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THE IMPACT OF THE AUTUMN 2024 FLASH FLOODS IN SPAIN FROM A FINANCIAL STABILITY STANDPOINT

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THE IMPACT OF THE AUTUMN 2024 FLASH FLOODS IN SPAIN FROM A FINANCIAL STABILITY STANDPOINT

Abstract

This article analyses the impact that the flash floods that occurred in Spain in late October and early November 2024 have had on bank credit to households and firms in the areas affected, primarily in Valencia province. To this end, we first describe the size, composition and quality of the lending exposures in the areas affected at the date of the catastrophe, by matching geolocalisation data (Copernicus) with information from the Banco de España's Central Credit Register and the Cadastre (Ministry of Finance). In addition, we review the academic literature that analyses the economic and financial impact of natural disasters and compile the main public support measures aimed at mitigating the effects of the catastrophe. Against this background, we use panel analysis techniques and exploit granular Central Credit Register information to identify whether credit developments in the affected areas have followed distinct patterns since the flooding. For instance, a few months after the flash floods a statistically significant increase in the stock of loans to households and non-financial corporations was observed. Moreover, non-performing loans saw a moderate increase from December 2024 and there was a temporary uptick in stage 2 loans. As these effects are local and have a limited impact on lending at national level, no signs of systemic risk for the banking sector are identified.

Keywords: flash floods, natural disasters, economic measures, Official Credit Institute, Insurance Compensation Consortium.

1 Introduction

On 29 October 2024, several parts of eastern Spain were hit by a "cut-off low", a meteorological phenomenon that caused severe flash floods, particularly in Valencia province, resulting in a significant loss of life (235 victims)[1] and devastating material damage. This article seeks to provide a comprehensive and detailed view of one very specific dimension of the flash floods: their effect on bank credit in the areas affected, considering also the economic support measures deployed.

Natural disasters give rise to economic losses, as they directly disrupt local economic activity and damage infrastructure, productive assets and housing. Moreover, the uncertainty caused by extreme weather events has an indirect effect on households' and firms' consumption and investment decisions, with an added impact on economic activity (Baker, Bloom and Terry, 2023). As a result of climate change, the frequency and impact of

1 La Moncloa, Latest data from the Spanish Government, 4 April 2025 (in Spanish).

extreme weather events are intensifying (Intergovernmental Panel on Climate Change, 2023), which has prompted greater interest in the study of their economic impact in recent years.

Although events such as flooding usually have a significant economic impact in the short term, the historical evidence suggests that their negative effects on GDP tend to be temporary (Cavallo and Noy, 2011). This is largely attributable to the fiscal stimulus from reconstruction measures and to the increased spending by firms and households on replenishing capital and durable goods. However, if a recovery is to fully materialise, there can be no financial constraints and the aid received must be effective (Usman, González-Torres and Parker, 2024). In this respect, access to credit plays a fundamental role in mitigating the impact of such disasters on the local population (Billings, Gallagher and Ricketts, 2022).

The banking sector's response to such events is key to softening the economic impact and supporting the recovery. In this article, we analyse developments in bank credit to households and non-financial corporations (NFCs) in the affected areas since the flash floods. We also explore the implications of such disasters for financial stability. Their significant local impact underscores the risks they pose if they become more frequent and widespread due to insufficient action on climate change and environmental degradation. In the case at hand, the public support measures deployed have played a crucial role in mitigating the impact, but such interventions would be more costly, and even less feasible from a fiscal standpoint, should these events become more commonplace.

This article is organised as follows. First, we analyse the banking sector's pre-existing exposure to the worst hit areas. We then review the literature examining the impact of natural disasters on different factors of the economy (such as house prices, demand for labour and migration rates), before going on to discuss the public measures deployed to support the areas affected. Lastly, we assess the impact that the flash floods have had on lending to the areas affected and the risk classification of these exposures through a panel study using difference-in-differences (DiD) techniques.

2 The banking system's exposure to the flash floods

2.1 Exposures according to Royal Decree-Law 6/2024

The flash floods have had a significant impact on the economy of the municipalities affected, which account for around 2% of the national total based on various metrics (such as population, employment and business activity). An initial delineation of these areas was established in the annex to Royal Decree-Law (RDL) 6/2024 of 5 November 2024, which contained a list of the municipalities and districts that had suffered flooding, for the most part in Valencia province, except for three located in the provinces of Albacete, Cuenca and Malaga.

By matching the list of postcodes of these municipalities and districts with the information reported by banks to the Banco de España's Central Credit Register (CCR), a first estimate of the banking sector's credit exposure affected by the catastrophe can be calculated.[2] In order to include all potential affected borrowers, a loan is deemed to have been affected by the flash floods when any of them is domiciled in one of the postcodes identified or when a property located in one of the affected areas serves as mortgage collateral for the loan or credit in question.

Under this approach, at end-September 2024 (the last monthly close available before the disaster) the banking sector's exposure to the affected municipalities stood at around €27 billion, of which €17 billion corresponded to households and €10 billion to NFCs. These amounts accounted for 2.6% and 1.7% of total credit at the national level to households and firms, respectively, and for 2.1% of lending to these sectors overall.

As regards these loans to households, 73.7% comprised lending for house purchase (€12.9 billion) and 10.5% were consumer loans. Meanwhile, in terms of firm size, 56% of the credit affected (€5.7 billion) was to small and medium-sized enterprises (SMEs), accounting for 2.5% of total national lending to this sector.

In September 2024, 8.5% of the credit to firms in the affected areas was classified as stage 2,[3] while 5.5% was considered non-performing.[4] In the case of household lending, these figures were 6.4% and 4.3%, respectively. These initial levels of credit quality were somewhat worse than the national averages:[5] in Spain as a whole, 6.8% and 5.9% of credit to firms and households, respectively, was classified as stage 2 in September 2024, while 4.2% and 3.8%, respectively, was classified as non-performing.

2.2 Exposures according to geolocalisation data

Drawing on the Copernicus[6] geolocalisation study of the areas affected, it is possible to analyse the bank exposures affected by the flash floods with greater geographical granularity than when using the postcodes of the municipalities and districts in RDL 6/2024.

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2 For this analysis, the monetary volume of loans granted by any bank operating in Spain is considered.

3 In accordance with Annex 9 of Banco de España Circular 4/2017, a loan transaction is classified as stage 2 if there has been a significant increase in credit risk since initial recognition, but it is not in default. An increase in the credit risk of these loan transactions calls for closer monitoring by banks. Allowances and provisions for impairment shall be made for an amount equal to expected credit losses over the life of the loans. Interest income shall be calculated by applying the effective interest rate to the gross carrying amount.

4 In accordance with Annex 9 of Banco de España Circular 4/2017, a loan transaction is classified as non-performing if it is in default and its recovery is highly uncertain. This includes loans with amounts past-due by more than 90 days, as well as those for which it is considered unlikely that the borrowers will be able to meet their obligations without resort to the collateral. Allowances and provisions shall be made for an amount equal to expected credit losses. Interest income shall be calculated by applying the effective interest rate to the amortised cost (i.e. adjusted for any credit loss allowance) of the financial asset.

5 Using CCR data.

6 Copernicus is the European Union's Earth observation programme which is coordinated by the European Commission and provides information drawing from satellite Earth Observation and in-situ (non-space) data.

This study includes both the flooded areas and those classified as "flood traces" (i.e. the flow paths). The overview map was updated in real time and, for the purposes of our analysis, it was decided to overlap several dates to define the maximum impact area.[7]

Drawing on information from the CCR and the Directorate General for the Cadastre (Ministry of Finance), the real estate collateral associated with bank loans can be geolocalised and thus linked with the Copernicus data to identify the exposures affected. Moreover, the exposure to firms domiciled in the area affected was also analysed.[8]

The exposures thus identified are therefore a sub-set of those identified drawing on the information in RDL 6/2024. First, not all the exposures in each postcode are included, but only those that are within the areas affected according to the Copernicus maps. Second, only information on firms' registered offices was available, meaning that exposures to individuals (including sole proprietors) not secured by real estate collateral are excluded from this part of the study.

In addition, to identify the possible impact of the flash floods beyond the areas that were directly flooded, for the purposes of our study the areas identified in the Copernicus map were extended by a 500-metre radius. These expanded areas still nevertheless capture a sub-set of the total population within each postcode area. Thus, bank customers that may have been affected indirectly due to proximity are included.

Table 1 shows the exposure associated with the directly affected areas at end-September 2024, the month before the disaster. The flash floods directly impacted exposures accounting for 0.3% of total credit to households and firms in Spain, which increases to 1% if the areas affected due to proximity are considered. This percentage is half the proportion of total credit obtained when the postcodes identified in accordance with RDL 6/2024 are considered. Virtually all the exposures affected are in Valencia province, where the flash floods affected 22% of credit to households and firms based on the postcode approach and 7.7% of loans linked to directly flooded areas.

Drawing on the information in Table 1, credit in the directly flooded areas and nearby areas (within 500 metres) accounts for approximately 50% of credit in the municipalities and districts affected, evidencing the systemic importance of the disaster at local level. Therefore, the main method used for most of the rest of this article will be the postcode approach, to make the most comprehensive impact assessment possible of this natural disaster.

2.3 Characteristics of the exposures affected

The CCR and Cadastre information reveals some additional characteristics of the exposures affected by the flash floods and the associated collateral. This section focuses on Valencia province and applies the same geolocalisation criteria as in the previous section.

7 The Copernicus maps of the areas affected by the flash floods are available here.

8 Around 96% of registered offices could be geolocalised; the remaining addresses could not be geolocalised due to formatting issues in the data reported.

Table 1
Affected exposures by province, at September 2024

€m	Albacete	Cuenca	Malaga	Valencia	Total
Exposure: postcodes affected according to RDL 6/2024	9.3	10.0	1,295.2	26,239.7	27,554.3
Exposure: geolocalised areas (a)	4.9	5.7	417.0	12,846.5	13,274.2
Of which: households and NFCs with real estate collateral	2.6	3.8	241.3	8,245.4	8,493.0
Directly affected by the flash floods	0.1	1.6	14.0	2,163.2	2,178.8
Affected due to proximity (500 m)	2.5	2.2	227.3	6,082.2	6,314.2
Of which: NFCs without real estate collateral	2.3	1.9	175.7	4,601.1	4,781.2
Directly affected by the flash floods	0.0	0.4	0.0	2,313.1	2,313.6
Affected due to proximity (500 m)	2.3	1.5	175.7	2,288.0	2,467.6
%					
Share of provincial or national total (b)					
Exposure: postcodes affected according to RDL 6/2024	0.1	0.3	3.3	44.9	2.1
Exposure: geolocalised areas (a)	0.1	0.2	1.1	22.0	1.0

SOURCE: Banco de España.

a Geolocalised areas on the basis of Copernicus, including both the areas directly flooded and the areas within a 500-metre radius. In the case of firms, loans secured by real estate collateral held by firms with a registered office in the area affected are analysed, while in the case of households, only loans secured by real estate collateral are analysed.
b The columns corresponding to an individual province show credit to households and firms in the areas identified as affected as a percentage of the total lending volume in that province. The "Total" column, which corresponds to the sum of the four provinces affected, shows credit to households and firms in the areas identified as affected as a percentage of the total national volume.

Chart 1 shows the distributions at September 2024 of the affected exposures by portfolio and credit quality in the three geographical areas under analysis (geolocalised directly flooded area, impact area extended by 500 metres and postcode area affected according to RDL 6/2024).

Chart 1.a presents the percentage of sub-portfolios in Valencia province that were affected, by type of borrower and real estate collateral.[9] The largest relative impact in this province was in the sub-portfolio of loans to large firms secured by real estate collateral, although the volume actually affected was limited (€1,918 million). Of this sub-portfolio, 16.5% is linked to directly flooded areas, which increases to 54.7% if the areas affected due to proximity are included, and to 58.3% if the postcode approach (upper geographical bound) is used. The portfolio of mortgages to individuals had the largest total volume of exposures affected, amounting to €22,516 million (around 40% of this type of credit in Valencia province). In this portfolio, 5.5% of exposures were directly affected, rising to 22.8% if the area is expanded by 500 metres, and to around half the portfolio if the postcode approach is considered.

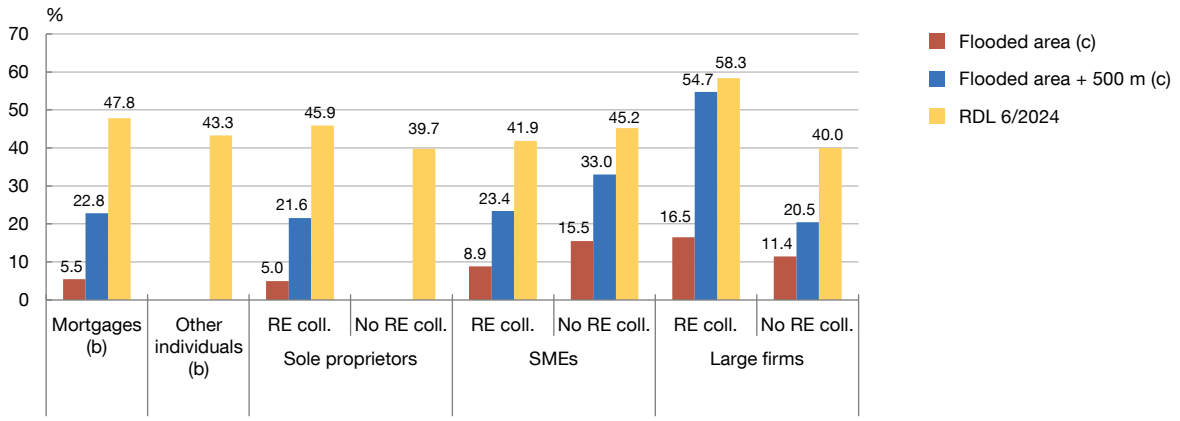
Chart 1.b analyses the credit quality of the affected exposures using the “stage” classification of credit risk reported by banks to the CCR: (i) stage 2 (loan transactions that show a significant

9 That is to say, the denominator includes all credit in the sub-portfolio (for example, large firms) in Valencia province, identified on the basis of whether the collateral is located, or the borrower is domiciled, in Valencia province.

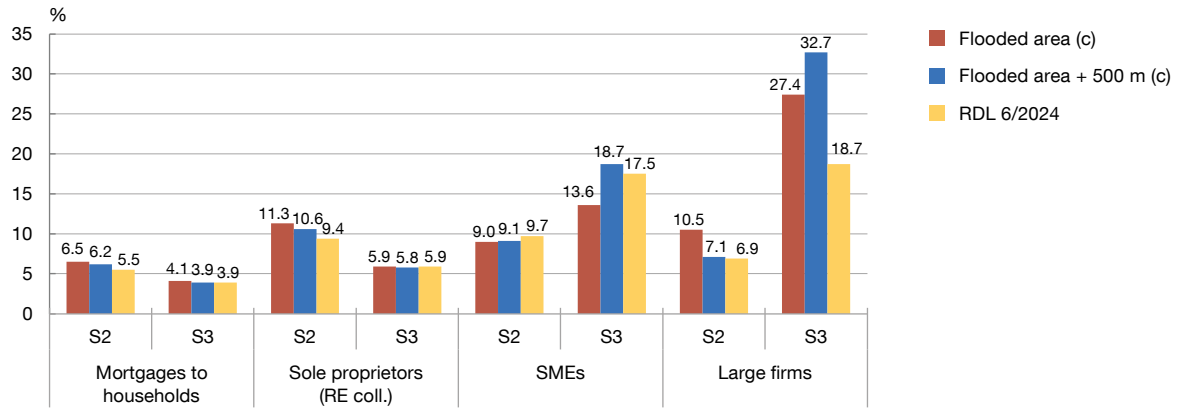
Chart 1

Analysis of the exposures affected in Valencia province, at September 2024

1.a Proportion of exposures affected, by portfolio (a)



1.b Classification of exposures affected, by sector (d)



SOURCE: Banco de España.

a Bars are not included for "Flooded area" and "Flooded area + 500 m" in the case of the "Other individuals" and "Sole proprietors without real estate collateral" portfolios, as geolocalised data at these levels of granularity are not available.
b The "Mortgages" and "Other individuals" categories represent households with no business activity.
c The areas affected by the flash floods are identified by linking the information from the CCR and the Directorate General for the Cadastre with the Copernicus data.
d S2 refers to stage 2 or with a significant increase in credit risk. S3 refers to stage 3 or non-performing.

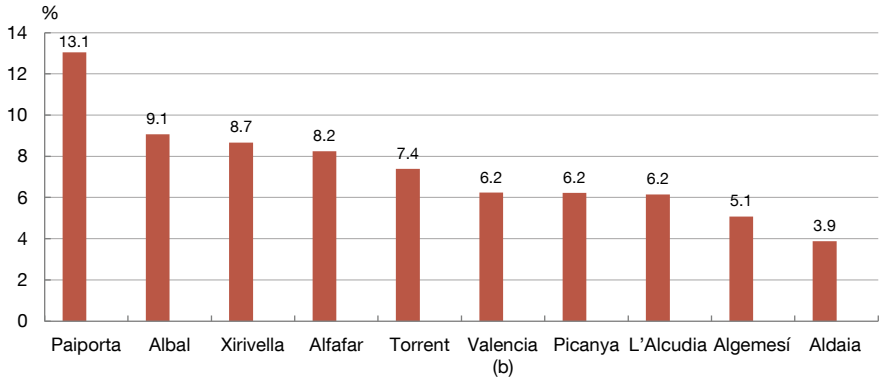
increase in credit risk, but insufficient signs of impairment to be considered non-performing); and (ii) stage 3 (non-performing, financial assets that have experienced a significant deterioration in credit quality).

At September 2024, the highest percentages of stage 2 exposures were observed in loans to SMEs (9.7% under the postcode approach), sole proprietors (9.4% under the postcode approach) and large firms (ranging from 6.9% under the postcode approach to 10.5% on the basis of the directly flooded areas). Large firms have the highest percentage of stage 3 exposures: 18.7% under the postcode approach and 32.7% if the flooded area plus a 500-metre radius is considered.

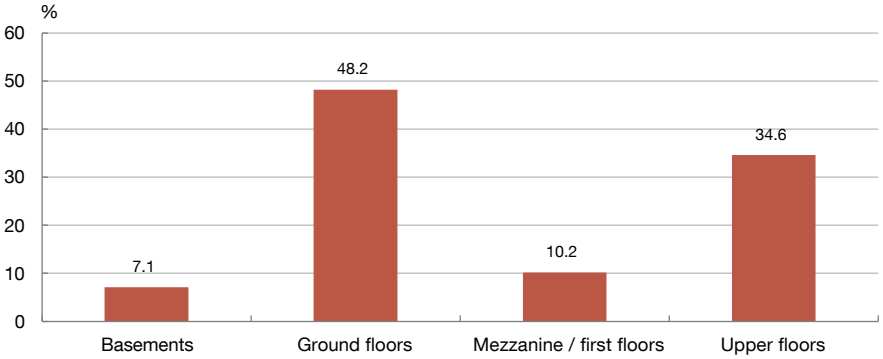
Chart 2

Analysis of real estate collateral in Valencia province associated with exposures directly affected according to geolocalisation, at September 2024

2.a Top ten municipalities, according to real estate exposures affected (a)



2.b Distribution by height of the exposures secured by real estate collateral affected



SOURCE: Banco de España.

a Includes loans to households and NFCs secured by real estate collateral. The data presented only consider the areas directly affected.
b Only certain districts of Valencia city were affected.

In the portfolio of mortgages to individuals, stage 2 and stage 3 exposures amount to roughly 6% and 4%, respectively, and do not vary significantly according to the geographical area analysed (directly flooded, directly flooded + 500 metres or postcode area according to RDL 6/2024).

Chart 2 analyses in further detail the affected exposures secured by real estate collateral. Chart 2.a shows the ten municipalities that concentrate a larger share of credit secured by real estate collateral in the directly flooded areas. As can be seen, around 22% of such exposures are located in the municipalities of Paiporta and Albal. Overall, these ten municipalities account for over 70% of such credit in the areas that were directly affected by the flash floods, highlighting the local scale of the disaster.

Chart 2.b shows the distribution of the credit exposures secured by real estate collateral located in the affected areas, based on the height of the property serving as collateral. The

Cadastre information available (which has over 200 categories for property height) has been classified into four categories:[10] (i) basement; (ii) ground floor; (iii) mezzanine and first floors; and (iv) upper floors. Over half this exposure in the area directly affected is secured by basements and ground floor properties, which are associated with a greater potential impact of flood damage.

3 Natural disasters and their economic impact. A review of the academic literature

The growing frequency and severity of climate-fuelled natural disasters have elevated environmental risks to a central concern within academic discourse. In general, the literature has found that natural disasters cause economic losses as they directly disrupt local economic activity and damage infrastructure, productive assets and housing, and tend to be followed by a contraction in economic growth (Bayoumi, Quayyum and Das, 2021; Ficarra and Mari, 2024). They also drive down house prices and demand for labour, and increase local emigration rates (Lamas Rodríguez, García Lorenzo, Medina Magro and Pérez Quirós, 2023; Boustan, Kahn, Rhode and Yanguas 2020). Further, aside from the impact of any direct damage, the uncertainty caused by extreme weather events harms the economic growth outlook (Baker, Bloom and Terry, 2023).

There is, however, prevailing evidence in the literature indicating that, although natural disasters such as floods have significant negative impacts on GDP in the short term, there are no negative effects in the long term (Cavallo and Noy, 2011). That is to say, the historical evidence available suggests that the negative impact of floods is essentially temporary, as it is subsequently offset by the fiscal stimulus from the various support measures and the increased spending by firms and households on replenishing capital and durable goods. Furthermore, some studies indicate that in certain cases floods could have a positive impact on economic activity in the long run, as the surviving firms replace obsolete assets with more productive capital and the reallocation of resources from less productive to more productive firms gathers pace (Erda, 2024).

The level of economic development, the scale of the public aid measures, insurance coverage and access to credit are all key determinants to mitigate the impact of a disaster on the affected population.

Toya and Skidmore (2007) find that higher living standards and a more highly developed financial system are associated with fewer deaths from natural disasters. Bayoumi, Quayyum and Das (2021) find that countries with more fiscal space (i.e. less public debt) and those with disaster preparedness mechanisms in place are less likely to experience a significant drop in

10 Information is not available for around 6% of these properties, and they have therefore been classified under “Upper floors”. There is also some imprecision with single-family houses, which have been included in the “Ground floor” category, but it is unknown whether these dwellings have basements or upper floors.

economic growth rates after an extreme weather event. Public aid has the potential to neutralise the impact of a disaster on households' long-term financial stability (Ratcliffe, Congdon, Teles, Stanczyk and Martín, 2020). However, several studies warn that the efficiency of public support varies and that the design of these measures is crucial to achieve the desired outcome (Billings, Gallagher and Ricketts, 2022; Barone and Mocetti, 2014).

In Billings, Gallagher and Ricketts (2022), households affected by floods in areas where insurance is obligatory do not experience a deterioration in their financial health, while those located outside compulsory insurance areas default on their loan payments at increasing rates over time.

Another key factor in the speed of the local economy's recovery is the banking sector's response to natural disasters. Cortés (2014) and Álvarez-Román, Mayordomo, Vergara-Alert and Vives (2024) find that natural disasters have a smaller negative impact on employment in the areas affected where banks have a more local focus. Indeed, it has been observed that banks with a larger local market share reroute credit supply to the regions affected (Koetter, Noth and Rehbein, 2020; Chavaz, 2016; Gallagher and Hartley, 2017; Álvarez-Román, Mayordomo, Vergara-Alert and Vives, 2024), while larger and more geographically diversified banks, along with non-bank financial institutions, offset the impact of this rerouting in the regions not affected, thereby reducing spillover effects (Ivanov, Macchiavelli and Santos, 2022; Cortés and Strahan, 2017).

However, the evidence available on the effect of banks' geographical specialisation is not entirely unanimous. In Blickle, Hamerling and Morgan (2021), the increase in lending after a disaster in the United States is driven by banks that operate across multiple counties, rather than by those that only operate in one. This suggests that access to a broader financing base, along with other lending-related factors, also influences banks' capacity to lend in areas affected by disasters.

The bank studies available suggest that, shortly after a natural disaster, demand for corporate credit rises but may not necessarily be fully met by supply. Berg and Schrader (2012) observe an increase in loan applications to a microfinance institution following a volcanic eruption in Ecuador, and a simultaneous decline in the loan approval rate, especially for new borrowers. Álvarez-Román, Mayordomo, Vergara-Alert and Vives (2024) document a relative decline of 6% in the amount of outstanding credit among firms affected by wildfires in Spain, compared with those not affected. Koetter, Noth and Rehbein (2020) also report a general decline in debt volumes among firms located in areas affected in the two years following a flood. Several studies conclude that stronger bank-borrower relationships facilitate access to credit after a disaster.

The financial literature highlights the importance of considering the heterogeneity of firms and households when analysing the impact of natural disasters on default rates. Although the average effect may seem moderate (Gallagher and Hartley, 2017), especially where those affected have access to insurance and government support measures, the financial consequences for low-income households can be severe (Billings, Gallagher and Ricketts,

2022; Ratcliffe, Congdon, Teles, Stanczyk and Martín, 2020). The business borrowers most vulnerable to disasters are microenterprises and younger and low-tech firms (Clò, David and Segoni, 2024). The impact also varies across sectors in terms of scale and persistence of effects (Ficarra and Mari, 2024).

When granting loans, lenders generally consider the risk of natural disasters. Blickle, Perry and Santos (2024) find that banks originate fewer mortgages and charge higher interest rates on loans with a lower loan-to-value (LTV) ratio for properties subject to flood risk. Local banks, with a better understanding of local risks, may be more likely to consider them (Blickle, Hamerling and Morgan, 2021).

Recent literature also suggests that physical damage resulting from extreme weather events does not undermine banking sector stability in developed countries (Klomp, 2014). Blickle, Hamerling and Morgan (2021) find that extreme disasters have a moderate negative impact (in terms of a higher risk of default) on smaller banks and, at the same time, a positive impact on net income for both small and large banks. These authors argue that, in addition to the cushioning effect of insurance and government support programmes, income from disaster recovery loans offsets banks' losses in their pre-disaster loan portfolios. Moreover, smaller local banks manage their exposure to these risks by leveraging their greater knowledge of the local environment.

4 Public measures to mitigate the economic effects of the flash floods

4.1 An overview of the public measures adopted

The Spanish Government rolled out a broad set of economic measures to mitigate the effects of the flash floods.[11] One week after the disaster, which directly affected an area of over 600 km^2 and more than 300,000 people,[12] the Council of Ministers approved a battery of economic support measures (RDL 6/2024) of up to €10.6 billion, mainly aimed at providing liquidity to the agents in the areas affected to ease the consequences of the interruption of economic activity. These measures notably include:

- A specific guarantee facility of up to €5 billion, managed by the Official Credit Institute (ICO), to provide liquidity to households, self-employed persons and firms and to enable them to collect compensation linked to insurance policies in advance. This guarantee facility includes a specific tranche for the self-employed and SMEs, to ensure that they can fund investments and cover their working capital cycle.

- A possible moratorium on loans for all households and for firms with turnover of less than €6 million in the areas affected. The moratorium would apply both to mortgage

11 For a summary of all the measures adopted by the Spanish Council of Ministers, see Presidencia de Gobierno (2025).

12 In Valencia province alone, at 21 March 2025 the regional government estimates that 552 km^2 and 306,000 people were affected, with material damage to 11,242 homes and 141,000 private vehicles (Generalitat Valenciana, 2025).

and non-mortgage loans and would last 12 months for principal repayments and three months for interest payments.

- Direct support for firms (between €10,000 and €150,000, depending on their turnover in 2023) and the self-employed (€5,000).

- Support for natural and legal persons facing personal injury or damage to housing or industrial, commercial or services premises (varying amounts depending on the type and severity of the damage).

- A one-off increase of 15% in payments under the minimum income scheme.

- Special tax relief and tax reductions for agricultural activities.

- Expedited processing of claims by the Insurance Compensation Consortium (CCS) to ensure that funds are effectively made available in the extraordinary circumstances following the flash floods.

The severity of the emergency required ongoing efforts by the authorities to continue to roll out the necessary measures. Barely a week after the disaster, RDL 7/2024 was adopted, including, among other provisions, measures to ease and defer utility bill payments (electricity, natural gas), energy supply guarantees, and investments to rebuild electricity networks, as well as various tax and support measures for the main economic sectors, housing, employment and social security.

One month after the flash floods, the Government continued to adopt support measures, focused on helping people replace their cars (which suffered extensive damage) and on actions to reactivate industry and the tourism sector and support export activities (RDL 8/2024).

From early November 2024 the regional government of Valencia also began to approve a complementary package of economic measures, including direct support of €6,000 per dwelling affected for the purchase of essentials and €800 per month for access to rented housing. Once the critical first few weeks after the flash floods had elapsed, the regional government took steps to restore and rebuild the businesses that had been hardest hit, with measures focused on specific groups of workers and business sectors (for more details, see Annex 2).

The Ministry of the Economy, Trade and Business and the regional administration have stressed their commitment to keeping the support measures in place, so that the areas affected can overcome the impact of this natural disaster and return to their normal levels of activity.[13] Thanks to this stance and to the potentially high amounts of the measures implemented relative to the size of the areas affected, this disaster could have a lower economic

13 Ministerio de Economía, Comercio y Empresa (2024f).

impact than similar ones in the past. But it is too early to draw conclusions in this respect and ongoing monitoring of the economic and financial recovery in these areas is still needed. To contribute to this task, in section 5 we present an analysis of the credit dynamics in these areas in the period after the flash floods.

Steps taken by other Spanish institutions, such as the Banco de España itself or the General Council of Notaries, are described in Annex 2.

4.2 Support granted through the ICO and the CCS

As part of the battery of government measures described above, in November 2024[14] the ICO introduced the first tranche of the specific guarantee facility for households, self-employed persons and firms, to provide them with liquidity and enable economic activity to return to normal as soon as possible. The guarantees are free of charge for banks and for their customers and can be requested by banks to cover financing granted up to 30 November 2025.

Under the different modalities of this programme, the ICO can provide State guarantees for 80% of financing granted by banks in advance of compensation payments from the CCS or other aid that may be offered by the different tiers of government. The programme will also enable the self-employed and firms to finance the investments and working capital needed to restore their activity.

According to the latest data available for preparation of this article (at 31 March 2025), the ICO had provided guarantees amounting to €516.74 million, over a total of 2,074 loans (i.e. with an average amount close to €249,000), the bulk of which granted since February 2025. The amount provided up to that date accounts for around 42% of the first two tranches approved by the Government and for barely 10.3% of the maximum amount initially envisaged for this guarantee programme.[15] This flow of new financing represents 1.9% of the total stock of credit to households and firms at September 2024 in the directly flooded areas. Overall, the information available points to significant spare capacity in the programme, should a higher volume of requests be received in the remainder of 2025.

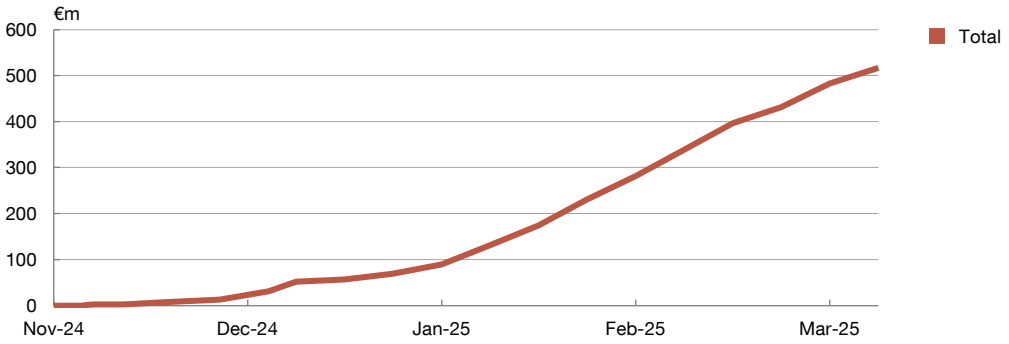
In the first week of November 2024 the CCS began to assess and handle claims for the extensive damage caused by the flash floods, coordinating the initial deployment on the ground of more than 400 loss assessors, who were soon joined by experts provided by the Spanish Association of Insurers (Unespa).[16] This unprecedented mobilisation of resources was prompted by the need for a quick and effective response to one of the biggest natural disasters in Spain's recent history.

14 Ministerio de Economía, Comercio y Empresa (2024d).

15 On 11 November 2024 the Council of Ministers approved the activation of the first tranche of the guarantee facility for an amount of €1 billion. A second tranche amounting to €240 million was approved on 3 December 2024.

16 Ministerio de Economía, Comercio y Empresa (2024b and 2024e).

Chart 3
Total ICO flash floods guarantee facility (at 31 March 2025)



SOURCE: Banco de España (data provided by banks).

Table 2
Insurance claims filed with the CCS and sums paid (at 31 March 2025)

Material damage	Claims filed	Claims paid	% of claims paid	Total paid (€m)
Small businesses, warehouses and other	14,617	9,710	66	456.67
Industrial premises	4,550	2,747	60	280.96
Civil engineering infrastructure	76	19	25	8.14
Offices	988	662	67	22.17
Vehicles	142,775	118,317	83	1,033.66
Homes and homeowner associations	78,544	53,241	68	810.54
TOTAL	241,550	184,696	76	2,612.14

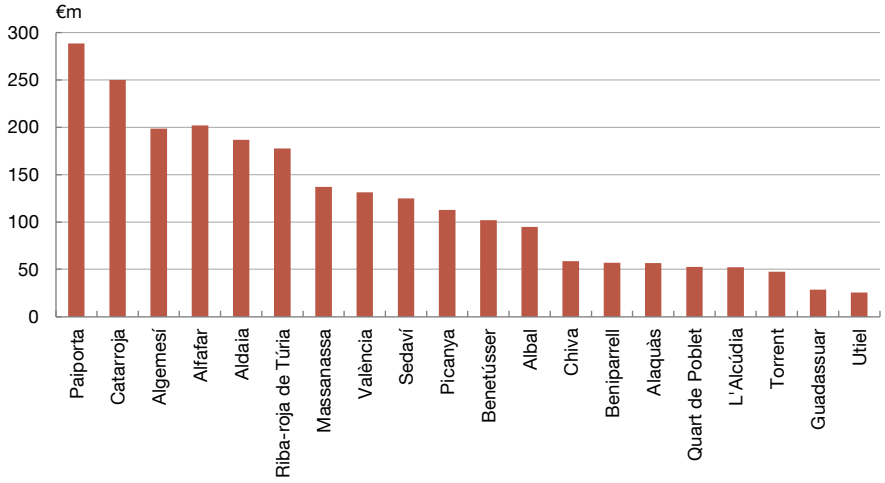
SOURCE: CCS.

Table 2 reflects the scale and complex causes (a combination of torrential rain and flooding) of the claims filed. Compensation for lost or damaged vehicles is the largest item, followed by compensation for homes and homeowner associations and, at a considerable distance, for small businesses, warehouses and industrial premises.[17]

Although the flash floods affected several provinces in the east and south of mainland Spain (Castile-La Mancha and Andalusia), as well as the Balearic Islands, more than 95% of the damage was concentrated in Valencia province. Drawing on CCS data, Chart 4 shows the municipalities awarded compensation over €25 million. In addition, Table A1.1 lists the municipalities where average compensation exceeded €12,000.

17 CCS (2025).

Chart 4
Distribution of municipalities in Valencia province awarded compensation over €25 million (at 31 March 2025)



SOURCE: CCS.

5 Impact of the flash floods on bank lending

Here we present an exercise that analyses the short-term impact of the flash floods (up to February 2025) on credit granted to the firms and households affected. This analysis is necessarily limited to a very short time frame. To obtain a higher estimate of the possible medium and long-term effects, we use as a proxy the 2011 Lorca earthquake, another natural disaster in a nearby area. The preliminary analysis shows that the effects on firms could emerge up to one year after the disaster (see section 5.2 below). However, the impact of the flooding in 2024 could be tempered, compared with the experience in Lorca, depending on how effective the public measures already adopted and other possible future ones prove to be. In addition, the material damage caused by flooding and by earthquakes is not fully comparable.

5.1 Short-term credit dynamics

For this analysis, we use granular CCR borrower-level loan data (both for firms and households), to ascertain how their total credit stock has changed or if credit quality has been affected. To do so we conduct a DiD study[18] where the flash floods are the shock. The treatment group

18 The DiD method is an econometric technique used to assess the impact of an intervention or treatment, comparing changes in outcomes over time between a treatment group (affected by the intervention) and a control group (with similar characteristics and that ideally would only differ from the treatment group in not having been affected by the intervention). It is assumed that, without the intervention, the differences between the two groups would remain constant. Thus, any additional changes observed in the treatment group are attributed to the effect of the intervention. The first documented use of the DiD method is attributed to the British physician John Snow (1855), who studied the relationship between contaminated water supply and the incidence of cholera in London. For a detailed explanation of the DiD method see, for example, Angrist and Pischke (2008).

comprises the loans in the postcodes located in the municipalities and districts affected that are included[19] in RDL 6/2024. The control group selects loans in comparable postcodes using propensity score matching.

In particular, this score matching technique seeks to select for each postcode affected by the flash floods another one with similar observable characteristics in terms of average household income, population, percentage of population over 65,[20] number of firms, percentage of non-performing loans (NPLs) to firms[21] and probability of a 500-year flood (the latter variable, taken from the National System of Mapping of Areas at Risk of Flooding).[22] Drawing on these variables, the algorithm pairs each affected area with another that has similar characteristics (the control group).

In the results presented throughout the main text of this section, the control group has been taken from postcodes located along the Mediterranean coast of mainland Spain. As Table 3 shows, when the postcodes affected are compared with others in the Mediterranean regions, the similarity is high except in terms of income, which is lower in the postcodes of the affected areas. After pairing, the postcodes considered are similar for the treatment and control groups, not only in terms of the paired variables but also as regards other factors, such as percentage of Spanish nationals, percentage of population under 18, average age of population, total bank credit or percentage of stage 2 loans to firms.

In Annex 4 we present additional results using a geographically broader control group (the whole of Spain) as a robustness exercise. In qualitative terms, the conclusions drawn are similar to those of the main analysis. Regarding pairing, there are significant differences between the characteristics of the postcodes affected and those of the rest of Spain in almost all variables (except, in this case, in average income). Overall, these exercises show that the Mediterranean area postcodes are more similar to those of the treatment group. In addition, the geographical location could be capturing important unobservable (for instance, sociocultural) factors not captured by the observable variables. In consequence, our base model uses this control group.

The regression to be estimated follows a DiD model based on the following equation:

$$y_{it} = \beta * I_t * \text{Affected borrower}_i + \mu_i + \Omega_{it} + \varepsilon_{it}$$

where i is the borrower (household or firm), t is time, I_t is a set of time dummies (indicator variable) and the Affected borrower variable is binary, taking the value 1 for firms or households

19 The areas affected are classified based on the postcodes of the municipalities listed in RDL 6/2024 (which mostly belong to Valencia province, except for three, in the provinces of Albacete, Cuenca and Malaga). The approach used aims to include any potential affected borrower, so it considers that a loan has been affected by the flash floods when any of the borrowers belong to one of the postcodes of the locations deemed to be affected, or when a property located in one of the areas affected serves as mortgage collateral for the loan or credit in question.

20 Information available in the Household Income Distribution Map of the National Institute of Statistics (INE) by census section, mapped using the INE's cartographic information to estimate postcode level values.

21 Data on the number of firms and the percentages of stage 2 and stage 3 loans to firms provide information on the productive system within the postcode. This is relevant for supply and demand for credit among households and firms and for their credit risk.

22 Available from the Ministry for Ecological Transition and the Demographic Challenge.

Table 3

Test of averages of postcodes classified according to whether or not they were affected by the flash floods (a) (b) (c)

	Mediterranean coast areas									
	Before propensity score matching					After propensity score matching				
	Not affected		Affected		Test of averages	Not affected		Affected		Test of averages
	Average	Std. Dev. / Prop.	Average	Std. Dev. / Prop.		Average	Std. Dev. / Prop.	Average	Std. Dev. / Prop.	
Number of postcodes	2,293	(95.7%)	103	(4.3%)		99	(50.0%)	99	(50.0%)	
Average net household income (€)	33,579.14	(96.85)	30,486.54	(75.82)	0.001	31,765.71	(86.74)	30,643.21	(75.83)	0.247
Population (thousands)	1,428.04	(27.06)	1,469.90	(22.59)	0.568	1,434.34	(22.46)	1,482.58	(22.62)	0.512
Percentage of persons over 65	21.40	(2.40)	21.61	(2.39)	0.715	21.53	(2.46)	21.49	(2.37)	0.964
Number of firms	175,118	(592.94)	212,107	(545.04)	0.293	236,222	(586.97)	220,646	(547.66)	0.739
Percentage of NPLs to firms	9.04	(3.80)	8.78	(3.81)	0.860	8.48	(3.30)	8.78	(3.81)	0.871
Probability of a 500-year flood (%)	3.47	(3.28)	14.20	(4.34)	0.001	15.30	(4.89)	14.74	(4.36)	0.857
Total credit (€m)	69.10	(0.01)	88.27	(0.01)	0.382	119.11	(0.02)	91.83	(0.01)	0.617
Percentage of stage 2 loans to firms	10.03	(3.59)	9.77	(3.23)	0.841	8.29	(2.71)	9.77	(3.23)	0.258
Percentage of Spanish nationals	85.16	(3.28)	89.49	(1.92)	0.001	89.82	(2.26)	89.40	(1.92)	0.512
Percentage of persons under 18	16.24	(1.92)	15.93	(1.81)	0.402	16.09	(1.89)	15.99	(1.81)	0.837
Average household size	2.49	(0.52)	2.42	(0.47)	0.009	2.47	(0.47)	2.42	(0.47)	0.138
Average age	44.50	(1.90)	44.87	(1.87)	0.312	44.64	(1.94)	44.80	(1.86)	0.760

SOURCES: Banco de España, INE and authors' calculations.

a The table presents postcode-level averages of a series of factors used to match postcodes affected by the flash floods (according to RDL 6/2024) and postcodes not affected along the Mediterranean coast.
b For each group and variable, the "Std. Dev./Prop." column shows the standard deviation in brackets, except for the "Number of postcodes" variable, where it denotes the postcodes in each group as a percentage of the total (thus, 95.7% of the postcodes along the Mediterranean coast are classified as areas not affected, and 4.3% as areas affected, by the flash floods).
c The "Test of averages" column shows the p-value for each variable analysed. High p-values suggest that the null hypothesis (that both averages are the same) could not be rejected. Propensity score matching is a statistical technique used to select observational units that are similar to those deemed affected according to a set of observable variables of a specific population (in this case, average income, population, number of firms, percentage of population over 65, NPL ratio and probability of a 500-year flood).

affected by the flash floods and the value 0 for those not affected. The controls include firm- and household-fixed effects (μ_i), as well as certain conditions affecting the borrower that vary over time (Ω_{it}) and that are linked to their sector of activity[23] or main bank.[24] In different regressions, the variable y_{it} denotes either (i) the borrower's total debt, (ii) their new debt in the period, or (iii) their credit risk, measured through binary variables that take, respectively, the value 1 if they have any stage 2 or stage 3 loans, and 0 otherwise.

The β coefficient captures the differential effect of the flash floods on a given credit metric (y_{it}) of the borrowers affected, compared with those not affected in the study period. The period considered runs from September 2024 to February 2025, that is, from two months before the flash floods[25] (29 October 2024) to four months after. The regression error terms are grouped (in clusters) at the firm/household, sector, main bank and postcode level.

A basic assumption in this methodology is that the treatment and control groups behave similarly before the shock. This will be checked by analysing the significance of the estimated coefficients for the month of October.

The main results for developments in credit (stock of credit and new lending) are presented in Chart 5.a, which shows the coefficient estimated for each date with 95% confidence bands.[26] In the case of the affected firms, the flash floods had no significant differential impact on either the change in the total stock of credit or the flow of new lending up to February 2025, as the confidence levels were contained at 0 in the previous months. In February (the last month for which there are data available) the firms affected by the catastrophe presented credit growth of 2%, higher than that recorded for firms in unaffected areas. There were already signs of this in January 2025, possibly owing to the greater use of credit facilities, driven by the arrangement of new loans.

Moderately adverse effects are also observed on credit risk in business lending, captured through the proportion of stage 2 or non-performing (stage 3) loans to firms. The results obtained are shown in Chart 6.a. In assessing these findings, it should be borne in mind that, during this period, credit quality developments may have been positively affected by the different types of aid – mainly moratoria – channelled through RDL 6/2024.

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23 For firms, sectors as per the Spanish National Classification of Economic Activities (CNAE) 2-digit code. For households, as per the most granular information available on household activity. For self-employed households, the 2-digit CNAE code is used; for other households, distinctions can be drawn between employee households, banking sector, public sector or similar employee households, retiree households, rentier households, unemployed households, student households, housewife or similar households and others.

24 The results are similar when no main-bank time-fixed effects are introduced or if only invariant time-fixed effects are included, although some coefficients lose significance as the standard errors increase.

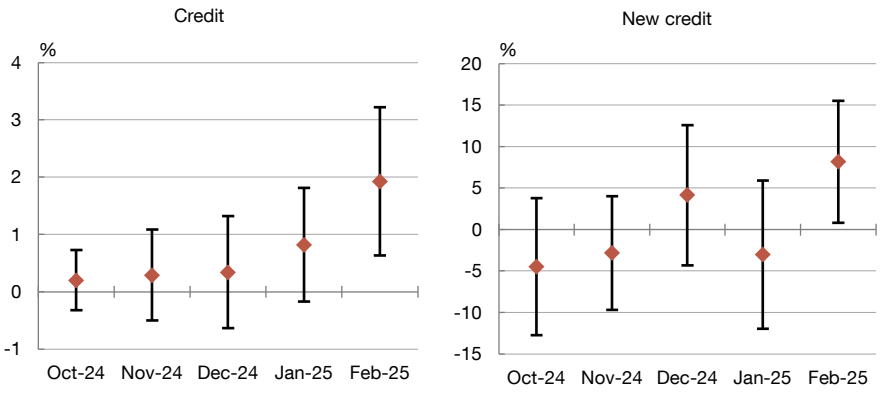
25 The month of October is included in the ex ante period under the reasonable assumption that end-October balances will be very similar to those at 28 October and that the few days in between are insufficient for credit impairments to materialise.

26 In the case of households, the database size requires that estimates be made using population samples, facilitating, from a computational viewpoint, the estimation of the various coefficients. Different sized samples were considered to reproduce the sectoral composition of loans to households, in accordance with their categorisation in the CCR (natural person households, sole proprietor households, homeowner association households and other households). The results are robust to a sample size over 20% of the population. This article shows the results for households with a sample size of 30% of the population.

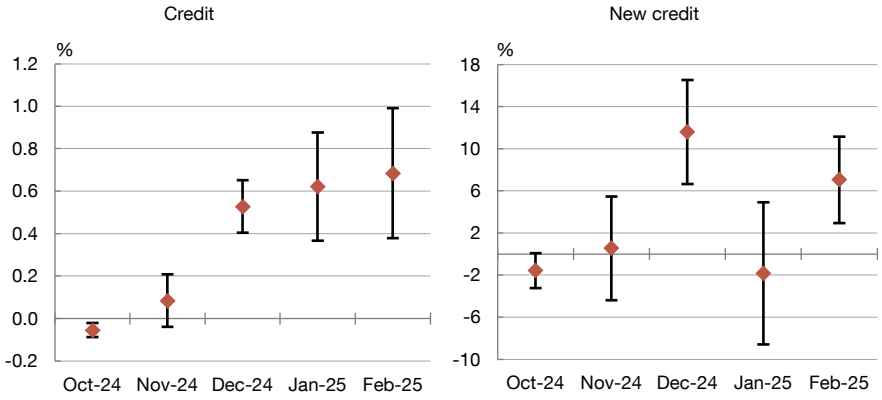
Chart 5

Impact of the flash floods on loans to firms and households. Mediterranean coast areas (a) (b)

5.a Firms



5.b Households



SOURCE: Authors' calculations, drawing on the CIRBE.

a The charts show changes over time in the estimated coefficient (and its 95% confidence bands) of a DiD regression that controls for firm and sector fixed effects x time and main bank x time. Standard errors are clustered at firm, sector, main bank and postcode level.
b "Households" includes natural person households, sole proprietors, homeowner associations and other households. "Firms" includes NFCs.

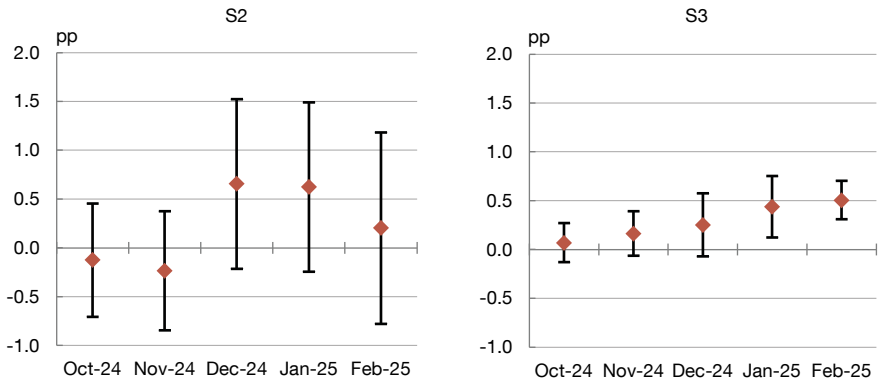
In the case of stage 2 loans, the October coefficient estimate is statistically similar to that of September (the reference month), which is compatible with the assumption that the treatment group and the control group behaved in parallel before the shock. In addition, they continued to behave similarly in November, the first month after the impact of the flooding. An increase of nearly 0.5 pp in the differential effect was observed from December which, while insignificant on a month-by-month basis, is significant for December 2024 and January 2025 combined. This figure means that there was a 4.5% increase in the proportion[27] of stage 2 loans in the areas affected compared with the average. The differential effect decreased in February 2025 (the latest available figure).

27 In this section the relative effects are estimated with respect to average sample values calculated for all the months and borrowers analysed.

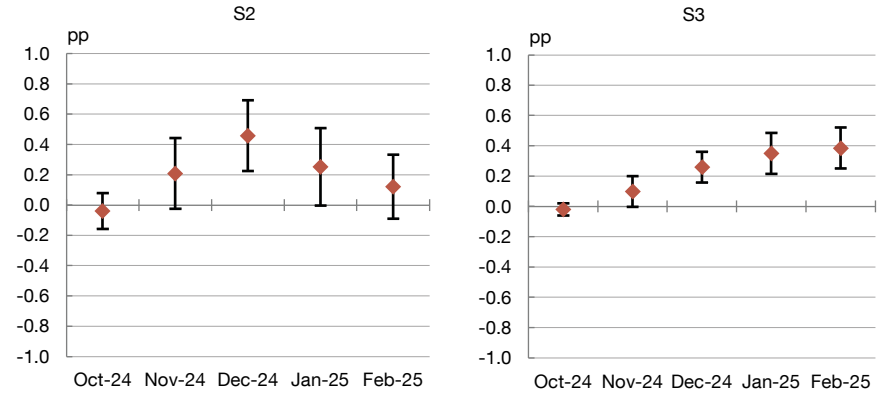
Chart 6

Impact of the flash floods on the proportion of firms and households with credit quality problems. Mediterranean coast areas (a) (b)

6.a Firms



6.b Households



SOURCE: Authors' calculations, drawing on the CIRBE.

a The charts show changes over time in the estimated coefficient (and its 95% confidence bands) of a DiD regression that controls for firm and sector fixed effects x time and main bank x time. Standard errors are clustered at firm, sector, main bank and postcode level.
b "Households" includes natural person households, sole proprietors, homeowner associations and other households. "Firms" includes NFCs.

As regards NPLs, the impact is significantly different from 0 since the start of 2025 (Chart 6.a), with an increase of 3.4% in the proportion of NPLs for firms in the affected areas compared with the average.[28] The difference is statistically significant, but in terms of economic materiality, the impact is limited.

28 As a robustness test, if a firm's affected debt as a proportion of its total bank debt is used as a proxy to determine whether or not a firm is affected, rather than a dichotomous variable, the results are stronger (qualitatively and quantitatively) both for the control group selected from the Mediterranean regions and for that which uses all of Spain. A less precise manner of capturing how intensely affected a firm was by the flash floods could be to use the percentage of land flooded in the firm's postcode. The problem with this measure is that, despite indicating how intensely an area was affected by the heavy rain, it may not accurately reflect the fact that even if only a small part of a specific area were flooded, the firms established there could still have been severely affected. Considering the problems of such an approximation, the results thus obtained reinforce the fact that stage 2 loans increased in late 2024.

As with firms, no immediate differential effect of the flash floods was observed on the total stock of credit to households, as the confidence bands were contained at 0 in both October and November. A positive differential effect was, however, observed from December, with the growth in the stock of credit to households in February 2025 being up to 0.7% higher in the affected areas than in the unaffected areas.

There are also adverse effects on credit risk in lending to households. Specifically, our analysis of changes in stage 2 and stage 3 loans revealed no significant effects in October or November 2024. However, a significant effect of 0.45 pp in the proportion of stage 2 loans was observed in December (a 4.1% increase over the average stage 2 loan ratio). From January 2025 no significant differences were observed in the proportion of stage 2 loans in the affected areas, meaning that the effect seems to be temporary.

As regards non-performing (stage 3) loans to households, no significant differences were observed in the months immediately following the flash floods. However, from December 2024 a relative increase of 0.44 pp was observed in the ratio of stage 3 loans to households in the affected areas, compared with those in unaffected areas (a relative increase of close to 9.1% with respect to the average NPL ratio).

Lastly, to analyse whether the effects were greater for a specific type of bank, we defined a bank-level measure of credit concentration in the affected areas (credit in the area relative to total credit before the flash floods). Also, a priori the impact was expected to be greater for SMEs; accordingly, we defined an indicator variable to identify these firms. These variables (concentration metric and SME indicator) are included in a regression as a triple interaction with the borrower identifier variables in the affected area.

It was verified that the proportion of stage 2 loans to firms increased especially at the banks whose business was most concentrated in the affected areas. For these banks, that proportion increased by 24% after the flooding (from early October 2024 to end-February 2025). By contrast, in that same period, stage 3 loans to affected firms decreased by 9% at the banks whose business was most concentrated in the affected areas, while they increased by slightly over 3% at other banks.[29] No particular effect was observed regarding changes in SME credit quality.

In the case of households, the banks most exposed to the affected areas recorded higher growth in new lending to this segment in those areas, although the differential effect is very limited (0.02 pp up to February 2025). Also, analysis of the heterogeneous effects of the flash floods on credit risk by household type reveals that the proportion of stage 2 loans grew more in the affected areas among the self-employed. This was to be expected a priori, owing to possible flood damage to family businesses, where these were a main source of income. As regards the heterogeneous effects by bank, the banks most exposed to the affected areas are the ones that have reclassified the most risk to stage 3 (0.18 pp less) and to stage 2 (0.49 pp more).

29 A bank is considered to be highly exposed to the affected areas if its credit in these areas accounted for more than 40% of its total credit before the flash floods. Further analyses seem to suggest that the hardest hit banks rolled over fewer pre-existing loans to the firms most affected.

5.2 Case study: the 2011 Lorca earthquake

Since we are unable to study the effects of the flash floods in the financial sector from a medium/long-term perspective (as they occurred so recently), it is useful to analyse the experience gained after other natural disasters that caused substantial material and personal damage. Analysis of the earthquake of 11 May 2011 in Lorca (Murcia) is particularly relevant, despite the differences between these disasters in terms of the size of the area affected and the subsequent mobilisation of resources. Indeed, the broad public response to the flash floods could mean that the consequences observed in the past cannot be extrapolated in equal measure to the latest disaster. In any event, it is useful to estimate a potential upper bound to the medium-term effects of the catastrophe, to guide our monitoring of the changes in credit in the areas affected by the flash floods.

The Lorca earthquake was a moderate tremor, measuring 5.2 on the Richter scale, with (i) a very shallow hypocentre (only 1km deep) and (ii) the epicentre[30] in the town itself, which had a population of 92,000. These two amplifying factors were the reason for the significant damage it caused, which led to it being considered the greatest urban disaster in Spain since the Civil War. In terms of material damage, around 24,000 properties were affected (80% of the total in the municipality) and 800 business premises, as well as roads and all kinds of public infrastructure. More than 1,700 dwellings were demolished in the aftermath. Personal damage was also significant, with nine fatalities, hundreds injured and thousands affected. The recovery entailed a cost for the State of over €800 million. The CCS received 32,700 compensation claims for a total of nearly €450 million.

The earthquake had medium-term effects on the local economy. Thus, one year later, between 15% and 20% of businesses in the town remained closed, either because premises were unable to reopen due to the severe damage suffered or because they had to be demolished. According to the Lorca Confederation of Employers' Organisations, the earthquake resulted in a 40% drop in firms' sales over the following 12 months.

The analysis of the impact of the Lorca earthquake on bank loans focuses on SMEs and on changes in lending, as well as on SME default rates up to four and a half years later.

In particular, to identify an NFC's bank debt, the CCR was used as a monthly data source for the period between January 2010 and December 2015.

Once again, the method used was a DiD analysis in which a set of firms affected by the earthquake (exogenous shock) was identified and classified as a treatment group (in accordance with the terminology used in this analysis). A control group was also identified, comprised of firms that were not (or were less severely) affected. Each firm's postcode was used to carry out this classification.[31] Thus, if the firm was located in any of the neighbourhoods

30 The epicentre is the point on the Earth's surface directly above the hypocentre, which is the point below the Earth's surface where the earthquake originates.

31 As the CCR data are prior to 2016, there is no direct information on firms' postcodes, so these were assigned drawing on CCR data from 2016 onwards. Firms that had ceased to operate before then and were no longer in the CCR were not included in the analysis. This could lead to a certain survival bias, meaning that the effects may be overestimated.

hardest hit by the earthquake (as per information obtained from the Lorca Town Council website, based on the neighbourhoods that were rebuilt after the earthquake) it was treated as an affected firm. To establish the control group, we identified the firms in the other Lorca neighbourhoods plus those in other Spanish postcodes selected through a propensity score matching procedure.[32]

To assess the robustness of this specification, the two control groups – (i) firms in less affected Lorca neighbourhoods and (ii) firms in postcodes with features comparable to Lorca's affected neighbourhoods – were considered separately. In addition, the analysis was conducted using SMEs in Murcia but outside the municipality of Lorca as a control group. The results of all the robustness analyses confirm the main findings reported in this article.

At firm-month level, two analyses were carried out using the CCR: one on changes in lending and the other on changes in firms' default rates (using a dichotomous variable that takes the value 1 if a firm has significant defaulted loans more than 90 days past-due and 0 otherwise). The regression equation used is as follows:

$$y_{it} = \beta \times I_t \times \text{Affected firm}_i + \mu_i + \mu_t + \varepsilon_{it}$$

where i is the firm, t is time and the controls include both firm-fixed effects (μ_i) and time-fixed effects (μ_t), It is a time indicator variable and the Affected firm variable is binary, taking the value 1 if the firm was affected by the earthquake and 0 otherwise. The β coefficient captures the differential effect of the earthquake on a given metric (y_{it}) – lending volume or existence of default – of the firms affected compared with those not affected in the period studied. This analysis allows us to see how β changes over time (by using multiple time indicators in the interaction for different months rather than just one for the entire period studied). This shows that the hypothesis that the two groups of firms behaved similarly before the earthquake holds true (parallel trends).[33] The errors are clustered at firm and time level.

Charts 7.a and 7.b present the results of the estimated changes in lending volume and in defaults when the main coefficient (β) is allowed to change over time. These results include 95% confidence bands.

Thus, Chart 7.a shows the month-by-month variation in credit for the affected firms relative to those not affected compared with January 2010. Prior to the earthquake, the two groups behaved similarly and no differential effect was observed afterwards.

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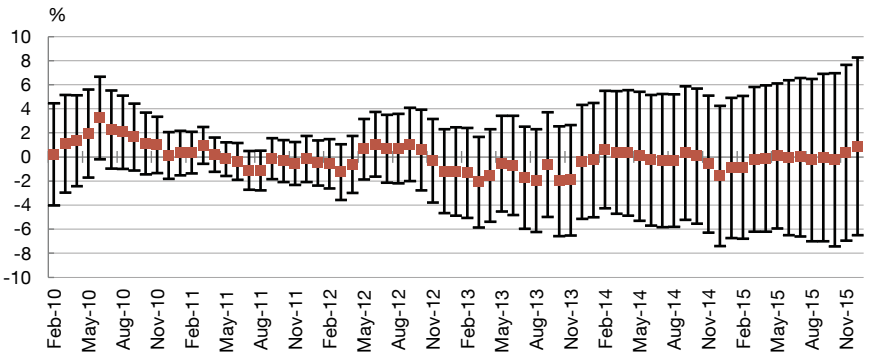
32 The neighbourhoods considered to be hardest hit by the earthquake were: San Diego, Alfonso X, San José, la Viña, San Fernando, San Pedro and Barrios Altos. The variables used for the score matching were average household income in a given postcode, population, number of firms, proportion of persons over 65 and the NPL ratio.

33 We also studied the impact on firms' financial health, by analysing their probability of closure in the following years. To establish whether a firm closed in a given year, this information is matched with the INE's Central Business Register and analysed at firm-year level. The results show a 52% increase in business closures two years after the earthquake, an increase that subsequently disappears.

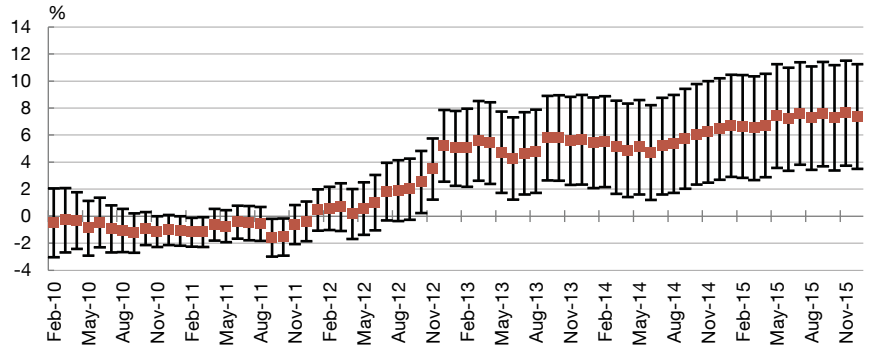
Chart 7

Impact of the Lorca earthquake on NFCs (SMEs) (a)

7.a Impact on credit to SMEs (b)



7.b Impact on the proportion of SMEs with defaulted loans (c)



SOURCES: Banco de España and authors' calculations.

a The charts show changes over time in the estimated coefficient (and its 95% confidence bands) of a DiD regression that controls for firm and time fixed effects. Standard errors are clustered at firm and time level.
b Month-by-month change in credit with respect to 2010 for affected SMEs compared with those not affected.
c Month-by-month increase in affected SMEs' probability of default. A default event is deemed to be when a firm has significant defaulted loans more than 90 days past-due.

Chart 7.b shows the month-by-month increase in the probability of default by the affected SMEs. As in the case of credit, prior to the earthquake the two groups behaved similarly. However, in this case, one year after the catastrophe the probability of default had gradually increased for the firms that had been hardest hit. Thus, the proportion of firms with defaulted loans peaked four years after the earthquake (the figure being nearly 5 pp higher than for the firms in the control group).

These results evidence that Lorca's business sector was affected by the earthquake in the medium and long term, with persistent consequences in terms of defaults. It should be borne in mind that these results cannot be directly extrapolated to the 2024 flash floods, given the volume of the aid mobilised in the most recent disaster and the differences between the two catastrophes, as earthquakes are much more damaging for certain infrastructures. Nevertheless, despite these limitations, it is advisable to take this previous experience into

account and to continue monitoring credit quality in the areas hardest hit by the recent catastrophe.

6 Conclusion

This article has analysed the impact that the flash floods that hit several areas in Spain in late October 2024 had on the banking sector's lending activity and the damage covered by the CCS. Despite the destructive effect of the flash floods at local level, the impact on financial stability was limited. This owes to fact that the credit exposures affected accounted for a small percentage of the national total and to the mitigating measures adopted by general government.

At the local level, in December 2024 differentiated patterns started to emerge in the affected areas relative to other comparable areas from a socio-economic standpoint that were not affected by the catastrophe. In general, lending to households and firms grew more in the affected areas, helping to mitigate the adverse economic effects of the flash floods, but the credit quality performance was worse. The magnitude of these local effects on lending was relatively contained in economic terms.

In any event, the economic and financial consequences of the flash floods are still very present and the actions taken will continue to be closely monitored over the coming months, to assess their effectiveness and determine when it is time to withdraw (or, if appropriate, prolong) the public measures deployed (all of which are inherently temporary).

Within the remit of its competences in relation to oversight and supervision of the banking sector, the Banco de España (in coordination with other authorities) will be particularly observant of how business credit risk evolves (and how it is reflected in firms' stage 2 and stage 3 loans), to ensure that the appropriate steps are taken to facilitate a safe return to financial normality in the areas affected by the flash floods in Spain.

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Annex 1 Municipalities most affected by the flash floods according to CCS data

Table A1.1
Municipalities where average compensation per claim exceeded €12,000 (at 31 March 2025)

	Province	Claims	Total paid (€m)	Amount per claim (€)
Quart de Poblet	Valencia	2,367	52.60	22,223
Riba-roja de Túria	Valencia	8,572	177.43	20,699
Silla	Valencia	467	8.08	17,293
Beniparrell	Valencia	3,412	57.06	16,722
Llocnou de la Corona	Valencia	123	2.05	16,639
Letur	Valencia	116	1.69	14,563
Benicull de Xúquer	Valencia	172	2.44	14,157
Massanassa	Valencia	9,904	137.14	13,847
Albal	Valencia	7,111	94.79	13,330
Alfafar	Valencia	15,172	202.04	13,317
Sedaví	Valencia	9,860	124.79	12,656
Paiporta	Valencia	23,550	288.27	12,241
Torrent	Valencia	3,885	47.49	12,223
Picanya	Valencia	9,327	112.61	12,074

SOURCE: CCS.

Annex 2 Other public measures to mitigate the flash floods

Measures taken by the regional government of Valencia[1]

In parallel to the Spanish Government, the regional government of Valencia began to approve a series of economic support measures from November 2024, including:

- Direct support of €6,000 per dwelling affected for the purchase of essentials (Regional Council Decree 163/2024 of 4 November 2024).
- Direct support for the municipalities affected (Regional Council Decree 164/2024 of 4 November 2024).
- Direct support of up to €800 per month for access to rented housing for individuals whose main and permanent residence was affected by the damage caused by the flash floods (Regional Council Decree 167/2024 of 12 November 2024).
- Direct aid to sustain the employment and economic recovery of firms affected by the flash floods (Regional Council Decree 172/2024 of 26 November 2024).
- Urgent support for the self-employed in the areas of Valencia region affected by the flash floods (Regional Council Decree 176/2024 of 3 December 2024).
- Urgent support for irrigation communities and other irrigation entities affected by the damage caused by the flash floods (Regional Council Decree 182/2024 of 10 December 2024).
- Direct aid for firms with activity in Valencia region to cover the financial costs of working capital and investment financing operations, arranged with financial institutions and secured by a guarantee from a mutual guarantee company, to ease the damage caused in Valencia region by the flash floods (Regional Council Decree 190/2024 of 17 December 2024).
- Direct support for the municipalities affected in Castellón province (Regional Council Decree 196/2024 of 23 December 2024).
- Direct aid for cultural industry professionals and firms affected by the flash floods (Regional Council Decree 197/2024 of 23 December 2024).

1 Summary of measures taken to mid-February 2025. For further details, see "Information for those affected by the flash floods" (in Spanish) on the Valencia regional government's website.

— Direct aid for publishing firms affected by the flash floods (Regional Council Decree 198/2024 of 23 December 2024).

— Direct aid for third sector social action organisations affected by the flash floods (Regional Council Decree 201/2024 of 30 December 2024).

— Support to compensate the efforts of host households resident in the affected areas (Regional Council Decree 12/2025 of 28 January 2025).

— Support for workers whose employment contracts have been suspended under a job retention scheme due to force majeure as a result of the flash floods (Regional Council Decree 17/2025 of 4 February 2025).

— Support to revive business and community associations in the municipalities affected by the flash floods (Regional Council Decree 20/2025 of 11 February 2025).

The regional government of Valencia also adopted a comprehensive package of tax relief measures (extensions, rebates, reductions and exemptions) for those affected by the flash floods (Regional Council Decree-Law 12/2024 of 12 November 2024 and Regional Council Decree-Law 17/2024 of 23 December 2024).

The role of the Banco de España

Within the area of its functions, the Banco de España took various steps in response to the flash floods.[2] First, on 5 November 2024 it released an initial calculation of the financial sector's overall exposure in the areas affected, broken down by loans to households and firms/SMEs, along with the number of individual and business borrowers (mortgage and other loans) in the areas affected by the disaster.

The Banco de España closely monitored the availability of cash in the ATMs that remained operational after the flash floods, to ensure that the general public had access to cash at all times. It also took one-off measures to facilitate the exchange of banknotes and coins damaged in the floods, opening counters to the public at the Valencia branch office specifically for this purpose and with no need for an appointment. A specific exchange procedure was also arranged in collaboration with local credit institutions.

Within the context of institutional social responsibility, the Banco de España launched two microeconomic initiatives:

— A programme of 150 direct grants[3] (€1,000 per person) for students residing in areas affected by the flash floods who are enrolled in an official intermediate or higher

2 Banco de España (2024).

3 Banco de España (2025a).

vocational course or an official university course in the areas of finance, business administration or economics.

— Donation of 1,500 disused computers to various schools, families and organisations affected by the flash floods in the provinces of Valencia and Albacete, through the Fundación Adelias[4] (which works to reduce the digital divide among vulnerable groups). This was the largest donation of IT equipment made to date by the Banco de España.

Other entities and administrations

The Association of Notaries made available to those affected by the flash floods: (i) a free notary assistance service comprising searches for and issuance and delivery (free of charge) of copies of the public deeds of properties; and (ii) a form for requesting a notarial certificate of the damage caused by the flash floods.

The Association of Property Registrars provided registry extracts free of charge, to enable accreditation of current ownership of property for the purposes of applying for support and grants.

4 Banco de España (2025b).

Annex 3 Results obtained using postcodes from across Spain as a control group

This annex presents the results of a robustness check of the DiD analysis, in which the control group is identified by matching with postcodes throughout Spain, rather than solely with postcodes along the Mediterranean coast (as in the main text).

Table A3.1 shows the test of averages performed to determine the differences between the treatment group and the control group constructed before and after matching. There are significant differences between the postcodes affected and the rest of Spain in the observable characteristics related to demographics, the productive system, average income and even flood probability. After matching, the postcodes in the rest of Spain used as a control are similar not only in the variables used for the matching, but also in other factors such as percentage of Spanish nationals, percentage of population under 18, average age of population, total bank credit and percentage of stage 2 loans.

In addition, the coefficients estimated are included for each date with 95% confidence bands. The estimated equation is similar to that set out in the main text but, in this case, the control group was constructed considering postcodes throughout Spain. In qualitative terms, the results are similar to those obtained above, except in the case of new credit to firms, where no significant differences are observed when postcodes from across Spain are included in the control group.

Table A3.1

Test of averages of postcodes classified according to whether or not they were affected by the flash floods (a) (b) (c)

	Total Spain									
	Before propensity score matching					After propensity score matching				
	Not affected		Affected		Test of averages	Not affected		Affected		Test of averages
	Average	Std. Dev. / Prop.	Average	Std. Dev. / Prop.		Average	Std. Dev. / Prop.	Average	Std. Dev. / Prop.	
Number of postcodes	11,105	(99.1%)	103	(0.9%)		99	(50.0%)	99	(50.0%)	
Average net household income (€)	31,311.33	(89.09)	30,486.54	(75.82)	0.295	30,891.57	(81.35)	30,643.20	(75.83)	0.78
Population (thousands)	1,055.08	(25.73)	1,469.90	(22.59)	0.001	1,581.91	(24.94)	1,482.57	(22.62)	0.225
Percentage of people over 65	27.77	(3.06)	21.61	(2.39)	0.001	21.27	(2.57)	21.48	(2.37)	0.801
Number of firms	87,915	(17.26)	212,107	(17.23)	0.001	198,970	(18.19)	220,646	(17.31)	0.632
Percentage of NPLs to firms	7.32	(3.91)	8.78	(3.81)	0.346	8.37	(3.32)	8.78	(3.81)	0.823
Probability of 500-year flood (%)	2.50	(2.79)	14.19	(4.34)	0.001	13,86	(4.59)	14.74	(4.36)	0.762
Total credit (€m)	43.69	(0.01)	88.27	(0.01)	0.150	72.76	(0.00)	91.83	(0.00)	0.426
Percentage of stage 2 loans to firms	10.06	(3.93)	9.77	(3.23)	0.853	11.83	(3.66)	9.76	(3.23)	0.233
Percentage of Spanish nationals	91.79	(2.83)	89.49	(1.92)	0.004	88.45	(3.03)	89.39	(1.92)	0.347
Percentage of persons under 18	12.68	(2.24)	15.93	(1.81)	0.001	16.13	(1.97)	15.98	(1.81)	0.787
Average household size	2.33	(0.55)	2.42	(0.47)	0.003	2.46	(0.49)	2.42	(0.47)	0.206
Average age	48.82	(2.41)	44.87	(1.87)	0.001	44.57	(2.02)	44.80	(1.86)	0.679

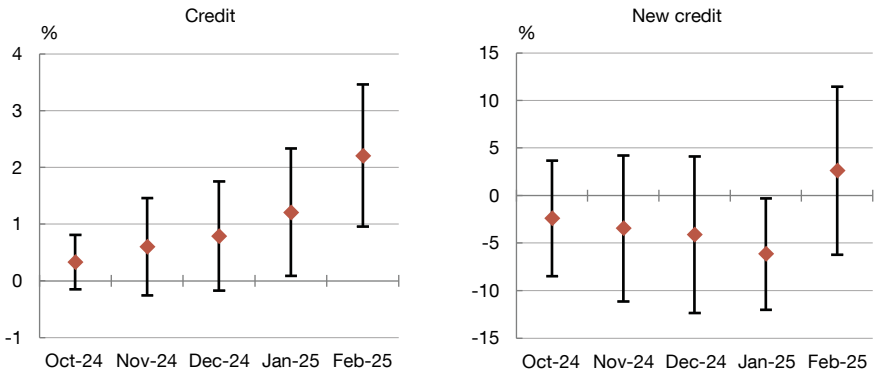
SOURCES: Banco de España, INE and authors' calculations.

a The table presents postcode-level averages of a series of factors used to match postcodes affected by the flash floods (according to RDL 6/2024) and postcodes not affected across Spain.
b For each group and variable, the “Std. Dev./Prop.” column shows the standard deviation in brackets, except for the “Number of postcodes” variable, where it denotes the postcodes in each group as a percentage of the total (thus, 99.1% of the postcodes in Spain are classified as areas not affected, and 0.9% as areas affected, by the flash floods).
c The "Test of averages" column shows the p-value for each variable analysed. High p-values suggest that the null hypothesis (that both averages are the same) could not be rejected. Propensity score matching is a statistical technique used to select observational units that are similar to those deemed affected according to a set of observable variables of a specific population (in this case, average income, population, number of firms, percentage of population over 65, NPL ratio and probability of a 500-year flood).

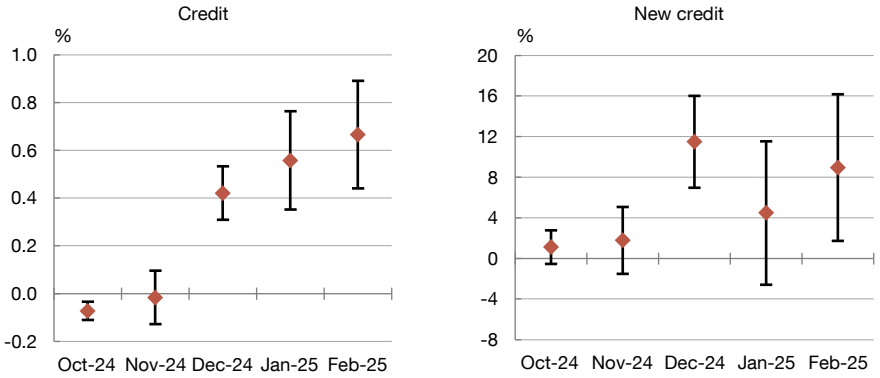
Chart A3.1

Impact of the flash floods on loans to firms and households. Spain (a) (b)

A3.1.a Firms



A3.1.b Households



SOURCE: Authors' calculations, drawing on the CIRBE.

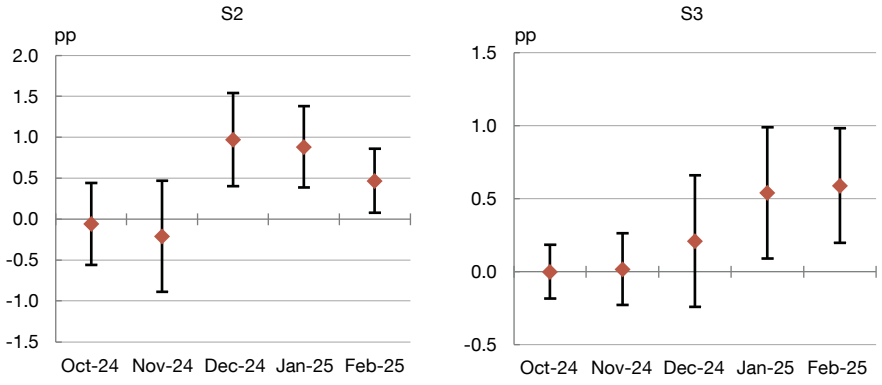
a The charts show changes over time in the estimated coefficient (and its 95% confidence bands) of a DiD regression that controls for firm and sector fixed effects x time and main bank x time. Standard errors are clustered at firm, sector, main bank and postcode level.

b "Households" includes natural person households, sole proprietors, homeowner associations and other households. "Firms" includes NFCs.

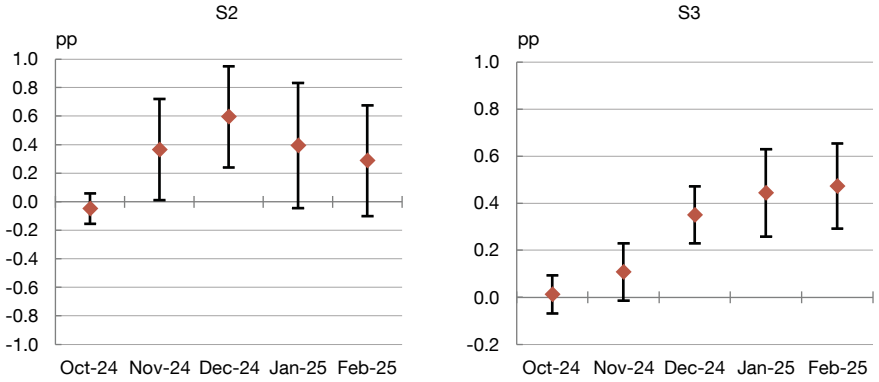
Chart A3.2

Impact of the flash floods on the proportion of firms and households with credit quality problems. Spain (a) (b)

A3.2.a Firms



A3.2.b Households



SOURCE: Authors' calculations, drawing on the CIRBE.

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b "Households" includes natural person households, sole proprietors, homeowner associations and other households. "Firms" includes NFCs.

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

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

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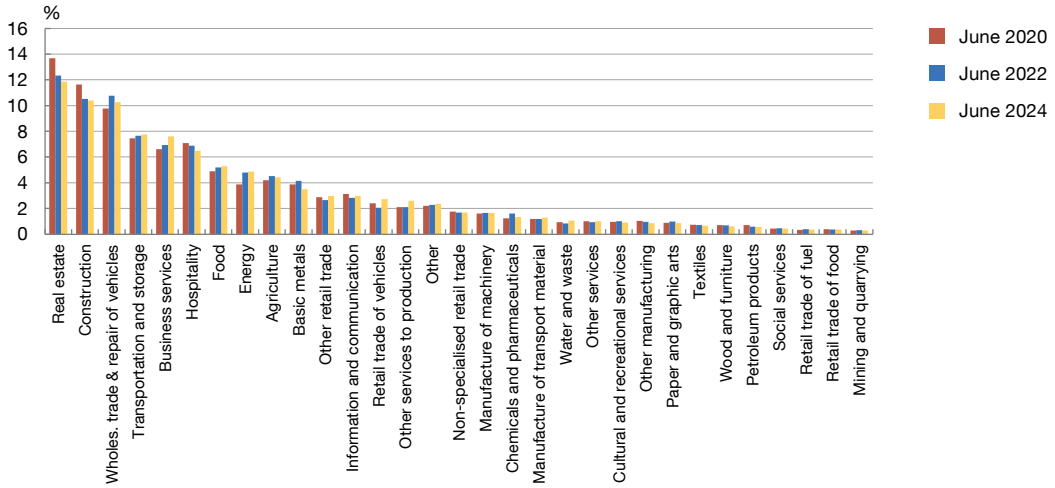
3 See, for example, Chart 2.3 of the Autumn 2021 *Financial Stability Report,* Chart 2.3 of the Autumn 2022 *Financial Stability Report,* Chart 2.4 of the Spring 2023 *Financial Stability Report* or Chart 2.3 of the Autumn 2024 *Financial Stability Report.*

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.

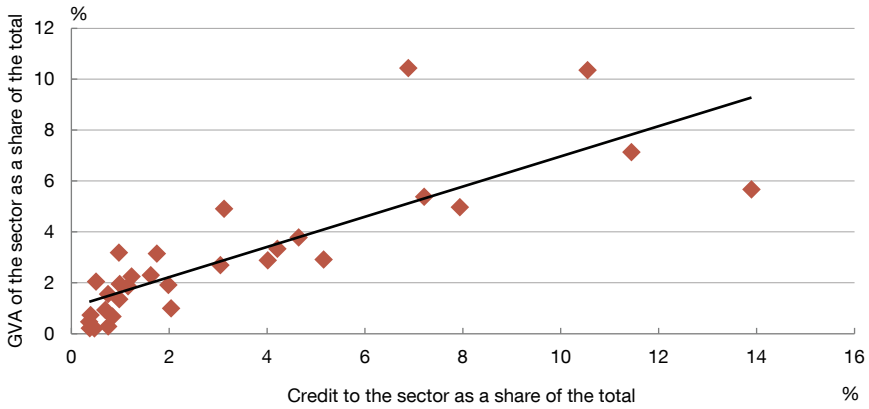
Chart 1

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.

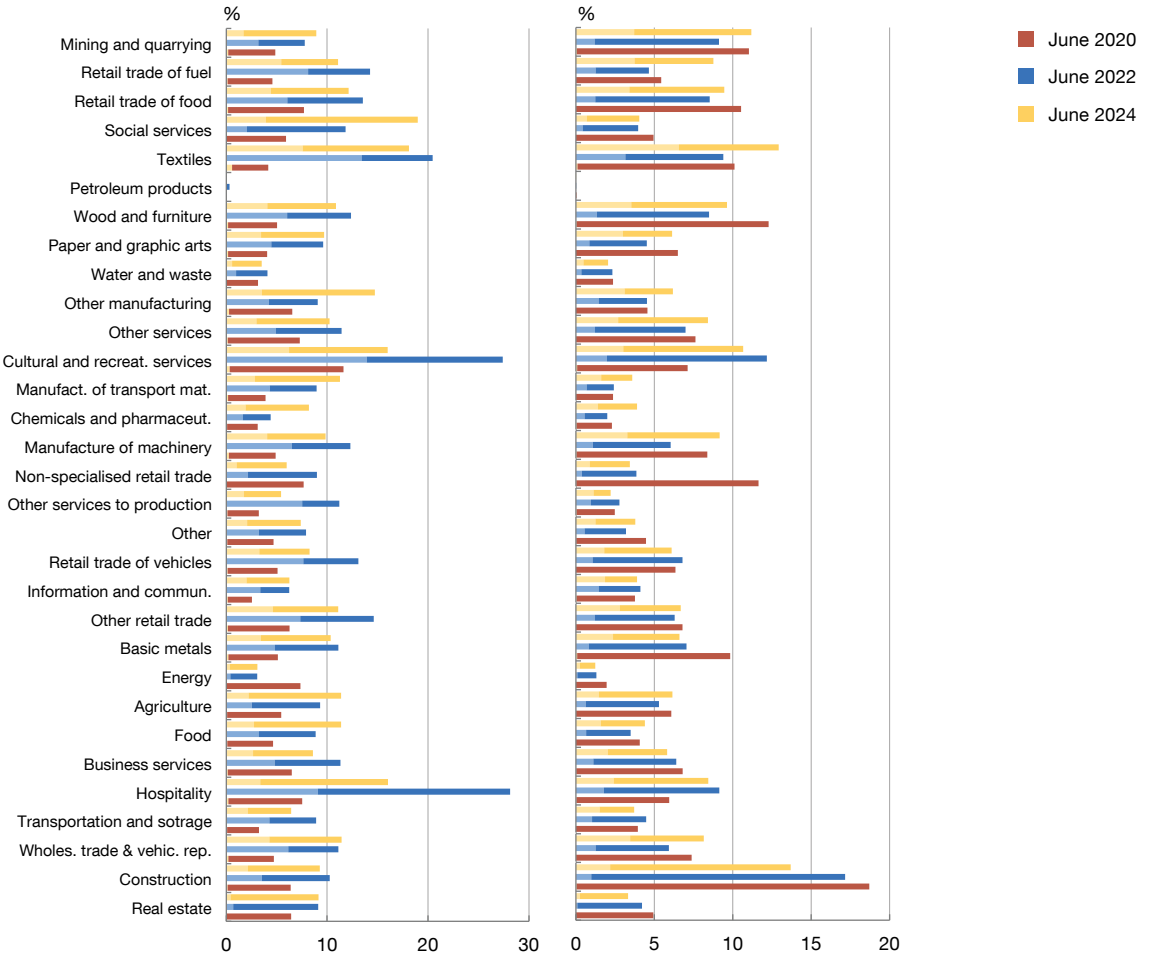
Some of this increase was corrected in the following two years, coinciding with the period of rising interest rates. Thus, the stage 2 ratio declined between June 2022 and June 2024 for 19 of the 31 sectors, although by markedly less than it had previously risen, with an average decrease of 1.2 pp and 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.*

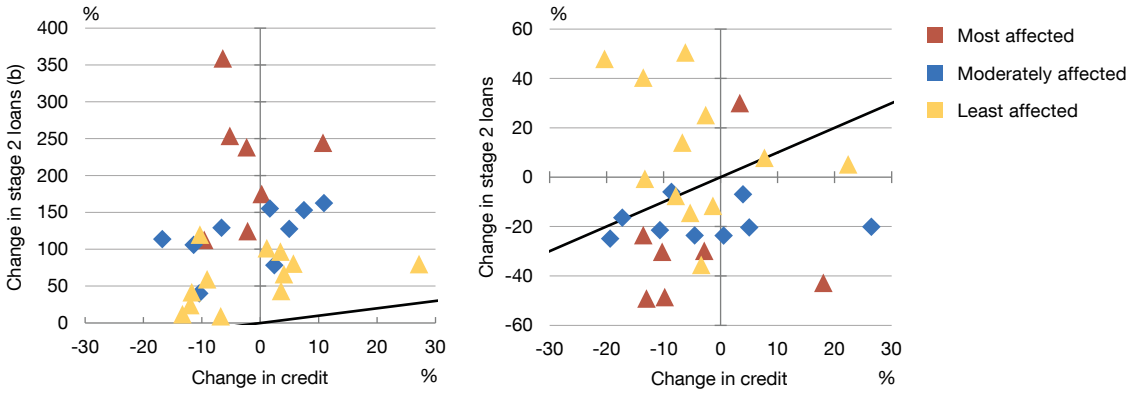
13 See, for example, Chart 1.7 of Banco de España (2021b).

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.

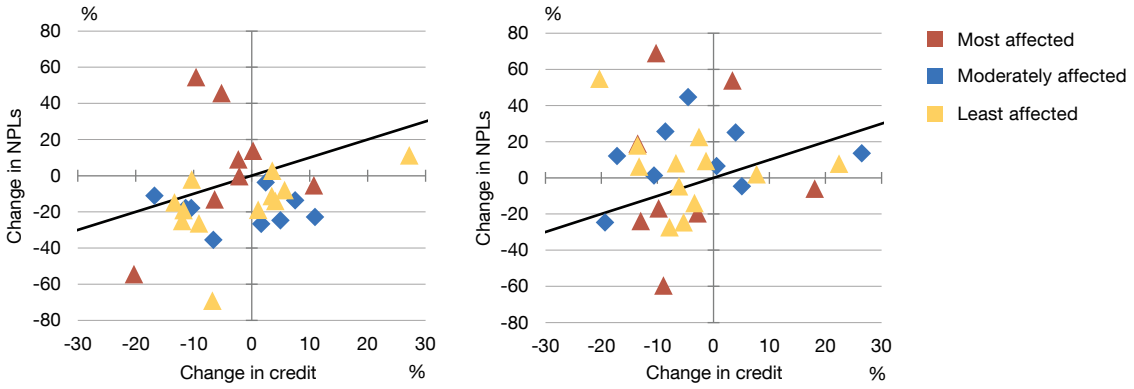
Chart 3

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.

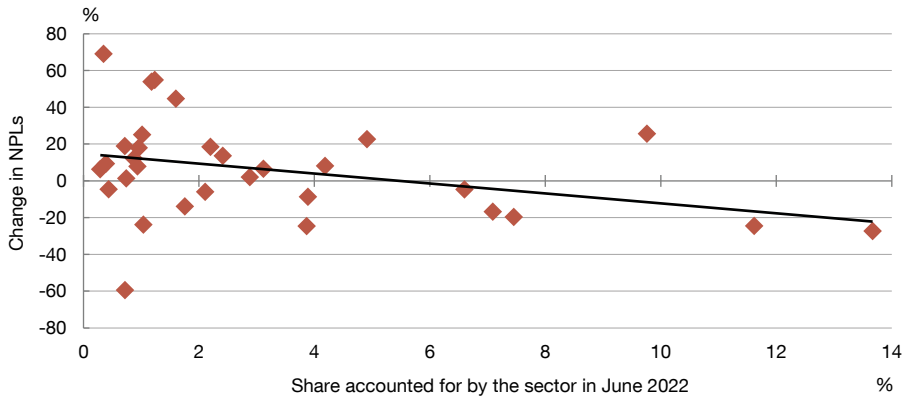
recovery of sales in the different sectors. Total credit declined for most sectors, pushing up stage 2 ratios in those sectors where stage 2 loans increased most.

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.

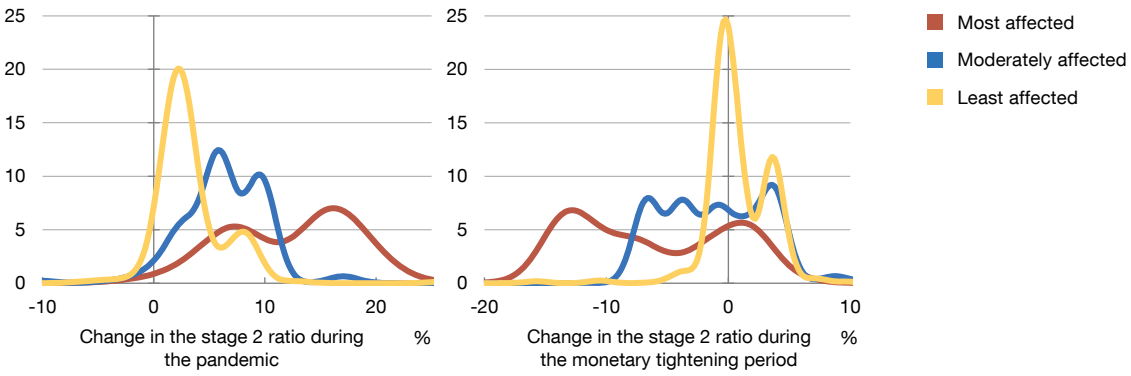
It is also important to analyse the degree of heterogeneity in the cross-bank distribution of the change in the stage 2 and NPL ratios for exposures to the sectors most and least affected by the pandemic. Chart 5.a shows that the increase in the stage 2 ratio during the pandemic was more homogeneous 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

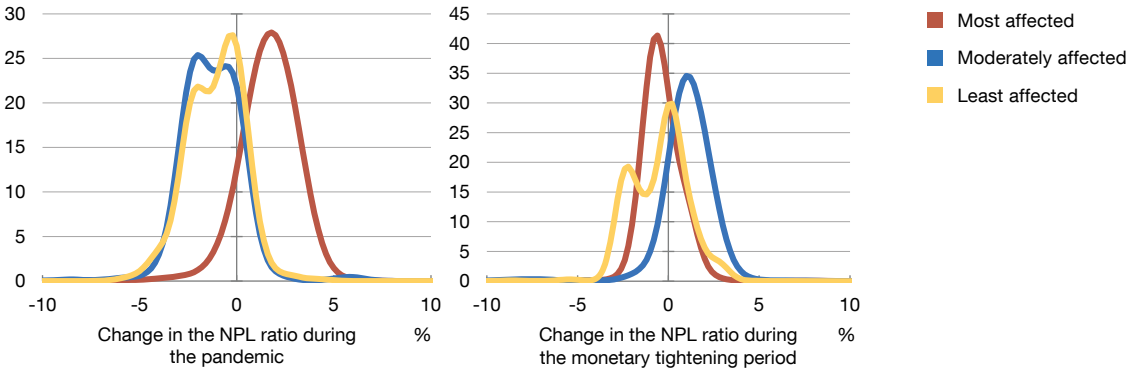
Chart 5

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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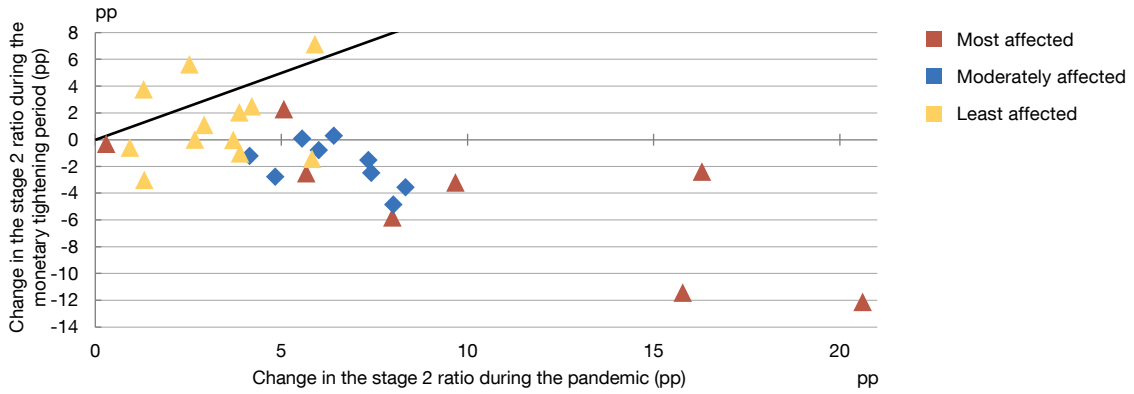
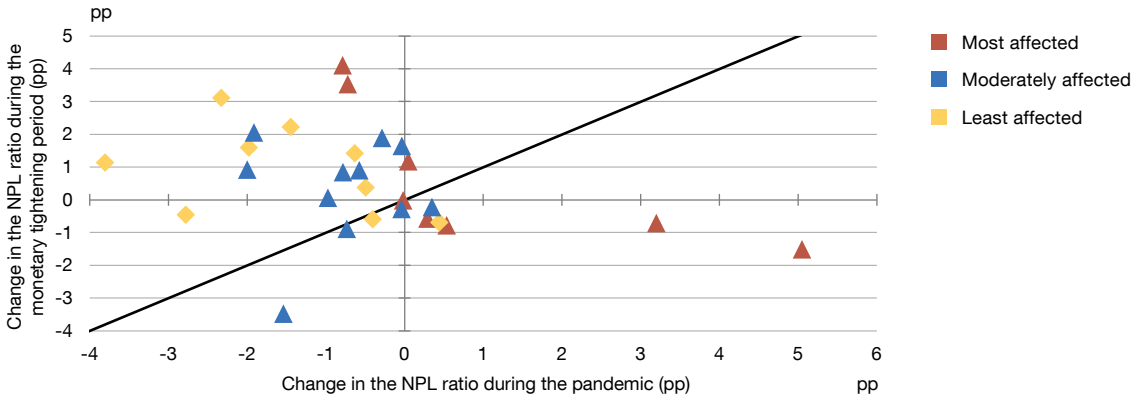
Chart A.1

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.

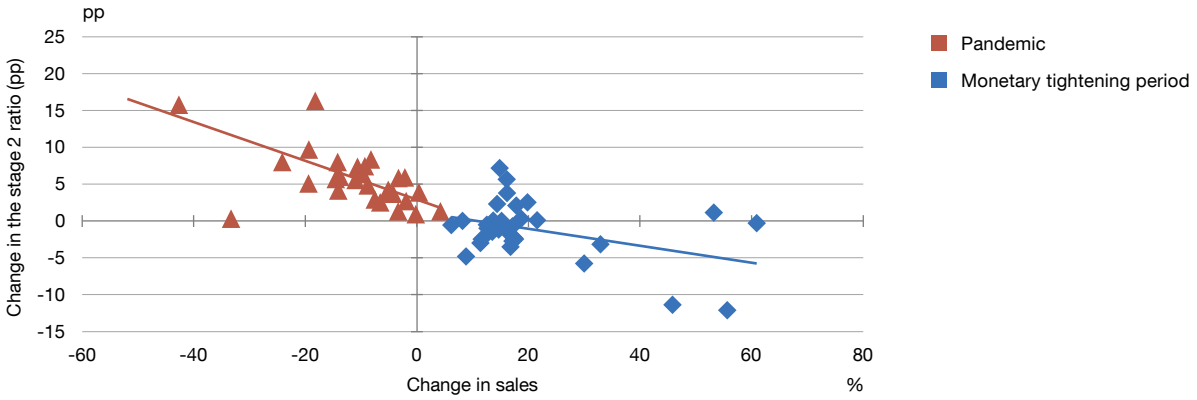
a Points below the diagonal line indicate rises (falls) in the stage 2 and NPL ratios during the pandemic that were higher (lower) than the rises (falls) in the stage 2 an NPL ratios during the monetary tightening period. The opposite is true for points above the diagonal line.

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).

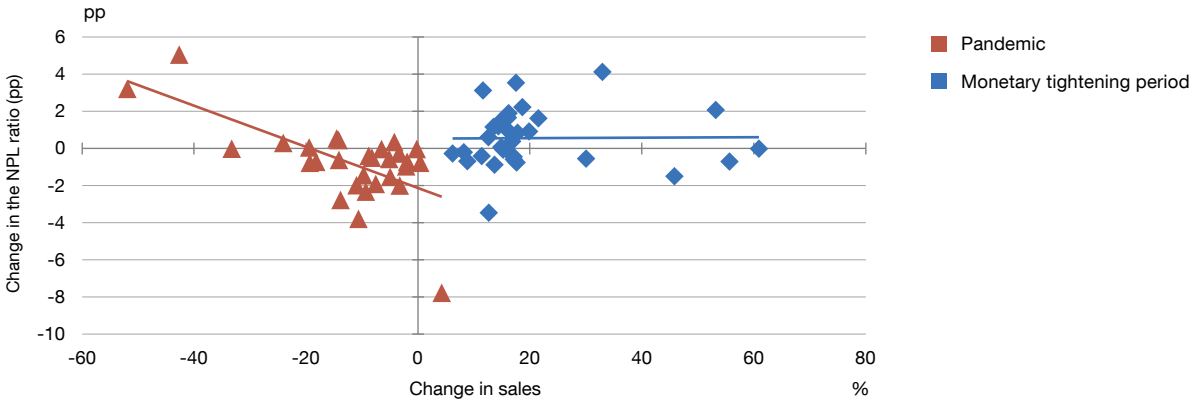
Chart A.2

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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THE EVOLUTION OF PAYMENT SERVICES AND THEIR REFLECTION IN EUROPEAN REGULATION

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THE EVOLUTION OF PAYMENT SERVICES AND THEIR REFLECTION IN EUROPEAN REGULATION

Abstract

This article elaborates on the definition of payment services contained in the European Union (EU) regulation on the matter (PSD2) and then sets forth the various interpretative issues that have arisen in relation to these definitions in recent years. This is followed by a brief description of the new developments related to the identification of payment services introduced by the European Commission's 2023 proposals for a new Payment Services Directive (PSD3) and a new Payment Services Regulation (PSR). Lastly, this article contains brief considerations on electronic money and on the electronic money services included in the PSD3 and PSR.

Keywords: payment services directive, cash deposit, cash withdrawal, payment account, execution of payment transactions, issuance of payment instruments, electronic money account, electronic money tokens.

1 Introduction

The regulation of payment services in the EU has evolved constantly, driven by the need to adapt to technological developments and the demands of consumers and businesses in an increasingly digitalised market.

The Payment Services Directive (PSD) adopted in 2007[1] established a harmonised framework for the creation of an integrated payments market in the EU; it included a list of payment services whose provision was restricted to certain providers; and it introduced a single authorisation for all providers not connected to deposit-taking or electronic money issuance seeking to provide payment services.

The Payment Services Directive adopted in 2015[2] (PSD2) added new payment services, such as account information and payment initiation, and facilitated the entry of new providers into the market, which promoted competition and innovation.

On 28 June 2023, the European Commission published a package of legislative proposals to modernise the regulation of payment services.[3] These include, inter alia, a new Payment Services Directive (PSD3) and a new Payment Services Regulation (PSR), both of which are

1 Directive 2007/64/EC of the European Parliament and of the Council of 13 November 2007 on payment services in the internal market amending Directives 97/7/EC, 2002/65/EC, 2005/60/EC and 2006/48/EC and repealing Directive 97/5/EC.

2 Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC.

3 Accessible at European Commission (2023a).

intended to replace the current framework contained in PSD2 and also in the 2009 Electronic Money Directive (EMD2).[4] These proposals represent a change with respect to the current regulatory framework. They respond, in no small measure, to the technological innovations that have arisen in the payments sector and that have contributed to offering new ways and solutions to facilitate and speed up payments.

The following sections offer a description of the evolution in the regulation of payment services in the EU in recent years. It starts with the current regulation, contained in PSD2, and describes the amendments proposed in PSD3 and PSR. It concludes with a brief reference to electronic money and electronic money services, the latter being regulated for the first time in PSD3 and PSR. The following Figure graphically illustrates the evolution of the regulation of payment services from PSD through PSD2 to PSD3 and PSR.

The following sections are, therefore, intended to reflect the current situation, the debate on the payment services environment and their foreseeable development in future European regulation. Insofar as these are issues that offer different margins for interpretation and are constantly evolving, this article is limited to the current state of play of this debate.

2 Payment services in PSD2

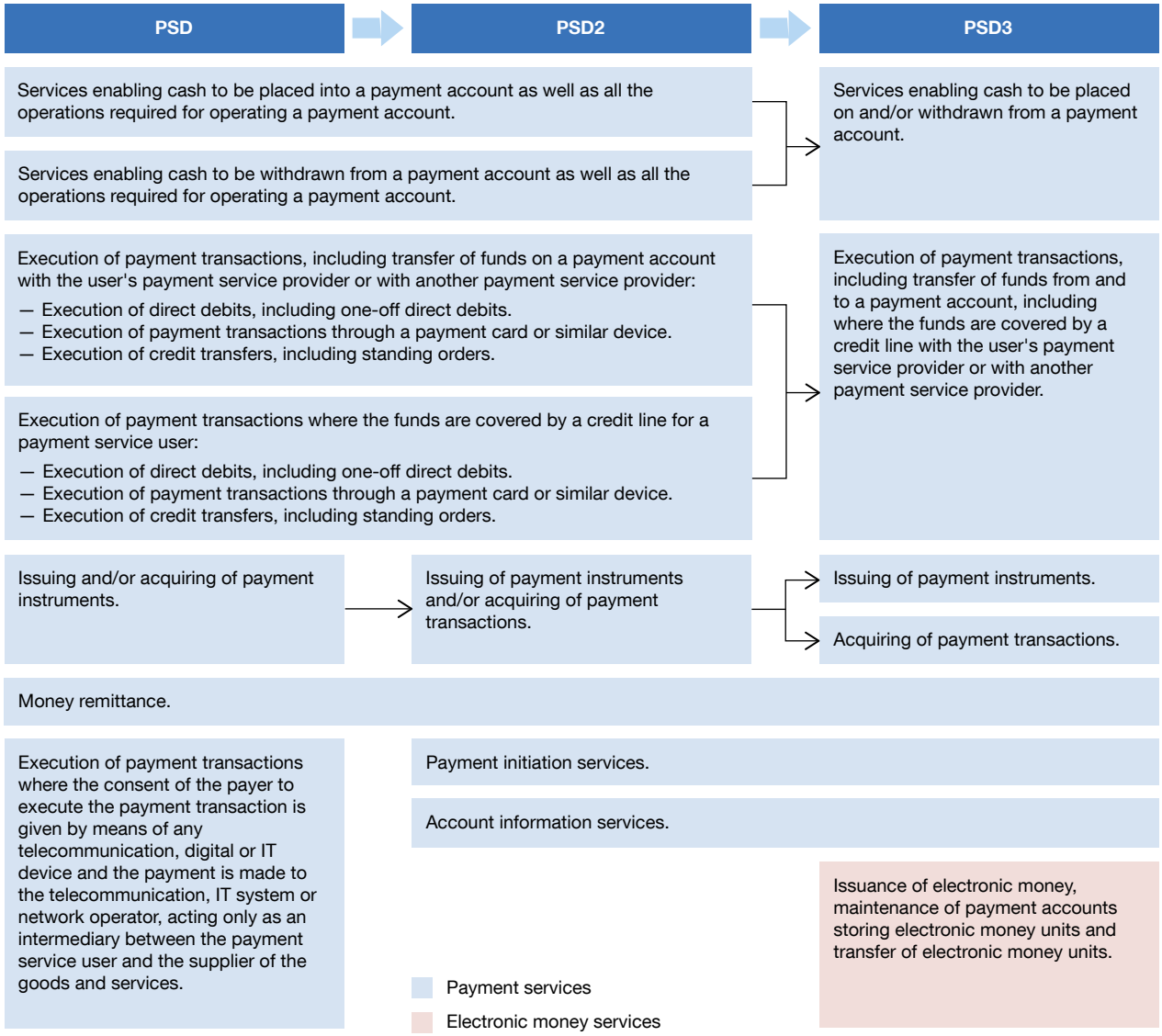
PSD2 defines payment services by reference to those listed in Annex I thereto (money remittance, credit transfers and acquiring of payment transactions, inter alia). This enumeration is uniform throughout the EU, so that Member States cannot maintain or introduce different payment services in the domestic legislation transposing PSD2. PSD2 does not, therefore, contain a general definition of what a payment service is. However, this has not prevented the Court of Justice of the European Union (CJEU) from finding that the activity of a payment institution which consists in receiving funds from a user of a payment service, where such funds are not immediately accompanied by a payment order and therefore remain available on a payment account operated by that payment institution, constitutes a payment service.[5]

The first two payment services mentioned in PSD2 are those which enable cash to be placed or withdrawn and, in both cases, all the operations required for operating a payment account. Neither cash deposit nor cash withdrawal are defined in PSD2. However, PSD2 provides guidance for outlining both services. A cash deposit would be an act, initiated by the service user, of placing funds into a payment account. A cash withdrawal would allow the service user to receive funds from a payment account to which an amount equivalent to the funds obtained is debited. In this case, his/her provider would not necessarily be the one managing the account to which the amount is debited. PSD2 recognises that there may be

4 Directive 2009/110/EC of the European Parliament and of the Council of 16 September 2009 on the taking up, pursuit and prudential supervision of the business of electronic money institutions amending Directives 2005/60/EC and 2006/48/EC and repealing Directive 2000/49/EC.

5 Court of Justice of the European Union (2024a), paragraph 52.

Figure 1
Evolution of payment services in European regulation



SOURCE: Banco de España calculations.

ATM cash withdrawal service providers which are not party to the framework contract with the consumer withdrawing cash from a payment account.

The concept of the payment account and the transactions necessary to operate it, which are mentioned in PSD2 together with cash deposit and cash withdrawal, have not had an uncontested interpretation in the EU. PSD2 defines a payment account as an account held in the name of one or more payment service users which is used for the execution of payment transactions. This definition has led to questions as to whether certain types of accounts, which could include electronic money accounts linked to prepaid cards, savings accounts, reference accounts or credit card accounts, could be considered payment

accounts.[6] In this respect, the CJEU has stated that if payment transactions cannot be made directly from the account in question, but the use of an intermediary account is necessary, the account is not a payment account.[7]

The interpretation of the transactions necessary for the operation of a payment account has also been controversial. On the one hand, there are questions as to whether such a transaction would be a distinct and separate payment service from services enabling cash to be placed or withdrawn, even though it is mentioned after both services. On the other hand, in certain EU Member States, opening and maintaining a payment account requires its provider to obtain authorisation as a payment institution to provide certain payment services, namely those provided for in paragraphs 1 ("Services enabling cash to be placed"), 2 ("Services enabling cash to be withdrawn") and 3 ("Execution of payment transactions", whether direct debits, payment card transactions or credit transfers) of Annex I to the PSD2. In other Member States, payment institutions do not require authorization with this scope to open and maintain payment accounts for users and to provide payment services to them.[8] This lack of clarity has led to the suggestion that the management of a payment account should not be considered a distinct or separate payment service whose provision alone requires an authorisation for the provision of payment services under paragraphs 1 and 2.

The third and fourth payment services consist of the execution of payment transactions, whether the funds are not covered by a credit line for a payment service user (third payment service) or they are covered (fourth payment service). The execution of payment transactions can take the form of direct debits, including one-off direct debits; payment transactions through a payment card or a similar device; or credit transfers, including standing orders. The distinction between these two payment services on the basis of whether or not the funds used for the execution of these payment transactions are covered by a credit line for a payment service user has been considered artificial and, therefore, unjustified, insofar as both services are identical in nature.[9]

Direct debit is a payment service for debiting a payer's payment account initiated by the payee on the basis of the consent given by the payer to the payee, to the payee's payment service provider or to the payer's own payment service provider. In a direct debit, the payer instructs the payee to initiate regular payments. Subsequent debits are initiated by the payee, without the involvement of the payer, which highlights the similarity of these transactions with card payment transactions initiated exclusively by the payee.[10] It is also worth noting that the CJEU has stated, on the basis of the PSD, that the absence of consent of the holder of the account

6 European Banking Authority (2022c), paragraph 29, p. 12, and European Commission (2023a), pp. 109-110. Difficulties in identifying payment accounts can already be found in studies on the 2007 Payment Services Directive. See London Economics, Institut für Finanzdienstleistungen and PaySys (2013), pp. 95-97.

7 Court of Justice of the European Union (2018), paragraphs 31 and 32. See also European Banking Authority (2021a).

8 European Banking Authority (2022c), paragraphs 10-13, pp. 9-10.

9 European Banking Authority (2022c), paragraphs 14-16, p. 10.

10 European Banking Authority (2019a).

to which the direct debit is debited does not exclude the qualification of the direct debit as a payment service.[11]

Credit transfer is a payment service for crediting a payee's payment account with a payment transaction or a series of payment transactions from a payer's payment account by the payment service provider which holds the payer's payment account, based on an instruction given by the payer.

The *execution of payment transactions through a card or similar device* is not defined in PSD2. The scope and content of this service are connected to the payment services of the issuing of payment instruments and the acquiring of payment transactions, which are referred to below.

The fifth payment service is the issuing of payment instruments and/or the acquiring of payment transactions. However, these are two different services. The *issuing of payment instruments* is a service by a payment service provider contracting to provide a payer with a payment instrument to initiate and process the payer's payment transactions. A payment instrument is a personalised device or set of procedures agreed between the payment service user and the payment service provider and used in order to initiate a payment order.

The issuing of payment instruments has been subject to various interpretations. On the one hand, questions have been raised as to whether the issuing of payment instruments would also include the execution of payment transactions with the issued payment instrument.[12] On the other hand, questions have been raised as to whether the issuer of the instrument should be the same as the party holding and managing the funds that are the subject of the payment transaction or whether it could be a different party.

The concept of the payment instrument has also generated debate as to its meaning and scope. The requirement that the payment instrument must be a personalised device has led to the argument that prepaid cards on which no identifier of the holder appears could not be considered as payment instruments.[13]

The CJEU has, furthermore, interpreted the scope of the concept of the payment instrument on several occasions. In particular, on the basis of PSD, which contained a definition substantially similar to the definition contained in PSD2, in 2014 the CJEU held that both the procedure for submitting credit transfer orders by means of a payment form with the payer's handwritten signature and the procedure for submitting credit transfer orders online constitute payment instruments.[14] Subsequently, in 2020, the CJEU concluded that, under PSD2, the *Near Field Communication* (NFC) functionality of a personalised multifunctional bank card, by means of which low-value payments are debited from the associated bank account,[15] also

11 Court of Justice of the European Union (2019b), paragraph 48.
12 European Banking Authority (2022c), paragraph 19, p. 11.
13 European Banking Authority (2022c), paragraph 38, p. 14.
14 Court of Justice of the European Union (2014), paragraph 44.
15 Court of Justice of the European Union (2020), paragraph 79.

constitutes a payment instrument. Lastly, in 2024, again on the basis of PSD, the CJEU held that a power of attorney, by which the holder of a bank account authorises an agent to make a disposal of assets, on that account, by means of a payment order, does not, in itself, constitute a payment instrument. However, a set of procedures, agreed between the holder of that account and the payment service provider, which allows the agent appointed in such a power of attorney to initiate a payment order from that account, may be classified as a payment instrument.[16]

Technological innovations have added further complexity to all of the above. This is due, in particular, to the tokenisation of payment instruments, understood as the creation of a value that replaces the payment instrument's *primary account number* (PAN) and serves to initiate a payment order. In view of the token's functionality and autonomy, the question arises as to whether this is merely the provision of a technical service by the creator of the token, or whether it is the issuance of a payment instrument and, therefore, the provision of a payment service.[17]

The acquiring of payment transactions is a payment service provided by a payment service provider contracting with a payee to accept and process payment transactions, which results in a transfer of funds to the payee. In Recital 10, PSD2 qualifies this definition as neutral in order to capture not only the traditional acquiring models structured around the use of payment cards, but also different business models, including those where more than one acquirer is involved. PSD2 also clarifies that technical services provided to payment service providers, such as the mere processing and storage of data or the operation of terminals, should not be considered to constitute acquiring. Lastly, it adds that some acquiring models do not provide for an actual transfer of funds by the acquirer to the payee because the parties may agree upon other forms of settlement.

EU law refers to this payment service as a chain of operations from the initiation of a card-based payment transaction to the transfer of the funds to the payment account of the payee.[18] The acquirer is actively involved in the process of ordering the payment, usually through payment order transmission, validation, etc.[19] As noted above, moreover, the acquiring of payment transactions does not require opening and maintaining payment accounts with the acquirer itself. The acquirer can, for example, merely create internal records, which are not considered payment accounts, in order to ascertain to whom and how many payments and repayments are to be made.[20]

The sixth payment service is money remittance. PSD2 defines it as a payment service where funds are received from a payer, without any payment accounts being created in the

16 Court of Justice of the European Union (2024b), paragraph 47.

17 European Banking Authority (2022c), paragraphs 35 and 85, pp. 13 and 24; Haut Comité Juridique de la Place financière de Paris (2023), p. 66; and European Commission (2023a), p. 104.

18 Paragraph 30 of Regulation (EU) 2015/751 of the European Parliament and of the Council of 29 April 2015 on interchange fees for card-based payment transactions.

19 London Economics, Institut für Finanzdienstleistungen and PaySys (2013), p. 102.

20 European Banking Authority (2022b).

name of the payer or the payee, for the sole purpose of transferring a corresponding amount to a payee or to another payment service provider acting on behalf of the payee, or where such funds are received on behalf and made available to the payee. Recital 9 of PSD2 connects this service to the service provided by supermarkets, merchants and other retailers to the public enabling them to pay utilities and other regular household bills.

As noted above, the money remittance service provider does not operate any payment account for either the payer or the payee This conclusion has not, however, done away with the advisability of clarifying whether a money remittance service (rather than the execution of a credit transfer) is involved where the transfer of funds is initiated from a payer's account held with a payment service provider other than the one providing the money remittance, to a payee who does not hold a payment account, or where the payer, who does not hold a payment account, initiates the transfer of funds to the payee's payment account held at a payment service provider other than the one providing the money remittance service.[21]

The seventh payment service in PSD2 is payment initiation. PSD2 defines it as a payment service to initiate a payment order at the request of the payment service user with respect to a payment account held at another payment service provider. This service emerges as a payment solution that enables the initiation of transfers to merchants for consumers to pay for the online purchase of goods and services.[22] Along these lines, Recital 27 of PSD2 states that the payment initiation service plays a part in e-commerce payments by establishing a software bridge between the website of the merchant and the online banking platform of the payer's *Account Servicing Payment Service Provider* (ASPSP) in order to initiate internet payments on the basis of a credit transfer. According to Recital 29, payment initiation services enable the payment initiation service provider to provide comfort to a payee that the payment has been initiated in order to provide an incentive to the payee to release the goods or deliver the service without undue delay. Such services offer a low-cost solution for both merchants and consumers and provide consumers with a possibility to shop online even if they do not possess payment cards.

As can be seen, the background to the payment initiation service and the cited PSD2 Recitals link this service directly to e-commerce. However, no such direct link exists in the regulation of this service. The payment initiation service has been regulated more broadly. This has led to questions as to the characteristic element that would enable their identification, and the sending of a payment order from the service user to the ASPSP[23] has been highlighted as such. Distinguishing this service from the service provided by certain companies that virtually replicate a payment instrument (token) may not be straightforward, insofar as these companies control the technical process of initiating the payment order and authenticating the user.[24]

PSD2 provides that the payer of a payment transaction has the right to make use of a payment initiation service provider (PISP) as long as the relevant payment account is accessible online.

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21 European Banking Authority (2022c), paragraph 8, p. 9.

22 London Economics, Institut für Finanzdienstleistungen and PaySys (2013), p. 105.

23 Haut Comité Juridique de la Place financière de Paris (2023), pp. 71-75.

24 Haut Comité Juridique de la Place financière de Paris (2023), p. 66, and European Commission (2023a), p. 104.

The PISP can initiate the same payment transactions that the ASPSP offers to its own customers, such as instant payments, batch payments, recurring transactions, international payments or future-dated payments.[25] Furthermore, if the ASPSP allows the payment service user to initiate payment transactions —through the ASPSP's browser environment or a mobile banking app of the ASPSP— using different unique identifiers (including national bank account numbers or IBAN), the user should have the right to initiate the same payment transactions through a PISP by using the same unique identifiers. This should apply regardless of the type of interface used by the PISP to securely communicate with the ASPSP, i.e. a dedicated interface, or the interface used by the ASPSP for authentication and communication with its users.[26]

However, in the view of the European Banking Authority, the conclusion would be different for mobile payments that rely on a mobile phone number as a proxy for the payee's unique identifier, such as an IBAN. Such mobile payments entail an additional service (the use of the payee's mobile number as a proxy for the payee's unique identifier) that is offered by the ASPSP to its users complementary to the underlying transaction that is a conventional transaction, such as a credit transfer. Such additional service is often based on contractual agreements between ASPSPs and a third party operating and maintaining these solutions, including the database of phone numbers. Whilst the ASPSP should enable PISPs to initiate the underlying transactions, PSD2 does not require ASPSPs to allow PISPs to initiate mobile phone transactions of the kind described above. However, market participants can agree to allow PISPs to initiate such transactions, on an industry-wide or a bilateral contractual basis.[27]

Lastly, the provision of the payment initiation service is not dependent on the existence of a contractual relationship between the PISP and the ASPSP for this purpose. However, this does not prevent both providers from entering into agreements. In this regard, certain providers initiate payment orders using secure corporate payment procedures and protocols available to payers that are not consumers and that are based on specific, often bilateral, agreements with the ASPSPs for the provision of those services through a custom-built IT system. In relation to these business models, it has been considered that they would not carry the same level of risk and that, in these cases, it would not be justified for the services provided under such an arrangement to be included within the scope of the payment initiation service.[28]

The last payment service covered by PSD2 is the account information service. This is an online service to provide consolidated information on one or more payment accounts held by the Payment Service User, either with another payment service provider or with more than one payment service provider. This service therefore allows the Payment Service User to have an overall view of its financial situation immediately at any given moment. However, it is not necessary that its provider (AISP) provides the consolidated information to the user in order to

25 European Banking Authority (2018), paragraph 29, p. 6, and European Banking Authority (2022a).

26 European Banking Authority (2021b).

27 European Banking Authority (2021b).

28 European Banking Authority (2022c), paragraphs 21 and 22, p. 11. On this issue, see European Banking Authority (2019b).

identify this service, as the AISP may transmit it to a third party with the user's explicit consent.[29]

3 Regulation of payment services in the European Commission's 2023 legislative package

On 28 June 2023, the European Commission published several legislative proposals to modernise the regulation of payment services. These proposals include a new Payment Services Directive (PSD3) and a new Payment Services Regulation (PSR). These proposals are intended to introduce certain new features to the payment services listed in PSD2 and briefly described in the previous section.

The first payment service mentioned is identified as the service enabling cash to be placed on and/or withdrawn from a payment account. As is already the case in PSD2, these two services remain undefined in PSD3 and PSR. Since they are similar in nature, as they require the use of cash, the two services (cash deposit and cash withdrawal) have been grouped together in a single payment service.[30] However, the reference in PSD2 to the performance of all the operations required for operating a payment account has been removed. Recital 7 of PSD3 and Recital 8 of PSR note in this respect that it is appropriate to separate the service of withdrawing cash from a payment account from the activity of servicing a payment account, as the providers of cash withdrawal service providers do not necessarily service payment accounts.

In relation to the latter issue, the definition of a payment account is amended, in line with the CJEU (in its judgment of 4 October 2018). A payment account is defined as an account at a payment service provider in the name of one or more payment service users which is used for the execution of one or more payment transactions and allows for sending and receiving funds to and from third parties. Thus, if payment transactions cannot be executed directly from the account in question, but require the use of an intermediate account, that account is not a payment account. Recital 9 of PSD3 and Recital 20 of PSR specify in this respect that savings accounts are excluded from the definition of payment accounts.

The second payment service mentioned is the execution of payment transactions, including transfers of funds from and to a payment account, including where the funds are covered by a credit line with the user's payment service provider or with another payment service provider. The distinction in PSD2 between two payment services on the basis of whether or not the funds used for the execution of payment transactions are covered by a credit line for a payment service user is therefore eliminated. The separate reference to direct debit, credit transfer and execution of payment transactions through a payment card or similar device is also removed from the identification of this payment service.

29 European Banking Authority (2019c).

30 European Banking Authority (2022c), paragraph 13, p. 10.

The definitions of direct debit and credit transfer remain substantially similar to those in PSD2, albeit with certain differences worth noting. Direct debit is defined as a payment service for debiting a payer's payment account, where a payment transaction is initiated by the payee on the basis of a mandate (in PSD2 it is consent) given by the payer to the payee, to the payee's payment service provider or to the payer's own payment service provider.[31] Transfer is defined in the same way as in PSD2, but it is added that this payment service includes instant credit transfers, i.e. credit transfers which are executed immediately, regardless of the day and time, in line with the regulation of such credit transfers published in 2024.[32] Instant credit transfers are, therefore, a type of credit transfer.

The third payment service is the issuing of payment instruments. This retains its definition as a payment service by a payment service provider contracting to provide a payer with a payment instrument to initiate and process the payer's payment transactions. However, the definition of payment instrument is amended. The payment instrument is an individualised device or devices (in PSD2 it is personalised) and/or set of procedures agreed between the payment service user and the payment service provider which enables the initiation of a payment order. Recital 12 of PSD3 and Recital 23 of PSR state that, since there are pre-paid cards where the name of the holder of the instrument is not printed on the card, the identification of a payment instrument as a personalised device could leave those cards outside this definition. The replacement of the qualifier "personalised" by "individualised" is intended to avoid this result.

Recital 11 of PSD3 and Recital 22 of PSR also clarify that the NFC functionality of a card, which enables payments to be made, is not a payment instrument, but rather a functionality of a payment instrument. This addresses the criticisms levelled in relation to the conclusions reached by the CJEU in its judgment of 11 November 2020, which considered the NFC functionality to be a payment instrument. Given that this qualification gives rise to interpretation problems regarding the payment services regulation, while this NFC functionality can be considered, rather, as a means of communication between the POS terminal and the card, PSD3 and PSR opt to exclude this NFC functionality from the qualification as a payment instrument.[33]

Lastly, with regard to payment instruments, Recital 13 of PSD3 and Recital 24 of PSR also distinguish between *pass-through wallets* and *staged wallets.* The former involve the tokenisation of an existing payment instrument, e.g. a payment card. They are not payment instruments, but rather payment applications, i.e. computer software or equivalent loaded on a device enabling card-based payment transactions to be initiated and allowing the payer to issue payment orders.[34] Their creation is considered a technical service and not the issuing of

31 PSR defines the mandate as the expression of authorisation given by the payer to the payee and, directly or indirectly through the payee, to the payer's payment service provider, allowing the payee to initiate a payment transaction for debiting the payer's specified payment account and to allow the payer's payment service provider to comply with such instructions.

32 Regulation (EU) 2024/886 of the European Parliament and of the Council of 13 March 2024 amending Regulations (EU) No 260/2012 and (EU) 2021/1230 and Directives 98/26/EC and (EU) 2015/2366 as regards instant credit transfers in euro.

33 European Banking Authority (2022c), paragraph 36, p. 14; European Commission (2023a), p. 112, and Haut Comité Juridique de la Place financière de Paris (2023), p. 70.

34 Article 2(21) of Regulation (EU) 2015/751.

a payment instrument. Staged wallets are prepaid electronic wallets where funds are stored for future online transactions. They are considered as payment instruments and their creation is an issuing of a payment instrument.

The fourth payment service is the acquiring of payment transactions. This service is separate from the issuing of payment instruments, but retains the same definition, i.e. a payment service provided by a payment service provider contracting with a payee to accept and process payment transactions, which results in a transfer of funds to the payee.

The fifth payment service is money remittance. It is defined in much the same way as in PSD2. It is a payment service that enables funds to be received from a payer without any payment account being created in the name of the payer or the payee, for the sole purpose of transferring a corresponding amount to a payee or to another payment service provider acting on behalf of the payee, or receiving funds on behalf of the payee and making them available to the payee. Along the same lines as Recital 9 of PSD2, both Recital 14 of PSD3 and Recital 27 of PSR state that in some EU Member States, supermarkets, merchants and other retailers provide a service to the public enabling them to pay utilities and other regular household bills. These services should be treated as money remittance.

However, it does not contain any indication as to whether it is a money remittance service (as opposed to the execution of a credit transfer) when the remittance of funds is initiated from an account of the payer held at a payment service provider other than the one providing the money remittance, to a payee that does not have a payment account; or when the payer, which does not have a payment account, initiates the remittance of funds to the payment account of the payee held at a payment service provider other than the one providing the money remittance.

The sixth payment service is payment initiation. Its definition differs with respect to the identification of this service in PSD2. Payment initiation service is defined as a service consisting of placing[35] a payment order at the request of the payer or the payee (in PSD2 it is at the request of the payment service user) with respect to a payment account held at another payment service provider.

It seems to follow from PSD3 and PSR that the payment initiation service can be provided to the payer, but also exclusively to the payee. This interpretation is supported in Recital 54 and Article 36(4)(a) of PSR, which acknowledge that a PISP may instruct a direct debit to an ASPSP, i.e. a payment transaction which, by the very definition of the debit, is initiated by the payee. However, it should also be noted that the payee can only initiate a debit if it has the consent (in PSD2) or mandate (in PSR and PSD3) of the payer. In view of the latter, the question arises as to whether the payment initiation service can be defined as a service in the absence of any involvement of the payer.

35 In PSD2, the term is "*initiate*".

The seventh and last payment service is the account information service. Like payment initiation, this service also differs with respect to PSD2. PSR notes the existence of business models where the AISP provides aggregated information on a consumer's payment account to a third party in order for the third party to provide other services (e.g. credit, evaluation of creditworthiness) to that consumer using these data. In view of these business models, PSR considers it necessary to clarify that the information aggregated by the AISP may be transmitted to a third party to enable that third party to provide another service to the user, with the user's permission. The account information service is thus defined as an online service of collecting, either directly or through a technical service provider, and consolidating information held on one or more payment accounts of a payment service user with one or more account servicing payment service providers.

4 Electronic money and electronic money services

Electronic money is not regulated in PSD2, but in EMD2. It is defined as electronically, including magnetically, stored monetary value as represented by a claim on the issuer which is issued on receipt of funds for the purpose of making payment transactions, as defined in PSD2, and which is accepted by a natural or legal person other than the electronic money issuer. Electronic money is not a payment service, a deposit or a debt security. It is a monetary asset separate from the funds received,[36] which, according to Recital 13 of the EMD2, is a surrogate for coins and banknotes for use as a means of payment.

PSD2 and EMD2 do not define electronic money services. The issuance of electronic money and electronic money distribution and redeemability do not qualify as **electronic money services**, nor do electronic money payment transactions. These transactions are payment services which, where applicable, are linked to the issuance of electronic money if the provision of these services triggers the issuance or redemption of electronic money in a single payment transaction.[37] The fact that electronic money payment transactions involve the use of electronic money accounts —a figure which is covered by Recital 8 of EMD2 but has no definition of its own distinct from that of the payment account— does not alter the above conclusions. Rather, this raises the question as to the justification for maintaining a regulatory separation between electronic money accounts and payment accounts.[38]

In this situation, PSR and PSD3 opt for an approach in which electronic money and certain related activities are incorporated into payment services legislation. Electronic money retains its definition as an electronically, including magnetically, stored monetary value as represented by a claim on the issuer which is issued on receipt of funds for the purpose of making payment transactions and which is accepted by other natural or legal persons than the issuer of electronic money. Electronic money accounts, however, are not mentioned.

36 Court of Justice of the European Union (2024a), paragraphs 47 and 48.
37 Court of Justice of the European Union (2019a), paragraph 30.
38 European Banking Authority (2022c), paragraph 100, p. 27.

Also, PSR and PSD3 identify electronic money services separately from payment services. Electronic money services are the issuance of electronic money, the maintenance of payment accounts storing electronic money units and the transfer of electronic money units. However, these services are not individually defined. In addition, the redemption of electronic money is not included among electronic money services, which may give rise to certain critical considerations, since the issuance of electronic money unconditionally and automatically confers entitlement to redemption.[39] The European Central Bank has pointed out in this respect that the definition of electronic money services should be revised to include the withdrawal and redemption of electronic money, but only to the extent that these are not part of the payment transaction itself.[40]

Lastly, PSD3 and PSR take into account Electronic Money Tokens (EMTs) regulated in the Markets in Crypto-Assets Regulation (MiCAR).[41] MiCAR defines EMTs as a type of crypto-asset that, in order to maintain a stable value, is referenced to the value of one official currency. MiCAR subsequently states that EMTs shall be deemed to be electronic money. On this basis, EMTs are included, as electronic money, in the definition of funds (Recital 16 of PSD3 and Recital 29 of PSR). The PSD3 and PSR impact assessment report further adds that payment transactions using EMTs would be considered as falling within the scope of payment services regulation, and this latter issue has still to be clarified definitively.[42]

5 Conclusions

PSD3 and PSR represent an evolution in, and an update of, the regulation of payment services. Payment services are not substantially altered. The identification of certain payment services remains essentially unchanged (e.g. money remittance and the deposit and withdrawal of cash from a payment account). The definition of other payment services undergoes some change, mainly due to the emergence of different business models (account information) or technological innovations (issuance of payment instruments).

Notably, PSD3 and PSR incorporate electronic money into payment services legislation and regulate electronic money services for the first time. The definition of electronic money remains unchanged, while (new) electronic money services are identified with the issuance and holding of payment accounts storing electronic money units and the transfer of electronic money units. Any mention of electronic money accounts disappears. Lastly, PSD3 and PSR include EMTs, as electronic money, in the definition of funds.

39 Court of Justice of the European Union (2019a), paragraph 28.

40 European Central Bank (2024), paragraph 6.1.1.

41 Regulation (EU) 2023/1114 of the European Parliament and of the Council of 31 May 2023 on markets in crypto-assets, and amending Regulations (EU) No 1093/2010 and (EU) No 1095/2010 and Directives 2013/36/EU and (EU) 2019/1937.

42 European Commission (2023c), pp. 56, 172-173.

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A MAP OF THE SPANISH FINANCIAL SYSTEM: A TOOL FOR ANALYSING INTERCONNECTEDNESS AND STRESS TRANSMISSION CHANNELS

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A MAP OF THE SPANISH FINANCIAL SYSTEM: A TOOL FOR INTERCONNECTEDNESS AND STRESS TRANSMISSION CHANNELS ANALYSIS

Abstract

Following the methodology in Andersen and Sánchez Serrano (2024), this article presents a map of the Spanish financial system as at June 2024. The study shows banks' pivotal role in the Spanish economy, channelling savings from households into loans to the real economy. The non-bank financial sector, encompassing investment funds, money market funds, other financial institutions, pension funds and insurance corporations, appears to play a lesser role in Spain than in the euro area as a whole. One finding of the study refers to the role of the rest of the world in the Spanish economy, be it as investor in financial markets (it is the main investor in corporate and government bond markets and in listed shares) or as a channel for the investment of savings, mainly through investment fund shares. Looking at data for the International Investment Position, investment fund shares predominantly explain Spanish residents' exposures to funds domiciled in Ireland and Luxembourg. Developing these maps is useful to understand interconnectedness and potential transmission channels of stress, whether originating inside the country or elsewhere.

Keywords: interconnections, sectoral accounts, banking, financial stability.

1 Introduction

In advanced economies, the financial system has grown in importance and complexity in recent decades, with a greater role played by non-bank financial institutions, an increase in cross-border transactions and a growing number of interconnections between institutions. The financial system's traditional role of channelling savings from the real economy – households and non-financial corporations (NFCs) – into lending opportunities has been complemented by a wide range of new business models (such as passive investment funds) and new financial products (such as securitisation). Moreover, the development of information technologies has increased the speed and frequency of communications, also contributing to today's interconnected financial system.

Following the methodology in Andersen and Sánchez Serrano (2024), a map of the Spanish financial system is built using primarily data from the European Central Bank (ECB) (Quarterly Sectoral Accounts, QSA). The map shows the cross-sectoral interconnections and exposures, albeit at a high level of aggregation. Balance sheet structures and interconnections are key to identifying contagion channels of financial stress. Although it is beyond the scope of this article, the map can also be used to analyse trends in bilateral positions over time and could even be useful to answer more restricted "research questions".[1]

1 For example, the extent to which financial flows from the rest of the world contributed to the large increase in bank credit in the years leading up to the global financial crisis.

Using national accounts, including flow of funds data and QSA, to understand interconnectedness is not new. A first reference is Castrén and Kavonius (2009), who use flow of funds data to create a sector-level network of the financial system's bilateral balance sheet exposures. Pozsar, Adrian, Ashcroft and Boesky (2010) provide a detailed overview of the US shadow banking system and its interaction with banks and broker dealers during the global financial crisis. In this seminal work, they explain how developments, exposures and imbalances in that system triggered the global financial crisis. Moving to the UK, Burrows, Cummings and Low (2015) use national accounts, complemented by other national data sources, to produce a map of the UK financial system. They conclude with a set of recommendations to enrich the flow of funds data and compile new statistics on debt exposures. More recently, Acharya, Cetorelli and Tuckman (2024) use expanded data from the US financial accounts to investigate the links between banks and non-banks, focusing on the transformation of risks between the two sectors. Mouakil, Heipertz, Stojanovic and Guinouard (2024) discuss interconnections in the French financial system using the methodology in Andersen and Sánchez Serrano (2024), while Saldias (2025) looks at the interconnections in the Portuguese financial system using the whom-to-whom accounts for Portugal. This article is thus close to Mouakil, Heipertz, Stojanovic and Guinouard (2024) and Saldias (2025).

This article is organised as follows. The next section discusses the methodology used to build the map, highlighting where it departs from the methodology in Andersen and Sánchez Serrano (2024). The subsequent two sections present the balance sheet of Spanish financial institutions and the main interlinkages with other institutional sectors (particularly with the real economy). A description is then provided of the main issuers and investors in the corporate and government bond markets and listed shares market. Next, the aggregate of the rest of the world is analysed more closely to identify Spain's main counterpart countries. The last section concludes.

2 Methodological considerations

This study applies the methodology developed by Andersen and Sánchez Serrano (2024) to obtain the necessary data points to build the map of the Spanish financial system. The approach provides a solid starting point for this analysis, as it is based on datasets (mainly the QSA) provided by the ECB, with sound methodologies and data quality. All data points are on a non-consolidated basis, so intragroup exposures across sectors and between Spanish residents and the rest of the world are included in the map. There are, however, some differences which are explained in the following paragraphs.

First, no data are used from EMIR or the Securities Financing Transactions (SFT) database on derivatives and repos, respectively. There are two main reasons for this, one conceptual and the other practical. On the conceptual side, the methodologies in EMIR and SFT are rather different to those in the QSA, thus limiting the comparability of the data with those in this analysis. Besides, these activities have a strong cross-country component and getting the aggregates for Spanish

institutions is not straightforward, particularly for large banking groups operating in several euro area countries (one question, for instance, is whether or not the map should include derivatives reported by a subsidiary of a Spanish bank in another EU country). On these grounds, it has been decided to exclude them from the map of the Spanish financial system.

Second, given the ECB's monetary policy function for the euro area as a whole,[2] the central bank's full balance sheet is not included in the map of the Spanish financial system.[3] It would be technically possible, albeit not straightforward, to create a "central bank sector" for the Spanish financial system (probably comprising the Banco de España's balance sheet and the proportional share of the ECB's balance sheet). However, the central bank's balance sheet is not the focus of this article. Indeed, the central bank is only considered when looking at the main investors in government and corporate bond markets, where it has been playing a pivotal role since 2015. In this case, its government and corporate bond holdings are indirectly computed as the difference between the total holdings of monetary financial institutions, as reported to the ECB whom-to-whom accounts, and the holdings of banks and money market funds (MMFs).

Related to this, the computations of the main items on the banks' balance sheet have been slightly changed. Exposures between banks and the central bank in the form of deposits could not be adequately captured in whom-to-whom data, creating issues when computing the banking sector's balance sheet. Therefore, instead of using whom-to-whom data and then discounting the amounts attributed to the central bank and MMFs, data on Spanish deposit-taking financial corporations (link) have been used to compute the total amount of deposits in the balance sheet of the Spanish banking sector.[4] The underlying methodologies of these two datasets are broadly aligned, so this should not have substantially impacted the analysis.

Third, there is an important consideration to be made about the rest of the world sector. In the case of the Spanish economy, this sector comprises countries both within and outside the euro area. As a result, some of the computations used in Andersen and Sánchez Serrano (2024) had to be changed as they covered only exposures outside the euro area. This mainly affected the insurance corporation and pension fund sectors.

In relation to the previous point, data for the International Investment Position (IIP) of Spain (compiled by Eurostat) have been used to deepen the analysis of the rest of the world sector. The IIP offers a breakdown of assets and liabilities with the rest of the world by country that is not available in the QSA (which only contain an aggregate for the rest of the world). In general, the provisions of the European System of Accounts 2010 (ESA 2010), which serves as the

2 The euro area comprises 20 EU Member States: Austria, Belgium, Croatia, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Portugal, Slovakia, Slovenia and Spain.

3 In a strict sense, then, the map is incomplete as it does not offer the financial flows and the balance sheet of the central bank.

4 Deposit-taking corporations (defined as financial institutions primarily engaged in financial intermediation and whose activities consist of receiving deposits and/or close substitutes and granting loans and/or investing in securities on their own account) are, with minor exceptions (such as e-money institutions), banks.

basis for the preparation of the QSA, and the 6th Edition of the Balance of Payments and IIP Manual (BPM6) should ensure comparability and consistency between the rest of the world sector in national accounts and in balance of payments statistics. While discrepancies are still possible, an analysis by Eurostat and the ECB shows that they tend to be minor (Eurostat, 2024).[5]

3 Balance sheet of the Spanish financial system's main sectors

The analysis starts with an overview of the balance sheet for the Spanish financial system's main sectors in 2024 Q2. The balance sheets of the general government sector, households and NFCs, which constitute the real economy, are not covered.

Banks had a total balance sheet of just over €3 trillion in 2024 Q2, with deposits and loans as their main liabilities and assets, respectively (Table 1). Deposits, including interbank deposits, accounted for more than 70% of the balance sheet, while bonds (10%) and listed shares (6%) played a more limited role. On the asset side of the balance sheet, loans account for almost half of the assets, followed by interbank deposits (20%). Corporate and government bonds together represent more than 15% of their assets, with investment fund shares and MMF shares playing a marginal role (less than 1%).

Other financial institutions are the second largest financial sector in Spain, with a total balance sheet of €635 billion in 2024 Q2. As Table 2 shows, unlisted shares are the main item on both sides of the balance sheet, related to their ties with NFCs through captive financial institutions and as holding entities. Other financial institutions also include securitisation vehicles, meaning they have strong linkages with banks, evident in the amount of deposits and corporate bonds on the balance sheet.

Turning to investment funds (Table 3), more than 60% of investments are in corporate bonds (€253 billion), with lower investments in listed shares (€65 billion), government bonds (€40 billion) and real estate (€1 billion). The balance sheet structure differs from that for the euro area, particularly in the sizeable position in corporate bonds.

Insurance corporations and pension funds have a similar balance sheet structure, with substantial technical provisions as the largest liability and government and corporate bonds as the main assets (Table 4 and Table 5). Pension funds have around 30% of their assets in the form of investment fund shares (mainly equity investment funds). However, investment fund shares make up a low proportion of Spanish insurance corporations' balance sheet, in contrast to the situation for the euro area as a whole, as documented in Andersen and Sánchez Serrano (2024). The main assets of Spanish insurance corporations are corporate and government bonds, each representing more than 30% of the total balance sheet.

5 For further details, see Sánchez Serrano (2025).

Table 1
Aggregated balance sheet of Spanish banks, 2024 Q2

€m and %

	€m		% of total assets	
	Assets	Liabilities	Assets	Liabilities
Cash	6,782		0.22	
Corporate bonds	262,548	319,507	8.70	10.59
Government bonds	223,641		7.41	
Listed shares	54,321	179,334	1.80	5.94
Unlisted shares	222,438		7.37	
MMF shares	13,096		0.43	
Investment fund shares	2,288		0.08	
Loans	1,400,856		46.43	
Deposits	646,681	2,172,209	21.43	71.99
Derivatives	112,340	106,921	3.72	3.54
Other	72,228	239,248	2.39	7.93
Total assets	3,017,219	3,017,219	100.00	100.00

SOURCES: ECB (QSA and balance sheet items) and author's calculations.

Table 2
Aggregated balance sheet of other Spanish financial institutions, 2024 Q2

€m and %

	€m		% of total assets	
	Assets	Liabilities	Assets	Liabilities
Corporate bonds	2,943	138,806	0.46	21.87
Government bonds	4,621		0.73	
Listed shares	29,613	41,370	4.66	6.52
Unlisted shares	333,882	303,262	52.59	47.77
Investment fund shares	10,368		1.63	
Loans	68,660	51,768	10.82	8.15
Deposits	166,613		26.25	
Other	18,129	99,623	2.86	15.69
Total assets	634,829	634,829	100.00	100.00

SOURCES: ECB (QSA) and author's calculations.

Last but not least, the MMF sector is relatively small in the Spanish financial system, with a total balance sheet of around €18 billion (Table 6). Its main assets are corporate bonds (70% of assets), typically of short maturities, followed by loans (24% of assets).

In overall terms, the Spanish financial system is dominated by banks, which have a substantially larger balance sheet than other institutions. Compared with the euro area financial system, banks represent a larger share of the Spanish financial system, while other financial

Table 3
Aggregated balance sheet of Spanish investment funds, 2024 Q2

€m and %

	€m		% of total assets	
	Assets	Liabilities	Assets	Liabilities
Corporate bonds	252,791		61.40	
Government bonds	39,536		9.60	
Listed shares	64,874		15.76	
Real estate	1,487		0.36	
Investment fund shares	12,994	408,106	3.16	99.13
Loans		1,247		0.30
Deposits	33,842		8.22	
Other	6,157	2,328	1.50	0.57
Total assets	411,681	411,681	100.00	100.00

SOURCES: ECB (QSA and investment fund statistics) and author's calculations.

Table 4
Aggregated balance sheet of Spanish insurance corporations, 2024 Q2

€m and %

	€m		% of total assets	
	Assets	Liabilities	Assets	Liabilities
Corporate bonds	109,312	976	31.74	0.28
Cash and deposits	12,954		3.76	
Government bonds	106,767		31.00	
Listed shares	9,443	380	2.74	0.11
Derivatives	5,511	14,807	1.60	4.30
Investment fund shares	36,627		10.64	
Loans		3,882		1.13
MMF shares	1,271		0.37	
Unlisted shares	12,987	48,668	3.77	14.13
Technical provisions		230,027		66.79
Other	49,527	45,659	14.38	13.26
Total assets	344,399	344,399	100.00	100.00

SOURCES: ECB (QSA and insurance corporation fund statistics) and author's calculations.

institutions, investment funds, insurance corporations and MMFs comprise a smaller share (Chart 1). In Spain, the non-bank financial sector accounts for 34% of the total financial system, whereas in the euro area it accounts for 58%. Much of this difference compared with the euro area aggregate owes to the smaller size of other financial institutions and of investment funds in Spain. While the lesser role of insurance corporations and pension funds may be linked to structural issues, investment funds, MMFs and other financial institutions tend to be concentrated in certain euro area countries, with residents in other jurisdictions readily accessing them.

Table 5
Aggregated balance sheet of Spanish pension funds, 2024 Q2

€m and %

	€m		% of total assets	
	Assets	Liabilities	Assets	Liabilities
Corporate bonds	34,505		20.63	
Cash	1,269		0.76	
Government bonds	27,424		16.39	
Listed shares	23,207		13.87	
Derivatives	183	113	0.11	0.07
Investment fund shares	48,071		28.74	
Net worth		726		0.43
MMF shares	957		0.57	
Deposits	7,735		4.62	
Technical provisions		165,854		99.15
Other	23,927	585	14.30	0.35
Total assets	167,278	167,278	100.00	100.00

SOURCES: ECB (QSA and pension funds statistics) and author's calculations.

Table 6
Aggregated balance sheet of Spanish money market funds, 2024 Q2

€m and %

	€m		% of total assets	
	Assets	Liabilities	Assets	Liabilities
Corporate bonds	12,800		69.32	
Cash	146		0.79	
Government bonds	1,125		6.09	
Loans	4,395		23.80	
MMF shares		17,105		92.63
Other		1,361		7.37
Total assets	18,466	18,466	100.00	100.00

SOURCES: ECB (QSA and money market fund statistics) and author's calculations.

4 The Spanish financial system and the real economy

To examine how the financial sector interacts with the real economy, one must look first at the interconnections between the different sectors in the Spanish economy in 2024 Q2.

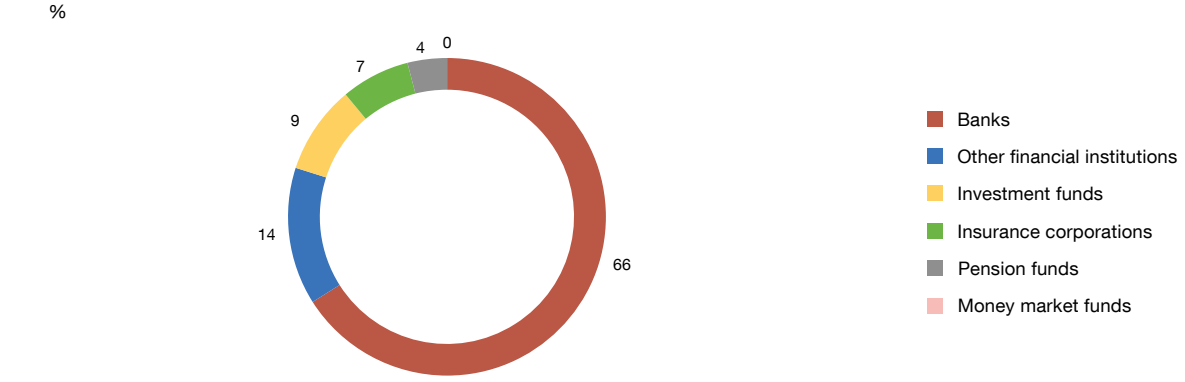
A map of the Spanish economy is shown in Figure 1. To avoid cluttering the figure, only flows between two sectors above €25 billion are represented (with the sole exception of banks' holdings of MMF shares). The listed shares, corporate bond and government bond markets are shown separately in green boxes, as they typically do not entail bilateral contacts between sectors, instead being organised markets where sellers and buyers meet. Further details

Chart 1

Sectoral composition of the financial system in Spain and in the euro area

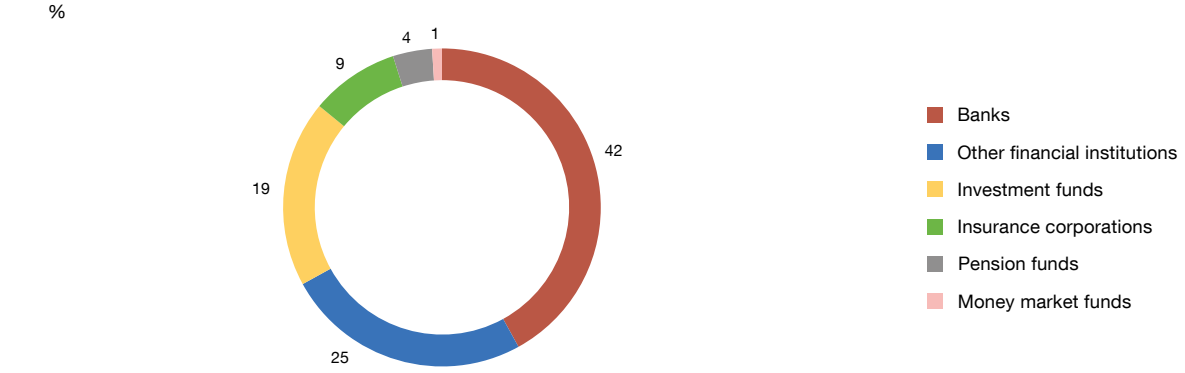
1.a Spain, 2024 Q2

%



1.b Euro area, 2023 Q2

%



SOURCES: ECB (QSA, balance sheet items, investment fund statistics, insurance corporation statistics, pension fund statistics and money market fund statistics), Andersen and Sánchez Serrano (2024) and author's calculations.

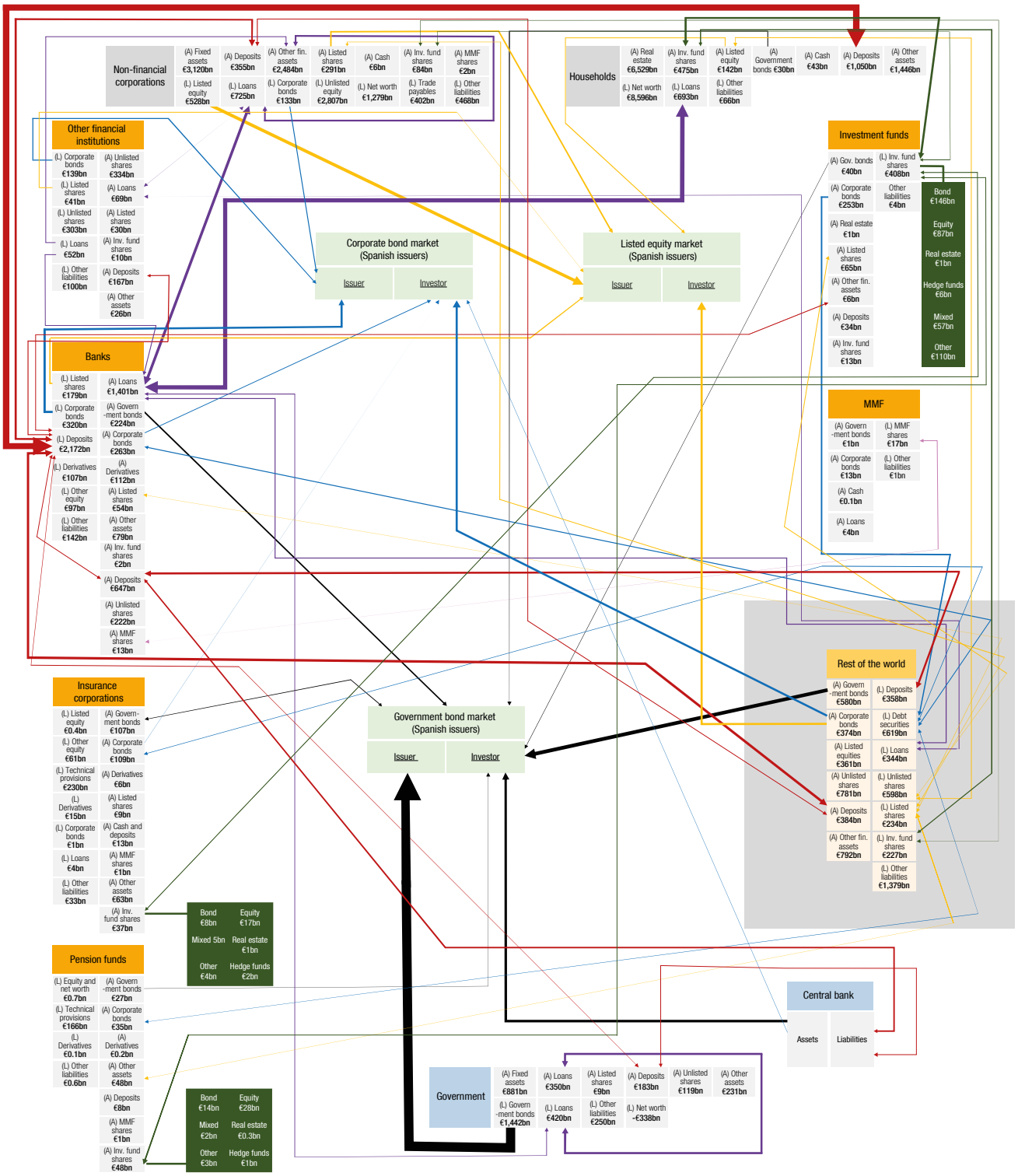
about investors and issuers in these markets are provided later in the article. Finally, a generic sector for the central bank is included to reflect Spanish sectors' exposures to it (in the form of central bank reserves for banks and as deposits for the general government sector) as well as its holdings of Spanish corporate and government debt.

As can be seen, the Spanish system is dominated by a handful of interconnection channels between banks, households and NFCs through loans and deposits. Banks are obviously at the core of the system through bank deposits, which link them to the other sectors in the economy. The provision of credit to households and NFCs is basically undertaken by banks, with credit provided by other financial institutions amounting to just €35 billion (compared with €1,134 billion provided by banks). Aside from equity, bank loans are the main funding source for NFCs, tripling the amount of corporate bonds issued. Loans within the NFC sector are also large, at circa €250 billion.

While interconnections with the rest of the world are (individually) not sizeable, they cover a wide range of financial assets and liabilities. For instance, the rest of the world is the main

Figure 1

A map of the Spanish financial system



SOURCES: ECB (QSA, balance sheet items, investment fund statistics, insurance corporation statistics, pension fund statistics and money market fund statistics) and author's calculations.
NOTES: Only flows above €25bn are shown. The width of the arrows is proportional to the amount of the flow.

Table 7
Twenty largest financial assets in the Spanish economy by holding or issuing sector

€bn

Financial instrument	Holding / Issuing sector	Amount, 2024 Q2
Unlisted shares	Issued by non-financial corporations	2,807
Deposits	Issued by banks	2,172
Debt securities	Issued by government	1,442
Loans	Granted by banks	1,414
Debt securities	Issued by the rest of the world and held by Spanish residents	619
Unlisted shares	Issued by the rest of the world and held by Spanish residents	598
Listed shares	Issued by non-financial corporations	528
Loans	Granted by the government (incl. intra-government loans)	420
Investment fund shares	Issued by investment funds	408
Trade payables	Issued by non-financial corporations	402
Deposits	Issued by the rest of the world	358
Loans	Granted by the rest of the world	344
Debt securities	Issued by banks	320
Unlisted shares	Issued by other financial institutions	303
Loans	Granted by non-financial corporations	249
Listed shares	Issued by the rest of the world and held by Spanish residents	234
Technical provisions	Issued by insurance corporations	230
Investment fund shares	Issued by the rest of the world and held by Spanish residents	227
Central bank reserves	Issued by the central bank (bank deposits at the central bank)	192
Listed shares	Issued by banks	179

SOURCES: ECB (QSA, balance sheet items, investment fund statistics, insurance corporation statistics, pension fund statistics and money market fund statistics) and author's calculations.
NOTES: we exclude non-financial items, such as net worth or real estate assets, and residual categories, such as other assets and other liabilities.

investor in government bond, corporate bond and listed shares markets. At the same time, insurance corporations, pension funds, MMFs and other financial institutions tend to have limited interconnections with other sectors. Investment funds have large exposures with the rest of the world, signalling their role as a vehicle for Spanish residents' exposure to the rest of the world.

Banks' central position in the financial system is also evident when looking at the twenty largest financial assets by issuing sector (Table 7).

In the euro area, investment fund shares are the largest item in the financial system (Andersen and Sánchez Serrano, 2024), while in the case of Spain they stand in ninth position, behind bank loans and deposits. This hints at a certain dominance of the banking sector in Spain, contrasting with the more prominent role played by non-bank financial institutions in the euro area. Furthermore, Table 1 features no items from MMFs, while technical provisions of insurance corporations appear towards the bottom of the table. Technical provisions of pension funds would stand in twenty-first position. Unlisted shares issued by other financial institutions also appear towards the end of the table.

Second, the importance of the rest of the world is evidenced by Spanish residents' holdings of the sector's debt securities (fifth position), unlisted shares (sixth position), deposits (eleventh position), loans (twelfth position), listed shares (sixteenth position) and investment fund shares (eighteenth position). Some of these exposures may be towards non-bank financial institutions, e.g. holdings of investment fund shares and unlisted shares, which may be issued by other financial institutions in other EU Member States and owned by large Spanish NFCs.

Third, a comparison with the main euro area items, as detailed in Andersen and Sánchez Serrano (2024), primarily shows the lower weight of non-bank financial institutions in the Spanish economy, evident, for instance, through the position in investment fund shares or technical provisions of insurance corporations. It also reveals a greater role for listed shares issued by NFCs (approximately 75% of the value of government bonds in the euro area and around 35% in Spain) and central bank reserves.[6]

The connections between banks, households and NFCs are presented in Figure 2 (which is based on Mouakil, Heipertz, Stojanovic and Guinouard (2024), albeit only showing exposures above €15 billion between sectors in the real economy – households, NFCs and the general government sector – and banks, plus the central bank, in the form of deposits, loans, debt securities and listed shares).[7]

Starting with households, these provide more funds to banks (€1,085 billion) than they receive in the form of loans (€684 billion). For NFCs the opposite is true: loans (€450 billion) and debt securities (€30 billion) exceed deposits (€335 billion). Similarly, bank loans to the general government sector (€91 billion) and government bonds held by banks (€224 billion) more than offset government deposits with banks (€82 billion).

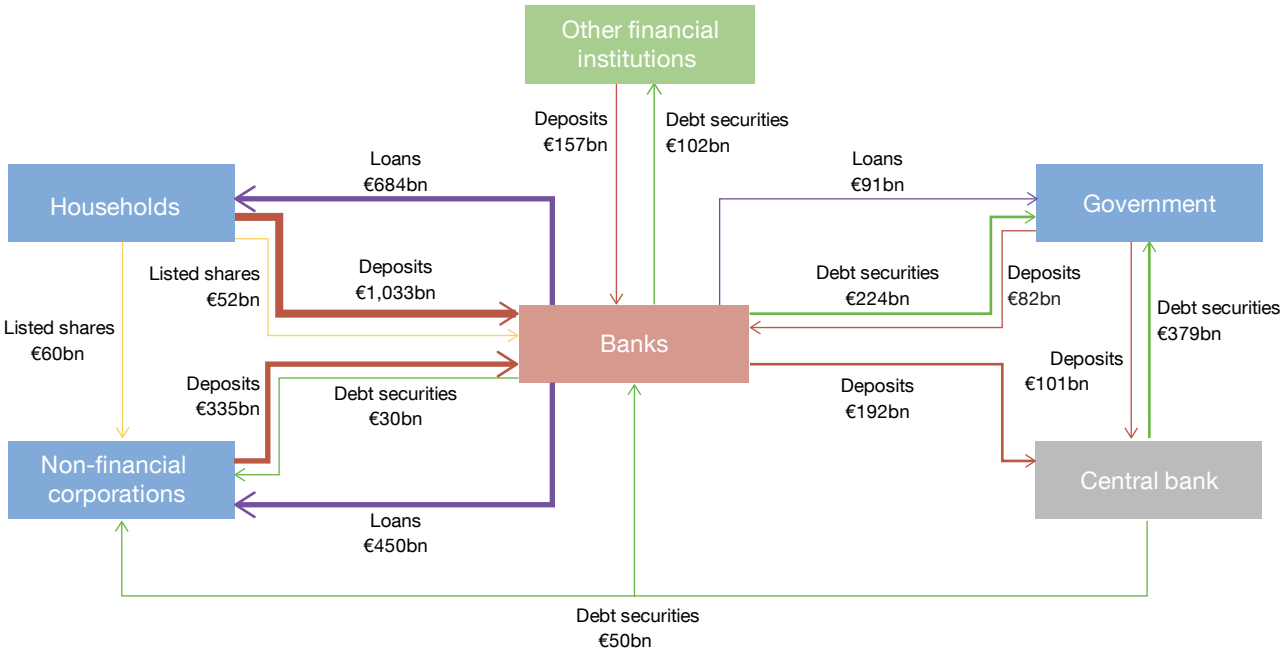
Banks can thus be seen as acting as intermediaries, whereby net savings by households (€401 billion) are channelled to NFCs (€145 billion) and to the government sector (€231 billion). Other financial institutions also have more deposits at banks (€157 billion) than debt securities (€102 billion), although in this case their exposures are mainly linked to securitisation vehicles. The central bank also contributes to funding the general government sector, NFCs and banks through its asset purchase programmes.

Furthermore, households also have large holdings of unlisted shares (€805 billion) and of investment fund shares (€475 billion). Investment funds offer Spanish residents exposure to financial assets in the rest of the world (Figure 3). This exposure can be direct, through the

6 In a similar vein, a comparison of Table 7 with the French economy, as in Mouakil, Heipertz, Stojanovic and Guinouard (2024), provides interesting insights. While the top financial instruments are broadly the same (unlisted shares issued by NFCs, bank deposits, bank loans and government debt), there are certain items that appear in the French financial system and which are not in the Spanish one, such as bank derivatives (assets and liabilities). Other items seem to have higher importance in France than in Spain, such as listed shares issued by NFCs or technical provisions of insurance corporations, and vice versa, such as debt securities issued by the rest of the world or trade payables of NFCs. Despite these differences, there are more similarities between Spain and France than between Spain and the euro area.

7 Unfortunately, the whom-to-whom decomposition of unlisted shares, which is also a relevant exposure channel for the real economy, is not available.

Figure 2
Financing flows in the real economy in 2024 Q2 (€bn)



SOURCES: ECB (QSA, balance sheet items, investment fund statistics, insurance corporation statistics, pension fund statistics and money market fund statistics) and own calculations.

holdings of foreign investment funds (€227 billion), or through investment in the foreign assets of Spanish investment funds (€293 billion). Spanish residents' position in foreign investment funds represents around 55% of the investments in Spanish funds. Holdings of financial assets issued by Spanish residents and held by investment funds domiciled in Spain are relatively small, with the main item being government bonds (€40 billion).

As shown in Figure 3, €504 billion is channelled from Spanish economic sectors to the rest of the world (the green boxes in the figure) through investment funds. Similarly, although not shown in the calculations, the rest of the world also invests heavily in the Spanish economy. This is considered in further detail in the next section.

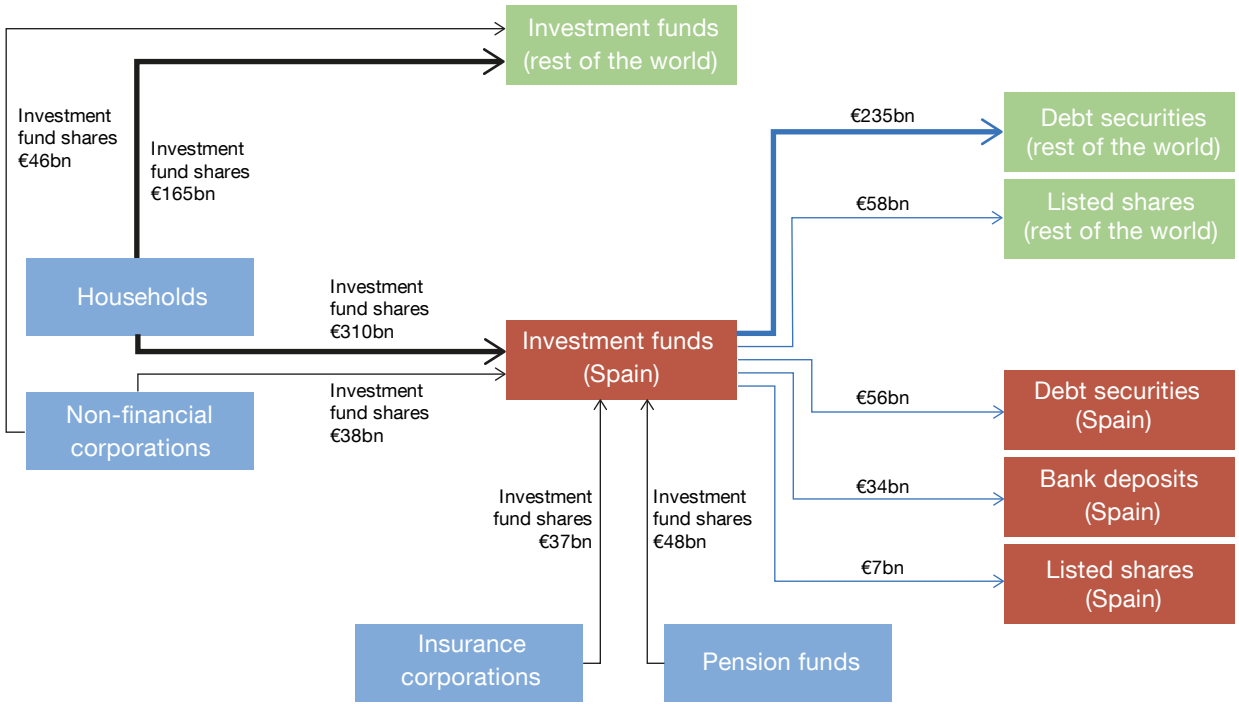
5 Issuers of and investors in corporate bonds, government bonds and listed shares

Let's now take a look at the main issuers and investors in three key financial markets: government bonds, listed shares and corporate bonds (Table 8).

As seen in the first two columns of Table 8 and the x-axis in Chart 2, the rest of the world was the main investor in government bond markets in 2024 Q2 (€580 billion), followed by the central bank (€379 billion), banks (€224 billion) and insurance corporations (€107 billion). In relative

Figure 3

Financing flows through investment funds in 2024 Q2 (€bn)



SOURCES: ECB (QSA, balance sheet items, investment fund statistics, insurance corporation statistics, pension fund statistics and money market fund statistics) and author's calculations.

Table 8

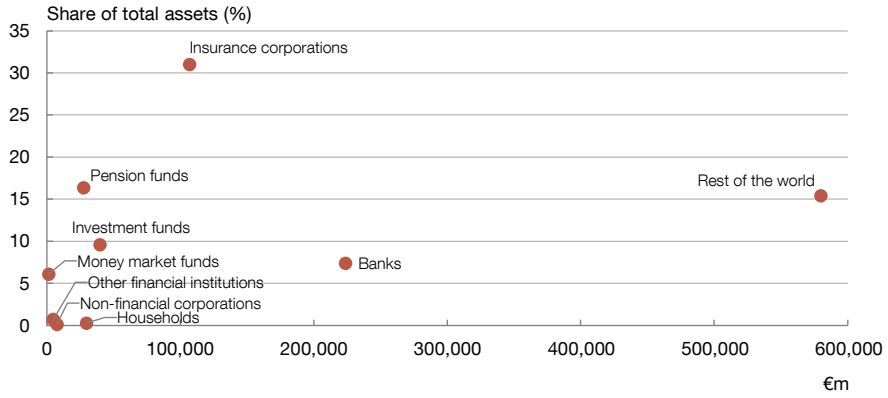
Main issuers and investors in main Spanish financial markets

€m

	Government bonds		Corporate bonds		Listed shares	
	Issuer	Investor	Issuer	Investor	Issuer	Investor
Government	1,441,769					
Investment funds		39,536		17,199		6,959
Insurance corporations		106,767	976	19,817	380	2,502
Other financial institutions		4,621	138,806	1,810	41,370	14,933
Banks		223,641	319,507	118,430	179,334	11,912
Rest of the world		579,890		373,612		361,243
Pension funds		27,424		1,760		2,158
Money market funds		1,125		608		8,780
Households		29,581				119,675
Central bank		378,784		50,072		
Non-financial corporations		7,410	133,038		528,196	222,043
Not allocated		42,990		9,019	925	
Total	1,441,769	1,441,769	592,327	592,327	750,205	750,205

SOURCES: ECB (QSA, balance sheet items, investment fund statistics, insurance corporation statistics, pension fund statistics and money market fund statistics) and author's calculations.

Chart 2
Main investors in government bond markets



SOURCES: ECB (QSA, balance sheet items, investment fund statistics, insurance corporation statistics, pension fund statistics and money market fund statistics) and author's calculations.

terms, as a share of the total balance sheet of each sector, government bonds represented more than 30% of the assets of insurance corporations and more than 15% of the total assets of pension funds and of all Spanish financial assets held by the rest of the world (y-axis in Chart 2). Holdings of government bonds by the real economy (i.e. households and NFCs) are marginal in both absolute and relative terms.

The Spanish government bond market has changed substantially since the global financial crisis. First, during the period of quantitative easing (from 2015 until circa 2022) the central bank was the main investor in Spanish government bonds. Before that, there were concerns in the euro area about the sovereign-bank nexus, because banks had large holdings of domestic government bonds (see, among others, Altavilla, Pagano and Simonelli, 2017, and Dell'Ariccia et al., 2018). For example, in 2012 Q1 banks were the main investors in government bonds (€244 billion), followed by the rest of the world (€215 billion). These two sectors alone represented 60% of the total investments in government bonds.

Turning to corporate bond markets, the main issuing sectors are banks (€320 billion in June 2024), other financial institutions (€139 billion) and NFCs (€133 billion). In terms of market size, corporate bond markets are around one-third of the government bond market. The modest issuance of corporate bonds by NFCs is also notable, signalling the limited development of this market to fund the real economy (on the other hand, large multinationals may issue corporate bonds abroad, which are not shown in Table 8). On the investor side, the main investor is the rest of the world (€374 billion in June 2024, representing more than 60% of the total market), followed by banks (€118 billion) and the central bank (€50 billion). Other sectors hold less than €20 billion on their balance sheets. Only banks are active on both sides of the market, while NFCs and other financial institutions are mainly active on the issuing side. Lastly, although not directly observable in Table 8, investment funds and pension funds invest more in bonds issued abroad than in those issued in Spain, while banks and insurance corporations focus on bonds issued in Spain (including government bonds).

The third market in Table 8 is that of listed shares. NFCs are the largest issuers (€528 billion in June 2024), followed by banks (€179 billion) and other financial institutions (€41 billion). On the investor side, the rest of the world is the largest investor (€361 billion), followed by NFCs (€222 billion) and households (€120 billion). Interestingly, banks, investment funds, insurance corporations and pension funds tend to have higher holdings of listed shares issued abroad than of those issued in Spain.

In the analysis of these three markets, the rest of the world plays an important role as investor. At the same time, some sectors (particularly investment funds) tend to have higher holdings of such instruments issued by the rest of the world than of those issued by Spanish residents. Looking at the latter, insurance corporations are large investors only in government bonds, while banks are key investors in government and corporate bond markets. As seen above, these three markets can be an important channel of interconnection between banks and the real economy (i.e. NFCs and general government).

6 A closer look at the rest of the world

It is by now clear that the rest of the world has multiple interconnections with the Spanish financial system. It is the main investor in Spanish listed shares and in government and corporate bond markets, providing funding to the Spanish economy. At the same time, Spanish residents hold more than €3 trillion in financial assets outside Spain.

The rest of the world encompasses a broad spectrum of countries (other EU Member States, other advanced economies and emerging economies in Latin America, for example), with which Spain has wide-ranging links. To get further insights into the interactions of Spanish residents with the rest of the world, the analysis draws on IIP data for Spain, as compiled by Eurostat. While the data offer a broad country breakdown, they do so for the aggregate of the total economy, without allowing for sectoral breakdowns. Therefore the sectoral perspective is lost in this analysis, while the country perspective is gained. Moreover, the structure of the IIP data is slightly different to that of the QSA data used so far. Financial assets and liabilities are classified into three categories: (i) foreign direct investment (FDI), whereby a resident in one country obtains a lasting interest (implying a long-term relationship and significant influence) in an enterprise resident in another country; (ii) portfolio investment, which involves transactions with securities that are negotiable in organised markets; and (iii) other investment, which comprises mainly loans and deposits. A foreign subsidiary of an NFC is an example of FDI, while the purchase of shares in a secondary market in a third country is an example of portfolio investment.

At this stage, it is worth noting that the current data reported to Eurostat do not offer a complete country breakdown of financial assets and liabilities with the rest of the world. The data reported to Eurostat cover 38 countries and so, by definition, cannot reach 100% coverage of the rest of the world aggregate in the QSA. In some cases, such breakdown is simply not available, like for portfolio liabilities (which would require tracking non-residents' ownership of

Table 9
Comparison of the rest of the world aggregate, 2024 Q2

€bn

	Assets	Liabilities
Quarterly Sectoral Accounts	3,272	3,759
International Investment Position	2,852	3,672
Difference	420	87
Difference (% of QSA)	12.85	2.32

SOURCE: ECB (QSA), Eurostat (IIP) and author's calculations.

financial instruments issued by Spanish residents). At the other end of the spectrum, the current country breakdown covers more than 90% of the total exposure with the rest of the world for portfolio assets and FDI liabilities. For the other components, the country breakdown coverage ranges between 75% and 90% of the total exposure, except for deposits (both assets and liabilities) and other investments.

Table 9 shows the data reported for the rest of the world aggregate in June 2024 in the QSA and in the IIP. In overall terms, the divergences are not large, particularly for liabilities (which only include FDI and other investments).

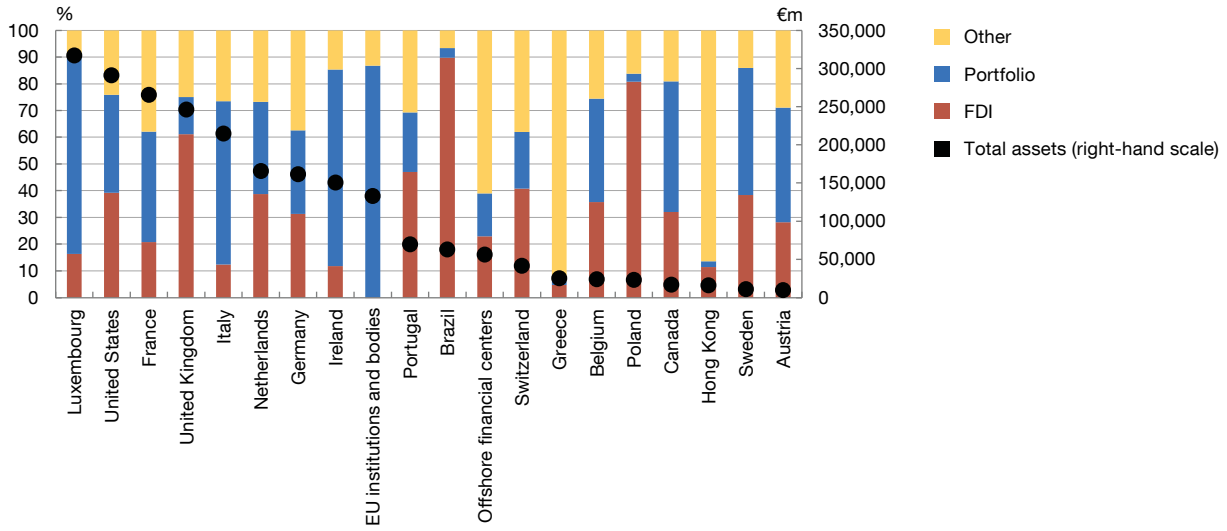
Turning to the financial assets of Spanish residents with the rest of the world, Chart 3 shows the top 20 countries at the end of June 2024 and the breakdown by portfolios. The main destinations for investments from Spain are Luxembourg, the United States, France, the United Kingdom and Italy, each of them receiving more than €200 billion. Many investment funds and captive financial institutions are based in Luxembourg, which explains why the country appears in first position in Chart 3. Among the 20 countries listed are 12 EU Member States (plus EU institutions and bodies) and just one emerging economy (Brazil).[8] In terms of portfolios, FDI dominates in only four countries: Brazil, Poland, the United Kingdom and, to a lesser extent, Portugal. Other investments, mainly comprising bank loans and deposits, are the primary type of investment by Spanish residents in offshore financial centres, Greece and Hong Kong. These exposures, particularly those through portfolio and other investments, could act as vehicles for the transmission of financial stress from these countries to Spain.

Regarding liabilities, as already noted, the Eurostat dataset lacks a country breakdown for portfolio investments, showing only FDI and other investment. Chart 4 ranks the top 20 countries and includes similar names to Chart 3; the Netherlands, France, the United Kingdom, Germany and Luxembourg represent the top 5, with more than half of liabilities held through FDI. These are the countries that invest most in Spain. While the top 20 is again dominated by other EU countries, two emerging economies, Brazil and China (plus Hong Kong), and Japan appear towards the end. Other investment tends to stand below 50% for most countries, with EU institutions and bodies, Hong Kong and Austria being the only exceptions.

8 Additionally, it can be assumed that exposures to Hong Kong ultimately go to China.

Chart 3

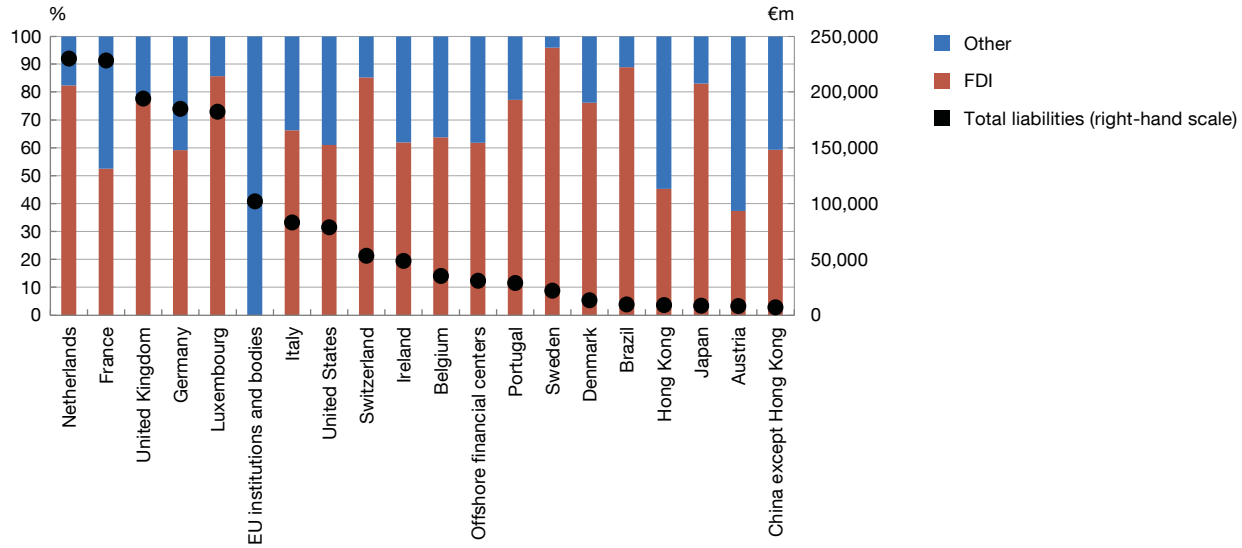
Top 20 countries: Financial assets held by Spanish residents



SOURCES: Eurostat (IIP) and author's calculations.

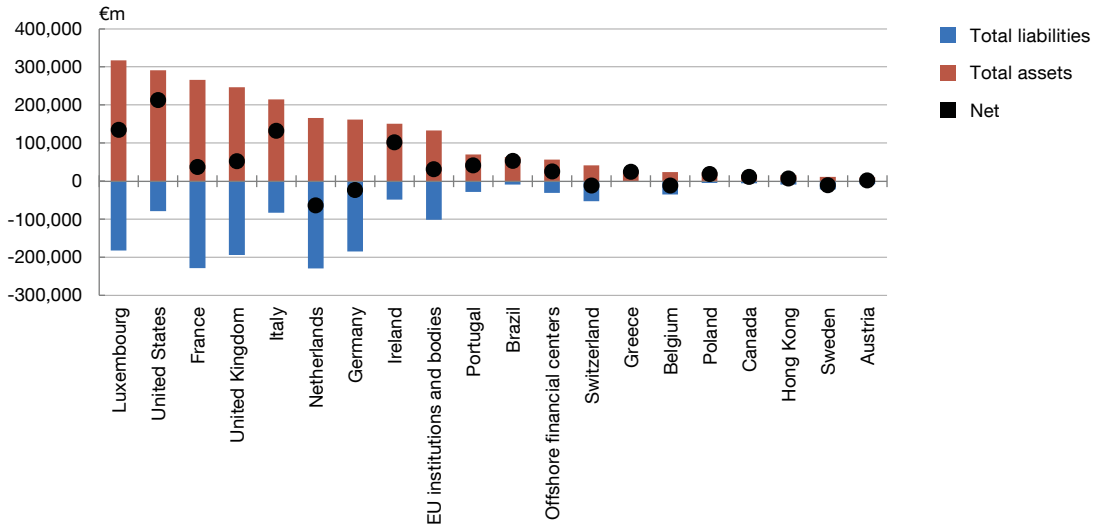
Chart 4

Top 20 countries: Financial liabilities held by Spanish residents



SOURCES: Eurostat (IIP) and author's calculations.

Chart 5
Top 20 countries: net financial assets held by Spanish residents



SOURCES: Eurostat (IIP) and author's calculations.
NOTE: the countries shown are the top twenty to which Spanish residents are most exposed, as in Chart 3.

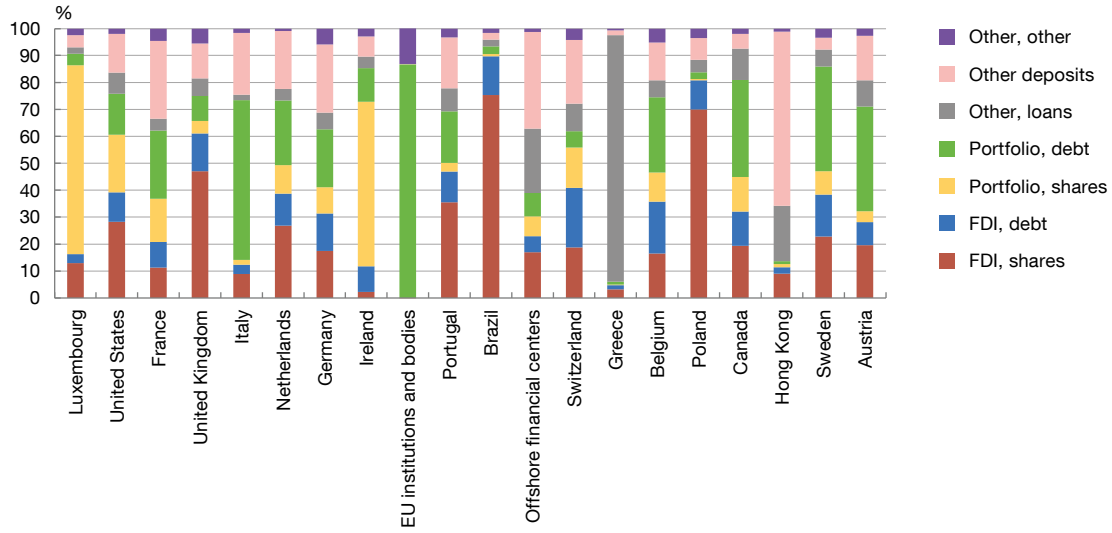
In net terms (assets minus liabilities), the United States, Luxembourg and Italy have the highest net assets (Chart 5). Countries with negative net assets (i.e. larger financial liabilities than assets) are the Netherlands, Germany, Switzerland, Belgium and Sweden, all of which provide net funding to Spanish residents.

Delving deeper into the types of assets vis-à-vis the main countries (Chart 6), Luxembourg and Ireland show large holdings of portfolio shares (related to investment funds), at €222 billion and €92 billion, respectively. Shares issued in Luxembourg are among the largest financial items in the Spanish financial system according to Table 7 above. FDI in the United Kingdom through shares is also significant, at €116 billion. Portfolio debt is also relatively sizeable in Italy, at €127 billion. Loans tend to be rather small, with the main exception of Greece. Deposits are large with Hong Kong, offshore financial centres,[9] Germany and France, pointing to potential financial stress contagion channels in the banking system.

We end this section with an analysis of developments in the main items since the data were first reported in 2013 Q1. Covering a period of 10 years, the data are deflated to remove the influence of prices and then an index is built, with the first observation indexed to 100. Chart 7

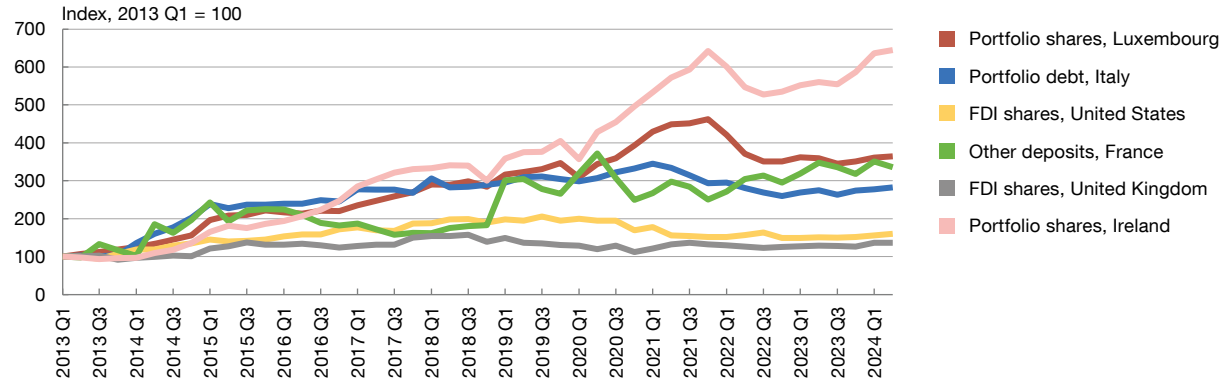
9 Offshore financial centres are countries or jurisdictions that provide financial services to non-residents on a scale that is incommensurate with the size and the financing of their domestic economies. According to Appendix 7 of the 2016 Balance of Payments Vademecum, offshore financial centres are Andorra, Antigua and Barbuda, Anguilla, Aruba, Barbados, Bahrain, Bermuda, Bahamas, Belize, Cook Islands, Curaçao, Cayman Islands, Dominica, Grenada, Guernsey, Gibraltar, Hong Kong, Isle of Man, Jersey, St Kitts and Nevis, Lebanon, Saint Lucia, Liechtenstein, Liberia, Marshall Islands, Montserrat, Mauritius, Nauru, Niue, Panama, Philippines, Seychelles, Singapore, Sint Maarten, Turks and Caicos Islands, Saint Vincent and the Grenadines, Virgin Islands (British), Virgin Islands (U.S.), Vanuatu and Samoa (link).

Chart 6
Breakdown of financial assets with top 20 countries



SOURCES: Eurostat (IIP) and author's calculations.

Chart 7
Developments in the main financial assets of the Spanish economy with the rest of the world



SOURCES: Eurostat (IIP) and author's calculations.

shows a sharp increase for portfolio investment shares based in Ireland, related to the growth of the investment fund sector in the euro area. Portfolio investment shares with Luxembourg have also seen a remarkable 3.5-fold increase. Deposits with France have followed a similar path, with large peaks around the outbreak of the COVID-19 pandemic. Conversely, FDI shares in the United Kingdom and the United States have not changed substantially over the period. Lastly, the increase in Italian portfolio debt mainly took place between 2013 and 2015, maintaining a slight upward trend until 2021 and decreasing thereafter.

The analysis above points to the potential to use IIP data to better understand Spain's exposure to other countries through financial instrument holdings. Although there are gaps in the country breakdown and differences with the data reported in QSA, such information can be relevant for macroprudential analyses as it may signal potential channels of contagion from the rest of the world.

7 Conclusions

Following the methodology in Andersen and Sánchez Serrano (2024), QSA data have been used to draw a map of the Spanish financial system, showing cross-sectoral linkages through financial instruments.

As at June 2024, banks still play a pivotal role in the Spanish economy, channelling savings from households into loans to the real economy. The non-bank financial sector (including investment funds, MMFs, other financial institutions, pension funds and insurance corporations) appears less important in Spain than in the euro area aggregate. However, it is also worth noting that cross-border flows between Spanish residents and foreign non-bank financial institutions exceed those with foreign banks.

The analysis also finds that the rest of the world plays a significant role in the Spanish economy, be it as investor in financial markets (indeed, it is the main investor in corporate and government bond markets and in listed shares) or as a channel for the investment of savings, mainly through investment fund shares. Looking at the IIP data, such investment fund shares predominantly account for Spanish residents' exposures to Luxembourg and Ireland. Exposures to and from the rest of the world could act as a transmission channel of financial stress to the Spanish financial system and economy.

Undertaking this type of analysis is useful for understanding potential contagion channels for stress, whether originating inside the country or coming from elsewhere through exposures with the rest of the world. Desktop exercises could even be conducted to simulate the impact of certain shocks on the national economy. The methodology used here relies on datasets of the highest quality and should enable comparisons across countries. These are important endeavours that would have a large positive impact on the current monitoring of financial stability in the EU (see also Rehn, Cecchetti, de Guindos and Hernández de Cos, 2024).

Finally, there is one dimension of the map that has not been exploited in this article. In addition to examining the exposures across sectors at a certain point in time (2024 Q2), we might also have looked at developments in these exposures over time. In theory, one could examine changes in the map during, for example, the build-up to the global financial crisis or over the course of the sovereign debt crisis. This constitutes a relevant avenue of analysis for macroprudential policy purposes, as it may offer insights into how exposures in the financial system evolve over time, during both normal and stressed times. This is an avenue of research that merits attention in the future.

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