BBVA | RESEARCH

Banking Outlook

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Contents

Summary

1. Trends and developments in the Spanish banking sector

In 2016, the system made a profit of €6,086 million, after posting losses of €2,201 million in the fourth quarter due to: 1) the entry into force of Circular 4/2016 of the Bank of Spain which adapts the Spanish accounting to IFRS 9; 2) the ruling on of the interest rate floor; and 3) the increasing in provisions by a domestic entity. The trend of recent quarters continues, with revenue slightly down and costs under control. Credit to households and SMEs rebounded in January despite credit stock continuing its downward trend, which has led, in turn, to a slight rise in the non-performing loan (NPL) ratio although delinquencies continue to fall.

2. Spanish banks' ROE, COE and P/BV ratio

The relationship between ROE and COE is captured by the P/BV ratio. At present, Spanish banks' average P/BV is 0.84, which does not reflect undervaluation but the market's expectation that Spanish banks will have weak profitability that will not cover their COE. Average P/BV has decreased mainly due to ROE, not COE. Although many factors can explain the low P/BV (legacy assets, litigation expenses, low growth, etc.), the main drivers are low interest rates and the impact of regulation. All in all, Spanish banks are in a better position than other European systems in part due to the deep restructuring they have undergone..

3. Evolution of the financial burden of families in Europe

Financial burden is an important indicator of the over-indebtedness of families. Analysing the financial burden of some European countries, we see that, in most cases, it has declined since the beginning of the crisis. Analysing the financial burden breakdown, we can see that countries like Spain and Portugal have tended to deleverage more rapidly, mainly due to reduced interest rates, while other countries such as Italy and France have increased their indebtedness.

4. Management of non-performing assets in Europe

Accumulated non-performing assets on bank balance sheets are an inherited burden of the crisis that really should be managed faster. Currently, there are about one trillion euros in bad loans in Europe, very unevenly distributed across countries. The European authorities are considering various ways to accelerate the management of defaulters, such as creating a single "bad bank" or a European clearing house.

5. Peru: deposits in soles and exchange rate expectations

Deposits in the Peruvian financial system are established in soles and US$. The first mostly sustain the transactional function of the economy and the latter function as store of value. Expectations about the exchange rate play an important role in the transfers from one to another. The impact of exchange rate expectations is proportional to the size of the expected appreciation or depreciation and symmetric in the short, but not long term.

1 Evolution of the Spanish banking sector

The tables and data can be found in the appendices to this document. The majority of the data come from Chapter 4 of the Bank of Spain's Statistical Bulletin. The analysis of the Spanish banking sector is confined to banking business in Spain (important: see the footnote below[1]).

Sector results

- The Spanish banking system incurred losses of €2,201 million in the fourth quarter of 2016 because of the significant increase in provisions caused by three non-recurring circumstances:
    1. The entry into force of Circular 4/2016 of the Bank of Spain, which partially adapts the Spanish accounting system to IFRS 9, whose main impact has been an increase in delinquencies. This forced a rise in provisions to maintain a stable level of coverage of 59%.
    2. The ruling of the Superior Court of Justice of the EU on the interest rate floor clauses that has forced entities to make provisions in their accounts for amounts which they previously had not provided for, which, according to the institutions themselves, amounted to €1.7tn.
    3. The restructuring of a domestic entity whose delinquencies rose sharply in 2016: € 5bn vs. € 3bn in 2015; and which has set aside nearly €6bn, of which €4.6bn were provided in the last quarter (non-recurring €4.4bn, according to the entity).

- The rest of the profit and loss account continues the trend of recent quarters: pressure on income and stable expenses. The gross margin was reduced by 6% in 2016, with falls in all components, especially net interest margin (-8% y-on-y) mainly because of the reduction in volumes and the interest rate environment. Interest rates of new credit operations fell further in 2016 (they rebounded slightly in January 2017), as well as the deposit rates, but in this case since there is virtually no headroom. Operating expenses increased by 0.5% in 2016, thus maintaining the efficiency ratio of 54%, excellent in comparison with international ratios. Net margin was reduced by 13% in the year.

- Finally, the increased provision already mentioned (Euro 15,838 million in the fourth quarter, including provisions for insolvencies, restructurings and foreclosures) made the income before tax fall by 38% and net attributable income fall by 35% to €6,086 million in 2016 (€8,288 million to September, with growth of 16% in the first nine months of the year).

Activity

- The total balance sheet of the system fell by 5.5% y/y in January 2017 (Table 1). Since its peak of December 2012, total assets decreased by €805bn (72% of GDP), which was accompanied by significant cuts in the number of employees and branches (Table 3).

1: Throughout the document, "€ billion" refers to thousands of millions of euros.

- The credit volume maintained its downward trend, while the fixed income and equity portfolios increased their weight during the crisis, despite its decreasing in 2016 and January 2017 (Table 1). Progress in the sovereign debt portfolio, with growth of 121% since 2008, is especially noteworthy although during the 12 months to January 2017 it fell by 14%.

- System deposits (current accounts and savings and term deposits, Table 6) are stable after deducting volatile items, showing no leakage of deposits. An important shift from time deposits to savings and sight deposits has taken place due to the former's low profitability in the current interest rate environment.

- The volume of debt issued by banks (bonds and notes, Table 1) has fallen by 52% since 2008 and fell 12% for the year to January 2017, in line with the contraction of the funding gap (credits minus deposits, Table 9) due the deleveraging of the system. ECB liquidity rebounded in early 2017 after the TLTRO auctions (+ 11% year to February), but remains well below the highs of 2012.

- Shareholders' equity (Table 1) remained stable in 2016, having increased by 26% since 2008 (+€ 52bn).

Spotlight on lending and delinquency

- Table 4 shows that in 2016 the total credit to the private sector (Other Resident Sectors, ORS) was reduced by 4%, a cumulative decline of 32% from 2008 (€608bn, 55% of GDP). All credit portfolios fell for the year, especially real estate and construction loans (-10.3% in 2016). This item only represents 13% of the stock, although it accounts for 37% of non-performing loans.

- The system default rate stood at 9.17% in January 2017, a slight increase from the close of 2016, but about one percentage point below the figure of 2015. NPLs declined by 13.3% y/y. With the exception of November 2016, NPLs have shown a continuous monthly decline since February 2014.

- New credit operations (Table 5) fell by 13.7% in 2016 due to credit for large companies (loans over one million euros), but rebounded strongly in January 2017 compared to the same month of the previous year, particularly mortgage loans. The volume of new credit in 2016 was 35% of the average granted during the three years before the start of the crisis, so these growths are no cause for concern.

Main ratios

- The cost-to-income ratio was 54.5% thanks to cost control and improved system productivity (volume and profit before tax per office). Operating costs as a percentage of Average Total Assets (ATM) have been held below 1% since 2008 (Figure 6, Appendix 1).

- Solvency continues to improve. The volume of capital and reserves reached 8.6% of total assets (Figure 3, Annex 1), and the amount of equity on balance sheet almost doubled the amount of non-performing loans in the system, reaching 197% in January 2017 (figure 2, Annex 1).

- System liquidity, measured as the ratio of ORS credits and ORS deposits, further improved to 109% to January 2017, 49 percentage points (pp.) below the level of 2008 (Figure 3, Annex 1). The sector funding gap (ORS credit less ORS deposits) fell to €105bn (4.0% of total assets), the historical minimum level (Figure 4, Annex 1).

- The system maintains satisfactory levels of provisions. The effort in provisions (provisions/net margin) and the cost of risk (provisions/average total loans), remain at pre-crisis levels despite endowments in the last quarter of 2016 (see Chart 1, Annex 1). Profitability remains positive, although weak, following losses in 2011 and 2012 (Figure 5, Annex 1). Data collected on closing 2016 show the impact of the additional provisions in the quarter, which we mentioned above.

International comparison

Comparing developments in the Spanish banking system with the average of EU banks (Appendix 2), the following are the main conclusions of the analysis of the data from the “Risk Dashboard” of the European Banking Authority (EBA), which show the average of 158 of the main EU banking institutions. The latest data available is from September 2016.

- Spanish banks are less leveraged and are more efficient than their European competitors (Figure 1, Annex 2). To be specific, figures to September 2016 show that Spanish banks hold 39% more equity on balance sheet than the European average (+17% in 2009). Efficiency levels are also 9.3% better than the average for European banks (see Figure 5, Annex 2).

- The write-off efforts made by Spanish banks (Figure 3, Annex 2) were necessary to show the fair value of assets and to approach their European competitors. The coverage of NPLs with specific provisions reached a similar level to the European average in mid-2014, and has remained slightly higher ever since.

- As for negative aspects, the default rate remains higher in Spain (Figure 2, Annex 2). Nonetheless, Spain's NPL rate has been falling since 2013. The system's profitability is slightly lower than the European average (Figure 4, Annex 2), which seems reasonable in a sector that still faces a high delinquency rate and has increased its capital stock more than their European competitors.

2 Spanish banks' ROE, COE and P/BV ratio

Why is the P/BV ratio above or below 1? The concept of residual income

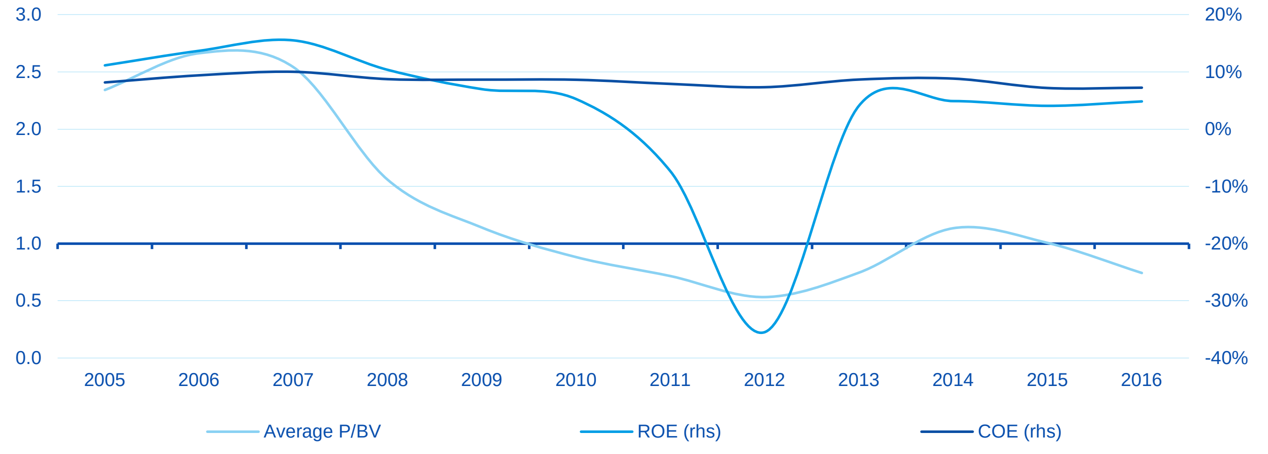
The P/BV ratio is the price multiple that best measures the relationship between ROE and COE. Assuming that the Gordon constant growth model holds, the P/BV ratio for a single stock is the ratio of *(ROE – g)* to *(COE – g)*, where "*g*" is the sustainable growth rate. Accordingly, **the P/BV ratio will be above 1 whenever ROE is higher than COE**. So, what is the market telling us now?

Average P/BV of the Spanish banking system

Using the latest data provided by Bloomberg, we can see that Spanish banks' average P/BV is 0.84. It started its decline towards 1 after BNP announced the suspension of three of its funds when problems in the US subprime mortgage market prevented it from calculating their value (August 2007, considered as the official beginning of the crisis). Since the end of 2009, average P/BV has remained at, or below, 1.

Figure 1

Evolution of Spanish bank's annual average P/BV, ROE and COE[2]



Source: BBVA Research, Bloomberg

Current P/BV level is slightly higher than between February 2010 (the beginning of the Greek debt crisis) and November 2013 (the end of the system's restructuring process and full recognition of losses). During this period P/BV was under 1, showing that the market considered that the valuation of some assets was below fair value, which was expected to result in losses. This is what actually happened in 2011 and 2012.

At present, Spanish banks' P/BV is under 1 on average, which means that they will generate negative residual income. The market expects that further losses will be registered or, more likely, that they will be

[2]: Average P/BV and COE refer to the mean of Spanish listed banks' P/BV and COE (using consolidated data), whereas ROE refers to the whole Spanish banking system's return on equity as reported by the Bank of Spain (business in Spain).

weak, keeping ROE below COE for some time. All in all, the markets believe that Spanish banks' book value reflects, with a sufficient degree of certainty, their actual net worth.

Why is ROE below COE, on average, in Spanish banks?

ROE and COE have a different "nature": **ROE is a flow indicator**. It measures a single year's profitability for shareholders. **COE is a structural indicator**. It reflects the current cost of equity that emerges from the entity's capital structure. As such, **ROE is volatile whereas COE is stable**. In other words, **changes in P/BV primarily reflect changes in ROE (or changes in expected earnings) rather than changes in COE**, which adapts more slowly to changes in its main components. This can be appreciated in Figure 1.

Although many factors can explain the current low level of ROE (legacy assets, low growth, etc.), the main issues are the low interest rate environment and the impact of regulation. On the other hand, given that changes in COE reflect permanent changes in the business environment, it is more stable than ROE. In fact, COE has declined during the financial crisis, although less than ROE because of two main effects: 1) the historical direct relationship between leverage and beta was broken in 2013 (i.e. banks' beta is no longer determined in a significant way by leverage); and 2) so far, the market does not seem to recognise that loss-absorbing liabilities are actually equivalent to equity capital. So long as these factors, together with those that primarily affect ROE, are priced-in, Spanish banks' average P/BV should rise towards one.

International comparison

Taking into account national differences and specificities, everything that has been said about Spanish banks can be applied to other European banking systems. Between 2009 and 2013 almost all European banking systems' average P/BV remained below 1, and according to the latest data, only Swedish, Danish and Dutch banks have an average P/BV above 1, whereas German and Italian banks have presented average P/BV ratios below 1 since 2008. As for Spain, average P/BV is slightly above those of Belgium, the UK and Austria, and higher than France, Portugal, Italy (both with and without BMPS) and Germany due to: 1) Spanish banks' assets and liabilities reflecting their fair values with reasonable credibility after the system's restructuring process; 2) Spanish banks fully complying with the EBA's definitions of NPLs; and 3) Spanish banks' low financial leverage, or "gearing", resulting from their high RWA density.

Table 3

European banks average P/BV, 2008 – Latest

	2008	2009	2010	2011	2012	2013	2014	2015	2016	Latest (23 Jan 17)	Variation 2008-Latest
Spain	**1.56**	**1.14**	**0.88**	**0.72**	**0.53**	**0.75**	**1.13**	**1.01**	**0.74**	**0.84**	**-46.0%**
Germany	0.83	0.64	0.75	0.57	0.44	0.48	0.55	0.51	0.31	0.38	-54.7%
France	1.00	0.73	0.75	0.59	0.40	0.58	0.69	0.68	0.53	0.68	-32.1%
Italy	0.85	0.47	0.37	0.27	0.26	0.33	0.44	0.56	0.22	0.23	-72.9%
Italy excluding BMPS	0.82	0.51	0.47	0.32	0.30	0.37	0.61	0.76	0.41	0.46	-44.6%
UK	1.25	0.77	0.95	0.76	0.63	0.92	1.01	0.95	0.74	0.82	-34.8%
Portugal	1.45	0.90	0.75	0.57	0.49	0.75	1.15	0.79	0.52	0.43	-70.1%
Austria	1.52	0.76	0.88	0.71	0.51	0.63	0.70	0.74	0.68	0.82	-45.6%
Belgium	1.21	1.12	0.90	0.56	0.33	0.58	0.73	0.88	0.73	0.83	-31.3%
Denmark	1.18	0.73	0.98	0.83	0.73	0.92	1.09	1.19	1.07	1.23	4.5%
Netherlands	1.33	0.53	0.65	0.64	0.46	0.58	0.89	1.08	0.93	1.14	-14.5%
Sweden	1.12	0.79	1.14	1.13	1.20	1.59	1.76	1.81	1.56	1.79	60.3%

Source: BBVA Research, Bloomberg

3 Evolution of the financial burden of families in Europe

Financial burden is an important indicator of the over-indebtedness of families. Analysing the financial burden of some European countries, we see that, in most cases, it has declined since the beginning of the crisis. Analysing the financial burden breakdown, we can see that countries like Spain and Portugal have tended to deleverage more rapidly, mainly due to reduced interest rates, while other countries such as Italy and France have raised their indebtedness.

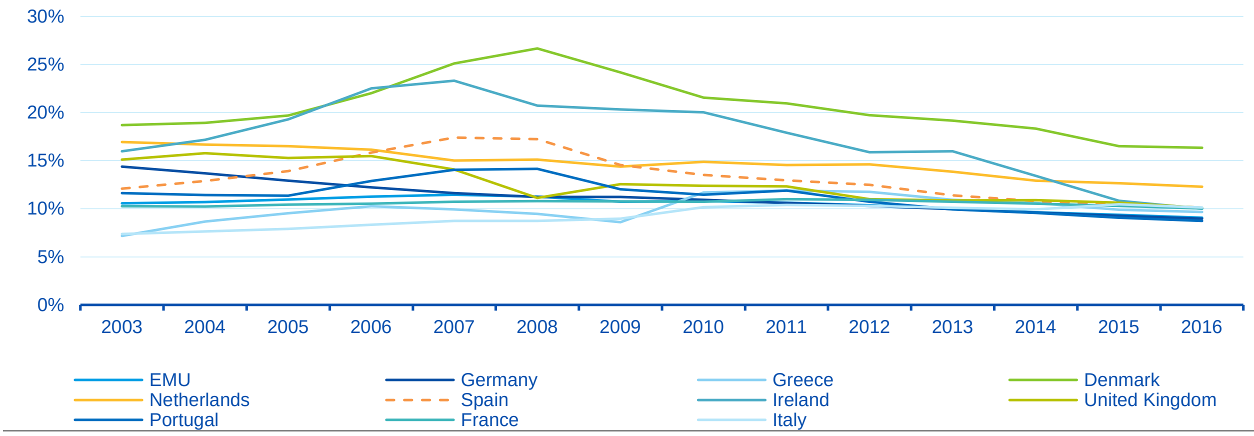
Financial burden of families in Europe (2003-2016)

Between 2003 and 2008 there was an increase in the financial burden in the Euro area driven by increases in both interest rates and the credit stock. This was most evident in countries with a greater weight of variable rate mortgages and a higher proportion of owned housing. Since 2008, most countries' financial burden has shown a tendency to decline, mainly because of lower interest rates (the 12-month Euribor varying from a maximum of 5.4% to its current -0.1%) and the drop in credit due to the economic crisis.

Thus, the dispersion of financial burdens across Europe has moderated due to the reduction of the most indebted countries. Currently, the greatest financial burdens are in Denmark (15.9%), the Netherlands (12.0%), Ireland (10.4%), Italy (10.2%) and Spain (10.1%).

Figure 1

Financial burden of households (annual percentage of bank debt on disposable income,%)



Source: BBVA Research, BCE and central national banks

In particular, how has the significant drop in interest rates affected the finances of European households (2008-2016)?

With this in mind, determinants of the variation in financial income and expenses of the families in Germany, France, Italy, Portugal and Spain have been quantified. We have assessed the impact of the descent of the 12-month Euribor and the system's deleveraging process (which was partly helped by low interest rates).

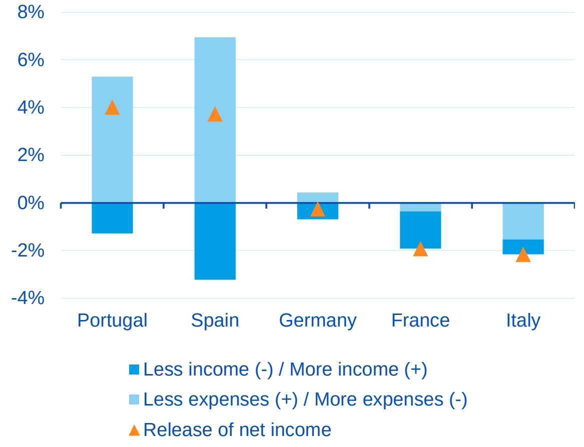
In total, the reduction of the financial burden has saved Portuguese and Spanish families over 3.5% of their gross disposable income (GDI). German households show a balanced situation and French and Italian families saw their financial expenses increase during the period, at around 2% of their GDI.

The breakdown of the various factors shows that the reduction in income on deposits is spread across all countries. However, such adjustment occurs most significantly in Spain - 3% of the GDI - in other countries it is below 2% of the GDI as remuneration has decreased more in Spain (see Chart 2).

Instead, expenditure is more standardised. In Spain, Portugal and Germany these are adjusted, raising household income, while in France and Italy they reduce family income. The adjustment of interest expenses is common in all countries (see Chart 3). However, credit stock evolves differently: the Spanish and Portuguese families have strongly deleveraged (part of the deleveraging has been favoured by low interest rates, in what has been called "voluntary deleveraging"), while the Germans, French and Italians have increased their debt.

Figure 2

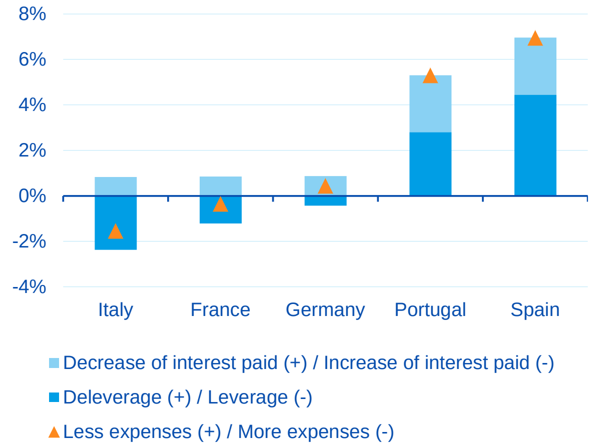
Breakdown of the change in net financial burden of households (Sep'08 – Sep'16): variation in financial income and expenses



Source: Bank of Spain, European Central Bank and Eurostat

Figure 3

Contributions to the change in financial costs of European households (% RBD)



Source: Bank of Spain, European Central Bank and Eurostat

In short, the financial burdens of European families have been declining since the beginning of the economic crisis, improving the financial situation of households in countries with the highest debt ratios. Moreover, the effect of the fall in interest rates in European households has been mixed, largely favouring Spanish families.

4 Management of non-performing assets in Europe

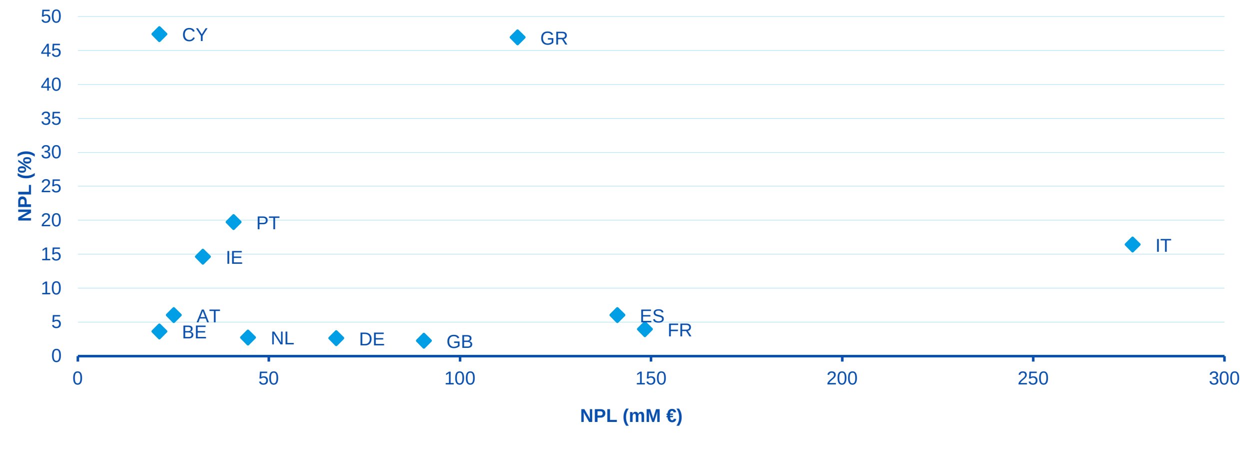
The burden of bad debt on bank balance sheets

The European economy seems to have left behind the worst of the economic crisis, and countries seem to be returning to the growth path, albeit modestly for the moment. In the same vein, the European banking systems appear to be marginally improving their situation. However, the inherited burdens of the crisis still need resolving, among which are non-performing exposures or non-performing loans. These assets, which originated during the crisis, are still on bank balance sheets and are taking a long time to fully dissolve. There are several reasons why non-performing assets are a problem for banks and economies:

- Maintaining them is costly: costs of recovery of loans, asset maintenance, taxes, appraisals, marketing expenses, registry of transactions and legal expenses.
- They involve suboptimal allocation of capital that could be better spent on new credit operations to sustain the economy.
- They may exacerbate the vicious bank-sovereign circle, since the European regulation says that after the entity has exhausted its resources the national government must recapitalize it in the first instance.
- This hinders the granting of new credit and thus impedes the transmission of European monetary policy.

Figure 1

Non-performing loans by country (June 2016, % gross loans and € billion)



Source: BBVA Research based supervisory information from the European Banking Authority

European loan delinquencies have been gradually declining, reaching €1.06Trn in June 2016, 5.4% of gross loans. Its distribution across countries is very unequal, as can be seen in the accompanying graph.

European authorities could intervene to accelerate the management of NPLs

Various European institutions are considering various actions to promote the reduction of delinquent portfolios, such as a supervisory impulse, asset protection schemes, guarantees for the issuance of securitisations, creating one or more asset management companies (so-called "bad bank") or the impulse of clearing houses to promote sales.

The creation of a single European bad bank, as suggested by the European Banking Authority (EBA) may pose significant practical difficulties. While it is true that it would be a quick way to clear banks' balance sheets and have more time to sell them, the different initial situation of European banks may be a major stumbling block. For example, some countries have already created their own bad banks and delinquency has remained contained in part of the banking systems. On the other hand, they should find buyers for the assets and investors in the vehicle. Also, if the transfer price is low enough, banks may need recapitalizing, which, according to the EBA, each country should tackle according to the common bail-in rules, and that may lead to conflict.

Another option would be to create a European "clearing house" where information is shared but risks are not transferred. This would provide a single standardized information point for all Europe on the assets for sale (but not on the bidding banks) where authorities would ensure the quality of the data. This would allow investors to conduct their analysis at a lower cost and they could build portfolios by gathering assets from different banks. In any case, the information should be sufficiently detailed to evaluate assets correctly, including –for example– data on collateral for loans.

In any case, European banks are in different states regarding the management of their debtors and assets are very different, which should also be taken into account in the measures taken. Only a European, but individualized, approach to each case can accelerate the process of managing non-performing assets, which is vital for the proper functioning of banking systems.

5 Peru: deposits in soles and exchange rate expectations

The financial system of Peru is bimetallic (soles and US$) for both assets and liabilities. Credit quota in US$ fell from 80% in early 2000 to less than 30% in 2016. In liabilities, the process was more gradual and deposits in US$ fell from 70% in 2003 to 50% in 2016. Peruvians' preference for deposits in US$ was born of the inflationary processes of the 70s and, above all, the hyperinflation of the 80s, as a defence mechanism against the erosion of value of assets in soles. **The 1993 Constitution established the free possession of foreign currency.** In order to foster financial intermediation, Peruvian citizens who had dollars abroad, or locally but outside the system, were guaranteed that they would not suffer confiscations or be forced to convert to soles (as happened in 1985) if they deposited their dollars in resident banks. As a result, the financial system grew rapidly but dollarization has remained. Economic agents optimize their portfolios by diversifying currencies based on their exchange rate expectations, which in Peru is simple and with small transaction costs. **Currently, deposits in soles play a transactional role and foreign currency deposits function as store of value.**

The response of deposits in soles to the exchange rate

Using monthly data since 2008[3] we explain the evolution of deposits in soles according to[4]: 1) the relationship between increased economic activity (GDP) and a higher volume of deposits; 2) a real interest rate (TD_MN) in each currency so that the higher the remuneration the higher the volume of deposits; 3) the interest rate differential between deposits in soles and US$ (Spread TD_MN-TD_MX); and 4) the exchange rate level (TC) and exchange rate expectations[5] as the difference in value between currencies (appreciatory Expectation = Expec $_{(t+12)}$ / TC $_{(t)}$ <0, depreciatory Expectation = Expec $_{(t+12)}$ / TC $_{(t)}$> 0) so that an appreciation (depreciation) of the exchange rate and the expectation of an appreciation (depreciation) leads to an increase (decrease) in deposits in soles. In determining deposits not only agents with rational expectations about the exchange rate intervene, but also agents with adaptive expectations, whose reference is the current and recent exchange rate levels. From here, we shall answer the following questions: a) how and by how much does the exchange rate and expectations affect the evolution of deposits in soles? b) do deposits in soles react to exchange rate expectations in the same way? c) is the reaction proportional or are there different answers depending on the percentage exchange rate variation?

Table 1 shows the response to the explanatory variables. The first column synthesizes the long-term impacts of each of the variables, and shows the sensitivity of deposits in soles to the exchange rate and its expectations. The responses to the expectations are not symmetrical. To see this, we have segregated the expectations variable (local currency) into two components: appreciatory expectations when the variable is

3: The analysis has been performed since 2003 and the results show the same conclusions except that the sensitivities to different variables are higher than those shown in this synthesis.
4: We use an Error Correction Mechanism linear model.
5: The spot rate is end of the month, as is the survey of macroeconomic expectations for the exchange rate at the end of this year (t) and the following year (t + 1) of the Central Bank, aimed at economic analysts, financial system agents and non-financial companies. To construct the BBVA Research expectations indicator one year ahead, the expectation of the month is weighted according to the number of months corresponding to each period / year . And we shall build the depreciatory (+) / appreciatory (-) expectation as the BBVA expectation ratio a year ahead of the spot rate for the month.

negative and depreciatory expectations when it is positive. The third and fourth columns show the impacts of short-term expectations. The second column attempts to answer the question of whether deposits respond differently when expectations exceed certain thresholds[6]. In our case,[7] these thresholds are: variations in excess of 2% for appreciations and 3% for depreciations.

Table 1

Estimates of the actual impact on deposits in soles

	Sample: jan.2008-oct.2016			
	Long Term		Short Term (D)	
	Total	-2%/+3%	month (0)	month (1)
GDP real	2.21			
Exchange rate	-0.29		-0.37	
Appreciaton Expectation (-)	-2.62	-2.05	-0.80	0.37
Depreciaton Expectation (+)	-1.34	-1.12	-0.80	0.32
Interest rate Depos MN(*) real x100 bps	0.010		0.003	
Spread (TD_MN-TD_MX) x100 bps	-0.017		-0.022	
ECM paremeter	-0.47			
R2bar %	66.1%			
Error standar %	1.48%			

(*) MN = national currency (Soles); MX = foreign currency (US $)
Source: BBVA Research

It can be seen that **deposits in soles, in real terms, have an elasticity of 2.21 to GDP** (for every unit of variation in GDP, deposits in soles vary somewhat more than double), **an elasticity of -0.29 to the spot exchange rate** and a contemporary impact of almost -0.4, that is, if the exchange rate depreciates by 10% in one month deposits would decline by 4% that month, but end up being adjusted in the following months to a drop of 3%. Moreover, deposits respond to **appreciatory expectations with an elasticity of -2.6 and depreciatory expectations with an elasticity of -1.3.** That is, they are twice as sensitive to expectations of appreciation as they are to depreciatory expectations. However, they are equally sensitive (-0.8) to contemporary impacts (short-term responses). Therefore, **the response of deposits in soles to expectations is symmetric in the month, but asymmetric in the long term,** being twice as sensitive to appreciation than to depreciation. The remuneration of deposits does not explain their evolution. In response to the question on proportional or linear sensitivities, the second column shows the combined result of the first column and the impact of an appreciation greater than 2% and a depreciation of 3%. It can be seen that the sensitivities are somewhat lower than estimated in the first column, but this difference is not significant. Therefore, we can note that **there appears to be a non-proportional or non-linear behaviour** in variations exceeding certain appreciatory / depreciatory expectation thresholds.

6: Previous works examine this aspect, although their thresholds were at 1% for two consecutive months: “Drivers of dollarization in Peru" Mercedes García-Escribano. Estudios Económicos Magazine N° 21, pages 23-40 (June 2011)
7: The appreciatory and depreciatory expectations were analysed separately and they each show different standard deviations, so that 2% and 3% correspond to 2 standard deviations.

Appendix 1: Main indicators for monitoring the Spanish banking system

Table 1

Summary Balance of the banking system. € bn and % variation

Assets	2010	2011	2012	2013	2014	2015	2016	Date	Growth rate 00-'08	Growth rate 08 - latest	Growth rate y-on-y
Total lending	2,153	2,106	1,951	1,716	1,651	1,603	1,556	Jan-17	217%	-29.1%	-2.9%
Public corporations	*79*	*90*	*114*	*87*	*101*	*90*	*88*	*Jan-17*	*69%*	*80.8%*	*3.1%*
Domestic resident sector	*1,844*	*1,783*	*1,605*	*1,448*	*1,380*	*1,327*	*1,276*	*Jan-17*	*234%*	*-32.5%*	*-4.3%*
Non residents	*230*	*234*	*232*	*180*	*169*	*186*	*191*	*Jan-17*	*164%*	*-26.9%*	*4.6%*
Fixed income securities and equity stakes	564	656	766	773	754	662	610	Jan-17	132%	22.7%	-8.3%
Fixed income securities	*384*	*406*	*509*	*493*	*492*	*415*	*366*	*Jan-17*	*135%*	*12.6%*	*-12.7%*
Of which: sovereign debt	*165*	*198*	*247*	*264*	*288*	*251*	*225*	*Jan-17*	*6%*	*121%*	*-14.1%*
Equity	*180*	*251*	*258*	*280*	*262*	*246*	*244*	*Jan-17*	*128%*	*41.8%*	*-0.7%*
Interbank lending	234	251	279	211	155	164	163	Jan-17	81%	-41.7%	-9.0%
Other assets (net of interbank lending/deposits)	301	387	426	326	354	331	319	Jan-17	230%	8.3%	-10.0%
Total assets	**3,252**	**3,400**	**3,423**	**3,026**	**2,913**	**2,760**	**2,647**	**Jan-17**	**184%**	**-18.8%**	**-5.5%**
Liabilities and Shareholders' Equity											
Customer deposits	2,031	1,934	1,725	1,684	1,686	1,637	1,578	Jan-17	169%	-22.5%	-4.6%
Public corporations	*79*	*70*	*69*	*63*	*76*	*77*	*54*	*Jan-17*	*263%*	*-29.4%*	*-30.1%*
Domestic resident sector	*1,440*	*1,373*	*1,317*	*1,314*	*1,289*	*1,261*	*1,243*	*Jan-17*	*192%*	*-14.1%*	*-2.4%*
Non residents	*511*	*492*	*339*	*306*	*320*	*299*	*281*	*Jan-17*	*113%*	*-45.3%*	*-7.6%*
Interbank deposits	270	373	573	381	312	303	288	Jan-17	95%	-9.8%	-6.2%
Pro memoria: net interbank position	*36*	*122*	*294*	*171*	*157*	*139*	*125*	*Jan-17*	*215%*	*152.3%*	*-2.8%*
Debt issued	433	435	394	297	249	225	201	Jan-17	625%	-51.6%	-11.5%
Other liabilities	340	439	535	430	436	368	352	Jan-17	253%	11.1%	-8.4%
Shareholders' equity	178	220	195	233	230	227	227	Jan-17	134%	25.7%	0.4%
Pro memoria: ECB funding	*70*	*132*	*357*	*207*	*142*	*133*	*140*	*Feb-17*	*566%*	*55.8%*	*10.6%*
Total Liabilities and Shareholders' Equity	**3,252**	**3,400**	**3,423**	**3,026**	**2,913**	**2,760**	**2,647**	**Jan-17**	**184%**	**-18.8%**	**-5.5%**

(*) Includes ORS credit, credit to the Public Administration and credit to non-residents
(**) Includes ORS deposits, deposits by the Public Administration and deposits by non-residents
Source: Statistical Bulletin of the Bank of Spain

Table 2

Summarized balance sheet of the banking system. Cumulative annual earnings € mn and % change

	2010	2011	2012	2013	2014	2015	2016	Date	Growth rate 00-'08	08-latest	y-on-y
Net interest revenue	34,292	29,565	32,739	26,816	27,118	26,411	24,297	Dec-16	92%	-30.9%	-8.0%
Net fees and commissions	11,870	11,750	11,275	10,931	11,257	11,237	11,059	Dec-16	79%	-15.1%	-1.6%
Trading gains and other revenue	17,151	15,811	15,493	17,797	17,043	13,884	13,081	Dec-16	276%	-28.1%	-5.8%
Total revenue	**63,313**	**57,126**	**59,507**	**55,544**	**55,418**	**51,532**	**48,437**	**Dec-16**	**118%**	**-27.0%**	**-6.0%**
Operating expenses	-29,431	-28,464	-26,951	-26,798	-26,116	-26,261	-26,389	Dec-16	54%	-10.6%	0.5%
Personnel expenses	-17,643	-16,889	-15,587	-15,108	-14,329	-14,182	-13,943	Dec-16	54%	-22.1%	-1.7%
Other operating expenses	-11,789	-11,574	-11,364	-11,690	-11,787	-12,079	-12,446	Dec-16	54%	7.2%	3.0%
Pre-provision profit	**33,882**	**28,662**	**32,556**	**28,746**	**29,302**	**25,271**	**22,049**	**Dec-16**	**226%**	**-40.2%**	**-12.8%**
Loan-loss provisions	-16,719	-22,668	-82,547	-21,800	-14,500	-10,698	-8,340	Dec-16	620%	-45.3%	-22.0%
Other income, net	-7,326	-23,430	-37,142	-2,789	-1,739	-3,819	-7,032	Dec-16	-299%	466.9%	84.1%
Profit before taxes	9,837	-17,436	-87,133	4,156	13,063	10,754	6,677	Dec-16	108%	-67.3%	-37.9%
Net attributable income	**9,673**	**-14,717**	**-73,706**	**8,790**	**11,343**	**9,312**	**6,086**	**Dec-16**	**122%**	**-67.0%**	**-34.6%**

Source: Statistical Bulletin of the Bank of Spain

Table 3

Relative size and resources %, number and % variation of the banking system

	2010	2011	2012	2013	2014	2015	2016	Date	Growth rate 00-'08	08-latest	y-on-y
Lending to the private sector / GDP	171%	166%	152%	139%	133%	123%	113%	Jan-17	94%	-32.4%	-10.4%
Private sector deposits / GDP	114%	111%	111%	113%	111%	108%	103%	Jan-17	69%	-2.5%	-7.2%
Number of employees	263,715	248,093	236,504	217,878	208,291	202,959	n.d.	Dec-15	14%	-27.1%	-2.6%
Number of branches	43,267	40,202	38,237	33,786	32,073	31,155	28,959	Dec-16	17%	-37.3%	-7.0%

Source: Statistical Bulletin of the Bank of Spain

Table 4

ORS credit breakdown, defaults and non-performing asset ratios by portfolio. € bn and % variation

									Growth rate		
Lending volume	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Date**	**00-'08**	**08 - latest**	**y-on-y**
Loans to households	**813**	**793**	**756**	**715**	**690**	**663**	**652**	**Dec-16**	**236%**	**-20.4%**	**-1.6%**
Of which:											
Housing loans	632	627	605	581	558	531	517	Dec-16	270%	-17.6%	-2.8%
Other loans to households	180	167	151	134	132	132	136	Dec-16	159%	-29.5%	2.9%
Lending to corporates and SMEs	**1,013**	**971**	**830**	**719**	**674**	**644**	**605**	**Dec-16**	**237%**	**-40.5%**	**-6.1%**
Of which:											
Lending to real estate	430	397	300	237	200	179	161	Dec-16	517%	-65.8%	-10.3%
Other lending to corporates and SMEs	583	574	530	482	474	465	444	Dec-16	142%	-18.8%	-4.5%
Total lending to domestic private sector *	**1,844**	**1,783**	**1,605**	**1,448**	**1,380**	**1,327**	**1,262**	**Jan-17**	**234%**	**-32.5%**	**-4.3%**
Non-performing loans											
Loans to households	**26.0**	**28.7**	**37.0**	**49.4**	**46.8**	**37.0**	**35.7**	**Dec-16**	**1062%**	**46.7%**	**-3.4%**
Of which:											
Housing loans	15.2	18.2	24.0	34.6	32.6	25.5	24.1	Dec-16	1878%	62.6%	-5.5%
Other loans to households	10.8	10.5	13.0	14.8	14.1	11.4	11.6	Dec-16	607%	22.0%	1.3%
Lending to corporates and SMEs	**79.7**	**109.9**	**128.4**	**146.1**	**124.6**	**94.2**	**79.2**	**Dec-16**	**818%**	**112.5%**	**-15.9%**
Of which:											
Lending to real estate	58.0	81.9	84.8	87.8	70.7	50.4	42.4	Dec-16	2790%	57.8%	-15.9%
Other lending to corporates and SMEs	21.7	28.0	43.6	58.2	53.9	43.7	36.8	Dec-16	232%	253.5%	-15.8%
Total lending to domestic private sector *	**107.2**	**139.8**	**167.5**	**197.2**	**172.6**	**134.3**	**115.7**	**Jan-17**	**808%**	**83.5%**	**-13.3%**
NPL ratio											
Loans to households	**3.2%**	**3.6%**	**4.9%**	**6.9%**	**6.8%**	**5.6%**	**5.5%**	**Dec-16**	**246%**	**84.3%**	**-1.8%**
Of which:											
Housing loans	2.4%	2.9%	4.0%	6.0%	5.9%	4.8%	4.7%	Dec-16	434%	97.2%	-2.9%
Other loans to households	6.0%	6.3%	8.6%	11.1%	10.7%	8.7%	8.5%	Dec-16	173%	73.0%	-1.5%
Lending to corporates and SMEs	**7.9%**	**11.3%**	**15.5%**	**20.3%**	**18.5%**	**14.6%**	**13.1%**	**Dec-16**	**173%**	**257.2%**	**-10.4%**
Of which:											
Lending to real estate	13.5%	20.6%	28.2%	37.1%	35.3%	28.2%	26.4%	Dec-16	369%	361.4%	-6.3%
Other lending to corporates and SMEs	3.7%	4.9%	8.2%	12.1%	11.4%	9.4%	8.3%	Dec-16	37%	335.4%	-11.8%
Total lending to domestic private sector *	**5.8%**	**7.8%**	**10.4%**	**13.6%**	**12.5%**	**10.1%**	**9.2%**	**Jan-17**	**172%**	**171.9%**	**-9.4%**

(*) Total ORS credit incorporates total credit to households, total credit for productive activities, non-profit institutions serving households (NPISHs) and unclassified credit. From January 2014 it includes credit to Financial Institutions.
Source: Statistical Bulletin of the Bank of Spain

Table 5

Details of new lending transactions Cumulative annual earnings € bn and % change

									Growth rate		
Lending volume	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**Date**	**03-'08**	**08-'16**	**y-on-y**
Loans to households	**74.3**	**63.3**	**51.2**	**60.5**	**75.7**	**80.6**	**6.1**	**Jan-17**	**0.7%**	**-56.7%**	**22.0%**
Of which:											
Housing loans	37.5	32.3	21.9	26.8	35.7	37.5	2.8	Jan-17	-15.6%	-56.9%	28.4%
Other loans to households	36.8	31.0	29.4	33.7	40.0	43.1	3.3	Jan-17	21.3%	-56.4%	17.1%
Lending to corporates and SMEs	**527.5**	**484.8**	**392.6**	**357.2**	**392.6**	**323.6**	**26.9**	**Jan-17**	**29.2%**	**-65.2%**	**8.3%**
Of which:											
Less than €250,000	136.4	114.4	106.1	112.3	128.7	133.6	10.8	Jan-17	n.d.	-18.7%	9.2%
Between €250,000 and €1million)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Jan-17	n.d.	-21.0%	-0.2%
Corporates (loans > €1mill.)	353.4	338.9	258.2	210.3	227.2	152.6	13.6	Jan-17	43.5%	-66.4%	9.3%
Total new lending flows	**601.8**	**548.1**	**443.9**	**417.7**	**468.3**	**404.1**	**33.0**	**Jan-17**	**23%**	**-58.0%**	**10.6%**

Source: Banco de España.

Table 6

Detail of deposits of residents. € bn and % variation

									Growth rate		
	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Date**	**00-'08**	**08 - latest**	**y-on-y**
Sight deposits	262	270	265	282	329	384	454	Jan-17	100%	86%	16.1%
Savings deposits	211	203	199	206	222	254	288	Jan-17	73%	60.3%	13.5%
Term deposits	744	698	684	668	588	499	394	Jan-17	270%	-45.9%	-20.5%
Foreign currency deposits	19	18	20	21	22	21	20	Jan-17	527%	-30.4%	-0.6%
Total deposits of domestic resident sector *	**1,236**	**1,188**	**1,168**	**1,177**	**1,160**	**1,159**	**1,157**	**Jan-17**	**163%**	**-2.2%**	**-0.4%**

(*) Total ORS deposits does not match the data of Table 1 because it incorporates liabilities from asset transfer, subordinated deposits, CTAs and hybrid instruments.
Source: Statistical Bulletin of the Bank of Spain

Table 7

Interest rates on credit operations. Rates in % and variation in pbs

	2011	2012	2013	2014	2015	2016	2017	Date	Growth rate (bps) 03-'08	08 - latest	y-on-y
Loans. Stock (NDER)											
Loans to households											
Housing loans	3.12	2.61	2.11	1.89	1.53	1.30	1.27	Jan-17	178	-438	-24
Other loans to households	5.73	5.78	5.80	6.10	5.98	6.17	6.19	Jan-17	113	-88	19
Loans to corporates and SMEs	3.90	3.47	3.44	2.84	2.38	2.04	2.04	Jan-17	204	-351	-27
Loans. New lending transactions (APRC)											
Loans to households											
Housing loans	3.66	2.93	3.16	2.64	2.31	2.19	2.23	Jan-17	238	-360	-13
Consumer loans	9.11	8.32	9.52	8.98	8.43	8.14	8.68	Jan-17	237	-231	-31
Other	6.29	6.23	5.92	4.91	4.28	4.26	5.16	Jan-17	224	-188	0
Loans to corporates and SMEs (synthetic average)	4.03	3.66	3.57	2.73	2.58	2.30	2.54	Jan-17	112	-233	-30
Less than €250,000	5.57	5.67	5.54	4.56	3.61	3.29	3.72	Jan-17	n.a.	-83	-33
Between €250,000 and €1million)	4.79	4.27	4.03	2.91	2.20	1.91	2.01	Jan-17	n.a.	-188	-33
Corporates (loans > €1mill.)	3.53	3.00	2.83	2.10	2.07	1.63	1.94	Jan-17	n.a.	-77	-9

NDER: Narrowly Defined Effective Rate (APR less commissions)
APR: Equivalent Annual Rate. Narrowly Defined Effective Rate (APR less commissions)
Source: Statistical Bulletin of the Bank of Spain

Table 8

Deposit interest rate* Rates in % and variation in pbs

	2011	2012	2013	2014	2015	2016	2017	Date	Growth rate (bps) 03-'08	08 - latest	y-on-y
Deposits. Stock (NDER)											
Households deposits											
Sight deposits	0.28	0.21	0.22	0.17	0.12	0.06	0.05	Jan-17	6.5	-63	-5
Term deposits	2.76	2.72	2.08	1.39	0.75	0.30	0.27	Jan-17	232	-414	-43
Corporates and SMEs deposits											
Sight deposits	0.61	0.37	0.35	0.31	0.24	0.15	0.16	Jan-17	111	-161	-10
Term deposits	2.68	2.64	1.93	1.40	0.91	0.65	0.66	Jan-17	223	-372	-24
Deposits. New transactions (NDER)											
Households deposits											
Sight deposits	0.28	0.21	0.22	0.17	0.12	0.06	0.05	Jan-17	30	-63	-5
Term deposits	2.79	2.83	1.50	0.66	0.39	0.11	0.10	Jan-17	225	-408	-25
Corporates and SMEs deposits											
Sight deposits	0.61	0.37	0.35	0.31	0.24	0.15	0.16	Jan-17	111	-161	-10
Term deposits	2.13	2.08	1.31	0.51	0.31	0.13	0.14	Jan-17	146	-334	-15

NDER: Narrowly Defined Effective Rate (APR less commissions)
APR: Equivalent Annual Rate. Narrowly Defined Effective Rate (APR less commissions)
Source: Statistical Bulletin of the Bank of Spain

Table 9

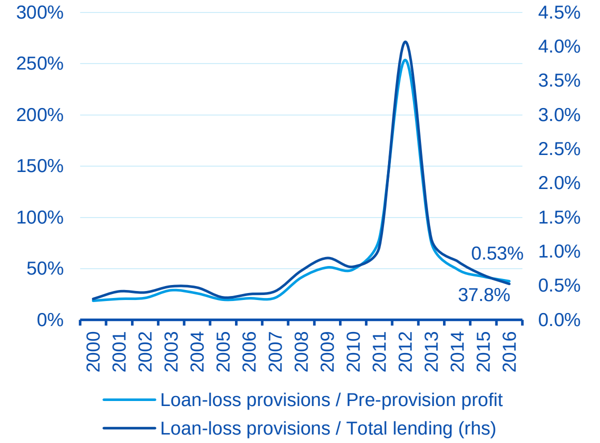
Main ratios

	2010	2011	2012	2013	2014	2015	2016	Date	Growth rate 00-'08	08-latest	y-on-y
Productivity											
Business volume* per branch (€'000)	71,187	73,894	72,524	77,713	79,197	79,794	83,533	Dec-16	169.7%	26.3%	4.9%
Profit before tax per branch (€'000)	227.3	-433.7	-2,279	123.0	407.3	345.2	230.6	Dec-16	77.5%	-47.8%	-33.2%
Efficiency											
Cost-to-Income ratio (Oper. expenses / Total revenue)	46.5%	49.8%	45.3%	48.2%	47.1%	51.0%	54.5%	Dec-16	-29.3%	22.6%	6.9%
Operating expenses / ATA	0.91%	0.86%	0.79%	0.83%	0.88%	0.93%	0.98%	Dec-16	-43.4%	2.1%	7.7%
Profitability											
RoE	5.2%	-7.4%	-35.5%	4.1%	4.9%	4.1%	2.7%	Dec-16	-3.4%	-74.2%	-33.9%
RoA	0.30%	-0.52%	-2.55%	0.13%	0.44%	0.38%	0.25%	Dec-16	-23.6%	-62.6%	-33.6%
NIM (Net interest rev. / ATA)	1.06%	0.89%	0.96%	0.83%	0.91%	0.93%	0.90%	Dec-16	-29.6%	-21.1%	-1.6%
Liquidity											
Loans-to-Deposits (resident sector)	149%	150%	137%	123%	119%	115%	109%	Jan-17	14.8%	-31.0%	-3.9%
Funding gap (Loans - Deposits, EUR bn)	607.9	594.4	436.8	270.9	220.1	168.3	104.7	Jan-17	349%	-84.8%	-33.3%
Funding gap / Total assets	18.7%	17.5%	12.8%	9.0%	7.6%	6.1%	4.0%	Jan-17	57.7%	-81.4%	-30.3%
Solvency and Asset Quality											
Leverage (Shareholders' equity / Total assets)	5.5%	6.5%	5.7%	7.7%	7.9%	8.2%	8.6%	Jan-17	-17.8%	53.4%	5.2%
Shareholders' equity / NPLs	166%	158%	117%	118%	133%	169%	197%	Jan-17	-74.3%	-31.4%	16.1%
Provisioning effort (Loan-loss prov. / Pre-provision profit)	49.3%	79.1%	253.6%	75.8%	49.5%	42.3%	37.8%	Dec-16	121%	-8.5%	-10.6%
Cost of Risk (Loan-loss provisions / total lending)	0.78%	1.06%	4.07%	1.19%	0.86%	0.66%	0.53%	Dec-16	134%	-26.7%	-16.9%
NPL ratio (resident sector)	5.8%	7.8%	10.4%	13.6%	12.5%	10.1%	9.2%	Jan-17	172%	172%	-9.4%
NPL coverage ratio (total)	66.9%	59.6%	73.8%	58.0%	58.1%	58.9%	58.9%	Jan-17	-58.2%	-16.8%	-1.2%
NPL coverage ratio (specific provisions)	39.6%	37.1%	44.7%	46.9%	46.7%	47.0%	46.9%	Dec-16	-39.0%	56.8%	-0.8%

(*) ORS Credit plus ORS Deposits
Source: Statistical Bulletin of the Bank of Spain

Chart A1.1

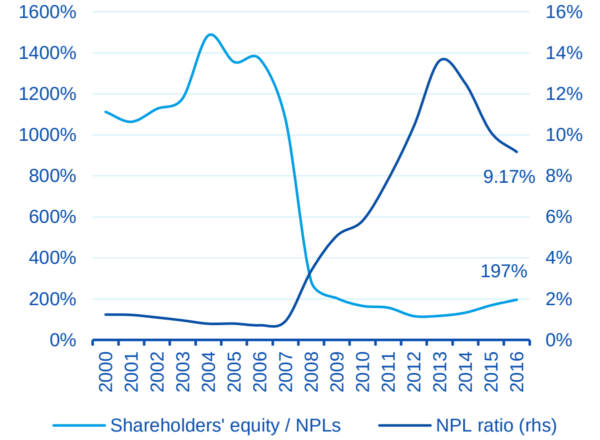
Effort in provisions



Source: BBVA Research

Chart A1.2

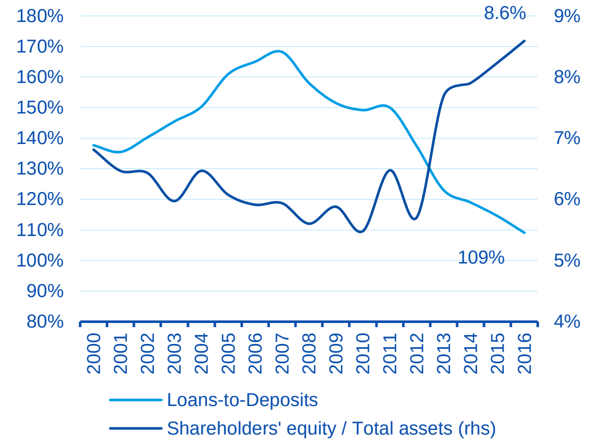
Delinquency and Capital Delinquency



Source: BBVA Research

Chart A1.3

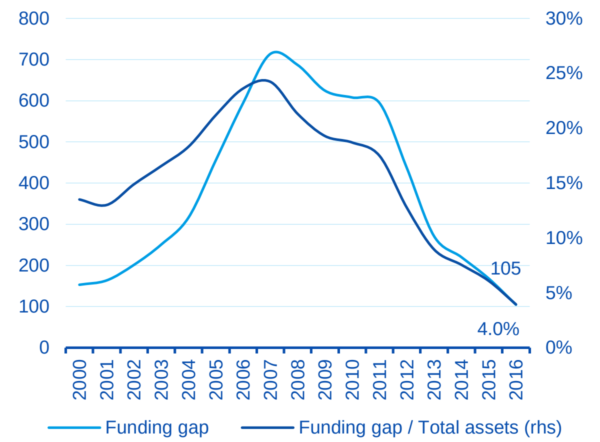
Liquidity and leverage



Source: BBVA Research

Chart A1.4

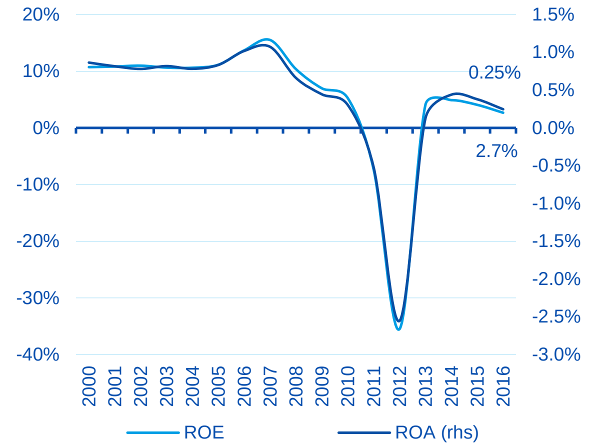
Funding gap (ORS credit – ORS deposits, € bn)



Source: BBVA Research

Chart A1.5

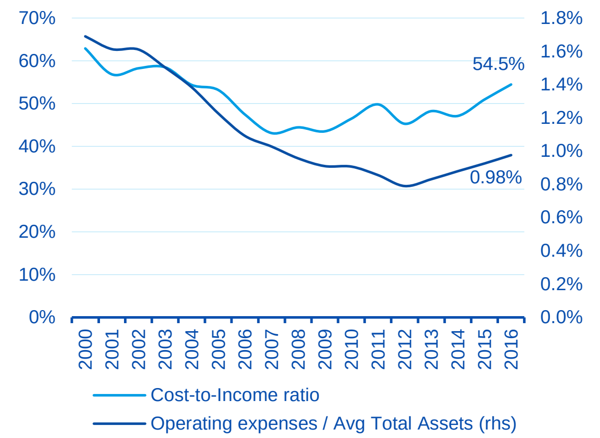
Return:



Source: BBVA Research

Chart A1.6

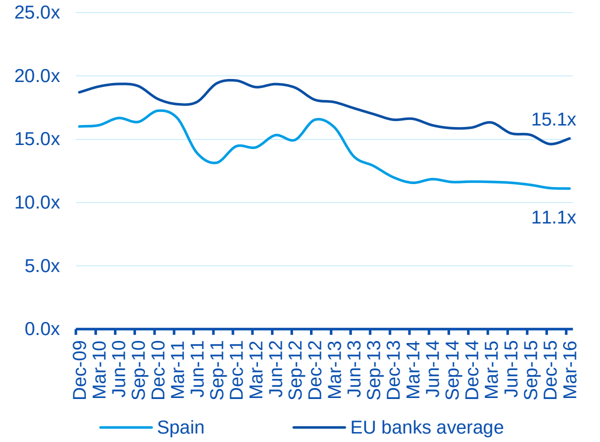
Efficiency



Source: BBVA Research

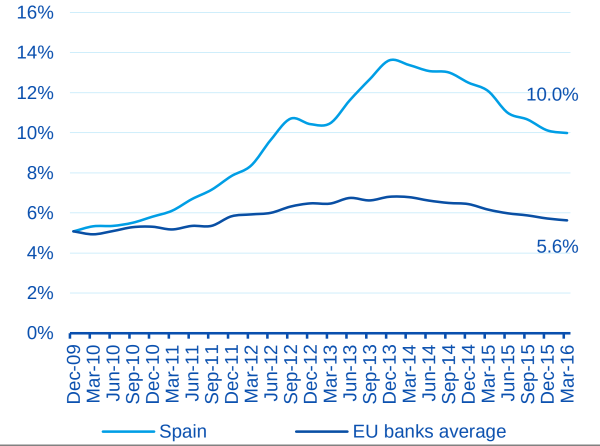
Appendix 2: Evolution of the Spanish banking sector

Chart A2.1
Total liabilities / Capital in balance



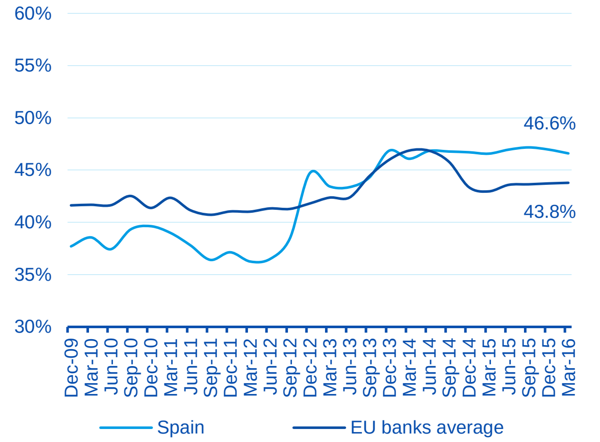
Source: EBA, Banco de España, BBVA Research

Chart A2.2
Delinquency ratio



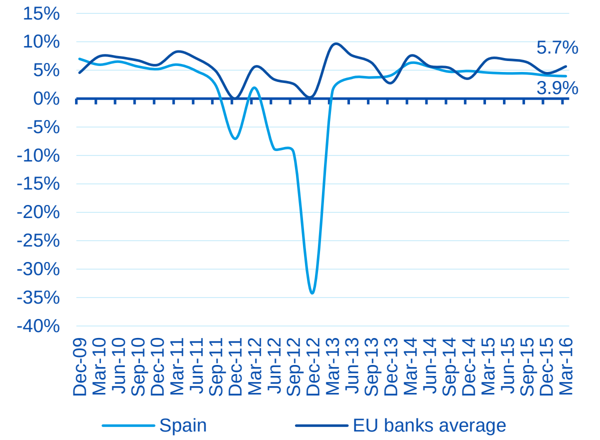
Source: EBA, Banco de España, BBVA Research

Chart A2.3
Coverage ratio (specific provisions only)



Source: EBA, Banco de España, BBVA Research

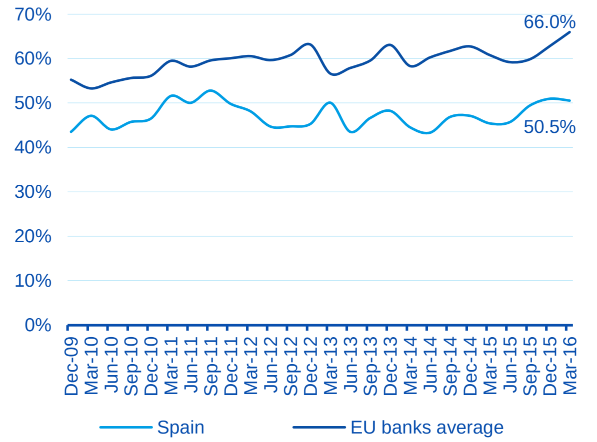
Chart A2.4
ROE



Fuente: EBA, Banco de España, BBVA Research

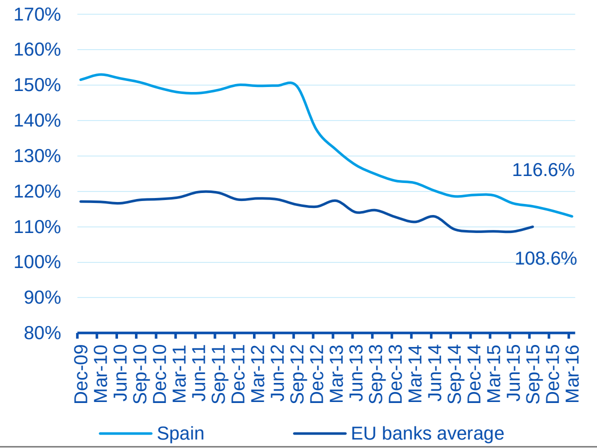
Chart A2.5

Cost/income ratio:



Source: EBA, Banco de España, BBVA Research

Loans-to-Deposits



Source: EBA, Banco de España, BBVA Research

Note: The averages data of the European banks come from "Risk Dashboard" of the EBA, composed of a panel of 158 major banks in the EU.

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