction and lifting of restrictions during the health crisis.

The debt-to-sales ratio was significant in the health crisis, correlating positively with the NPL ratio, indicating that sectors in which this leverage metric was higher had a higher NPL ratio. The correlation inverts (though significance drops to 10%) for the monetary tightening episode, which could be explained by the support measures, as sectors with higher debt-to-sales ratios are those receiving larger ICO-backed loans, which have favourable conditions and are mostly fixed rate.[20]

19 The only finding was that specialisation intensified the impact of sales on the stage 2 ratio in the pandemic period, with a 10% level of significance.

20 Similarly, the NPL ratio's negative coefficient in the control period can be explained by construction and real estate activities, the most-leveraged sectors relative to their sales, which saw notable falls in their NPL ratios during the years covered by the control period.

Regarding other controls used, ROA was observed to have a significant and negative effect on the NPL ratio during the monetary tightening period and the control period, suggesting that more profitable banks tend to have lower NPL ratios. Similarly, in general terms (not for all periods and types of troubled assets), there is a significant negative correlation with solvency and liquidity, indicating that banks with a higher common equity tier 1 (CET1) ratio and liquidity coverage ratio (LCR) are associated with better credit quality. This finding spotlights banks' prudence as reflected in solvency, liquidity, and late payment rates, suggesting that each bank's overall policies are consistent in these three areas. Change in lending was also found to have a positive effect on the NPL ratio in the health crisis (and in the control period), consistent with the expansion of credit to less robust borrowers, who are, therefore, more sensitive to shocks.

Finally, two additional robustness exercises were conducted. For the first, the change in the stage 2 ratio during the health crisis is taken as a control for the regressions of the monetary tightening episode. This is intended to reveal whether sectoral credit quality during the monetary tightening episode was driven solely by its performance during the pandemic. The results are quite interesting: a negative and significant coefficient is obtained in the regression of the stage 2 ratio alongside a positive and significant coefficient in the regression of the NPL ratio. This could mean that loans to the sectors that saw the largest increases in the stage 2 ratio during the pandemic recorded a decline in that same ratio in the monetary tightening period, with some loans deteriorating to non-performing status and others being reclassified as performing. However, the decline in sales remains statistically significant (with a negative sign) when the change in the stage 2 ratio is regressed. In the second exercise, interest margin to average total assets is used as a measure of profitability instead of ROA. The main results of the analysis, including the significance and expected sign of the change in sales, are upheld in this exercise. Moreover, the effect of net interest income is generally significant and positive, pointing to the classic risk-return relationship, where achieving higher returns on loans is associated with higher risk.

4 Conclusions

This article examines developments in corporate credit quality at the sectoral level in recent years in Spain. In this time, the corporate sector has faced two serious challenges with differing origins, nature and consequences. The health crisis caused by COVID-19 was followed by a surge in inflation that led to the marked tightening of the Eurosystem's monetary policy. First, it is established that these episodes did not significantly alter the composition of sectoral credit, which has remained relatively stable in recent years. Second, the descriptive analysis indicates a close relationship between change in sector sales and sectoral credit quality. In this regard, it can be concluded that a sector's sales (obtained from the Spanish tax authorities) can be a relevant variable in the estimation of potential impacts on sectoral credit quality in future unforeseen shocks.

This relationship between sales and credit quality was closer during the health crisis than during the monetary tightening period, suggesting that the decline in sales during the pandemic

was a decisive factor behind the deterioration of corporate credit quality, whereas more factors came into play in the latter period. Additionally, the impact of sales was greater on stage 2 loans than on NPLs, which can be partly explained by the fiscal and monetary policy measures implemented to mitigate the pandemic's impact (ICO-backed loans in particular). These relationships are confirmed in the econometric analysis at the end of the article.

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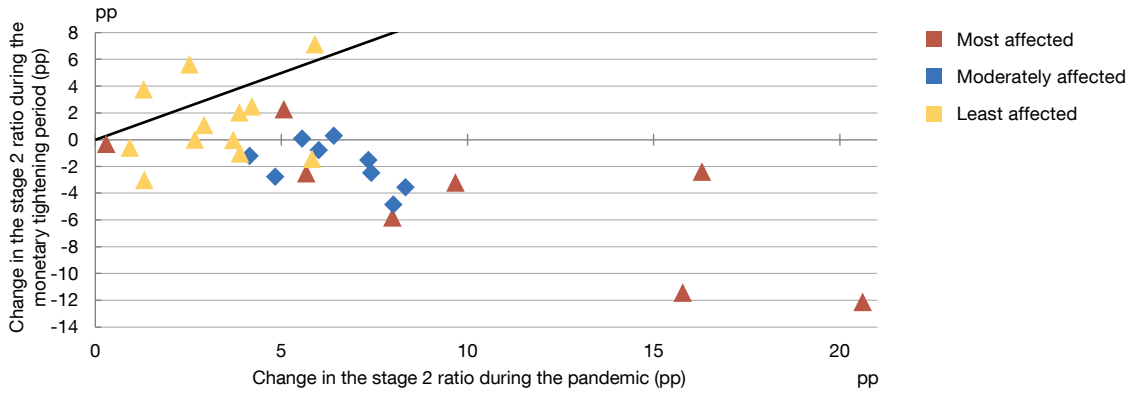
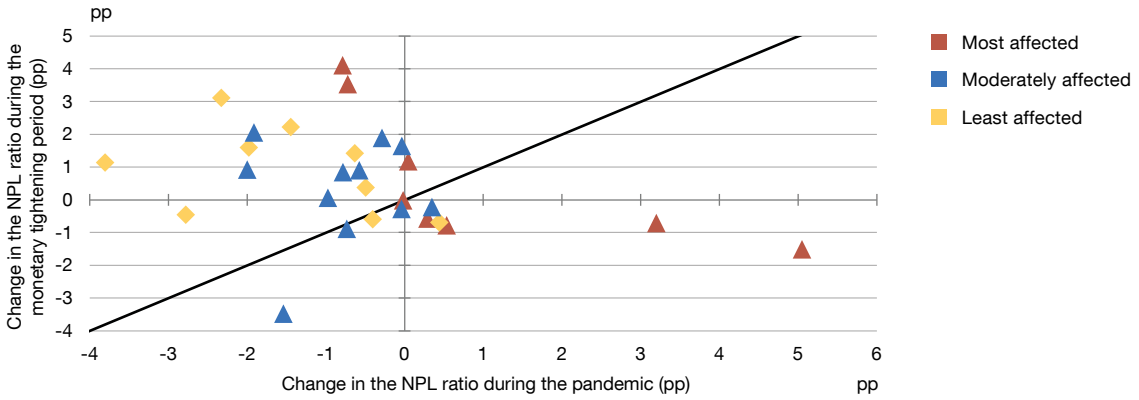
Chart A.1

The sectors most affected by the pandemic in terms of falling sales were, in general, those that saw the greatest rises in stage 2 and NPL ratios, which have still not returned to their pre-pandemic levels

A.1.a Stage 2 ratio during the pandemic and the monetary tightening period (a)



A.1.b NPL ratio during the pandemic and the monetary tightening period (a)



SOURCES: Spanish tax authorities and Banco de España.

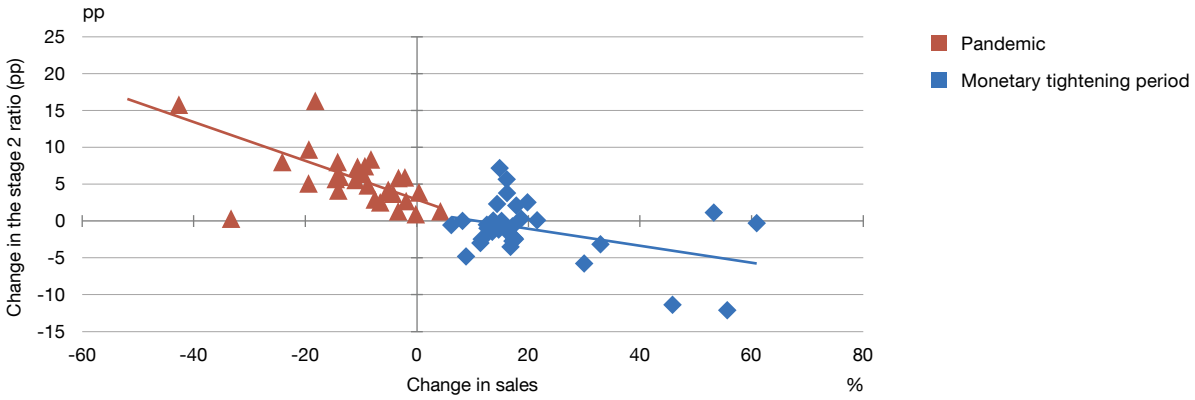
a Points below the diagonal line indicate rises (falls) in the stage 2 and NPL ratios during the pandemic that were higher (lower) than the rises (falls) in the stage 2 an NPL ratios during the monetary tightening period. The opposite is true for points above the diagonal line.

Chart A.1.a shows developments in the stage 2 ratio in both episodes, summarising the evidence set forth in section 2. This ratio rose during the health crisis across all sectors, often significantly so, although these increases were partly unwound during the rate hiking period for most sectors. The link for the NPL ratio, meanwhile, is not as clear-cut, and the falls seen during the pandemic were followed in the rate hiking period by declines in larger sectors and rises in smaller ones (Chart A.1.b).

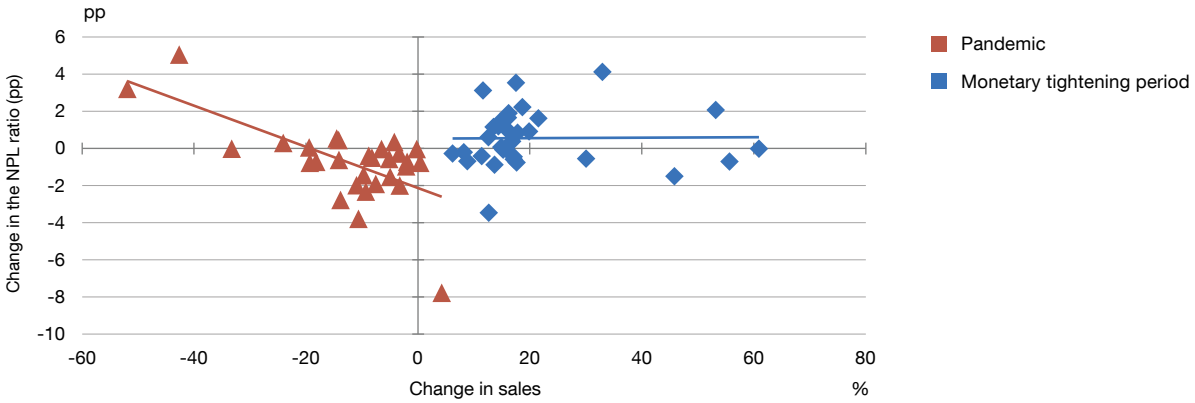
Chart A.2

For both shocks – the pandemic (fall in sales), as well as the subsequent monetary tightening episode (recovery in sales) – there is a close relationship between sales and credit quality in terms of the stage 2 ratio. However, in terms of the NPL ratio, this relationship only holds true during the health crisis

A.2.a Change in the stage 2 ratio and change in sales (a)



A.2.b Change in the NPL ratio and change in sales (a)



SOURCES: Spanish tax authorities and Banco de España.

a The change in the stage 2 and NPL ratios covers the time periods defined in the previous charts, i.e. from June 2020 to June 2022 for the pandemic shock an from June 2022 to June 2024 for the monetary tightening episode. By contrast, that for sales covers the change between 2020 and 2019 for the pandem shock (based on a definition that classifies sectors as most, moderately and least affected) and the change between 2022 and 2021 for the monetary tightenin episode. The reason for this difference between the periods (one year for sales and two for troubled assets) is the delay between the impact on activity and it consequences on borrower defaults.

Within this descriptive analysis, developments in sector sales activity were also identified as a relevant factor behind the response of sectoral credit quality during both periods. Chart A.2 shows that it correlated negatively with the stage 2 ratio in both periods, with larger falls (rises) in sector sales being linked to larger increases (decreases) in the sector's ratio. This same relationship was observed for the NPL ratio during the pandemic period, but not during the rate hiking episode. Section 3 of the article seeks to verify this observed relationship between developments in activity and sectoral credit quality using an econometric model that controls for potential additional factors.

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