

2 THE CHALLENGES FACING THE SPANISH BANKING SECTOR



Europa Meeting Room in the Cibeles building during the III Economic History Conference.

Summary

Despite the major advances of recent years, the Spanish banking sector continues to face significant challenges, many of which it shares with other euro area banking systems. Following the crisis and the subsequent banking sector restructuring and clean-up, the economic recovery of recent years has helped to reduce non-performing loans (NPLs) and raise profitability.¹ However, the effects of the crisis on the financial position of banks have far from completely disappeared. Thus profitability remains below the medium- and long-term reference levels and banks face a new and more demanding regulatory and competition framework (see Diagram 2.1). In a highly banked economy such as that of Spain, it is important to address these challenges so as to put the banking sector in a sufficiently strong position to contribute to economic growth and job creation.

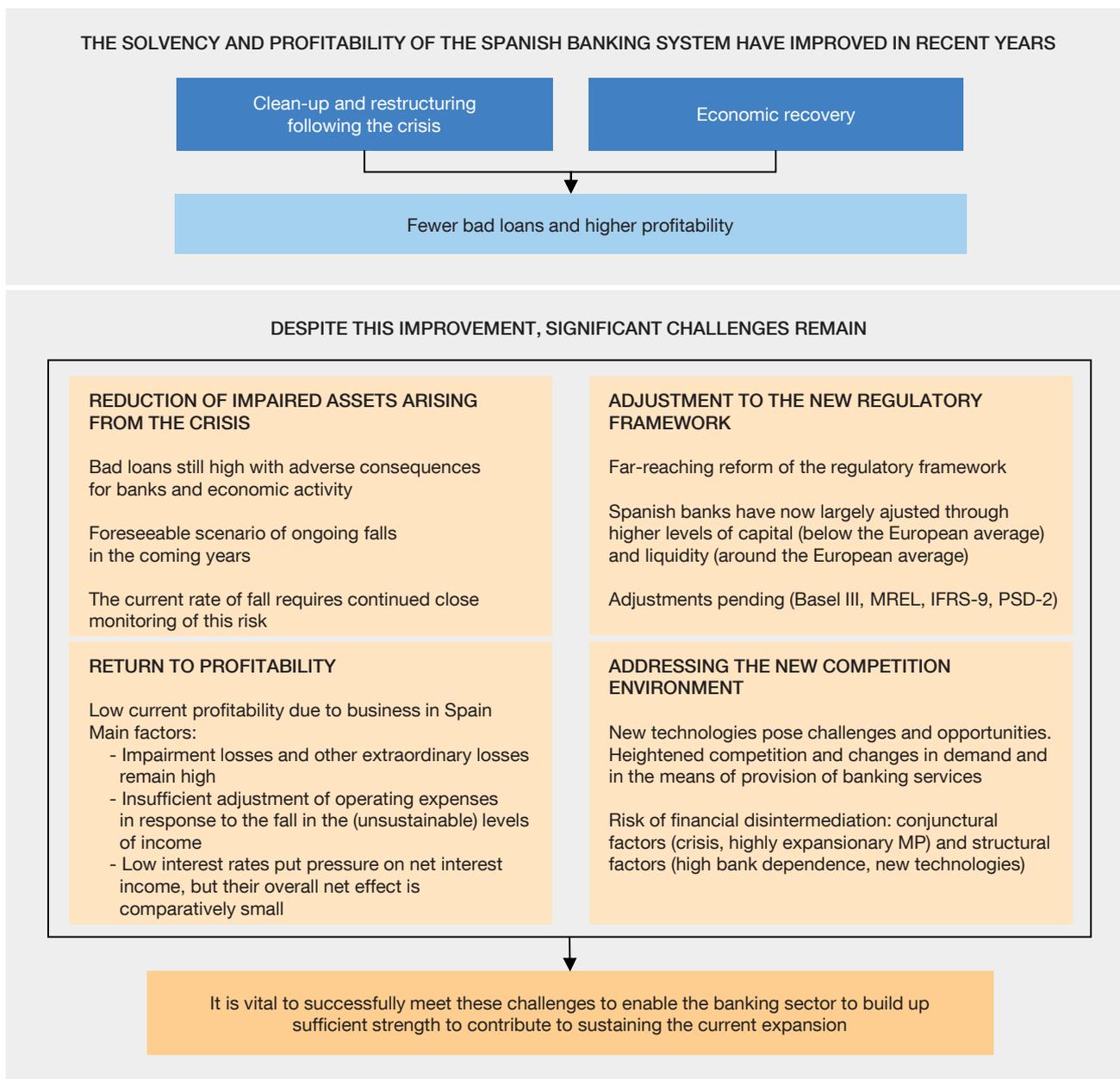
The volume of impaired bank assets has decreased significantly from its peak, but remains high. The coming years will foreseeably see these assets continue to decrease. However, at the pace of the current fall, the NPL ratios will continue to be relatively high at the end of 2020, so it is of particular interest to the supervisory authorities that banks address this challenge promptly.

The recovery of Spanish bank profitability is another major challenge. Its low current level is mainly due to the residual effects of the crisis and the consequences of the deleveraging of the private sector of the Spanish economy. Impairment losses and other extraordinary losses continue to eat up a large portion of income compared with the situation prior to the outbreak of the international financial crisis in 2008. Moreover, the adjustment of operating expenses has been unable to fully offset the fall in income since then. The overall net effect of the low interest rates seems to have been comparatively lower, despite the fact that they have exerted negative pressure on net interest income.

In the regulatory arena, banks have now largely adapted to the new requirements calling for, inter alia, higher levels of own funds and liquid assets. In both cases Spanish banks amply meet the minimum requirements, although, with respect to the European average, their liquidity position compares better than that of capital. Furthermore, some reforms still have to be defined in detail or fully implemented, which will require further adaptation by Spanish banks.

The main medium-term challenge lies in the new competition framework derived from the new technologies and the progressive financial disintermediation. Financial innovation represents both a threat and an opportunity for banks. It will foreseeably bring increased competition in some segments and changes in the demand for banking services and how they are provided, which will oblige banks to embark on a process of anticipation and adaptation. At present, the penetration of these new technologies in Spain is limited and there is much uncertainty as to their final effects, although they may be considerable. Financial disintermediation similarly poses a challenge for banks, the progress of which will depend on both conjunctural and structural factors, such as interest rates, the purchase of corporate bonds by the Eurosystem, new competitors, advances towards a capital markets union and trends in long-term saving.

¹ On the crisis, see the *Report on the financial and banking crisis in Spain, 2008-2014*, Banco de España.



SOURCE: Banco de España.



1 Introduction

The Spanish banking sector has undergone extensive restructuring since the onset of the crisis in 2008. The number of Spanish banking entities (Spanish-owned consolidated groups and banks not belonging to a group) fell from 122 at the beginning of the crisis to 65 in 2017, and the number of branches and employees decreased by 40% and 32%, respectively, in that same period.² As a result, there was a considerable increase in concentration in the banking industry. Thus the five largest groups went from representing 49% of the total assets of business in Spain in 2008 to 70% in 2017, some 20 pp above

² The number of branches decreased most sharply in the more populous municipalities, where the network expansion of 2000-2007 had been concentrated, and this mitigated somewhat the concern over financial inclusion of rural populations. However, these rural populations show a long-term trend, dating from before 2007, of decline in the number of branches, which is related to their demographic decay. For more details, see Banco de España, *Financial Stability Report*, 11/2017, Box 2.5.

the EU average.³ The consequences of the crisis are also plainly visible in the outstanding balance of banks' customer lending in Spain, which increased sixfold in the long expansion from 1995 to 2008 and then contracted by a third, and in the cumulative losses on the income statement due to asset impairment in Spain, which at end-2017 exceeded €310 billion (equal to 11% of the total balance sheet at 31 December 2007).⁴

However, the profitability of the banking sector has not recovered fully and the volume of NPLs on bank balance sheets is still high. The recovery of the Spanish economy since the end of 2013 has helped Spanish banks to reduce their bad loans and improve performance. Nevertheless, their return on equity (ROE) remains low in historical terms and the stock market prices of Spanish (and, more generally, European) banks continue to reflect investors' uncertain expectations as to the future bank performance.

Consequently, Spanish credit institutions continue to face a number of challenges, largely shared with other euro area banking systems, which may have macroeconomic repercussions. Some of these challenges are associated with the conjunctural situation, while others are medium- and long-term issues. In a highly banked economy such as Spain, it is vital to address these challenges and strengthen the banking sector so it can contribute to economic growth and job creation, effectively performing its task of financial intermediation. The experience of the past crisis illustrates how the weakness of banking systems in some countries contributed to intensifying the crisis. The following sections of this chapter analyse these challenges. They begin with the reduction of impaired assets resulting from the crisis and continue with the reestablishment of profit margins more in line with the rates of return required by investors and the adaptation to the new regulatory and competition framework.

2 The reduction of impaired assets arising from the crisis

The onset of the crisis was followed by a sharp rise in the bad loans of Spanish deposit institutions. In 2013, when the impairment of bank balance sheets peaked, non-performing loans in customer business in Spain reached nearly €200 billion, nearly eight times more than in the previous crisis in 1994.⁵ Additionally, banks' balance sheets in 2013 included foreclosed real estate assets with a gross book value of nearly €80 billion.⁶ Four years later, the former had decreased by half, albeit still remaining at high levels, while the latter had fallen to €58 billion.⁷

High levels of bad loans have negative consequences not only for banks themselves, but also for the economy as a whole. An increase in bad loans impacts initially on the income statement and capital of banks, but, once this stage has passed, the persistence of high ratios of troubled assets (non-performing loans and foreclosures) for a prolonged period has additional effects. First, it means that human and physical resources have to be deployed for their management, preventing these resources from being used in other activities, including the extension of new loans. Second, their maintenance introduces an additional element of uncertainty as to the quality and valuation of bank assets, which may contribute to raising the cost of bank funding. One way or another, this may lead to a tightening of the supply of credit.

³ Counting its business abroad, the concentration of the Spanish banking sector is even higher (81.5% in 2017).

⁴ In this chapter use is made sometimes of consolidated data and at other times of the individual data for business in Spain of deposit institutions. The former are useful for international comparisons and the latter serve to focus on developments in Spain.

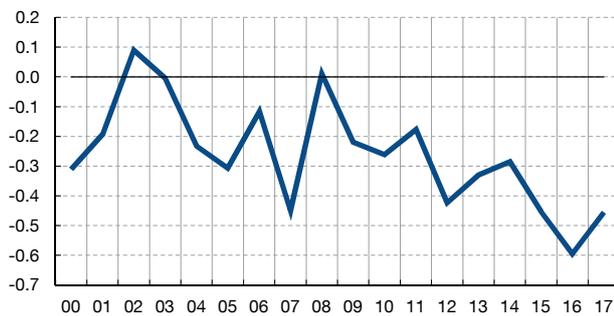
⁵ With an outstanding volume of lending five times larger.

⁶ Book value before deduction of impairment provisions recorded subsequent to foreclosure.

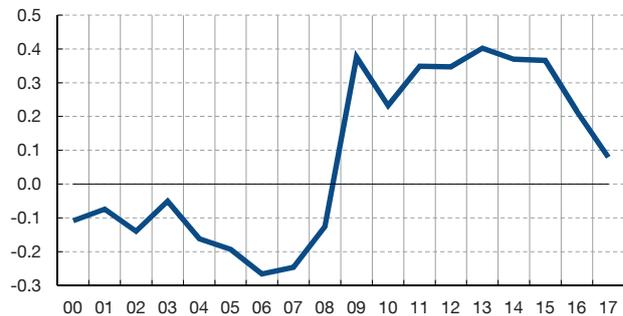
⁷ The fall was concentrated in 2017, the last year for which data are available, largely for accounting reasons. It was due, firstly, to the adjustment of the gross book value of the foreclosed assets of Banco Popular Español to their value net of provisions at the date of its resolution and, secondly, to additional reporting adjustments in the rest of the system.

Since the crisis, the banks with higher NPL ratios have seen lower credit growth and a higher cost of funds.

1 CORRELATION BETWEEN THE YEAR-ON-YEAR CHANGE IN CREDIT EACH YEAR AND THE NPL RATIO A YEAR EARLIER (a)



2 CORRELATION BETWEEN THE COST OF FUNDS EACH YEAR AND THE NPL RATIO A YEAR EARLIER (a)



SOURCE: Banco de España.

a Cross-sectional correlations of 61 Spanish deposit-taking institutions (the significant institutions and the main less-significant institutions, including all the credit cooperative sector).

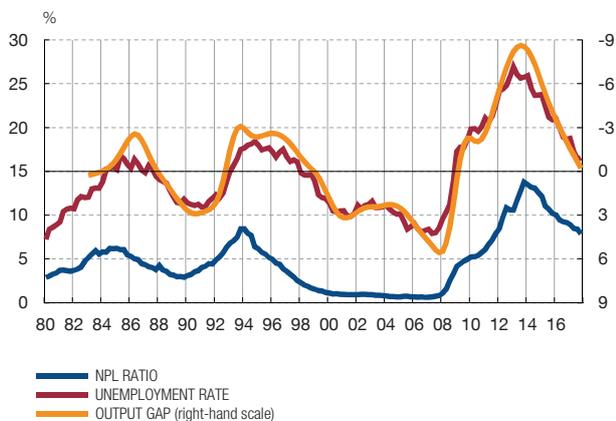
The available evidence suggests that there is a negative relationship between bad loans and new credit extension. Chart 2.1 shows the correlation coefficient between the NPL ratio lagged by one period and, firstly, the change in credit (see Chart 2.1.1) and, secondly, the cost of funds (see Chart 2.1.2), for a sample of 61 Spanish deposit-taking institutions between 2000 and 2017. The correlation with the rate of change of credit is negative in practically the whole period, and more so from 2009, coinciding with the economic crisis. This observation is in line with the thesis that banks with higher NPL ratios are those which most reduce (or least increase) their credit, particularly during the crisis. Chart 2.1.2 shows that the correlation between NPL ratio and cost of funds was negative before 2009,⁸ but became positive thereafter and its absolute value was higher than in the previous period, reflecting the fact that banks with higher NPL levels had a higher cost of funds. In recent years the relationship between NPLs and cost of funds has loosened, coinciding with the abundant market liquidity linked to the Eurosystem's expansionary monetary policy and the firming of the economic recovery, but the negative relationship with credit growth remains.

Additionally, the persistence of high NPL levels may have other negative consequences. In particular, the persistence of a high proportion of households and/or non-financial corporations in a fragile financial position, with high levels of debt, may reduce the momentum of spending and curtail the recovery of the economy, with feedback effects on bank balance sheet quality. Moreover, in the case of the euro area countries, the prompt correction of the NPL levels derived from the crisis is now also necessary to foster greater progress in the construction of the banking union. As noted in Chapter 1, there is a certain consensus that the greater sharing of risk entailed by the pieces yet to be put in place to complete the banking union (financial backing to the SRM, the European Deposit Guarantee Scheme) will only be possible if simultaneous progress is made in reducing the currently existing risks.

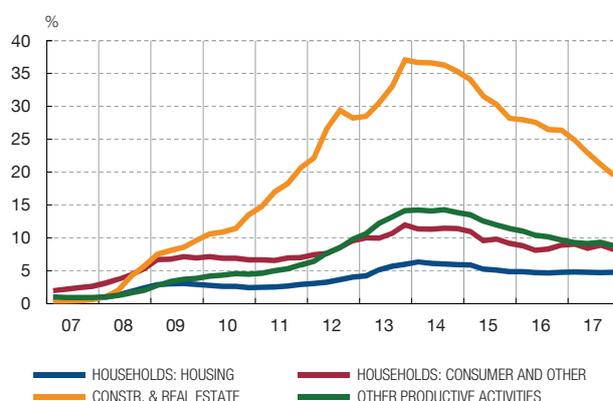
⁸ Particularly in the final years of expansion, in which those banks which most increased their lending (and consequently most reduced their non-performing to total loans ratio by raising the denominator) had a higher cost of funds.

The NPL ratio in Spain is being corrected within the framework of cyclical recovery of the Spanish economy and is now around the euro area average. Foreclosed assets are also being reduced, albeit at a slower pace, which will foreseeably quicken in 2018 with the execution of major sale transactions announced in 2017.

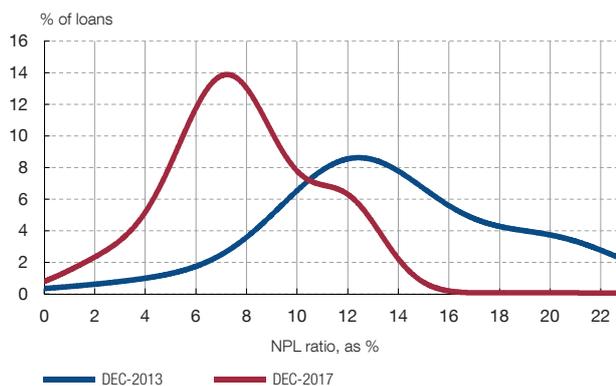
1 HIGH CORRELATION BETWEEN NPLs AND THE ECONOMIC CYCLE



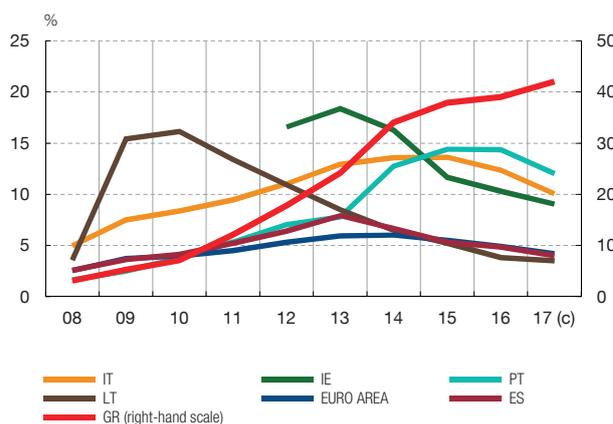
2 THE NPL RATIOS ARE BEING CORRECTED, ALBEIT UNEVENLY ACROSS SECTORS



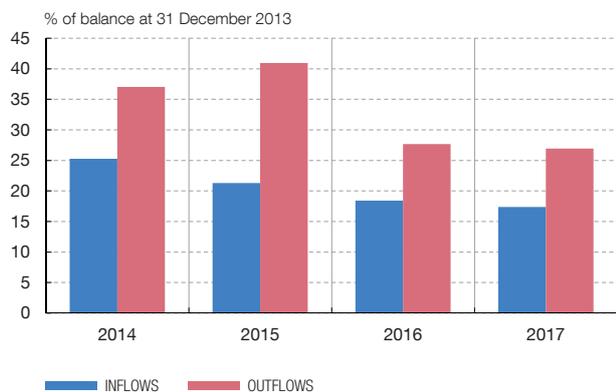
3 DECREASE IN THE PERCENTAGE OF BANKS WITH VERY HIGH NPL RATIOS (a)



4 THE ADJUSTMENT OF THE NPL RATIO IS MORE ADVANCED IN SPAIN THAN IN OTHER EURO AREA COUNTRIES (b)



5 DECREASE IN GROSS INFLOWS OF NEW NPLs (d)



6 INCREASE IN OUTFLOWS OF FORECLOSED ASSETS



SOURCES: ECB, INE and Banco de España.

- a Distribution by bank of the NPL ratio for credit to the resident private sector.
- b NPL ratios for debt instruments (loans and debt securities) at consolidated level.
- c Data as at September 2017.
- d Inflows and outflows of the stock of NPLs to the resident private sector.



The outlook for bank balance sheets is favourable, given the impact that the economic recovery is having on the reduction of the NPL ratio of the resident private sector. Chart 2.2.1 shows how the NPL ratio is highly correlated with the economic cycle and exhibits a downward trend whenever GDP picks up and the unemployment rate falls, as is expected to occur in the coming years. The correction is particularly apparent in loans to construction and real estate development firms (see Chart 2.2.2), a segment in which the NPL ratio reached higher levels from the onset of the crisis and where, despite having decreased, it was nearly 20% in December 2017. In lending to households, this ratio has decreased more moderately and recently non-performing assets and the NPL ratio have even risen somewhat in the “consumer credit and lending for purposes other than house purchase” sector.⁹ In any event, more disaggregated analysis shows not only that the average level of the ratio has decreased but also that the percentage of banks with high levels of the ratio has fallen particularly sharply (see Chart 2.2.3).

With respect to the banks of other euro area countries which also accumulated high NPL levels during the crisis, Spanish banks are at a relatively advanced stage in the reduction of non-performing assets. Indeed, the ratio of non-performing exposures to total loans and debt securities of Spanish banks at consolidated level now stands close to the euro area average (see Chart 2.2.4). Furthermore, the inflows and outflows of NPLs (see Chart 2.2.5) have a negative net balance (explaining the fall in the ratio), with a decrease of 31% in inflows of new NPLs between 2014 and 2017. Meanwhile, foreclosed assets (see Chart 2.2.6) peaked in June 2012 (€96 billion) and the decreases since then have been more limited, despite the transfer of assets to the Spanish Asset Management Company (*Sociedad de Gestión de Activos procedentes de la Reestructuración Bancaria* – Sareb). However, in recent years the net balance of inflows and outflows has become negative due to the increase in the latter. This trend may become more marked in 2018 if, as announced, the major real estate asset sale transactions initiated by some of the biggest Spanish banks materialise.

In any event, the adjustment currently under way in the NPL ratio in Spain is proceeding at a relatively moderate pace. Charts 2.3.1-2.3.4 compare the behaviour in the quarters following each of the last three peaks in the ratio in recent decades in Spain (March 1985, March 1994 and December 2013). As can be seen, the rate of decline in the most recent period is lower than on the previous two occasions (see Chart 2.3.1). However, this is explained mainly by the atypical behaviour of lending (the denominator of the ratio, shown in Chart 2.3.2), which not only has failed to expand but rather has fallen off during the current recovery phase as a whole. Regarding NPLs, the decrease was particularly slow in the second half of the 1980s, while it seems to have been similar in the two subsequent episodes (see Chart 2.3.3), in line with the also similar behaviour of real GDP in these two cases (see Chart 2.3.4).¹⁰ Even so, the decrease in NPLs is somewhat slower in the last few quarters and, at the rate of fall of the last three years, NPLs would still exceed €50 billion at the end of 2020, a figure which is still significant (4.4% of credit to the resident private sector at end-2017). This assessment is in line with that resulting from analysis of the historical relationship between the volume of NPLs and their basic determinants (see Chart 2.3.5).¹¹

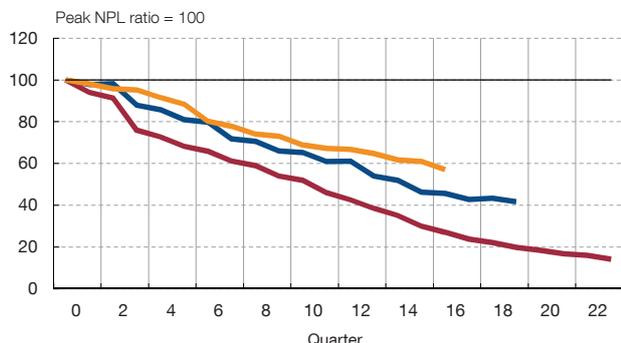
⁹ See Banco de España, *Financial Stability Report*, 05/2018.

¹⁰ Adjusted for inflation, the cumulative decrease since 2013 is 13 pp less than the previous correction and 6 pp more than in the late 1980s.

¹¹ There is no systematic information on foreclosed assets prior to 2010, which prevents comparative analysis of their behaviour in previous recessions as has been done for NPLs.

The slow fall in the NPL ratio is due mainly to the decrease in the denominator (loans). However, NPLs are also falling somewhat more slowly than in the previous recovery and more sluggishly than would be predicted by a model of their relationship with their basic determinants. Although a slow correction is usual in this type of crisis, at its current rate of fall the NPL ratio would still be relatively high at the end of 2020.

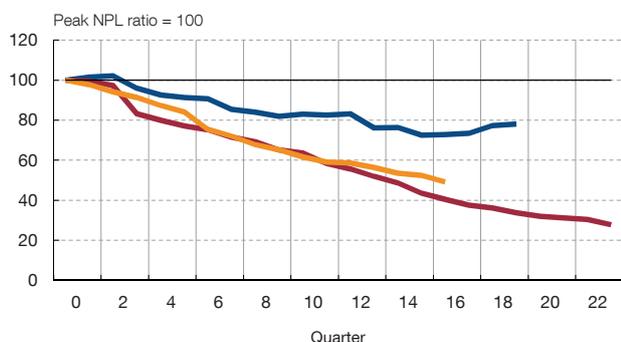
1 THE NPL RATIO (a) IS DECREASING MORE SLOWLY THAN ON PREVIOUS OCCASIONS



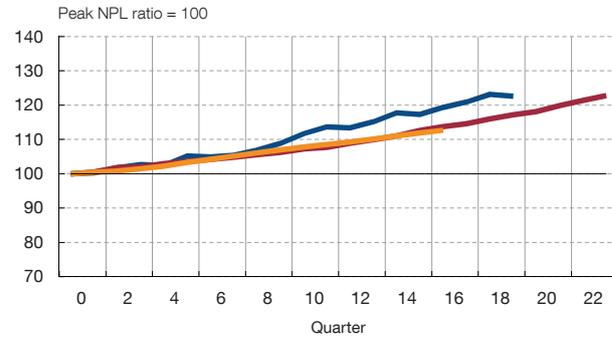
2 LENDING



3 UNTIL RECENTLY, THE VOLUME OF NPLs WAS DECREASING AS IN THE PREVIOUS RECOVERY

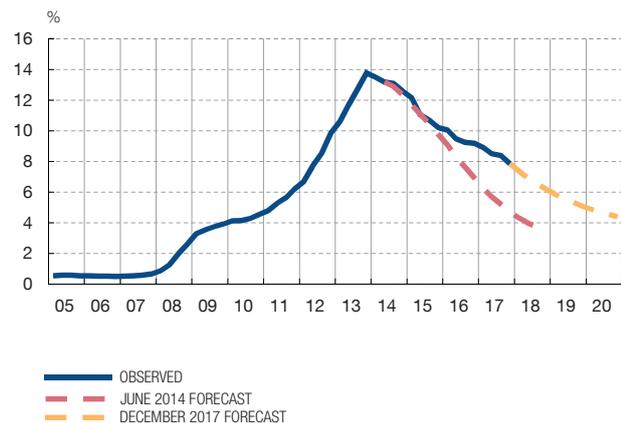


4 REAL GDP IS BEHAVING AS IN THE PREVIOUS RECOVERY

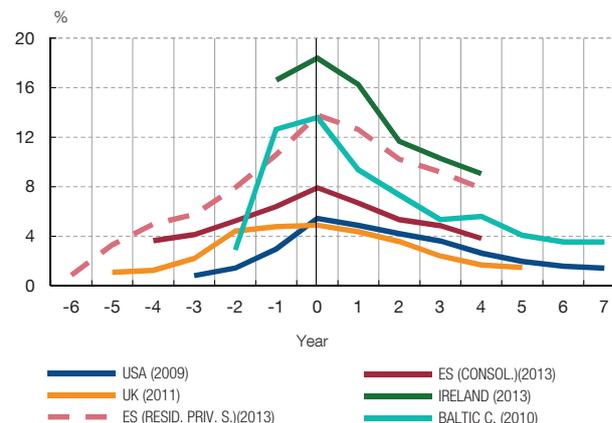


1985 Q1 - 1989 Q4 1994 Q1 - 1999 Q4 2013 Q4 - 2017 Q4

5 PROJECTED NPL-TO-LOANS RATIO (b)



6 INTERNATIONAL COMPARISON OF NPL RATIOS (c)



SOURCES: ECB, CGFS, FDIC and Banco de España.

- a NPLs as a proportion of total credit to the resident private sector.
- b Based on a dynamic single-equation model relating the volume of NPLs to GDP, the unemployment rate, the credit-to-GDP ratio, changes in real GDP and in the nominal lending interest rate and lags in the dependent variable.
- c The consolidated data for Spain, Ireland and the Baltic countries are obtained from the ECB and consist of NPLs as a proportion of total debt instruments. The data for the United States are from the FDIC (call reports). The data for the United Kingdom are from the BIS report entitled "Structural changes in banking after the crisis".



Analysis of similar episodes in other countries confirms that when the NPL ratio rises significantly, it takes a long time to recoup its previous level (see Chart 2.3.6). In the United States, for example, following the 2009 crisis, the NPL ratio did not return to its previous levels for 5–6 years after reaching its cyclical high. In other cases, in which the increase in NPLs was extremely sharp and fast, such as the Baltic countries and Ireland, the correction was somewhat faster, but even so required a similar number of years. The resolution of the situations of financial fragility of agents which lie behind these high impaired asset ratios requires some time, and the optimum strategy for maximising recoverable value is not always that of immediate settlement of the transaction. Therefore, historically, the remediation of such situations of high NPLs tends to be progressive and to extend over long periods.

However, these situations also have negative implications for the economy as a whole which go beyond the direct impact on banks, and this is the reason for the diverse measures taken within the framework of the July 2017 Action Plan of the European Council. The measures include most notably the package made public by the European Commission in March this year proposing to review the capital requirements legislation in order to introduce a provisioning schedule for future NPLs, a draft directive for creating a secondary NPL market, an out-of-court mechanism for accelerating the recovery of collateral value and the publication of guidance to facilitate the creation of asset management companies.¹² At the same time, in its capacity as prudential supervisor of significant institutions in the euro area, the Single Supervisory Mechanism (SSM) assumed leadership in this area with major initiatives. These included the issuance in March 2017 of guidance on NPL management and, more recently in March 2018, the publication of an addendum to the previous guidance to make public its supervisory expectations on the provisioning of new NPLs within the framework of the annual supervisory review and evaluation process (SREP).¹³ This supervisory authority also continues its close oversight of compliance with strategic plans to reduce the impaired assets of the banks under its control which have high NPL ratios.

3 Return to profitability

3.1 DELIMITING THE PROBLEM

The crisis highlighted the problems built up during the expansion, such as the over-indebtedness of the private sector, and had a notable impact on the profitability of Spanish banks. The high volume of losses generated in the crisis materialised principally in 2012 when the Bankia crisis took place and substantial write-offs were made, largely linked to the results of the stress tests conducted within the framework of the programme of financial aid to the sector by European institutions. Consequently, the aggregate ROE of deposit-taking institutions in Spain at consolidated level fell to -25% (see Chart 2.4.1).

Subsequently, profitability partially recovered and has remained at positive, albeit low, levels. Bank profitability presently stands clearly below its pre-crisis levels and also below available estimates of the return demanded by investors (or cost of capital; see Box 2.1). Consequently, the valuations of bank shares are generally below book value. In comparative terms, Spanish bank profitability in 2016 was slightly better than that of the euro area as a whole or of UK, German and Swiss banks, but clearly below the returns obtained in other advanced economies such as Australia, Canada, the USA or Sweden (see Chart 2.4.2).

The main differences between Spanish banks and those of other countries with higher bank profitability are due to expenses and impairment losses. This can be seen

¹² See http://europa.eu/rapid/press-release_IP-18-1802_en.htm.

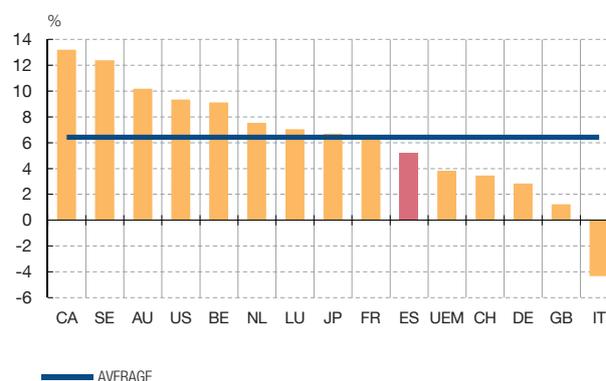
¹³ See ECB (2017), *Guidance to banks on non-performing loans* and ECB (2018), *Addendum to the ECB Guidance to banks on non-performing loans: supervisory expectations for prudential provisioning of non-performing exposures*.

Following the losses of 2012, profitability has again become positive, but has not returned to pre-crisis levels and stands below the levels of countries such as Australia, Canada, the USA or Sweden, although above the euro area average.

1 RETURN ON EQUITY OF SPANISH CREDIT INSTITUTIONS (a)



2 INTERNATIONAL COMPARISON. ROE (2016) (b)



SOURCES: BIS and Banco de España.

- a The 2017 data do not reflect the losses of Banco Popular Español in the first half of the year. If these were included, the aggregate ROE for 2017 would be 2.2%.
 b Data taken from the report of the BIS Committee on the Global Financial System, entitled "Structural changes in banking after the crisis".



in Chart 2.5, which shows the behaviour of various income statement items of Spanish credit institutions and the average behaviour in five advanced economies in which the average ROE was above 9% in 2015-2016. The chart also shows the average behaviour for euro area countries. The banks with current high profitability underwent their crisis before Spanish banks did (in 2008, compared with 2012) and it was generally less marked. The return on assets (ROA) of these banks subsequently recovered to levels similar to those before the crisis, while this did not occur in the case of ROE, this differing behaviour being due to their lower leverage in recent periods partly associated with the greater capital requirements under the new regulations. Even so, ROE stood above 10% in this group of countries in 2016, compared with 5% in Spain. Measured as a percentage of assets, from 2007 to 2016 net interest income and total operating income performed similarly in Spain and on average in the five countries with higher profitability; by contrast, operating expenses and impairment losses behaved worse in Spain.¹⁴ The former behaviour is related to the process of capacity adjustment and the latter to the consequences of the crisis. Both are considered in greater detail below.

The impact of the crisis was sharper at banks focused on business in Spain (see Chart 2.6). The activity of Spanish banks abroad continued to expand in those years, while that in Spain contracted. This activity abroad, however, is concentrated in a very small number of banks. Specifically, in December 2017, just four groups accounted for 99% of total international exposure and the bulk continued in the hands of the two largest banks. For these banks, their international business constituted a valuable source of risk diversification during the crisis, although that is not to say that this business segment was bereft of challenges.¹⁵

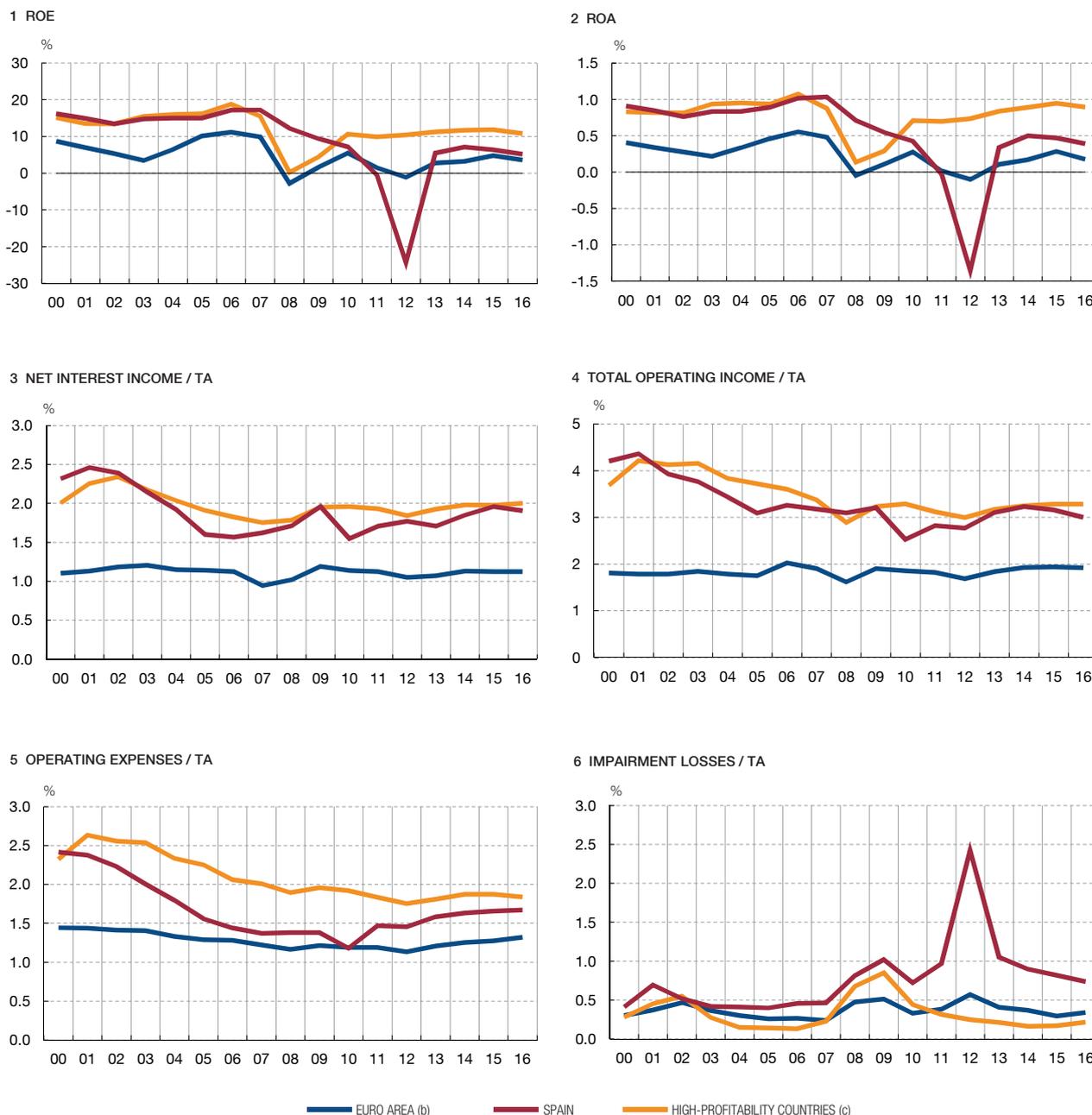
¹⁴ In the comparison, it must be kept in mind that some differences, particularly in the levels of certain time series, may be due to regulatory differences. Also, the country averages naturally mask any more volatile behaviour of specific countries.

¹⁵ See I. Argimón (2017), *Decentralized multinational banks and risk taking: the Spanish experience in the crisis*, Working Paper 1749, Banco de España.

POORER RELATIVE PERFORMANCE OF OPERATING EXPENSES AND IMPAIRMENT LOSSES IN SPAIN SINCE 2007 (a)

CHART 2.5

Comparison of Spain with five developed countries whose banking systems had profitabilities above 9% in 2015-2016 shows that since 2007, expressed as a percentage of assets, the income of Spanish banks does not seem to perform worse than the average of those five countries. By contrast, operating expenses and impairment losses perform clearly worse in Spain.



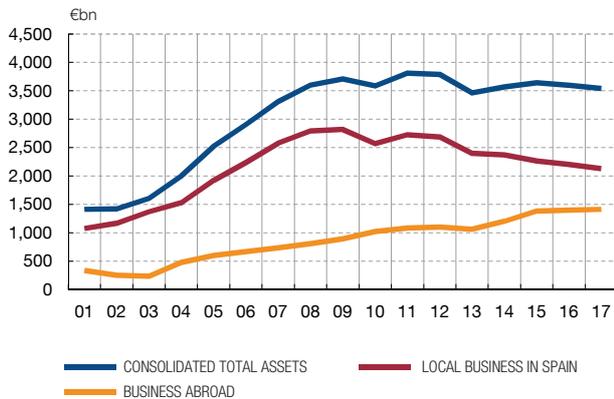
SOURCES: BIS and Banco de España.

- a Data taken from the report of the BIS Committee on the Global Financial System, entitled "Structural changes in banking after the crisis".
- b Weighted average of available countries.
- c Average of countries with ROE above 9% in 2015-2016 (Australia, Belgium, Canada, the USA and Sweden).



The activity of Spanish banks abroad continued to expand during the crisis, while it contracted in Spain. For those few banks engaging in such business abroad, it represented a valuable source of income during the crisis.

1 CONTRACTION OF LOCAL BUSINESS AND EXPANSION OF BUSINESS ABROAD



2 DIFFERING BEHAVIOUR OF PROFITABILITY (ROA) IN SPAIN AND ABROAD



SOURCES: Asociación Española de Banca and Banco de España.

a The 2017 data do not reflect the losses of Banco Popular Español in the first half of that year. If these were included, the ROA for 2017 would be 0.09%.



The type of international business of Spanish banks enabled them to withstand the effects of the crisis better than other European banking systems. The crisis particularly affected international business conducted and funded from the countries of origin, which had grown strongly in the previous years, especially in Europe. The financial crisis and the tighter regulation led many banks to reassess their international activity, reducing it and concentrating it in their main markets.¹⁶ The international business of Spanish banks, by contrast, was based mainly on activities carried out through subsidiaries, largely in emerging markets, and funded mainly in local currency. Due to its nature, this type of business is less exposed to tensions on the global funding markets such as those seen during the crisis.¹⁷ Following the acquisitions made during the crisis, the external activity of Spanish banks is now spread mainly between the United Kingdom, Latin America and the United States.

Given that international business is concentrated in very few banks and has performed better recently, the rest of this section focuses on banking activity in Spain. This means that the conclusions drawn from the analysis are not affected by the significant activity abroad of the two main Spanish banking groups which, at consolidated level, continued to gain weight in 2017, their share of the total activity of the sector rising to 36%.

3.2 THE MAIN DETERMINANTS OF LOW PROFITABILITY

Several factors contribute to explaining the low profitability of the banking sector in Spain. Some are cyclical and others are of a more structural nature. A number of them are shared with other banking systems while others are more specific to Spain. The factors potentially more significant in Spain include notably the impact of bad loans, the contraction

16 See R. N. McCauley, A. Bénétrix, P. McGuire and P. von Goetz (2017), *Financial deglobalization in banking?*, Working Paper 650, Bank for International Payments.
 17 Recent evidence points to a certain shift to this type of model in general. See, for example, IMF (2015), *“International banking after the crisis: increasingly local and safer?”*, *Global Financial Stability Report*, April, and L. Gambacorta, S. Schiaffi and A. Van Rixtel (2017), *Changing business models in international bank funding*, Working Paper 1736, Bank for International Settlements.

of local activity and the low interest rates. Each of these is analysed in greater detail below. The tighter banking regulation (described in Section 4 below) also affects the profitability of certain activities and obliges banks to readjust their business structure. Some activities have to be transformed and the means used for provisioning them must be appropriately readjusted, a process which is not always free from friction.¹⁸ In any event, as we have seen, there are banking systems whose profitability, although below pre-crisis levels, is relatively high despite the current environment of stricter regulation, which indicates that such transformation is possible and that this factor cannot be considered to be a basic determinant of the current low profitability in Spain.

Furthermore, profitability depends on the specific characteristics of the business of each bank. This explains why banks which perform very differently coexist in the same country. Box 2.2 analyses the determinants of profitability from a microeconomic standpoint, and finds that variables such as size, solvency, efficiency or asset quality also contribute to explaining differences between banks.

3.2.1 Impact of bad loans

The deterioration of the credit quality of assets affects the income statement of credit institutions in two ways. First, an increase in NPLs reduces the interest income received. Second, a higher probability of default reduces the value of the related assets. The latter is undoubtedly the main effect and largely explains banks' conjunctural profit performance. Calculated using data on business in Spain expressed as a percentage of assets, the correlation between impairment losses and net profit is -0.97, indicating the extent to which credit institutions' profitability is dependent on these results.¹⁹

Impairment losses peaked in 2012 and have subsequently moderated, although without returning to their pre-crisis values. Chart 2.7.1 shows how these losses consumed half of operating income before provisions and impairment charges in 2016, and the bulk of it in 2017, which contrasts with the levels of around 25% in the years prior to the crisis. Expressed in terms of assets, these losses were twice as high in 2015-2017 as in 2003-2005. Had they remained at their 2003-2005 level, the ROE of the local business of Spanish banks in the last few years would have been 5.2% instead of the 1.7% observed. Finally, Chart 2.7.2 shows how, in terms of GDP, the fall in the net profit of business in Spain between the aforementioned two 3-year periods is basically due to impairment losses.²⁰ By contrast, operating income expressed as a percentage of GDP scarcely changed, and the other items contributing to the fall in profit are other net gains/losses and intangible asset amortisation, while the lower taxes partially offset those negative results.

The behaviour over time of impairment losses is directly related to the level of NPLs and foreclosed assets, but also to the volume of provisions. A high but decreasing level of NPLs, such as currently exists in Spain, does not necessarily imply additional future losses if those loans are sufficiently provisioned. In this respect, the clean-up in 2017 of the balance sheet of Banco Popular Español and other similar measures taken that

18 The document entitled *Structural changes in banking after the crisis*, by the Committee on the Global Financial System (CGFS) shows how banks now operate with higher levels of capital (and thus lower leverage ratios), a lower volume of activity on certain higher-risk markets with complex products and less recourse to wholesale funding, particularly at short-term.

19 Even excluding the years 2011 and 2012, the correlation continues to be high at -0.78. At consolidated level the correlation is -0.92 in the period 2001-2017.

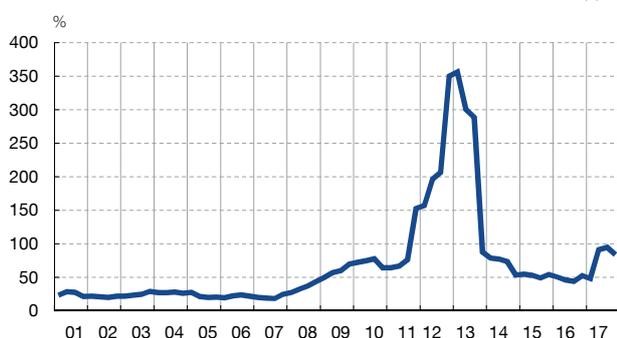
20 Normalisation by GDP controls for the impact of the crisis on the level of assets and equity, which are the two variables typically used to measure bank profitability.

IMPAIRMENT LOSSES AND OTHER EXTRAORDINARY EXPENSES CONTINUE TO BE ABOVE PRE-CRISIS LEVELS (a)

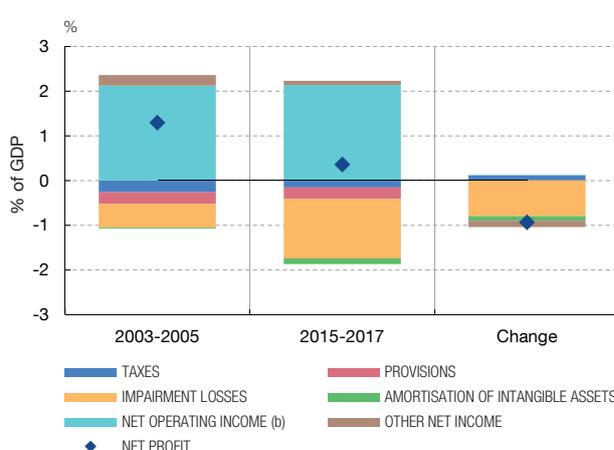
CHART 2.7

In the income statement for credit institutions' business in Spain, the main differences relative to the pre-crisis situation lie in the items below net operating income, which include the impact of the crisis on impairment losses and other extraordinary expenses.

1 IMPAIRMENT LOSSES AS A PERCENTAGE OF NET OPERATING INCOME (b)



2 INCOME STATEMENT BREAKDOWN



SOURCE: Banco de España.

a Individual statement of income. Business in Spain.

b Gross income less operating expenses, excluding items with extraordinary gains/losses during the crisis, such as contributions to the Deposit Guarantee Scheme, severance payments and amortisation of intangible assets.

[Download](#)

year have raised the credit quality of the sector's assets. In September 2017, the coverage ratio of NPLs to the resident private sector in Spain was 41%, slightly below the European average. That ratio rises considerably, to 87%, if the value of the collateral on those loans is also taken into account.

3.2.2 Contraction of the volume of activity and operating costs

The crisis highlighted the unsustainability of the previous strong credit growth in Spain and prompted a sharp correction. Between 2000 and 2008, the total assets and bank credit to customers in Spain, expressed as a percentage of GDP, increased by 107 pp and 81 pp, respectively, to 266% and 158%. Since then, those increases have been largely corrected in both cases (see Chart 2.8.1).

During the expansion phase, bank income grew more strongly than expenses. The high demand for bank credit spurred net interest income, which practically doubled between 2000 and 2008, and at the same time other operating income (fees and commissions, gains on financial transactions, etc.) also rose at the same or an even faster pace. As a result of this, total operating income exceeded 6% of GDP, more than 1 pp above the levels at the beginning of the century (see Chart 2.8.2). Against this background, banks also expanded their capacity, increasing the number of branches and employees by 17% and 14%, respectively. Total operating expenses increased by more than 50%, but this was less than that of income, so the operating efficiency of banks improved notably.

The correction of the level of credit following the outbreak of the crisis unleashed a process of sharp reduction in income. Net interest income was particularly affected by the fall in credit and total assets and by the lower interest rates. Other sources of income also evolved negatively. Net fees and commissions, for example, decreased by 20% between 2007 and 2013, influenced by the decrease in those for receipt and payment

The crisis evidenced the unsustainability of the previous strong credit growth and prompted a still-ongoing correction which fed through also to the income of the banking sector in Spain. Despite the simultaneous sharp adjustment of employment and branch numbers, operating expenses decreased to a much smaller extent, partly because of the rise in some items mainly linked to new technological developments.

1 STRONG EXPANSION AND SUBSEQUENT CORRECTION OF VOLUME OF ACTIVITY



2 OPERATING INCOME (b)



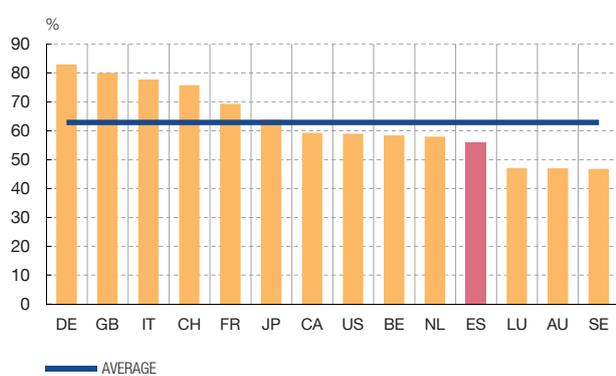
3 ADJUSTMENT OF CAPACITY OF DEPOSIT-TAKING INSTITUTIONS IN SPAIN



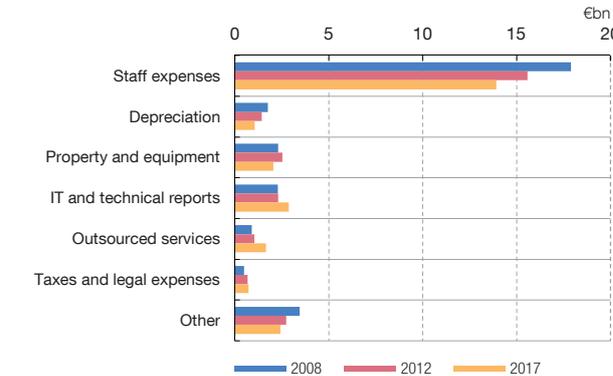
4 EFFICIENCY RATIO OF BUSINESS IN SPAIN (c)



5 INTERNATIONAL COMPARISON OF EFFICIENCY RATIO IN 2016 (d)



6 BREAKDOWN OF OPERATING EXPENSES (b)



SOURCES: BIS, INE and Banco de España.

- a Individual balance sheets and income statements. Business in Spain.
- b Operating income and expenses, excluding items with extraordinary gains/losses during the crisis, such as contributions to the Deposit Guarantee Scheme, severance payments and amortisation of intangible assets.
- c Operating expenses as a proportion of gross income, excluding items with extraordinary gains/losses during the crisis.
- d Consolidated data from the report by the BIS's CGFS entitled "Structural changes in banking after the crisis".



services.²¹ In response to the fall in income, Spanish banks undertook a major adjustment of their productive capacity, helped by a simultaneous process of concentration. In all, they downsized their branch network by 40% and cut staff by 32% with respect to the peaks reached in 2008 (see Chart 2.8.3). However, their operating expenses in business in Spain decreased by only 15%,²² compared with a fall of 30% in income.

The downward stickiness of operating expenses is due partly to some fixed costs and partly to the growth of some items. The existence of fixed costs is reflected in the procyclical behaviour of the efficiency (cost/income) ratio, clearly visible in Chart 2.8.4. In any event, at consolidated level, Spanish banks continued to compare favourably with the majority of their peers in other developed countries (see Chart 2.8.5). Furthermore, disaggregated analysis of the components of operating expenses shows how, while staff expenses and tangible fixed asset depreciation decreased by 22% and 40%, respectively, other administrative expenses (quantitatively less than staff expenses) even increased slightly between 2008 and 2017, and only in the last two years have they initiated a downward course. This reflects the uneven behaviour of the various component items (see Chart 2.8.6). In particular, there were increases in IT and technical report expenses, taxes and legal expenses,²³ and especially in outsourced services, which nearly doubled.

In the short- and medium-term, the high bank credit balances seen in the previous expansion are not expected to return, so banks will have to persevere in their search for alternative sources of income and in the control of their costs. Box 2.3 analyses the determinants of household and non-financial corporation debt. The conclusions are that some of the factors behind the increase in debt in the opening years of this century (demographic behaviour, strong growth in house prices and the real estate investment boom) will probably act much more weakly or even in the opposite direction in the coming years. Against this background, the levels of income seen during the period before the last crisis are not expected to return in the short and medium term, so banks will have to adapt their expenses and business structure to this new environment. In some cases, this may require further advances in banking consolidation, at domestic and/or euro area level, to accelerate the adjustment of banks' cost structures, without any reduction in the level of competition in the sector.

3.2.3 Low interest rates

The effects of low or even negative interest rates on bank profitability operate in opposing directions. It should be kept in mind that the low interest rates are largely a consequence of the monetary policy formulated in response to an environment of low growth and inflation. Against this background, these measures should have a favourable impact on economic activity and consequently on the demand for credit and other bank services, as well as on the value of assets and the volume of loan losses of banks. The latter have decreased not only because of the smaller debt burden due to the lower interest rates, (particularly in countries where variable-rate loans predominate, such as Spain), but also because of the expansionary effects on GDP and employment, agents' income and the value of collateral assets. Unquestionably, a less accommodative monetary policy would have hindered achievement of the current economic recovery, which is what is allowing credit institutions to return to lower NPL levels and positive profitability. By

21 The strongly cyclical behaviour of these fees and commissions is due to those relating to credit and debit cards, which currently account for 40% of them and which rose by 63% between 2000 and 2007 and subsequently fell by 47% between 2007 and 2015.

22 The operating expenses shown do not include severance payments or intangible asset amortisation, two items which grew exceptionally strongly during the crisis, so their behaviour is not considered to be representative of banks' normal operating costs.

23 This does not include expenses deriving from implementation of court decisions on floor clauses and the like, which are included in net interest income.

contrast, against a background of banks' strong reluctance to introduce negative remuneration of deposits, falls in interest rates tend to reduce net interest income per unit of assets. Although this effect may temporarily be offset partially by the capital gains derived from the increase in value of some assets in a setting of low interest rates, below a certain threshold (reversal rate) the net impact would be negative.²⁴ In countries where fixed-rate loans prevail, the Eurosystem's unconventional monetary policies have additional negative effects at medium and long term through the flattening of the yield curve. However, this is less significant in Spain due to the predominance of variable-rate loans.

The results of the available estimates of the net effect of interest rates on bank profitability are not conclusive. Some studies report a negative impact.²⁵ By contrast, others find that this result disappears when the effect of variables which capture expectations as to economic growth, inflation and the risk of borrower default is taken into account.²⁶ The ECB's estimates similarly suggest that the various opposing effects tend to cancel out not only in the euro area as a whole, but also in Spain and in the other large euro area economies.²⁷ A recent study on this subject using data obtained from euro area banks reveals that the banks which recognise a larger negative impact on their net interest income from the negative rates applied by the ECB to its marginal deposit facility are those which, in general, have a lower level of capitalisation and thus a lower capacity to assume new risks to offset the contractionary effect of negative interest rates on their per-unit net interest income.²⁸

International comparison of the current profitability of the various banking systems suggests that quantity-related effects may outweigh price-related effects. Chart 2.9.1 shows that only the banking systems of countries in which total financing to the private sector (bank loans and debt securities) grew by at least 3% posted ROEs above 9% in 2015-2016, despite interest rates that were negative (as in Belgium, Sweden or Finland) or very low (as in Hong Kong, the USA, Canada or Norway). In this respect, Chart 2.9.2 of the same chart shows how, in Spain, two-thirds of the fall in deposit-taking institutions' net interest income between 2008 and 2017 was due not to the decrease in unit margins but to the contraction of assets and the post-crisis shift in the asset mix towards a lower weight of credit.²⁹

In any event, the responses of Spanish and European banks to the specific question in this respect contained in the Eurosystem Bank Lending Survey confirm that low interest rates negatively affect their net interest income through the narrowing of unit margins.³⁰ The quantitative information is consistent with this result, although the

24 See M. K. Brunnermeier and Y. Koby (2018), *The reversal interest rate*, mimeo. This model, however, does not take into account the aforementioned effects on NPLs and credit volume.

25 See, for example, C. Borio, L. Gambacorta and B. Hofmann (2017), "The influence of monetary policy on bank profitability", *International Finance*, 20, spring, pp. 48-63, and S. Claessens, N. Coleman and M. Donnelly (2017), "*Low-for-long*" interest rates and banks' interest margins and profitability: cross-country evidence, International Finance Discussion Papers 1197, Board of Governors of the Federal Reserve System.

26 C. Altavilla, M. Boucinha and J. L. Peydró (2017), *Monetary policy and bank profitability in a low interest rate environment*, Working Paper No 2105, European Central Bank. Also described in this study are net results which are zero in a BVAR model and positive in the response of bank stock market values to monetary policy expansionary surprises in the euro area.

27 See European Central Bank, *Annual Report, 2017*.

28 See O. Arce, M. García-Posada, S. Mayordomo, and S. Ongena (2018), *Adapting lending policies when negative interest rates hit banks' profits*, forthcoming.

29 See also J. Martínez (2017), *Spanish deposit-taking institutions' net interest income and low interest rates*, *Economic Bulletin* 3/2017, Banco de España.

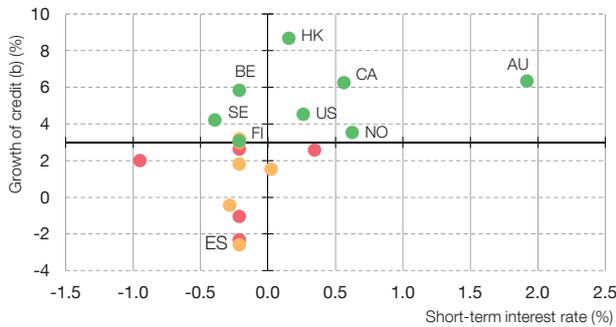
30 See, for example, I. Roibás (2017), *The October 2017 Bank Lending Survey in Spain*, *Economic Bulletin*, Banco de España. By contrast, banks report that other monetary policy measures such as targeted longer-term refinancing operations (TLTROs) and the Eurosystem's asset purchase programme have had a positive impact on their profitability.

THE REDUCTION IN NET INTEREST INCOME IN SPAIN IS DUE MORE TO THE FALL IN ACTIVITY THAN TO A DECREASE IN INTEREST RATES

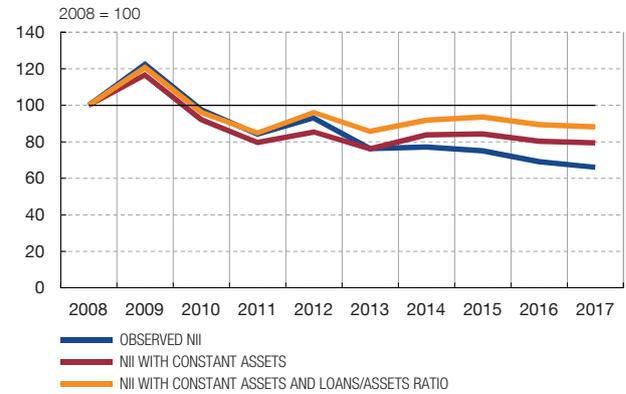
CHART 2.9

In Spain, the fall in credit institutions' net interest income since 2008 is due more to the lower volume of activity than to the contraction of unit margins, in a setting where the interest rates on new loans and on outstanding loan balances underwent smaller decreases than did market interest rates.

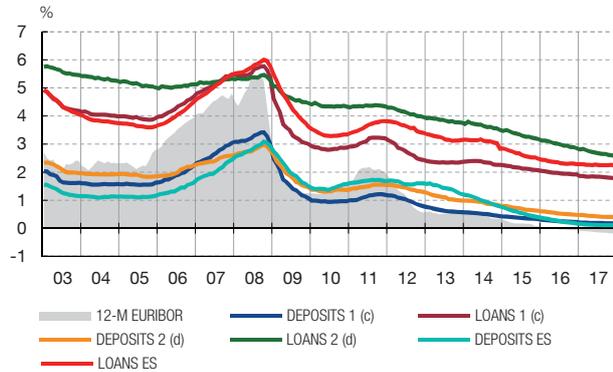
1 COUNTRIES WITH LOW INTEREST RATES BUT HIGHER CREDIT GROWTH SHOW HIGH BANK PROFITABILITY (a)



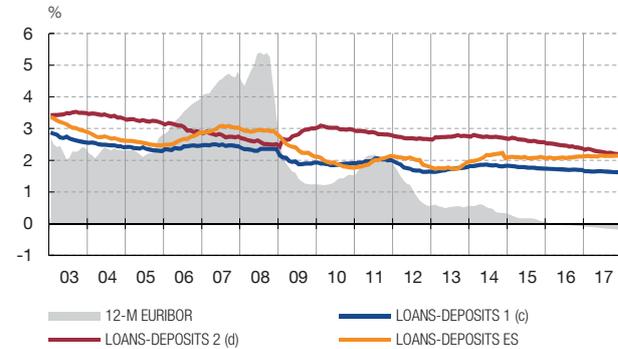
2 TWO-THIRDS OF THE FALL IN NET INTEREST INCOME IN SPAIN IS DUE TO THE CONTRACTION OF ASSETS AND LENDING



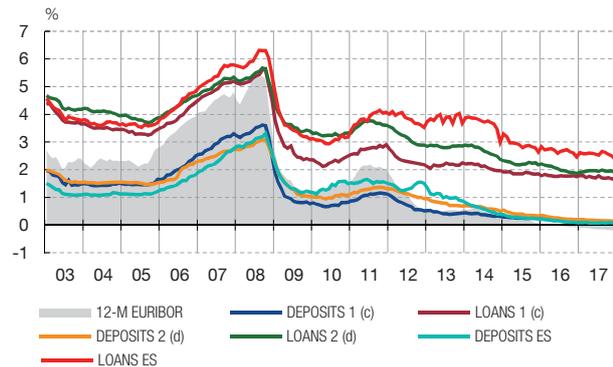
3 THE STRUCTURE OF INTEREST RATES (FIXED OR FLOATING) DETERMINES THE DYNAMICS OF THE RESPONSE OF INTEREST RATES ON OUTSTANDING BALANCES



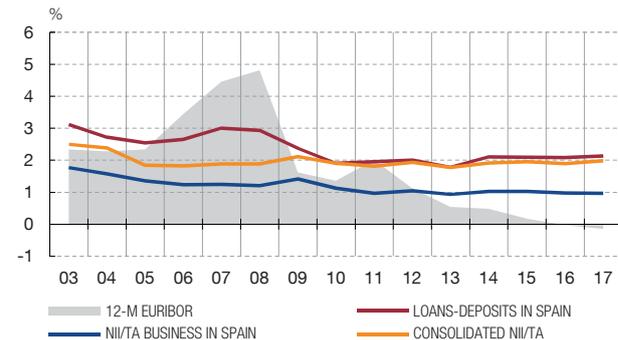
4 WHICH ALSO AFFECTS THE LOAN-DEPOSIT UNIT MARGIN



5 LIMITED DECLINE IN INTEREST RATES ON NEW LOANS IN SPAIN



6 RELATIVE STABILITY IN NET INTEREST INCOME MARGINS IN SPAIN IN RECENT YEARS



SOURCE: BIS, ECB and Banco de España.

- a International comparison of averages in 2015-2016 for 19 developed countries (Germany, Australia, Austria, Belgium, Canada, Denmark, United States, Spain, Finland, France, Netherlands, Hong Kong, Italy, Japan, United Kingdom, Sweden and Switzerland), obtained from the report by the Committee on the Global Financial System of the Bank for International Settlements entitled "Structural changes in banking after the crisis". Red denotes ROE below 4%, yellow, between 4% and 9% and green, above 9%.
- b Total (bank and non-bank) credit to the private non-financial sector
- c Countries where floating-rate credit predominates (Austria, Finland and Luxembourg).
- d Countries where fixed-rate credit predominates (Germany, France, Netherlands and Belgium).



price effect seems to have been moderate as a result of the partial pass-through of market interest rate falls to bank credit (see Charts 2.9.3-2.9.6). Thus, although the zero rate effectively acted as a floor for the average remuneration of deposits, this negative effect on the margin tended to be offset by an also generally lower pass-through of market movements to the lending interest rate. In the case of Spain in particular, the latter decreased by 1.7 pp in new lending and by 2 pp in outstanding balances from the pre-crisis period (average of 2003-2007) to 2017, compared with a decrease of 3.1 pp in the reference interest rates.³¹ This has resulted in fairly steady net interest income margins in Spain in recent years at both local and consolidated level (see Chart 2.9.6). Insofar as the reluctance of banks to cut their margins explains a portion of the contraction in lending in Spain, in this way, the low interest rates may have also contributed indirectly to the decline in net interest income. However, the fact that firms with alternative sources of financing have made only limited use of them does not seem to indicate the existence of a significant demand ousted by relatively high bank lending interest rates.

In short, the overall net effect of the low interest rates on bank profits seems to have been comparatively smaller than that of the other factors analysed, although the low interest rates have exerted negative pressure on net interest income. That said, if interest rates remain very low for a long period, against a background in which this monetary stimulus does not induce a sufficient recovery in the economy and of the demand for credit, the negative effects on bank income may ultimately predominate over the positive impact.

4 The new regulatory framework

The global financial crisis initiated in 2008 prompted a broad regulatory response which included the strengthening of solvency standards and the introduction of liquidity and resolution requirements. The set of rules known as Basel III represents an international consensus on the reform of banking regulation following the crisis. The first phase of the Basel III reforms, designed between 2010 and 2011, focused on raising the amount and improving the quality of bank capital, the inclusion of macroprudential instruments and developing liquidity standards and counterparty exposure limits.³² Basel III also introduced new short-term (30 days) and medium-term (1 year) liquidity requirements based on the liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR). These measures set a required minimum volume of liquid assets (such as, for example, sovereign debt securities) with respect to the funding requirements calculated under stressed scenarios for the relevant period. In the resolution arena, the relevant European directive (BRRD, Directive 2014/59/EU) and the Single Resolution Mechanism Regulation (SRMR, Regulation EU 806/2014) establish a common framework in the EU which aims to accurately delimit the circumstances in which financially distressed banks are subject to winding-up or resolution processes, defining the responsible authority (the Single Resolution Board) and the characteristics of those processes. In addition, the principal of separation between the supervisory and resolution authorities is established and the financial liability of bank stakeholders is expressly defined, removing the previous uncertainty created by a system of implicit government guarantees.³³

31 Although Spanish banks saw a significant (2.7 pp) fall in the average return on their mortgage loans to households as a result of the predominance of interest rates tied to 12-month EURIBOR, the declines were clearly smaller in loans to non-financial corporations and in consumer credit and other lending to households (1.9 pp and 0.4 pp, respectively).

32 This first round of reforms was incorporated in Spanish legislation through Law 10/2014, Royal Decree-Law 84/2015 and Banco de España circular 2/2016.

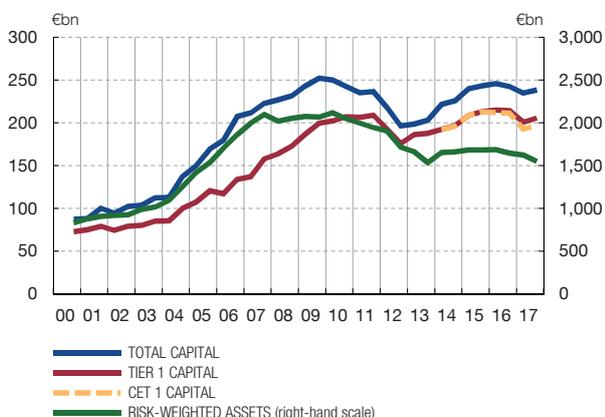
33 This European legislation was transposed into Spanish law in 2015 by means of Law 11/2015 and Royal Decree 1012/2015, although the Spanish regulatory response to the crisis already contained significant changes in this area prior to approval of the BRRD and the SRMR, including the creation of the *Fondo de Reestructuración Ordenada Bancaria* (Spanish Resolution Authority) and the reform of the deposit guarantee fund, among other measures.

SIGNIFICANT STRENGTHENING OF SOLVENCY AND LIQUIDITY MEASURES AT SPANISH CREDIT INSTITUTIONS

CHART 2.10

Spanish credit institutions have substantially strengthened their solvency since the onset of the crisis. At end-2017 the highest-quality capital and short-term liquid assets ratios were materially above the minimum regulatory requirements in both cases, but below the European average in the first case.

1 FALL IN RISK-WEIGHTED ASSETS AND INCREASE IN CAPITAL SINCE THE ONSET OF THE CRISIS



2 INCREASE IN REGULATORY CAPITAL RATIOS



3 FULLY-LOADED CET 1 CAPITAL RATIO (a)



4 SHORT-TERM LIQUIDITY RATIO (LCR)



SOURCES: EBA and Banco de España.

- a Applying the final Basel III rules, in force from 2019.
- b Latest available data for EU average.



Practically all the requirements of the first phase of Basel III will become effective at the end of 2019. In 2018 the capital buffers additional to the basic Pillar 1 requirement stand at 75% of their final value, while the deductions from own funds subject to a phase-in schedule will be applied in full. The LCR requirement was 80% in 2017 and is 90% in 2018, and the NSFR requirement has entered into force this year with a minimum level of 100%.³⁴

In Spain, these measures are bringing about a significant increase in the solvency indicators of Spanish credit institutions. Chart 2.10 shows that in the expansionary period prior to the crisis (2000-2007) capital and risk-weighted assets (RWAs) increased

³⁴ A study by the European Banking Authority (EBA), for a sample of 144 EU banks, shows that, at December 2016, the average NSFR was 112%. 88% of the banks considered met the minimum of 100% and, for those that did not do so, the shortfall was €116 million, equal to 4.6% of their assets (see *CRD IV – CRR/Basel III monitoring exercise results based on data as of 31 December 2016*), 12 September 2017.

sustainedly and that the total capital and Tier 1 capital ratios held steady. After 2007, in line with the higher regulatory requirements, capital increased more rapidly than RWAs, which were steady or decreasing, giving rise to an increase in regulatory solvency ratios.³⁵ The available evidence indicates that the benefits of raising capital ratios with respect to the pre-crisis requirements, in terms of lower risk and volatility of the financial sector, clearly exceed the costs derived from lower availability of credit.³⁶ Regarding other European countries (see Chart 2.10.3), the Tier 1 capital ratio³⁷ of Spanish significant institutions at September 2017 stood at 11.3%, clearly above the regulatory minimum but below the average of 14.3% of significant institutions monitored by the European Banking Authority.³⁸ There is of course heterogeneity in the level of solvency of the sample of Spanish banks, but individually they all have capital in excess of the regulatory minimum. It should also be noted that in terms of the simple leverage ratio, which is not affected by possible limitations on RWA measurement, the average shown by Spanish banks in September 2017 (5.6%) was above the European average of 5.2%. In terms of liquidity, Spanish banks had an LCR ratio of approximately 150%, also clearly above the regulatory requirement and in line with the European average (see Chart 2.10.4). The fact that the average capital of Spanish banks is lower than the average of their European peers may imply less favourable funding conditions, which provide an incentive to continue strengthening their capital ratios.

In December 2017 the finalisation of a second phase of post-crisis reforms within the framework of Basel III was agreed.³⁹ This second phase focuses on developing the regulatory framework for the calculation of RWAs, since the excessive variability between banks for similar risks led some market agents to question the reliability of their calculation in some cases. The reforms envisaged include: improvement of credit and operational risk calculation methods under the standardised approach, constraints on the use of internal models and the introduction of a leverage ratio based on unweighted total assets to supplement the risk-weighted capital ratio, the current levels of which have been described in the preceding paragraph. These reforms will be implemented stepwise in two phases which will commence in 2019 and 2022 and will end in 2027.

In the resolution arena, the approval of the Bank Recovery and Resolution Directive (BRRD) likewise did not mark the end of the process of reform, since various areas of discussion remain open on how to implement major aspects of this framework. The European Commission published a package of proposed legislative changes to the BRRD and the Single Resolution Mechanism Regulation (SRMR). Some of these reforms have already been approved through Directive 2017/2399 amending the BRRD and creating a new category of non-preferred senior (ordinary) debt instruments. This new category ranks behind ordinary debt in the order of seniority of claims in insolvency proceedings, so it facilitates compliance with the minimum requirement for own funds and eligible liabilities (MREL) for loss absorbency purposes. However, many other proposals remain under discussion, particularly the inclusion in European legislation of international resolution agreements on total loss-absorbing capability (TLAC). The requirements of the TLAC agreements for global systemically important institutions are interrelated with the requirements set out in European MREL rules, creating a regulatory challenge in the

35 In 2012, Royal Decree-Laws 2/2012 and 8/2012 tightened the provisioning rules for real estate exposures; they had a significant negative impact on the profits and capital of the Spanish banking system.

36 See P. Aguilar, S. Fahr, E. Gerba, and S. Hurtado (2018), *Quest for robust optimal macroprudential policy*, forthcoming.

37 Fully loaded CET1 ratio, i.e. applying the Basel III rules in force from 2019.

38 EBA data, which consider a representative European level sample, although the level of coverage differs across countries.

39 The text of the post-crisis reforms approved can be found at *Basel III: Finalising post-crisis reforms*.

immediate future. The negotiations on these texts are expected to be completed by the end of 2018, thereby reducing from that date the uncertainty currently faced by banks over future legislative developments and the consequent funding needs.⁴⁰

European and, in particular, Spanish banks also face, from 2018, new accounting requirements derived from the international agreement on International Financial Reporting Standards (IFRS-9). Banco de España Circular 4/2017, which came into force in January 2018, adapted IFRS-9 to Spanish legislation and introduced as the main new feature a change of criterion (from incurred loss to expected loss) in the calculation of provisions, which entails earlier recognition of financial impairment losses. The circular deals with other accounting requirements, such as the classification of financial assets under IFRS-9 and the requirements for the use of internal models in the calculation of provisions. Last year the EBA completed its second impact assessment of IFRS-9 through a survey of 54 large European banks in which these estimated the effect of the new rules on capital and provisions.⁴¹ The survey results reported by the EBA were an estimated increase of 13% in credit loss provisions as a result of application of the new methodology and a decrease of 45 bp in the CET1 ratio. Despite being a useful reference, this survey does not dispel the uncertainty associated with the new Standard, since the sample of banks, albeit representative, is not complete, and it is based on estimates by the survey respondents.

All in all, the regulatory changes introduced and those yet to be defined constitute a significant alteration of the framework in which credit institutions operate, to which they still have to complete their adaptation. From an aggregate standpoint, the possible negative impact on bank profitability of some of the new rules recently approved or in the process of adoption (due to the disappearance or reduction of previous implicit government guarantees or to the obligation to make increased use of more expensive funding instruments, such as capital and hybrids) should be offset by the greater stability of banking systems. For individual banks, the new environment requires an adaptation in which the possible loss of profitability is offset by gains in efficiency and/or business structure redefinition. Although a good part of the regulatory changes have already taken place, the interaction between the implementation schedules of the reforms still pending and the market funding conditions will determine the remaining costs of transition.

5 The new competition framework

In addition to the challenges described earlier, credit institutions face other challenges deriving from the current business environment. These include most notably new technological developments and the possible acceleration of the financial disintermediation process.

5.1 TECHNOLOGICAL DEVELOPMENTS

New technological resources bring important challenges and opportunities for banking institutions. Over the course of time the financial sector has been subject to multiple technological changes that have modified the way it operates. However, what distinguishes these transformations – which relate to the internet, to the increase in computational capacity for big data processing and to the greater automation of processes – is how rapidly they are implemented and disseminated. Such a combination has led to a reduction in barriers to entry in certain traditional banking activities, creating the possibility

⁴⁰ Preliminary estimates of the EBA for a significant sample of EU banks showed an increase in the ratio of MREL eligible liabilities to RWAs from 35.9% in 2015 to 37.8% 2016 (see [EBA updates its quantitative analysis on MREL](#)).

⁴¹ [EBA report on results from the second EBA impact assessment of IFRS 9](#), 13 July 2017.

for new competitors to arise which, at any given time, are able to access bank customers in a highly dynamic manner for a relatively modest additional investment outlay.

This means that banks need to increase their investment in innovation, which entails a rise in costs in the short term, in order to anticipate possible changes in their business environment. The arrival of new technologies in financial services may lead to an essential change in the way that banks operate and deal with customers, which should be designed and implemented rapidly to avoid losing market share. This challenge is even more complex considering the present environment of low profitability and uncertainty about the viability of the different projects.

The growing demand for immediate access from different places and channels to a broad range of financial services calls for changes to the structure and business model of traditional banking, which in turn require improvements in efficiency. These improvements affect the branch network and the development of applications for mobile devices and for the internet, which allow general administrative expenses to be reduced. In this connection, some of the developments made in the latest wave of digital technological innovation, commonly known in the financial sphere as fintech, can easily be converted into operational tools for banking.⁴²

Additionally, the technological revolution opens the door to new competitors in various business areas, often operating in very specific market segments, by allowing the disaggregation of the value chain. One of the areas with the highest degree of penetration by new competitors is payments, particularly retail payments, involving large technological firms and a high data processing capacity. In this connection, several joint ventures or other kinds of alliances with traditional banks have been undertaken to harness synergies but, in any event, increased competition in this segment of traditional banking business is causing a decline in income from transactional services. The entry into force in 2018 of the new European directive on EU-wide payment services (known as PSD-2), coinciding with the implementation of the new directive on data protection (the General Data Protection Regulation), is an important challenge in this connection, as it introduces new providers that are able to access bank customers without actually being banks or being subject to bank regulations.

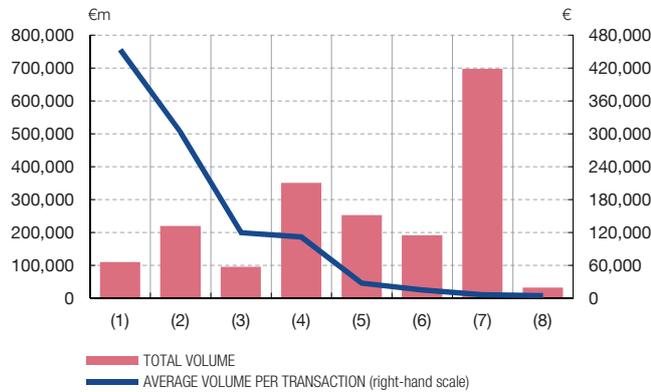
The future outlook for other areas characterised by a greater financial rather than technological component is more uncertain, and its permanent effects on, for instance, the traditional provision of credit through banks are still unknown. The application of artificial intelligence and the systematic use of large databases with real-time information and a high degree of disaggregation (commonly known as big data) in these areas or in that of regulatory compliance will necessarily entail efficiency gains, which can be developed at the banks themselves. However, the room for the emergence and growth of new competitors may also be high.

The development of this new financial ecosystem has positive and negative implications, in the form of higher risk, not only for the banking system. Notable among the advantages is that some innovations can generate greater financial inclusion by reducing intermediation costs, providing additional SME access to funding (particularly in the case of new businesses), and delivering efficiency gains in the financial sector as a

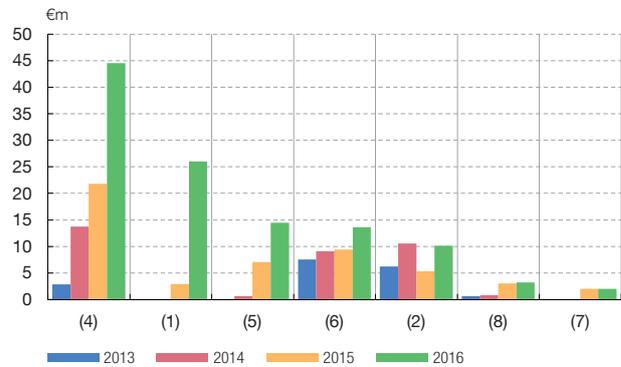
⁴² These include, for example, the application of high-speed analyses of big data to better define customer risk profiles, cloud storage, mobile payment services and the new remote identity proofing methods.

There is a predominance of P2P consumer lending, which also features the highest proportion of cross-border activity, although the highest average value per transaction is found in real estate crowdfunding. Although immaterial in terms of amount, alternative finance in Spain enjoys sustained growth, especially in lending to enterprises, where more than one-third of inquiries received by the CNMV are concentrated.

1 TRANSACTIONS BY ALTERNATIVE FINANCE MODEL IN THE EUROPEAN UNION IN 2016 (a)



2 ALTERNATIVE FINANCE BY MODEL IN SPAIN 2013-2016 (a)



SOURCE: Cambridge Centre for Alternative Finance (2018) and CNMV.

a The categories in the chart relate to: (1) real estate crowdfunding, (2) equity-based crowdfunding, (3) P2P property lending, (4) P2P business lending, (5) invoice trading, (6) reward-based crowdfunding, (7) P2P consumer lending and (8) donation-based crowdfunding.



whole. As regards costs, more competition in the banking sector could erode profitability from banks' traditional sources of income, incentivising greater risk-taking. Also, adapting to these technologies might involve greater reputational and operational risks, with aspects such as cybersecurity gaining in importance and becoming one of the principal challenges for institutions. The higher risk of non-compliance in the areas of data protection or prevention of money laundering and terrorist financing, regulatory arbitrage, the increased interdependence between multiple actors within the financial sector and the potential disintermediation of some of them are other potential cost-generating areas.

At end-2017 this sector in Spain employed more than 5,000 persons in more than 300 firms (238 fintech and 63 insurtech companies).⁴³ In the case of alternative finance platforms, according to private consultant surveys, the highest volume of funds is channelled in Spain through loans between individuals for business projects, while on average in the EU it is the loans between individuals to finance consumption which have the highest volume of activity (see Chart 2.11). The weight of cross-border transactions can represent almost 50% of the total volume of activity in some models. In order to promote initiatives in this field, the CNMV created in mid-2017 a fintech portal to address consultations,⁴⁴ which channelled 130 requests for assistance up to December. The creation in early 2018 of the Associate Directorate General Financial Innovation and Market Infrastructures reflects the importance assigned by the Banco de España to these developments.

The relatively scant penetration of digital banking in Spain may be one of the determining factors behind the efficiency gains which can be associated with these technological changes. A recent report considers that the relatively high mobile

43 Data from the Spanish Fintech and Insurtech Association. These terms refer to high-tech companies operating in the financial and insurance businesses, respectively.

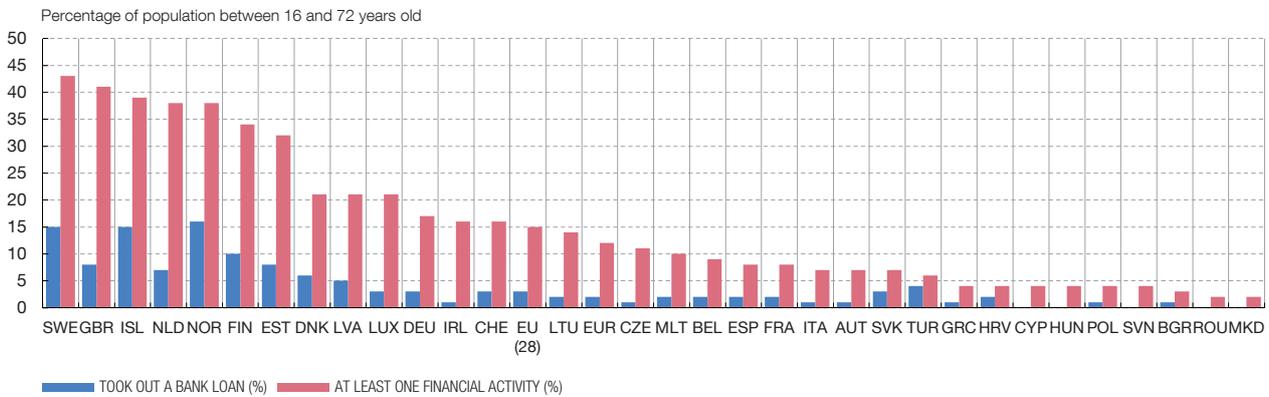
44 <http://www.cnmv.es/portal/Fintech/Innovacion.aspx?lang=en>.

SUSTAINED GROWTH IN THE USE OF THE INTERNET FOR FINANCIAL TRANSACTIONS IN THE EU AND IN SPAIN

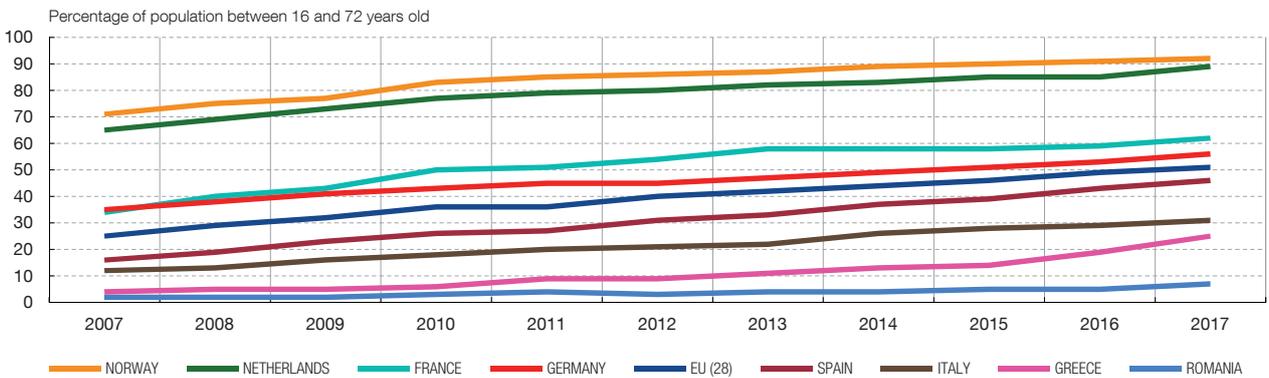
CHART 2.12

In ten years the percentage of people using the internet to communicate with banks has doubled to 50%, although in Spain this percentage is lower than 15% in the case of persons who have made one financial transaction and stands at 2% in the case of persons taking out a loan.

1 POPULATION USING THE INTERNET TO CARRY OUT FINANCIAL TRANSACTIONS IN 2017



2 POPULATION USING THE INTERNET TO INTERACT WITH BANKS



SOURCE: Eurostat.



phone penetration in Spain and, especially, the small number of customers per branch, below that for all the countries analysed, means that there is much potential for improving efficiency through these channels in Spanish banking.⁴⁵ The importance of physical vs digital distribution channels is, in the ECB's opinion,⁴⁶ one of the differentiating factors between countries in terms of efficiency gains deriving from the technological revolution. According to Eurostat data (see Chart 2.12.2), Spain ranks fourth in Europe by number of financial transactions in cash, with a penetration of digital banking in 2017 of 46%,⁴⁷ below the percentage for the EU-28 (51%) and very far from that for the more digitalised countries, such as Iceland (93%), Norway (92%) and Denmark (90%). On 2017 data, the percentage of individuals who requested a bank loan, purchased shares or bonds, or took out or rolled over insurance policies via the internet in Spain was very low (see Chart 2.12.1). However, only 14% of the population had never used the internet in 2017,

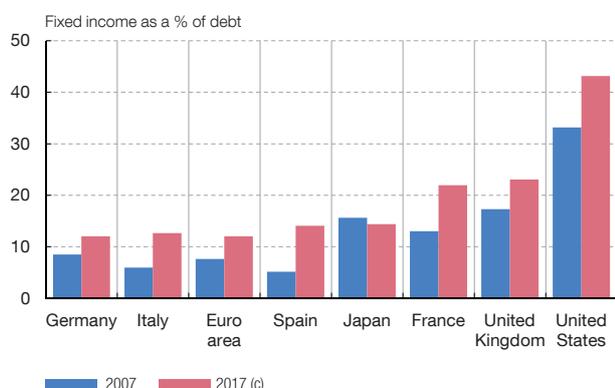
⁴⁵ See Morgan Stanley Research, *Global banks and diversified financials. Banking at the speed of light*, 7 January 2018.

⁴⁶ See European Central Bank, *Financial Stability Review*, May 2017.

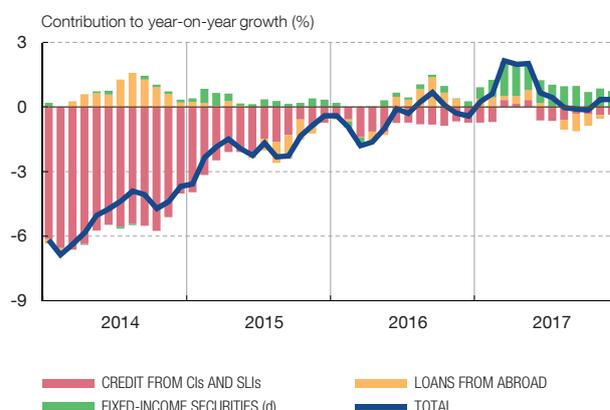
⁴⁷ Approximated by the percentage of individuals between age 16 and 74 who in the last three months before the survey used the internet to interact with a bank, including making payments or consulting bank account movements or balances.

Spain has traditionally been a heavily banked economy, but the increase in non-bank lending to non-financial corporations in recent years poses a challenge for banks.

1 THE PREDOMINANCE OF BANK CREDIT IN THE FINANCING OF NON-FINANCIAL CORPORATIONS IN SPAIN IS DECLINING (a) (b)



2 IN 2017 FINANCING TO NON-FINANCIAL CORPORATIONS INCREASED, BUT BANK CREDIT DECREASED



SOURCES: ECB, BIS and Banco de España.

- a Spanish fixed-income securities include issues by resident and non-resident subsidiaries at market price, which are deducted from the loans obtained by the sector. Issues by German non-resident subsidiaries are also high, but the figure cannot be adjusted owing to the lack of information.
- b Debt includes fixed-income securities and total loans.
- c Data as at June 2017 for Japan and the United States and as at September 2017 for the rest.
- d Includes issues made by resident subsidiaries.



compared with 43% ten years earlier. Although a lower predisposition to the use of digital channels has been observed to date in Spain as compared with other European countries, their implementation has grown rapidly and, accordingly, the use of online banking is expected to increase.

5.2 BANKING
DISINTERMEDIATION

The funding structure of Spanish firms, including most large corporations, has been traditionally marked by the predominance of bank credit. Thus, Chart 2.13.1 shows that in 2007 loans accounted for 95% of Spanish non-financial corporations' total debt (including fixed-income securities). From the institutions' viewpoint, such loans represented 51% of credit to the private sector in Spain and 32% of non-consolidated total assets.

A banking disintermediation process was initiated during the crisis, which certain recent developments might contribute to accentuate, thus reducing the weight of banks in the funding of economic agents. In this connection, the possible entry of new competitors with innovative technologies would be particularly significant, as explained in Section 5.1 above. Stricter bank regulations and the development of new infrastructures, such as the alternative fixed-income market (MARF, by its Spanish abbreviation), the definition of simple and transparent securitisations and other measures which may arise from the European project to create a capital markets union, will foreseeably exert influence in the same direction. It is perceived that a more diversified funding structure at aggregate level is more stable in the face of possible shocks and, therefore, the regulatory trend will continue in the direction of eliminating any potential constraints on financing sources alternative to the banking sector. Also, a potential increase in long-term savings, in response to, among other factors, the ageing of our society, will also probably contribute

in this sense, although to date savings of this kind in Spain have also been largely intermediated by the banks themselves.⁴⁸

In more conjunctural terms, recently there has been a relative increase in the cost of bank funding as compared with that obtained from the markets. The limited pass-through of the decrease in market interest rates to bank credit interest rates mentioned previously and certain effects of the Eurosystem's asset purchase programme have contributed to this. Specifically, the evidence available shows that the announcement of the corporate sector purchase programme in March 2016 led to an increase in the propensity to issue eligible bonds in Spain and a decrease in issuing firms' demand for bank credit.⁴⁹ The positive aspect is that a high proportion of funds released was converted into loans to other firms, generally smaller and non-bond issuing, and, therefore, the net impact on banks was clearly lower. Additionally, other unconventional measures of the Eurosystem, such as injecting liquidity at long-term and at potentially negative interest rates could have favoured a larger volume of bank credit.

The path followed in previous years towards a certain loss of weight of bank funding continued in 2017. The past year was the first since 2010 in which the outstanding balance of funding of non-financial corporations in Spain increased, albeit very slightly (see Chart 2.13.2). However, this increase arose mainly from sources other than banking sources, since credit from Spanish institutions contracted once again for the ninth year running (by 0.6%), while the outstanding balance of fixed-income securities increased (by 7.6%).

The continuation of this trend poses an additional challenge for credit institutions as it entails a further decline in their volume of business and income. This is particularly relevant in the current setting of a modest increase in the overall demand for financing in Spain – which, as has been seen, explains in some measure the current low profitability of the Spanish banking sector – and could contribute to eroding the unit margins which to date permitted sustaining in part the profitability of institutions.

48 In connection with the structure of households' asset portfolios in Spain, see I. Fuentes and M. Mulino (2017), "Evolución de los flujos y los balances financieros de los hogares y de las empresas no financieras en 2016", *Boletín Económico*, 2/2017, Banco de España; I. Fuentes (2016), "Evolución reciente de los planes y fondos de pensiones en España", *Boletín Económico*, December, Banco de España; and V. García-Vaquero and F. Alonso (2015), "Desarrollos recientes de la industria de la inversión colectiva en España", *Boletín Económico*, December, Banco de España.

49 See O. Arce, R. Gimeno and S. Mayordomo (2017), *Making room for the needy: the credit-reallocation effects of the ECB's corporate QE*, Working Paper No. 1743, Banco de España.

This box analyses the change in recent years in the cost of equity (COE) for the banking systems of Spain, Germany, France and Italy compared with the COE for the United States. The COE is the return required by investors for acquiring shares in a firm, in this case in particular in a bank. Long term, return on equity (ROE) should be consistent with the cost of equity,¹ making the COE an important benchmark for measuring bank profitability. The cost of equity is not a directly observable variable, so it must be estimated. There are various possible methods that may be used, but the usual method is the Capital Asset Pricing Model (CAPM) which calculates the COE as the sum of a bank-specific risk premium

and the risk-free rate of return. The risk premium, in turn, is obtained by multiplying the correlation between the bank's share value and a market index (in other words, the bank's beta) by the overall market risk premium; the higher the beta, the higher the return required of the bank.

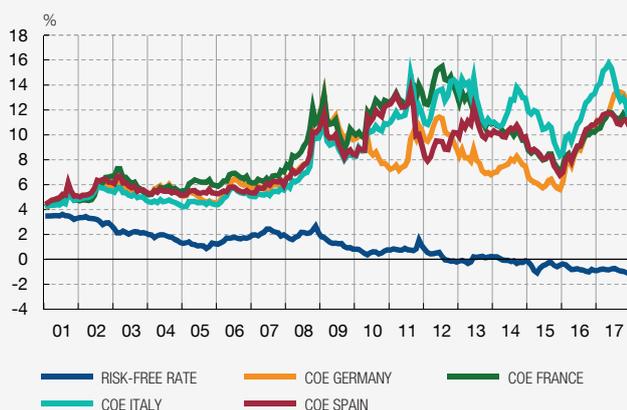
The methodology used in this box to calculate the cost of equity divides into two stages.² First, the aggregate risk premium of euro area listed financial and non-financial corporations is calculated as the difference between the real discount rate implicit in the share

1 This does not necessarily mean that if ROE is lower than the COE banks cannot raise new own funds on the market, but they should do so at a lower price, equating expected future profitability to the cost of equity.

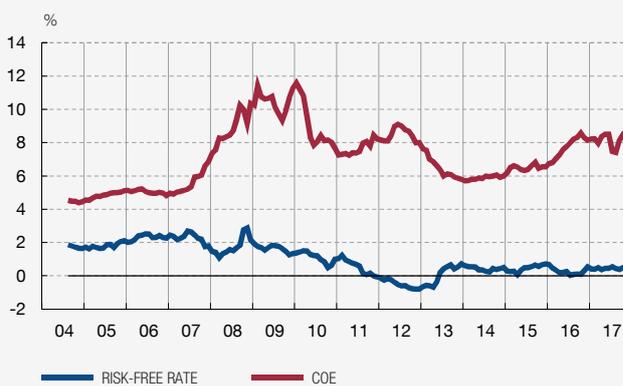
2 This methodology is similar to that used by the ECB. See, for example, Box 5 of the ECB's *May 2015 Financial Stability Review* and Box 1 of the ECB's *Economic Bulletin 1/2016*. It was also used by the Banco de España in Box 2.2 of its *May 2016 Financial Stability Report*.

Chart 1
COST OF EQUITY (COE) OF EUROPEAN AND US BANKS (a)

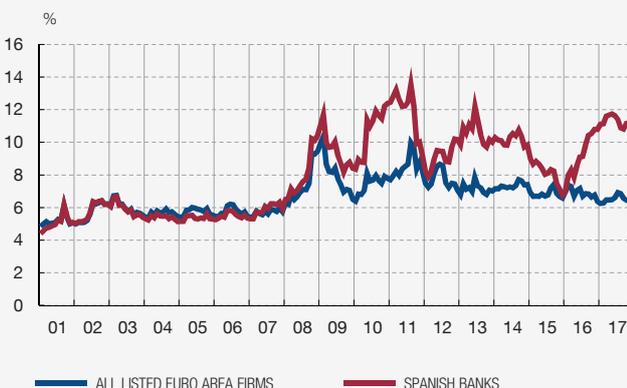
1 ESTIMATED COE OF BANKS IN MAIN EURO AREA COUNTRIES



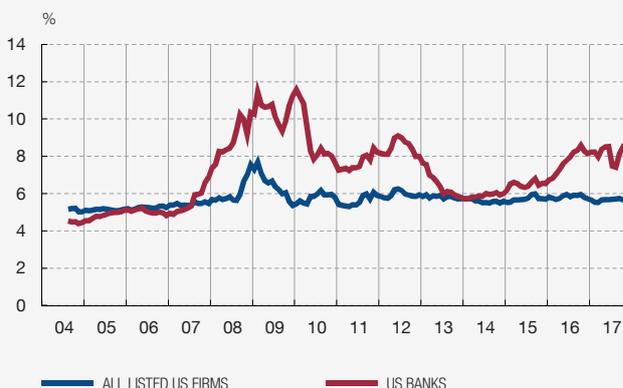
2 ESTIMATED COE OF BANKS IN THE UNITED STATES



3 COE OF SPANISH BANKS COMPARED WITH EURO AREA FIRMS OVERALL



4 COE OF US BANKS COMPARED WITH US FIRMS OVERALL



SOURCES: Datastream, Consensus Economics, Federal Reserve Economic Data and Banco de España.

a Estimates based on profit forecasts and stock prices of EURO STOXX and S&P 500 firms. Risk-free interest rates obtained from returns on French government and US Treasury inflation-indexed bonds.

price and the real risk-free interest rate.³ The discount rate is obtained by equating the present value of the expected future profits of EURO STOXX firms to their market price.⁴ The banking sector premium for each country is then obtained by multiplying the market risk premium by the beta corresponding to the EURO STOXX Banks index of each country.⁵ The cost of equity is the result of adding this banking sector premium for each country to the real risk-free rate of return. It is, therefore, a measure expressed in real terms. In the case of the United States, an equivalent methodology is used, taking the S&P 500 index and the S&P 500 Banks index, respectively, to calculate the market premia and the banking sector beta.⁶

Following the methodology described, Chart 1.1 depicts the change in the risk-free interest rate and the cost of equity (both

³ Owing to its high liquidity, in the euro area the yield on a French government bond index was used (inflation-indexed bonds with an average duration of nine years).

⁴ Future profits are estimated, by tranches, drawing on analysts' expectations (I/B/E/S) and on expectations of potential economic growth. This proxy is commonly known as the three-stage Gordon model.

⁵ Beta is estimated as the coefficient of the daily market return in a regression in which the endogenous variable is the daily return on the subindex. To take into account possible changes in the value of beta over time, this estimate is made using one-year rolling windows.

⁶ In this case, the risk-free asset is the ten-year US Treasury inflation-indexed bond.

in real terms) for the banking systems of Spain, Germany, Italy and France. As it shows, at end-2017 the cost of equity was over 10% in all four countries, while the risk-free rate of return, which is common to all four, was negative. Pre-crisis, the cost of equity of banks held relatively stable around 6%, while the risk-free interest rate fluctuated between 2% and 4%. Accordingly, the risk premium required of Spanish and other European banks rose significantly during the crisis and continued to rise, albeit with fluctuations, up to end-2017. This high risk premium could be associated with the greater uncertainty that continues to loom over asset values and over the prospects for returns in the new post-crisis framework. In the United States, both the risk premium and the cost of equity also rose, but to a lesser extent (see Chart 1.2). The cost of equity of banks in the United States at end-2017 was some 2 pp lower than that of their European counterparts (8%), possibly reflecting less uncertainty surrounding expected future profits on one and the other side of the Atlantic.

Lastly, Charts 1.3 and 1.4 show how the returns required of credit institutions by investors have responded to changes common to listed financial and non-financial corporations overall and to changes specific to the banking sector. In particular, since early 2016, the cost of equity of banks has risen compared with that of other sectors, both in Europe and in the United States, as it did in the most critical stages of the crisis.

The average profitability of a country's banking sector for a specific period is influenced by the sector's aggregate structure and by macroeconomic and financial conditions. Knowledge of these

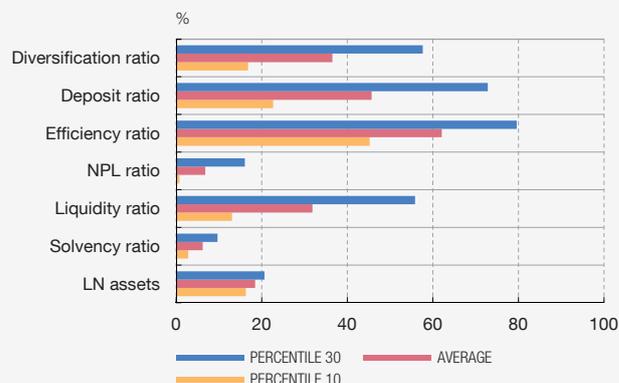
conditions is not sufficient, however, to explain the heterogeneous results obtained by different banking groups in the same country. With the aim of analysing the dispersion of bank profitability, this

Chart 1
DETERMINANTS OF PROFITABILITY IN A SAMPLE OF EUROPEAN BANKS (a)

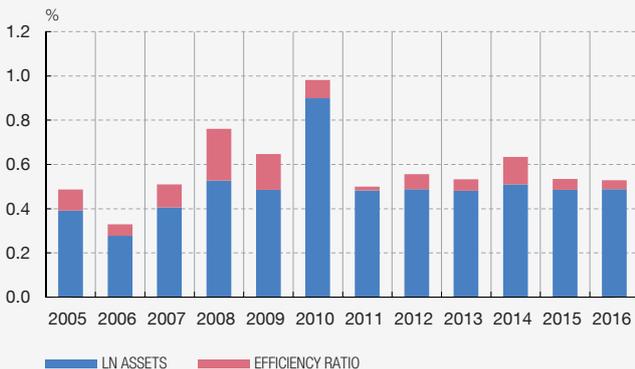
1 HETEROGENEITY IN RETURN ON ASSETS (ROA)



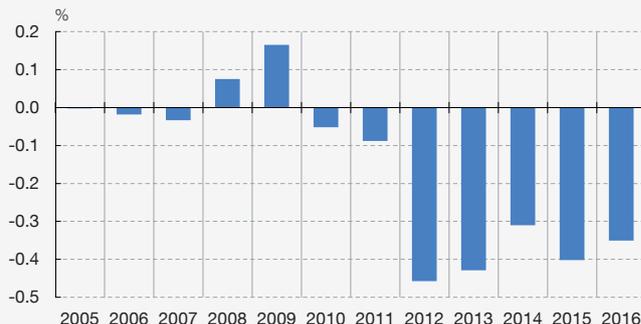
2 HETEROGENEITY IN BALANCE SHEET AND EARNINGS CHARACTERISTICS



3 CONTRIBUTION OF SIZE AND EFFICIENCY TO THE SPAIN-EURO AREA PROFITABILITY DIFFERENTIAL (b)



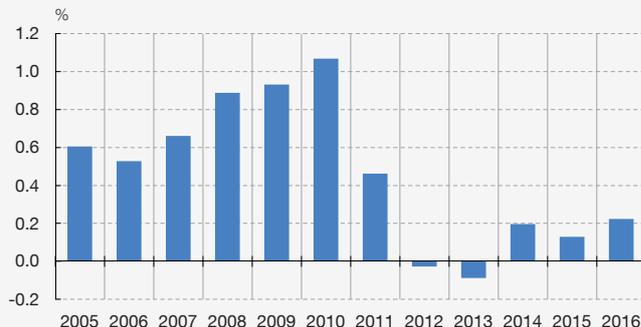
4 CONTRIBUTION OF THE SOLVENCY RATIO TO THE SPAIN-EURO AREA PROFITABILITY DIFFERENTIAL (b)



5 CONTRIBUTION OF THE NPL RATIO TO THE SPAIN-EURO AREA PROFITABILITY DIFFERENTIAL (b)



6 COMBINED EFFECT OF THE SIGNIFICANT CHARACTERISTICS ON THE SPAIN-EURO AREA PROFITABILITY DIFFERENTIAL (b)



SOURCES: SNL Financial, IMF, BIS and Banco de España.

- a Sample of 106 international banks from 23 countries from the euro area, the United Kingdom and Nordic countries for the period 2005-2016. Definition of the variables: diversification ratio (proportion of non-attributable operating profit to net interest income), deposit ratio (proportion of deposits to total assets), efficiency ratio (operating expenses to operating profit), NPL ratio (ratio of non-performing loans to total loans), liquidity ratio (proportion of liquid assets to total assets), solvency ratio (capital per books to total assets ratio) and LN assets (natural logarithm of total assets).
- b Charts 1.3-1.5 show, for the corresponding i variable, the effect of the difference between the average of that variable at Spanish banks ($X_{(i,ESP)}$) and in the euro area as a whole ($X_{(i,Z EUR)}$) on the profitability explained by the regression model, namely, $\beta_i \cdot (X_{(i,ESP)} - X_{(i,Z EUR)})$, where β_i is the coefficient of the model estimated in accordance with specification (2) of Table 1. Chart 1.6 totals for each year the effects of the four variables in Charts 1.3-1.5 in order to obtain the aggregate effect of the significant characteristics.

box looks at the relationship between the return on assets (ROA) and different individual characteristics for a sample of European listed banks focusing on the euro area in the period 2005-2016.¹

Chart 1.1 shows that the ROA ratio declined from the start of the crisis in 2008 for the sample as a whole but that there was a

1 The United Kingdom and the Nordic countries with monetary autonomy are also considered to check the robustness of the results found in the main sample.

substantial degree of heterogeneity across banks which grew as the crisis progressed. While in 2005-2006 the dispersion range (approximated by the difference between percentile 10 and percentile 90) stood at 0.7 pp - 1.1 pp, it grew to 2.9 pp in 2012 and held above 1.5 pp in the last few years of the sample. Chart 1.2 shows that there is also cross-bank heterogeneity in terms of their different individual characteristics (such as size, asset quality and efficiency). The analysis below seeks to determine the relationship between the variation in the two datasets. Specifically, a regression

Table 1
DETERMINANTS OF THE RETURN ON ASSETS (ROA) OF BANKS IN EUROPE (2005-2016) (a)

	(1)	(2)	(3)	(4)	(5)
	Euro area	Euro area	Euro area - restricted sample	Europe	Europe - restricted sample
ROA (first lag)	-0.0313 (0.101)	-0.139 (0.134)	-0.148 (0.137)	-0.128 (0.124)	-0.120 (0.129)
LN assets	2.134*** (0.547)	1.298** (0.630)	1.899*** (0.551)	1.115** (0.567)	1.186** (0.505)
Solvency ratio	0.539*** (0.131)	0.408*** (0.113)	0.488*** (0.114)	0.387*** (0.114)	0.432*** (0.109)
Liquidity ratio	0.00645 (0.0103)	0.0105 (0.0162)	0.0122 (0.0219)	0.00979 (0.0175)	0.0143 (0.0195)
NPL ratio	-0.0388** (0.0194)	-0.0854** (0.0394)	-0.0844** (0.0355)	-0.0812** (0.0343)	-0.0823** (0.0346)
Efficiency ratio	-0.0109*** (0.00277)	-0.0102** (0.00459)	-0.00415 (0.00431)	-0.00967** (0.00476)	-0.00837** (0.00372)
Deposit ratio	0.0366** (0.0152)	0.0247* (0.0143)	0.0308* (0.0178)	0.0233 (0.0163)	0.0268 (0.0172)
Diversification ratio	-0.00601 (0.00371)	-0.00412 (0.00435)	0.00776 (0.00494)	-0.00286 (0.00455)	0.00394 (0.00520)
Estimation	AB - dependent variable instrumented	AB - all endogenous variables	AB - all endogenous variables	AB - all endogenous variables	AB - all endogenous variables
Control of macroeconomic situation	Yes	Yes	Yes	Yes	Yes
Lags used as instruments	2-4	3-4	2-4	3-4	2-4
P-value AB statistic - autocorr. (2)	0.2286	0.0472	0.1104	0.0486	0.103
P-value AB statistic - autocorr. (3)	0.5324	0.6408	0.4479	0.3682	0.8198
P-value AB statistic - autocorr. (4)	0.2186	0.4092	0.2867	0.3564	0.3461
Observations	582	582	468	661	518
Number of banks	83	83	67	92	72
Period	2005-2016	2005-2016	2005-2016	2005-2016	2005-2016

SOURCES: SNL Financial and Banco de España.

a Estimated using the Arellano-Bond method. The asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level. Columns (1) and (2) present the results for banks in the 17 countries of the euro area; in (3) the sample is restricted to Spain, France, the Netherlands, Italy, Germany, Portugal, Ireland and Greece; in (4) the observations of Sweden, Denmark, Norway and the United Kingdom are added to the sample in (1); in (5) the observations of the United Kingdom are added to the restricted sample in (3). The variables are defined in the notes to Chart 1 of this box. We use the Arellano-Bond method (1991) with between 2 and 4 lags of non-exogenous variables as instruments: (i) AB - dependent variable instrumented (only the first lag of the dependent variable is instrumented); (ii) AB - all the endogenous variables (all the explanatory variables at bank level are instrumented). Control of macroeconomic situation indicates whether the common time effect of macroeconomic variables is controlled. We present the p-values of the Arellano-Bond autocorrelation tests (1991) of the second to fourth-order autocorrelation.

is performed using the panel data methodology² where ROA is explained based on banks' individual characteristics, controlling for unobserved fixed effects of the banks, the effect of lagged ROA and aggregate conditions.³ Table 1 presents the results of the different specifications estimated.

First, a sample of euro area banks is studied using a model which only treats lagged ROA as an endogenous variable. The analysis shows that, during the period analysed, the largest banks, those with a lower NPL ratio, higher solvency, greater efficiency and a more significant weight of deposit-based funding, were the most profitable. In columns (2) to (5) all the explanatory variables at bank level are considered potentially endogenous in order to test the robustness of the result above. The qualitative findings of column (1) are maintained in column (2). Restricting the sample to the larger euro area countries – column (3) – does not alter the findings on the effect of size, solvency and asset quality, but the efficiency ratio does lose explanatory power. The sample is extended in columns (4) and (5) to include the United Kingdom and the other Nordic countries and the findings are robust once again, especially for the solvency ratio.

Charts 1.3-1.6 display the impact on the ROA ratio of the differences of Spanish banks with regard to the European

average in the most significant variables of the estimation. For example, on average Spanish banks have maintained higher assets than other European banks during the period 2005-2016, and since this is a characteristic which is associated positively with profitability, the model implies a positive average contribution to ROA of 0.4 pp. The efficiency ratio is associated with higher profitability throughout the period but more clearly in 2005-2009. Conversely, the poorer relative positions of Spanish banks in terms of solvency and NPLs as from 2010 and 2012 are associated with negative contributions of up to -0.4 pp. The aggregate effect of these significant characteristics is positive until 2011 and turned negative again in 2012-2013 due to the contribution of the effect of the solvency ratio, and recovered slightly positive values after 2014.⁴

The positive significant relationship between profitability and asset quality implied by the NPL and solvency ratio coefficients indicate a possible advantage for the European banking sector of making progress in cleaning up its balance sheets. The positive asset size coefficient could also indicate that a greater concentration of European banks would have positive effects on their profitability.

In any event, the findings of this box need to be taken with caution insofar as they are based on the relationship between the variables analysed for a specific period (2005-2016) and they do not necessarily take into account the most recent changes in the structure of the sector and those which may arise in future.

2 The Arellano-Bond method is used. See M. Arellano and S. Bond (1991), "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations", *Review of Economic Studies*, no. 58, pp. 277-297.

3 The estimates include the following as control variables: GDP growth (World Economic Outlook, IMF) and credit (BIS statistics), interest rate levels (EURIBOR) and concentration measured by the Herfindahl-Hirschman index (ECB statistics for the euro area).

4 Note the caveat that the business models associated with higher profitability in the European sample analysed would not necessarily maintain their contribution to profitability in other periods and geographical areas.

To analyse the drivers of the change in private sector debt and to simulate its possible future trajectory, several error correction mechanism models¹ have been estimated to characterise the performance of the real debt balance of households, on the one hand, and of corporates, on the other. In particular, in the case of households, the following explanatory variables have been included: real gross disposable income, the ex ante real cost of financing (calculated by subtracting a measure of long-term

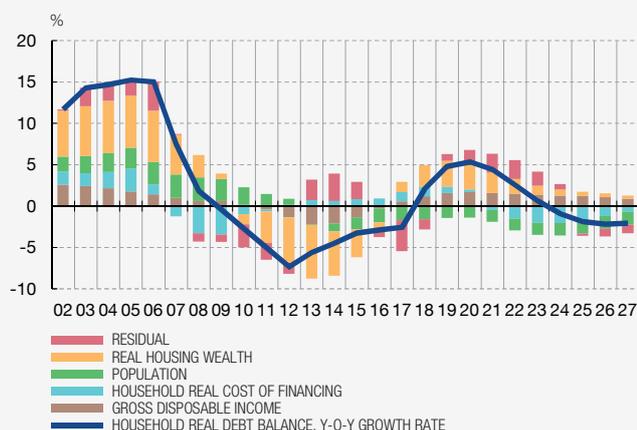
inflation expectations from nominal bank lending rates), housing wealth in real terms and, lastly, the population in the 30 to 54 age group (which is the population group holding the largest proportion of debt).² For corporates, the balance of total financing is modelled as a function of private productive investment, residential investment, house prices (all variables in real terms) and an ex ante real synthetic cost of financing (proxied by subtracting a measure of long-term inflation expectations from the nominal cost).

1 The models were estimated with data up to 2017 Q4, from 1987 Q2 for households and from 1990 for corporates.

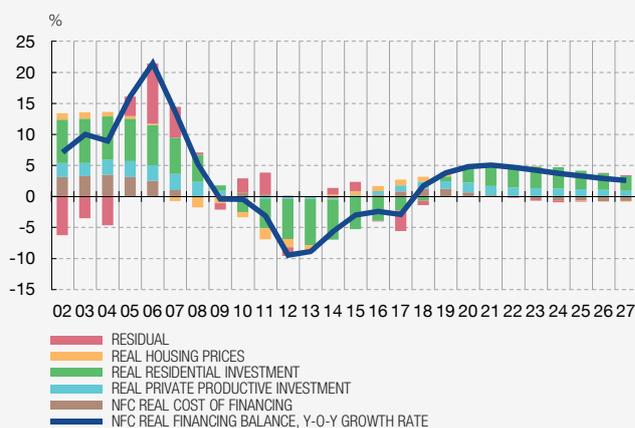
2 According to the latest edition of the EFF (2014), 79.7% of total household debt was held by households whose head was in the 30-54 age group.

Chart 1
NON-FINANCIAL PRIVATE SECTOR INDEBTEDNESS

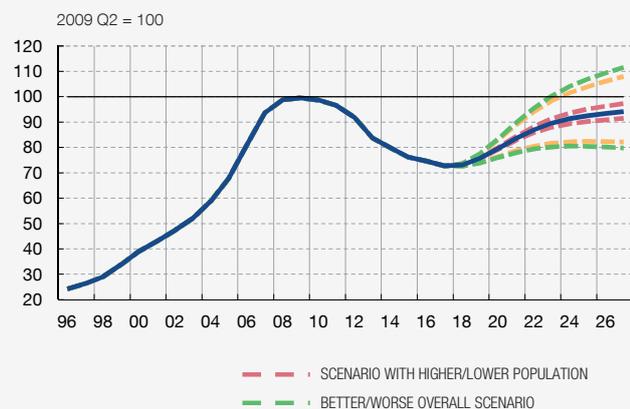
1 CONTRIBUTION TO YEAR-ON-YEAR GROWTH OF REAL HOUSEHOLD DEBT (a)



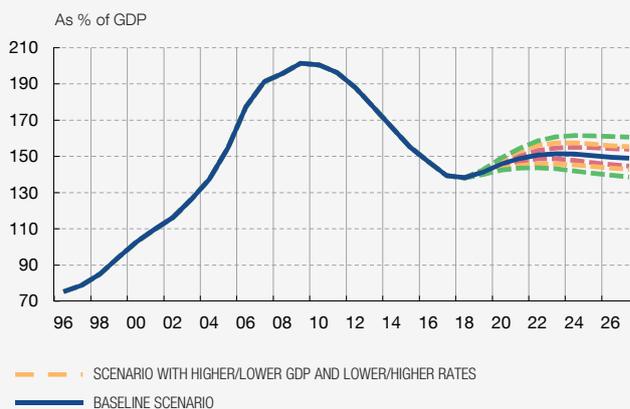
2 CONTRIBUTION TO YEAR-ON-YEAR GROWTH OF REAL NFC DEBT (b)



3 REAL BALANCE OF NON-FINANCIAL PRIVATE SECTOR DEBT (c)



4 DEBT RATIO OF NON-FINANCIAL PRIVATE SECTOR



SOURCE: Banco de España.

- a The nominal balance was deflated using the consumption deflator to calculate real growth.
b The nominal balance was deflated using the GDP deflator to calculate real growth.
c Real balances deflated using the GDP deflator.

Based on these estimates and on various paths of the explanatory variables, a number of simulations of the change in private sector debt up to 2027 have been obtained. Thus, in the baseline scenario, all the developments in explanatory variables, up to 2020, are in line with the forecasts contained in the Banco de España's latest macroeconomic projection exercise. Subsequently, up to 2027, the variables continue to evolve: in the case of the scale variables, in step with the potential growth of the economy; in the case of the cost of financing, in accordance with market expectations for EURIBOR; and in the case of the population variable, in keeping with the latest INE projections. From this baseline scenario another six scenarios have been drawn, presenting a possible reference range within which non-financial private sector debt could evolve in the future. Specifically, the first two scenarios consider that the population in the 30 to 54 age group increases/decreases by 1 pp more than in the baseline scenario; the next two assume that GDP grows at a rate that is 1 pp higher/lower than in the baseline scenario and that rates fall/rise by 100 bp compared with the projection in the baseline scenario; and the last two include both of the extreme scenarios described above.

As Charts 1.1 and 1.2 show, according to the results, all the explanatory variables considered made a positive contribution to the growth of real debt of households and non-financial corporations in the pre-crisis years. Following the onset of the crisis, the rate of growth of private sector debt corrected sharply, as the macroeconomic situation deteriorated, the real estate bubble burst and the real cost of financing rose. Additionally, in the case of households, from the latter part of 2008 the positive contribution of the population variable began to decline. These patterns persisted, in the case of households until late 2012, when debt fell by 7.3% year-on-year, and in the case of corporates until 2013 Q2, when real debt fell by 13.4% year-on-year. Subsequently, the gradual improvement in the macroeconomic scenario, which fuelled income and investment growth, together with the gradual recovery of the property market and, more recently, the favourable financing conditions, boosted by the ECB's expansionary monetary policy, prompted a slowdown in the decline of non-financial private sector debt (down to 2.9% year-on-year for corporates and to 2.6% for households at end-2017).

With all due caution,³ the simulations made for the 2017-27 horizon show that, in the baseline scenario, real household debt would post positive growth rates in coming years, before returning to negative values from 2024, adversely affected in part by population ageing. By contrast, non-financial corporations' debt would start to record positive growth in 2018 and would remain positive throughout the projection horizon, driven mainly by investment growth. Thus, according to these simulations, the level of debt of the non-financial private sector would increase very gradually in coming years, so that by the end of the projection horizon, total debt would amount to slightly more than 90% of the peak level recorded in 2009 Q2 (see Chart 1.3). The alternative scenarios considered point to a band of debt volume ranging from 80% to 112% of that level by end-2027, in the latter case surpassing the 2009 peak, although the assumptions in this scenario are highly optimistic and, therefore, the likelihood of this occurring is limited.

Chart 1.4 shows the developments in the private sector debt ratio in the different scenarios. In the baseline scenario, the ratio climbs slightly in coming years, before falling back again also slightly, to reach 149% of GDP by end-2027, some 10 pp above the end-2017 levels. The bands calculated for the various scenarios show that, in principle, the debt ratio would not head back to the peak levels of 2010, when it exceeded 200% of GDP, not even in the most optimistic scenarios.

Obviously, these results should be taken with due caution, not only in view of the customary uncertainty of estimates based on a specific period in the past, but also because of the need to make long-term projections of economic and population variables that are subject to a high degree of uncertainty.

³ In particular, these projections signal, in the near term, a recovery in credit that seems overoptimistic given the most recent developments. In this respect, the main value of the exercise is to proxy medium and long-term credit trajectories, without attaching importance to the profile of the projections.