BOXES

The financial situation of households, and particularly their level of indebtedness, can affect their spending decisions. The debt/income ratio of Spanish households – a standard indebtedness indicator – rose significantly up to 2010 and has subsequently declined, also significantly. However, it remains high compared both with past periods of economic recovery and with other developed countries. This box analyses the implications for recent and future consumption patterns.

Panel 1 compares consumption patterns among different groups of households, according to their level of indebtedness, and shows that the most marked decline in consumption during the crisis was among the most highly indebted households. Further regressions to explain household level consumption growth on the

basis of income, wealth and indebtedness levels confirm this inverse relationship between debt and spending.[1]
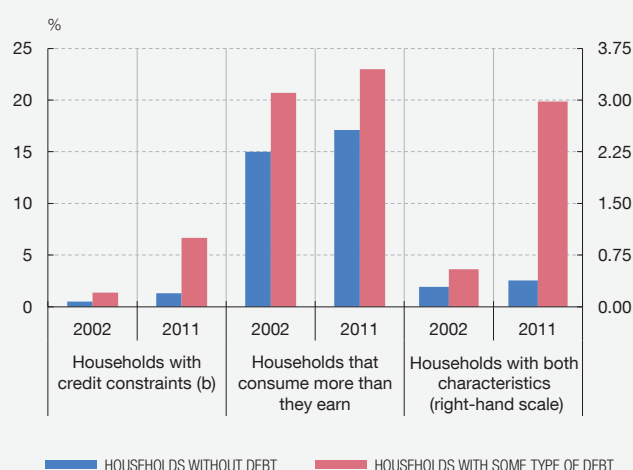
However, for a more in-depth analysis of the possible effects of the present indebtedness levels on Spanish household consumption (and, therefore, on the economic recovery momentum), a further angle must be included in the study, namely the behaviour of households that have no ability to save after debt servicing and that find it more difficult to access new credit. Panel 2, obtained from the Spanish Survey of Household Finances (EFF), depicts the percentage of households whose annual spending is in excess of their income and the percentage of households that reported credit

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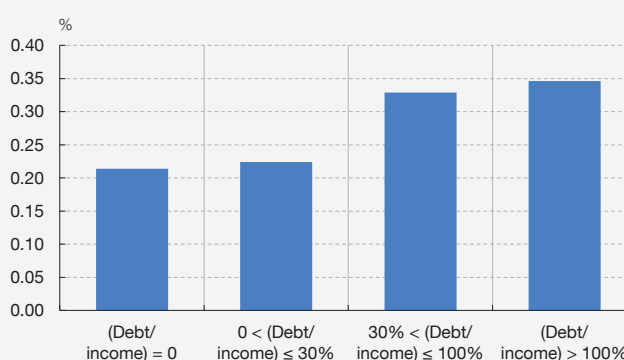1 See Casado and Folch (2015) for more details on these findings.

1 CONSUMPTION GROWTH

HOUSEHOLDS WITHOUT DEBT   HOUSEHOLDS WITH SOME TYPE OF DEBT   HIGHLY INDEBTED HOUSEHOLDS (a)
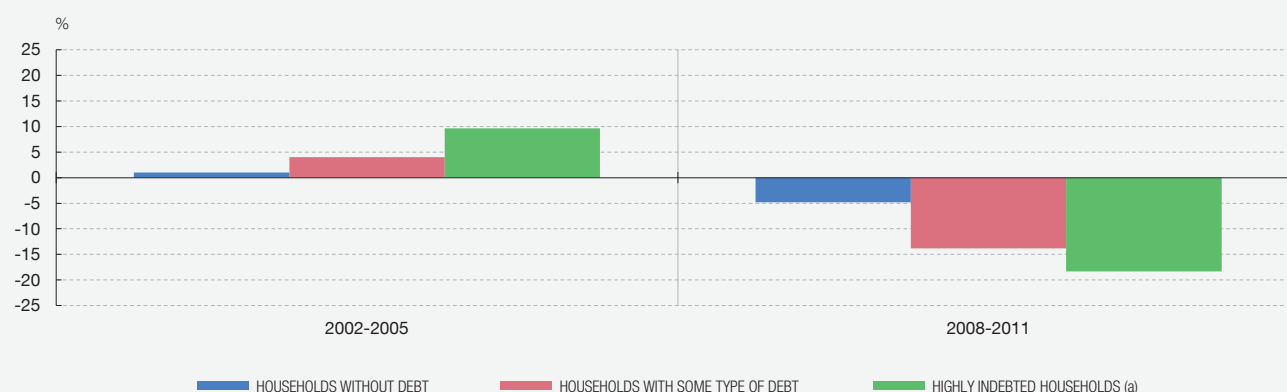
2 HOUSEHOLDS WITH FINANCIAL DIFFICULTIES

HOUSEHOLDS WITHOUT DEBT   HOUSEHOLDS WITH SOME TYPE OF DEBT

3 RESPONSE OF CONSUMPTION TO CHANGES IN INCOME BY DEBT LEVEL (c)

SOURCE: Survey of Household Finances (EFF).

a Households that have a debt/income ratio of over 300%, a debt/wealth ratio of over 75%, or who pay more than 40% of their income on loan interest and principal repayments.
b Households with credit constraints are defined as those whose loan application has been partly or fully rejected.
c This panel shows the elasticity of consumption to income. See J.M. Casado and M. Folch (2015) for further details.

constraints[2] (as well as the percentage of households that simultaneously conform to both criteria). As may be observed, these figures are clearly higher for indebted households and they have risen during the crisis. For these households, consumption growth relies more on their current income than on possible expected increases in their future income, as these cannot be transformed into spending until they actually materialise. The above-mentioned regressions confirm this hypothesis and show that the consumption response to changes in (current) income rose during the crisis. Panel 3 depicts the estimates of this response for different groups of households, according to their level of indebtedness, and shows that higher consumption associated with higher income is most marked among the more highly indebted households.

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2   Defined as the proportion of households whose loan applications have
    been partly or fully rejected.

Accordingly, the conclusion may be drawn that high indebtedness levels among Spanish households have adversely affected household consumption, which was to be expected, but at the same time that they have also rendered it more sensitive to changes in current income. This increased sensitivity of consumption to current income helps to explain the recent growing momentum in household consumption, in light of the clear recovery observed in household income. It also signals that, in this recovery phase, the improvement in employment could have a comparatively more positive effect on consumption than in comparable periods in the past. In any event it should also be recalled that the still-high level of indebtedness makes household demand more sensitive to changes in borrowing costs, although in the medium term a sharp rise in interest rates that could have a significantly contractionary effect on household spending levels is unlikely.

The Spanish economy, on balance of payments data, again recorded net lending in 2014 (1.2% of GDP), although the level was lower than in 2013 (2.1%). This box identifies the variables that contributed to the slowdown in the improvement in the external balance in 2014, as well as the factors underlying its behaviour, in an attempt to determine the effects of the recent moderation on the external balance.

Both the current account balance and, to a much lesser extent, the capital account balance helped to reduce the external surplus last year (by 0.6 pp and by 0.3 pp of GDP, respectively). In relation to the current account, the component that caused the largest reduction in its balance (to 0.8% of GDP, from 1.4% the previous year) was the goods and services balance, the surplus of which shrank notably in 2014 (by 0.8 pp to 2.6% of GDP). In contrast, the primary and secondary income balances improved slightly (by 0.2 pp, to -1.8% of GDP).

The deterioration of the goods and services balance was a result, in turn, of the reduction in the non-energy goods surplus, which was only partly mitigated by the improvement in the energy goods and services balances (see Panel 1). In particular, as regards goods trade, the sharp recovery in non-energy imports counteracted the growth in exports (see Panel 2), which continued to gain world market share, and the positive impact on the energy bill derived from the decline in the price of oil, which became more obvious by the end of the year.[1] Accordingly, most of the reduction in the current surplus in 2014 was notably due to external purchases of non-energy goods, while exports continued to grow at a high rate.

The healthy performance of goods exports, which since the start of the crisis have grown at a faster rate than world demand and price competitiveness,[2] reflects the impact of several developments that, together, would indicate that there has been a certain structural change in their behaviour. A simple way of illustrating this possible effect is to analyse whether the relationship between exports and their determinants has changed during the crisis. The historical relationship between these variables is therefore estimated for the period 1998-2008 and, on the basis of this estimate, the growth of exports is predicted for subsequent years using the observed path of world demand and the competitiveness of Spanish products.[3] If the predicted path of exports is similar to the actual path then there would appear to

have been no change in the relationship between this variable and its determinants.

As seen in Panel 3, exports have grown systematically at a faster rate than predicted by the estimated equation, which suggests that there have been significant changes in the historical relationship between external sales and their determinants. The geographical diversification of exports, the increase in the number of regular exporters (15.6% more than in 2008) and, also, the increasing internationalisation of SMEs would explain the improved performance of exports, in relation to their determinants, in the most recent period. Especially important, given the average small size of Spanish companies, is the increasing role of SMEs in recent export developments (see Panel 4). Without a doubt, the wage moderation that began in 2010, along with the consequent competitiveness gains,[4] has facilitated the internationalisation of Spanish businesses and their penetration of increasingly competitive markets, since their lower costs have enabled Spanish firms to access markets in which prices were low in comparison with production costs in Spain. Against this backdrop of recovering cost competitiveness, the attractiveness of the Spanish economy as a destination for direct investment flows has increased, which has had a positive impact on the efficiency and competitiveness of the target firms. Thus, insofar as a large part of the competitive adjustment achieved in recent years has been of a structural nature, the level of exports can be expected to remain higher in future.

With regard to imports, as mentioned above, one of the most significant developments in 2014 was the sharp recovery in purchases of goods from abroad. In order to try to determine whether this surprisingly sharp increase was a consequence of a change in the historical relationship between imports and their determinants (basically final demand and competitiveness) or of the latter's own behaviour, a similar exercise to the one described for exports was performed. On this occasion, the growth of total imports is observed to have been in line with that derived from the estimated prediction, so that there does not appear to have been any significant change in the historical relationship between purchases from abroad and their main determinants (see Panel 5).

A similar conclusion is reached for 2014 when this analysis is performed at a disaggregated level, except in the case of imports of non-energy intermediate goods,[5] which continued to grow at a faster rate in 2014 than would have been expected on the basis of the behaviour of their main determinants, reflecting the dynamism of certain vertically integrated industries (e.g. the car industry).[6] By contrast, the notable rise in consumer durables and capital goods imports is in keeping with the greater buoyancy displayed by these components in final demand (see Panel 6).

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1   The energy bill appears to have fallen by 5% in 2014 as a whole (0.2 pp of GDP). This decline reflects the impact of cheaper oil (8%), while the energy balance in real terms deteriorated by 2.7%. The decline in the oil price predicted for 2015 can be expected to reduce the energy bill further this year. On average, the energy bill falls by around 0.5% of nominal GDP for every €10 by which the price of a barrel of oil declines.
2   García, C. and E. Prades (2015), "Actualización de la función de exportaciones españolas de bienes", *Boletín Económico,* April, Banco de España.
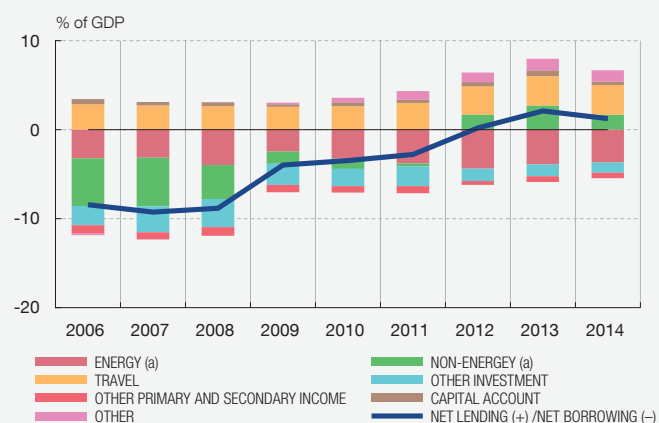**3**   Specifically, the equation includes the variable that reflects the evolution of Spain's export market and goods export and import deflators. In alternative specifications national demand is also included.

4   See Box 5, "Competitividad, costes laborales y empleo", in Informe Trimestral de la Economía Española, *Boletín Económico,* December 2014.
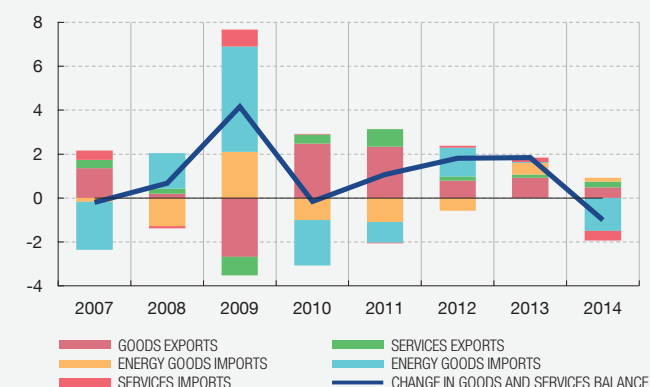**5**   Energy imports declined, in nominal terms, in response to the fall in the price of oil.
6   See Box 5, "The recent behaviour of imports and their determinants", *Economic Bulletin,* April 2014.
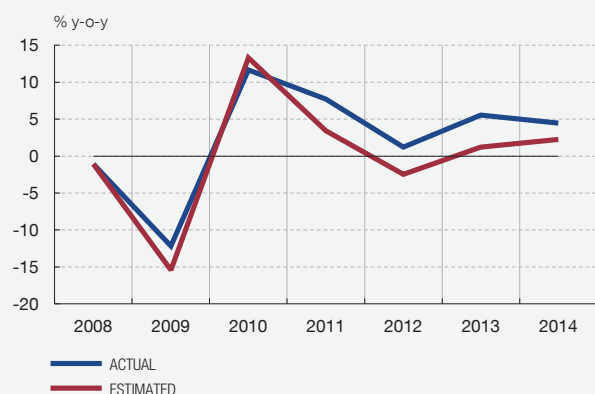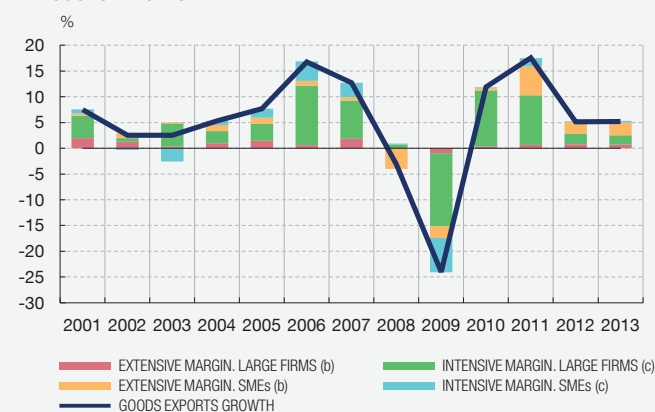
1 NET LENDING/ NET BORROWING

% of GDP

Legend:
- ENERGY (a)
- NON-ENERGEY (a)
- TRAVEL
- OTHER INVESTMENT
- OTHER PRIMARY AND SECONDARY INCOME
- CAPITAL ACCOUNT
- OTHER
- NET LENDING (+) /NET BORROWING (–)

2 CHANGE IN GOODS AND SERVICES BALANCE: CONTRIBUTION BY COMPONENT

Legend:
- GOODS EXPORTS
- SERVICES EXPORTS
- ENERGY GOODS IMPORTS
- ENERGY GOODS IMPORTS
- SERVICES IMPORTS
- CHANGE IN GOODS AND SERVICES BALANCE

3 GOODS EXPORTS

% y-o-y

Legend:
- ACTUAL
- ESTIMATED

4 EXTENSIVE AND INTENSIVE MARGIN: CONTRIBUTION TO CHANGE IN GOODS EXPORTS

%

Legend:
- EXTENSIVE MARGIN. LARGE FIRMS (b)
- INTENSIVE MARGIN. LARGE FIRMS (c)
- EXTENSIVE MARGIN. SMEs (b)
- INTENSIVE MARGIN. SMEs (c)
- GOODS EXPORTS GROWTH

5 GOODS IMPORTS

% y-o-y

Legend:
- ACTUAL
- ESTIMATED

6 GOODS IMPORTS (NOMINAL)

% y-o-y

Categories:
- Cars
- Transport equipment and other capital
- Other consumer goods
- Intermediate metal and electrical goods
- Intermediate textile goods
- Intermediate goods for manufacture of means of transport
- Total

Legend:
- RATES 2014
- RATES 2009-2013

SOURCES: Banco de España (based on Balance of Payments, CBA and mercantile registries statistics) and the AEAT (Spanish Tax Revenue Service) Customs and Excise Department.

a The energy and non-energy balances are estimates by the Banco de España drawing on Customs data.
b The extensive margin is defined as the contribution to the increase (decrease) in the exported value derived from an increase (decrease) in the number of "firm-country of destination" trade relations.
c The intensive margin is defined as the contribution to the increase (decrease) in the exported value derived from an increase (decrease) in the amount exported by each firm to each country.

In any event, in the current stage of the cycle, spending is being directed towards goods with a high import content, which suggests that the effects of the changes in the composition of demand have been contributing to the recent growth in imports. The rise in capital goods imports (18.7% year-on-year in 2014 as a whole), linked to the recovery of investment and to the above-mentioned growth in exports, reflects the dependence of Spanish industry on high value added imported inputs. Also notable in this respect is the vigorous growth of consumer durables imports (20% year-on-year in real terms), which may reflect a certain overreaction linked to the large cumulative fall in the consumption of such goods since the start of the crisis (-6.2% over the period 2008-2013, as against –1.9% in the case of total spending). As for imports of non-durable consumer goods, with the firming of the recovery, a greater coincidence has been observed between actual purchases abroad and those predicted by the model, so that no significant substitution effect between domestic production and imports has yet been detected.

In conclusion, the improvement in the cyclical position of the Spanish economy, along with the realisation of purchase decisions that had been postponed during the crisis, appears to have had a significant impact on the external balance in 2014, having led to strong import growth. On the other hand, the fall in the price of oil, competitiveness developments and the expansion of the export base and its geographical diversification partly offset the negative impact of the cycle. In the future, while the business cycle will continue to support import growth, the impact of pent-up demand will ease over time. Moreover, despite the lack of evidence of a substitution effect on total imports, one would expect the gains in competitiveness arising from the still-ongoing internal devaluation, together with the changes in the productive structure, to be conducive to a reduction in import dependence in the medium term.[7]

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7 See Chapter 3 "Growth and reallocation of resources in the Spanish economy", *Annual Report,* 2014, Banco de España.

The Great Recession has highlighted the difficulties facing monetary policy when additional monetary stimulus measures are needed and policy rates are already close to their effective lower bound. In response to this challenge, monetary authorities have introduced various unconventional measures that seek to achieve financial conditions that are more likely to allow them to meet their targets. In particular, two types of instruments have been used. First, as discussed in Chapter 2 of the Spanish version of the Annual Report, regular use has been made of forward guidance,[1] a strategy that seeks to influence the formation of agents' expectations, putting downward pressure on long-term interest rates and, therefore, affecting the slope of the yield curve. Second, central banks have resorted to purchasing public and private assets, in some cases on a large scale.

This box analyses the transmission channels through which these asset purchases operate and their effectiveness in a setting in which monetary policy has exhausted its conventional room for manoeuvre. For this purpose, the accompanying panels present various simulations made with a model calibrated for the euro area, one fundamental aspect of which is the existence of financial restrictions on the borrowing capacity of agents, and in particular of banks.[2] The exercise considers a recession caused by turbulence originating in the financial sector – a decline in the quality of assets on banks' balance sheets – that drives down both GDP and inflation, in the baseline scenario (the green line in the panels) by more than 6 and 3 pp, respectively.

This turbulence is transmitted to the economy through various channels. Initially, impairment of bank assets reduces the value of banks' capital and raises their already high borrowing levels, forcing them to deleverage, selling assets at prices far short of their acquisition cost. These "fire sales" amplify the initial turbulence, driving asset prices down further, prompting additional balance sheet losses for banks and pushing up their financing costs which will subsequently be passed through to the cost of credit, with contractionary effects on productive investment, consumption and, in short, aggregate demand and activity. Moreover, these interactions display important feedback effects, as the deterioration in the economic outlook drives down asset prices yet again and further debilitates the financial situation of banks, heightening both the depth and the duration of the recession.

Typically, the conventional monetary policy response to this concatenation of events (the red line in the panels) would be to cut short-term interest rates sharply, partially offsetting the increase in financing costs and thus curbing the impact on aggregate demand. This would, in turn, mitigate the adverse negative amplifying effect

that the decline in activity has on banks' balance sheets. However, this hypothetical scenario is not feasible, since the monetary authority's capacity to act may be restricted by the fact that interest rates are already at their effective lower bound, as is the case in this simulation just three quarters after the original turbulence. The existence of this curb on monetary policy's countercyclical response exacerbates the increase in financing costs and depresses aggregate demand even further, generating a considerably deeper and more protracted recession. In accordance with the simulation (the green line in panels 3 and 4), in this baseline scenario GDP and inflation would fall 0.75% and 1 pp respectively more than if there was no effective lower bound, while financing costs would rise 1 pp more.

To overcome these hurdles, central banks have at their disposal other unconventional instruments, such as purchases of non-financial private sector assets, if need be on a large scale. The blue line in the panels depicts an alternative scenario where the monetary authority launches a sufficiently large quantitative easing programme so as to approximately offset the adverse effect of the zero interest-rate bound being reached.[3] Such measures directly affect the prices of the assets purchased, and indirectly affect, through the subsequent portfolio reallocation process, the prices of other substitute assets, narrowing the spreads between them. The pass-through of the overall drop in yields to the cost of private sector borrowing cushions both the initial drop in aggregate demand and the amplifying effects arising from deleverage at the banks. In the exercise presented, an asset purchase programme equivalent to around 9% of GDP overcomes the drag on monetary policy's countercyclical response that the existence of a lower bound on short-term interest rates entails, allowing GDP and inflation to behave as if conventional monetary policy were not subject to the zero lower bound (the red line). Despite the uncertainty as to the calibration of a simplified model such as this, the findings are consistent with the empirical evidence on the impact of a quantitative easing programme, available for the recent experience in the United States and the United Kingdom (see Table 1).

It is important to note that, owing to its necessarily simplified nature, the exercise does not include many aspects that may be relevant when it comes to assessing how effective the instrument is. Thus, for example, the model considered relates to a closed economy and, therefore, there is no consideration of the exchange rate channel, which may play a very important role in certain circumstances. In addition, other key aspects of the interaction

1 For a general discussion on how central banks have used forward guidance see, for example, M. Woodford (2013), "Forward Guidance by Inflation-Targeting Central Banks", *Sveriges Riksbank Economic Review,* 3, pp. 81-120, presented at 'Two Decades of Inflation Targeting,' Sveriges Riksbank, 3 June 2013.

2 The macroeconomic model used is a version of the model developed in M. Gertler and P. Karadi (2011), "A model of unconventional monetary policy", *Journal of Monetary Economics,* vol. 58 (1), pp. 17-34.

3 The theoretical exercise envisages a programme of purchases of securities issued by private entities, whereas, in practice, the programmes launched by central banks, shaped by relative market size, have largely focused on purchases of public debt securities. This difference could qualify the scale of the impact of the quantitative easing shown here, since for a specific volume of purchases, the macroeconomic impact of purchases of public debt securities is smaller, as it is a deeper and more efficient market (see M. Gertler and P. Karadi, 2013, "QE1 vs. 2 vs. 3: A Framework to Analyze Large Scale Asset Purchases as a Monetary Policy Tool", *International Journal of Central Banking,* vol. 9, pp. 5-53).

with other economic policies, such as fiscal policy, are excluded, as is the fact that the financial structure of an economy – understood as the financing and investment instruments available, financial intermediaries and relations between them – is too complex to be fully covered by the model. Nevertheless, the

quantitative exercise clearly illustrates the potential effectiveness of the large-scale asset purchase programmes that the main central banks, and in particular most recently the ECB, have implemented since 2008, once they had exhausted their respective room for manoeuvre in terms of conventional measures.
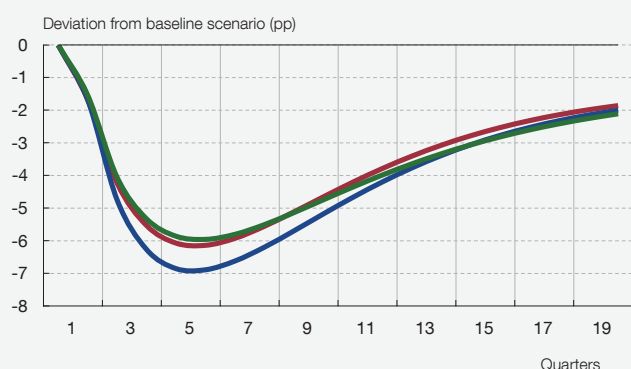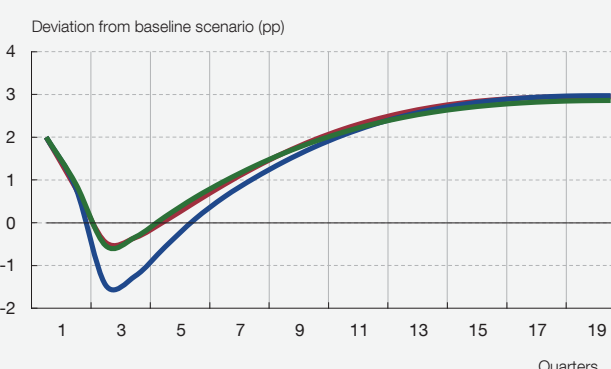
1 NOMINAL INTEREST RATE
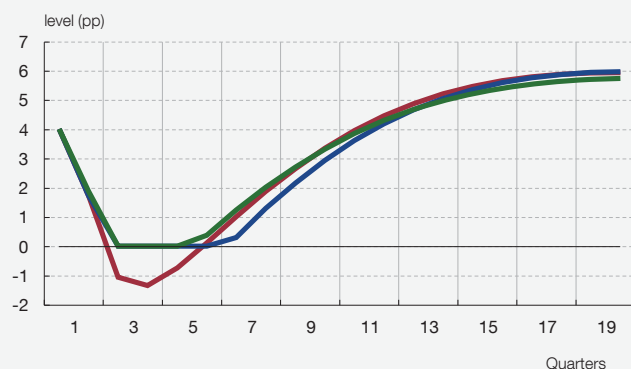
2 FINANCING COST
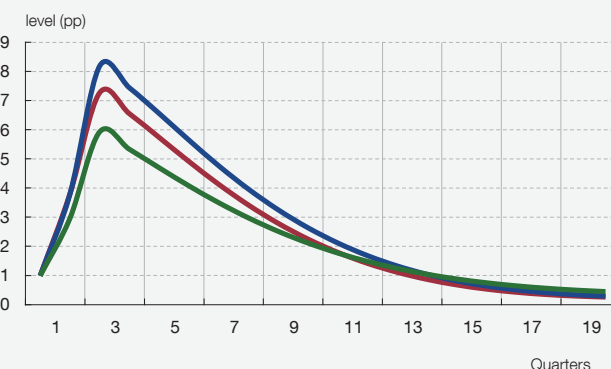
3 GDP

4 YEAR-ON-YEAR INFLATION RATE

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──────  BASELINE SCENARIO          ──────  NO ZERO-INTEREST-RATE BOUND SCENARIO          ──────  QUANTITATIVE EASING SCENARIO
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1 EMPIRICAL EVIDENCE ON THE MACROECONOMIC IMPACT OF QUANTITATIVE EASING (a)

United States (asset purchases $1,000 bn)			United Kingdom (asset purchases £200 bn)		
	GDP level	Inflation rate		GDP level	Inflation rate
Gertler & Karadi (2013)	1.7	1.7	Ashworth & Goodhart (2012)	3	0.4
Del Negro et al. (2011)	1.4	0.7	Joyce et al. (2011)	1.5 - 2.5	0.7 - 2.5
Fuhrer & Olivei (2011)	0.8 - 1.3	0.2	Bridges & Thomas (2012)	2	1
Chung et al. (2011)	1.2	0.35	Kapetanios et al. (2012)	1.5	1.2
Chen et al. (2012)	0.2	0.1	Pesaran & Smith (2012)	1	…

SOURCE: Banco de España.

a Based on V. Constâncio (2015), presentation at the 2015 US Monetary Policy Forum, Panel discussion on Central Banking with Large Balance Sheets. To enhance the comparability, the impact has been rescaled to the size of each programme. The figures reflect deviations from the baseline scenario, expressed as a percentage for the level of GDP and in percentage points for the inflation rate.

This box analyses the possible repercussions on the main macroeconomic variables of both the euro area and the United States of various monetary policy tightening scenarios in the United States, based on simulations made using the global NiGEM model.[1] These simulations present different paths for short-term interest rates in the period 2015-16. The main macroeconomic effects are transmitted through some of the channels described in Chapter 2 of the Spanish version of the Annual Report: the exchange rate (which in the simulations is based on uncovered short-term interest rate parity), long-term interest rates and multilateral trade.
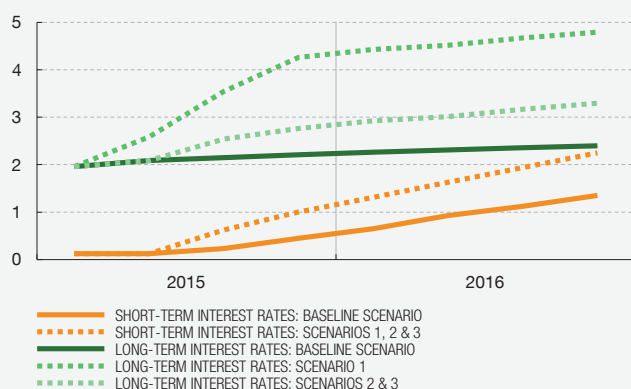
By way of illustration, in the baseline scenario, interest rates behave in accordance with the expectations being factored in by
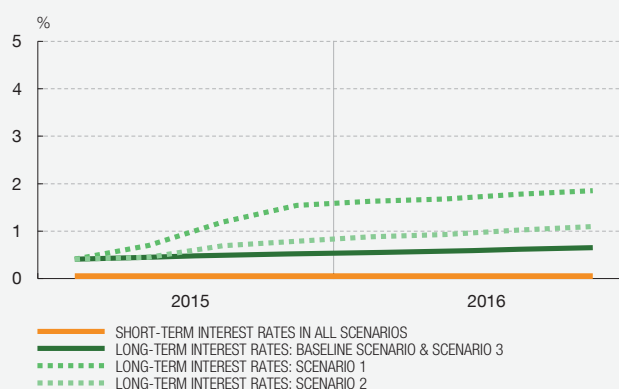
futures markets in early March 2015, i.e. that short-term rates in the United States would start to rise in 2015 Q3, increasing by more than 100 bp by end-2016, below the figure projected by the FOMC following its December 2014 meeting. Long-term rates would also start to rise in Q3, but at a slower pace, by just 40 bp, resulting in a flatter yield curve. In the euro area, the short-term rate would remain at zero throughout the simulation period in all the scenarios, while the German long-term rate would rise by 25 bp by end-2016. For all other euro area countries, it is assumed that the sovereign spreads with Germany would be maintained, meaning that the degree of financial fragmentation of the euro area would remain unchanged.

This box analyses three alternative scenarios. The first two draw on two previous episodes of monetary tightening in the United States (1994-95 and 2004-06), which coincided in both cases with periods when there were cyclical divergences among the developed economies and also marked differences in the behaviour of financial markets. In both scenarios it is assumed that short-term rates in the United States will be in line with the projections of the FOMC, which point to an increase of more than
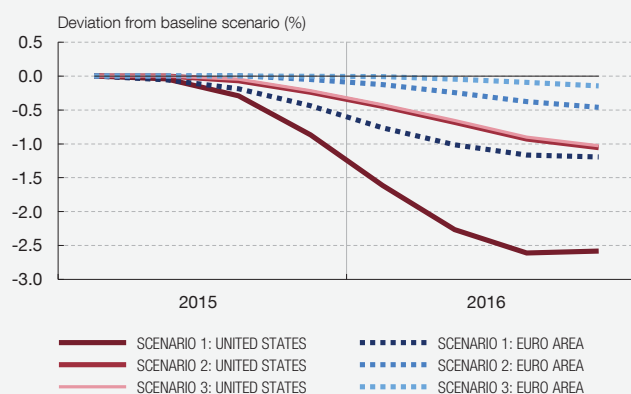
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1 NiGEM is an estimated quarterly macroeconometric model, which includes standard relationships between the different economic variables. It is a global model covering, with a varying degree of detail, some 60 countries or geographical areas and the interactions between them. For more information on the main characteristics of NiGEM see: http://nimodel.niesr.ac.uk.

1 INTEREST RATES
United States

SHORT-TERM INTEREST RATES: BASELINE SCENARIO
SHORT-TERM INTEREST RATES: SCENARIOS 1, 2 & 3
LONG-TERM INTEREST RATES: BASELINE SCENARIO
LONG-TERM INTEREST RATES: SCENARIO 1
LONG-TERM INTEREST RATES: SCENARIOS 2 & 3

2 INTEREST RATES
Euro area

SHORT-TERM INTEREST RATES IN ALL SCENARIOS
LONG-TERM INTEREST RATES: BASELINE SCENARIO & SCENARIO 3
LONG-TERM INTEREST RATES: SCENARIO 1
LONG-TERM INTEREST RATES: SCENARIO 2

3 IMPACT ON GDP
United States and euro area

Deviation from baseline scenario (%)

SCENARIO 1: UNITED STATES
SCENARIO 2: UNITED STATES
SCENARIO 3: UNITED STATES
SCENARIO 1: EURO AREA
SCENARIO 2: EURO AREA
SCENARIO 3: EURO AREA

4 IMPACT ON INFLATION
United States and euro area

Deviation from baseline scenario (pp)

SCENARIO 1: UNITED STATES
SCENARIO 2: UNITED STATES
SCENARIO 3: UNITED STATES
SCENARIO 1: EURO AREA
SCENARIO 2: EURO AREA
SCENARIO 3: EURO AREA
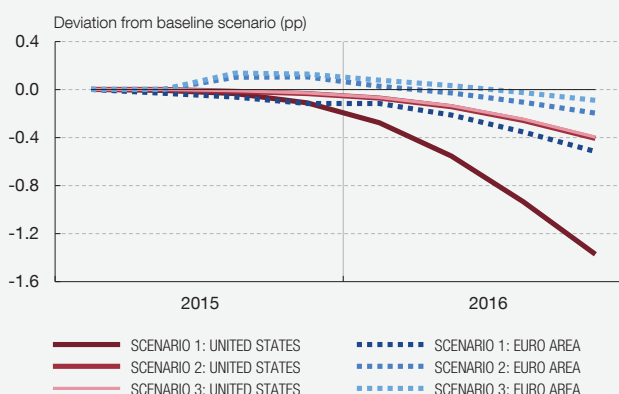
SOURCE: Banco de España.

200 bp, entailing greater tightening than that discounted in the baseline scenario.

In the first scenario there is also a higher increase in long-term rates, in accordance with the pattern seen after the US recession of the early 1990s. In February 1994 good macroeconomic data prompted the Federal Reserve to make surprise rate increases, embarking on a monetary tightening cycle. This move was accompanied by an increase in long-term rates, higher asset price volatility and heavy losses for market participants owing to their excessive leverage. The international repercussions were also unexpected and far-reaching, as bond yields rose in the United Kingdom, Japan and the euro area member countries. At that time most of those economies were at the initial recovery stage, there was no sign of inflation and monetary policies were expansionary. Compared with the baseline scenario, short-term rates in the United States would be 80 bp higher and long-term rates more than 200 bp higher at end-2016, reflecting a gradual increase in the term premium (see Panel 1).

In the case of the euro area (see Panel 2), short-term rates would remain at zero, as there is no room for more expansionary monetary policy using conventional measures, but long-term rates would increase by slightly more than 100 bp compared with the baseline scenario, assuming, in keeping with historical evidence,[2] that 50% of the increase in long-term rates in the United States would pass through. This assumption regarding the pass-through rate is, in any event, disputable in the present circumstances. The fact that official interest rates in the euro area have reached their zero lower bound could make long-term rates more sensitive than in the past. Conversely, with the launch of the securities purchase programme, the Eurosystem could influence the long end of the yield curve, neutralising the effect of monetary tightening in the United States.[3]

Panels 3 and 4 trace the impact of this scenario on growth and inflation in the United States and in the euro area. As was to be expected, monetary policy tightening has an adverse effect on both variables in both areas. Beyond the specific quantitative effect, which seems rather high in view of the findings using other models, it is noteworthy that the impact is much greater in the United States than in the euro area, which would help to smooth out the cyclical differences between the two economies.

In the second scenario there is no increase in the term premium, in keeping with what was named the "conundrum" in the period 2004-06, which was the last time that interest rates were raised in the United States. Between June 2004 and June 2006 the official interest rate was increased to smooth the strong economic momentum and high inflation. The extraordinary nature of this period was that long-term government bond yields remained virtually unchanged. During this period there were also cyclical differences between the US economy and the other developed economies, but there was no financial contagion or heightened market volatility. Europe and Japan were both in a downturn, monetary policy remained expansionary and long-term rates continued to head downward, not responding to the monetary tightening in the United States. Among the factors cited as a possible explanation for this are the greater credibility of the Fed reducing the macroeconomic risk and the growth in savings in emerging countries which drove up the demand for safe assets. In consequence, long-term interest rates would increase by less than 100 bp compared with the baseline scenario in the United States, and by approximately 60 bp in the euro area (see Panels 1 and 2). As increases in long-term interest rates are lower in both areas, the effects on growth and inflation are also negative, albeit less so (see Panels 3 and 4). Naturally, they are still higher in the United States, so the cyclical differences are corrected in this case also.

The third scenario envisages the possibility that the launch of the ECB's securities purchase programme will immunise the euro area from the increase in long-term interest rates in the United States. Accordingly, this scenario repeats the second scenario, but with euro area interest rates as in the baseline scenario. Panels 3 and 4 show that the impact of this third scenario on the US economy is largely similar to that of the second scenario; however, in the case of the euro area, GDP is practically unchanged on the baseline scenario and inflation is even slightly higher, as the exchange rate depreciation effect predominates, so this would be an additional boost for achievement of the ECB's goal.

To conclude, the exercise shows how monetary tightening in the United States could have a significant impact on economic activity in the euro area. Although this would help to smooth out the cyclical differences between the two areas, it would be at the cost of lower growth. The main effects are channelled through the increase in long-term interest rates in the United States and the pass-through to long-term interest rates in the euro area. In both cases there is considerable uncertainty regarding the scale of these effects. In the case of the euro area, although there is no scope for a more expansionary conventional monetary policy, the securities purchase programme launched by the Eurosystem could mitigate the effect on long-term interest rates. It is difficult to include these aspects in the analytical framework considered, but they highlight the need for the ECB Governing Council to remain alert, in view of the possibility of undesirable episodes of spillover of US interest rate rises.

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2   See, for example, S. Gilchrist, V. Yue and E. Zakrajsek (2014), "U.S. Monetary Policy and Foreign Bond Yields", presented at the IMF's 15th Jacques Polak Annual Research Conference; and also S. Arslanalp and Y. Chen (2014), "U.S. Interest Rates: The Potential Shock Heard Around the World", http://blog-imfdirect.imf.org/2014/05/21/u-s-interest-rates-the-potential-shock-heard-around-the-world/.

3   The IMF's April 2015 "Global Financial Stability Report" presents some evidence to support the view that the causal relationships between US and euro area interest rates may have changed since the ECB announced its securities purchase programme.

The degree of competition is a fundamental determinant of an economy's productive structure and may affect its sectoral composition and the effective allocation of resources among firms in each sector. Regulation is one factor that can influence the degree of sectoral competition. Indeed, in some cases regulation is justified precisely as a means of bringing competition to markets that could intrinsically be oligopolies.[1] However, excess or, in general, inappropriate regulation can be a barrier to entry for competitors or can permit collusion between established firms, boosting profit margins and reducing output and efficiency.

This box aims to show how regulatory changes may have affected the degree of efficiency of the intra-sectoral reallocation of resources, based on the analysis of a specific sector, namely Spanish retail trade. This is a highly important sector, owing not only to its share of GVA (6.7%) and employment (13.4%), in both cases in terms of the market economy, but also to the role the distribution channels play in productivity and price formation. Regulation of retail trade is extensive and complex and has traditionally posed numerous barriers to competition. In Spain, powers over domestic trade are devolved to the regions, which are responsible for regulating retail trade, although the central government has the power to establish basic general rules. As a result, sector regulations vary significantly from region to region.

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1 Aside of regulation, there are demand conditions and cost structures that would lead to natural differences in the degree of competition between sectors.

These differences and how they have evolved can be illustrated by building synthetic regulation indicators by region.[2]
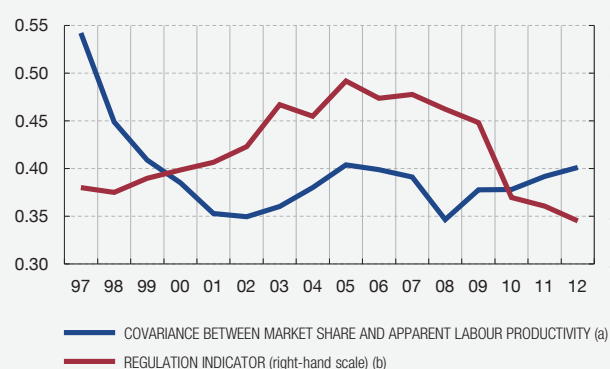
As shown in Panel 1, which aggregates the synthetic regulation indicators of the regions, weighted by population, 1999 saw the start of a period of intense regulatory activity in the retail trade sector, with the regional authorities, in an endeavour to protect traditional retailers, introducing increasingly stringent regulations. Restrictions – moratoria – were set on new openings[3] and second trading licences were required of ever smaller retailers and even of hard discount stores,[4] pitching them in together for that purpose

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2 See Matea and Mora (2012), "El comercio minorista y regulación autonómica: efectos en la densidad comercial, el empleo y la inflación", *Revista de Economía Aplicada*, no. 59, vol. XX, pp. 5-54. In that article, synthetic indicators are built reflecting a series of legislative aspects of the sector, aggregated using the factorial analysis method. These are, specifically, regulation on Sunday and public holiday trading, weekly opening hours, sales periods, taxes on large retail outlets, moratoria on new openings, the definition of large retail outlet which entails the need for a regional licence (save in Madrid in recent years) and the need for a regional licence for hard discount stores. By design, these indicators take values between 0 (no regulation) and 10 (maximum regulation). Evidence is found to show that greater regulation of retail trade in Spain is associated with higher inflation, lower employment in the sector and higher retail density.
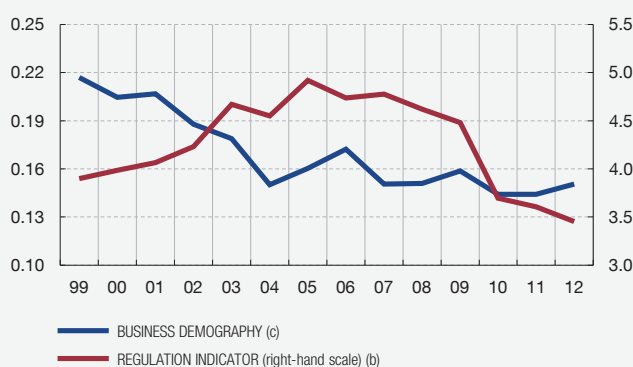
3 A ban on new openings of large retail outlets in a specific region in a given period.

4 The definition of hard discount stores varies somewhat from region to region but is based on a minimum number of own (private label) brand products on sale and a minimum number of stores of the same size trading under the same name.

RETAIL TRADE: REGULATION AND PRODUCTIVITY

COVARIANCE BETWEEN MARKET SHARE AND APPARENT LABOUR PRODUCTIVITY (a)
REGULATION INDICATOR (right-hand scale) (b)

RETAIL TRADE: REGULATION AND BUSINESS DEMOGRAPHY

BUSINESS DEMOGRAPHY (c)
REGULATION INDICATOR (right-hand scale) (b)

SOURCE: Banco de España.

a The annual average in each of the periods of covariance between the share of employment of retail sector firms and their labour productivity relative to their sector average has been calculated using the CBSO and mercantile registers. The higher the covariance, the more efficient the allocation of employment among sector firms. The covariance has been calculated for NACE Rev. 2, Division 47, retail trade, except for retail trade, except for motor vehicles and motorcycles, excluding groups 47.3, 47.8 and 47.9 and class 47.73 as they are not affected by the regulatory aspects considered.
b Population-weighted average of the synthetic regulation indicators of the regions. The synthetic indicator of each region takes into account regulation on Sunday and public holiday trading, weekly opening hours, sales periods, taxes on large retail outlets, moratoria on new openings, the definition of large retail outlet and the regional licence for hard discount stores. By design, this indicator takes values between 0 (no regulation) and 10 (maximum regulation). See Matea and Mora (2012).
c The Central Companies Directory (DIRCE) has been used to calculate the sum of the entry and the exit rates of firms over existing firms in the retail sector. The data to 2007 have been taken using NACE Rev. 1.1 and the data from 2008 using NACE Rev. 2.

with large retail outlets. Also during the period, a special tax on large retail outlets was first introduced in some regions. This regulatory surge peaked in 2005 when opening hours were reduced (in terms of Sunday and public holiday trading and maximum opening hours per week), with the brunt of these regulations borne by the large outlets.

However, in 2009, some regions started to adopt measures ahead of the transposition of the Services Directive in March 2010 and the regulatory surge was brought to a halt. The Services Directive marked a turning point, as from then on barriers to competition were gradually eliminated or at least lowered. Specifically, although large retail outlets still need a regional licence (except in Madrid), most authorities have raised the threshold for stores to be considered large outlets, withdrawn the specific licence for hard discount stores and removed the moratoria on new openings. In addition, the administrative procedures for opening small stores have been simplified and the restrictions on opening hours and sales periods have been eased. The criteria to be met to be deemed a "major tourist area"[5] have also been relaxed, meaning that more areas now have unlimited opening hours. More recently, in

2013 and 2014, the rules on opening hours and sales periods were further relaxed.

The impact of these regulatory changes on sector efficiency may be approximated by the relationship between the regulation indicator described above and various efficiency measures (see section 4 of this chapter). Based on the information supplied by the Central Balance Sheet Data Office (CBSO), Panel 1 depicts the aforementioned regulation indicator together with a sector efficiency indicator calculated as the covariance between the share of employment of the retail sector firms and their labour productivity relative to the sector average. The higher the value of the indicator, the higher the proportion of employment concentrated in the most productive firms and, in consequence, the better the allocation of employment among the sector firms. The relationship between the two indicators shows, broadly speaking, that more (less) stringent legislation is associated with lower (higher) aggregate sector productivity. Specifically, it is observed that when regulation was most stringent (between 1997 and 2001) the allocation of employment was increasingly inefficient; subsequently, when regulation eased (between 2008 and 2012) the allocation of employment became more efficient. A similar message can be drawn from the relationship between the regulation indicator and a measure of sectoral momentum such as business demography (entry and exit rates of retail trade firms; see Panel 2) which traces a continuous downward pattern until 2005, holds steady until 2010 and then turns upward.[6]

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5   Major tourist areas may be municipalities or areas of municipalities that meet at least one of the following criteria: a) have sufficient concentration of tourist accommodation or second homes; b) are declared a world heritage site or house a site or building of cultural interest; c) border on or consist of areas of influence of border zones; d) host certain national or international sporting or cultural events; e) are close to tourist cruise ports; f) are key shopping tourism areas; g) meet other criteria that warrant their inclusion. These areas have unlimited opening hours.

6   This upturn continued throughout 2013 and 2014.

ESTIMATION OF RELATIONSHIP BETWEEN EFFICIENCY IN ALLOCATION OF RESOURCES AND REGULATON IN RETAIL TRADE (1997-2012)

Dependent variable: efficiency in allocation of resources (a)

Regression	Explanatory variables (b)	Estimate not population-weighted	Estimate population-weighted
1	Synthetic regulation indicator (c)	-0.095*	-0.131*
2	Sunday and public holiday trading	-0.176*	-0.155*
3	Weekly opening hours	-0.073*	-0.084*
4	Sales period	-0.108*	-0.149*
5	Taxes on large retail outlets	-0.011*	-0.013*
6	Moratoria on new openings	-0.008	-0.018*
7	Definition of large retail outlets	-0.006	-0.015*
8	Regional licence hard discounters	-0.002	-0.001*

SOURCE: Banco de España.
NOTE: * Significant coefficicent at 5%.

a   Measured as the covariance between labour productivity and the share of employment calculated for NACE Rev. 2, Division 47, retail trade, except for motor vehicles and motorcycles, excluding groups 47.3, 47.8 and 47.9 and class 47.73 as they are not affected by the regulatory aspects considered.
b   In regression 1 the explanatory variable is the synthetic regulation indicator, whereas in the other regressions the explanatory variable is each of the separate regulatory aspects that make up the synthetic regulation indicator. All the variables are calculated by region and year. Annual dummy variables are included in all cases.
c   The synthetic regulation indicator is built on the basis of regulation on Sunday and public holiday trading, weekly opening hours, sales periods, taxes on large retail outlets, moratoria on new openings, the definition of large retail outlet and the regional licence for hard discount stores. See Matea and Mora (2012).

In order to analyse the extent to which the different regulatory policies have determined the degree of sector efficiency, the regulatory differences from region to region over time are exploited to estimate the impact of different regulatory aspects on the first of the efficiency measures mentioned (see table).[7] As can be seen, greater regulation, measured by the synthetic indicator, results in less efficient allocation of employment (equation 1).[8] The adverse

effect of stricter regulation is also observed in the relationship with each of the regulatory aspects separately (equations 2 to 8), although the taxes on large retail outlets, the moratoria on new openings and the licence for large retail outlets and hard discount stores have a lesser impact than aspects such as opening hours (Sunday and public holiday trading and opening hours per week) and sales periods.

In short, this analysis illustrates how economic regulation can affect economic efficiency. In the specific case of retail trade, the analysis performed confirms that transposition of the Services Directive and other recent measures adopted relating to opening hours and sales periods has boosted productivity in the sector.

7 This exercise cannot be conducted with entry and exit rates of firms as these rates are not available for the sector by region.

8 The regression made includes annual dummy variables to prevent temporary factors, such as the crisis, which should affect all regions equally, from being confused with the regulation effect. In this respect, the regulation difference by region is being exploited. The findings also hold if regional dummy variables are included in the above equations, in this case to exploit the change over time of the covariance and regulation in each region.

During the economic crisis, certain employment segments bore the brunt of job destruction. In particular, approximately 60% of all jobs lost since 2008 are in the construction sector, which accounted for 5.7% of total employment in 2014, down from 12% in 2008. It is important to analyse how construction workers have been affected, not only because of the scale of the job losses in the sector but also because of the workers' particular characteristics,[1] such as their lower skill levels, which could, *a priori,* make them less employable in other sectors, even against a backdrop of economic recovery such as that envisaged for Spain in the coming years.

It is possible to analyse the employment situation of construction workers who lost their jobs during the crisis using the social security administrative labour records (MCVL).[2] Panel 1 traces the change, in the period 2007 to 2013, in the employment situation of construction workers who were employed in the sector at the start of 2007, according to whether they continue to work in the sector, found work in another sector or are unemployed. Panel 2 shows the same information for workers from the rest of the economy. As a result of the high level of job destruction, by 2009 less than 50% of construction workers were still in their jobs and by 2013 only 17.6% were still employed in the industry. These figures are much lower than for the rest of the economy, where almost 50% of workers continued to be employed in the same sector throughout the period.

Moreover, the percentage of workers who found jobs in a different sector is relatively low. Specifically, only 22.9% of those employed in the construction sector at the start of 2007 were working in other industries in 2013, which is 27.8% of those who lost their jobs in construction, compared with 40% for those who lost their jobs in other industries in the period. Analysing the sectors in which workers found employment, Panel 3 shows that more former construction workers than those from other sectors found jobs in manufacturing and in certain service industries, such as transport, trade or hotels and catering, reflecting a greater similarity between the skills required in these industries and the skills offered by former construction workers. Conversely, significantly fewer former construction workers than workers from the rest of the economy found jobs in financial services, healthcare or education. As regards geographical mobility, 18.9% of construction workers who found employment in other industries did so in a different province than where they were working in 2007, which would indicate greater labour mobility than in other sectors (13.2%).

In order to identify the characteristics of construction workers that may explain the problems involved in their sectoral reallocation, Table 1 analyses the effect of certain personal characteristics on the likelihood of finding oneself unemployed, employed in the same sector or employed in another sector, drawing a distinction between workers who were employed in construction at the onset of the crisis and those who were employed in the rest of the economy. The table shows that older, less-skilled workers with more years of service have had particular difficulties finding other work, which probably reflects their higher level of firm-specific human capital and the greater obstacles they face to achieve professional re-training. Specifically, younger workers are less likely to be unemployed, which is because they are more employable in other sectors, since the likelihood of their remaining in the construction industry is similar to that observed among older workers. By skill level, construction workers with higher skill levels are less likely to be unemployed, because more of them keep their jobs in construction and because it is also easier for them to find jobs in other sectors. Workers with fewer years of service at the onset of the crisis were more likely to lose their jobs and are more likely to be unemployed in 2013. However, they are also more likely to have found work in other sectors than workers who had more years of experience at the start of the crisis.

This sectoral reallocation process may be analysed further by examining the wages received[3] by these workers in 2013. Table 2 shows how median wages evolved between 2007 and 2013, according to the sector of employment during that time. Among workers who remained in the construction industry, wage adjustment was not consistent with the severity of the crisis in the industry, since wages remained steady in real terms (0.3%). Indeed, workers with higher skill levels saw their wages grow by 3.3% in cumulative terms, similar to the wage rise observed in the rest of the economy, although the increase in real terms in less-skilled workers' wages was lower than in the rest of the economy.

Among workers who found jobs in other sectors, former construction workers experienced a significant wage adjustment in real terms (10.6% less than in 2007) that is not observed among other workers. The drop in wages was most severe among less-skilled workers with fewer years' experience, which would reflect, among other factors, the loss of firm-specific human capital by former construction workers who found jobs in other industries. This wage adjustment could approximate the cost, in terms of loss of productivity, associated with the sectoral reallocation process.

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1   According to the Spanish Labour Force Survey (EPA), compared with the unemployed from other sectors, they have more years of service and lower skill levels, they have had less ongoing training and they have been mostly employed in low-skilled posts.

2   For a description of this database, see S. Galán and S. Puente (2015), "Minimum Wages: Do They Really Hurt Young People?" in *The B.E. Journal of Economic Analysis and Policy*, 15 (1), pp. 299-328.

3   The social security administrative labour records (MCVL) contain information on reported contribution bases which approximate the wages received by workers, save for those whose wages exceed the maximum contribution base. The calculations presented are not affected by the exclusion of these workers from the analysis.

1 LABOUR MARKET SITUATION BETWEEN 2007 AND 2013 OF WORKERS EMPLOYED IN THE CONSTRUCTION SECTOR AT THE START OF 2007
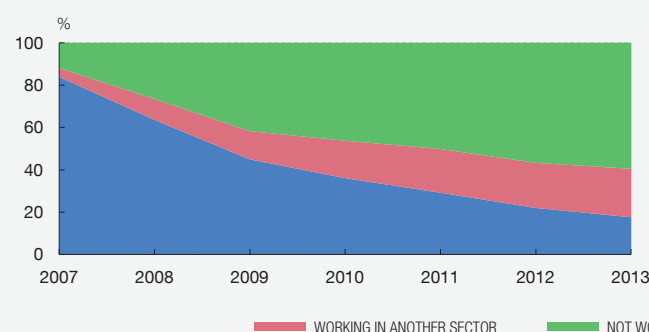
2 LABOUR MARKET SITUATION BETWEEN 2007 AND 2013 OF WORKERS EMPLOYED IN OTHER SECTORS AT THE START OF 2007

■ WORKING IN ANOTHER SECTOR   ■ NOT WORKING   ■ WORKING IN SAME SECTOR
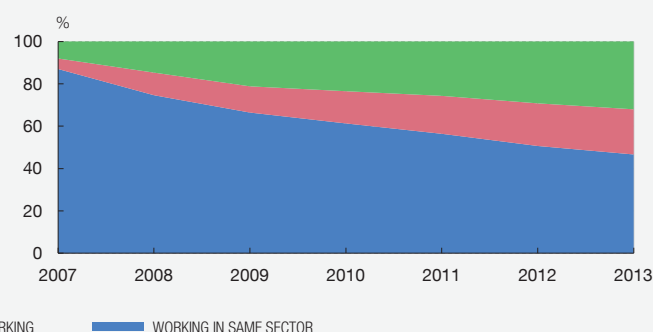
3 SECTOR OF DESTINATION FOR WORKERS CHANGING SECTOR BETWEEN 2013 AND 2007 DIFFERENCES IN PERCENTAGE POINTS BETWEEN WORKERS FROM THE CONSTRUCTION SECTOR AND WORKERS FROM OTHER SECTORS
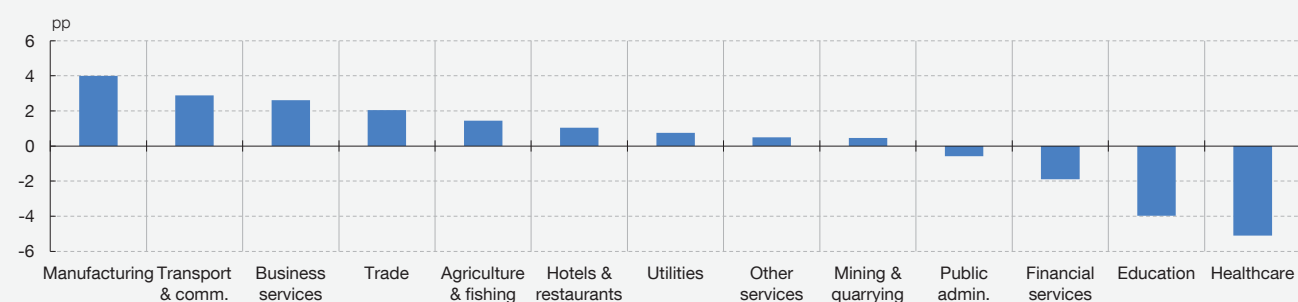
1 IMPACT OF PERSONAL CHARACTERISTICS ON PROBABILITY OF EMPLOYMENT SITUATION IN 2013 BY SECTOR OF ORIGIN IN 2007 (a)

January 2007	Workers in construction sector in 2007			Workers in rest of economy in 2007		
	Without employment	In same sector	In another sector	Without employment	In same sector	In another sector
Foreign nationals	0.189 ***	-0.103***	-0.086***	0.210***	-0.178***	-0.031***
Male	0.048***	-0.005	-0.042***	0.009***	-0.032***	0.023***
Aged between 16 and 35	-0.165***	0.005	0.159***	-0.047***	-0.077***	0.124***
Aged between 35 and 45	-0.109***	0.012***	0.097***	-0.063***	-0.001*	0.065***
Length of service: < 6 months	0.185***	-0.227***	0.042***	0.200***	-0.286***	0.086***
Length of service: 6 to 12 months	0.138***	-0.176***	0.038***	0.153***	-0.212***	0.059***
Length of service: 1 to 3 years	0.096***	-0.120***	0.024***	0.086***	-0.119***	0.032***
Contribution group: between 1 and 3	-0.144***	0.112***	0.031***	-0.099***	0.112***	-0.012***

2 PERCENTAGE CHANGE IN MEDIAN WAGE BETWEEN 2013 AND 2007 BY SECTOR IN 2013 AND SECTOR OF ORIGIN IN 2007 (b)

	Construction in 2007		Rest of economy in 2007	
	Same sector in 2013	Other sector in 2013	Same sector in 2013	Other sector in 2013
Total	0.3	-10.6	3.0	5.0
Skill level				
High	3.3	-5.5	2.7	5.8
Low	0.8	-11.3	2.7	4.6
Experience				
More than one year in company	-0.2	-8.1	1.1	0.1
Less than one year in company	0.2	-14.2	8.6	11.4

SOURCES: Ministerio de Empleo y Seguridad Social and Banco de España.
NOTE: *, ** and *** Significance coefficients at 1%, 5% and 10%, respectively.

a Probability of being unemployed, employed in the same sector or employed in another sector, by sector of activity in 2007 and workers' personal characteristics, estimated using a multinomial logit model. Reference group: female, Spanish national, over 45, with more than three years' service and contribution group between 4 and 11.
b CPI-deflated wages.

In short, the above analysis shows that the process of sectoral reallocation of construction workers who have lost their jobs since the onset of the crisis is far from over, as the proportion of workers having found employment in other sectors is still relatively low. Moreover, this is proving to be a particularly costly process for certain groups, such as older and less-skilled workers, who may be less employable in other sectors. Active employment policies should focus on providing these groups of workers with the skills needed in other sectors of the economy.

This box analyses the potential macroeconomic impact of a persistently very low-inflation environment arising from a contraction of aggregate demand aggravated by a possible disanchoring of long-term inflation expectations. Similarly, the role that various economic policies may play to mitigate the contractionary effects of this environment is assessed. To this end, several scenarios are presented which are constructed from a general equilibrium model developed by Arce, Hurtado and Thomas (2015)[1] and designed to include certain key features of the Spanish economy as it is at present. This model includes two regions within a monetary union with the aim of showing some of the most significant differences between the macroeconomic environment of those countries in the euro area which have experienced greater financial strains during the crisis (region A, in terms of the model), compared with other countries which were less affected in this episode (region B)[2]. An essential differentiating feature between the two regions is that in region A there is a financial shock which gives rise to a gradual and lasting private-sector deleveraging process.

The first of the following scenarios illustrates the contractionary effect which may be produced by some disanchoring of long-term inflation expectations in a setting in which interest rates have reached their effective lower bound. Taking this as a starting point, in the second scenario, the individual effects of the following are analysed: using non-standard monetary policy measures aimed at reducing expected medium-term interest rates; structural reforms in product and labour markets; and an expansionary fiscal policy in the region of the monetary union which is not undergoing private-sector deleveraging (region B).[3] Finally, the effects of applying these policies simultaneously and possible synergies between them are analysed[4].

Panel 1 shows a scenario in which the deleveraging process in region A occurs in tandem with a sharp contraction of aggregate

demand across the area, triggered by a fall in households' propensity to consume, which is similar to that which would be prompted, for example, by an increase in aggregate uncertainty. This shock is sufficiently intense for the central bank to hold its interest rates at the lower bound for a year, from which the recovery in inflation in the area as a whole leads it to set positive rates again (blue line). A disanchoring of long-term inflation expectations, which under normal circumstances would involve a very moderate real impact – insofar as the central bank would reduce nominal interest rates in order to avoid an increase in real rates – may be particularly contractionary when it occurs once interest rates are already at their lower bound. Specifically, the restriction imposed by the lower bound of nominal interest rates, together with abnormally low inflation expectations, results in the short term in lower inflation and in higher real interest rates in relation to the scenario without the *disanchoring* of expectations. The combination of these two factors triggers additional negative effects on economic activity which are particularly intense in the region which is reducing its indebtedness (red line).

Panel 2 includes the marginal effect (with respect to the previous scenario and with the disanchoring of expectations) produced by the implementation of: (i) non-standard monetary policy which induces a decline in the expected path of future interest rates (green line); (ii) structural reforms in product and labour markets in region A (blue line), and (iii) temporary fiscal expansion in region B (red line)[5]. First, a monetary policy measure which puts downward pressure on the path of expected nominal interest rates triggers an increase in GDP in the area as a whole[6], due to a reduction in expected real interest rates. Second, as a natural outcome of the higher degree of competition and efficiency of the product and labour markets, structural reforms in region A generate a positive impact on the competitiveness of these markets which prompts a significant increase in this region's exports, in employment (which grows as a result of wage moderation and the increase in external demand) and in future growth expectations. The foregoing gives rise to more buoyant activity in the short term. Finally, a fiscal stimulus in the region least affected by the crisis (region B) produces, albeit with a certain lag, clearly positive effects on the activity elsewhere in the area through exports and also through the consequent positive effect on inflation, which reduces real interest rates and erodes the real value of the debt.

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1 O. Arce, S. Hurtado and C. Thomas (2015), *Policies for a low-inflation environment in a monetary union,* Documentos de Trabajo de Banco de España (forthcoming). See also J. Andrés, O. Arce and C. Thomas (2014), *Structural reforms in a debt overhang,* Documentos de Trabajo, No. 1421, Banco de España.

2 Although the model incorporates a broad set of realistic elements, its calibration is not designed to reproduce quantitative responses by the variables that may be interpreted from an empirical perspective. Accordingly, the magnitudes in the exercises presented below are merely illustrative of the qualitative behaviour of the key channels and variables in the model.

3 The aim of using expansionary fiscal policy is to illustrate the theoretical effect of measures such as those recommended recently in different circles to attempt to stimulate activity in the euro area as a whole, using in this connection the fiscal capacity of those economies in a more comfortable public finances position. See, for example, International Monetary Fund (2014), "Is it time for an infrastructure push? The macroeconomic effects of public investment", *World Economic Outlook,* Chapter 3, October.

4 The idea about the possible existence of synergies between the types of policies analysed here is implicit, for example, in President Draghi's introductory statement following the ECB Governing Council meeting of 15 April 2015.
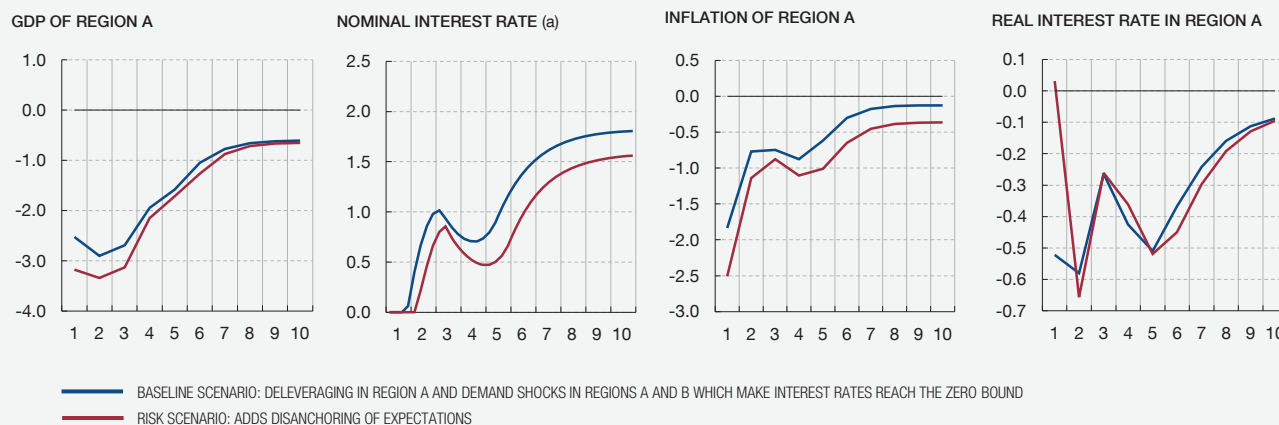
5 In the context of the model, the product market reform comprises a permanent reduction in mark-ups set by companies. In a symmetrical manner, the labour market reform involves a decrease in the margin between the wage earned by employees and their reservation wage, together with a greater degree of flexibility in the adjustment of nominal wages. The fiscal expansion in region B is instrumented by increasing the level of public spending, which will gradually decrease in terms of size following the implementation of the fiscal expansion.

6 For a recent analysis of the impact of this type of policies in the context of a closed economy (with an independent monetary policy), see P. Benigno, G. Eggertsson and F. Romei (2014), *Dynamic debt deleveraging and optimal monetary policy,* NBER Working Paper No. 20556.
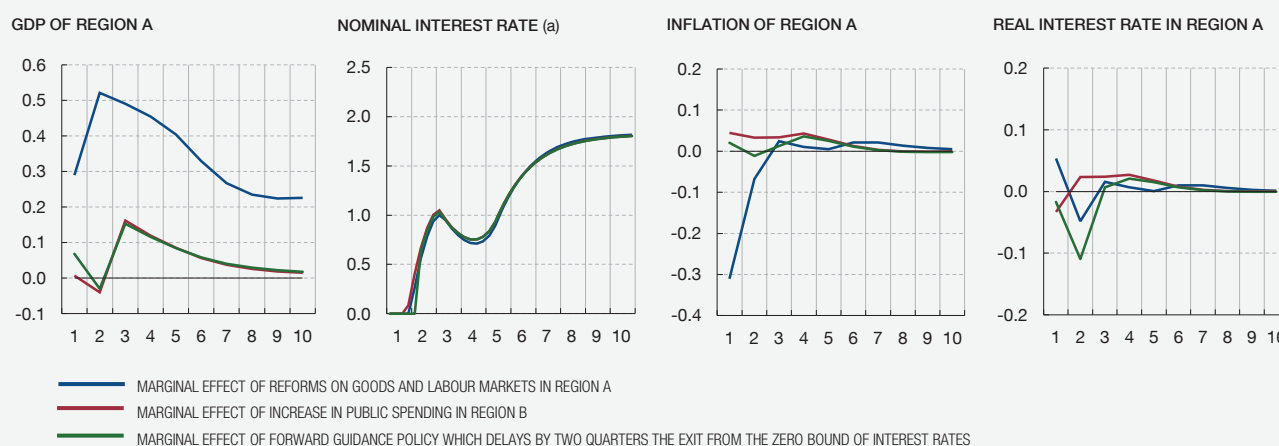
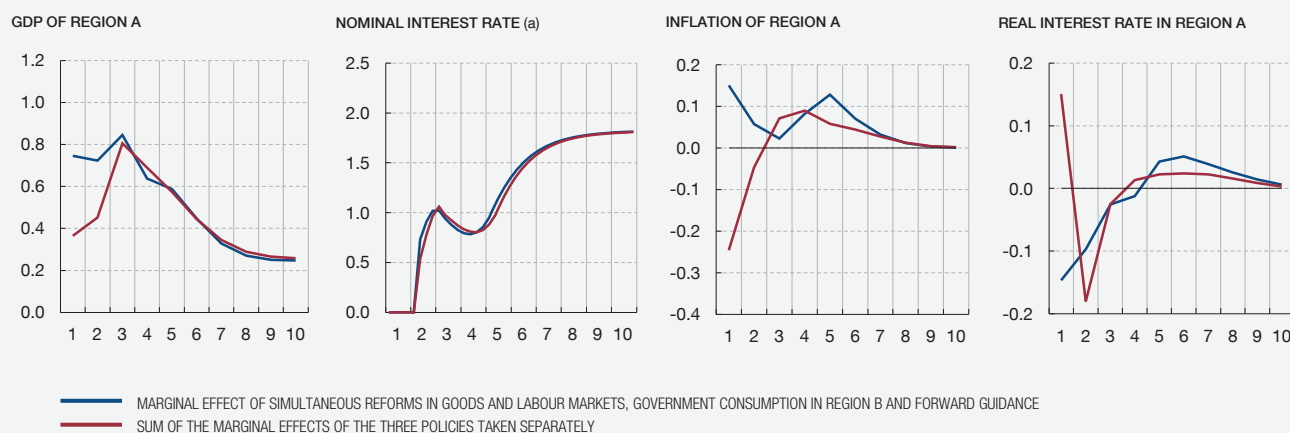1 SIMULATIONS WITH INTEREST RATES LIMITED BY THE ZERO BOUND
   Deviations from initial state. % difference (vertical axis), year (horizontal axis)

GDP OF REGION A

NOMINAL INTEREST RATE (a)

INFLATION OF REGION A

REAL INTEREST RATE IN REGION A

———— BASELINE SCENARIO: DELEVERAGING IN REGION A AND DEMAND SHOCKS IN REGIONS A AND B WHICH MAKE INTEREST RATES REACH THE ZERO BOUND
———— RISK SCENARIO: ADDS DISANCHORING OF EXPECTATIONS

2 MARGINAL IMPACT OF ECONOMIC POLICIES ON THE ZERO BOUND OF INTEREST RATES
   Deviations from scenario with shocks but without policies. % difference (vertical axis), year (horizontal axis)

GDP OF REGION A

NOMINAL INTEREST RATE (a)

INFLATION OF REGION A

REAL INTEREST RATE IN REGION A

———— MARGINAL EFFECT OF REFORMS ON GOODS AND LABOUR MARKETS IN REGION A
———— MARGINAL EFFECT OF INCREASE IN PUBLIC SPENDING IN REGION B
———— MARGINAL EFFECT OF FORWARD GUIDANCE POLICY WHICH DELAYS BY TWO QUARTERS THE EXIT FROM THE ZERO BOUND OF INTEREST RATES

3 IMAPCT OF THE THREE ECONOMIC POLICY MEASURES TAKEN JOINTLY OR SEPARATELY
   Deviation from shock scenario but without policies. % difference (vertical axis), year (horizontal axis)

GDP OF REGION A

NOMINAL INTEREST RATE (a)

INFLATION OF REGION A

REAL INTEREST RATE IN REGION A

———— MARGINAL EFFECT OF SIMULTANEOUS REFORMS IN GOODS AND LABOUR MARKETS, GOVERNMENT CONSUMPTION IN REGION B AND FORWARD GUIDANCE
———— SUM OF THE MARGINAL EFFECTS OF THE THREE POLICIES TAKEN SEPARATELY

SOURCE: Banco de España.

a Variable presented as a level (not as a deviation from initial scenario).

With the aim of analysing the possible synergies between the three measures above, Panel 3 represents their marginal effects in two alternative scenarios. In the first scenario (red line), the marginal effects described in the previous paragraph are added together, that is to say, those effects arising from implementing each measure *separately*. In the second scenario (blue line), the marginal effects of applying *jointly* structural reforms in region A and temporary fiscal expansion in region B are calculated, in a setting in which the central bank also applies non-standard monetary policy such as that considered in this box. The main result of this exercise is that the joint implementation of structural reforms (in the region that suffers the crisis more directly), counter-cyclical fiscal policies (in the region with margin to do so) and non-standard monetary policy measures produces considerably higher expansionary effects in the short term than those which could be obtained if these policies were applied separately.

In the second half of 2014, oil prices decreased considerably from levels of more than $110 (€80) per barrel in June 2014 to lows in January 2015 of slightly more than $45 (€40) per barrel, and have risen moderately since then. This box quantifies, first, the impact of these changes in oil prices on some of the main macro magnitudes of the Spanish economy, using the Quarterly Macroeconometric Model of the Banco de España (MTBE by its Spanish abbreviation)[1]. Second, it analyses in depth the interplay between a persistent decrease in oil prices and some of the specific conditioning factors of the Spanish economy at present, such as the current situation of monetary policy, for which purpose the general dynamic equilibrium model of Arce, Hurtado and Thomas (2015)[2] is used.

The direct impact of the fall in oil prices on consumer prices was felt rapidly, mainly via its pass-through to heating and vehicle fuel prices. As indicated in the main text of this report, the negative year-on-year rates of the CPI since July 2014 are essentially explained by the behaviour of fuel prices. Accordingly, it should be noted that, in Spain, the rate of indirect taxation levied on heating and vehicle fuels has a high fixed component, which amplifies the impact of changes in oil prices on the CPI when the starting point for these prices is a high level[3].

According to the MTBE, which estimates both direct and indirect effects via their pass-through to the economy as a whole, a

permanent unanticipated reduction in crude oil prices of 10%, at the beginning of a three-year projection horizon (2015-2017)[4], would rapidly pass through to the inflation rate, prompting a fall of 0.4 pp in the HICP in the first year, which would continue in subsequent years (see accompanying table). In terms of activity, the greatest effects would be felt in household spending (consumption and residential investment) as a result of the positive impact on their disposable income and wealth in real terms. In turn, higher spending would encourage private productive investment and employment. An increase in domestic demand would have an expansionary effect on imports, which would trigger a fall in the external sector's contribution to GDP growth. Nevertheless, the decline in the energy bill would, in net terms, improve the economy's net lending position. The second-round effects on prices and wages, according to this model's estimates, are very moderate, owing, on one hand, to the degree of nominal rigidity inherent in the model and, on the other, to the effect of higher employment, which causes the decrease in inflation to have a small impact on wages. Overall, for this fall of 10% in oil prices, the model estimates that GDP would increase by 0.15 pp in the first year and by a further 0.04 pp in the second and third year, making for a cumulative increase of 0.23 pp over three years.

The above estimated impacts are of the sign expected under normal circumstances, considering that the Spanish economy is highly dependent on imported crude oil. However, these estimates should be interpreted with a degree of caution, insofar as the MTBE does not consider certain factors specific to the current economic situation which, might otherwise condition the sign of the effect of lower oil prices on economic activity. One of these specific factors is the role of the monetary policy of the ECB, which is currently deploying several non-standard measures in a setting where benchmark interest rates have reached levels close to their lower bound (see Chapter 2 of this report).

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1 See S. Hurtado, P. Manzano, E. Ortega and A. Urtasun (2014), *Update and re-estimation of the quarterly model of Banco de España (MTBE)*, Documentos Ocasionales, No 1403, Banco de España.

2 See O. Arce, S. Hurtado and C. Thomas (2015), *Policies for a low-inflation environment in a monetary union,* Documentos de Trabajo, Banco de España (forthcoming). See Box 4.1 of this chapter for a description of the main features of this model.

3 Thus, for example, the estimated direct effect on the overall HICP of a reduction of 10% in oil prices when oil is trading at €80/barrel is –0.4% (–3.4% on the energy component of the HICP), whereas if the starting level is €40/barrel the impact is –0.3% on the overall HICP and –2.5% on the energy component

4 Taking €65/barrel as the starting level for oil prices, which would be the average of the previous quarters.

FALL OF 10% IN OIL PRICES

	Accumulated level differences		
	2015	2016	2017
GDP	0.15	0.19	0.23
Contributions to real GDP growth			
Domestic demand	0.12	0.18	0.24
Net exports	-0.04	-0.07	-0.09
Net lending position	0.10	0.09	0.08
HICP	-0.40	-0.41	-0.42
Wages	-0.06	-0.05	-0.05
Employment	0.19	0.25	0.31

SOURCE: Banco de España.

Certain recent papers have argued that, where nominal rates are constrained by the zero bound[5], a fall in oil prices might not be expansionary since its deflationary effect could prompt rises in real interest rates which limit short-term domestic demand. However, this literature has omitted the potential role of non-standard policies which entail a reduction in the expected path of interest rates. Accordingly, presented below are the effects which would be produced by a shock, similar to a fall in oil prices, in the model [Arce, Hurtado and Thomas (2015)] comprising two regions in a monetary union. Specifically, the effects of a supply-side shock are considered which causes inflation to fall and increases real household disposable income in three different scenarios (see accompanying panel): (i) where the shock occurs when interest rates are far removed from the lower bound (blue line); (ii) where nominal interest rates are constrained at the lower bound (red line), and (iii) where rates are at the lower bound but the central bank applies non-standard monetary policy to reduce long-term nominal interest rates (for example, by managing the size and composition of its balance sheet or by guiding expectations) (green line).

As shown in the panel, the model concludes that a shock of this type would trigger a fall in inflation in the three scenarios[6]. However, the monetary policy response, which varies in the different cases, has significant effects on the response of inflation and GDP. First, where interest rates are clearly above the lower bound, the fall in inflation leads the monetary authority to cut nominal rates substantially and, consequently, real interest rates moderate and GDP responds positively. By contrast, in the second scenario, it is considered that nominal interest rates are restricted by the lower bound and lower inflation, in the absence of a counterbalancing response by nominal rates, which pushes real interest rates higher, giving rise to an impact of a contraction in GDP. In this case, although the medium and long-term effect continues to be positive, GDP declines during the first two or three quarters.

As highlighted in the latter scenario, the previous short-term contractionary effect of the moderation in oil prices might be mitigated largely where the monetary authority responds to a fall in short-term inflation (and lower medium-term expectations) with a non-standard policy of managing its balance sheet and providing forward guidance, which keeps interest rates at their lower bound for longer than the rules governing their usual behaviour would suggest. In short, this central bank policy affects agents' expectations and neutralises the contractionary effect of a fall in oil prices which, in fact, becomes slightly expansionary from as early as the initial quarters.

5   See, for example, S. Neri and A. Notarprieto (2014), *Inflation, debt and the zero lower bound,* Occasional Paper No 242, Banca de Italia, I. Fisher (1933), "The debt-deflation theory of great depressions", *Econometrica,* B. Bernanke (2007), "Inflation expectations and inflation forecasting", in his speech at the NBER Summer Institute of July 2007 and D. Laxton, P. N'Dyiage and P. Pesenti (2006), "Deflationary shocks and monetary policy rules: an open-economy scenario analysis", *Journal of the Japanese and International Economies.*

6   The panel shows the responses of economy A in the two-region model, which is in a deleveraging phase. The responses of region B are qualitatively similar.
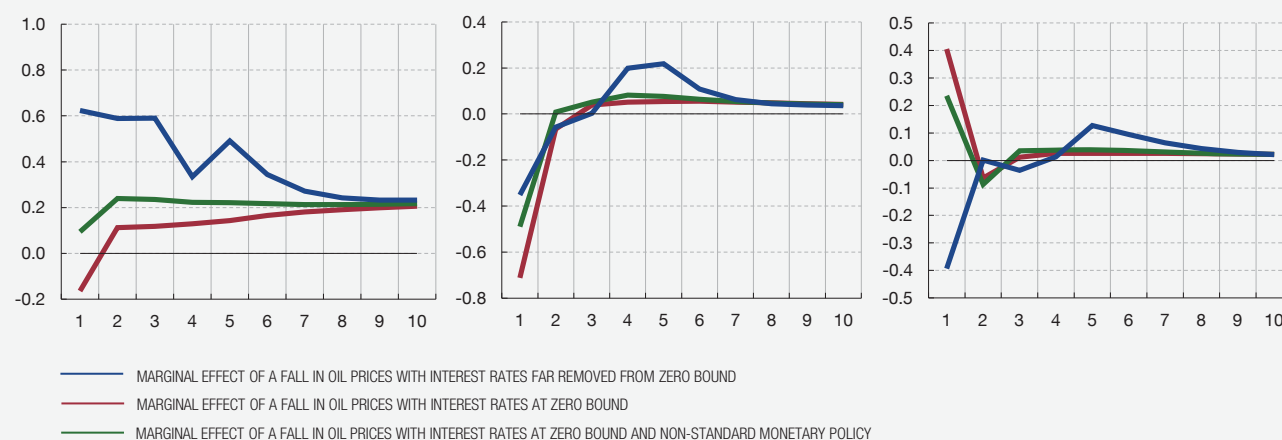
MARGINAL IMPACT OF A FALL IN OIL PRICES
% deviations from scenario with no change in oil prices. % difference (vertical axis), year (horizontal access).

GDP OF REGION A   INFLATION OF REGION A   REAL INTEREST RATE OF REGION A

——— MARGINAL EFFECT OF A FALL IN OIL PRICES WITH INTEREST RATES FAR REMOVED FROM ZERO BOUND
——— MARGINAL EFFECT OF A FALL IN OIL PRICES WITH INTEREST RATES AT ZERO BOUND
——— MARGINAL EFFECT OF A FALL IN OIL PRICES WITH INTEREST RATES AT ZERO BOUND AND NON-STANDARD MONETARY POLICY

SOURCE: Banco de España.

Creditless recoveries are generally defined as periods when GDP grows in real terms after a recession and the aggregate stock of credit to the private sector contracts. The literature on these episodes, which originated with the seminal work by Calvo *et al.* (2006),[1] shows that they are not rare, since they affect between 20% and 25% of all economic recoveries [Abiad *et al.* (2011),[2] Sugawara and Zalduendo (2013),[3] Bijsterbosch and Dahlhaus

(2011)[4]] and, although they are more frequent in emerging economies, they also occur in developed ones [Claessens *et al.* (2009),[5] Coricelli and Roland (2011)[6]]. Examples of creditless recoveries in developed countries include those that followed the Great Depression of the 1930s in the United States or the Nordic banking crises of the early 1990s.

The works cited identified certain factors that significantly increase the probability of a creditless recovery. These include, in particular,
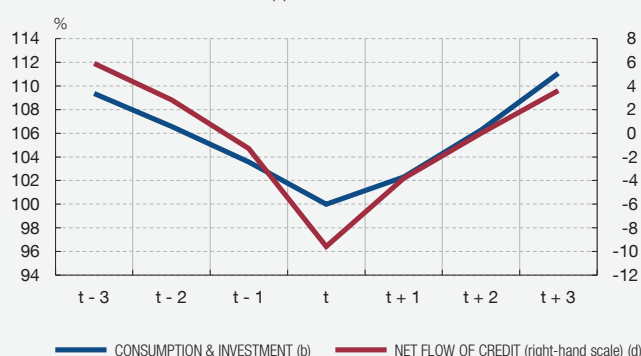
1 G. Calvo, A. Izquierdo and E. Talvi (2006), "Sudden Stops and Phoenix Miracles in Emerging Markets", *American Economic Review Papers and Proceedings*, vol. 96, No. 2, pp. 405-410.
2 A. Abiad, G. Dell'Ariccia and B. Li (2011), *Creditless Recoveries,* IMF Working Paper WP/11/58.
3 N. Sugawara and J. Zalduendo (2013), *Creditless Recoveries. Neither a Rare nor an Insurmountable Challenge,* World Bank Policy Research Working Paper No. 6459.

4 M. Bijsterbosch and T. Dahlhaus (2011), *Determinants of Creditless Recoveries,* ECB Working Paper Series No. 1358.
5 S. Claessens, M. A. Kose and M. E. Terrones (2009), "A recovery without credit: possible, but…", VoxEU.org, 22 May 2009.
6 F. Coricelli and I. Roland (2011), *How do Credit Conditions Shape Economic Recoveries?* CEPR Discussion Paper Series No. 8325.
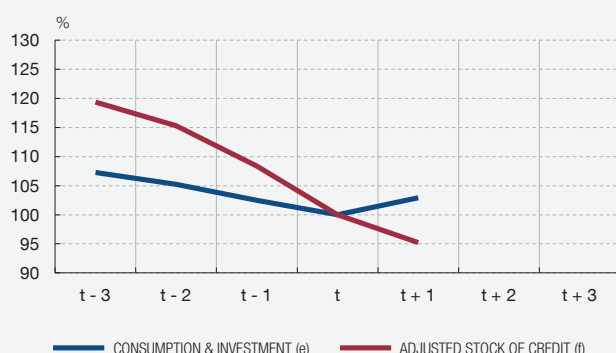
1 DOMESTIC DEMAND AND STOCK OF CREDIT.
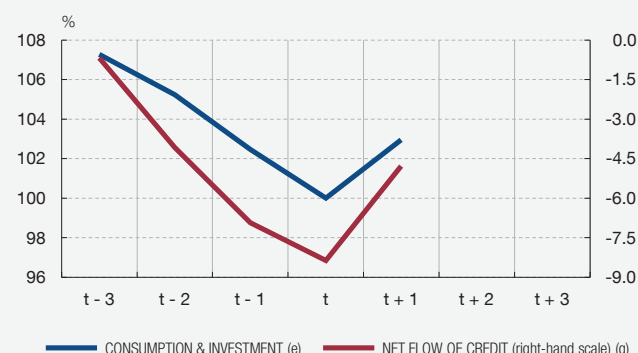   AVERAGE OF BANKING CRISES (a)

CONSUMPTION & INVESTMENT (b)   STOCK OF CREDIT (c)
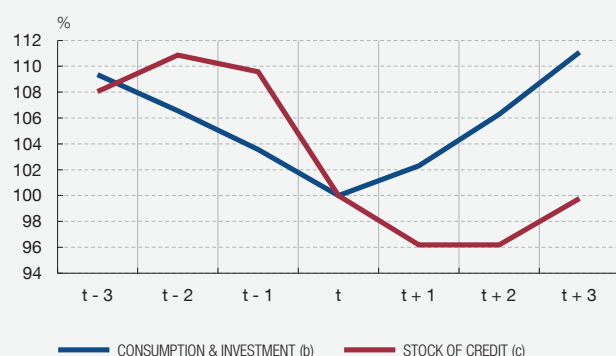
2 DOMESTIC DEMAND AND NET FLOW OF CREDIT.
   AVERAGE OF BANKING CRISES (a)

CONSUMPTION & INVESTMENT (b)   NET FLOW OF CREDIT (right-hand scale) (d)

3 DOMESTIC DEMAND AND ADJUSTED STOCK OF CREDIT. SPAIN 2010-14

CONSUMPTION & INVESTMENT (e)   ADJUSTED STOCK OF CREDIT (f)

4 DOMESTIC DEMAND AND NET FLOW OF CREDIT. SPAIN 2010-14

CONSUMPTION & INVESTMENT (e)   NET FLOW OF CREDIT (right-hand scale) (g)

SOURCE: Banco de España.

a The data correspond to Finland (1990-96), Japan (1990-96), Norway (1988-94), Spain (1981-87) and Sweden (1990-96). Source: M. Biggs, T. Mayer and A. Pick (2010), *Credit and Economic Recovery: Demystifying Phoenix Miracles,* mimeo.
b Arithmetical mean of the volume indices of private consumption and investment of Finland, Japan, Norway, Spain and Sweden, with base 100 at the minimum point of the series.
c Arithmetical mean of the stock of credit of Finland, Japan, Norway, Spain and Sweden, with base 100 at the minimum point of their corresponding consumption and investment series.
d Annual change in the stock of credit index of Panel 1.
e Sum of the volume indices of private consumption and investment, with base 100 at the minimum point of the series.
f Base 100 at the minimum point of the consumption and investment series. The series includes the securitisation vehicles and loans transferred to Sareb and is adjusted for changes not linked to financial flows, such as valuation effects and loan write-offs.
g Annual change in the stock of credit index of Panel 3.

that the recovery follows a recession that was accompanied by a banking crisis and was preceded by a major credit surge.[7] Separately, these two factors also raise the probability significantly, along with other factors such as high private sector debt, a housing market slump or an exchange rate crisis. In addition, economies that are highly reliant on flows of foreign capital are more susceptible to creditless recoveries. Lastly, expansionary tax policies increase the incidence of these episodes, while expansionary monetary policies reduce it.

There are several factors that set creditless recoveries apart. One such factor is significantly lower GDP growth,[8] especially in the first two years [Sugawara and Zalduendo (2013)]. As a result, and since creditless recoveries are usually preceded by deeper recessions, it takes longer to return to potential output levels. The growth breakdown is also different. In turn, domestic demand grows at a slower pace, although no differences are observed in the contribution of foreign demand relative to with-credit recoveries. The most dynamic component of domestic demand is generally consumption, while investment — especially non-residential investment — takes longer to recover. On the supply side, the contributions of capital and productivity are much lower than in with-credit recoveries, while there is no difference in employment. In the breakdown by sector, growth is lower in sectors that are more reliant on external financing [Abiad *et al.* (2011), IMF (2009)[9]] and higher in sectors that are reliant on trade credit rather than bank credit [Coricelli and Roland (2011)]. This finding, together with the observation that creditless recoveries are much more frequent after banking crises, leads Coricelli and Roland (2011) to argue that these episodes are, at least partially, a consequence of deterioration in the supply of bank credit. Accordingly, they argue, policies designed to restore efficient financial intermediation should generate higher growth. The IMF (2009) and Kannan (2010)[10] also suggest that credit supply constraints may have a significant impact on the strength of recoveries.

Various explanations for creditless recoveries have been proposed in the literature. Calvo *et al.* (2006) argue that using the economic slack that has built up during a crisis may boost output with no need for higher investment and, therefore, for credit. According to the IMF (2009) and Darvas (2013),[11] higher foreign demand and depreciation of the real exchange rate are both factors that can play a prominent role in creditless recoveries, allowing export companies to fund their business growth out of higher sales revenues. Claessens *et al.* (2009) and Coricelli and Roland (2011) suggest that in creditless recoveries sources of funding other than bank loans (trade credit, bonds, internal financing) may be used to fund private sector spending. These same authors indicate that a reallocation of credit to less credit-intensive and more productive sectors can generate economic growth even in a setting of private-sector deleveraging on the back of productivity gains.

In turn, Biggs *et al.* (2010)[12] highlight that in economic recoveries, changes in the flow of credit play a more important role than growth in the stock of credit, because the former are a better proxy of new credit, which is that used to fund consumption and investment growth. Specifically, the authors show that an increase in the net flow of credit (which may even be negative) alone is sufficient to trigger domestic demand growth. They illustrate this argument by analysing the main creditless recoveries that followed banking crises in developed countries in the 1980s and 1990s (see Panels 1 and 2). Thus, although the stock of credit continued to decline in the two years after private domestic demand touched bottom, the net flow of credit – albeit still negative – began to recover as domestic demand increased. This is observed in the present cycle in Spain, although the cumulative contraction in credit has been more marked than in the average of the episodes depicted in Panels 1 and 2 (see Panels 3 and 4). Thus, in 2014, when domestic demand first started to recover, the stock of credit held by households and firms continued to decline, but the net flow of credit rose. If the regularity observed in past banking crises is repeated in this case, the stock of private sector credit would not start to increase in Spain until end-2015.

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7 Probability of 80%, according to Abiad *et al.* (2011).

8 According to Abiad *et al.* (2011), a third lower than in with-credit recoveries.

9 IMF (2009), World Economic Outlook, April, Chapter 3.

10 P. Kannan (2010), *Credit Conditions and Recoveries for Recessions Associated with Financial Crises,* IMF Working Paper WP/10/83.

11 Z. Darvas (2013), *Can Europe recover without credit?* Bruegel Policy Contribution, February 2013.

12 M. Biggs, T. Mayer and A. Pick (2010), *Credit and Economic Recovery: Demystifying Phoenix Miracles,* mimeo.

The information contained in the Banco de España's Central Credit Register (CCR) database permits a disaggregated analysis of recent changes in the supply of and demand for credit, and in access to credit, by non-financial corporations. The CCR compiles monthly individual information on the credit balances and credit situation of loans over €6,000 provided by all the credit institutions operating in Spain. The database also contains the requests for information that the institutions file with the CCR to ascertain the debt position of firms that apply to them for funding and with which they have no exposure (they receive this information automatically on firms with which they already have exposure). Using these information requests it is possible to identify a subgroup of firms that are seeking bank funding (only firms applying for loans to banks with which they do not already have loans). Moreover, by observing how their credit balances evolve, it is also possible to know if those firms actually obtain the funding.[1] Therefore, the number of requests may be used as a proxy variable for demand for credit, while the proportion of firms that obtain funding is a measure of access to credit which depends both on the lending standards applied by institutions and the credit quality of the firms applying for funding. Panels 1 to 4 depict both indicators, together with the number and volume of bank loans granted proxied by the growth in firms' credit balances.

As Panel 1 shows, the onset of the crisis in 2008 was accompanied by a severe contraction in demand for credit by Spanish firms which lasted through to early 2013. However, by sector, the demand performance was not uniform either in terms of timing or intensity. Thus, while demand in construction and real estate services fell sharply between 2008 and end-2010, demand in all other sectors was virtually unchanged. Subsequently, loan applications gradually declined across the board, so that by end-2013 the number of firms seeking funding was 60% and 16% below the pre-crisis levels in the real estate and other sectors, respectively. At the same time, the proportion of firms that applied for and obtained funding (with institutions with which they had no exposure) dropped markedly in 2008-09 and then fell more gradually thereafter, touching bottom in April 2013 at 36%, almost 20 pp below the early 2008 level (see Panel 2). This was most likely the result of the tightening of credit supply conditions and of the institutions' perception of deterioration of credit quality of the applicants. The drop in credit demand and in the proportion of successful loan applications resulted in a sharp decline in the volume of new lending (see Panels 3 and 4). Both these factors played a more important role in the real estate sector, triggering a more pronounced decline both in the proportion of corporations obtaining funding and in the volume of new lending.

From early 2013, the improved economic situation and macroeconomic outlook prompted a reversal in these patterns.

Thus, the demand for credit by firms tended to recover, driven exclusively by non-real-estate firms, and the proportion of firms obtaining the requested funding tended to increase, in general, growing by some three percentage points from the 2013 low to approximately 40% in October 2014. In the real estate-related sector, the number of credit applications remained stable in the period, although a larger number of these applications for bank funding were successful. Lastly it should be noted that despite the improved access to credit and the growth in demand, the volume of new lending has barely risen, indicating that for the subgroup of firms analysed here more loans are being granted but for lower average amounts than in the past.

In order to ascertain the extent to which the recent recovery observed in the proportion of firms obtaining funding reflects a genuine improvement in access to credit or changes in the characteristics of the corporations concerned, the probability of a firm being granted a loan has been modelled as a function of a series of firm-specific variables and a set of fixed effects[2] and also permitting time-varying coefficients by sub-period (see Table 5). In particular three sub-periods are considered: the expansionary phase (2003-07), the crisis (2008-12) and the recovery (2013-14). In general, the estimated coefficients of the variables have the expected sign and are statistically significant. Thus, as the table shows, the debt ratio, the interest burden and the fact that a firm has an NPL balance with a bank in the month previous to the loan application all have a negative effect on the probability of it obtaining funding from a bank with which it has no previous lending ties. Also according to the estimates, and counter-intuitively, the asset volume of a firm has an adverse effect on the probability of it obtaining a loan, which may be linked to a possible bias in the sample of firms used in the estimations.[3] Analysis of the findings by sub-period shows that after the crisis the probability of obtaining a loan became more sensitive to changes in financial determinants of firms, which suggests that institutions would be discriminating between firms to a greater extent than in the expansionary phase.

Lastly, Panel 6 shows the different probabilities of obtaining a loan by type of corporation: 1) the median firm, which proxies a typical firm; 2) firms with a sounder financial position; 3) firms with a

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1   More specifically, a firm is considered to have obtained funding when its credit balance (including both the amount drawable and the amount drawn) increases between t-1 and t+3 with banks with which it had no exposure.

2   The estimates derive from a linear probability model that includes as explanatory variables asset size, a binary variable that indicates whether the firm has an NPL balance, the logarithm of 1 plus the age in years of the firm, the debt ratio and the interest burden ratio. It also includes fixed firm effects, fixed year effects and fixed time effects combined with an age binary variable. The estimates were made for the subgroup of firms in the CCR for which there is information at the Central Balance Sheet Data Office (CBSO). The data cover the period 2003-14.

3   In particular, the CCR only identifies firms that apply for funding to institutions with which they have no exposure. One possible explanation for this result could be that the larger firms applying for loans from institutions with which they have no exposure are precisely those whose usual banks have refused to grant them funding in view of their perceived poor credit quality.
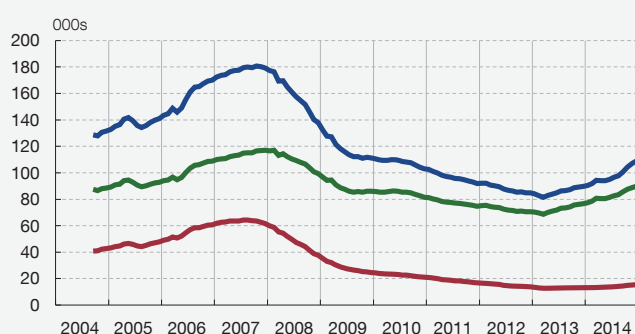
1 NUMBER OF LOAN APPLICATIONS
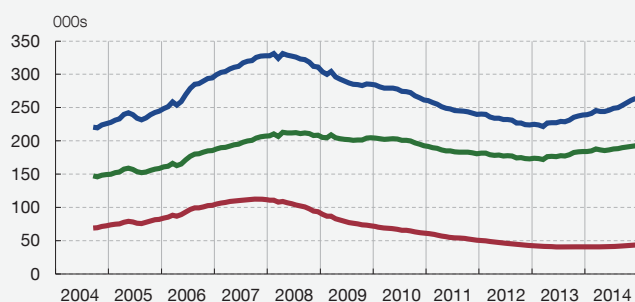
2 PERCENTAGE OF FIRMS THAT OBTAIN A LOAN
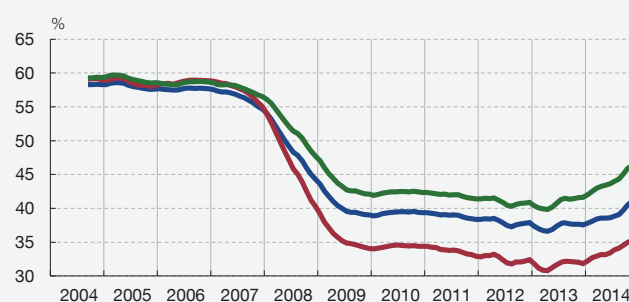
3 NUMBER OF LOANS GRANTED

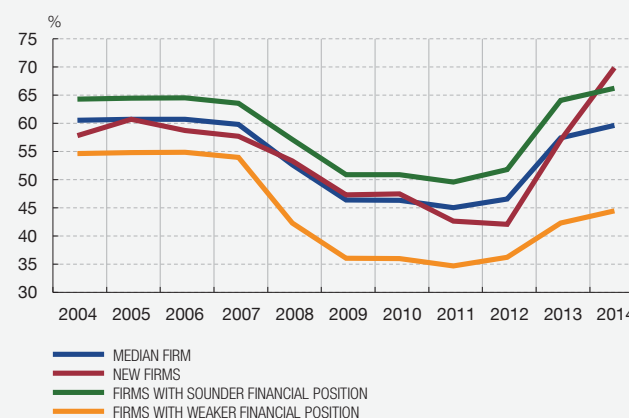4 VOLUME OF LOANS GRANTED

— TOTAL　　　　　— CONSTRUCTION & REAL ESTATE　　　　　— OTHER SECTORS

5 MARGINAL IMPACT ON PROBABILITY OF LOANS BEING OBTAINED (a) (b) (c)

	2003-2007	2008-2012	2013-2014
NPL	-0.111*	-0.133*	-0.132*
Debt	-0.053*	-0.073*	-0.073*
Interest burden	-0.002*	-0.005*	-0.005*
Assets	-0.062*	-0.052*	-0.046*
Age	-0.002	0.014	0.009

6 ESTIMATED PROBABILITY OF LOANS BEING OBTAINED (d)

— MEDIAN FIRM
— NEW FIRMS
— FIRMS WITH SOUNDER FINANCIAL POSITION
— FIRMS WITH WEAKER FINANCIAL POSITION

SOURCE: Banco de España.

a Results based on a linear probability model estimated using data from the period 2003-14 for the subgroup of firms in the CCR for which there is information at the CBSO. The coefficients represent the marginal effects of each of the variables one period lagged on the probability of loans being obtained.

b The total assets variable is the logarithm of total assets of the firm. The NPL variable is a binary variable that takes the value of 1 if the firm has an NPL balance with any bank in the previous period, and a value of 0 otherwise. The age variable is the logarithm of 1 plus the age in years. The debt ratio is calculated as total debt minus the most liquid assets minus loans granted over total assets. The interest burden is calculated as interest over gross operating profit plus financial income.

c (*) Indicates coefficient significance at 1% confidence level.

d Probability for four types of corporations: 1) median firm (for which the median value of all the variables is taken); 2) firms with a sounder financial position (for which the value of the 10th percentile of the interest burden and of the debt ratio is taken); 3) firms with a weaker financial position (for which the value of the 90th percentile of the distribution of the interest burden and of the debt ratio is taken): and 4) new firms (those that are two years old or less).

weaker financial position;[4] and 4) new firms.[5] The results show that the deterioration in access to credit was similar for new and established firms in the period 2007-10, whereas in 2011-12 the tightening continued for new firms but remained unchanged for established ones. Since then access to credit has improved, especially for new firms, returning even to pre-crisis levels, although this finding should be viewed with caution as the coefficient associated with this effect cannot be measured precisely. In turn, in terms of financial position, the panel shows how the probability of obtaining a loan during the crisis declined more severely for firms with higher debt and a higher interest burden and how, since 2012, that probability is recovering at a slower pace than for firms with a better financial position. Thus for this last group, in accordance with the results of the estimates, by 2014 the probability of obtaining a loan had returned to pre-crisis levels, whereas in the case of firms with a weaker financial position it was still very much below those levels. In any event, all these results must be viewed with caution as they are based on estimates.

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4   To calculate the probability of firms with a weaker and a sounder financial position obtaining a loan, the value of the 90th and 10th percentiles, respectively, of the interest burden and the debt ratio are taken and the median for the other variables.

5   New firms are considered to be those that are two years old or less. The median value of the other variables is taken to calculate the probability.