

SPANISH BOOM-BUST AND MACROPRUDENTIAL POLICY

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Abstract

In this paper we review the experience of the last Spanish boom and bust to cast some reflections on macroprudential policy. These reflections take place in a country, Spain that is a (relatively small) member of a larger monetary union, which also has a single banking microsupervisor as well as a central bank, the ECB that can top-up national macroprudential decisions. Beyond the euro zone, the experience of the Spanish lending boom-bust maybe also interesting for other policy makers, with a full array of tools to tame the lending cycle.

1 Introduction

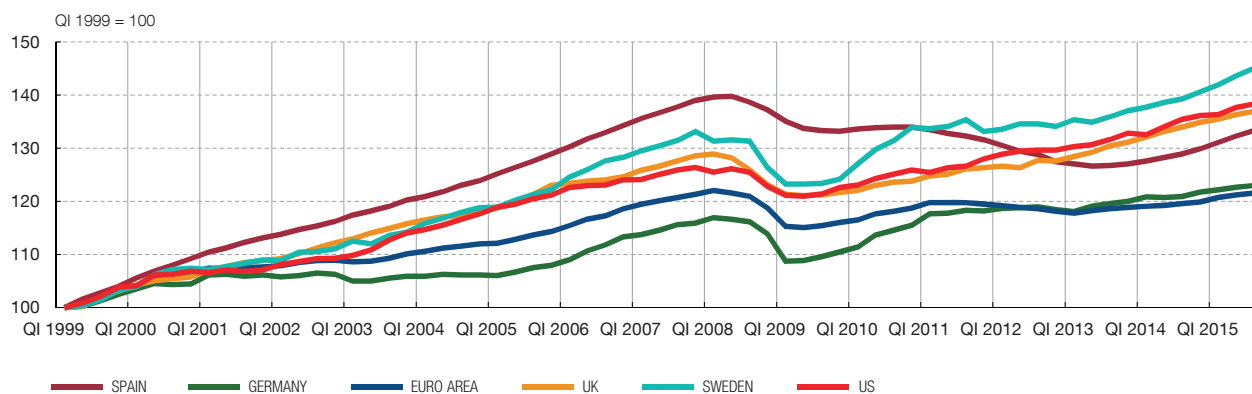
Before the crisis that hit financial markets and banking systems in August 2007 bringing about the Great Recession in advanced economies, there was a broad consensus that monetary and fiscal policies should be used to manage the business cycle. In particular, at that time it was thought that monetary policy should play an active role while fiscal policy should be more passive, relying on powerful automatic stabilizers. In fact, if the main frictions in the economy are nominal, a monetary policy targeting a low level of inflation is enough to maximize social welfare. However, if real rigidities also play a relevant role, stabilizing inflation could amplify the cyclical fluctuations, thus justifying also a focus on output gap [Blanchard and Galí (2007)]. In any case, monetary and fiscal policies were the only instruments for carrying out macroeconomic tasks.

Banking regulation and supervision were kept at the domain of microprudential policies, aiming at delivering a safe and sound banking system basically by ensuring the solvency of each individual bank in it. At the same time, the stance in banking regulation and supervision had progressively focused more and more on a proper level of capital against risk, as Basel 2 discussions, started in 1999, were trying to improve 1988 Basel 1 agreement deemed not enough risk-sensitive.

The crisis and its high cost in terms of output, employment and taxpayers money to protect banks' deposits, has deeply challenged the old policy paradigm. At the macroeconomic level, the great success in terms of low inflation of goods and services achieved the last two decades before the crisis,¹ has been challenged in terms, first, of the imbalances that were developed at the same time (both internal and external) and, second, of the quite significant decline in output that many developed economies witnessed when those imbalances begun the correction process (see Chart 1). At a policy level, the strategy of mopping up (use monetary policy after a shock hits the economy) is now judged inferior to a leaning against the wind strategy were monetary (and fiscal) policies could have been used to prick asset bubbles in some markets or, at least, to tame earlier increased imbalances [Borio (2014)].

Moreover, a significant challenge is also for banking regulation and supervision strategy prior to the crisis. It is thought now that the microeconomic dimension (*i.e.* focus the analysis bank by bank, ensuring each one is safe and sound in itself) is not enough. In fact, from a theoretical perspective it has been shown that, in the presence of financial rigidities, the maximization of social welfare requires financial stability to be an additional target for the economic authorities, like inflation and output stabilization [IMF (2013)]. Thus, there is a growing consensus that banking regulation and supervision need to embrace also a macroprudential

¹ Part of the success in taming inflation was the result of the incorporation of emerging countries to international supply and trade circuits.



SOURCE: Eurostat.

dimension,² focusing on the safety and soundness of the banking sector against systemic risk, that is, the risk of impairment of the normal working of a financial/banking sector that has an impact on the real economy. As financial conditions could amplify the fluctuations of the business cycle and the macroeconomic imbalances, it is argued that a macroprudential approach for banking supervision could have spotted problems earlier and contributed to reduce systemic risk materialization [De Larosière (2009)].

The new approach to banking regulation and supervision that is being adopted enlarges the traditional microprudential toolbox with other instruments that, albeit micro in essence, have a macroprudential aim. Basel 3 agreement includes a countercyclical capital buffer, aiming at reducing the time dimension of systemic risk, as well as a global systemically important banks (GSIB) capital surcharge, to reduce the cross-section dimension of systemic risk. The CRD IV/CRR in the European Union develop even further those macroprudential instruments enlarging the toolbox by including a systemic risk buffer and a potential surcharge for domestic systemically important banks. Other reforms, such as the progress in resolution mechanisms for large and complex banks, also try to reduce the interconnections in the financial system to reduce fragility. In parallel, capital requirements at the microprudential level have been reinforced increasing its minimum required level as well as its quality. In Europe, a macroprudential supervisor was created in 2011 (the European Systemic Risk Board), with the power to issue warnings and recommendations to states, national and supranational supervisors. Following one of its recommendations (ESRB 1/2013), macroprudential national authorities have been created in almost all European countries.

The interest on macroprudential policies and tools goes beyond banking regulation. A growing chorus of support is being developed for using macroprudential policies as an additional tool for macroeconomic policy. In this view, monetary policy should be used to target inflation, that is, price stability, (and output stabilization, like fiscal policy) while macroprudential tools could be targeted to the new goal: financial stability. From this perspective, there is not much interaction between monetary policy (and fiscal policy) and financial stability policies. They are two separated domains and should remain as such. Macroprudential tools should be able to tame systemic risk originated by large banks as well as that related to credit and financial cycle developments. Should a country face a too

² See Mencía and Saurina (2016) for a description of the macroprudential framework (*i.e.* indicators, instruments, objectives and policies) being developed by the Banco de España.

rapid credit growth, countercyclical and/or systemic risk buffers together with, probably, time changing liquidity requirements, should be enough to control it. Sometimes, the ambition set for this macroprudential arm of policy is not modest as their supporters claim that it could have a substantial impact on the management of the business cycle, by affecting the lending cycle, and/or some real markets (*i.e.* impact on housing market via changes in loan-to-value – LTV – and loan-to-income – LTI – ratios). In a sense, a new paradigm is emerging attributing a much larger role to macroprudential policies in order to deliver financial stability or even less output volatility. A practical materialization of this paradigm is to observe that some central banks are organized along three “business lines”: monetary policy, financial stability/macroprudential policy, and banking (micro) supervision.³

Against this view of macroprudential policies and instruments, there are other more nuanced views where monetary policy, fiscal policy and macroprudential policies are all of them interconnected. The empirical evidence suggests that the interest rates can have a long-lasting effect on financial conditions;⁴ for instance, in a lending cycle the level of interest rates may have an impact on the level of credit risk that the banking sector is willing to take. There is a growing amount of literature supporting this so-called risk-taking channel of monetary policy.⁵ Similarly, the tax treatment of equity and debt may have an impact on the level of leverage households and firms may want to assume. Targeted taxes to the housing market may contribute to put sand in the wheels of too exuberant developments in the land, commercial real estate and/or housing markets, contributing to tame lending to such sectors and, therefore, the risks of financial instability. Moreover, the explicit and implicit guarantees provided to bank deposits and senior debt may also have had an important impact on the speed of the lending cycle (*i.e.* the housing boom could have been very different if construction and real estate developer firms had to fund their expansion by issuing directly uninsured debt to investors). On the other side, there is certain evidence showing that specific macroprudential tools can also affect the business cycle.⁶ This view is especially adequate for countries that, like Spain, are (relatively small) members of a monetary union (*i.e.* limited ability to use monetary policy) and, now, with an also limited capacity of actively using fiscal policy to accommodate shocks.

The holistic view of the former paragraph is not yet supported by a fully fledged analytical framework. Moreover, the interrelationships among the three policy stances make the analysis complex and difficult to communicate to the public. In this respect, the aim of this paper is relatively modest. It tries to spur the debate of the usage of macroprudential tools, sketch the limits of what they can do and analyze the circumstances in which help from other policies may be required. We focus our analysis on Spain, as it has been one of the countries where the financial crisis has been more costly, even though some macroprudential tools were deployed well before financial imbalances developed in full. Besides, Spain is a member of the European monetary union, what could have relevant implications. Thus, section 2 looks at the lending boom and bust in Spain from a broad perspective, focusing on monetary, banking supervision, fiscal and macroprudential policies. Section 3 broadens the paper focusing at euro area countries and the challenges/opportunities for macroprudential policies that the lack of synchronization of the business and financial cycles under a common monetary policy may pose. Finally, in section 4 we conclude with some reflections extracted from the Spanish experience.

3 Haldane (2014) calls this the “3M” regime (monetary, macroprudential and microprudential).

4 See, for example, Zdzienicka *et al.* (2015).

5 See, for example, Jiménez *et al.* (2012, 2014) for an empirical analysis and Abbate and Thaler (2015), for a theoretical discussion.

6 See, for example, Vuletin (2014).

2 Boom and bust in Spain

As shown in Chart 1, the Spanish economy registered a remarkable output growth during fourteen consecutive years before the Great Recession. Spain even managed to escape from the dot.com bust which affected other developed economies. However, this was at the cost of growing external and domestic imbalances by the private sector that, when the bust came, made the adjustment deeper and the recovery wavering until recent times.

In the years that preceded the monetary union inception, Spain had devaluated the old peseta by more than 30%, so the exchange rate at the end of 1998 was relatively competitive. At the same time, important efforts were made to fulfil the Maastrich convergence conditions, especially by reducing public deficit and inflation. The perspective of joining the monetary union resulted in a deep and quick reduction in interest rates before 1999 (600 basis points in four years). Putting all together, it is obvious that the expansionary demand shock hitting the Spanish economy was of an unprecedented size. Besides, the level of indebtedness of the private sector was moderate (total credit to the non-financial private sector represented around 100% of GDP) and, a few years later, abundant liquidity around the world allowed important capital flows entering in the Spanish economy looking for safe assets, channelled partially via covered bonds (so-called *cédulas hipotecarias*) and RMBS (Residential mortgage backed securities).⁷

At that time, not only financing was cheap and abundant, intensive immigration flows were observed (4.5 million people entered in the country in the same period, out of a total population of 45 million), adding labour to the capital influx and, probably, reinforcing each other dynamics. According to Arce *et al.* (2013), these conditions could only result in an overdevelopment of the residential construction sector, not only in terms of prices but also in terms of activity. In fact, between 1999 and 2007 housing prices in real terms rose by 168% on a cumulative basis, the proportion of employment in those sectors increased from 5% to 13% and the weight of banking credit to the construction and real estate sector increased by 30 percentage points.⁸

Activity and employment in the construction sector started to diminish by the end of 2007, but it was at the turn of 2008 when the decline in activity spread to the rest of the economy and was substantially accelerated as a consequence of the international financial crisis. Initially, an expansionary fiscal policy was adopted and the financial sector was supported with liquidity measures. Later on, with the emergence of the Euro area sovereign crisis, fiscal policy turned restrictive, and the financial sector was restructured including important capital injections mostly on behalf of tax-payers. Besides, the accommodative monetary policy was counteracted by the segmentation of the financial markets in the Euro area. This, jointly with the deleveraging process of both households and firms, in a context of a protracted banking crisis and inflation well below the target, resulted in the important cumulative reduction in GDP already mentioned, as well as in a significant employment destruction. In fact, by the end of 2015, GDP was still 4% below the level reached in 2008Q2.

Analyzing how different policies reacted in such a situation could be of interest for policy makers in other countries facing a similar unprecedented expansionary shock.

⁷ For an analysis of the drivers of securitization in Spain, see Almazán *et al.* (2015).

⁸ Notice that the monetary union meant a process of interest rate convergence among country members with risk premium per country disappearing. This had an asymmetric impact across countries and assets. In particular, for Spain it meant a reduction in interest rates that had a positive impact on the prices of long term assets (as the discount factor decreased) such as houses. The initial pressure on prices may have not been met by the supply of assets given real constraints (*i.e.* available land, construction permits, the own building process...) so that prices jumped additionally, setting in motion a process that would end up in an overvaluation of houses and oversupply, but only years later.

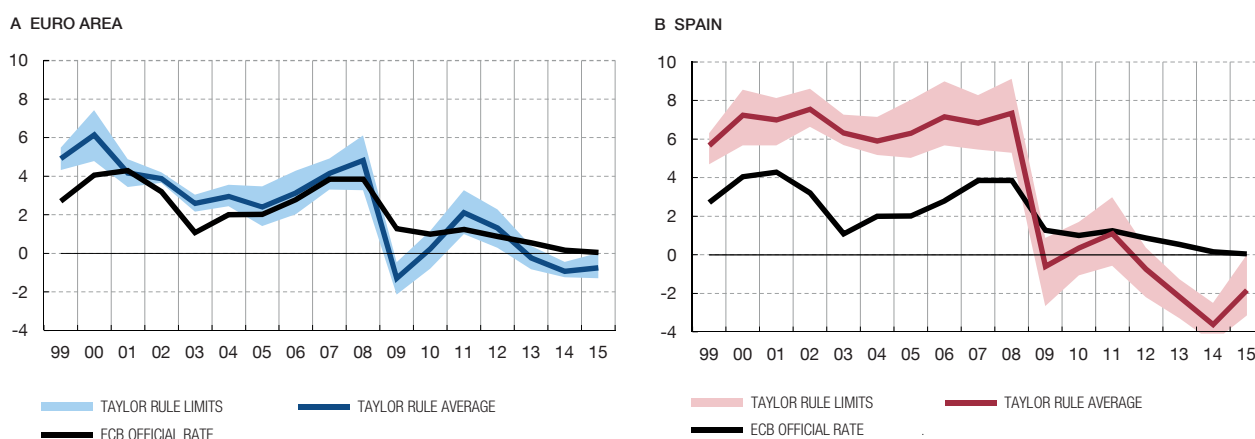
In the year 1999 the monetary policy in Spain was subject to a crucial structural change as a result of the monetary union. In being a member of that club, Spain gained in macroeconomic discipline, credibility and stability, but an important instrument of economic policy, the interest rate, was lost.

A simple way of analysing the monetary policy stance consists on calculating the deviations of the central bank policy rate from that implied by a Taylor rule.⁹ The Taylor rule is a rule of thumb for interest rate determination by the monetary authorities. It implies that interest rates will be above (below) the equilibrium rate when inflation is higher (lower) than the target and/or the output gap is positive (negative). A monetary union is characterized by a common interest rate for all the countries, so the inflation and output gap relevant would be those of the average conditions of the area as a whole.¹⁰ Thus, if there are divergences in the cyclical conditions or the inflation rate of the countries, monetary policy could be inadequate for them.

That seems to be the case of the Spanish economy. As can be seen in Chart 2 (panel A), before the Great Recession the ECB official rate was in line with that suggested by the Taylor rule for the euro zone as a whole. However, between 1999 and 2008 that common interest rate was permanently below that suggested by the Taylor rule for the Spanish economy (see Chart 2, panel B). As an average it was 380 basis points lower, reaching a maximum deviation by 2003 over 500 basis points.¹¹ This implies that real interest rates were negative most of that period. After the financial crisis the situation changed dramatically, as the intervention interest rate is now above that implied by the Taylor rule; the maximum divergence was reached in 2014, although it was also quite significant in 2015. In fact, the persistent indication by the Taylor rule of negative interest rates, which, from 2014, were also apparent for the euro area as a whole, suggested the need for unconventional monetary policy actions, which were finally adopted in a broad sense by mid 2014. In the Spanish case, this was more imperative when it is taken into account that the relevant interest rates for demand decisions in Spain showed a spread with respect to the euro area average, resulting from a fragmentation brought about by the sovereign

THE TAYLOR RULE

CHART 2

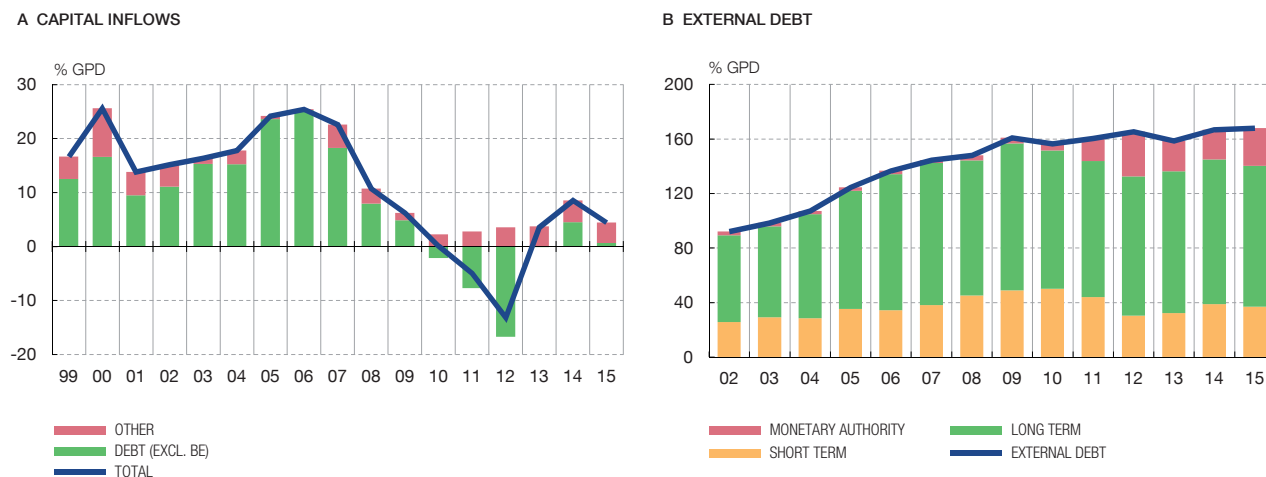


SOURCES: ECB, Eurostat and own calculations.

9 In deriving the Taylor rule we have followed the procedure proposed by Hofmann and Bogdanova (2012), with minor innovations. See Annex 1 for details.

10 This means that the inflation and output gaps of the member countries should be weighted according to the private consumption/GDP of each economy. Benigno and López-Salido (2006), show that optimal weights could be different if the intensity of nominal rigidities is not the same across countries.

11 See Jordà *et al.* (2014) for a similar line of reasoning.



SOURCES: Banco de España and own calculations.

crisis which diffculted the transmission of monetary policy in the euro area. After the programmes implemented by the ECB that spread has diminished, but it is still positive.

Besides, the interest rate does not fully reflect the very easy liquidity conditions that the Spanish economy enjoyed after the monetary union in 1999. As can be seen in Chart 3 (panel A), between 1999 and 2007 capital inflows represented around 20% of GDP, while in the years previous to the monetary union they were around 7%. They accelerated sharply since 2004 with the deepening of securitization, which went from close to negligible in the early 2000s to over 50 billion Euros of securities issued every year (over 5% of GDP).¹² In fact, most of this affluence of liquidity was in the form of debt instruments, which jumped from 5% of GDP before the monetary union to 15.5% between 1999 and 2008. Behind that behaviour could be the structural change associated with being a member of an area macroeconomically more stable, but also a combination of search for yield and for scarce safe assets that the Spanish economy produced by developing the real estate sector and securitizing mortgage loans. As a result of this substantial influx of capital from abroad, the stock of foreign debt to GDP increased from a 57.5% of GDP in 1998 to 148% in 2008 (see Chart 3, panel B).

After the financial crisis the situation changed radically, disappearing these flows, especially those based on debt instruments as a result of the reassessment of its soundness as well as their market prices.¹³ The Target system avoided a sudden stop.

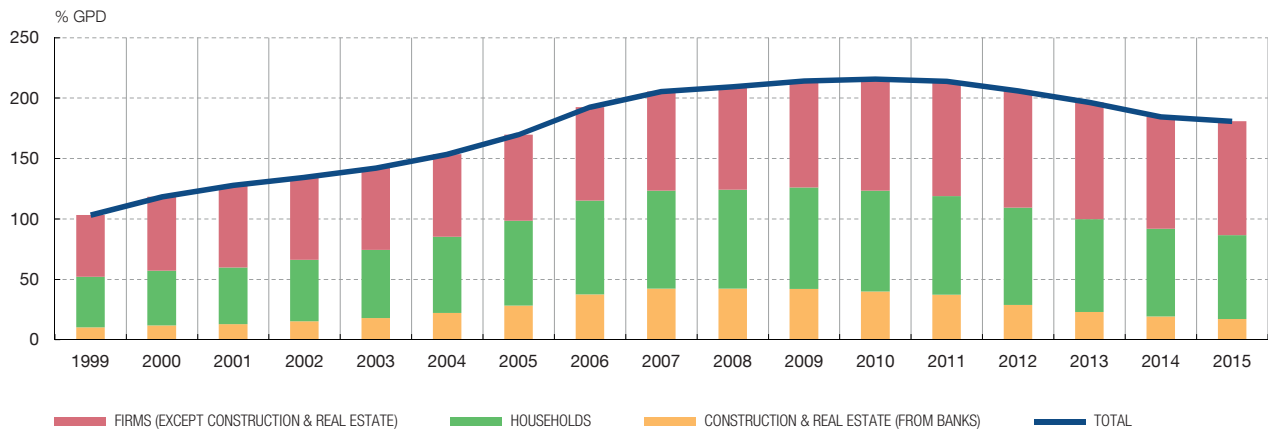
This long period of very moderate interest rates, abundant liquidity and financial innovation derived in a quick process of increasing indebtedness and risk-taking by banks in the non-financial private sector, which, as a percentage over GDP, increased from 103% at the beginning of 1999 to 206% at the end of 2007. It affected all the sectors, but especially the construction and real estate development activities. In fact, the bank credit to these

¹² See, for example, Jiménez *et al.* (2011).

¹³ Incidentally, asset managers are assessed (and paid) according to returns based on mark to market criteria. Therefore, even despite the low effective default rates in covered bonds (*e.g.* no default at all) and in Spanish RMBS, secondary market prices dropped substantially bringing about a rush for the exit of international bondholders, as soon as subprime crisis erupted and well in advance of the sovereign euro zone crisis. The decline in secondary prices was so pronounced that Spanish issuers (*e.g.* the banks) bought back some of these bonds booking a significant profit given the known and proven quality of the underlying assets (mortgages with a relatively low non-performing loan ratio).

NON-FINANCIAL PRIVATE CREDIT BY SECTORS AS A PERCENTAGE OVER GDP

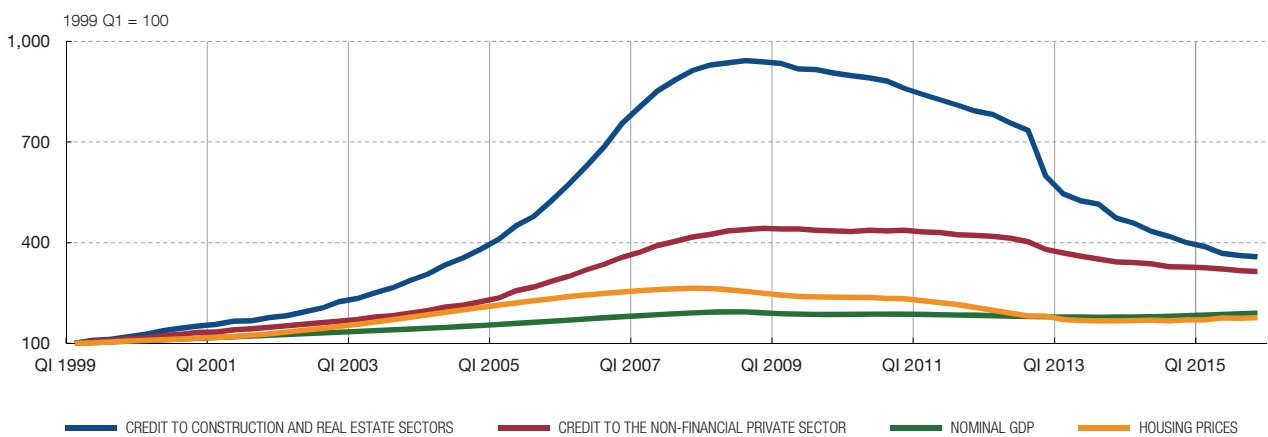
CHART 4



SOURCES: BIS, Banco de España and own calculations.

A SURGE IN CREDIT

CHART 5



SOURCES: INE, Banco de España and own calculations.

industries rocketed from 10% of GDP in 1999 to 42% in 2007 (see Chart 4), averaging nominal growth rates per year during that decade of 29%.¹⁴ The Chart also shows the intensity of the deleveraging process started in 2010, which accumulates a decline of 35 percentage points. This was achieved mainly through debt amortization, which is one of the most costly (in terms of growth) ways of doing it.

All in all, a lax monetary policy stance, given the specific circumstances of the Spanish economy at the time, abundant liquidity in international markets, search for yield and the development of securitization allowed channelling funds from international investors into the Spanish banking market so that a lending cycle was inflated at a much higher speed than local deposits evolved. Viewed in retrospect (see Chart 5), the surge in credit from 1999 (euro zone creation) till the beginning of the crisis (around 2008) was overwhelming. The correction afterwards has also been impressive. However, the participation of each individual bank in this credit expansion was different, as there were the lending standards applied by each of them.

¹⁴ A part of the increase of non-financial firms' indebtedness is the result of their international expansion. Some large Spanish firms have been borrowing at home (from Spanish banks mainly) to acquire assets abroad. While the funding is registered in Spain, the assets are abroad, providing a steady and diversified stream of income to those firms.

The need for macroprudential policies and tools in banking regulation and supervision becomes evident when the risk exposition and financial instability of individual banks are insufficient to assess and manage the systemic risks emerging as a result of complex interdependencies among financial agents, including banks, within countries and cross borders. However, there is evidence too suggesting that macro-prudential tools, to be effective, will have to be sensible to banking supervision practices that are at the core of microprudential tools.

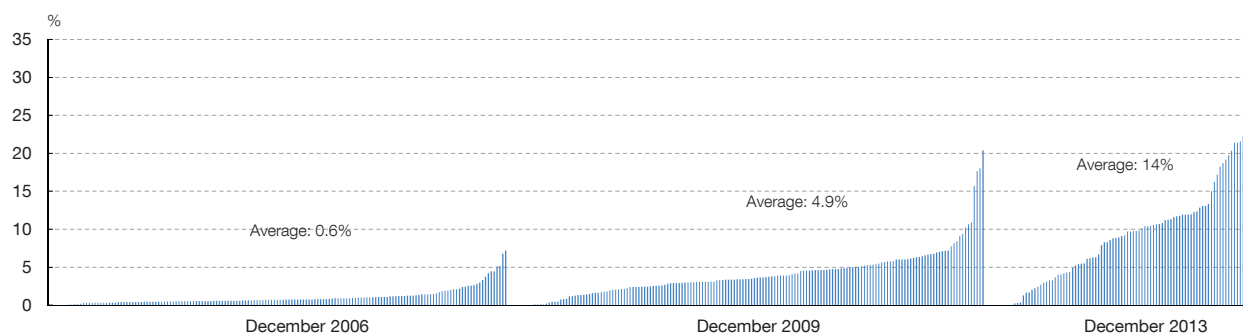
In this section of the paper we provide some evidence to highlight the relevance of a proper diagnosis of the behavior and performance of individual banks in managing risks in designing supervision practices and effective microprudential tools.¹⁵ We will concentrate mainly in the credit risk. The sensitivity of credit risk of individual banks to the business and economic cycle is well documented¹⁶. In periods of economic expansion the ratio of NPL of all banks comes down and in periods of economic contraction all go up. But much less is known on what happens to the dispersion of NPL ratios in periods of both economic expansion and contraction.

Chart 6 shows clearly how much NPLs can change along time and across banks with data from Spanish banks. NPL ratios of credit to the private sector were at the peak of the lending boom in Spain below 1%, with little dispersion across banks (December 2006). By the second date, December 2009, once the worst recession in more than 60 years had hit the Spanish economy, NPL ratios had increased 8 times on average and, what is more important here, the dispersion of ratios across banks had increased substantially, with differences among high and low NPL ratios of more than 10 percentage points. Data at December 2013, when the Spanish economy had gone through a second recession and the housing bubble had burst, reinforces the message. The average NPL ratio in December 2013 was more than 20 times the average in December 2006 and dispersion in the value of the ratio across banks has increased again, with difference between high and low NPL ratios across banks of more than 20 percentage points.

Why dispersion in NPL ratios across banks is lower in periods of economic expansion and higher in recessions would deserve a more thorough analysis. At this point one could

NON-PERFORMING LOANS RATIO IN THE NON FINANCIAL PRIVATE SECTOR BY CREDIT INSTITUTION IN SELECTED PERIODS

CHART 6



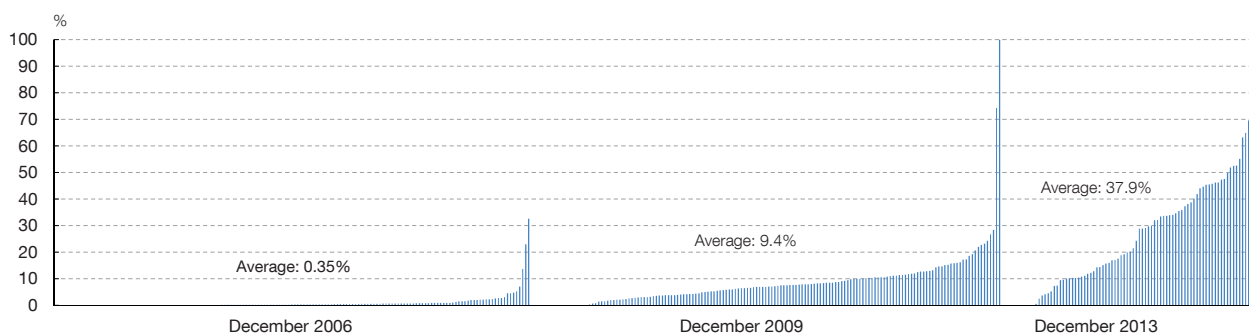
SOURCES: Banco de España and own calculations.

¹⁵ Our approach departs from Benabou (2009) collective delusions or groupthink and from Foote *et al.* (2012) wrong beliefs of borrowers and investors motives for the housing crisis. We do not exclude them, but we do believe that there were also other mechanisms at work with a significant impact in the final outcome. Our reasoning here is more in line with Schularick and Taylor (2012) as we analyze a large credit boom gone bust bringing about a systemic banking crisis.

¹⁶ See, among others, Rajan (1994), Salas and Saurina (2002) and Jiménez and Saurina (2006).

NON-PERFORMING LOANS RATIO IN CONSTRUCTION AND REAL ESTATE BY CREDIT INSTITUTION IN SELECTED PERIODS

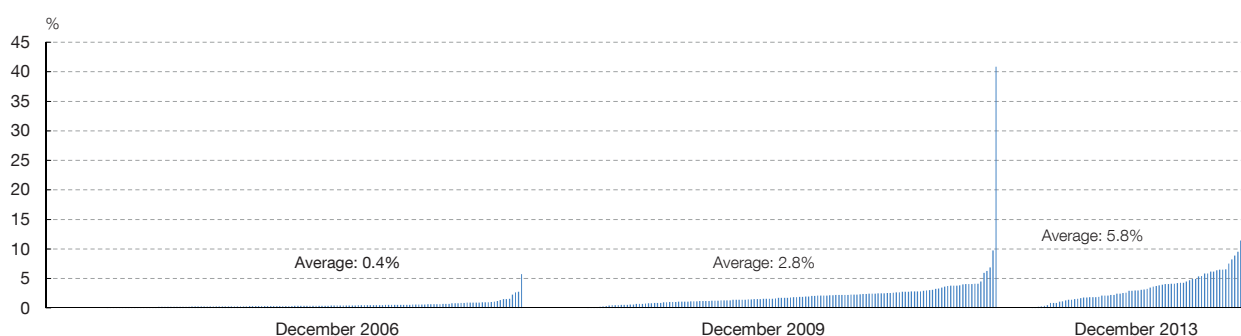
CHART 7



SOURCES: Banco de España and own calculations.

NON-PERFORMING LOANS RATIO IN HOUSEHOLDS MORTGAGES BY CREDIT INSTITUTION IN SELECTED PERIODS

CHART 8

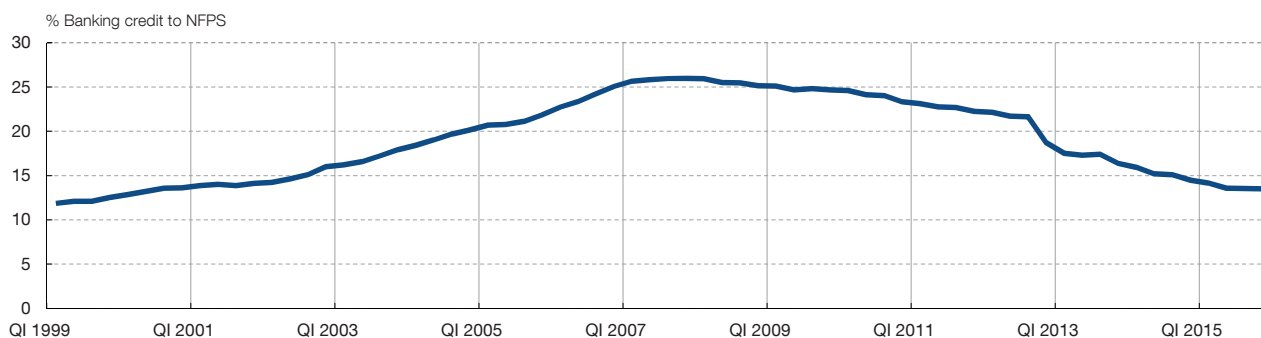


SOURCES: Banco de España and own calculations.

argue that the evidence in Chart 6 could be the result of different segment specialization by banks. That is, the differences could be just the result of some banks specializing on real estate funding (usually with a much higher NPL ratios during crisis) and others in mortgages (with usually lower NPL ratios). Charts 7 and 8 confirm that real estate exposures are much riskier than mortgages in Spain (average NPL ratio in end-2013 of 38% versus close to 6% in mortgages). However, more importantly, the pattern of dispersion of NPL ratios shown in Chart 6 appears again in both real estate and mortgage portfolios of bank loans.

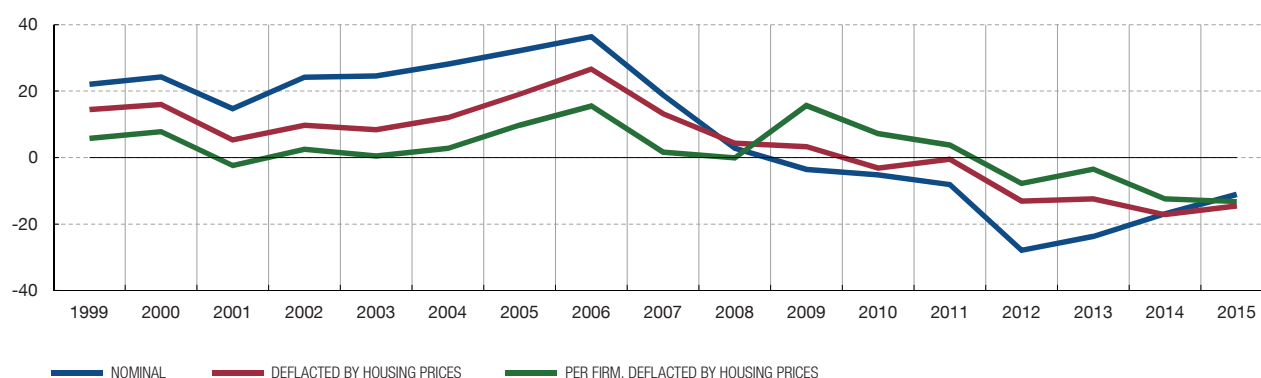
Since real estate loans are probably the most pro-cyclical ones (*i.e.* Chart 9 shows the evolution along the business cycle of lending concentration in construction and real estate exposures) it is worth mentioning here some additional features of lending to construction and real estate activities, observed in Spanish data. Chart 10 presents the growth rates of the bank credit to the construction and real estate activities in nominal terms (blue line), deflated by the housing price (red line) and growth of bank credit per construction firm (total credit divided by number of registered construction and real estate firms). During the expansionary period the average growth rate of the stock of credit to construction and real estate in nominal terms was 23%; this rate diminishes to 13% when it is deflated, and to 4% when it is calculated as growth of average credit per firm.

If one would compare these growth rates with growth of real GDP, which averaged a rate of 3.7% in the expansionary period, growth in credit per firm would have been considered “normal” and aligned with general trend of growth for the whole economy. The growth of



SOURCES: Banco de España and own calculations.

CREDIT GROWTH IN THE CONSTRUCTION AND REAL ESTATE ACTIVITIES



SOURCES: BIS, Banco de España, INE and own calculations.

total credit, in nominal and in real terms was quite above the “normal”. To understand the different patterns of growth in credit to construction and real estate in the aggregate and per firm it is important to keep in mind the common practice in the construction sector of creating an independent legal firm under limited responsibility for each separate construction project, probably to protect the construction firm from risks of insolvency, but translating the risks to lenders, banks in this case, if that insolvency occurs.

In the years of the crisis the restructuring of the construction and real estate sectors is done by closing down the numerous firms that were created in the expansion period. This is clear from Chart 10 if we notice that the fall in credit to the construction and real estate sector is high at the aggregate level but much lower in the credit per firm. Firms closing down in the recession were probably highly leveraged and if external collateral¹⁷ was low (since the crisis affected particularly hard the construction and real estate industry), the parent firms of these small subsidiaries attached to a particular construction project experienced insolvency situations in all the subsidiaries at the same time, so the insolvency of firms translated immediately into higher NPL of banks.

What lessons can be drawn from these analyses? One can reasonably associate the change in the average level of NPLs along the economic cycle to the macroeconomic developments, but the observed dispersion in NPL across banks in the recession period

¹⁷ See Jiménez *et al.* (2006) for the analysis of the determinants of bank collateral.

must respond also to other reasons. We conjecture that differences across banks must be, on average, the result of different lending standards in the boom phase. These differences in lending standards may in turn respond to different credit policies, different skills in screening and evaluating borrowers and their investment projects, to different compensation policies and managerial incentives,¹⁸ among other issues. The microprudential approach to banking stability must then reinforce the attention to banks' policies and behavior in order to link them with lending decisions in good times that will be more or less sensible to expose the bank to high credit risk in less favorable macroeconomic conditions. The second lesson has to do with the relevance of tailoring the microprudential tools and supervision practices to the idiosyncratic ways of doing business in each sector of economic activity, and in particular to the implications for credit risk of lending to business groups of legally separated firms, or to corporations that manage all their assets and activities under a single entity. Legal entities are protected by limited responsibility even if they belong to a business group (single management unit) so *a priori* the guarantees lenders call for in lending decisions should be determined under this premise. Finally, the industry dimension approach is also relevant. Thus, the industry dimension in determining credit concentration restrictions should be reinforced. In any case, effective banking supervision requires a sound risk diversification according to Basel Committee Core Principles [BCBS (2012)], which are a guide to bank managers and bank supervisors for properly monitoring risks at banks.

2.3 FISCAL POLICY

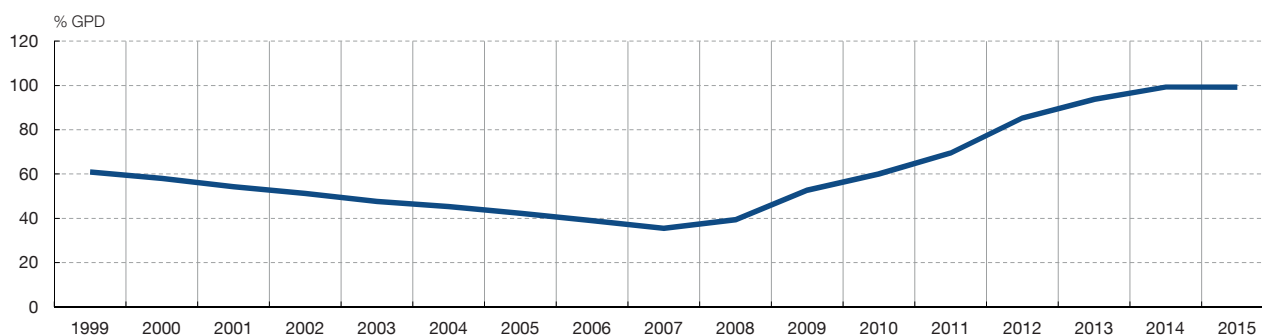
How can fiscal policy contribute to preserve the financial stability, if it has to? In this section we try to analyze some of the links between both macroeconomic policies using the Spanish experience.

From a long term perspective, fiscal policy can support financial stability by strengthening the incentives to capital financing. And not only in the case of financial firms, but also for non-financial companies and households. Currently, the fiscal system applies a more favourable treatment to interest payments than dividends, thus implying a departure from Modigliani-Miller hypothesis, which raises the relative price of capital with respect to debt so that fostering the incentives of both households and firms to increase indebtedness and leverage.

In the case of the financial institutions, BCBS (2010) presents evidence showing that higher capital ratios (*i.e.* lower leverage) reduce the probability of having a banking crisis, and, in case of having it, its costs in terms of GDP foregone. This result has been confirmed in the Spanish case using very long time series [Estrada and Argimón (2014)]. In the case of non financial companies, the fiscal treatment of interest payments in the corporation tax has implied that most of the globalization process of the Spanish firms undertaken in the last decades was financed by debt issued in Spain. Recently, a reform in the corporation tax has limited the possibility of deducting interest payments from the tax base. In the case of households, until 2013 they could also deduct part of the interest payments in their mortgages in the income tax, thus favouring low down-payments when buying a house.¹⁹ According to empirical evidence, low down-payments favour house price increases for a given interest rate [Bover (1992)] and increase the probability of default [Mayer *et al.* (2009)].

¹⁸ See, for instance, Williamson (1963), Esty (1997), Saurina and Shin (2012).

¹⁹ They could also deduct part of the principal, thus introducing a bias in favor of housing property instead of renting. Well developed and deep rental markets reduce the probability of housing bubbles [Arce and López-Salido (2011)].



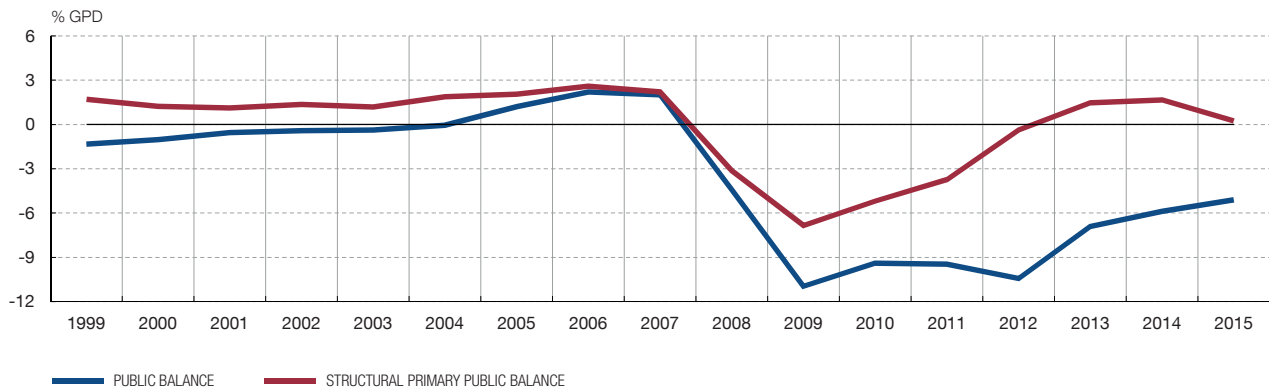
SOURCE: Banco de España.

Not only private debt, public debt is also crucial for financial stability, as banks usually maintain this asset in their portfolios. Therefore, a sound financial sector requires that fiscal authorities assure the sustainability of public debt. Sustainability is a forward looking concept that involves not only the current level of public debt, but also the future path of the public deficit. Thus, most of developed countries include in their laws explicit rules for the public deficit as a percentage over GDP and over maximum public expenditure growth. Besides, as the public pensions have characteristics of pay-as-you-go systems, internal automatic rules are being introduced in the regulation to face the aging problem. Spain is not an exception in this respect. In order to meet the Maastricht criteria on public debt (below 60% of GDP, see Chart 11), the main target of fiscal policy for joining the EMU was to reduce public debt, not only by constraining public deficits, but also by privatising public companies. By 2007 public debt had diminished to 36%, 30 percentage points below the average of the Euro area, helped also by the reduction in interest rates. Afterwards, it increased substantially, thus inducing a reform in the budgetary rules, introducing in 2011 the principles of the structural public balance equilibrium in the Constitution, and in the public pension system (2011 and 2013).

From a medium term perspective, fiscal policy can be used countercyclically to dampen the fluctuations of the business cycle beyond the automatic stabilizers built into the fiscal system. During recessionary periods activity diminishes, unemployment increases and, as a consequence, NPLs increase, damaging the profits of banks and consuming capital. Therefore, leaving apart direct support measures to the financial sector itself, fiscal policy can contribute to the stability of the financial system in these periods by sustaining activity and avoiding self-reinforcing negative spirals. In the expansionary periods it can also contribute to the financial stability by moderating the increase in activity.²⁰

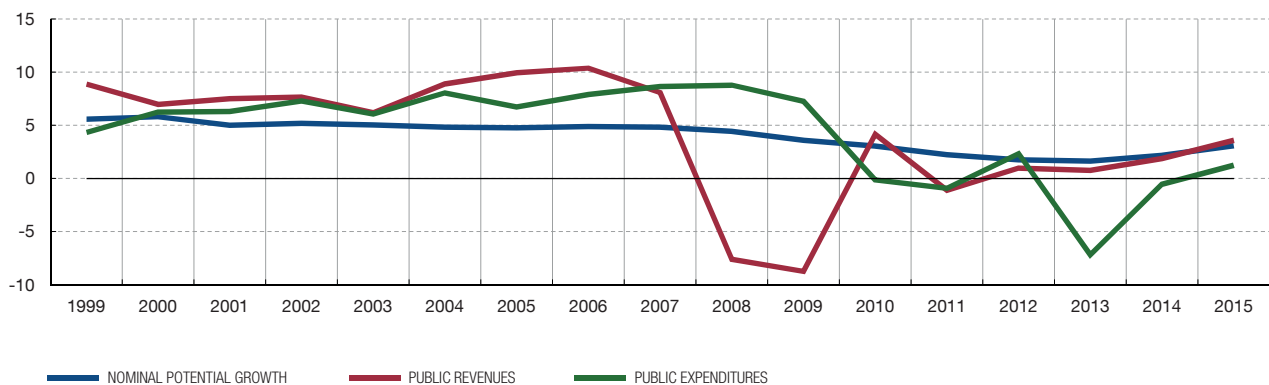
A look at the aggregate numbers of the Spanish public sector in the last fifteen years is revealing in this respect. As can be seen in Chart 12, at the euro inception public deficit was well below the limit established by the Stability and Growth Pact (3%) and it continued diminishing until reaching surpluses for three years in a row (2005-2007). The primary structural balance was in surplus all that period, and, in fact, it significantly increased from 2004 to 2007, signalling a restrictive orientation in fiscal policy. When the crisis erupted, both headline and structural public balances recorded a substantial deficit, thus reflecting an initial expansionary orientation of fiscal policy, which turned to contractive afterwards, as financial turbulences reached the country. However, these outcomes in terms of the

²⁰ There is evidence showing that the steepest the expansion the deepest the posterior contraction [Bordo and Haubrich (2012)], so another way to put a floor to the recession is limiting the previous expansion.



SOURCE: AMECO.

PUBLIC REVENUES AND EXPENDITURES GROWTH RATES



SOURCE: AMECO.

balances before the Great Recession were hiding increases in public expenditures well above potential growth (see Chart 13). Obviously, this can only be explained by public revenues, which were increasing even by more than expenditures. Part of that important increase of fiscal revenues was the result of automatic stabilizers, but other relevant part was the result of the overdevelopment of the housing sector. This revealed that not only fiscal rules on the balances need to be considered, but also on the public expenditure growth.²¹ After the recession, revenues severely contracted, while expenditures initially increased. Until 2014, revenues increased and expenditures diminished due to the discretionary measures adopted to control the public deficit.

But the capacity of the fiscal policy to influence the behaviour of some specific economic areas and, in particular, the housing sector, could be more interesting from the financial stability time perspective. The housing sector has played a capital role in the development of the recent banking crisis in Spain. However, Spain is not an outlier. There is overwhelming evidence showing the key role this sector plays in explaining financial instability both in different periods and across countries. In fact, the housing price is one of the indicators selected jointly with credit to estimate the financial cycle²² and it is almost always included

21 That kind of behavior was the motivation for introducing a public expenditure rule in the recent reform of the fiscal governance of the European Union.

See http://ec.europa.eu/economy_finance/economic_governance/sgp/index_en.htm.

22 See, for example, Claessens *et al.* (2011) or Borio *et al.* (2013).

in the group of leading indicators of banking crisis. Claessens *et al.* (2011) find that recessions are longer and its costs in terms of forgone GDP higher when there is a housing price burst.

Real estate activities are intensive in tax collection and taxes can influence the behaviour of the participants in these markets. In the Spanish case, capital gains are part of the fiscal base of the income tax, the corporation tax and a specific tax of municipalities; new house transactions are taxed by the VAT and second-house transactions by a specific regional levy; municipalities also collect taxes on land appreciation and obtain non-tax revenues by selling public land. Besides, the ownership of a house is also taxed by a local tax and imputed rents on secondary houses are also part of the fiscal base of the income tax. On the contrary, as we said before, until 2013 when a house was bought using a mortgage, part of the interest payments and the amortization of the principal were deductible in the income tax. These revenues constitute an important share of tax collection and were partly responsible of the unexpected increase in tax revenues during the expansionary period.²³

These taxes and fiscal benefits can be used to moderate housing demand, households leverage and housing price increase. Probably, the taxes most efficient in this respect are those related to the transmission of the real estate, as they impact directly and without delay on the housing market participants. The taxes whose fiscal base is the housing property will take more time to have an effect.

The evidence of the impact of housing taxation in housing prices in Spain is relatively scarce as very few changes in taxation were recorded in the expansionary period. During the recession some modifications have been introduced but mainly with the objective of increasing fiscal revenues. Some simulations by early 2000's pointed to reductions of housing prices between 16%-20% if deductions in the income tax were eliminated [López-García (2004)]. In fact, in the year 2006 this deduction in the income tax was cut; however, the reduction was moderate and, to some extent, financial sector innovation counteracted the measure, as long as the enlargement of mortgages maturity made non-binding the annual ceilings on the deduction. At the beginning of 2009 it was announced that by 2011 this measure for new buyers could be only applied by households with revenues below €24.000; in 2013 it was completely eliminated after being recovered in 2012. A look at the evolution of housing prices and transactions seems to show relevant effects of these changes in the income tax (see Chart 14). As can be seen, right after the 2009 announcement housing transactions (normalized by per capita income) changed their downward trend, showing increases during 2010. This increase in demand implied a slower reduction of housing prices (again normalized by per capita income). These trends were fully reversed when the measure become effective. At the end of 2012 something similar happened, although to a lower extent.

However, these effects could be just the result of the once for all nature of that measure. More insights could be obtained from the regional transaction tax for second hand houses. Before the financial crisis, all the regions had the same tax (7%),²⁴ but the fiscal consolidation process determined that some regions increased this rate in different years. In the year 2011 5 regions increased that tax by 1 or 2 percentage points; in the year 2013 8 regions increased it by 1, 2 or even 3 percentage points. Chart 15 suggests that the

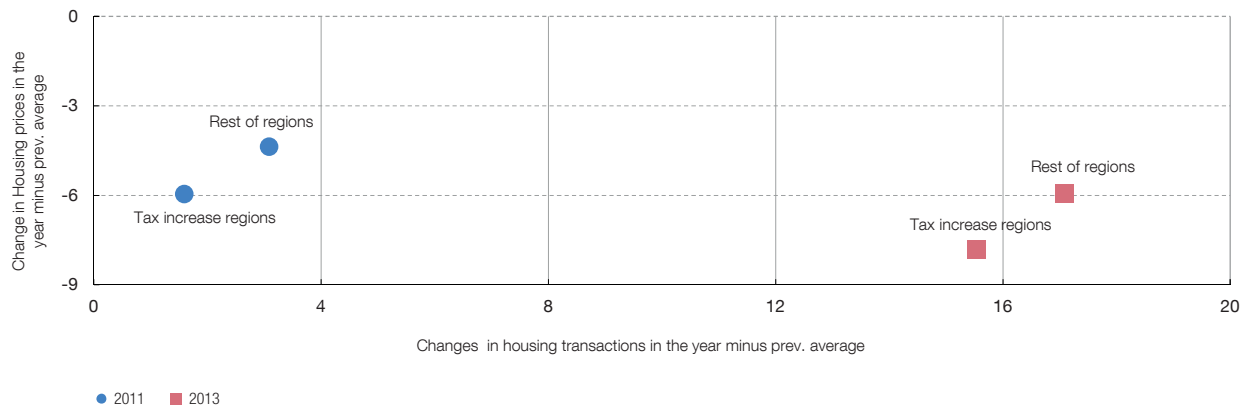
23 According to Castro *et al.* (2008), the fiscal revenues associated to the real estate overdevelopment explain two out of the four percentage points that fiscal revenues over GDP increased at that time. Obviously, when the burst came all these revenues evaporated.

24 Except those of the special (foral) fiscal regime (6%).



SOURCES: INE, Ministerio de Fomento and own calculations.

HOUSE PRICES AND TRANSACTIONS BY REGIONS AFTER TRANSACTION TAX CHANGES



SOURCES: INE, Ministerio de Fomento and own calculations.

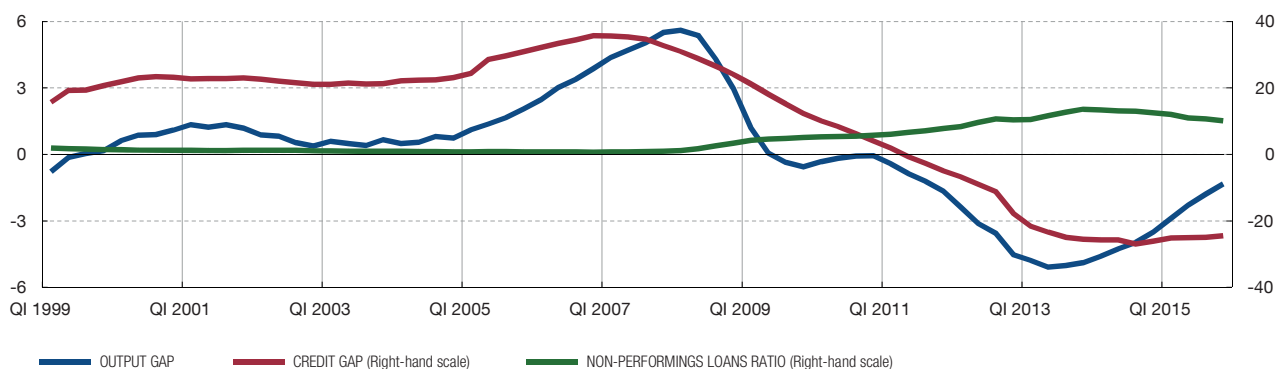
effects can be relevant. It presents the average change in house prices and transactions in the year after the tax was increased (minus the previous average change to control for the particular circumstances of each region) differentiating the regions where taxes were increased from the rest. In both years house prices declined by more in the regions that implemented rate increases and transactions increased by less.

The results presented here on housing taxation are only suggestive on the power fiscal policy can have on financial stability in the short term. Taxes over land and house transactions together with fiscal treatment of mortgages and debt in general may have a significant impact on lending booms fuelled by house price increases or excess indebtedness.²⁵

2.4 MACROPRUDENTIAL TOOLS

Spain implemented dynamic provisions in mid-2000, short after it joined the monetary union. Dynamic provisions are now counted as a macroprudential tool. At the time they were implemented, the idea was strikingly simple: banks should build up a buffer in good times to be used in bad times to protect its solvency. Jiménez and Saurina (2006) provide an empirical rationale for such a countercyclical provision. During lending booms banks relax their lending standards (including collateral requirements) so that loans granted in

²⁵ From a different angle, Piketty and Zucman (2014) point out wealth-income ratios in Spain at the peak of the housing bubble of 800%, even larger than those observed in Japan in the late 1980's.



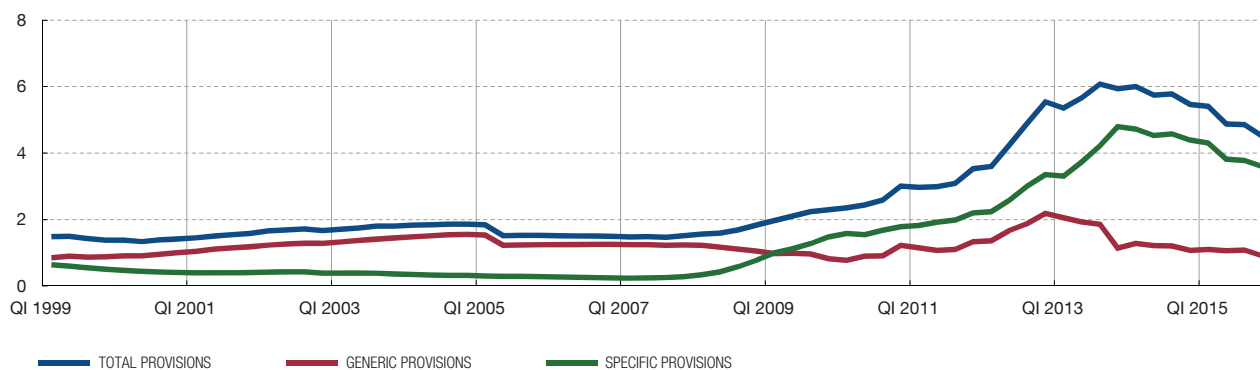
SOURCES: INE, Banco de España and own calculations.

good times are riskier. Competition is strong during booms so that risk pricing may be biased downwards. Bank managers' incentives do the rest. This evidence matches supervisory experience in the sense that lending mistakes happen in good times, when over optimism about loan prospects is abundant together with disaster myopia and fading memories of the last recession gaining weight among lender officials at banks. Therefore, it makes a lot of sense to introduce a surcharge in provisions to cope with credit risk mispricing and to build up a buffer to protect the bank when the recession appears and lurking credit risk manifests itself in a jump in NPLs.

Dynamic provisions evolved somehow along time, in order to adjust to IFRS (International Financial Reporting Standards) being imposed in 2005 as well as to the crisis impact. A detailed description of dynamic provisions working can be found in Saurina (2009a) while a first impact study is in Saurina (2009b). A more thorough and complete review of the performance of dynamic provisions along a full lending/business cycle can be found in Trucharte and Saurina (2013).

Dynamic provisions are governed by a simple formula with two components. The first component is proportional to the increase in the credit portfolio; with different buckets proportional to risk (*i.e.* the parameter for mortgages is lower than the one for consumption loans, which are riskier). The second component, the pure countercyclical one, compares the current level of specific provisions with an average of the cycle. In good times credit grows rapidly, NPLs are very low so that specific provisions are very small and, thus, the two components are positive which means that dynamic provisions are being accumulated. In bad times credit slows or turns negative, NPLs surge and so do specific provisions. The two components of the formula become negative so that dynamic provisions are drawn and booked in the profit and loss account of the bank in order to cope with credit losses and to protect the solvency of the bank.

Chart 16 reveals the three major characteristics of dynamic provisions. First, the base for the provision is not only a pro-cyclical variable (credit), but it is more volatile than the business cycle (notice that range of the right axis is six times higher than that of the left axis). Second, although the rates for the different buckets of risks are constant along the cycle, the average rate is also procyclical. This is a consequence of buckets of higher risks gaining relevance in the expansionary periods and losing it in the downturns. This implies that these provisions increase by more than credit and much more than GDP in the expansionary phases and decline by more than credit and GDP in recessions. In analogy with the fiscal theory jargon, these two characteristics imply a sort of "progressivity" to this provision.



SOURCES: INE, Banco de España and own calculations.

Third, the tool is fully automatic: no decision by the authorities is needed to accumulate or release the fund. The accumulation is activated when exposures increase and the release when loan impairments grow, as mentioned before. These two variables are positively and negatively correlated, respectively, with the business cycle. This is very similar to the working of the automatic stabilizers in fiscal policy.

As a result, general provisions have shown a pro-cyclical behavior, which has counteracted to an important extent the highly countercyclical pattern characterizing specific provisions. Thus, according to Chart 17, between 2000 and 2005 banks increased generic provisions by more than credit, compensating the progressive decline in specific provisions associated to the reduced ratio of non-performing loans observed during that period. In particular, the ratio of total provisions over total credit increased by 0.4 percentage points compared to a reduction in specific provisions of 0.3 percentage points. In 2005 the implementation of the IFRS in Spain implied a reduction in the ceiling for generic provisions that determined a one for all reduction in that fund, remaining quite stable afterwards. By 2008, after non-performing loans started to increase rapidly, the flow of generic provisions became negative, precisely when accounting rules determined a quicker accumulation of specific provisions. As the fund of generic provisions was positive, it was possible to use it (around 0.5 percentage points) in order compensate part of the increase in the specific ones (1.4 percentage points). Afterwards, the transitory improvement of the economic situation during 2011 was rapidly reflected in a new change in the trend of generic provisions, which increased additionally as a result of a one-off increase in the generic provision associated to real state exposures. The second dip of the economy during 2012-2013 and the corresponding increase in specific provisions were also cushioned by the use of cumulated generic provisions, although it was not enough to prevent a substantial decline in credit. More recently, the decline in non-performing loans in a context of still declining credit is determining a reduction in both general and specific provisions.

In fact, the available empirical evidence in Jiménez *et al.* (2016) supports the view of countercyclical provisions as a useful tool for macroprudential policy. It has affected the behavior of banks, generated countercyclical capital buffers and mitigated the credit cycle. In particular, after the introduction of the countercyclical provisions in 2000, banks reduced committed lending and tightened the general conditions for loans with the firms they used to work. Besides, that reduction was higher for those banks that had to provision the most. However, in these good times, firms were able, after three or four quarters, to redirect loan demands to those banks less affected by provisions, thus resulting in maintenance of the

overall level of borrowing. This last result also reveals the limits that macroprudential tools have due to leakage. In 2005, when countercyclical provision regulation was firstly modified, credit growth was also high. The empirical analysis results show a similar effect on credit to firms that after its introduction in 2000, but more muted, probably reflecting the relatively minor modification in the parameters.

On the contrary, by the end of 2008 a new modification in the regulation was introduced, diminishing the lower bound for the generic fund. This modification was introduced when the flow of credit was declining significantly, precisely to dampen that reduction. The evidence shows that the possibility of releasing more provisions in bad times helped in easing the credit conditions for firms and by most in the case of banks where the fund of provisions was closer to the floor. However, only well funded banks were able to ease the credit conditions to other firms they did not use to work with.

Thus, Spain was a pioneer among the developed countries in the introduction of countercyclical macro-prudential tools, despite the lack of interest from international regulators/supervisors at that time. In relative terms, dynamic provisions covered 1.1% of credit portfolios (1.5% for those with positive risk weights) and of almost 1% of total assets at the peak of the lending cycle. In terms of risk weighted assets, dynamic provisions reached 1.5% of credit risk weighted assets at the peak of the cycle, which is 60% from the maximum countercyclical capital buffer set at 2.5% in Basel 3. Dynamic provisions took around 15%/20% of the net operating income of each bank each quarter, which can explain the initial resistance of banks to dynamic provisioning, although they also acknowledged later on the proven benefits of these provisions in bad times. The assessment of dynamic provisions as a prudential tool must take into account that in the case of Spain were calibrated using the NPL and provision data of the 1993 recession, the worst in 30 years at that time, while, the macroeconomic shock that hit Spanish banks in 2008 and after was of a magnitude far much larger. GDP decline in 1993 was a bit more than 1% while in 2009 we had a 3.6% decline, followed by a double dip of another 3.3% in 2012 and 2013 altogether. It is clear that dynamic provisions helped banks to survive the crisis along other instruments and measures but, at the same time, they were not enough for some banks given the size of the shock.

All in all, in line with the holistic approach we spouse in this paper, a macroprudential tool like dynamic provisions should have been accompanied probably by other countercyclical tools, such as higher capital requirements in good times, LTV and LTI mandatory thresholds, closer scrutiny of lending standards, including concentration risk, collateral valuation policies, and remuneration incentives. But, given the size of the lending wave, fiscal and monetary policy measures leaning more against the wind may have also helped to tame that credit expansion. As mentioned before, monetary policy is set for the whole euro area, which opens the possibility for macroprudential instruments being potentially very useful for dealing with the time dimension of the lending cycle. We explore this issue in the next section.²⁶

3 Real and financial cycles in the euro area

Both academics and policy makers confer an especially relevant role to macroprudential policies in non-optimal monetary areas like the Euro area. The reason is that monetary policy cannot be used to stabilize the economy of a particular member when it is shocked by an asymmetric disturbance [Jeanne and Korinek (2014)], or when the reaction to a common disturbance is different due to the structural characteristics of that member

²⁶ Restoy (2015) argues along the same lines, insisting on the potential usefulness of macroprudential tools in monetary unions.

state. It could be argued that fiscal policy should play that role of macroeconomic stabilization. However, in the near future, the fiscal space is going to be very reduced in most of the Euro area countries.²⁷

Angeloni (2014) also recognizes that role for the macroprudential policy, but only to smooth out local credit cycles and having in mind that the final purpose should be enhancing the resilience of the financial sector. However, this author also sees the risk that it could “(re-)introduce a domestic dimension to credit and, indirectly, to monetary policy.” In fact, the interaction between monetary policy and macroprudential policy is a question of enormous interest. Most of macroprudential tools can have an impact on inflation and activity. For example, an increase in the capital requirements of the banks could increase the financing cost of the economy; higher leverage ratios could reduce the financial resources to lend; a reduction in the loan-to-value threshold could mean a cut in the value of collateral.²⁸ Macroprudential tools influence the transmission channels of monetary policy, both the traditional (substitution, income and wealth effects) and the balance sheet channel. Thus, it could happen that macroprudential policies reinforce the monetary policy decisions, but also that they counteract each other. Therefore, it is crucial the coordination among policies and member states.

The evidence on the co-movements of the business cycles in the Euro area is quite wide. Before the financial crisis, Giannone *et al.* (2010) showed how, after the monetary union, the country specific properties of the business cycles did not change significantly, and the dispersion, which declined considerably before 1999, remained quite stable afterwards. However, these conclusions were challenged by the financial crisis.

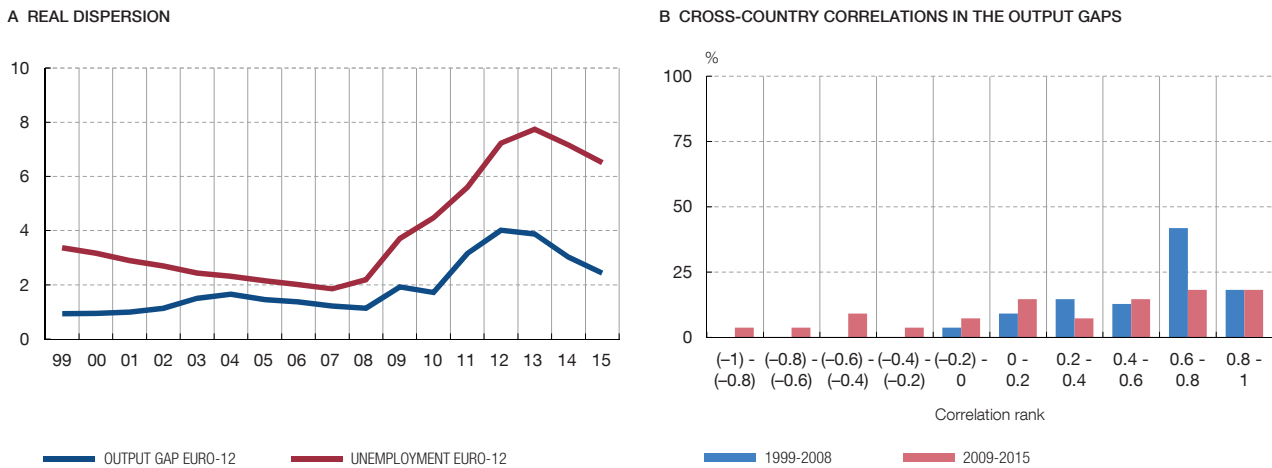
Chart 18 panel A reproduces the evolution of the unemployment rate dispersion²⁹ analyzed in Estrada *et al.* (2013), jointly with that of the output gaps. As can be seen, before the financial crisis there was a process of real convergence in the unemployment rate, while the cyclical synchronization among Euro-12 countries was quite high. After the financial crisis, dispersion increased substantially for both indicators, overpassing the levels observed at the inception of the monetary union. It is true that dispersion has tended to behave countercyclically in the past; however, the levels reached in 2012 and 2013 were much higher than those observed for the same countries in 1993-1995, or compared to the current crisis in other developed economies. In the last two/three years a steady reduction is being registered, which coincides with the implementation of important measures both at the euro area and the country level.

Panel B of the same Chart shows the histogram of the pair-wise correlations among the output gaps of the Euro-12 countries before and after the financial crisis. Before 2008, around 60% of the correlations were positive and relatively high (over 0.6). Besides, from a statistic perspective, there were no negative correlations; the distribution was clearly skewed to the right. After the crisis some countries have begun to diverge from others (20% of the correlations are negative) and the distribution has reduced its right skewness.

27 For instance, according to the European Commission, only five out of the nineteen Euro area members closed 2015 with a public debt ratio below 60%, the threshold established by the fiscal governance in the excessive deficit procedure.

28 A way to address these interactions could be through a cost-benefit analysis where the higher capital ratio reduces the output losses as it helps to containing banking crisis while, on the other hand, it increases the cost of lending and, thus it reduces the output of the economy. The huge cost of this last banking crisis in Spain and elsewhere probably will tilt the balance in favor of higher capital ratios for many years to come.

29 Calculated as the annual cross-country standard deviation of the corresponding variable. Using the first differences of the unemployment rate to proxy the cycle barely modifies this Chart.



SOURCES: Eurostat, AMECO and own calculations.

Thus, from the point of view of the business cycle, it seems that it is necessary to widen the tool kit of macroeconomic policies available for the national authorities to modulate the business cycle in a monetary union that, necessarily, applies the same monetary policy among all its members and at a time where fiscal room of maneuver is very small. An alternative better option would be the Euro area giving additional steps in order to mimic as much as possible to a fully fledged monetary union. Some steps are being taken in this direction by, for example, implementing the Banking Union. However, the fiscal dimension and, finally, the political one, should not be forgiven. Meanwhile, macroprudential policy could fulfill that necessity, although oriented to financial stability.

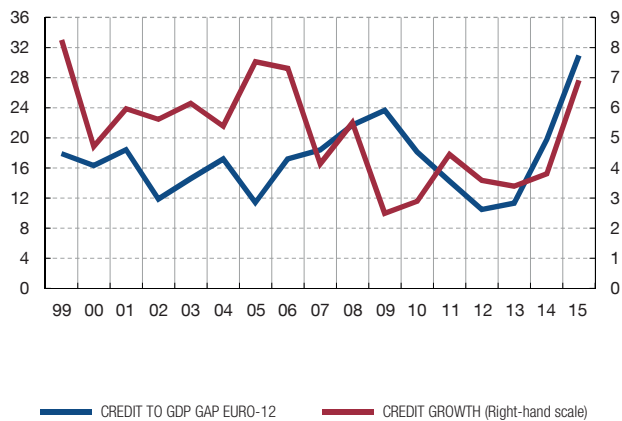
Financial and business cycles are not the same. Claessens *et al.* (2011) show that financial cycles are longer and sharper than business cycles. However, the synchronization degree between both cycles is quite high when the financial cycle is proxied with credit or housing prices. In the Euro area in particular, Haavio (2012), finds that financial cycles measured with house prices tend to precede business cycles and measured with credit to GDP to lag them. Less analysis has been made with respect to the synchronization of financial cycles across the Euro area member states. Here we present some exploratory results using the same tools than with the business cycles. We consider two variables to capture the financial cycle: the credit to the nonfinancial private sector to GDP gap calculated as recommended by the BIS³⁰ to activate the countercyclical buffers and the real credit growth.

As can be seen in Chart 19, the results are somewhat different from those of the business cycle. Starting with the panel A, the dispersion of the credit to GDP gap is higher than that of credit growth. Besides, the dispersion in both indicators of credit conditions is higher than that of the business cycle. Therefore, although the Euro area countries had to satisfy certain convergence criteria, being among them financial variables like the interest rates, the financial conditions in terms of volumes were far from being homogeneous at the monetary union inception.

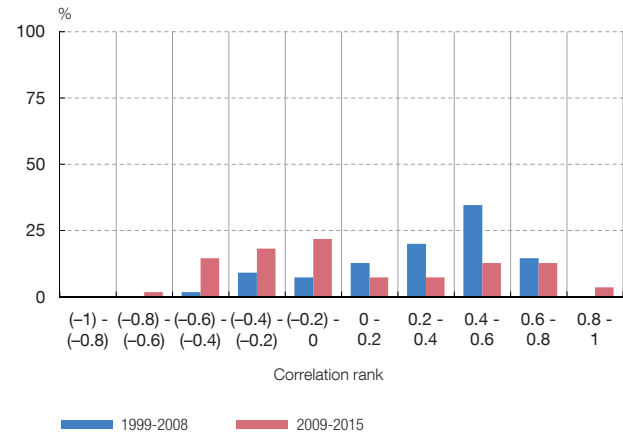
In fact, the evolution of the credit indicators has been quite different since the monetary union creation. Although in the first years of the Euro, both indicators pointed to a

³⁰ See, for example, Drehmann and Tsatsaronis (2014).

A FINANCIAL DISPERSION



B CROSS-COUNTRY CORRELATIONS IN CREDIT GROWTH



SOURCES: Eurostat, AMECO, BIS, ECB and own calculations.

σ -convergence of the financial cycles in the area, by 2001 credit growth started to diverge, and by 2006 the credit to GDP gap. In both cases, the divergence started well before that of the business cycle, that in fact, by that time suggested a higher synchronization degree. At the years 2005 and 2009 the divergence of both credit indicators reached a maximum close to the level observed in 1999. The financial crisis determined a process of convergence that, apparently, has not had continuity in recent times. However, this is mainly due to the important declines of credit observed in Netherlands in 2014 and 2015.

Panel B of Chart 19 shows that in the expansionary years of the monetary union, the co-movements in the credit growth among countries were positive, but the right skewness of the distribution was lower than that of the business cycle. After 2008 the distribution of the co-movements of credit growth has also flattened, appearing again quite high negative correlations. Thus, although the dispersion in credit growth has diminished after the financial crisis, it has been the result of very different paths in the different countries. The same chart using the credit to GDP gap provides a totally different outcome, a polarized distribution of highly negative and highly positive correlations before the recession and highly positive afterwards. These results can be interpreted as if the financial divergences before the crisis produced the illusion of a real convergence process that disappeared when they become unsustainable and the real adjustment took place [Praet (2014)].

Thus, it seems of crucial relevance to stabilize the financial cycle and to avoid financial divergences to arise in the euro area, also with the aim of not distorting the process of real business cycle convergence. Therefore, country specific macroprudential policies will have an important role to play in the euro area, as well as the ability of the ECB to top up them, which will counter any inaction bias national macroprudential authorities may display, at the risk of some overdoing.

4 Conclusions

The huge lending boom and bust that the Spanish economy underwent since it joined the euro is, probably, a unique experience. It is relevant for both policy makers and academics interested in learning more about macroprudential policies and the real working of some of its instruments (countercyclical capital or provision buffers). The case of Spain is of particular importance because, as members of a large monetary union, monetary policy

decisions are based on the average needs of a large number of countries, while banking supervision is now subject to common methodologies applied by the SSM.³¹

Lending standards set by individual banks as part of their credit policies are key for ensuring safety and soundness of banks as well as for reducing systemic risk. The observed dispersion in NPL across banks that experience the same macroeconomic shock and are subject to the same capital standard regulations, suggest the relevance of better understanding the micro foundations of lending decisions of banks, and incorporating the lessons from the analysis into supervision practices instrumented at the microprudential level. Lending standards and policies of individual banks, understood in a broader sense (screening and monitoring of borrowers, limits to concentration of risks, the organization for the evaluation of collateral, corporate governance, compensation policies) should be strengthened within regulatory and supervision principles and practices. To comply with Core Principles [BCBS (2012)] regarding credit risk is a good starting point to avoid trouble further down in the lending cycle, although the issues related to credit risk maybe too diluted among the long list of principles and practices contemplated.

Macroprudential policy may not be equally important across countries and periods. It seems particularly more suited for (non-optimal) monetary areas than for countries that are fully in charge of monetary, fiscal and regulatory policies. Europe offers now a fertile ground to test this hypothesis with countries inside a large monetary zone with diverging business and financial cycle positions, while other countries outside the euro zone, either inside the European Union (UK, Sweden) or outside it (Norway, Switzerland) may be experimenting pressures in some markets (e.g. housing) under a better economic shape. Similarly, periods where monetary policy is focused on avoiding significant output losses and where fiscal room of manoeuvre is almost inexistent, macroprudential tools may be the only instruments left to reduce systemic risk in both dimensions, along time and across banks.

Macroprudential tools are in line with a prudent way of conducting public affairs: build up buffers in good times to be used in bad times [Crockett (2000)]. A very simple but powerful idea which, of course, is not new and is very close to automatic stabilizers in fiscal policy. This extended experience in the design of fiscal tools may be also taken on board now that the development of macroprudential tools is in their first steps, even though the average duration of a financial cycle is larger than that of the business cycle.

Macroprudential tools aims are different from microprudential ones. Given the fact that macroprudential and microprudential tools (capital and liquidity ratios) are similar or even identical, the degree of coordination between macro and microprudential authorities should be as high as possible, in particular given the importance of monitoring the lending standards of each bank. The countercyclical capital buffer is such an example. During good times the buffer increases, helping to tame the lending cycle and/or building a nest that can be used in bad times. Basel 3 proposal is relatively automatic in terms of the build up as a function of the distance of the current level of credit to GDP to its trend. To be effective, the countercyclical capital buffer needs to be released in bad times, so that bank capital requirements are softened and banks do not feel the need to comply with them by trimming lending. Bank micro supervisors may be reluctant to release bank capital in bad times. If the microprudential view dominates, banks will reduce lending, unless convinced or forced to raise capital at a not very convenient time. Second round effects of that kind

31 Some of the lessons may not be too different from the ones taken from other countries that have also endured a large banking crisis (US, UK...) but still, the monetary union membership confers to the Spanish experience an additional value added.

of decisions may be a deepening of the recession that could erode the capital raised initially, leading to a self-defeating policy. From a macroprudential point of view, it is crucial to increase capital in good times so that banks have margin to reduce it in bad times without hurting too much the economy. The evidence we have for the Spanish case is compelling on that policy and the benefits it brings.³² Therefore, a close cooperation between micro and macroprudential authorities is needed.

Similar to automatic fiscal stabilizers, countercyclical macroprudential tools should be automatic in both the build up and the release, if we want them to perform a macro service. This does not imply eliminating the possibility of adopting discretionary decisions, but in exceptional circumstances and conditioned to a predefined plan for its release. One way to achieve at the same time separation and coordination of micro and macroprudential policies is by allocating the latter to a central bank, which is used to measure and manage the business cycle as well as systemic risk. If the central bank is also responsible for micro banking supervision (as, for instance, it is the ECB since November 2014 once the SSM has been set fully in motion, or is the case of the Bank of England now), the potential conflicts of interest are at least internalized. In any case, it is still important that inside a central bank with bank supervision, both areas, macro and microprudential supervision are separated so that one cannot stifle the other and both views are heard inside the central bank.

In any case, a significant amount of modesty is needed when designing and putting in place macroprudential tools. The holistic approach, precisely, hints that macroprudential tools are just a part of the toolbox of the policy maker and not always the most powerful ones.

Finally, we would like to end up this essay by summoning researches to do more work on the interaction between monetary, fiscal, micro and macroprudential policies. The Spanish boom and bust lending cycle hints towards the need to analyze thoroughly not only the individual policies, as we have done in the paper, but also their potential interactions. For that purpose, we need to develop an analytical framework where heterogenous agents (*i.e.* households, non-financial firms, banks, government...) interact with each other, incurring credit risk, with potential significant systemic risk and real effects in response to both internal and external shocks, while at the same time there is a central bank with monetary policy, micro and macroprudential tools to be deployed to counter systemic risk and real effects damaging welfare. In this framework we will be able to find advice on which is the optimal mix of tools to maximize welfare and/or to minimize systemic risk. The task is not easy but it is worth pursuing.

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³² See Jiménez *et al.* (2016).

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Annex 1. Derivation of Taylor rule

The Taylor rule has been obtained using a relatively standard procedure [Hofmann and Bogdanova (2012)]. The concrete expression is the following:

$$i = c + r^* + \pi^* + 1.5 (\pi - \pi^*) + 0.5 (y - y^*)$$

where i is the relevant interest rate for the monetary policy, r^* the long term real interest rate, π the inflation, π^* target inflation, y the GDP and y^* its potential level. c is the constant that makes the residuals of this relation zero in the average of the sample period.

Thus, this expression shows how the monetary policy intervention interest rate increases when positive deviations of inflation from its target arise. This coefficient should be higher than 1, to guarantee that real interest rates increase that inducing a downward adjustment in demand. Interest rates also increase when the output gap is positive, to drive demand to potential output.

In the empirical approximation two inflation indicators are considered: headline and underlying. Underlying inflation excludes the prices of energy products and non-elaborated food, which allegedly react more to specific supply shocks than to demand pressure. That way we adopt a neutral view on how monetary policy should react to sectoral supply shocks that could imply second round effects on other costs in the future. The inflation target corresponds to that announced by the corresponding central bank; when such a target did not exist, an average of inflation in the sample period is used.

We consider three estimates of potential growth: i) the H-P filter with smoothing parameter 10; ii) H-P filter with smoothing parameter 100 ; and the estimate of the IMF, which relies on a structural model.³³ The first statistical filter implies shorter and less persistent cycles compared to the second one. The IMF procedure is more robust from an economic perspective, as it considers the informational content of other variables to estimate potential growth.

Finally, the long term interest rate is proxied with the growth rate of potential output. As, theoretically, potential growth should be equal to the relevant user cost of capital, a constant is allowed in the Taylor rule to capture the depreciation rate and the risk premium investors have to pay. In this empirical application, that constant shows a structural break in all the countries analyzed in the new millennium.

³³ These estimates can be found in: <http://www.imf.org/external/pubs/ft/weo/2014/01/weodata/index.aspx>.