

2 FINANCING AND INVESTMENT DECISIONS OF SPANISH NON-FINANCIAL CORPORATIONS

Summary

Financial factors have played a significant role in the recent recovery of investment of Spanish non-financial corporations. On the one hand, the improved economic and financial position of firms has contributed to increasing the funds available to pursue their investment projects. Specifically, the higher level of corporate saving has favoured internal financing, while the healthier balance sheets of firms (deleveraging) and better profitability prospects have improved their access to external funds. On the other, the strengthening of the balance sheets of banks, the main suppliers of funds, following the restructuring and recapitalisation process undertaken by the sector, has had a similar impact, by removing some of their obstacles to lend. Thus, the proportion of Spanish firms facing external financing constraints which, at the height of the crisis, was far higher than that observed in the euro area as a whole, has gradually diminished, eventually converging to the average euro area level.

This aggregate view arises from widely differing realities within the business sector. During the phase of economic recovery, a significant, albeit declining, proportion of firms, characterised by a comparatively weaker financial position, were still immersed in deleveraging processes and their volume of investment was insufficient to cover amortisation of their fixed capital. However, there is also a growing number of firms with a sounder financial position which have used external financing to expand their productive capacity.

In recent years, the allocation of credit has been more efficient than that observed before the crisis. In particular, funds tend to head towards more productive firms and those with a comparatively sounder economic and financial position. Supply factors seem to have played a role in this respect, since there is evidence that banks have improved their selection of borrowers compared to the situation prevailing before the crisis. This change in the attitude of intermediaries could be related to the experience of the crisis, which had a very strong impact on this sector, and to the regulatory changes introduced in response to it. In particular, the regulatory requirements applied to credit institutions have tightened significantly worldwide to reflect the actual level of risk assumed by them. Although, in the short term, these measures may have given rise to a reduction in the supply of bank credit and to higher financing costs, and may have also encouraged a degree of disintermediation, they would be expected to have given the financial system more stability and to have contributed to the improved selection of borrowers observed in recent years.

Lastly, a process of disintermediation of financing of Spanish firms is under way. Although this is a global phenomenon, it has been somewhat more pronounced in Spain, where the use of banking services has traditionally been higher than in other European economies. The greater diversification of sources of financing may help to make firms less vulnerable to potential shocks from a variety of sources. That said, the disintermediation process is mostly limited to large companies.

1 Introduction

From the start of the recovery of the Spanish economy, private productive investment has shown notable dynamism, in a setting of intense deleveraging among non-financial corporations as a whole. It is therefore interesting to analyse the instruments used in recent years to finance the increase in gross fixed capital formation in the Spanish economy and, to this end, the overall picture provided by aggregate data must be complemented with an analysis of more granular information. This approach will help

address certain important issues such as identifying the characteristics of firms with greater investment momentum, the source of funds for investment and changes in the degree of access to external financing¹ and in its determinants.

The deleveraging of non-financial corporations at the aggregate level in recent years has proved compatible with the reallocation of financing flows among firms and with certain changes in the corporate financing channels. In this context, it is important to analyse the characteristics of firms receiving new credit and to determine whether the degree of efficiency with which it is allocated has improved in the recent period, that is to say, to what extent is credit earmarked for firms in a more favourable economic and financial position.

In recent years, there has been a process of disintermediation of financing of firms, as a result of which the relative weight of bank credit has diminished. It is therefore of interest to study the recent increase in the degree of diversification of the sources of corporate financing, in an environment in which certain factors, both temporal and structural, are contributing to the growing role of financial markets in channelling resources directly to non-financial corporations.

This chapter analyses the link between the investment and financing of Spanish non-financial corporations in recent years. Specifically, Section 2 discusses how the gross capital formation of Spanish firms was financed during the phase of economic recovery which started in the latter half of 2013, and how this was affected by changes in the degree of access to external financing. Section 3 focuses on the importance of firms' funding structure for their investment choices and on how recent developments have affected the path and future prospects of gross capital formation in the Spanish economy.

2 The role of financing in the recent recovery of investment of non-financial corporations

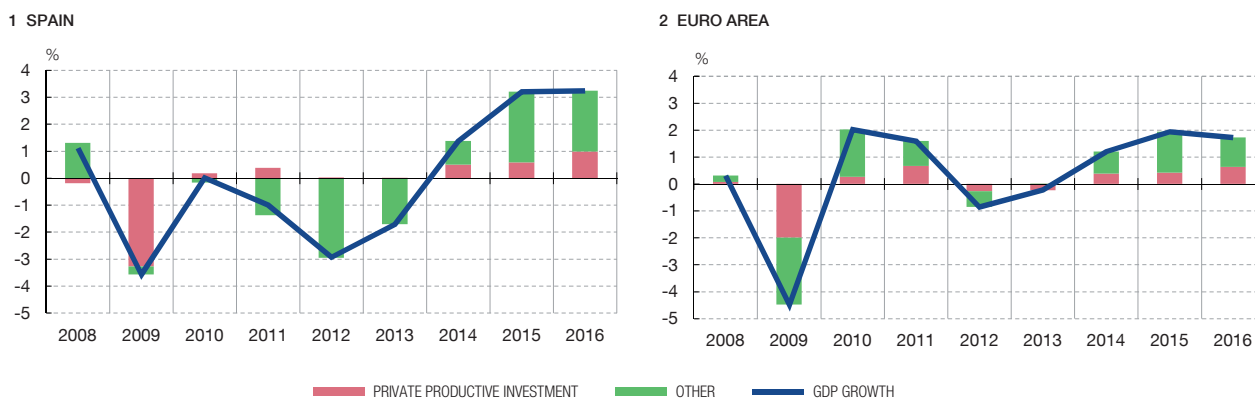
Private productive investment has played a significant role in the current phase of recovery of the Spanish economy, which began in the latter half of 2013. Specifically, this national demand component accounted for more than a fifth of GDP growth between 2014 and 2016 (see Chart 2.1)². The notable buoyancy of this aggregate is a distinguishing factor with respect to other euro area economies, in which the economic recovery is proving weaker and more sluggish, partly weighed down by the low dynamism of gross fixed capital formation. The sound performance of private productive investment in Spain which, in keeping with its markedly procyclical nature, has had higher growth than that of GDP, is particularly significant in a context in which Spanish non-financial corporations have been immersed in a process of deleveraging, which has to date been underpinned by negative financing flows (which are progressively more moderate). Against this background, it is important to analyse the instruments used to finance the gross fixed capital formation of Spanish firms in recent years and the changes in the degree of access to external financing.

2.1 INVESTMENT AND FINANCING FLOWS OF NON-FINANCIAL CORPORATIONS

At the aggregate level, the main source of financing for productive investment in recent years was the gross saving of non-financial corporations. According to Spanish National Accounts data, the gross fixed capital formation of non-financial corporations rose from 25% of gross value added (GVA) of this sector in 2013 to nearly 28% in 2016, a

¹ External financing refers to the funds that do not come from firms' self-financing derived from retained earnings.

² By component, the recovery has been particularly pronounced in investment in capital goods and transport equipment which, on average and in real terms, grew by 7% and 10%, respectively, in the three years from 2014 to 2016. Investment in intellectual property products also increased, albeit to a lesser extent (by 3%, on average, in the same period).



SOURCES: Instituto Nacional de Estadística (INE), ECB and Banco de España.



figure which is still below those posted before the crisis when values close to 35% were reached. This development has taken place in a context of recovery of firms' internally generated funds, boosted by the increase in their GVA, the contention of staff expenses and the fall in financial costs.³ Thus, the gross saving of non-financial corporations increased substantially, from 25% of GVA in 2011 to 32% in 2016, historical highs far exceeding those observed after the recession of the 1990s and, in general, in recent decades (see Chart 2.2, left-hand panel). In fact, gross saving in the sector has been higher than fixed capital investment in recent years, giving rise to a net lending capacity in the sector as a whole.

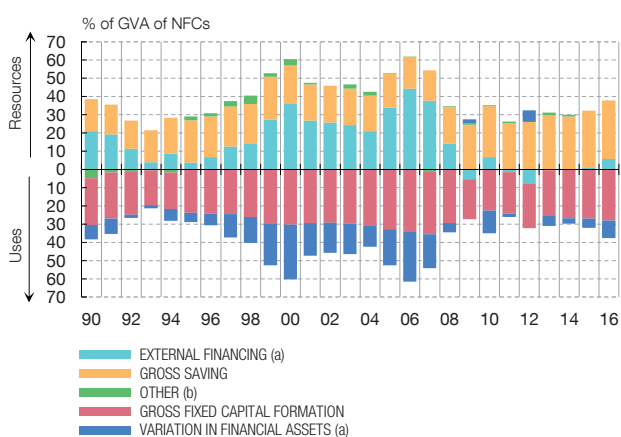
In contrast, at aggregate level, the recourse to external financing was virtually zero in net terms during the current recovery phase, except for in 2016, when it came to represent the equivalent of 5.7% of the sector's GVA. Until 2015, corporate saving not earmarked for financing productive investment stood at levels similar to the net acquisition of financial assets by the sector,⁴ which, in any event, was somewhat lower than that recorded during the recovery following the crisis of the 1990s and substantially lower than that observed between the end of the 1990s and the mid-2000s, when some Spanish multinationals underwent international expansion processes. Thus, until 2015, non-financial corporations as a whole covered the bulk of their acquisition of financial and real assets with internally generated income.

The recourse of non-financial corporations to external financing in recent years was lower than that observed following the crisis of the 1990s, with differences in the composition by instrument. Although the bulk of the sector's external financing

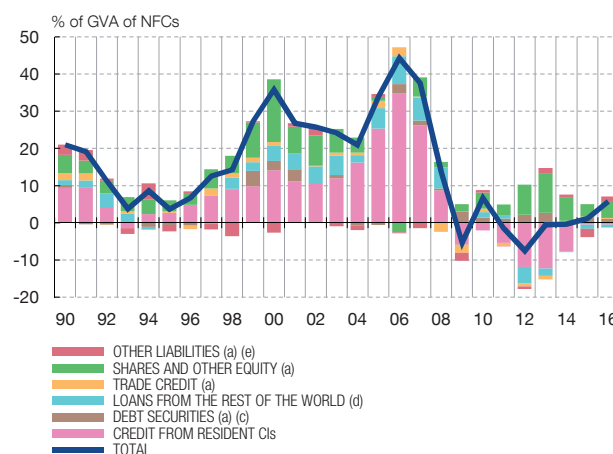
³ The growth of corporate income which, in real terms, was higher than in the latter half of the 1990s, was not only underpinned by the growth of the GVA generated by the sector, but also by the higher business margins, which, in turn, may have been boosted by the need for deleveraging persisting at non-financial corporations at the beginning of the current recovery phase. J.M. Montero and A. Urtaşun (2014) have found evidence of the existence of a positive association between the degree of financial pressure in each sector, measured through the debt ratio, and the growth rate of mark-ups over marginal cost (see "Price-cost mark-ups in the Spanish economy: A microeconomic perspective", Working Paper 1407, Banco de España).

⁴ For the analysis in this section based on data from the Financial Accounts of the Spanish Economy, the consolidated flows of non-financial corporations as a whole are used. Specifically, only the asset and liability flows of firms vis-à-vis other sectors are considered.

1 INVESTMENT AND FINANCING FLOWS



2 EXTERNAL FINANCING



SOURCES: INE and Banco de España.

- a Flows compared with sectors other than non-financial corporations.
- b Includes net capital transfers less the difference between the financing ability/need and net financial operations.
- c Includes net securities issues by subsidiaries of non-financial corporations.
- d Excludes trade credit and securities issued by resident subsidiaries in the rest of the world.
- e Includes statistical adjustments.



was channelled through own funds in the two episodes of economic recovery, the amount of these funds (specifically that relating to unlisted shares and other equity) has been particularly high during the current recovery phase (see Chart 2.2, right-hand panel). Specifically, between 2013 and 2016, the external financing through own funds of non-financial corporations overall was, on average, 6.3% of the sector's GVA, almost 3 percentage points (pp) more than in the four years from 1993 to 1996.⁵ However, debt has continued to contract in recent years, in contrast with the trend observed in the recovery of the 1990s. The then low level of debt of the corporate sector (below 45% of GDP) made it easier to obtain this type of financing, and the funds channelled in this way represented, in annual average terms, close to 2% of corporations' GVA between 1993 and 1996. The pace of debt accumulation then intensified during the expansionary cycle preceding the crisis that began in 2008, and reached 45% of GVA in 2006, giving rise to excessively high levels of corporate debt which had to be subsequently adjusted. The flow of interest-bearing financing raised by firms has effectively been negative since 2009, although from 2013 this decline has gradually steadied, to virtually zero in 2016.

These aggregate financing and investment flows may be the result of very diverse behaviour within the corporate sector. It is therefore necessary to carry out a study at firm level in order to properly assess the investment behaviour of Spanish non-financial corporations in recent years, how it relates to internal and external financing flows and the role of the financial position in explaining recent investment developments.

According to the Integrated Central Balance Sheet Data Office Survey (CBI, by its Spanish abbreviation) of the Banco de España,⁶ the proportion of firms making

⁵ The volume of own funds raised would include amounts arising from the conversion of debt into capital observed at some firms, a process which has acquired greater importance in recent years.

⁶ The CBI contains microeconomic data for some 600,000 firms per year, which facilitates the study of recent developments in the investment and financing flows of firms at a disaggregated level.

investments has risen in recent years. This proportion, which was close to 51% at SMEs and 54% at large firms in 2013, when the lowest levels were recorded since the onset of the most recent crisis, had risen by 3 pp and 5 pp, respectively, by 2015 (the last financial year available). The proportion of firms that invested amounts similar to or higher than the amortised capital (that is, those with positive net investment⁷) has also risen in recent years, to slightly more than 45% in both segments in 2015 (see Chart 2.3).

The recovery of gross capital formation can also be explained by the increase in the average amount of investment by firms. The top panels in Chart 2.3 show that the gradual recovery of this variable at the aggregate level in recent years has arisen not only from the higher proportion of firms that have expanded their productive capacity (that is, whose investment exceeds the amortised capital), but also from the increase in the average amount of investment. In parallel, gross investment of firms subject to decapitalisation processes continued to fall until 2014, to recover in 2015 (see Chart 2.3, bottom panels).

Firms with positive net investment made use of both internal and external financing. With respect to the latter, they raised funds both through capital increases and borrowing, the latter in contrast to the contraction of debt at aggregate level in the same period (see Chart 2.3). The relative importance of capital increases was comparatively higher in the case of large firms, while SMEs had greater recourse to borrowing.

The recourse to debt financing by firms with positive net investment was favoured by their comparatively healthier financial position vis-à-vis other firms. Specifically, these firms had, on average, lower levels of debt and a smaller debt burden. In addition, they were more productive and exhibited greater sales momentum. This would seem to indicate that the financial position of firms may have been a factor determining their investment choices. The results obtained from estimating a linear probability model also appear to point in that direction. Specifically, as shown in Table 2.1, the estimated probability of a firm having positive net investment depends positively on the growth of its sales, its productivity and its profitability in the previous year,⁸ and negatively on its debt burden and level of debt (also in the previous year). Moreover, the contractionary impact of the latter on the probability of a firm recording net investment higher than or equal to zero appears to have increased following the crisis. These results are consistent with evidence found in the literature regarding the impact of financial factors on investment, which shows that a less sound financial position (for example, arising from excessively high levels of debt or debt burden), when controlled for firms' profitability, translates into lower investment levels, particularly if the financial pressure faced by firms exceeds a certain threshold.⁹

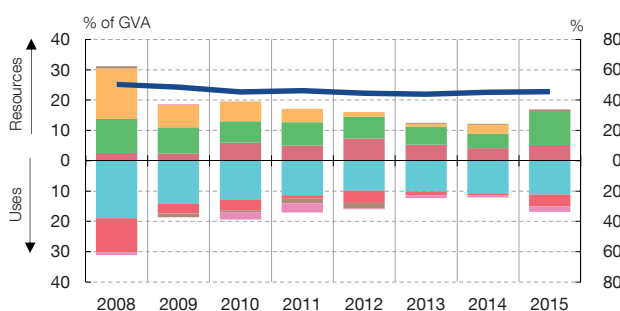
In contrast, firms with negative net investment reduced, overall, their levels of debt. This reduction was underpinned by an increase in own funds, by means of capital increases (especially in the case of large firms) and internal saving. In the case of SMEs, deleveraging was also underpinned by divestments of fixed capital stock, a characteristic not observed at large firms, which presented positive (albeit low) gross capital formation in all the years under review. It was also observed that, overall, firms with negative net investment increased

7 This group also includes those with zero net investment.

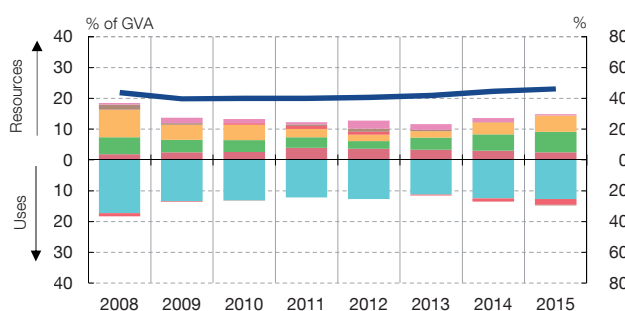
8 The relationship between profitability and investment was not significant during the crisis period, unlike other years.

9 For international evidence, see, for example, V. A. Aivazian, Y. Ge and J. Qiu (2005), "The impact of leverage on firm investment: Canadian evidence", *Journal of Corporate Finance*, 11, pp. 277-291 and L. Lang, E. Ofek and R. M. Sulz (1996), "Leverage, investment, and firm growth", *Journal of Financial Economics*, 40, pp. 3-29. For Spanish evidence, see F. Herranz and C. Martínez Carrascal (2017), "The impact of firms' financial position on fixed investment and employment. An analysis for Spain", Working Paper 1714, Banco de España.

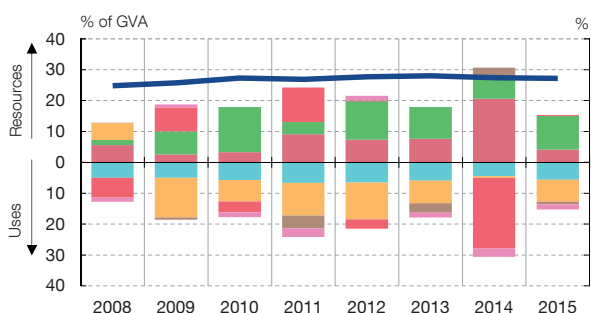
1 ASSET AND LIABILITY FLOWS OF LARGE FIRMS WITH ZERO OR POSITIVE NET INVESTMENT (a) (b)



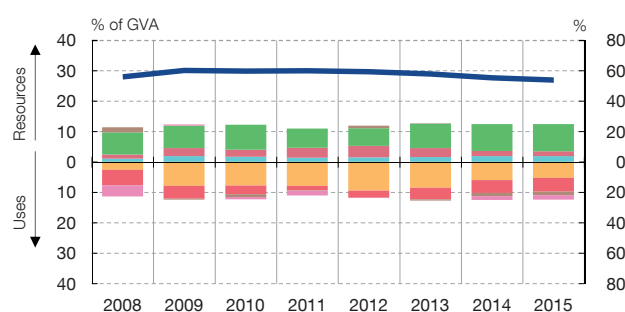
2 ASSET AND LIABILITY FLOWS OF SMEs WITH ZERO OR POSITIVE NET INVESTMENT (a) (b)



3 ASSET AND LIABILITY FLOWS OF LARGE FIRMS WITH NEGATIVE NET INVESTMENT (a) (b)



4 ASSET AND LIABILITY FLOWS OF SMEs WITH NEGATIVE NET INVESTMENT (a) (b)



NET CAPITAL INCREASES INTERNAL FINANCING FINANCIAL DEBT
 GROSS FIXED CAPITAL FORMATION FINANCIAL INVESTMENT NET TRADE CREDIT (ASSETS – LIABILITIES)
 OTHER NET FLOWS (ASSETS – LIABILITIES) FIRMS AS PERCENTAGE OF TOTAL (right-hand scale)

SOURCE: Banco de España.

a Net investment is understood to be the flow of gross fixed capital formation (tangible and intangible) net of capital consumption.
 b Definition of sizes in line with European Commission Recommendation (2003/361/EC).

their holdings of financial assets, especially cash and deposits, which may suggest that this group of firms includes certain firms whose limited investment effort responded more to insufficient or uncertain profitability prospects than to a lack of funds to finance investment.

In recent years, the proportion of firms which have maintained or increased their outstanding balance of bank credit has risen. In line with previous results, according to the data of the Banco de España’s Central Credit Register (CCR), which provide information on individual loans of more than €6,000 at the borrower level, the proportion of firms whose outstanding balance of bank financing did not decline began to rise in 2013. In 2016, this proportion was 43%, 8 pp higher than the lowest levels posted in 2012, although below the high levels of close to 52% observed in the years of strongest credit growth (see Chart 2.4, panel 2).

Firms whose outstanding balance of bank financing has not declined have a sounder financial and economic position than those which have reduced their level of debt. Specifically, these firms have higher profitability and a lower level of debt and debt burden, with more buoyant activity (proxied by the volume of sales) and higher levels of total factor productivity (see Chart 2.4, bottom panels). In addition, the differences in the indicators of the economic and financial position of these groups of firms seem to have become more

	Impact on the probability of zero or positive net investment		
	Coefficients for 2005-2007	Coefficients for 2008-2013	Coefficients for 2014-2015
Profitability _{it-1}	0.030***	-0.006	0.024***
Debt burden _{it-1}	-0.009***	-0.012***	-0.009***
Indebtedness _{it-1}	-0.038***	-0.065***	-0.058***
Sales growth _{it-1}	0.041***	0.032***	0.032***
Total factor productivity _{it-1}	0.035***	0.010***	0.041***
Firms	379,134	534,943	293,894
Observations	739,276	1,612,670	401,993

SOURCE: Banco de España.

- a Marginal impacts obtained by estimating a linear probability model using the fixed effect method, with standard errors corrected and clustered at firm level. The estimation is made using data from the Integrated Central Balance Sheet Data Office Survey for 2005-2015. All regressions control for firm sector, year and size. *, ** and *** indicate significance for confidence levels of 90%, 95% and 99%, respectively.
- b The variable to be explained takes a value of one if net investment is higher than or equal to zero and of zero if otherwise. Profitability is defined as the ratio between a firm's gross operating profit and its average volume of assets in the period considered; the debt burden, as the ratio between interest payments on financing received and gross income (sum of gross operating profit and financial revenue); and indebtedness, as the debt-to-assets ratio.

accentuated in recent years, also within each sector. In the specific case of total factor productivity, that of firms whose credit did not contract is statistically higher than that of other firms across all branches of activity, and the differences between the two groups have increased with respect to the pre-crisis period when the productivity gap between them was not significantly higher or lower than zero in some sectors. Likewise, the results of a linear probability model show that the contractionary impact of indebtedness on the probability of a firm increasing or maintaining its credit levels increased following the crisis (see Table 2.2)¹⁰. These results therefore suggest that the aggregate contraction in the outstanding balance of bank financing of non-financial corporations is compatible with a more efficient reallocation of credit within sectors, with credit channelled, on average, towards corporations with higher productivity and those in a better position to absorb a higher level of debt.

2.2 ACCESS TO EXTERNAL FINANCING

Access to external financing, a major factor determining firms' investment decisions, may also affect other variables such as current assets, growth of sales or personnel hires. Evidence of such effects in Spain and the euro area in the period from 2014 to 2016¹¹ is presented in Box 2.1. The extent of these effects is generally found to be similar in both areas. Specifically, the estimation results show that constraints on access to bank financing (that is, difficulties in obtaining funds in the form of bank loans or credit facilities) increase the

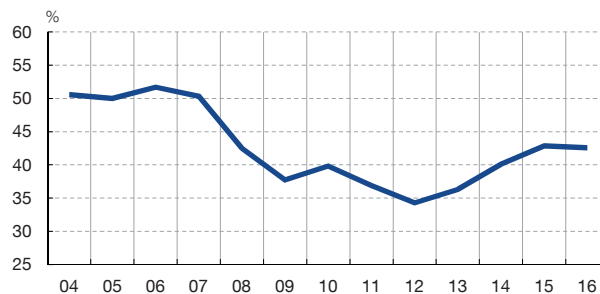
10 When firms' productivity and profitability are also included as variables in the model specification, no positive (and significant) impact on the probability of them increasing or maintaining their outstanding balance of credit is observed, possibly owing to their correlation with other variables included in the specification.

11 This evidence is consistent with that found in other developed economies. See, for example, T. Hoshi, A. Kashyap and D. Scharfstein (1991), "Corporate structure, liquidity and investment: Evidence from Japanese industrial groups", *The Quarterly Journal of Economics*, 106 (1), pp. 33-60 (Japan); S. Fazzari and B. Petersen (1993), "Working capital and fixed investment: New evidence on financing constraints", *RAND Journal of Economics*, 24 (3), pp. 328-342 (United States); S. Fazzari, R. Hubbard and B. Petersen (1998), "Financing constraints and corporate investment", *Brookings Papers on Economic Activity* 1, pp.141-19 (United States); F. Schiantarelli (1996), "Financial Constraints and Investment: Methodological Issues and International Evidence", *Oxford Review of Economic Policy* 12, pp. 70-89 (international evidence); S. Cleary (2006), "International corporate investment and the relationships between financial constraints measures", *Journal of Banking & Finance* 30(5), pp. 1559-1580 (Australia, Canada, France, Germany, Japan, United Kingdom and the United States); A. Buca and P. Vermeulen (2015), "Corporate investment and bank-dependent borrowers during the recent financial crisis", ECB Working Paper 1859 (Germany, France, Italy, Spain, Belgium, Portugal).

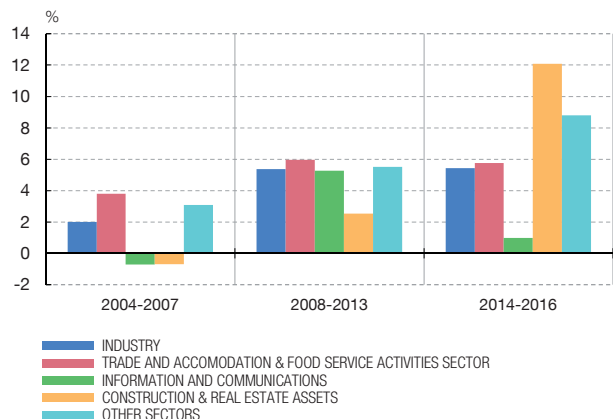
1 FINANCING TO NON-FINANCIAL CORPORATIONS. YEAR-ON-YEAR RATE OF CHANGE



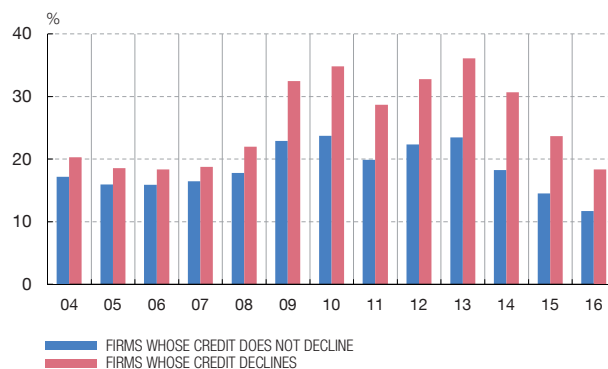
2 PROPORTION OF FIRMS WHOSE CREDIT DOES NOT DECLINE



3 AVERAGE DIFFERENCE IN TOTAL FACTOR PRODUCTIVITY, IN t-1, BETWEEN FIRMS WHOSE CREDIT IS NOT DECLINING AND THOSE WHOSE CREDIT DECLINES (a)



4 MEDIAN OF NON-FINANCIAL CORPORATIONS' FINANCIAL BURDEN (t-1) (b)



SOURCE: Banco de España.

- a The calculations have been made using cross-matched information from the CCR (Central Credit Register) and the CBSO (Central Balance Sheet Data Office). Total factor productivity measures the relationship between the use of productive factors and the amount of output obtained, and approximates the level of efficiency of the firm. It is obtained drawing on regressions made at the sectoral level of the logarithm of real gross value added over the logarithms of total capital, inputs and employment (time fixed effects are also included). An approximation is thus attained of the weights of capital and employment in the production function, providing for calculation of total factor productivity at the level of the firm. The chart plots the differences of the sectoral medians, once they have been normalised, taking as a reference the value of the median productivity of firms whose credit declines.
- b The debt burden is defined as the ratio between interest payments on financing received and gross income (sum of gross operating profit and financial revenue).



probability of declines in investment, working capital and business growth, measured both in terms of the number of employees and of sales (although in the case of the latter, estimation of the effects is less precise), and lower the probability of these variables increasing.

External financing constraints are generally more common in certain types of firms.¹² There is usually a negative link between a firm's size and the probability of it facing such constraints, although some papers have failed to find a strong correlation between these two variables. Also, there is evidence to suggest that financing constraints are inversely related with both a firm's age and total factor productivity. High-growth and innovative firms typically have more limited access to external funds. All these

12 For evidence on how external financing constraints vary depending on firms' characteristics, see, for example, T. Beck, A. Demirgüç-Kunt, L. Laeven and V. Maksimovic (2005), "Financial and Legal Constraints to Firm Growth: Does Firm Size Matter?", *Journal of Finance*, Vol. 60, No 1, pp. 137-177; T. Beck, A. Demirgüç-Kunt, L. Laeven and V. Maksimovic (2006), "The determinants of Financing Obstacles", *Journal of International Money and Finance*, Vol. 25:6, pp. 932-952; A. Ferrando and N. Grieshaber (2011), "Financing Obstacles among Euro Area Firms: Who Suffers the Most?" ECB Working Paper 1293; European Investment Bank (2016), "Investment and Investment Finance in Europe. Financing productivity and growth".

	Impact on the probability of increasing or maintaining bank credit		
	Coefficients for 2005-2007	Coefficients for 2008-2013	Coefficients for 2014-2015
Debt burden _{it-1}	-0.018***	-0.013***	-0.012***
Indebtedness _{it-1}	-0.188***	-0.232***	-0.216***
Sales growth _{it-1}	0.022***	0.015***	0.016***
Employment growth _{it-1}	0.015***	0.015***	0.021***
Firms	318,314	444,175	225,666
Observations	596,027	1,249,630	304,013

SOURCE: Banco de España.

- a Marginal impacts obtained by estimating a linear probability model using the fixed effect method, with standard errors corrected and clustered at firm level. The estimation is made using data from the Integrated Central Balance Sheet Data Office Survey for 2005-2015. All regressions control for firm sector, year and size. *, ** and *** indicate significance for confidence levels of 90%, 95% and 99%, respectively.
- b The variable to be explained takes a value of one if net investment is higher than or equal to zero and of zero if otherwise. Profitability is defined as the ratio between a firm's gross operating profit and its average volume of assets in the period considered; the debt burden, as the ratio between interest payments on financing received and gross income (sum of gross operating profit and financial revenue); and indebtedness, as the debt-to-assets ratio.

characteristics which make access to external financing more difficult for firms are directly or indirectly related to the greater risk perceived by lenders, to problems of information asymmetries or to the reduced availability of assets that may be used as collateral in financing operations.

The Survey on the Access to Finance of Enterprises (SAFE) allows for analysis of developments in the degree of access to external financing of non-financial corporations in Spain and the euro area. This survey has been conducted on a six-monthly basis by the European Central Bank (jointly with the European Commission once a year) since 2009, covering a broad range of European firms (between 12,000 and 18,000, depending on the edition), mainly SMEs.¹³ Based on the survey results, various indicators of constraints on access to external financing can be constructed for the main types of financing: bank loans, credit facilities, trade credit and other financing (leasing, factoring, debt issues, shares, loans from other firms). In the research based on this database, a distinction is normally drawn between objective and subjective external financing constraints.¹⁴ Among the objective constraints, two alternative indicators (narrow and broad) are defined. The first of these considers that a firm has restricted access if its request for financing has been rejected. The second adds the following three circumstances: the firm has not requested financing fearing that it would not be granted, the firm has obtained financing but has received less than 75% of the amount originally requested, and the firm has rejected the lender's offer since it considers that the interest rate is too high. Subjective constraints are proxied on the basis of the replies to a survey question in which firms assess whether access to financing is a major obstacle to their activity, assigning a rating from 1 to 10 (where 1 is irrelevant and 10 highly significant).

In recent years, there has been a significant drop in the proportion of Spanish firms facing bank financing constraints. This development follows on from the high levels

13 For more details on the survey, see European Central Bank (2016), "Survey on the access to finance of enterprises. Methodological information on the survey and user guide for the anonymized micro dataset". The European Central Bank publishes a six-monthly report on the main results of the survey. These reports are available at: https://www.ecb.europa.eu/stats/ecb_surveys/safe/html/index.en.html.

14 See C. Artola and V. Genre (2011), "Euro area SMEs under financial constraints: Belief or reality?", CESifo WP 3650.

reached in the worst years of the crisis, far exceeding those observed in the euro area overall. Thus, according to the broad indicator, the percentage of Spanish firms facing constraints in accessing bank loans fell from 24% in 2012 to 11% in 2016, reducing the gap with the euro area from 12 pp to 2 pp (see Chart 2.5, Panel 1).¹⁵ The same trend was observed with respect to credit facilities and the narrow indicator of constraints (see Chart 2.5, Panels 2 and 3). Specifically, in 2012, around 17% of firms in Spain had had their requests for bank loans rejected (compared with 10% in the euro area), while in 2016 this proportion had declined to 4%, slightly below the euro area figure.

The degree of access of Spanish firms to other types of financing has also tended to converge towards average euro area levels. Thus, according to the broad indicator, in 2012 around 18% of Spanish firms faced constraints in their access to trade credit, while this figure was 7% in 2016, slightly below that of the euro area (see Chart 2.5, Panel 4). As regards “other types of financing” (leasing, factoring, debt issues, shares, loans from other firms), 12% of Spanish firms stated that they faced constraints in 2011, compared with 7% in 2016, just 1 pp above the euro area level, compared with a difference of 5 pp five years earlier (see Chart 2.5, Panel 5).

The subjective financial constraints indicator draws similar conclusions. Thus, in 2011, the average Spanish firm assigned the problem of access to financing a rating of 6.4 points (on a scale of 1 to 10 in importance), 1 pp higher than the corresponding value for the euro area, whilst in 2016, the indicator had dropped to 4.6 points, a level similar to that of the euro area (see Chart 2.5, Panel 6).

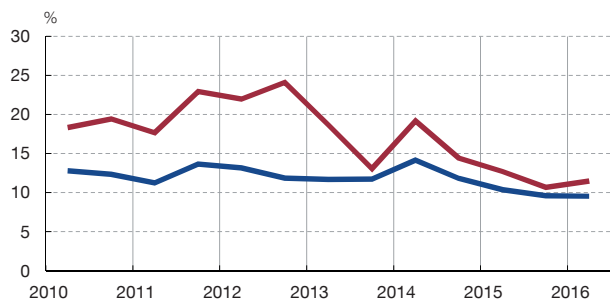
A regression analysis controlling for firm-level characteristics confirms these results. Some of the differences in the degree of access to external financing between Spanish and euro area firms may be due to their different characteristics. In order to isolate these factors, a regression analysis controlling for this factor was conducted. This analysis shows that the probability of facing constraints in access to bank financing (loans and credit facilities) was similar in Spain and the euro area in 2016 when using the broad indicator, and slightly lower in Spain when using the narrow indicator. When this exercise is applied to trade credit and “other types of financing”, it reveals full convergence between Spain and the euro area in the case of the broad indicator, and almost full in the case of the narrow indicator.

Convergence in the degree of access to external financing of Spanish and euro area firms has been widespread across different business segments. This is illustrated by Chart 2.6, which shows the percentage of firms with constraints on their access to bank loans, according to the broad indicator, both during the crisis (2011-2012) and more recently (2015-2016) in Spain and the euro area. There has been convergence across all firm sizes and ages (Panels 1 and 2), with a particularly sharp drop in the proportion of constrained firms in the case of firms aged five years or more. Convergence has also been broad-based across the different productive sectors and depending on firms’ level of innovation¹⁶ (Panels 3 and 4), with a notable improvement in the access to bank financing among Spanish construction firms and innovative firms, two segments which had faced severe constraints during the worst years of the crisis.

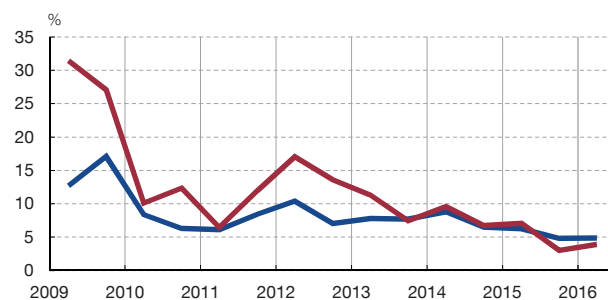
¹⁵ The gap with the core euro area countries (France, Germany, Netherlands, Austria, Finland and Luxembourg) also narrowed considerably, from 17 pp in 2012 to 4 pp in 2016.

¹⁶ A firm is considered to be innovative if, in the last 12 months, it has launched a new product or service on the market or has introduced a new production process, new working arrangements or new ways of selling its goods or services.

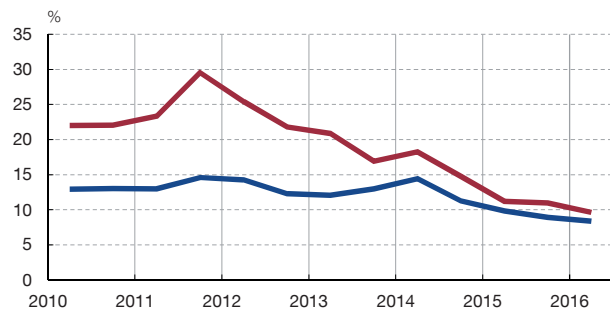
1 BROAD INDICATOR. BANK LOANS



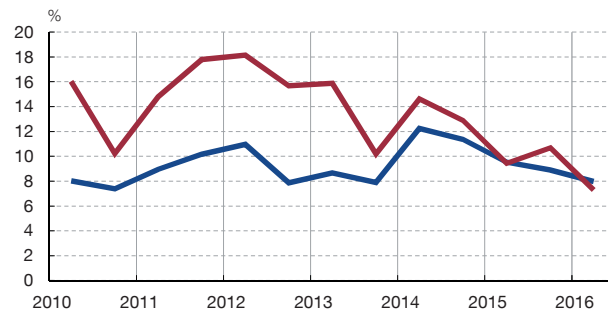
2 NARROW INDICATOR. BANK LOANS



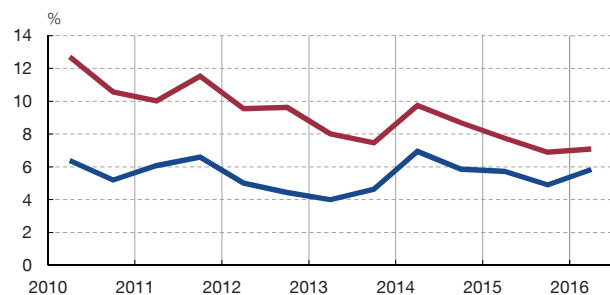
3 BROAD INDICATOR. CREDIT LINES



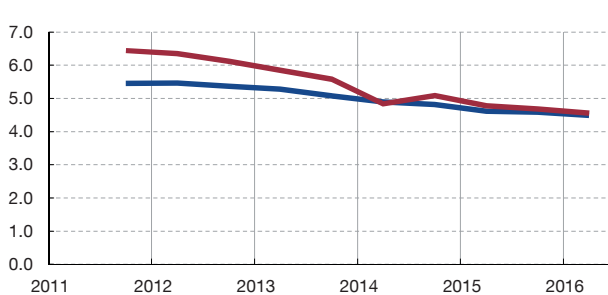
4 BROAD INDICATOR. TRADE CREDIT



5 BROAD INDICATOR. OTHER FINANCING



6 IMPORTANCE OF ACCESS TO FINANCING PROBLEM



— EURO AREA — SPAIN

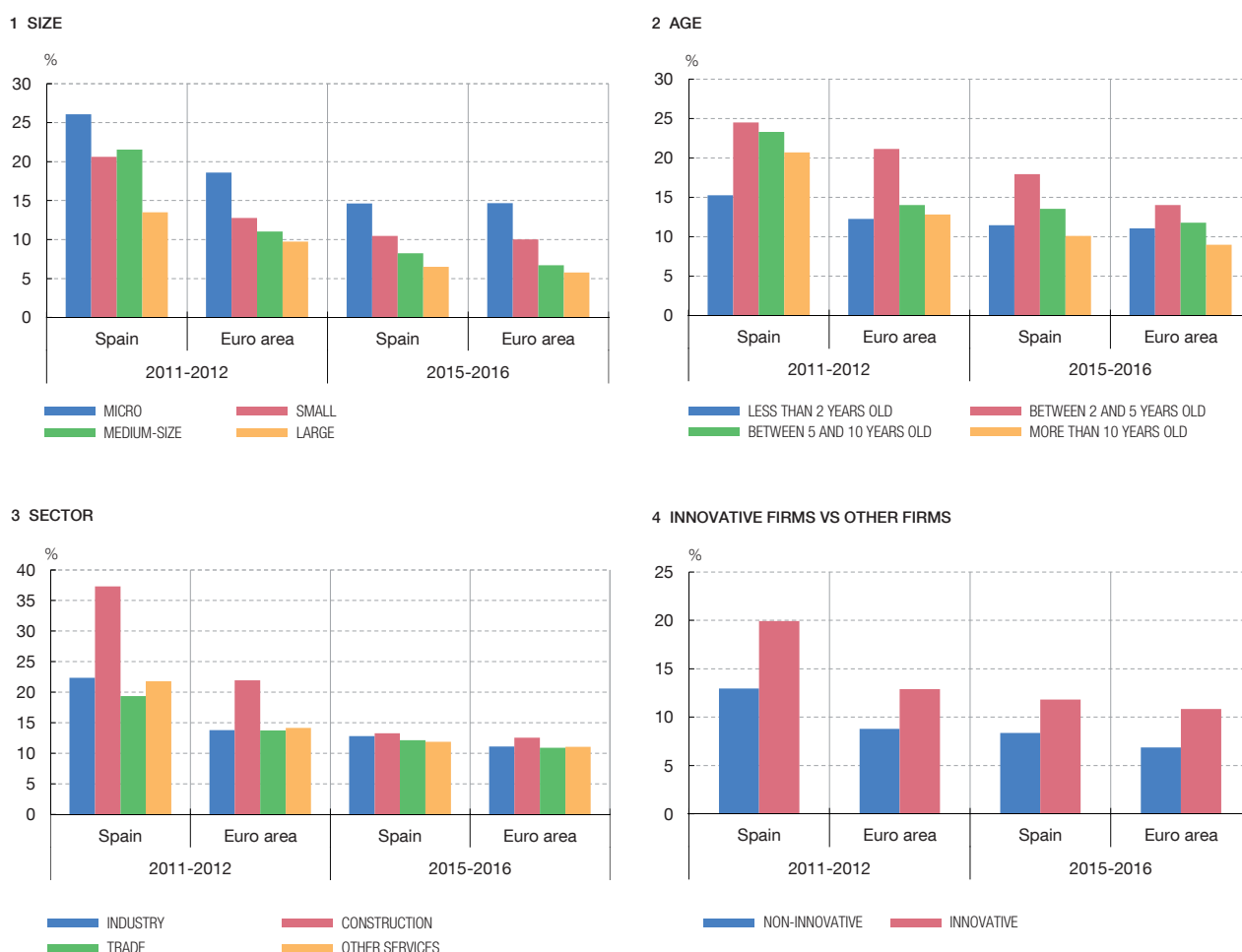
SOURCE: Survey on Access to Finance of Enterprises (SAFE).

a The chart shows the percentage of firms with constraints in Panels 1 to 5, and an index that takes values on a scale of 1 to 10 in Panel 6, obtained as an average of individual responses. The series are represented for the entire available time range, which is not the same in all cases. Thus, they do not all start on the same date.



However, there is a certain heterogeneity in the degree of access to external financing, in terms of firm characteristics. Specifically, younger, smaller and more innovative firms face more constraints, as lenders consider them to be higher-risk segments. The regression analyses for each business segment, which take account of the effect of the different characteristics of firms,¹⁷ reveal that some segments in Spain continue to face greater constraints than in the euro area, although the differences are

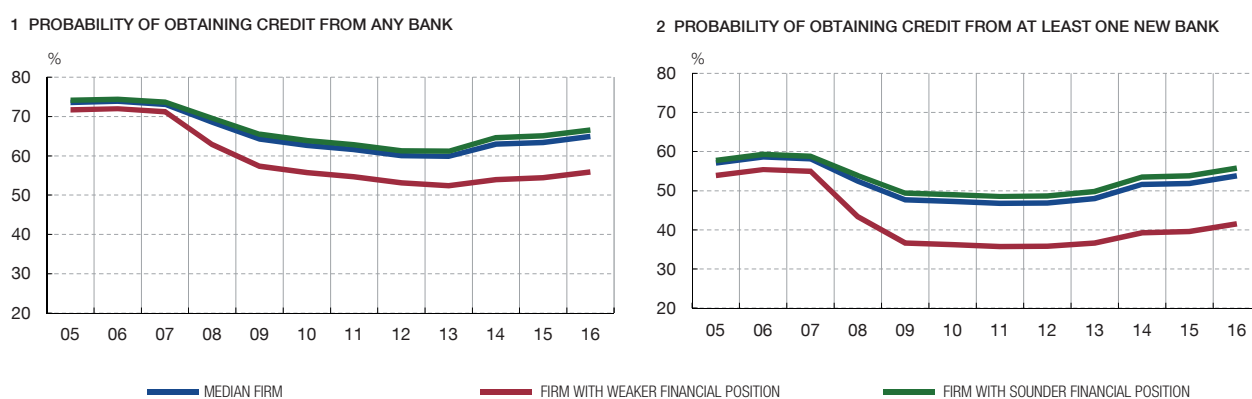
¹⁷ The characteristics taken into account do not include the profitability of firms, since this variable was not available in the database used for this analysis.



SOURCE: Survey on Access to Finance of Enterprises (SAFE).

generally small. Thus, according to the broad indicator, medium-sized Spanish firms and firms in services sectors other than trade, would be more likely (between 3pp and 4pp) to face constraints in access to bank loans than their European peers. Small firms in Spain and those in the trade sector would be more likely (between 3pp and 4pp) to face constraints on access to credit facilities than those of the euro area. Moreover, young Spanish firms (less than five years' old) and those in the trade sector would be more likely (between 3pp and 6pp) to face constraints on trade credit than similar firms in the euro area. Lastly, small, older (more than ten years' old) firms in Spain and those in other services sectors would be more likely (around 2pp) to face constraints on other types of financing than similar European firms.

The degree of access to bank credit of non-financial corporations depends as much on their characteristics as on those of the lenders. Specifically, the results detailed in Box 2.2 show that the probability of obtaining credit is higher the older and larger the firm and the sounder its financial position, aspects which are inversely correlated with the risk perceived by lenders. The number of institutions with which firms operate also has a favourable effect on this probability. The size (proxied by the total volume of assets) and financial soundness of credit institutions, measured through their capital and liquidity ratios and their non-performing loans ratio, are directly related to banks' readiness to extend loans. Therefore, these results suggest that the improved financial position of non-financial corporations and banks in recent



SOURCE: Banco de España.



years¹⁸ has contributed to increasing Spanish firms' access to bank financing. Additionally, some regulatory measures such as, for example, the change in the definition of SMEs for the purposes of the new capital regulations for credit institutions, which entered into force in 2013, have also favoured the access of such firms to external funds.¹⁹

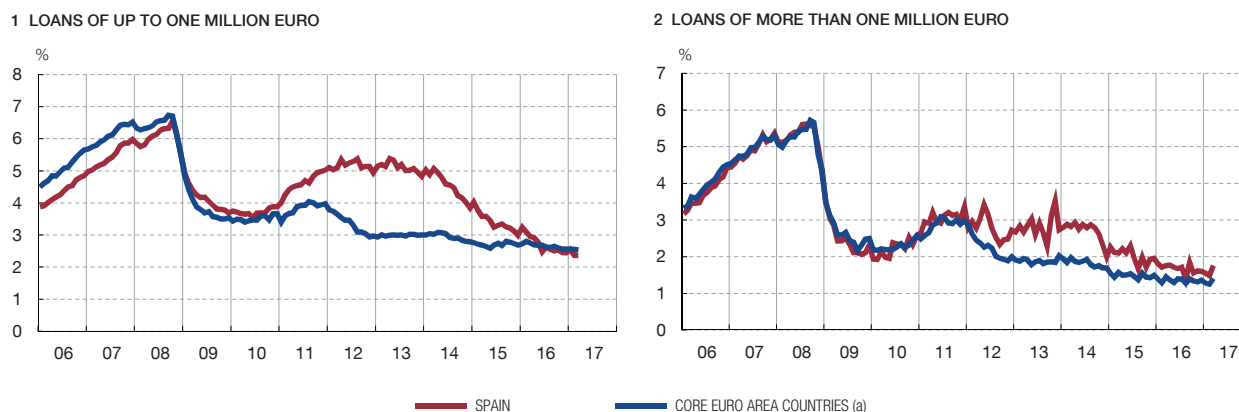
Recovery of the degree of access to credit has been higher for firms with a sounder financial position. Chart 2.7, which is based on the results discussed in Box 2.2, shows how the probability of obtaining credit for a typical firm with a fixed set of characteristics has risen since the start of the economic recovery, following the decline observed during the crisis years. This was observed both when banks with which firms had a previous credit relationship (left-hand panel) were considered and when these banks were excluded (right-hand panel).²⁰ The chart also shows how, after the onset of the crisis, the dispersion in the degree of access to credit on the basis of firm characteristics tended to increase, a trend that became somewhat more pronounced during the recovery phase. This evidence suggests that banks' selection of borrowers has improved in recent years, which has translated into a more marked recovery of the degree of access to bank financing for firms with a sounder financial position.

In short, one of the factors contributing to the recovery of investment of Spanish non-financial corporations in recent years is their improved access to external financing. Specifically, for 13% of Spanish firms which went from facing constraints on access to bank loans to not facing them in 2012-2016, the results shown in Box 2.1 indicate that the probability of their investment declining fell by more than 4 pp, and the probability of it

18 From 2013, the proportion of firms in a vulnerable position (defined as those with insufficient operating income to cover interest payments) has declined considerably, especially in the SME sector. For more details, see Menéndez and Mulino (2017), "Changes in the degree of financial pressure borne by Spanish non-financial corporations: 2007-2016", Economic Note, Banco de España. For an analysis of developments in the financial position of credit institutions, see the Financial Stability Reports of the Banco de España, published twice a year.

19 The new definition of SME, which is in line with the European Commission recommendation, is broader than the previous one (that is, it includes more firms). This change entailed a reduction in the capital requirements for loans to firms that became SMEs according to the new definition, thus favouring their access to bank financing. For more details on this regulatory change and its effects, see Chapter 3, pp. 43, of the Financial Stability Report, Banco de España, May 2014..

20 This estimated probability may differ from the probability of rejection obtained from the SAFE for a number of reasons. Firstly, for the indicator used in this section, the observations corresponding to firms whose loan applications are accepted by a bank but not formalised by the firm are erroneously recorded as rejections. Secondly, it should be noted that these calculations are based on a sub-sample of firms (only those which have requested bank financing from at least one bank with which they have no previous loans), which firms would appear to be more likely to have their loan applications rejected, since they are applying to an institution with which they have not had a previous credit relationship. Therefore, the indicator constructed with this data tends to underestimate the probability level of firms' obtaining credit.



SOURCE: Banco de España.

a Defined as the aggregate weighted by GDP at current prices for the same year of Germany, Austria, Finland, France, the Netherlands and Luxembourg. In 2017, 2016 GDP has been used. To aggregate the different categories by maturity within each country, the same weights are used (based on business volumes in Spain), whereby the comparison is not affected by differences between these weights from one area to another. A link was made to May 2010 to correct the break in the continuity of the series associated with a statistical change.



increasing rose by more than 7 pp. The fact that there has been a more marked improvement in the case of firms with a healthier financial position has favoured a reallocation of financial and productive resources to stronger firms, in line with the results discussed in section 2.1.

In parallel with the improvements in the access to external financing, the costs of such financing fell, also favouring the recovery of firms' investment. Thus, between 2013 and 2016, interest rates on bank loans to Spanish non-financial corporations fell significantly, particularly for amounts of less than €1 million, which include transactions with SMEs (see Chart 2.8). In this segment, average interest rates dropped by more than 230 bp, converging to values observed in the core countries of the euro area.

3 Funding structure of Spanish non-financial corporations

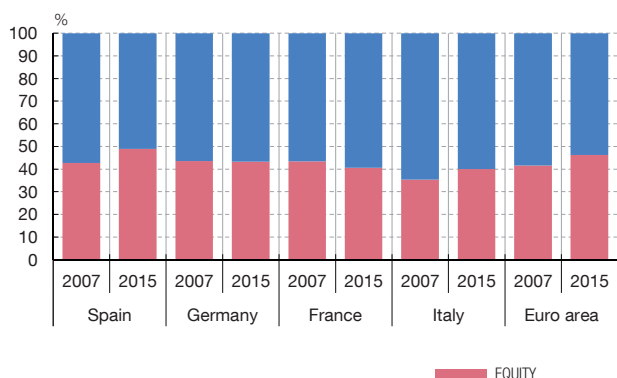
The composition of firms' liabilities may condition their investment decisions. The literature analysing firms' capital structure²¹ and its effects on their investment choices has focused on the distinction between own funds and borrowed funds (or debt), underlining the inverse relationship between debt-to-asset (leverage) ratios and gross capital formation.²² This appears to be linked to the greater loss-absorbing capacity of firms with lower leverage, since it allows them greater access to external financing as they are perceived to be lower risk by lenders. The composition of firms' borrowed funds (bank loans relative to debt securities) may also affect their investment decisions. In the literature there is no consensus as to which financial system – predominantly market-based or bank funding – presents better results in terms of economic growth, since both are vulnerable to certain specific disruptions.²³ In this setting, some papers show that having a variety of

21 See the pioneering works of S. Titman and R. Wessels (1988), "The Determinants of Capital Structure Choice", *Journal of Finance*, 43, pp. 1-19, or R. G. Rajan and L. Zingales (1995), "What do we know about capital structure? Some evidence from international data", *Journal of Finance*, 50, pp. 1421-1460.

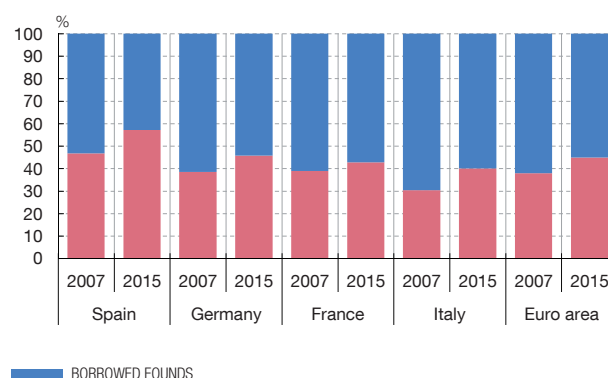
22 See footnote 2 that includes references with international evidence of this.

23 For evidence on the effects of disruptions affecting banks, see L. Alfaro, M. García-Santana and E. Moral-Benito (2016), "Credit Supply Shocks, Network Effects, and the Real Economy", Banco de España Working Paper, forthcoming, and S. Bentolila, M. Jansen, G. Jiménez and S. Ruano (2015), "When Credit Dries Up: Job Losses in the Great Recession", Working Paper 1310, CEMFI. For evidence on disruptions focused on markets, see A. Mody and D. Sandri (2012), "The eurozone crisis: how banks and sovereigns came to be joined at the hip", *Economic Policy*, 27, pp. 199-230, and A. Alter and A. Beyer (2014), "The dynamics of spillover effects during the European sovereign debt turmoil", *Journal of Banking and Finance*, 42, pp. 134-153.

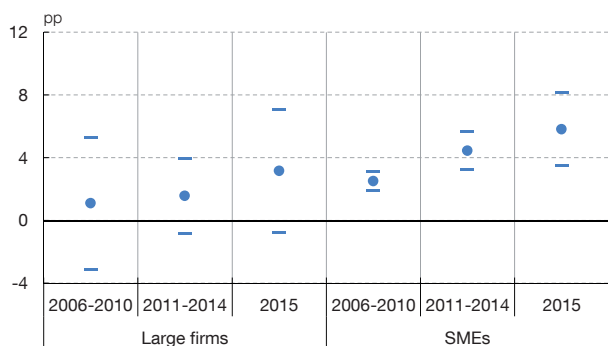
1 LARGE FIRMS (a)



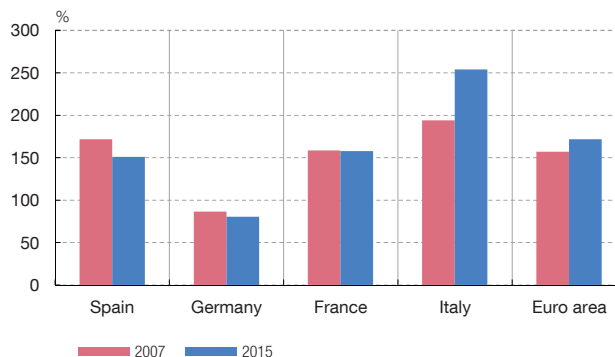
2 SMEs (a)



3 DIFFERENCES IN THE WEIGHT OF EQUITY. SPAIN VS EURO AREA (b)



4 BORROWED FUNDS WITH RESPECT TO GROSS OPERATING PROFIT PLUS FINANCIAL REVENUE. SMEs (a)



SOURCES: BACH, Amadeus and Banco de España.

- a Euro area includes France, Germany, Italy, Portugal and Spain.
- b The circles denote the difference between the average weight of equity to total assets for Spanish firms and the corresponding weight for firms with similar characteristics operating in the same sector in other European countries. The hyphens represent the 95% confidence interval. For purposes of comparison, the median firm for each sector (three digits), country and year, as regards size, profitability and availability of collateral and liquid assets, was considered. These estimates were made using data drawn from the Amadeus database.



sources of financing helps firms increase their resilience to disruptions of different origins and makes their investments less sensitive to adverse scenarios.²⁴ Given the potential implications that firms' financing structure may have on their investment decisions, it is interesting to analyse the most recent composition of the liabilities of Spanish non-financial corporations and to examine how it has changed in recent years compared with that of firms in other European economies.

The equity-to-assets ratio of large Spanish firms is above the average for their euro area peers.²⁵ As Panel 1 of Chart 2.9 shows, before the onset of the crisis, this ratio was

24 See, for example, A. Tengulov (2016), "The Impact of Borrowing Diversity on Firm Value, Financing and Real Decisions", Working Paper (30 December), available at SSRN, <https://ssrn.com/abstract=2361401> or <http://dx.doi.org/10.2139/ssrn.2361401>, and F. De Fiore and H. Uhlig (2015), "Corporate Debt Structure and the Financial Crisis", *Journal of Money, Credit and Banking*, 47, pp. 1571-1598.

25 In this section, aggregate euro area data are proxied, based on a varying number of countries, according to the data available, as a GDP-weighted average of the results. The figures used include, in all cases, at least the four largest economies (Germany, France, Italy and Spain), which together account for some 76% of euro area GDP.

similar in Spain to the average euro area ratio. Subsequently, however, owing to the more intense deleveraging process in Spain, the ratio rose more for Spanish companies than for the big euro area companies. Nevertheless, when controlled for firms' characteristics, these differences are not statistically significant (see Panel 3 of Chart 2.9).

Spanish SMEs had lower leverage than their euro area peers before the crisis and the differences have increased notably since then (see Panel 2 of Chart 2.9). Moreover, as Panel 3 of Chart 2.9 illustrates, this same pattern persists when controlled for firms' characteristics. Specifically in 2015 (the last financial year available), the proportion of equity on Spanish SMEs' balance sheets was 6 pp higher than that of European firms with similar characteristics.

Despite their lower leverage, Spanish SMEs were somewhat more vulnerable to earnings contraction than their euro area peers before the crisis. The lower return on assets (ROA) of Spanish SMEs meant that their debt-to-earnings ratio was above the average level for the euro area (see Panel 4 of Chart 2.9). In consequence, Spanish SMEs had a lower relative ability to meet the payments associated with their financial commitments. In addition, the fact that the crisis was more severe in Spain than in the rest of the euro area meant that these differences were amplified in the early years of the downturn. The growing financial pressure borne by firms forced them to make far-reaching cuts in their debt levels, while some were forced to disappear altogether, being unable to meet the payments associated with their liabilities. As a result of the decline in borrowed funds and the improved earnings performance in the subsequent economic recovery, by 2015 Spanish SMEs' debt-to-earnings ratio was below the average levels for the euro area. In any event, although Spanish SMEs' profitability levels have recovered, they continue to be lower than the average for comparable euro area companies, which is consistent with their lower productivity levels.²⁶

A breakdown of Spanish firms by size and age shows that the decrease in leverage observed in recent years has been widespread among SMEs (see Chart 2.10). However, despite this common characteristic, some patterns diverge. Thus it is observed that the older the SME, the higher the relative weight of equity, which could be the result of a degree of "survival bias" owing to the disappearance of the most highly leveraged firms during the crisis.²⁷ In addition, an inverse relationship is observed between size and the relative importance of equity. A regression analysis controlled for various characteristics of firms confirms that age and size are both variables that have a significant impact on the level of leverage at SMEs. The size effect, which is also consistent with the evidence mentioned above based on Spanish SMEs,²⁸ could be explained by larger firms' lower level of asymmetric information, easier access to market funding and lower cost of debt.

Significant differences in leverage levels by size and age are also observed for the subset of large firms.²⁹ There is also evidence that, both for SMEs and larger companies, those that have higher profitability and those that have lower risk³⁰ tend to have lower leverage levels.

²⁶ See *Annual Report 2015*, Chapter 4, Banco de España.

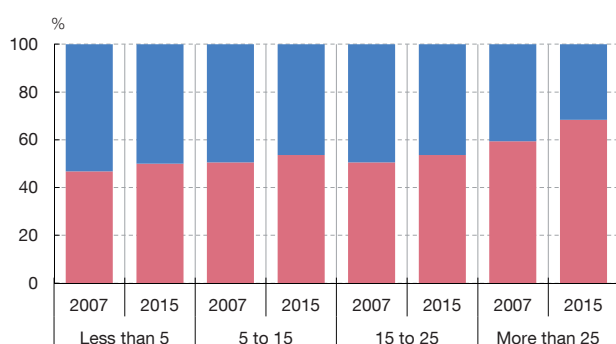
²⁷ Another possible explanation, as per M. A. Petersen and R. G. Rajan (1994), "The Benefits of Lending Relationships: Evidence from Small Business Data", *Journal of Finance*, 49 (1), pp. 3-37, is that older firms make more frequent use of retained earnings, while younger ones have to rely on borrowed funds.

²⁸ See F. Sogorb-Mira, "How SME Uniqueness Affects Capital Structure: Evidence from a 1994-1998 Spanish Data Panel", *Small Business Economics*, 25, pp. 447-457.

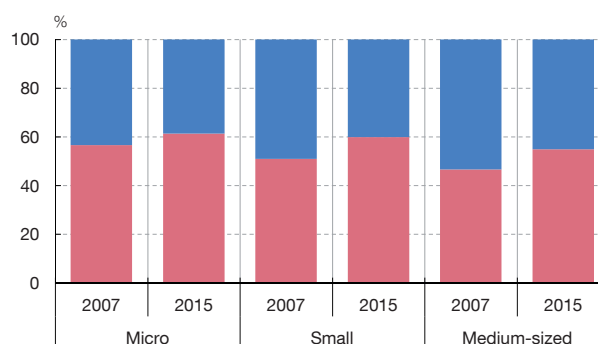
²⁹ As in the case of SMEs, there is evidence pointing to similar results for large firms, such as, for example, A. Agrawal and N. J. Nagarajan (1990), "Corporate Capital Structure, Agency Costs, and Ownership Control: The Case of All-Equity Firms", *Journal of Finance*, 45, pp. 1325-1331.

³⁰ Proxied by the Z-Score. See E. Altman (1968), "Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy", *Journal of Finance*, pp 189-209.

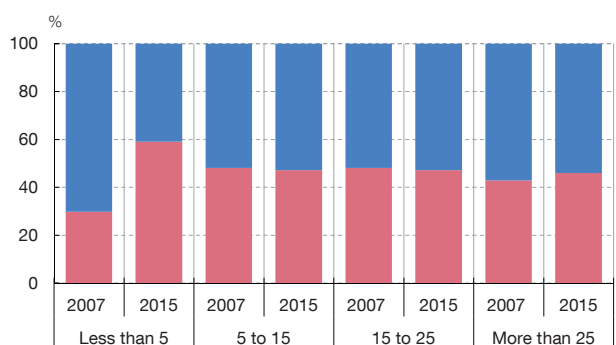
1 SMEs. BREAKDOWN BY AGE (YEARS)



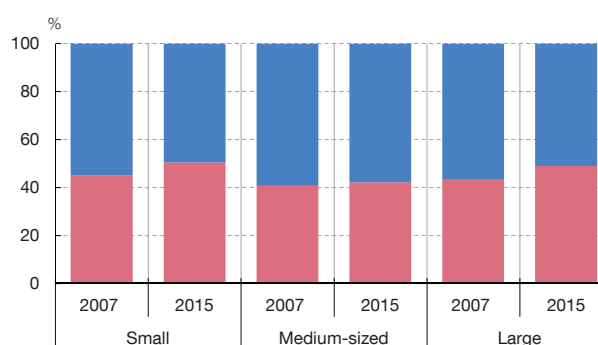
2 SMEs. BREAKDOWN BY SIZE



3 LARGE. BREAKDOWN BY AGE (YEARS)



4 LARGE. BREAKDOWN BY SIZE



EQUITY

BORROWED FUNDS

SOURCE: Banco de España.



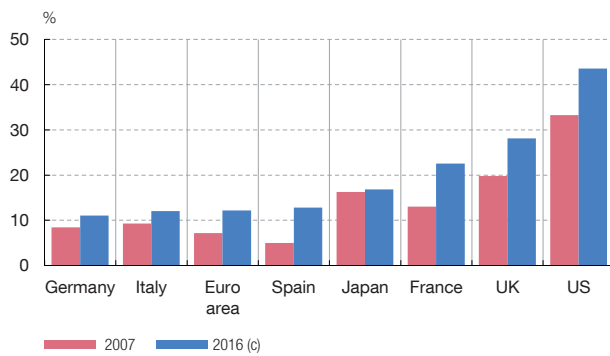
The deleveraging undertaken by Spanish firms in recent years places them in a more favourable position to pursue investment projects. Spanish firms, especially Spanish SMEs, currently have a more robust liabilities structure than their euro area peers. However, profitability is still low compared with that of their euro area peers, particularly in the smaller firms, and this continues to act as a constraint on their growth potential.

In recent years, Spanish firms have tended to step up their financing through issuance of debt securities more than their euro area peers. Panel 1 of Chart 2.11³¹ illustrates the growth in debt securities as a proportion of interest-bearing borrowing (which includes debt securities and total loans) at firms from several countries, including Spain. As may be observed, debt securities in companies of the euro area and Japan account for a smaller proportion than in companies in the United Kingdom and, especially, the United States. The chart also reflects how, in recent years, there has been quite a widespread process of disintermediation of financing of firms, as bank funding has declined in proportion to market funding.³² Various global factors underpin this pattern,

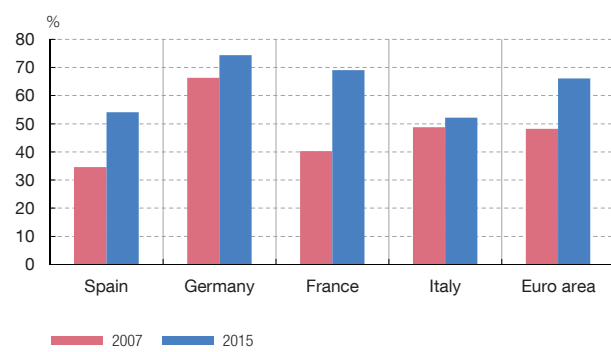
31 This chart draws on financial accounts and includes, in the case of Spain, issuance made by resident and non-resident subsidiaries as debt securities, assuming that they are part of the loans obtained by the sector.

32 By contrast, to date in Spain there has been very little development of non-bank financing sources such as crowdlending (financing through platforms that match lenders directly with borrowers) that have made great progress in other economies such as the United States, the United Kingdom or China.

1 TOTAL NON-FINANCIAL CORPORATIONS (a) (b)



2 LISTED GROUPS (d) (e)



SOURCES: ECB, Federal Reserve, Eurostat, BIS, ERICA and Banco de España.

- a Spanish debt securities include issuance by resident and non-resident subsidiaries at market price, considered as part of the loans obtained by the sector. Issuance by non-resident German subsidiaries is also high, but the data cannot be adjusted due to lack of information.
- b Debt includes debt securities and total loans. Data obtained from the BIS, except as regards the euro area (Eurostat) and Spain (Banco de España).
- c Year-end data, except for Japan and the United States which refer to Q3.
- d Debt includes debt securities and total loans. Data obtained from ERICA.
- e Euro area includes Austria, Belgium, France, Germany, Italy, Portugal and Spain.



including in particular the impact of the crisis on banks' ability to offer financing and the stricter regulations introduced in the sector as a response to the crisis. In Spain, debt securities issues have traditionally accounted for a smaller part of firms' liabilities than in the euro area overall, in keeping with the higher degree of banking intermediation in the Spanish economy. However, since the outbreak of the crisis, the process of disintermediation of financing of firms has been more intense than in the other European economies (see Panel 1 of Chart 2.11).³³

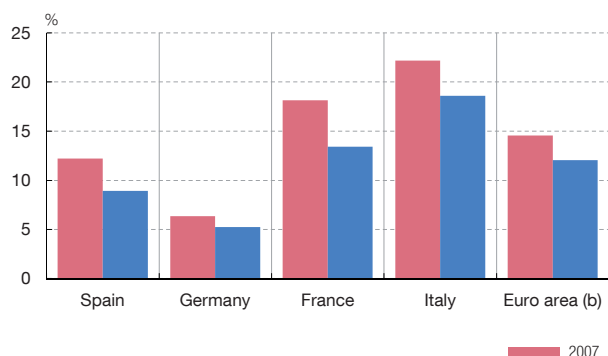
The same pattern is observed for listed groups, which have the most recourse to market funding owing to their larger size (see Panel 2 of Chart 2.11). Box 2.3 shows that Spanish listed companies have traditionally had less recourse to debt securities than other comparable European companies, although these differences have tended to diminish in recent years. Nevertheless, the increase in Spanish firms' recourse to funding via debt securities in the recent period is not only explained by the activity of listed groups. Thus, between early 2014 and December 2016, 38 groups of unlisted Spanish firms issued debt securities, 30 of which for the first time and 13 of which on Spain's alternative debt market (MARF).

One factor that has contributed to the greater relative appeal of funding via debt securities is the decline in their cost compared with bank loans³⁴ (see Box 2.3). This cost differential reached its most recent peak in 2012, against a backdrop of tension on the financial markets associated with the sovereign debt crisis. Since then the differential has narrowed, stepping up the relative appeal of market funding. Factors that have played a part in this change include the fall in market interest rates to very low levels, which has

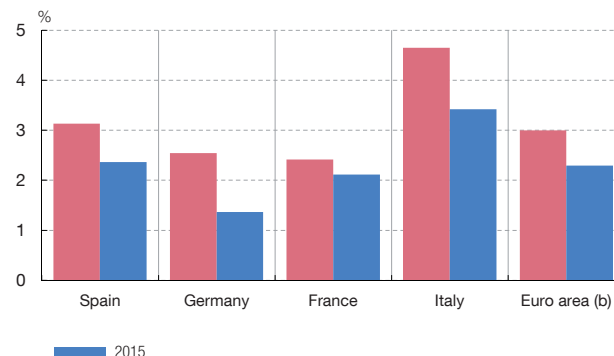
³³ Comparison of this ratio with the euro area ratio must be made with caution, as issues by non-resident subsidiaries are not considered in any of the other countries, only in Spain, owing to the lack of information. These issues are particularly high in the case of Germany.

³⁴ The cost of loans is proxied as the interest rate on loans over €1 million, which are those extended to large companies which are, in turn, those that have most recourse to market funding.

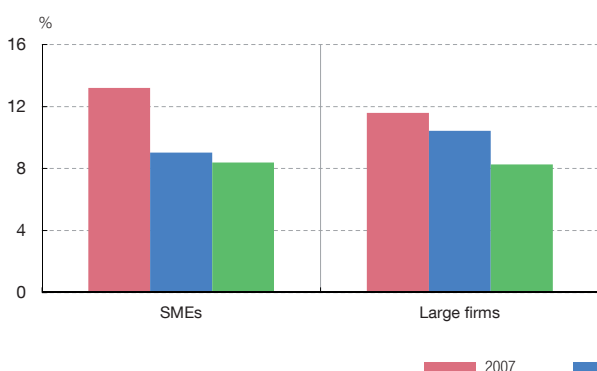
1 TRADE CREDIT RECEIVED, AS PROPORTION OF TOTAL ASSETS. INTERNATIONAL COMPARISON



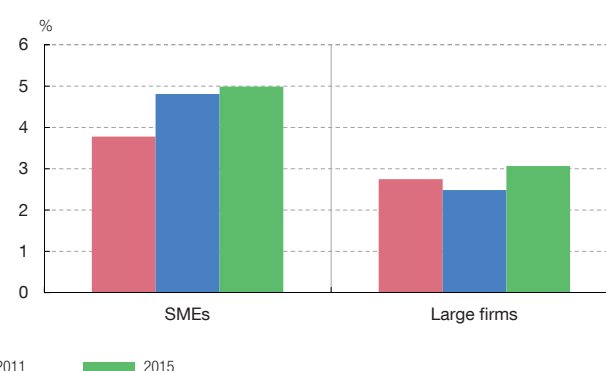
2 NET TRADE CREDIT AS PROPORTION OF TOTAL ASSETS. INTERNATIONAL COMPARISON (a)



3 TRADE CREDIT RECEIVED, AS PROPORTION OF TOTAL ASSETS. SPAIN



4 NET TRADE CREDIT AS PROPORTION OF TOTAL ASSETS. SPAIN (a)



SOURCE: BACH.

a Net trade credit (Assets–Liabilities).

b Euro area includes Austria, Belgium, France, Germany, Italy, Portugal and Spain.



eliminated the advantages of credit institutions’ funding costs over the markets,³⁵ and more recently the expansion of the Eurosystem’s asset purchase programme to include corporate bonds.³⁶

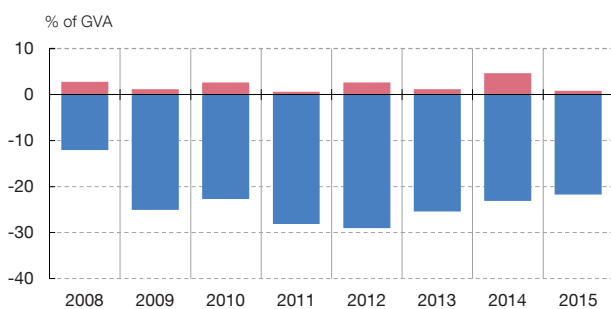
The greater diversification of Spanish firms’ liabilities in recent years has made firms less vulnerable to shocks affecting the credit channel. Nevertheless, the disintermediation process is mostly limited to large companies, since access to market funding is not generally a viable option for smaller firms. Accordingly, Spanish SMEs continue to be heavily reliant on bank credit.

Trade credit is, after bank loans, the most important source of borrowing for Spanish non-financial corporations. Compared with the rest of the euro area, in Spain it accounts

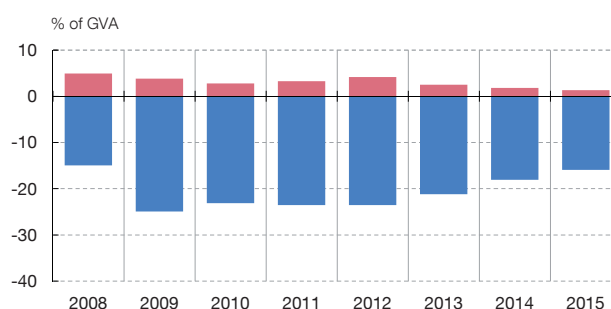
35 The cost of funding through deposits, the main source of banks’ financing, was traditionally lower than money market interest rates, but since Euribor rates turned negative the opposite is the case, since zero is the lower bound for retail deposits.

36 For an assessment of the impact of this programme on Spanish firms’ financing conditions, see Ó. Arce, R. Gimeno and S. Mayordomo, “Making room for the needy: The effects of the Eurosystem’s Corporate Sector Purchase Programme”, Banco de España Working Paper, forthcoming.

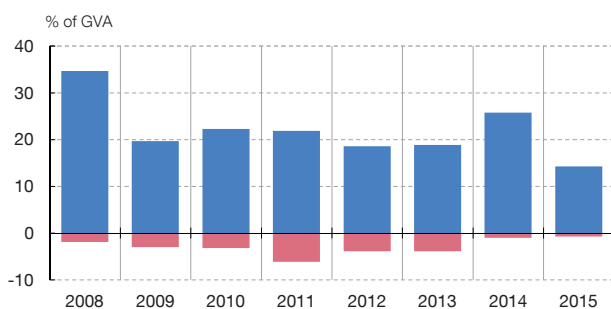
1 FIRMS THAT HAVE DELEVERAGED. LARGE (a) (b)



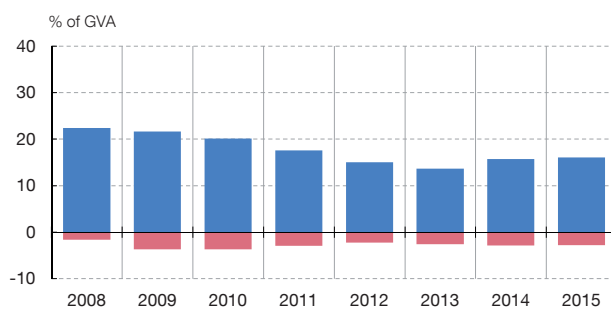
2 FIRMS THAT HAVE DELEVERAGED. SMEs (a) (b)



3 FIRMS THAT HAVE NOT REDUCED THEIR TOTAL DEBT. LARGE (a) (b)



4 FIRMS THAT HAVE NOT REDUCED THEIR TOTAL DEBT. SMEs (a) (b)



FINANCIAL DEBT

NET TRADE CREDIT (LIABILITIES - ASSETS)

SOURCE: Banco de España.

a Excluding holdings and firms with no debt.

b Definition of sizes in line with European Commission Recommendation (2003/361/EC).



for a slightly smaller proportion of balance sheets (see Panel 1 of Chart 2.12). Since the outbreak of the crisis, the relative weight of trade finance has tended to decline, both in Spain and, to a lesser extent, in the euro area as a whole. The main reason for this is the contraction in firms' activity during the downturn. This decline has been more marked among SMEs than among large firms, owing to the greater impact of the crisis on the SME segment (see Panel 3 of Chart 2.12). The regulations limiting payment periods in commercial transactions also assisted in this respect, both in Spain and in the rest of the euro area,³⁷ as did the supplier payment plans approved in Spain in 2012.³⁸

Firms also offer financing to their customers (other firms and the public sector) through commercial loans. Indeed, as shown in Panel 2 of Chart 2.12, both Spanish

37 In order to reduce supplier payment periods, a European Directive (2000/35/EC) was promulgated in 2000 proposing measures on combating late payment in commercial transactions. This regulation was transposed into Spanish legislation through Law 15/2010 (amending Law 3/2004) which set, for 1 January 2013 at the latest, maximum payment periods of 60 days for commercial transactions between firms and of 30 days for commercial transactions with the public sector. For more details, see V. García-Vaquero and M. Mulino-Ríos (2015), "Recent behaviour of the trade credit of non-financial firms in Spain", *Economic Bulletin*, January 2015, pp. 3-12, Banco de España.

38 The supplier payment plans established an extraordinary financing mechanism for payment and settlement of trade debt arranged with suppliers of regional and local governments where there were significant payment delays. For more details, see M. Delgado Téllez, P. Hernández de Cos, S. Hurtado and J. J. Pérez (2015), "Extraordinary mechanisms for payment of general government suppliers in Spain", Occasional Paper 1501, Banco de España.

firms and firms in the rest of the euro area provide net financing through commercial loans. By size, SMEs are the chief net lenders (see Panel 4 of Chart 2.12 for Spain), most likely as a result of their relatively lower bargaining power with customers and suppliers.

Trade credit has allowed Spanish firms to redistribute funds within the sector, thus mitigating the effect of bank funding constraints. As Chart 2.13 shows, Spanish firms, which in recent years have built up their outstanding balance of bank credit and which should, therefore, have better access to such funds, have increased their net funding provided to other firms through trade credit.³⁹ Accordingly, this may have helped ease the impact of the credit constraints on firms' real decisions.

³⁹ This is consistent with the evidence of the literature analysing the role played by trade credit. For example, see: M. A. Petersen and R. G. Rajan (1997), "Trade Credit: Theories and Evidence", *Review of Financial Studies*, 10, pp. 661-691; P. Hernández de Cos and I. Hernando (1999), "Crédito comercial a las empresas", *Moneda y Crédito*, num. 209; and S. Carbó-Valverde, F. Rodríguez-Fernández and G. F. Udell (2016), "Trade Credit, the Financial Crisis, and SME Access to Finance", *Journal of Money, Credit and Banking*, 48, pp. 113-143.

Credit constraints may have a negative impact on corporate investment decisions, working capital (current assets less current liabilities) and, lastly, on growth. To study these effects, the Survey on the Access to Finance of Enterprises (SAFE) conducted by the ECB in cooperation with the European Commission is used in this box. Specifically, the sub-sample of panel data¹ of this survey for the period 2014-2016² is used, for which information is available on all variables of interest, with a total of 16,000 enterprises and 37,000 observations.

In the exercises conducted, it is considered that an enterprise has restricted access to bank financing if, in accordance with the broad indicator,³ it has restricted access to bank loans and/or credit facilities.⁴ According to this indicator, on average, 17% of Spanish firms faced restrictions of this kind during the period 2014-2016, compared with 15% of European firms.

The other variables of interest can also be defined on the basis of the SAFE. Specifically, the survey inquires whether investment in

- 1 To obtain more accurate estimates semester-by-semester, the SAFE includes a rotating panel of firms.
- 2 Waves 11 to 15 of the SAFE.
- 3 For a definition of restriction on access to finance in a broad sense, see Section 2.2 of the main text of this chapter.
- 4 Therefore, it is implicitly assumed that loans and credit facilities are imperfect substitutes.

fixed assets (property, plant and equipment), inventories, working capital, turnover and number of employees have changed in the six months prior to the survey being conducted. Based on this information, ordinal variables were generated that take on a value of 1 if the indicator decreases, 2 if it does not change and 3 if it increases.

In order to identify the impact of credit constraints on investment, working capital and business growth, random-effects ordered probit models have been estimated⁵ where the dependent variables are the aforementioned indicators. In addition to the bank financing constraints indicator, the explanatory variables considered also include others to control for business features that affect demand for investment and current assets and companies' capacity for growth. Specifically, binary variables of size (based on number of employees⁶ and turnover), of sector (industry, construction, trade, other services), of age (under two years, between two and five years, between five and ten years, over ten years), of legal status (independent firm or subsidiary/branch of another firm), of ownership structure (single-member

- 5 Random effects are included in ordered probit models because the scant time variability of the credit constraint variable in such a short panel (two years) makes it impossible to identify its effect through fixed effects in a linear probability model.
- 6 One to nine employees, 10 to 49, 50 to 249, and 250 or more.

Table 1
MARGINAL IMPACT OF CREDIT CONSTRAINTS ON FIRMS' INVESTMENT, WORKING CAPITAL, TURNOVER AND EMPLOYMENT (a)

Independent variable (b)	Probability that investment will decrease	Probability that investment will increase
Credit constraint Spain	0.044**	-0.074**
Credit constraint. Euro area	0.041***	-0.054***
Independent variable (b)	Probability that working capital will decrease	Probability that working capital will increase
Credit constraint. Spain	0.041*	-0.058*
Credit constraint. Euro area	0.046***	-0.051***
Independent variable (b)	Probability that turnover will decrease	Probability that turnover will increase
Credit constraint. Spain	0.031	-0.043
Credit constraint. Euro area	0.051***	-0.065***
Independent variable (b)	Probability that employment will decrease	Probability that employment will increase
Credit constraint. Spain	0.050***	-0.089***
Credit constraint. Euro area	0.047***	-0.064***

SOURCE: Banco de España.

- a The first row shows the marginal effect in parts per unit of the main regressor for the sample of Spanish firms, the second row does the same for the sample of euro area firms. Controls: country-time, sector, size, age, legal status, and ownership and exporter structure dummies and dummies for changes in the debt-to-asset ratio and interest payment expense (lagged one period). Estimator: random-effects ordered probit. Robust standard errors to heteroskedasticity are used for the Spanish sample and are grouped by country for the euro area sample. *, ** and *** indicate significance for confidence levels of 90%, 95% and 99% respectively.
- b These variables are lagged one period.

company, family business, joint-stock company, etc.) and of exporter status (exporter or non-exporter) are included. Also, a series of binary variables are added which indicate whether interest expense and the debt-to-assets ratio have increased or remained unchanged in the last six months.⁷

Table 1 summarises the main results of the estimates for each of the four dependent variables (investment, working capital, turnover and number of employees), both for the sample of Spanish firms and for the euro area as a whole. Specifically, the marginal effects of indicators of bank lending restrictions on the probability that the respective dependent variable will decrease (column 1) or increase (column 2) are shown. In general, there is evidence that bank funding constraints have a negative impact on firms' activity and

growth.⁸ The magnitude of these effects is similar in Spain and in the euro area, except in the case of turnover, where the effects are smaller (and statistically non-significant) in Spain.

A more detailed analysis of the results for Spain shows that the existence of bank credit constraints raises by approximately 4 pp the probability that investment and working capital will decrease and reduces by 7pp and 6 pp, respectively, the probability that these two variables will increase. Also, restrictions on access to bank credit also have a substantial negative impact on business growth. Specifically, Spanish firms that face constraints in their access to bank financing are 5 pp more likely to reduce their workforce and almost 9 pp less likely to increase it. The effects on sales are somewhat smaller (3 pp and 4 pp, respectively), but their estimation is not very precise and they are statistically non-significant at conventional levels. Finally, it should be noted that these impacts can be seen across all business segments when disaggregated by features such as size, age and sector.

7 Lastly, country-time fixed effects are considered for the purpose of incorporating the effect of macroeconomic shocks idiosyncratic to each country of the sample. All the explanatory variables that change over time have been lagged one period so as to reduce possible endogeneity problems. Also, the use of random effects permits controlling for heterogeneity at firm level. Other potentially significant variables, such as firms' profitability, have not been added because they were not available in the database used.

8 It should be borne in mind that by using the firms in the survey's sub-sample of panel data, the total effects of credit constraints could be underestimated because firms which have had to close business owing to credit constraint-related problems are not taken into account.

This box analyses the factors determining the access of firms to bank financing, distinguishing between those related to the characteristics of firms applying for loans (non-financial corporations) and those related to the characteristics of suppliers (banks). It also analyses the extent to which sensitivity to these determinants has changed over the last cycle.

Three different sources of information have been combined for this analysis. First, use is made of the Central Credit Register (CCR) of the Banco de España, which contains individualised data on all the loans granted by credit institutions for amounts in excess of €6,000, and on requests for information submitted by banks to the CCR on firms with which they have not had prior credit relationships.¹ It is thus possible to identify the subgroup of companies requesting bank financing from at least one bank with which until then they had no outstanding loans or credit facilities, and on the basis of the changes in credit balances it is possible to determine whether the companies finally obtained the funds.² Second, these data are matched with those of the Central Balance Sheet Data Office to obtain information on the firm's economic and financial situation. Finally, use is made of the information on credit institutions drawn from supervisory returns. All of this serves to obtain a database of approximately 1.25 million observations for the period from January 2004 to June 2016.

This database was used to estimate several linear models to model, first, the probability of obtaining credit on the basis of a series of characteristics of the firm applying for funds and, second,

- 1 If a firm has already received credit from an institution, the latter receives a report on the firm's credit status by default.
- 2 Specifically, it is considered that a firm has obtained funding if its outstanding credit balance (including drawn down and undrawn amounts) increases within three months from the date it applied for a loan.

the probability of a firm obtaining a loan from a particular bank, where, in addition to the firm's variables, bank characteristics are also included.³ Also, estimated coefficients were allowed to differ by sub-periods in order to analyse the possible existence of structural changes.⁴ The three sub-periods considered, which were established on the basis of the observed growth of the economy, are: the expansionary phase prior to the crisis (2005 Q1 to 2008 Q1); the crisis period (2008 Q2 to 2013 Q3); and the recovery stage (2013 Q4 to 2016 Q2).

Table 1 shows the results when considering the probability of a firm obtaining credit from any bank regardless of whether it had prior loans from that institution. In line with expectations, the results show that age and size have a positive impact when significant, whereas the variables relating to the firm's financial position, i.e. the debt burden, indebtedness and the existence of previous doubtful loans, are inversely related to the probability of obtaining a loan. Also, the more credit relationships a firm applying for credit has with banks, the more likely it is to obtain funding.⁵ As regards changes throughout the cycle, in general, the results suggest that the sensitivity of the estimated probability to the explanatory variables increased during the crisis and, in the case of financial variables, increased further during the recovery stage.

3 For earlier work using a similar approach, see G. Jiménez, S. Ongena, J. Peydró and J. Saurina, *Credit Supply vs Demand: Bank and Firm Balance-Sheet Channels in Good and Crisis Times*, Discussion Paper from Tilburg University, No. 2012-005, Center for Economic Research.

4 Fixed effects of time, firm, bank or a combination of firm by time, depending on the specification, are included. All the estimates were made using clusters at firm and bank level.

5 The specification also includes other variables, such as firm profitability and productivity, but the estimated coefficients for these variables were not statistically significant.

Table 1
PROBABILITY OF A COMPANY OBTAINING CREDIT FROM ANY BANK (a)

	Coefficients for 2005 Q1-2008 Q1	Coefficients for 2008 Q2-2013 Q3	Coefficients for 2013 Q4-2016 Q2
Previous doubtful loans	-0.021	0.003	-0.042***
Indebtedness	-0.036***	-0.078***	-0.102***
Debt burden	0.000	-0.002***	-0.003***
Number of previous relationships with banks	0.006***	0.014***	0.015***
Total assets	-0.001	0.009***	0.005**
Age	0.004	0.018***	0.003

SOURCE: Banco de España.

a *, ** and *** indicate significance for confidence levels of 90%, 95% and 99%, respectively.

Since the existence of prior loans may condition loan supply from a particular institution, the same specification considered in the previous case has been used to estimate the probability of a generic company obtaining credit from at least one bank with which it had no previous credit relationship (see Table 2). In this case, both age and size are negative, which could be related to a possible bias in the sample of firms used.⁶ Regarding the other variables, as in the previous case, the weaker a firm's financial position, the less likely it is to obtain a loan, and the impact of this variable has tended to increase through the cycle. Notably, the coefficients estimated are higher (in absolute terms) than in the

foregoing specification, evidencing that in the event of an application for credit, if the bank has no prior credit link with the firm, its supply policy will tend to be more sensitive to the firm's characteristics.

Finally, in estimating the likelihood of a company obtaining credit from a bank in particular,⁷ the size of the bank has a positive impact, as does the capital ratio (since the crisis) and the degree of liquidity (in the years preceding the crisis, see Table 3).⁸ The

6 Specifically, this result could mean that the sub-sample of large and older firms is more likely to include companies applying for a loan to a new bank after having been rejected, owing to poor credit quality, by institutions where they had already taken out loans.

7 These estimates include the same firm variables as the foregoing specifications to control for firm characteristics.

8 The result relating to capital, in particular, confirms the importance of an appropriate macroprudential policy that aims to create additional buffers during cyclical upturns in order to mitigate the contraction of bank credit supply during downturns.

Table 2
PROBABILITY OF A COMPANY OBTAINING CREDIT FROM ANY BANK WITH WHICH IT HAS NO DEBTS OUTSTANDING (a)

	Coefficients for 2005 Q1-2008 Q1	Coefficients for 2008 Q2-2013 Q3	Coefficients for 2013 Q4-2016 Q2
Previous doubtful loans	-0.108***	-0.109***	-0.136***
Indebtedness	-0.039***	-0.108***	-0.118***
Debt burden	-0.001*	-0.005***	-0.005***
Number of previous relationships with banks	-0.052***	-0.057***	-0.052***
Total assets	-0.016***	0.004*	0.003
Age	-0.017**	-0.005	-0.028***

SOURCE: Banco de España

a *, ** and *** indicate significance for confidence levels of 90%, 95% and 99%, respectively.

Table 3
PROBABILITY OF A COMPANY OBTAINING A LOAN BASED ON THE BANK'S CHARACTERISTICS (a)

	Coefficients for 2005 Q1-2008 Q1	Coefficients for 2008 Q2-2013 Q3	Coefficients for 2013 Q4-2016 Q2
Total assets	0.140***	0.141***	0.140***
Capital ratio	0.323	0.644**	0.642**
Liquidity ratio	0.184***	0.065	-0.052
Percentage of doubtful loans	0.968	-0.250	-0.520***

SOURCE: Banco de España.

a Only the results obtained for the variables relating to banks' characteristics are shown, although the estimate also controls for firms' characteristics. *, ** and *** indicate significance for confidence levels of 90%, 95% and 99%, respectively.

percentage of doubtful loans in the institution's portfolio has a significant negative coefficient only during the period of economic recovery. These results indicate that the heterogeneity of banks' lending policies increased during the crisis according to the credit quality of their portfolio and their solvency, and did so further during the current phase of recovery. However, the differences in the degree of liquidity ceased to affect credit supply, possibly owing to the implementation of the extraordinary measures adopted by the ECB aiming to facilitate the availability of liquidity.

In short, based on the results described in this box, the likelihood of credit being granted depends both on the characteristics of potential borrowers (especially, their financial position) and on those of suppliers of funds (especially, the soundness of the institution's balance sheet). Additionally, the evidence provided shows that the sensitivity of probability to the characteristics of firms has tended to increase following the crisis, which would suggest that banks have since then attempted to discriminate more between firms on the basis of their characteristics, thereby promoting the reassignment of credit to companies with higher credit quality.

This box provides empirical evidence on the factors determining the use of debt securities by non-financial corporations and their relative weight compared with bank loans. This analysis is important to understand why Spanish firms have traditionally sought market funding less frequently than their European counterparts. The European Records of IFRS Consolidated Accounts (ERICA) database is used, which contains information on the consolidated financial statements of approximately one thousand listed non-financial groups from eight European countries: Austria, Belgium, France, Germany, Greece, Italy, Portugal and Spain.¹ This information reveals that, on average, bonds account for no more than 33% of total aggregate loans and bonds in any of those countries, with the highest figures being recorded in some of the smaller countries (Austria, Belgium and Portugal).

Factors that can explain firms' different external funding structures include firm-specific and country-specific (legal, institutional, historical, etc.) factors. To analyse the effect of all of these factors, a panel regression is made for the period 2009-2015 using two alternative specifications. In the first one, the dependent variable takes on a value of one if there are debt securities on the group's balance sheet and of zero otherwise. The dependent variable used

in the second specification is the ratio between the balance of debt securities to the sum of said balance and the balance of bank loans. The explanatory variables referring to firms' characteristics and countries are shown in Table 1. All of them are lagged one year.

The results show that group size has a positive effect on the use of debt securities to obtain funds, which could be explained by the existence of economies of scale which reduce the cost of issuance as the size of the operation increases.² Indeed, the explanatory power of variables indicating corporate size is much greater (specifically, ten times greater) than that of the next most relevant variable.

The results also show that higher-risk groups use debt securities more frequently,³ which could be related to the fact that higher-risk firms face less favourable conditions for accessing bank loans owing to the prudential requirements credit institutions have to comply with.

Additionally, in accordance with these estimates, the prevalence of debt securities in the liabilities of firms is greater at those with a higher volume of collateral. This could possibly respond to the fact that companies holding assets of this kind face better external

1 ERICA data are compiled by the ERICA Working Group of the European Committee of Central Balance Sheet Data Offices (ECCBSO). The data used are fully harmonised and subject to quality controls to ensure the reliability of the information. Most debt securities issuers are part of the sample. Although there is also information available on Greek firms, these are excluded from the analysis. As regards the Spanish groups, which are the focus of this box, the database covers all listed companies since 2011. In order to extend the sample period for Spanish companies, the data available at the Banco de España are used, which enables total coverage of listed non-financial groups since 2008 to be achieved.

2 See E. F. Fama (1985), "What's different about banks?" *Journal of Monetary Economics*, 15, pp. 29-39.

3 Group risk is measured on the basis of Altman's Z-score. Specifically, a discreet variable is used that takes on a value of one for firms whose Z-score is lower than 1.81 and which, therefore, are in danger of bankruptcy. For further details, see E. I. Altman (1968), "Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy", *The Journal of Finance*, Vol. 23, No. 4. pp. 589-609.

Table 1
EXPLANATORY FACTORS FOR THE USE OF DEBT SECURITIES BY EUROPEAN NON-FINANCIAL LISTED GROUPS (a)

	Debt securities (1 = Yes / 0 = No)	Debt securities / Debt securities + Loans
Large group (1 = Yes / 0 = No)	0.547***	0.358***
Medium group (1 = Yes / 0 = No)	0.152***	0.061***
High risk group (1 = Yes / 0 = No)	0.177***	0.092***
Financial leverage / Assets	0.003*	0.000
Net cash flow / Assets	-0.280***	-0.154**
Tangible assets / Assets	0.083*	-0.047*
Opacity (1 = Yes / 0 = No)	-0.023	-0.020**
Banking penetration (No. offices / 10,000 inhabs. logarithm)	-0.049***	-0.049***
Capitalisation of listed shares / GDP	0.159***	0.084***
Bond yield - loan interest rate (three-year moving average)	-4.561***	-3.912***
Sectoral fixed effects	Yes	Yes
Observations	6,444	6,111
Adjusted R-squared	0.285	0.292

SOURCE: Banco de España.

a The regression is based on ERICA data for the period 2009-2015. The coefficients are obtained on the basis of an ordinary least squares model that includes sectoral fixed effects, and standard errors are clustered at firm level. *, ** and *** indicate significance for confidence levels of 90%, 95% and 99%, respectively.

funding conditions.⁴ However, the availability of these assets seems to favour bank financing more markedly, since this variable is inversely related to the relative weight of debt securities in interest-bearing borrowing as a whole. Lastly, firms that are more opaque (proxied as those for which the absolute value of extraordinary income accounts for a greater proportion of their cash flows⁵) tend to finance themselves more with bank loans than with bonds.

The coefficients obtained for the country-specific variables are similar for the two specifications. As documented in the literature, firms resident in countries with high banking penetration, proxied by number of branch offices per inhabitant, tend to finance themselves with bonds less frequently and the relative weight of loans is higher. In line with this result, groups resident in countries where financial markets are more important, measured on the basis of the capitalisation of listed companies relative to the country's GDP, are more dependent on debt securities financing.

Lastly, the difference in the cost of financing through bonds as compared with bank loans has a significant effect on the composition of liabilities. Thus, an increase of one percentage point (1 pp) in bond yields relative to the interest rate on loans reduces the likelihood of issuance of securities by 4.6 pp. In this sense, the decrease seen since 2012 in the cost of financing of bonds in comparison with that of bank loans would have increased the appeal for this source of financing vis-à-vis with bank

financing, a factor which could help explain the recent increase in the degree of disintermediation of firms' financing.

In order to analyse changes in the funding structure of Spanish firms relative to European firms, and the latest position, an estimate is made of the difference between the average probability that Spanish firms will issue bonds and the average probability that similar corporate groups from the other European countries will do so.⁶ Chart 1 indicates that in the period prior to and during the sovereign debt crisis, Spanish listed groups used bonds to finance themselves less frequently than their European counterparts with similar characteristics. However, in 2015 these differences were no longer statistically significant. As regards the weight of these bonds in the total balance of loans and debt securities, the difference has also shrunk, although in this case there has been no convergence, and so for Spanish groups this proportion continues to be somewhat smaller than for European groups with similar characteristics. Finally, similar conclusions can be drawn by comparing Spain with each country on an individual basis in 2015 (see Chart 2), and it is found that the greatest convergence in terms of the weight of non-intermediated financing is seen in connection with the large euro area economies (Italy, Germany and France).⁷

4 See T. Hoshi, A. Kashyap and D. Scharfstein (1993), *The choice between public and private debt: an analysis of post-deregulation corporate financing in Japan*, NBER Working Paper series.

5 In line with G. López-Espinosa, M. Mayordomo and A. Moreno (2016), "When does relationship lending start to pay?", *Journal of Financial Intermediation*, forthcoming, and C. Leuz, D. Nanda and P. Wysocki (2003), "Earnings management and investor protection: an international comparison", *Journal of Financial Economics*, 69, pp. 505–527.

6 Specifically, an analysis was made using an estimation technique called "nearest neighbour matching". In accordance with this technique, in order to identify similar firms an exact equivalence is used regarding size (large, medium or small group), risk, opacity, sector and year. Additionally, the firms are matched in respect of their leverage, net cash flow and tangible assets. For more details, see A. Abadie and G. W. Imbens (2006), "Large sample properties of matching estimators for average treatment effects", *Econometrica*, 74, pp. 235–267, and A. Abadie and G. W. Imbens (2011), "Bias-corrected matching estimators for average treatment effects", *Journal of Business and Economic Statistics*, 29, pp. 1–11.

7 Prior to 2015 the presence and weight of debt securities were significantly lower for Spanish groups, except when compared with Italian groups.

DIFFERENCE IN NON-FINANCIAL CORPORATIONS' USE OF DEBT SECURITIES. SPAIN VIS-À-VIS THE EURO AREA

Chart 1
DIFFERENCE BY PERIOD (a)

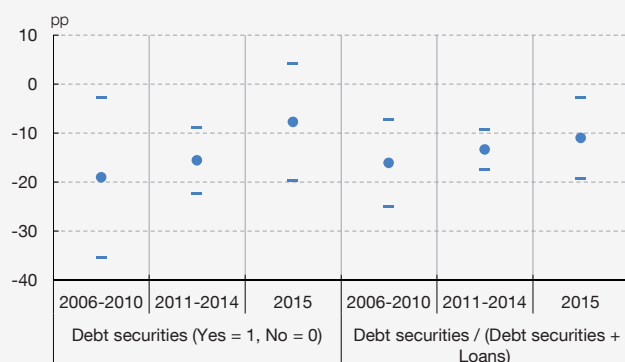
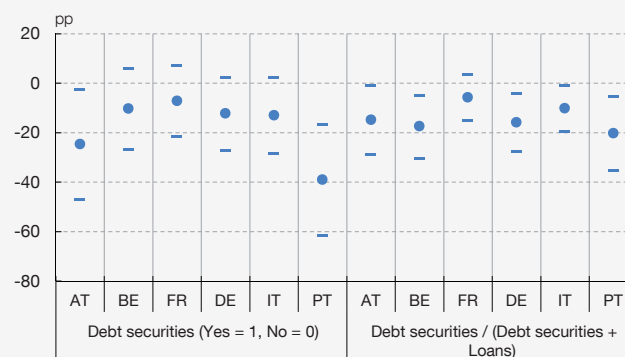


Chart 2
DIFFERENCE BETWEEN COUNTRIES. 2015 (a)



SOURCE: Banco de España.

a The circles show the difference in the average probability of Spanish firms having issued bonds (or their weight) with respect to the average probability of firms with similar characteristics in other European countries having done so (or their weight). A confidence level of 95% is represented by dashes.