# ASSET ENCUMBRANCE IN SECURED FUNDING OPERATIONS IN THE SPANISH BANKING SECTOR

Esther Cáceres and Jorge San Vicente

BANCO DE ESPAÑA

https://doi.org/10.53479/38944

The authors are grateful for the comments received from Carmen Broto, Javier Mencía, Ana Molina, Carlos Pérez Montes and an anonymous referee. This work was carried out during Jorge San Vicente's internship at the Financial Stability and Macroprudential Policy Department between February and June 2024. Email address for comments: esther(dot)caceres(at)bde(dot)es.

# ASSET ENCUMBRANCE IN SECURED FUNDING OPERATIONS IN THE SPANISH BANKING SECTOR


## Abstract

Credit institutions' access to funding is key to their survival, especially during crises, when market liquidity deteriorates. In such periods, the availability of assets that can be used as collateral could be instrumental in preserving access to finance. This article analyses the Spanish banking sector's ability to access the secured funding market since late 2014, when the European Banking Authority's asset encumbrance disclosure framework entered into force. The analysis shows that in Spain, as in all other European countries, asset encumbrance has been declining since 2022. With more unencumbered assets available, banks find it easier to access funding on the financial markets.



**Keywords:** liquidity risk, encumbered assets, secured funding, banking system, TLTRO.

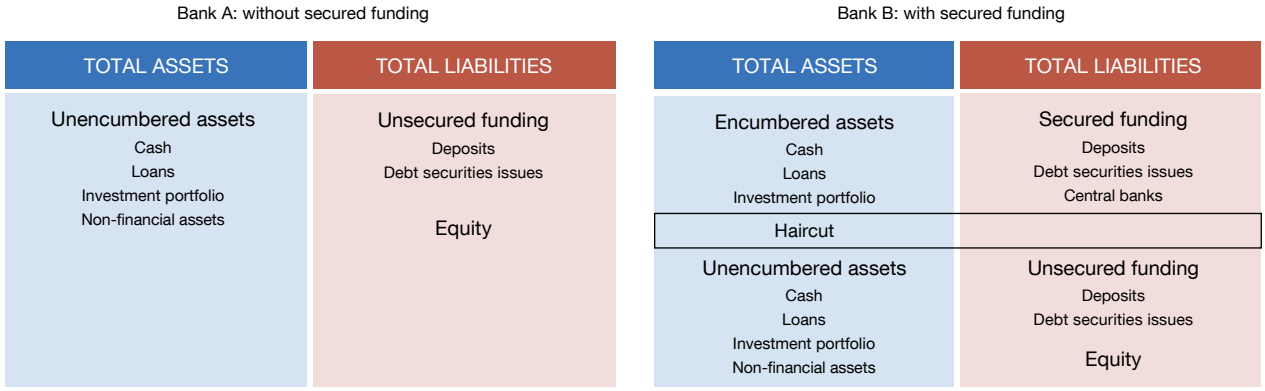

## 1 Introduction

The global financial crisis that began in the United States in 2008 revealed a number of weaknesses that threatened financial stability. The need to strengthen the regulation, supervision and risk management of credit institutions led the Basel Committee on Banking Supervision (BCBS) to phase in various requirements under the Basel III framework from 2008 onwards, including reforms in market and credit risk management, stronger capital requirements and, for the first time, the introduction of parameters for monitoring funding liquidity.[1] In addition to the two main liquidity risk indicators (the liquidity coverage ratio and the net stable funding ratio), these parameters notably included the ratio of asset encumbrance in secured funding operations. This indicator is defined as the proportion of both assets held on the balance sheet and assets received as collateral that have been used to back secured funding operations and are therefore unavailable to be pledged as collateral in new secured funding.

In addition to its importance from a regulatory standpoint, the asset encumbrance ratio gained significance as a counterparty risk management measure as investors increasingly pressurised banks to boost their secured funding, due to a greater aversion to counterparty risk after the financial crisis of 2008 (Berthonnaud et al., 2021). However, banks face a dilemma when deciding on how much secured funding to hold on their balance sheets, as this may have financial stability implications. On the one hand, given that this type of funding is backed by the assets pledged as collateral, it is safer for investors and it entails lower costs

1 Funding liquidity is that related to banks' ability to obtain market funding, whereas market liquidity is the ease with which financial assets can be sold on the markets with no significant impact on their price. For more information on funding liquidity, see Banco de España (2023).

Figure 1
**The effect of secured funding on a bank's balance sheet**




**SOURCE:** Devised by authors.

for banks. However, on the other hand, having a high proportion of secured funding reduces the assets available to banks to either access new secured funding or meet unsecured creditors' claims in the event of default, which may hinder banks' access to new financing and, in extreme financial stress situations, threaten their survival and lead to contagion across the banking system.

It should be noted that available assets are reduced to a greater extent than the secured funding obtained, due to the haircut applied to the assets used as collateral in this type of operations. In other words, these haircuts, which aim to reduce the lender's risk of loss in the event of the borrower's default and of possible fluctuations in the market value of the assets pledged as collateral, result in overcollateralisation[2] of this type of financing. The higher the haircut, the higher the level of overcollateralisation and thus the amount of unavailable assets. Figure 1 illustrates the balance sheet composition of two banks: one with 100% unsecured funding and one that also has secured funding. The value of the latter bank's encumbered assets exceeds the value of the secured funding obtained due to the haircut applied, leading to overcollateralisation of this funding.

This article analyses how the Spanish banking sector's asset encumbrance ratio has changed over time. The level of this ratio provides information on Spanish banks' ability to access secured funding, whether on the market or through operations with central banks (mostly with the Eurosystem). In particular, the higher this ratio, the lower the ability to access new secured financing. First, the article presents the regulatory framework for encumbered assets. It then analyses encumbered assets as a percentage of total assets and as a percentage of assets eligible as collateral for the European Central Bank (ECB) (hereafter, eligible assets), and their

2 Overcollateralisation implies using collateral with a value greater than the financing covered. This provides better protection for lenders against potential defaults.

distribution by asset type. The article also looks at secured funding and its degree of collateralisation.

## 2 Regulatory framework for asset encumbrance in secured funding operations

The 2008 global financial crisis highlighted the importance of liquidity risk for financial market stability and, consequently, for the banking sector. During this crisis many banks with adequate levels of capital required central bank support due to difficulties in accessing market funding (BCBS, 2010). Indeed, empirical studies conducted after the financial crisis suggest that the nature of this risk warranted the new BCBS liquidity measures.[3]

Following publication of the Basel III framework, in 2012 the European Systemic Risk Board (ESRB) issued a recommendation on funding of credit institutions, which included guidelines on the management and monitoring of assets encumbered in secured funding operations (hereafter, encumbered assets).[4] This recommendation, adopted by Spain, explicitly describes the need for national authorities to monitor encumbered assets. Subsequently, in July 2014, the EBA published the disclosure framework for encumbered assets, which entered into force in December 2014.[5] This framework contains information on assets and collateral received with and without encumbrance (including their sources of encumbrance), from which the asset encumbrance (AE) ratio can be derived. According to the EBA, this ratio is the proportion of assets and collateral received and reused as collateral to total assets and collateral received:

$$\text{AE ratio} = \frac{\text{Encumbered assets} + \text{Encumbered collateral received}}{\text{Total assets} + \text{Total collateral received}}$$

The AE ratio is part of the non-exhaustive list of indicators drawn up by Lamas Rodríguez (2016) to assess systemic liquidity risk in the Spanish banking system. As indicated in that article, according to the EBA, a ratio above 30% could be considered excessive, mainly because of the higher cost of unsecured funding due to the increase in its degree of subordination.

The proportion of ECB-eligible assets can be calculated analogously to determine banks' ability to access secured central bank funding.

$$\text{Eligible AE ratio} = \frac{\text{Encumbered eligible assets} + \text{Encumbered eligible collateral received}}{\text{Eligible assets} + \text{Eligible collateral received}}$$

3 Chen, Chen and Huang (2021) conclude that liquidity shortages are not merely a symptom of solvency problems related to banks' credit risk and that they have detrimental effects during crises.

4 For more information, see Recommendation ESRB/2012/2 of 20 December 2012 on funding of credit institutions.

5 For more information, see the Guidelines on disclosure of encumbered and unencumbered assets.

Since the entry into force of this disclosure framework, the EBA monitors encumbered assets in the European banking sector and publishes its findings in annual reports. The first (EBA, 2015) lists the objectives of these reports: (1) to compare banks' reliance on secured funding; (2) to assess their ability to handle funding stress and to switch from unsecured funding to secured funding; and (3) to assess the amounts of assets available in a resolution situation.

An important driver of secured funding and encumbered asset developments during the period analysed in this article is the ECB's liquidity provision programmes through refinancing operations. In response to the global financial crisis, the ECB launched its longer-term refinancing operations for euro area banks. Their main aim was to support price stability in an environment marked by liquidity shortages. Although they were designed to be temporary, the changing macro-financial context made it necessary to extend their application and to introduce further such operations. These operations have had a significant impact on the composition of credit institutions' funding and, therefore, on how their encumbered assets have changed over time. This is the case of the targeted longer-term refinancing operations (TLTROs), which were used to inject liquidity into the system and thus secure the flow of credit to households and firms. These programmes – TLTRO I launched in 2014, TLTRO II in 2016 and TLTRO III in 2019[6] – consisted of a series of Eurosystem loans to banks on better than market terms, provided that the banks met certain targets related to their lending to the real economy.

The following sections describe the changes in the Spanish banking sector's asset encumbrance ratio since the disclosure framework came into force in December 2014. They analyse factors such as the composition of these encumbered assets, the level of overcollateralisation and the importance of central bank funding in Spanish banks' balance sheets. They also study the heterogeneity of this indicator by type of institution. To this end, two groups of banks are identified and their ability to access secured funding is compared. The first group consists of domestic systemically important institutions, dubbed "other systemically important institutions" (O-SIIs),[7] and the second comprises Spanish institutions other than O-SIIs.

## 3 Asset encumbrance in secured funding operations

Between 2017 and 2019 the proportion of encumbered assets pledged by the banking sectors of the main European countries held relatively stable, with the EU average standing at around 27% (see Chart 1). This ratio rose after the COVID-19 pandemic, reflecting the greater reliance on Eurosystem refinancing operations as the ECB made the TLTROs more appealing to banks.[8]

6 For more information, see the ECB's decisions on TLTRO I, TLTRO II and TLTRO III.

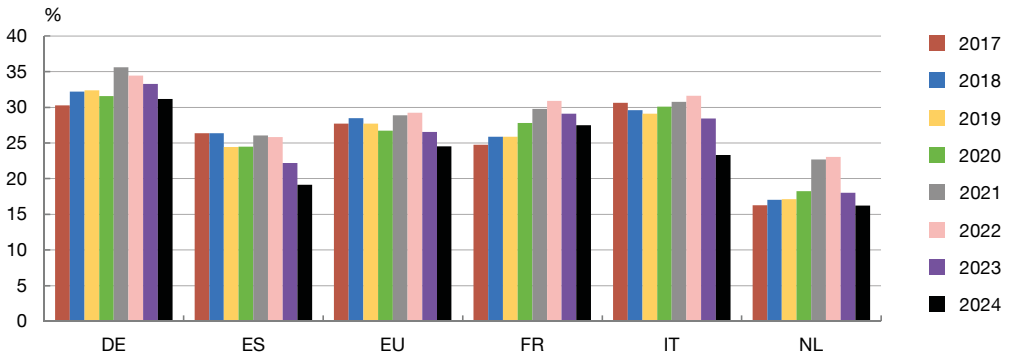
7 Similarly to global systemically important institutions (G-SIIs), these banks, dubbed "other systemically important institutions" (O-SIIs), are subject to additional capital buffers to compensate for the advantage of being "too big to fail". This advantage stems from the fact that the market presumes that, if they were to experience financial difficulties, they would potentially be bailed out to prevent them from failing. The most up-to-date list of O-SIIs in Spain features four institutions, one of which (Banco Santander) is also considered a G-SII (see press release).

8 The interest rate was set at 50 basis points below the deposit facility rate at the time, the maximum principal amount that counterparties were able to borrow was raised and a temporary adjustment was made to the eligible assets framework. Thanks

Chart 1

**Asset encumbrance ratio in the European banking sector**

1.a Asset encumbrance ratio by country (a)




**SOURCE:** EBA.

**a** Assets and collateral received and reused to secure funding as a proportion of total assets and collateral received, in the EU as a whole and in various European countries: Germany (DE), Spain (ES), France (FR), Italy (IT) and the Netherlands (NL). Data at end-March of the years indicated.

As these operations were gradually repaid, beginning in 2022, the asset encumbrance ratio decreased significantly both in the European Union (EU) as a whole and in the main European economies. By 2024 this ratio had fallen below the 30% threshold considered potentially excessive by the EBA, both in the European Union and in most of its largest economies.

In Spain the asset encumbrance ratio followed a similar trend, albeit at a somewhat lower level, with the gap between the EU and Spain widening in recent years.

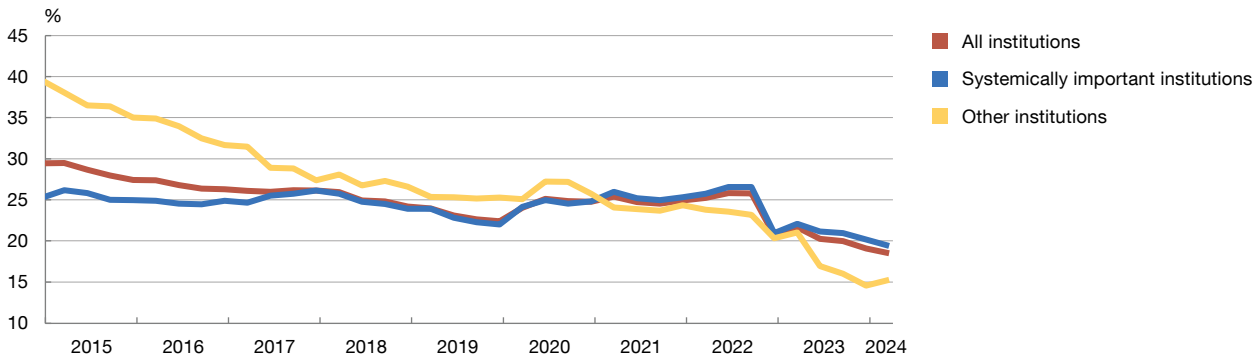
The asset encumbrance ratio of domestic systemically important institutions has historically been lower than that of other institutions (see Chart 2). This can be attributed to the lower cost at which systemically important institutions access the unsecured funding market compared with other institutions, as suggested by the findings of Babihuga and Spaltro (2014). However, this divergence narrowed over time until it was reversed after March 2021 as the TLTROs were repaid and, therefore, the secured funding programmes to which institutions other than O-SIIs had access ended. Since then, the asset encumbrance ratio for domestic systemically important institutions has remained above that of other banks, which make greater use of market funding.

The dispersion of the asset encumbrance ratio is relatively high in Spain (see Chart 3.a), although it began to decrease after 2021. The breakdown by type of institution shows that the dispersion of this indicator is lower at domestic systemically important institutions than at other institutions, as they are fewer in number and have more homogeneous characteristics (see Charts 3.b and 3.c).

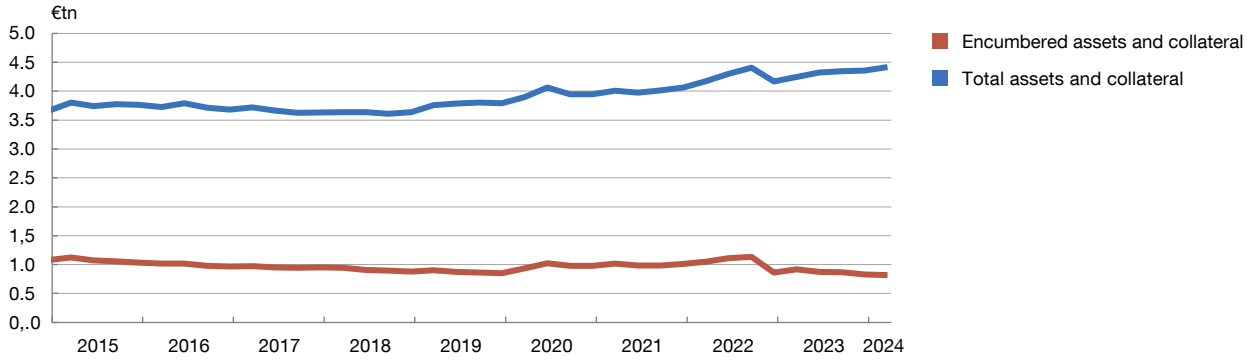
to these changes, there was no decline and even an increase in the level of lending (Castillo Lozoya, Esteban García-Escudero and Pérez Ortiz, 2022).

Chart 2
**Asset encumbrance ratio in the Spanish banking sector**

2.a Asset encumbrance ratio (a)




2.b Total and encumbered assets and collateral




**SOURCES:** Banco de España and authors' calculations.

**a** The asset encumbrance ratio is the assets and collateral received and reused to secure funding as a proportion of total assets and collateral received. It is calculated drawing on returns F32.01 on the assets of the reporting institution and F32.02 on collateral received, using the following formula: ({F32.01;010;010} + {F32.02;130;010}) / ({F32.01;010;010} + {F32.01;010;060} + {F32.02;130;010} + {F32.02;130;040}).

# 4 Central bank secured funding

As Chart 4.a shows, since the launch of the first TLTRO programme in 2014 the share of secured funding raised on the financial markets has gradually decreased, while that of central bank secured funding has risen. This trend intensified in 2020 after the launch of the third TLTRO series, whose enhanced terms led to record-level participation by banks at June 2020. In November 2022 this pattern reversed, when the share of secured market funding increased following the high early repayments of part of the outstanding TLTRO III operations, largely related to their changed terms.[9] The share of secured market funding rose again in June 2023 when TLTRO III.4 matured, and by March 2024 it amounted to 89.2% of the total.[10] All of which

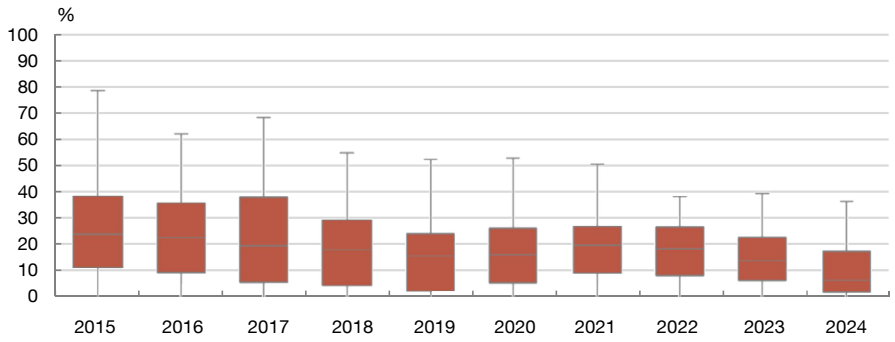
9 Against the backdrop of monetary policy tightening, the ECB altered the terms of TLTRO III, making them less favourable (see ECB decision of 27 October 2022).

10 For a more detailed analysis of the effect of TLTRO repayment, see Castillo Lozoya, Esteban García-Escudero and Pérez Ortiz (2024).

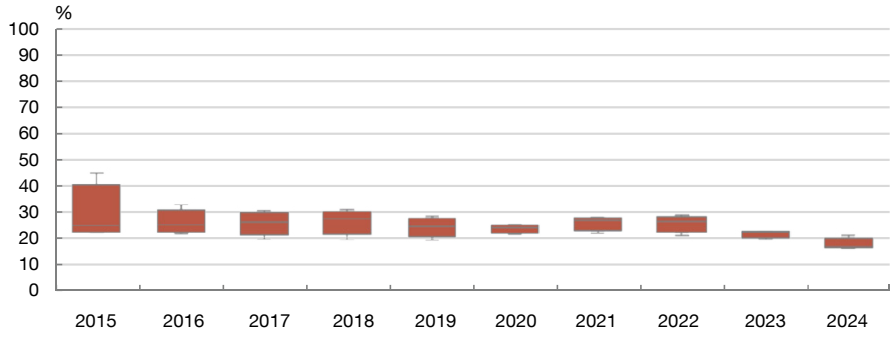
Chart 3

**Distribution of asset encumbrance at financial institutions in Spain** (a)

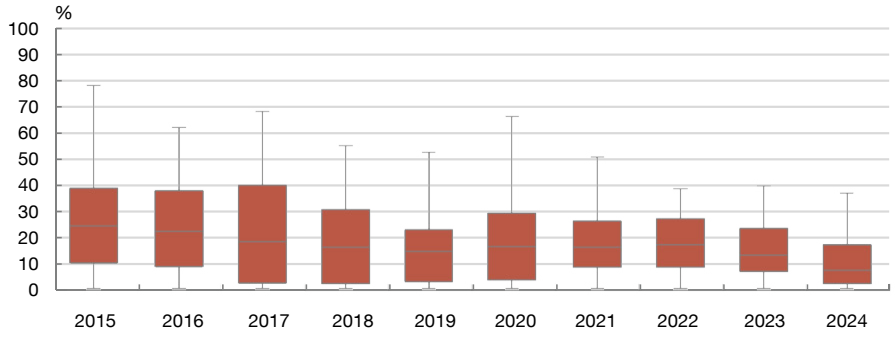
3.a All institutions




3.b Systemically important institutions




3.c Other institutions



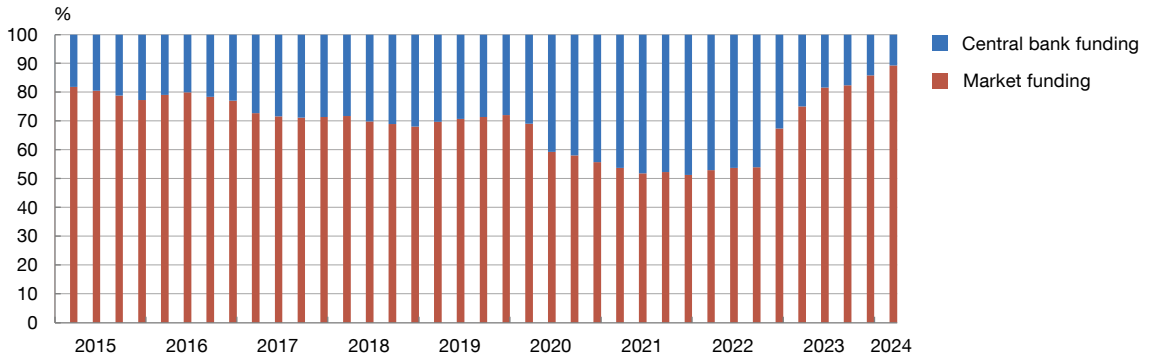

**SOURCES:** Banco de España and authors' calculations.

**a** Distribution of the asset encumbrance ratio in March of each of the years depicted, for all institutions (3.a), systemically important institutions (3.b) and non-systemically important institutions (3.c). The brown boxes represent the interquartile range: their upper bound is the third quartile and their lower bound the first quartile. The horizontal line inside the boxes is the median and the vertical lines above and below the boxes show the maximum and minimum level, respectively.

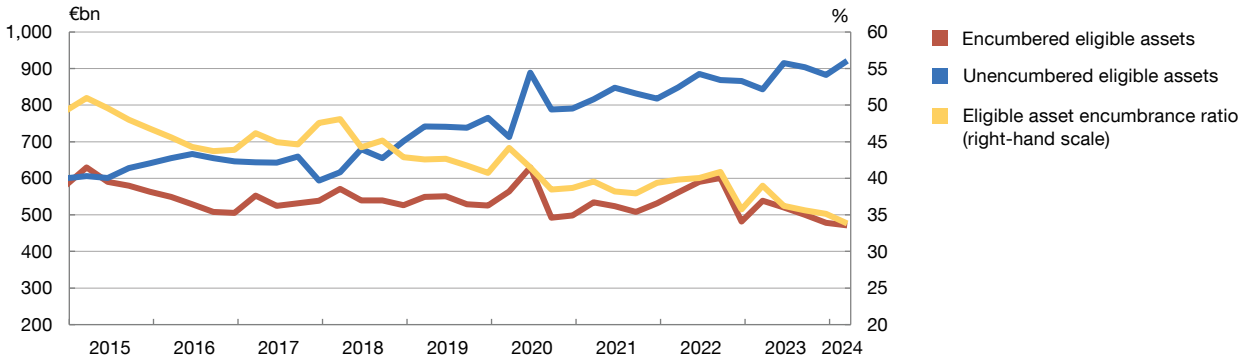
Chart 4

**Secured funding raised by Spanish credit institutions**

4.a Secured market and central bank funding




4.b Eligible assets (a)




**SOURCES:** Banco de España and authors' calculations.

**a** The eligible asset encumbrance ratio shows the proportion of ECB-eligible assets encumbered as collateral. Obtained from returns F32.01, on the assets of the reporting institution, and F32.02, on collateral received, using the following formula: ({F32.01;010;030} + {F32.02;130;030}) / ({F32.01;010;030} + {F32.01;010;080} + {F32.02;130;030} + {F32.02;130;060}).

shows that banks have gradually replaced part of their central bank funding with secured market funding.

Under normal conditions, secured market funding typically exceeds central bank funding, but the latter becomes more important in times of crisis. It is, therefore, appropriate to assess financial institutions' capacity to access this type of funding, which relies on the availability of unencumbered eligible assets. Chart 4.b shows that since 2017 the volume of such assets has risen. There are various reasons for this. First, the increase observed in April 2020 reflects the ECB's decision to temporarily ease the eligibility criteria in response to the COVID-19 pandemic, with the aim of facilitating access to bank funding.[11] Second, the heavy TLTRO III early

11 In its press release of 7 April 2020, the ECB set out the details of the temporary easing of the eligible assets framework, whereby assets guaranteed by governments or public sector entities were accepted, the minimum credit amount of €25,000 was waived, the percentage of unsecured debt instruments issued by a single issuer was increased from 2.5% to 10%, Greek sovereign debt became eligible as collateral and valuation haircuts were reduced.

repayments in November 2022 and the maturity of TLTRO III.4 in June 2023 resulted in a decline in eligible asset encumbrance. As a result of all the above, at March 2024 Spanish financial institutions presented high capacity to obtain central bank funding. It will, therefore, be interesting to monitor these indicators following the complete withdrawal of the collateral easing measures in March 2024 (Bakker et al., 2022).

## 5 Asset encumbrance in secured funding operations, by instrument

As Chart 5.a shows, loans and advances and debt securities make up the bulk of asset encumbrance. Loans and advances accounted for the largest share between 2017 and late 2022, with an average of 66.4%, compared with 25.2% for debt securities. As the outstanding TLTRO operations gradually matured, the share of loans and advances declined, reflecting the fact that these were the most common type of collateral used in the TLTROs.[12] In consequence, at March 2024 debt securities accounted for 34.1% of asset encumbrance and loans and advances for 58.8%. For their part, debt securities make up almost all the collateral received and reused in secured financing operations (see Chart 5.b).

The breakdown by instrument shows that debt securities have the highest levels of encumbrance, followed by equity instruments and loans and advances other than loans on demand (see Chart 6). The proportion of encumbered debt securities rose after 2020, reaching 54.21% in 2022 Q3. It then declined from 2023 Q2, as did the overall asset encumbrance ratio. Meanwhile, the proportion of encumbered loans and advances other than loans on demand stood at 24.4% on average between 2017 and 2022 and then fell in the following years, reaching 13.1% at March 2024. The proportion of encumbered equity instruments stood at 28.7% on average between 2017 and 2024, with no defined trend over the period.

## 6 Sources of encumbrance

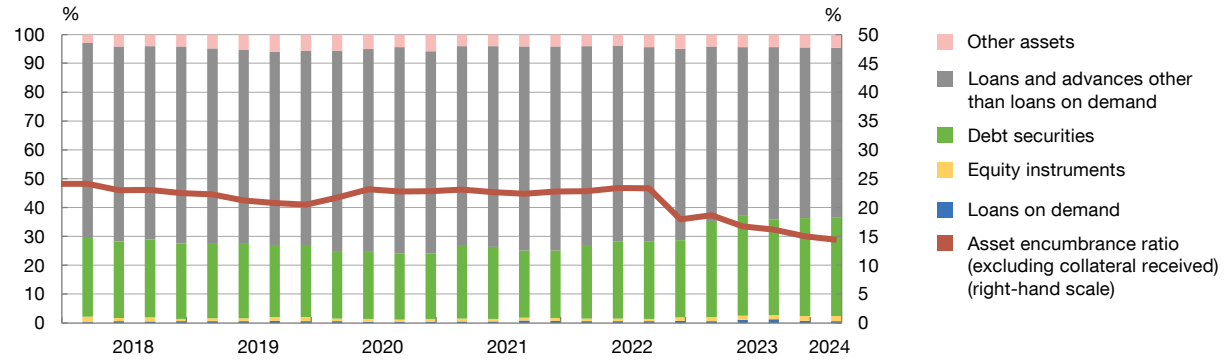
Chart 7.a presents a breakdown by liability type of the secured funding operations made by Spanish financial institutions since 2017. It shows that most funding comes from central banks, repos and covered bonds, which together account on average for around 71% of all sources of secured funding. Between 2017 and mid-2020 the relative share of the different sources of funding was quite stable, but thereafter the share of central bank funding increased, to the detriment of repo market funding. This reflects the fact that TLTROs had become more attractive to banks following the changes to their terms described earlier. These proportions held quite steady until December 2022, when reliance on central bank funding gradually declined as the outstanding amount of TLTROs decreased owing to maturity or early repayments. From 2022 Q3 the share of repo funding grew, reaching 44.85% in 2024 Q1, as

12 TLTRO III funding was mostly backed by term loans. In Spain one of the collateral easing measures taken during the COVID-19 pandemic was to accept loans guaranteed through the State guarantee facility provided by the Official Credit Institute (Escolar and Yribarren, 2021).

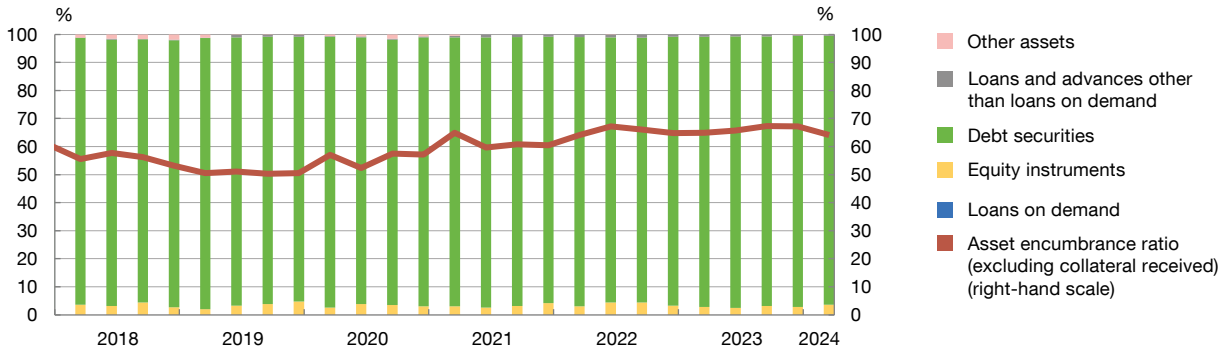
Chart 5

## Asset encumbrance by asset type in the Spanish banking system (a)

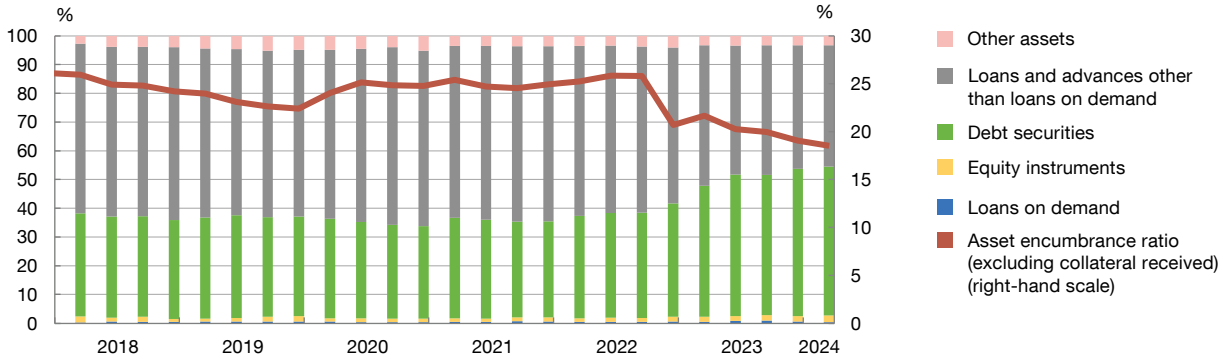
5.a Assets on balance sheet




5.b Collateral




5.c Assets and collateral

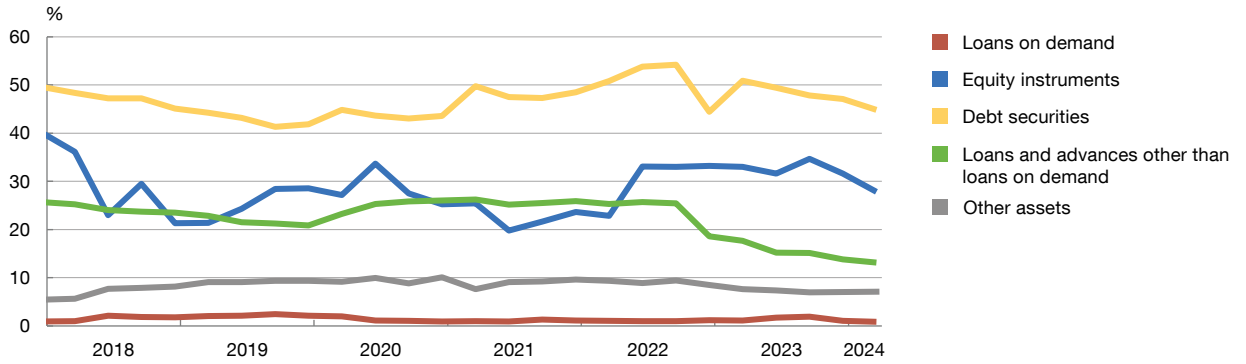



**SOURCES:** Banco de España and authors' calculations.

**a** The chart depicts each asset type as a proportion of total asset encumbrance (5.a), total collateral encumbrance (5.b) and total asset and collateral encumbrance (5.c).

Chart 6
**Asset encumbrance in the Spanish banking system by asset type**

6.a Asset encumbrance ratio by asset type (a)




**SOURCES:** Banco de España and authors' calculations.

**a** The chart depicts the proportion of encumbrance by asset type, i.e. the assets and collateral received and reused to secure funding as a proportion of the total assets and collateral received. Obtained from returns F32.01, on the assets of the reporting institution, and F32.02, on collateral received, using the following formula: ({F32.01;row by asset type;010} + {F32.02;row by asset type;010}) / ({F32.01;row by asset type;010} + {F32.01;row by asset type;060} + {F32.02;row by asset type;010} + {F32.02;row by asset type;040}).

financial institutions used it to replace part of their central bank funding, on account of the increased preference for short-term funding in 2022 and the maturity of TLTRO III.4 in June 2023 (Castillo Lozoya, Esteban García-Escudero and Pérez Ortiz, 2024). The breakdown by type of institution shows similar patterns for systemically important institutions and the rest of the banking system (see Charts 7.b and 7.c). The pattern is also similar in the other European countries, as described in the latest EBA report on asset encumbrance (European Banking Authority, 2023).

Chart 8 shows the maturity structure of the secured funding raised by Spanish financial institutions between March 2022 and March 2024. Between March and June 2020 the share of operations maturing between one and two years fell sharply, while the share of those maturing between six months and one year grew. This reflects the heavy early repayments of TLTROs in that period. Since then, the maturity structure has been more stable.

## 7 Level of collateralisation in secured funding operations

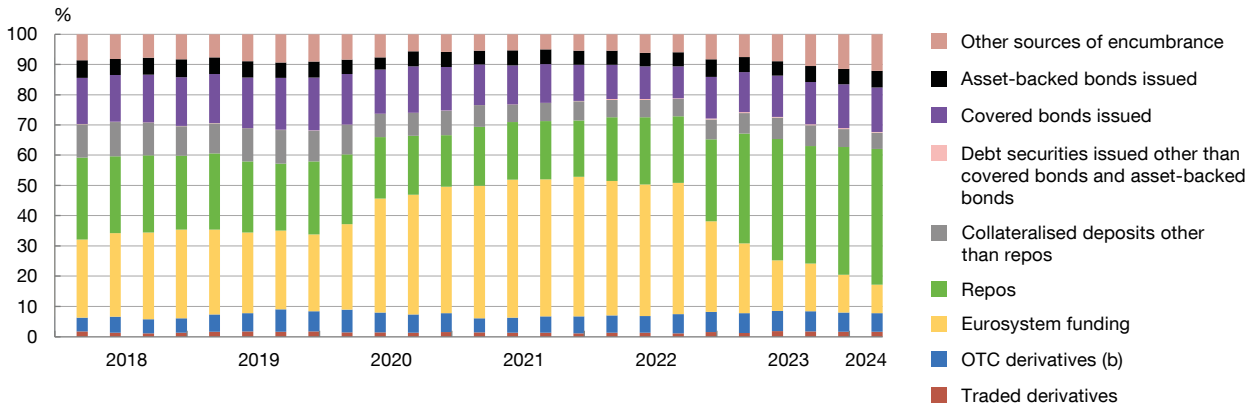
Chart 9 presents the level of collateralisation in secured funding raised by Spanish financial institutions, proxied by the ratio of the amount of encumbered assets and collateral received to the volume of secured funding raised.

Overcollateralisation makes funding more costly as it limits the amount that a bank can access per unit of collateral. The chart shows the level of assets and collateral pledged by financial institutions relative to their matching liabilities. For secured funding overall, this ratio has held quite steady, around 123%, since 2014 Q4. By liability type, debt securities issued (mainly

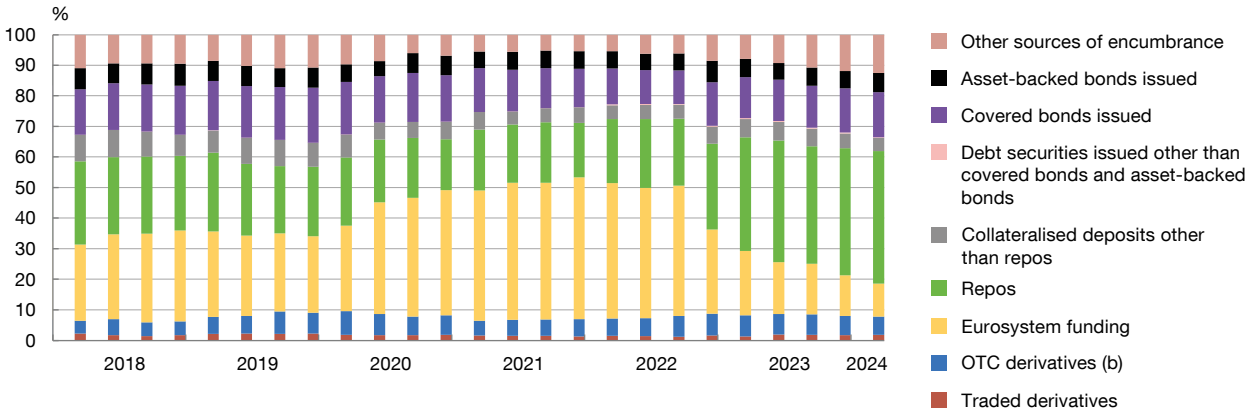
Chart 7

## Distribution of sources of asset and collateral encumbrance (a)

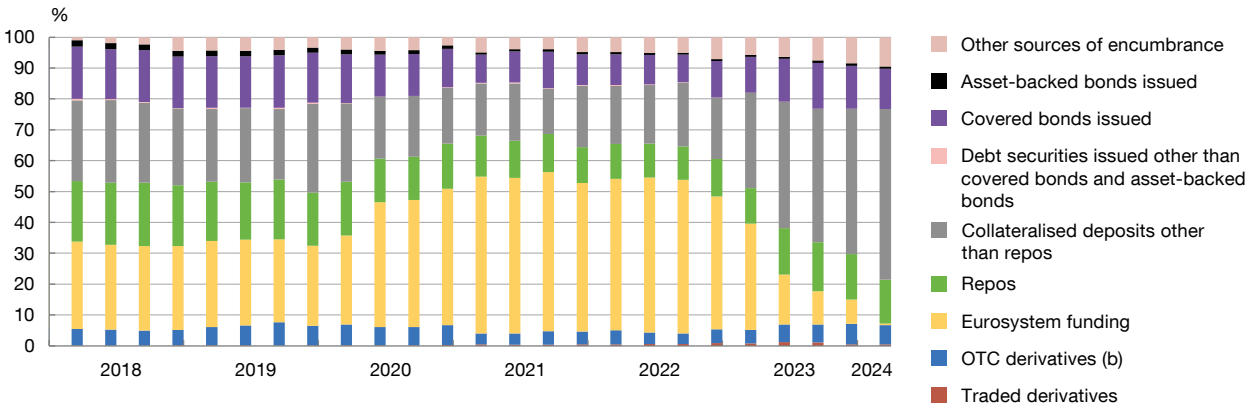
### 7.a All financial institutions




### 7.b Systemically important institutions




### 7.c Other institutions

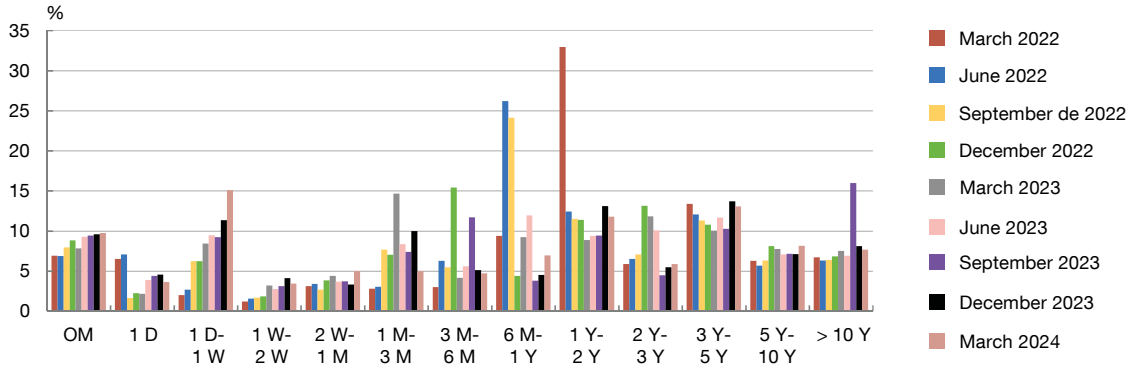



**SOURCES:** Banco de España and authors' calculations.

**a** The chart depicts the proportion of each liability type as the source of encumbrance of the assets or collateral received.
**b** OTC (over-the-counter) derivatives are those traded directly between two counterparties on markets with no intermediation by clearing houses.

Chart 8
**Maturity of secured funding raised by Spanish banks**

8.a Maturity structure (a) (b)

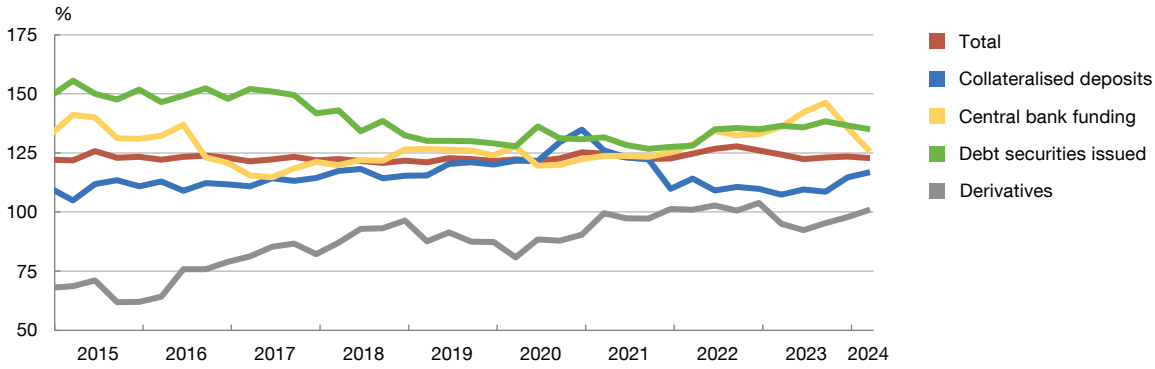



**SOURCES:** Banco de España and authors' calculations.

**a** The chart shows the maturity structure of the liabilities that are the source of encumbrance of the assets and collateral received.
**b** OM denotes open market operations. D, W, M and Y denote days, weeks, months and years, respectively.

Chart 9
**Level of collateralisation of secured funding raised by Spanish banks**

9.a Level of collateralisation by source of funding (a)




**SOURCES:** Banco de España and authors' calculations.

**a** The level of collateralisation is proxied by the ratio of the amount of encumbered assets to the volume of secured funding raised.

asset-backed bonds) have tended to have a higher level of collateralisation (138.6% on average for the period considered), while central bank funding and collateralised deposits have had a lower level (respectively 127.6% and 115.3%, on average, between 2014 and 2024). For derivatives, the level of collateralisation is less than 100% for much of this period.[13] Overcollateralisation has remained broadly constant, but has risen for some liabilities due, among other factors, to the increase in interest rates, which directly affects the market value of the assets used as collateral. In addition, the increase in valuation haircuts as a result of the

13 It is important to note that derivatives positions are reported on a gross basis, while collateral can be reported on a net basis.

gradual withdrawal of the temporary easing of the eligible assets framework drove up overcollateralisation in central bank funding in mid-2023.[14]

## 8 Conclusions

This article analyses how different indicators related to secured funding raised by Spanish banks evolved between December 2014, when the EBA requirement for disclosure of asset encumbrance came into force, and March 2024.

The main factor affecting these indicators was the support provided by the ECB through its liquidity injection programmes, and more specifically via TLTRO III, which played a hugely important role in the crisis triggered by the COVID-19 pandemic. These programmes were possibly even more important for non-systemic institutions, as the relaxation of the initial requirements enabled them to obtain ECB funding.

In Spain, as in all other European countries, the level of asset encumbrance in secured funding operations has declined since 2022, largely reflecting repayment of the outstanding amount of Eurosystem refinancing operations. The fact that more unencumbered assets are available makes it easier for banks to access funding on the financial markets. This is a positive factor, especially in highly uncertain environments such as the present one where geopolitical tensions continue. However, the gradual withdrawal of the ECB's refinancing operations also entails a reduction in the supply of funding available for banks. In practice, this could limit their ability to obtain secured funding if the collateral released struggles to meet market requirements.

14 The 20% reduction in haircuts was reduced to 10% in July 2022, and then to 0% in June 2023 (Bakker et al., 2022).

## REFERENCES


Babihuga, Rita, and Marco Spaltro. (2014). "Bank Funding Costs for International Banks". IMF Working Paper, 14/71, International Monetary Fund. https://www.imf.org/external/pubs/ft/wp/2014/wp1471.pdf

Bakker, Charlotte, Luca Bortolussi, Mark Büssing-Lörcks, Adina-Elena Fudulache, Diana Gomes, Iskra Pavlova and Stephan Sauer. (2022). "Gradual phasing-out of pandemic collateral easing measures". *Economic Bulletin - European Central Bank,* 3/2022. https://www.ecb.europa.eu/press/economic-bulletin/focus/2022/html/ecb.ebbox202203_07~441fce9f64.en.html

Banco de España. (2023). "Chapter 3. Systemic risk and prudential policy". In Banco de España, *Financial Stability Report. Autumn 2023,* pp. 123-139. https://www.bde.es/f/webbe/Secciones/Publicaciones/InformesBoletinesRevistas/InformesEstabilidad Financera/23/FSR_2023_2_Ch3.pdf

Basel Committee on Banking Supervision. (2010). *Basel III: A global regulatory framework for more resilient banks and banking systems.* December 2010 (rev June 2011). Bank for International Settlements. https://www.bis.org/publ/bcbs189.pdf

Berthonnaud, Pierre, Enrico Cesati, Maria Ludovica Drudi, Kirsten Jager, Heinrich Kick, Marcello Lanciani, Ludwig Schneider, Claudia Schwarz, Vasileios Siakoulis and Robert Vroege. (2021). "Asset encumbrance in euro area banks: analysing trends, drivers and prediction properties for individual bank crises". ECB Occasional Paper Series, 261, European Central Bank. https://www.ecb.europa.eu/pub/pdf/scpops/ecb.op261~d967b8f3e1.en.pdf

Castillo Lozoya, M.ª Carmen, Enrique Esteban García-Escudero and M.ª Luisa Pérez Ortiz. (2022). "The effect of TLTRO III on Spanish credit institutions' balance sheets". *Economic Bulletin - Banco de España,* 2/2022, Analytical Articles. https://repositorio.bde.es/handle/123456789/21069

Castillo Lozoya, M.ª Carmen, Enrique Esteban García-Escudero and M.ª Luisa Pérez Ortiz. (2024). "El efecto de la amortización de las TLTRO III en el balance de las entidades de crédito españolas". *Boletín Económico - Banco de España,* 2024/T2, 02. https://doi.org/10.53479/36274

Chen, Wei-Da, Yehning Chen and Shu-Chun Huang. (2021). "Liquidity risk and bank performance during financial crises". *Journal of Financial Stability,* Vol. 56, 100906. https://doi.org/10.1016/j.jfs.2021.100906

Escolar, Jorge, and José Ramón Yribarren. (2021). "European Central Bank and Banco de España measures against the effects of COVID-19 on the monetary policy collateral framework, and their impact on Spanish counterparties". Documentos Ocasionales, 2128, Banco de España. https://repositorio.bde.es/handle/123456789/19235

European Banking Authority. (2015). EBA Report on Asset Encumbrance. September 2015. https://www.eba.europa.eu/sites/default/files/documents/10180/974844/e6e2a6ee-6708-4430-a506-5f68ff70736d/EBA%20Report%20on%20Asset%20Encumbrance-%20September%202015.pdf

European Banking Authority. (2023). Asset Encumbrance Report. July 2023. https://www.eba.europa.eu/sites/default/files/document_library/Risk%20Analysis%20and%20Data/Risk%20Assessment%20Reports/2023/Asset%20encumbrance/1060673/Asset%20Encumbrance%20report%202023.pdf

Lamas Rodríguez, Matías. (2016). "Riesgo de liquidez sistémica. Indicadores para el sistema bancario español". *Revista de Estabilidad Financiera - Banco de España,* 31, pp. 43-62. https://repositorio.bde.es/handle/123456789/11300


## How to cite this document


Cáceres, Esther, and Jorge San Vicente. (2024). "Asset encumbrance in secured funding operations in the Spanish banking sector". *Financial Stability Review - Banco de España,* 47, Autumn. https://doi.org/10.53479/38944