ANNUAL REPORT

2018

BANCO DE ESPAÑA
Eurosistema

ANNUAL REPORT 2018

3

MONETARY POLICY DESIGN IN THE MEDIUM AND LONG TERM

4

ECONOMIC CONSEQUENCES OF DEMOGRAPHIC CHANGE

INDEX OF TABLES

INDEX OF CHARTS

INDEX OF CHARTS

INDEX OF FIGURES

Foreword by the Governor Pablo Hernández de Cos

The *Annual Report* of the Banco de España is the institution's main instrument for contributing to the dissemination of its analyses on our economy.[1] The introduction to the Report provides the Bank's overview of the latest developments, highlighting the challenges facing the economy and exploring possible avenues for addressing them. The report also has three theme-based chapters. These respectively tackle the study of the factors behind the current lengthy period of low inflation, not only in Spain but also in the euro area as a whole; considerations on monetary policy design in the long term following the experience gained in the crisis; and the economic consequences of the far-reaching demographic changes facing Spain.

Since the start of 2018 the Spanish economy has faced a more adverse international environment, notably marked by the uncertainty over trade tensions

The international economic environment turned more unfavourable in 2018, with a particularly sharp slowdown in global economic activity as regards trade. Various factors account for this downturn. They include most notably the impact of trade disputes, especially between the United States and China, and the uncertainty over the outcome of Brexit.

In this environment, the Chinese economy evidenced the difficulties involved in managing, in an orderly fashion, the impact on activity of its necessary deleveraging. Some of the emerging economies with the biggest imbalances, such as Argentina and Turkey, were particularly affected by the tightening of global financial conditions associated with US monetary policy normalisation.

---

1 The *Annual Report* complements other regular economic publications by the Banco de España. These include the *Financial Stability Report,* which offers a half-yearly analysis of the specific risks to the Spanish financial system and explains the institution's macroprudential policy; the *Economic Bulletin,* which sets out quarterly the developments in the Spanish economy, within the international and euro area settings, and the projections for the coming years; the *Annual Accounts,* published yearly; and the likewise annual *Institutional Report,* which offers the public at large an overview of the organisation and its functions, and a summary of the key activities undertaken during the year. This information is supplemented with the publication, inter alia, of specific annual reports on banking supervision activities, claims and the oversight of market infrastructures.

Growth in the euro area economy eased significantly, and the ECB maintained a very accommodative monetary policy

Given its high degree of external openness, increased uncertainty and the slowdown in global activity and trade particularly impacted the eurozone. As a result, growth in the area's economy eased significantly in 2018. It was also affected by various negative idiosyncratic shocks. These were particularly acute in Italy, as a result of uncertainty over the course of its economic policies, and in Germany, where they were concentrated in certain key productive sectors, such as the car industry.

Against this background, marked also by low core inflation levels, the ECB continued to pursue a very expansionary monetary policy. Thus, although it set an end to net asset purchases in December, it communicated its intention to hold interest rates at their current historically low levels at least until the end of 2019, and to continue reinvesting the assets accumulated on its balance sheet over an extended period past the date when it will start raising interest rates. It further announced a new series of targeted long-term refinancing operations (TLTRO). As a result, the financial markets expect low interest rates to continue over an extensive period.

The outlook for global and European growth is subject to downside risks which, in the case of the euro area, will require resolute action to strengthen its institutional architecture

Looking ahead, the outlook for global and European growth remains subject to sizeable downside risks. Notable among these is the impact on the world economy of the potential proliferation of protectionist measures. And compounding factors include the vulnerabilities of some emerging economies, in particular – given its importance – the Chinese economy, and the high levels of debt globally.

On top of the effects arising from the potential materialisation of these risks, the European economies also have substantial idiosyncratic factors of vulnerability: uncertainty over Brexit, the weakness of specific banks, the demographic outlook and low productivity levels, among others.

Addressing these challenges to the European economy calls for resolute action by national authorities to raise growth potential and reduce vulnerabilities. It must also

be acknowledged that the institutional and regulatory architecture of Economic and Monetary Union (EMU) remains incomplete, despite the reforms agreed on in recent years. The revision of this architecture must be completed, so as to prevent the single currency from continuing to be exposed to tensions should serious shocks occur. The need to act is most pressing in three areas. First, the Banking Union is still missing a very important pillar, namely the creation of a common deposit guarantee scheme. Second, fresh momentum must be given to the integration of capital markets, an area where progress continues to be very slow. And third, mutual insurance capacity would be strengthened if the creation of a cyclical stabilisation instrument were approved, although sufficient consensus has not yet been forged for this proposal.

Central banks in general, and the ECB in particular, face numerous difficulties. These include most notably the persistence of low inflation and the proximity of interest rates to their effective lower bounds. Central bank strategies for action may need to be reviewed

The developed economies – and among them, in particular, the euro area – have been immersed in a prolonged period of low inflation. This is partly in response to the high degree of cyclical slack stemming from the deep recession. Moreover, the prolongation of the period of flatter prices is expected to have contributed to reinforcing their persistence, by exerting downward pressure on agents' inflation expectations.

Adding to this are the effects of certain structural factors, such as population ageing, globalisation and the generalisation of new technologies. Further effects specific to the euro area include the impact of reforms and of competitive adjustments undertaken in some countries in the wake of the crisis. More recently, in the eurozone and in other areas, there has been a rise in wage growth that has so far not passed through to prices. Looking ahead, we cannot know to what extent this pass-through may occur, or whether, on the contrary, the impact of higher labour costs will tend to be absorbed, as in recent quarters, by a squeeze on firms' mark-ups.

The proximity of interest rates to their effective lower bound narrows central banks' room for manoeuvre to react to future recessions, which has opened a debate about possible avenues for alleviating this constraint. Specifically, consideration has recently been given to resorting to alternatives such as raising the numerical inflation

target or setting a price level target. However, such possibilities are not free from costs or disadvantages. Central banks will also have to assess whether their balance sheets should retain their substantial current size, or whether, on the contrary, it would be preferable for that size to come closer to its habitual pre-crisis level. Notwithstanding operational aspects, this issue is significant not only in terms of the effectiveness of monetary policy; it may also have consequences for the stability of the financial sector as a whole.

Against this external background, the behaviour of the Spanish economy remained favourable in 2018

With this hardly propitious external setting, the Spanish economy slowed slightly. But it showed substantial resilience compared with other developed countries. As a result, the recovery in activity continued for the fifth year running and the intensity of employment creation was maintained, which contributed to a further reduction in the unemployment rate.

Behind these favourable developments is highly dynamic domestic demand, which helped counter the notable loss of momentum of exports. Specifically, expansionary household and non-financial corporate income, the improvement in these sectors' financial position (essentially as a result of continuing deleveraging) and very favourable financing conditions all helped uphold private consumption and investment.

However, the strength of domestic demand was spurred by other less positive factors, insofar as they give rise to possible sources of vulnerability for the future. On one hand, budgetary policy remained expansionary, proving particularly conducive to the growth of household income. On the other, there was a fresh decline in the household saving rate, down to a historical low.

The expansion of the economy is underpinned by the correction of certain imbalances, in the form of private-sector deleveraging and improved competitiveness

From a broader time perspective, the assessment of the years elapsed since the start of the upturn may generally be viewed as positive. The last five-year period has been marked by high GDP and employment growth, which has clearly exceeded that observed in the euro area. Moreover, the recovery has enabled and,

in parallel, has been underpinned by the correction of some of the imbalances that built up in the previous upturn.

The current cyclical upturn is, in particular, thanks to the significant reduction in household and corporate debt, the far-reaching restructuring of the financial system and the pick-up in external competitiveness, which has provided for successive external surpluses. This latter development, in contrast to events in Spain in previous upturns, has enabled the nation's net debt to the rest of the world to begin to be reduced.

The notable improvement in external competitiveness has helped boost exports. And that has allowed the export share in the economy's output to increase notably. This, along with the increased weight of investment in equipment, has been a key feature of the changes in the productive structure of the economy over the course of the last few years.

The economy faces different challenges and vulnerabilities, which should be promptly addressed

Despite these developments, the economy faces major challenges and vulnerabilities, which need to be addressed in order to promote sustainable and balanced growth. The list of challenges – which, while not comprehensive, contains the main ones – includes: reducing the high public and external debt, and the high unemployment rate; raising productivity; the need to face up to the consequences of progressive population ageing; and the shoring up of the banking system.

The prevailing circumstances underscore the need to address these challenges urgently. First, it is crucial to harness the still-favourable economic setting to speed through the necessary reforms. The potential transitory costs that some of the structural reforms occasionally entail can be better addressed in benign economic scenarios. Also, the effect of some of these reforms is, precisely, to make the economy more resilient in the face of an adverse scenario. It should be borne in mind that the international scenario is, on top of the previously mentioned slowdown in global activity and trade, characterised by the presence of various sources of risk. The hypothetical materialisation of such risks would check the expansion, and the ensuing effects might be amplified by the presence of specific factors of fragility in

our economy. In contrast, the economic policy initiatives pursued in recent years to address these challenges have been scarce.

The current upturn should be harnessed to drive through an improvement in public finances

Among the difficulties requiring attention is the absence of a significant correction in the structural component of the budget deficit in recent years. While there has been a reduction over the course of the recovery in the general government deficit, it has essentially been due to the buoyancy in activity and the fall in interest rates. There has been no genuine improvement in the structural balance, which remains at very high levels. As a result, the public debt ratio has scarcely fallen from its 2014 peak, meaning that at the end of the first quarter this year it stood at slightly over 98% of GDP.

Running such high levels of public debt significantly constrains the fiscal policy room for manoeuvre ahead of a potential recessionary scenario; accordingly, budgetary consolidation is a priority.

Correcting the economy's external debt calls for maintaining the gains in competitiveness built up

Despite the notable correction to date, the negative net international investment position stands far above that observed in other developed economies. Moreover, the nation's gross debt is only slightly below its peak during the crisis.

Continuing to reduce debt vis-à-vis the rest of the world calls for external surpluses to be run in a sustained fashion over time. And that, in turn, requires additional gains in competitiveness to be achieved. Unlike in the recovery to date, when such gains have been based on the moderation of labour and financial costs, they must depend to a greater extent hereafter on productivity gains.

Extending the benefits of the recovery to all of society requires policies that boost job creation and job quality and promote productivity

In a context in which inequality increased during the crisis, one of the priorities of economic policy should be to ensure that the benefits of the recovery spread to as many layers of society as possible. Among other actions, this will involve achieving additional increases in employment and enhancing job quality.

The Spanish labour market continues to evidence symptoms of a high degree of dysfunctionality, chief among which is the persistence of very high unemployment. True, the unemployment rate has fallen most significantly since the start of the recovery; but it still remains very high. This is particularly so in some specific groups such as the young and the less skilled. And it is in these groups where long-term unemployment is largely concentrated. In addition, there is significant room for improvement in the quality of existing jobs, where the rates of temporary employment and unwanted part-time employment are very high.

Given this diagnosis, the remedies involve reducing the mismatch between the skills of the unemployed and those demanded by employers. This in turn, requires improving the human capital of the less-skilled unemployed, to allow for their reinsertion into the labour market. Moreover, the need to address phenomena such as globalisation and digitalisation calls for reconsideration of the institutional design of the education system, learning methods and the very content of the educational curriculum.

Reducing the high rate of temporary employment requires the adoption of regulatory changes that make permanent hiring more attractive. Collective bargaining should, moreover, take into account the high dispersion between sectors and firms in terms of productivity, in order to better align productivity and wage remuneration. Progress on these two fronts would help prevent adverse shocks from bearing down so disproportionately on employment, as has historically been the case in the Spanish economy.

Improving citizens' well-being hinges crucially, moreover, on increasing productivity gains, which have been very poor in the past decade. Indeed, compared with the mere accumulation of production factors, an increase in productivity is the sole mechanism capable of generating sustained and stable economic growth in the long run. The structural reforms needed to improve the dynamics of this variable must therefore be undertaken. Among other aspects, there is ample scope to pursue reforms that: reduce labour market duality; revise those regulations that unduly curb sectoral competition and deter or hamper business growth; improve the quality of institutions; and eliminate the human and technological capital shortfall. At the same

time, a review of public spending and revenue, so as to increase efficiency, and a general periodic and systematic assessment of public policies might contribute decisively to improving productivity.

The phenomenon of population ageing is a first-order challenge

The phenomenon of population ageing under way in the advanced economies will have far-reaching consequences. The effects of this demographic development will become patent in many areas of the economy. They will affect consumption and saving patterns; prompt a reduction in the workforce and, possibly, in the pace of productivity; and test the effectiveness of demand-side policies in stabilising activity.

It is thus important to stress that addressing the population challenge will require a multidisciplinary strategy. Among other aspects, this strategy must encourage the participation of older workers, tailor migratory policy to labour market needs and boost the birth rate. In this scenario, education and vocational training policies will be crucial.

Population ageing is also a first-order challenge for the sustainability of our welfare system. It will involve a most pronounced increase in public spending on specific items, which notably encompass the public pensions system. The reforms approved in 2011 and 2013 included certain adjustment elements that enabled the effect of ageing on public spending on pensions to be significantly countered by, above all, a likewise significant reduction in the replacement rate. The latest measures approved have delayed the application of the sustainability factor and have reintroduced in recent years the CPI-based revaluation of pensions. In this setting, ensuring the financial sustainability of the system will require additional measures. The importance of this issue highlights the need to forge broad consensus, without unwarranted delay, on the measures needed for our pension system to preserve intertemporal sustainability and intergenerational equity.

Progress has been made in shoring up the banking system, but significant work remains to be done

The strengthening of the banking system's financial situation continued in 2018, with a significant improvement in asset portfolio quality. The balance-sheet clean-up was underpinned both by the

continuation of the cyclical expansion and by the transfer and sale of problem assets undertaken in the sector. The overall result was the continuing pick-up in financial institutions' profitability.

Nonetheless, we must continue to tackle the considerable challenges still facing the banking system, which are in many cases shared by other European banking systems. In particular, further reductions in the volume of problem assets and the continuing streamlining of operating expenses are vital for restoring higher levels of profitability, which remain very low relative to the cost of capital these institutions must bear. Moreover, Spanish banks must reinforce their capital and liabilities susceptible to bail-in in order to address outstanding regulatory challenges and improve their resilience in the face of adverse shocks.

In addition, institutions must adapt, first, to the new sectoral structure taking hold, characterised by the influx of new competitors; and further, to the new technological environment, in which the digitalisation of many financial services poses significant risks but also offers many opportunities to credit institutions. Banks must also strive to improve their reputation, which was tainted in some respects in the wake of the crisis.

The recent creation of the Spanish macroprudential authority (AMCESFI) and the extension of the macroprudential tools available to the sectoral supervisory authorities strengthen the capacity for preventing and mitigating risks to financial stability

AMCESFI was created at the start of 2019. Its aims are to boost coordination, information exchange and the analysis of risks to financial stability among the Ministry of Economy and Enterprise, the Banco de España, the National Securities Market Commission (CNMV) and the Directorate General for Insurance and Pension Funds (DGSFP). In parallel, the set of instruments available to the sectoral authorities for application to the institutions subject to their regulation has been extended. In particular, the Banco de España is empowered to require, where appropriate, countercyclical capital buffers of banks by credit segment, limits on concentration vis-à-vis economic sectors and conditions on the extension of new loans. These instruments join those already in place (countercyclical capital buffer and capital

buffers for global and domestic systemically important institutions, among others). These developments should contribute to enhancing the authorities' capacity both for identifying risks to financial stability and for responding to mitigate them.

In sum, the positive course of the economy in recent years should not have us lose sight of the enormous challenges still ahead. Only by resolutely addressing these challenges can we give extra momentum to the current upturn, improve our economy's capacity to withstand negative scenarios in the future and steal a march on the numerous consequences of the major demographic changes that Spain must face.

Pablo Hernández de Cos
Governor of the Banco de España

Presentation of the *Annual Report 2018*
at the Banco de España Oviedo branch

28 May 2019.

Annual Report
Digest

Developments in 2018	• The expansion of the Spanish economy continued in 2018. GDP growth was 2.6%, somewhat down on 2017. Growth remained very intensive in employment creation.
	• The slight slowdown observed was in line with expectations, but the composition of GDP was very different: domestic demand continued to be very robust, set against the significant slowdown in exports.
	• Activity and world trade were affected by the tightening of global financial conditions and heightening uncertainty over trade conflicts and the Chinese authorities' difficulties in redressing this economy's debt [Box 1.1].
	• This scenario particularly impacted the exports of the (generally very open) euro area economies. Compounding this were the effects of the cumulative appreciation of the euro and the uncertainty arising from Brexit. Moreover, in some countries, such as Italy and Germany, there were other adverse factors bearing down on the weakness of domestic demand. As a result, year-on-year growth in the area dipped from 2.7% at end-2017 to 1.2% a year later.
	• The buoyancy of domestic demand in Spain accounts for GDP growth exceeding that of the euro area as a whole in 2018 [Box 1.2]. Underpinning the favourable course of household and business spending were the expansionary behaviour of these sectors' incomes, their improved financial position and the availability of financing under favourable conditions.
	• In the case of households, the fresh decline in the saving rate and the high growth of borrowing to finance consumption suggest that households might be basing their spending decisions on overly optimistic expectations about their future incomes.
	• Also upholding the strength of activity last year was the expansionary fiscal policy stance.
	• Overall inflation continued to be somewhat volatile, owing to the ups and downs of energy prices. Core inflation, meanwhile, remained low, against a background of rising unit labour costs.
Underpinnings and vulnerabilities	• The projected prolongation of the expansion in Spain is underpinned by several supporting factors:
	— The improved financial situation of households and firms, following the significant reduction in their debt over the past decade.
	— The balance-sheet clean-up and restructuring of the banking system. This helps the sector fulfil its function of financing agents' spending, and thus contribute to growth.
	— Recurrent external surpluses, thanks to improved competitiveness. Contributing factors here were the easing in labour costs and the greater flexibility in the use of the labour factor afforded by the latest labour market reforms.
	— The openly expansionary ECB monetary policy stance, which is expected to hold over a prolonged period.
	— The strengthening of the euro area's institutional architecture. Though incomplete, this has seen the introduction of new tools and institutions in the prudential supervision and macrofinancial stability area (such as the Single Supervisory Mechanism, the Single Resolution Mechanism and the European Stability Mechanism). Contributing at the national level in this connection is the recently created Spanish macroprudential authority (AMCESFI).
	• But there are still some factors of fragility leaving our economy vulnerable to potentially adverse shocks:
	— The high overall general government structural deficit and high public debt.
	— External indebtedness, despite running current account surpluses in recent years.
	— The vulnerability of some household groups as a result of the increased share of their spending against future income.
	— The risk of reversal of some of the reforms conducive to fomenting the current recovery.

How to address the challenge of achieving balanced and sustainable growth in the long term	• Challenges in the **public finances** domain: — Resumption of budgetary consolidation to afford fiscal policy greater room for manoeuvre ahead of future shocks. — Adoption of far-reaching measures to ensure the sustainability of the pension system and that pensions are fair from the standpoint of the attendant costs and benefits for different generations. — Revision of the composition of public spending and revenue, seeking to maximise their contribution to growth. • The need for **sustained external surpluses** to continue reducing the net debtor position vis-à-vis the rest of the world. That will require holding on the path of improved **competitiveness** which, unlike to date, should rest more on **productivity** gains than on wage moderation. This will call for improvements in **human and technological capital**. • The need to **correct structural shortcomings in the labour market.** Symptoms here include a high unemployment rate (especially among the young and less skilled), and high levels of temporary unemployment and unwanted part-time time employment [Box 1.3]. This requires measures that will: — Maximise employment generation and help increase the number of hours worked per person. These aspects would help prolong the recent reduction in income disparity [Box 1.4]. It will be crucial in this connection to revise active labour market policies and continuous training. — Increase the attractiveness of permanent hiring without giving up much-needed flexibility to prevent recessions translating into mass job losses. • The **strengthening of the banking system's** capacity to contribute to the financing of the economy as a whole: improved profitability, reduction in problem assets, strengthening of capital levels, adaptation to a new technological and competitive environment (FinTech, BigTech), and restoring of reputation. • The **deepening of the euro area's institutional architecture,** with a particular emphasis on introducing and developing risk-sharing and risk-mitigation elements more intensely and efficiently than has so far been the case.

Price stability and inflation targets	• Price stability contributes to the sustainable development of the economy and, therefore, is part of most central banks' mandate. At the ECB, **price stability** is set in terms of annual increases in the euro area HICP close to – but below – 2% in the medium term.
	• Since the launch of the single currency in 1999, the **area's inflation** has been in line, on average, with the ECB's objective; **since 2013,** however, it has been persistently **below the medium-term objective.**
	• More recently, the ECB has resorted extensively to extraordinary measures to provide the expansionary stimuli needed to raise actual inflation towards its objective [Box 2.1].

Inflation developments and expectations	• Diagnosing the determinants of the current **low-inflation scenario** characterising some of the main advanced economies, including the euro area, is crucial for monetary policy conduct.
	• This low-inflation scenario is partly the outcome of **transitory factors,** linked to cyclical circumstances and to energy prices.
	• But there are also more permanent, **structural factors.** These include population ageing, globalisation and new technologies and forms of trade, which are exerting downward pressure on inflation globally [Boxes 2.2 and 2.3].
	• Low inflation over a long period can lead long-term **expectations** ultimately to reflect, in part, current inflation. That may prompt some deanchoring of inflation expectations in relation to the ECB's medium-term objective.

Changes in the composition of inflation: by country and by sector	• To understand the low inflation in **the euro area,** regard should be had to its composition by country and sector: **inflation in the peripheral countries has converged on that of the core members** (1999-2018), and the reduction in services inflation has been particularly sharp.
	• Inflation has eased more in the countries which felt the impact of the crisis more acutely, pursued economic and financial adjustment programmes and implemented a more contractionary fiscal policy during the sovereign debt crisis; namely, in Portugal, Greece, Ireland and Spain. Inflation averaged 0.4% in these countries in 2013-2018, compared with 0.9% in the euro area. In the other members current inflation is only slightly lower, on average, than in the years following the launch of the euro.
	• **Energy prices** now have a more determining influence on inflation fluctuations. This is because the more stable components of price indices have tended to ease, especially **prices in services,** a traditionally more inflationary sector.

Some additional explanatory factors	• **Monetary policy** contributed positively to the rise in inflation and in GDP. It did so during the crisis and the recovery, and in the euro area and Spain alike, easing financial conditions and countering deflationary pressures.
	• The **limited cyclical sensitivity** of inflation in the euro area partly explains why the current economic upturn has not been accompanied by greater inflationary pressures. The **influence of the exchange rate** on euro area inflation has increased in the most recent period.
	• After the crisis, inflation eased more in Spain than in the euro area. In particular, **the moderation of labour costs has been central to flatter domestic prices.**
	— At the start of the crisis, prices partly reflected the reduction in labour costs because business mark-ups, in the face of tighter financing conditions and sectoral competition problems, did not adjust to the cyclical situation.
	• More recently, the rise in wages has coincided with an easing in business mark-ups (especially in services), both in Spain and in the euro area. As a result, the pass-through of higher labour costs to prices is proving very moderate.

Inflation outlook	• **Core inflation forecasts have been revised systematically downwards** in the past two years. In 2018, these revisions were across the board by country and by sector and, in particular, in services, despite the ongoing economic recovery.
	• The recurrent underestimation of inflation in recent years shows that the persistence of deviations from target is significantly higher than estimated to date.
	• Permanent supply-side factors (previously referred to) might also be operating. Their short-term impact is difficult to quantify.

Current monetary policy scenario and outlook	• The monetary policy response of the main advanced economies to the global financial crisis that broke a decade ago mainly involved the following actions: — Cutting **policy interest rates to historically low** and, in some cases, even negative levels. — **Quantitative easing:** large-scale asset purchases, and liquidity-provision and bank-refinancing operations. Outcome: unprecedented growth in the size of the main central banks' balance sheets. • Both aspects – low interest rates and large balance sheets – pose **challenges and dilemmas for monetary policy** in the coming decade.
Monetary policy strategies in a low interest rate environment	• Central banks currently face a scenario where interest rates are likely to oscillate around levels close to their lower bounds (hence, it may not be possible to further reduce the interest rate to provide additional monetary stimulus). — This occurs owing, among other factors, to the downward pressure exerted by adverse demographic developments on the interest rate [Boxes 3.1 and 3.2]. • To gain leeway, central banks are considering **alternative strategies** [Box 3.3]: — **Raising the numerical inflation target:** from the current 2% to 3% or 4%, for example. — Replacing inflation **targeting** with a **price level** (either permanently or only if interest rates reach their lower bound and, hence, high-inflation expectations are required). — **Replacing cash with digital money:** as a means of eliminating the lower bound on interest rates. — Yet these measures **are not free from costs and risks,** which should not be underestimated. • Other authorities can implement economic policies, such as **structural reforms and fiscal policy,** to raise natural rates, thus providing more room for monetary policy.
The size and composition of the central bank balance sheet: options	• The Eurosystem balance sheet has increased from 13% of euro area GDP in 2006 to 41% at end-2018: — On the asset side, through banks' long-term refinancing operations and large-scale asset purchase programmes (APP). — On the liabilities side, with the increase in bank reserves deposited by commercial banks in the Eurosystem. • ECB monetary policy implementation has evolved, adapting to the new scenario determined by the following measures: — Switching from a "corridor" system: when, in a context of scarce reserves, the ECB steers interbank rates (such as EONIA) within the corridor formed by its marginal lending facility rate ("ceiling" or upper limit of money market yields) and deposit facility rate ("floor" or lower limit). — To a "floor" system: when banks have abundant reserves, and the EONIA is close to its "floor", i.e. the deposit facility interest rate. • Central banks must **decide whether to maintain the size of their balance sheets at the current expanded levels, or whether they shrink them to pre-crisis levels.** — Since their liabilities consist mainly of (short-term) bank reserves, the central banks' choice between a large or small balance sheet (whose pros and cons are summarised in Fig. 3.4) amounts to that between maintaining the current floor system (with a large balance sheet) or returning to the pre-crisis corridor system (with a much smaller balance sheet) [Box 3.4]. — In this context, the possibility of lengthening the maturity of central bank liabilities is also discussed. • **Maintaining the floor system has certain advantages** (e.g. in terms of a greater control of interest rates). In the Eurosystem it would be **possible to maintain the floor system with a lower volume of excess reserves** (and, hence, a smaller balance sheet) **than at present.**

CHAPTER 4. ECONOMIC CONSEQUENCES OF DEMOGRAPHIC CHANGE

Changes in population structure: birth rate, longevity, immigration	• Demographic changes, along with technological advances, are transforming our economies, and will do so even more in the coming decades.
	
	• The age-based structure of the Spanish population is going to change in the coming years: we are moving towards a considerably older population. According to forecasts, the proportion of the over-66s compared with those aged 16-66 will double between 2018 and 2050: for each person over 66, there will only be two persons aged 16-66 [Box 4.1].
	
	• This population ageing can be explained:
	  — Among the elderly, by the increase in life expectancy and by the arrival of the 1960s baby boomers into this group.
	  — Among younger cohorts, by the decline in birth rates as from the 1980s.
	
	• This leads to an increase in the relative weight of retirees in relation to the population of working age, which we are already witnessing in the advanced economies. This has come to pass later in Spain, and will occur more swiftly in the coming years.

Impact on supply and demand and macroeconomic policies	• Population ageing affects aggregate supply and demand.
	  — Demand. Consumption, saving, investment, income and wealth patterns differ in each age group. Foreseeably, both consumption and its composition will vary (if the patterns of behaviour of the current generations hold). There will also be changes in the asset portfolios of the new cohorts of retirees [Box 4.2], which, at present, point to a higher weight of real estate relative to total wealth and a lower weight of pension funds and financial assets.
	  — Supply. Potential growth in the economy responds to changes in employment and in productivity. There is evidence that, in the advanced countries in recent decades, population ageing has been associated with a reduction in potential growth attributable to a lower employment rate and to a decline in productivity [Box 4.3]. To alleviate these effects on supply, education policies should be pursued to assimilate technological changes and to provide incentives to raise the age individuals exit the labour market.
	
	• As the proportion of the elderly increases, macroeconomic policies will be transmitted differently, and their effects will vary:
	  — Monetary policy: interest rates will foreseeably be low [Box 3.3], inflation-aversion greater and inflationary pressures lower.
	  — Fiscal policy: the level and composition of public spending and tax revenue will vary, with changes in the weight of social contributions relative to spending on pensions, and lower levels of personal and labour income tax revenue and, foreseeably, indirect tax revenue. The means of transmission of fiscal impulses to economic activity will likewise change [Box 4.4].

Social policies	• The decline in the weight of the working-age population relative to retirees means that revenue from social security contributions will fall relative to the higher spending on pensions, healthcare and dependency. • The revenue/expenditure imbalance calls for a far-reaching reform of the pension system and other social policies (spending on the health system and on dependency programmes). Their sources of financing and the level and efficiency of benefits will need revising. • The reforms must be financially sustainable, offer sufficient benefits and distribute fairly the costs and benefits between current and future generations. • Work-life balance policies and policies to boost birth rates may contribute to attaining more balanced demographics.

1

THE SPANISH ECONOMY AND THE MORE UNCERTAIN GLOBAL ENVIRONMENT

Recent developments, outlook and challenges

THE SPANISH ECONOMY AND THE MORE UNCERTAIN GLOBAL ENVIRONMENT
Recent developments, outlook and challenges

1 Introduction

The expansion of the Spanish economy continued for the fifth year running in 2018. GDP growth (2.6%) was 0.2 pp higher than expected at the start of the year, and slowed by 0.4 pp on 2017. As has been the case since the start of the recovery, the expansion in activity was job creation-intensive. That enabled the unemployment rate to fall to 14.4% of the labour force.

From the standpoint of the composition of growth, there was a notable decline in the contribution of the external sector. Net demand from the rest of the world, which subtracted 0.3 pp from GDP growth, was the source of the easing in the pace of expansion of activity. Exports lost notable momentum, dragged down mainly by negative developments in destination markets, which slowed significantly compared with 2017.

The unfavourable behaviour of external markets was the result of many compounding factors. Various factors dented the world economy, including most notably: the tightening of global financial conditions as a consequence of US monetary policy normalisation (which was, nevertheless, interrupted in early 2019); international trade tensions; the difficulties Chinese economic policy faces in reconciling the dual objective of redressing the country's high debt and sustaining the pace of activity; and uncertainty over the outcome of Brexit.

The euro area, in particular, slowed significantly from the start of 2018. Compared to forecasts which, at the start of the year, pointed to the continuation of the high growth rate of 2017, there were successive negative surprises. These were due both to transitory causes and to more persistent factors, such as the downturn in the external context of the euro area, to which this economy is particularly sensitive. This unfavourable economic setting was conducive to the adoption, in March 2019, of various monetary policy measures by the ECB to ensure that inflation should move steadily towards its price stability objective.

Countering the unfavourable behaviour of the external sector, domestic demand in Spain remained very buoyant. Compared with the slowdown in the euro area economy, activity proved more dynamic in Spain. Against the background of similar export weakness in both cases, the different behaviour had to do with more expansionary developments in spending by households, firms and the general govenment sector in Spain. Private consumption in particular was notably robust, more so than household income, which gave rise to a fresh decline in the saving rate

to the lowest level in its time series. Along with the high growth posted by consumer credit, this development suggests that some households might be basing their spending plans on overly optimistic expectations about their future income. A more expansionary fiscal policy stance than expected before the start of the year also contributed to spurring the growth of domestic demand.

From a broader time perspective, the high growth of activity and employment is marking the recovery. The expansion in Spain, one of the sharpest among the developed countries, is due to a series of factors. These include the effects of the adjustments and reforms implemented in the first half of this decade, the contribution of demand-side policies (fiscal and monetary policy) and, especially in the initial stages of the upturn, tailwinds in the form of certain favourable, temporary shocks. In particular, enhanced competitiveness and the internationalisation of firms have boosted exports, which in turn has fuelled the strength of investment, of employment and, through this latter variable, of consumption too.

Looking ahead, the Spanish economy has certain factors of support which can continue to underpin the current upturn. The progress in correcting the macrofinancial imbalances since the crisis has been substantial. First, the economy's competitive position, in terms of its relative costs vis-à-vis the countries with which it trades, is favourable. And further, household and corporate deleveraging is at a very advanced stage, and financial institutions' balance sheets have been strengthened following the sector's restructuring and recapitalisation. Both processes have been assisted by the economic recovery.

However, the economy's vulnerabilities, including most notably high public debt, remain notable. In recent years the budget deficit has declined owing to the effect of the business cycle and the reduction in interest expenses on debt, but not to the adoption of structural deficit-cutting measures. Accordingly, given the high levels of public debt and the structural deficit, budgetary consolidation must urgently be undertaken to afford fiscal policy greater room for manoeuvre ahead of any future shocks.

Despite the notable correction to date, the negative net international investment position remains very high. The downturn in exports and dearer crude oil made in 2018 for a reduction in the external surplus. However, set against these predominantly conjunctural factors, the adjustment of the current account balance has a significant structural component. This is associated with the cumulative gains in competitiveness and with the increased geographical diversification of exports and the number of firms regularly selling their products to the rest of the world. In 2018, unit labour costs once again grew less than they did in the euro area, which provided for a small additional gain in competitiveness vis-à-vis the rest of the euro area. To continue reducing debt to the rest of the world, sustained external surpluses must be run. That in turn calls for gains in competitiveness to be maintained. Such

gains have been based throughout the recovery on the moderation of labour and financial costs, but should depend to a greater extent, hereafter, on productivity gains.

One of the main current challenges in most of the advanced economies, including Spain, is to ensure that society as a whole benefits from the recovery. Ongoing employment generation has seen per capita income increase by 14% since the onset of the recovery, up to somewhat above its pre-crisis level. Yet the widening gap in terms of per capita income vis-à-vis the euro area as a whole – which stood at 16 pp in 2007 and increased to 26 pp in 2014, diminishing only to 24 pp in 2018 – has scarcely been corrected. Moreover, the crisis saw a rise in the main inequality indicators. In this respect, while job creation has had a positive and significant impact as regards reducing some income dispersion measures, these indicators are still at a higher level than in other EU economies.[1]

One of the main avenues for further improving standards of living and fairness is achieving additional increases in employment. The development of policies that help reduce the economy's vulnerability and, therefore, prolong the expansion is the most obvious means of preventing ongoing job creation from being interrupted. To this same end, it would be advisable to retain those elements of the current labour market legal framework that have proven most effective in ensuring that the adjustments in the face of adverse shocks are concentrated to a greater extent in labour costs, and that they therefore have less of a negative influence on employment. In addition, economic policy should be geared to fomenting the employability of the most disadvantaged and to promoting enhanced job quality. It is further necessary to reduce as far as possible the high disparity regarding the contractual protection of employees with permanent contracts as opposed to those on temporary contracts, without introducing elements that act as a deterrent to permanent hires.

Durable increases in citizens' general welfare require raising the productivity growth rate. The higher the increase in productivity, the greater the possibilities of raising wage levels and the quality of jobs created, and the greater also the resources available for funding public policies. In the recovery to date, the increase in per capita income has been the outcome of the rise in numbers employed, while the contribution of apparent labour productivity gains has been very small. That is in response to a wealth of institutional, regulatory and structural factors that public policy should seek to correct. These factors include shortcomings in the education system, scant generation and dissemination of technological advances, regulatory elements that stifle competition and the improvable quality of business management.[2]

---

1   See European Commission (2018).

2   Banco de España (2016b) addressed these last two aspects in detail.

Fiscal policy can contribute to improving long-term welfare, via budgetary consolidation, and the quality of public finances. In this area, re-defining the tax basket and re-directing spending towards items such as education, R+D and active labour market policies would help extend the benefits of the recovery and promote long-term growth.

One of the key dimensions of fairness is its intergenerational facet. Population ageing will have deep-seated consequences for public finances, in particular for the pensions system. Far-reaching measures will have to be adopted. In any event, the much-needed reform of the public pensions system should ensure that the funding of pensions for one generation is not at the expense of imposing an excessive burden on other generations.

The strengthening of the financial position of the banking system continued in 2018, with a significant improvement in asset portfolio quality. Underpinning this progress was the positive impact of the cyclical upturn on borrowers' ability to pay and on asset valuation. That contributed, in turn, to stepping up the ongoing reduction of impaired assets on bank balance sheets. The upshot was an improvement in the sector's profitability.

However, the scale of the challenges still facing credit institutions remains considerable. The banking sector should pursue its efforts to reduce its volumes of problem assets and streamline its operating expenses. In that way, the profitability of banking activity may continue gaining ground against the costs of capital, whose levels, moreover, should be strengthened, with a view to shoring up banks ahead of hypothetical adverse shocks. In addition, banks should adapt to the new sectoral structure being forged, in which new competitors are participating. They should also strive to improve their reputation, which was impaired in some respects following the crisis.

2   The global economic slowdown

2.1   A weaker and heterogeneous external environment, with notable downside risks

The world economy slowed in 2018, against a background of growing trade tensions and tightening financial conditions. Global GDP grew by 3.6%. The rate was somewhat lower than expected at the start of the year and 0.2 pp down on 2017, with a slowing profile that steepened in the closing months of the year. Compared with the previous year, the divergences in the trend of output were more marked by geographical area (see Chart 1.1). Among the advanced economies, activity remained

Chart 1.1

THE WORLD ECONOMY SLOWED IN 2018 WITH DIFFERENCES BY AREA

The world economy grew 3.6% in 2018 (less than expected) in a setting of significant trade tensions and tighter financial conditions. Furthermore, unlike the previous year, activity was more uneven: it was more buoyant in the United States than in other advanced economies and slowed considerably in the emerging economies which were affected most by the financial tensions, in contrast to the gradual easing in China.

1 GDP GROWTH

| ■ 2017 | ■ 2018 (a) | ■ 2019 (a) | ◆ 2018 (WEO JANUARY 2018) | ◆ 2019 (WEO JANUARY 2018) |
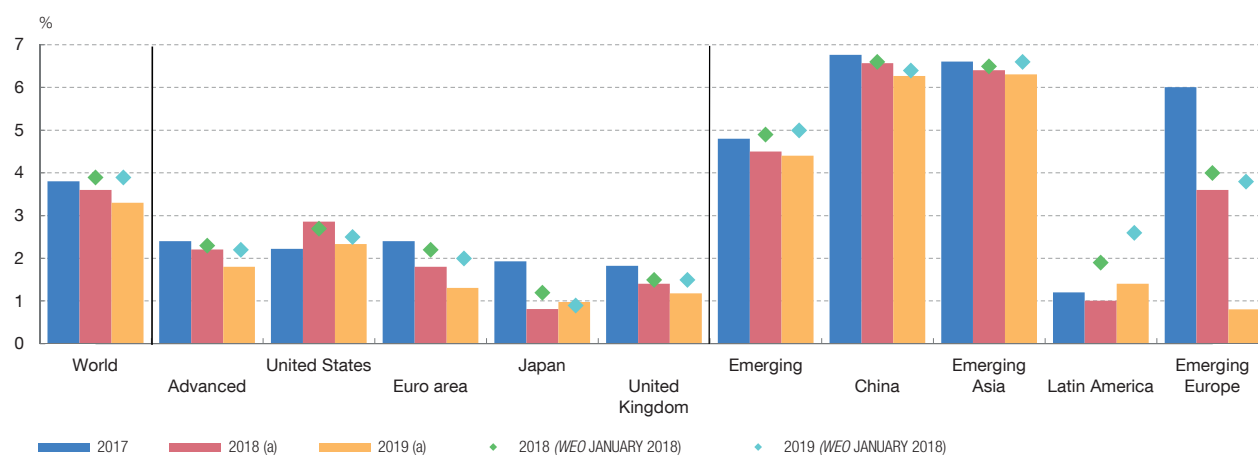
2 CONTRIBUTIONS TO GLOBAL GDP GROWTH

■ ADVANCED ■ LATAM. (EXCL. VENEZUELA)
■ EMERGING ASIA ■ EMERGING EUROPE
■ OTHER EMERGING ECONOMIES — GLOBAL
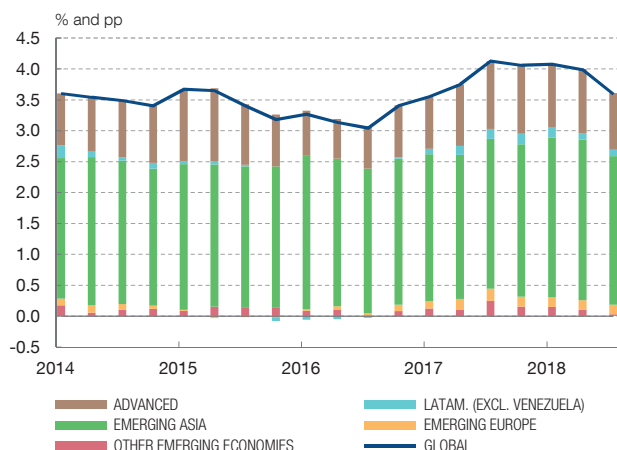
3 INVESTMENT, INDUSTRIAL OUTPUT AND PMI IN ADVANCED ECONOMIES

— INDUSTRIAL OUTPUT
— INVESTMENT
— PMI (right-hand scale)
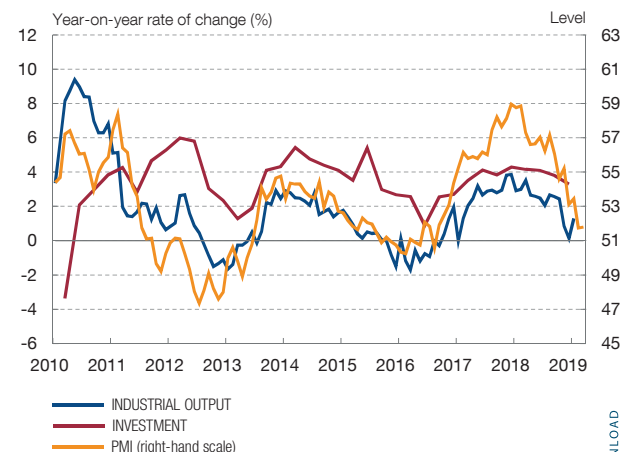
SOURCES: IMF (*WEO* April 2019, *WEO* January 2018), national statistics.

a Forecast from *WEO*, IMF, April 2019.

robust in the United States, underpinned by the fiscal expansion and the soundness of private demand. In other areas, meanwhile, GDP growth was increasingly weak. This was partly the result of idiosyncratic factors. In Europe, these were linked to the new automobile emission standards (affecting Germany above all) and to the uncertainty over economic policy in Italy and the Brexit negotiations. In Japan, some unfavourable natural events were responsible. Among the emerging economies there were notable region-by-region differences. Growth rates remained buoyant in Asia, albeit with signs of deceleration, especially in China. In Latin America and in

Chart 1.2
TRADE TENSIONS WEIGHED ON WORLD TRADE

World trade eased in 2018 and grew by around 4%, compared with 5.3% in 2017, weighed down by the effect of the trade tensions, especially between the United States and China. During the year several tariff measures were adopted by the US which were met with reprisals from the countries affected. At the expense of possibly resolving the conflicts through negotiations currently under way, the proliferation of protectionist measures is one of the biggest threats for the global economy.

1 GLOBAL TRADE GROWTH. CONTRIBUTION BY AREA
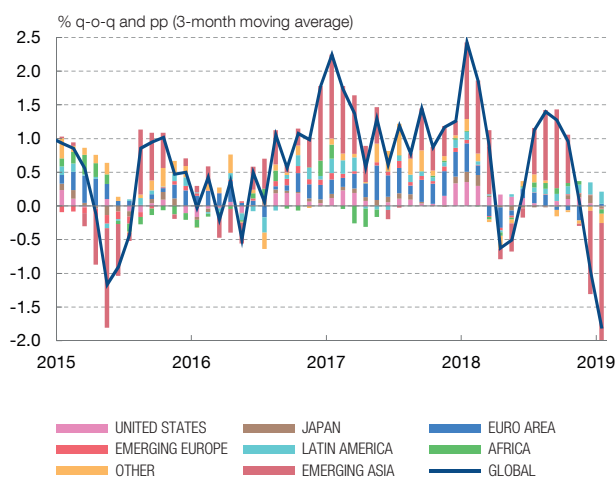
2 TARIFF MEASURES INTRODUCED BY THE US ON CHINESE EXPORTS
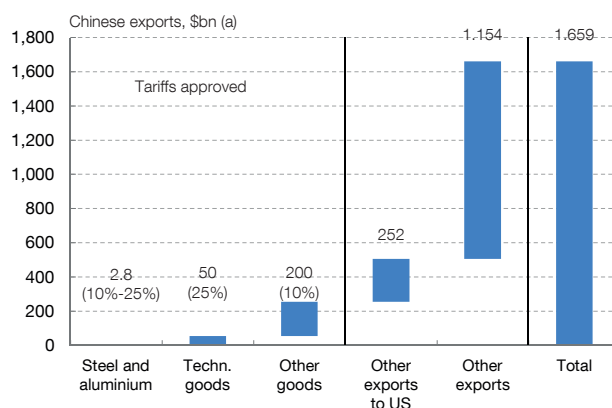
SOURCES: CPB, PIIE, US Census and FMI Dots.

a The percentages in brackets refer to the approved tariff rates.

DOWNLOAD

Eastern Europe, meantime, activity proved less dynamic, and especially in the economies most affected by the bout of financial tensions early in the summer.

International trade in goods and services, which had picked up sharply in 2017, slowed significantly in 2018. Having risen to rates of 5.4% the previous year, global trade increased by 3.8% in 2018. This slowdown was in response to the loss of momentum of activity (investment in particular) and to the growing trade tensions, chiefly between the United States and China. Indeed, the two factors were interrelated (see Chart 1.2).

The trade conflict unfolded in different stages in 2018. Spring saw the entry into force of higher US tariffs on different products (mainly imports from China), with the countries affected duly retaliating. Furthermore, the US government threatened to extend and step up tariff increases (including, in particular, vehicle imports, which are a substantial portion of the bilateral trade with Europe). This threat prompted a transitory pick-up in trade in the central months of the year, in anticipation of a possible future rise in the prices of products.

In the second half of the year, there were some positive trade developments. These included most notably the signing by the United States, Mexico and Canada of the agreement replacing NAFTA (parliamentary ratification is still pending), the

opening of negotiations for a pact between the United States and the EU, and a temporary truce between the United States and China to resolve their differences. However, the main points of conflict have still not been resolved. In these circumstances, and after having risen in the summer, international trade ended 2018 running at negative rates (see Chart 1.2). For the moment, the direct repercussions on global activity of the tariff measures so far adopted are estimated to have been relatively limited; but additional effects will have begun to be seen through their adverse impact on confidence.

In the near future, any proliferation of protectionist measures that were to affect confidence and financial conditions might ultimately have a severe impact on global GDP. According to IMF simulations, the impact on activity of the tariff measures in force would be limited. But the stepping-up of such measures would significantly heighten the adverse effect on activity. If this were compounded by a potential loss of confidence (affecting business investment), and a tightening of financial conditions, the costs for the global economy in the horizon to 2020 would be much heavier, at around 0.8% of global GDP relative to the baseline scenario.[3]

In the United States, the continuation of the cyclical upturn in 2018 was underpinned by the fiscal expansion. GDP grew by 2.9%, 0.7 pp up on the previous year, but with a less balanced composition. The tax reform approved in 2017 and strong job creation provided support for private consumption, while investment and exports slowed forcefully in the second half of the year. The fiscal stimulus is expected to still have a positive impact on growth in 2019. But as this impulse fades, it is estimated activity will slow to a growth rate closer to 2%.[4]

In China, GDP eased slightly in 2018 as a whole, although the high-frequency indicators slowed more markedly as the year unfolded. The Chinese economy posted annual average growth of 6.6%, 0.2 pp down on 2017. This cooling was due to trade tensions and to the measures adopted earlier by the authorities to mitigate the risks stemming from high business debt. These measures included a tightening of the financial regulations on shadow banking and restrictions on local government investment. However, in response to the signs of slowing, the authorities adopted a raft of measures aimed at preventing more pronounced weakening.[5] On the monetary front, the central bank reduced reserve requirements, injected liquidity into the banking system and introduced loan facilities to boost credit to the private sector. In the fiscal area, local government debt issuance increased for infrastructure investment, and tax cuts for households and firms were approved.

---

3   See IMF (2018) and Banco de España (2018b).

4   See Banco de España (2108l).

5   See Banco de España (2018n).

In these circumstances, China faces a dilemma. Its authorities must choose between: i) stabilising economic activity in the short term, at the cost of exacerbating macrofinancial imbalances and increasing the risk of an abrupt correction later; or ii) maintaining the adjustments, allowing, in exchange, the slowdown to intensify. Given the importance of China for the world economy, a sharp slowdown would have major global consequences, through various channels (trade, financial and commodities prices), as analysed in Box 1.1.[6]

The other emerging economies were also impacted by the trade disputes and the tightening of global financial conditions. After a very favourable performance in 2017 and in 2018 Q1, the emerging economies began to undergo the effects of the tightening of international financial conditions and of the China/US trade dispute. Nonetheless, the economic and financial impact of these factors differed from country to country, depending on their specific circumstances, and, in particular, on their integration into global trade, and, especially, their macrofinancial vulnerabilities.[7] The adverse reaction of the markets particularly affected those economies with bigger external imbalances and foreign-currency-denominated borrowing requirements, such as Argentina and Turkey, whose authorities had to adopt adjustment measures to stabilise their economies (see Chart 1.3).

In Argentina, the adjustment measures took the specific form of an agreement with the IMF signed in June 2018. In order to redress the major imbalances built up in the previous decade, the government that came into power in late 2015 initially opted to pursue a gradual fiscal consolidation, with the central bank concurrently assuming ambitious inflation-reducing targets. However, after the raising of the inflation target in December 2017, unexpectedly announced by the central bank, the lack of progress on this front in 2018, the tightening of international financial conditions and a heavy drought placed Argentina under the market spotlight. That prevented it from continuing to finance its gradual correction process and meant the government had to request financial assistance from the IMF for an amount that would rise to $50 billion.[8] The agreement with the Fund included the application of a sharp fiscal and monetary adjustment, which was necessary to return the economy to a stable growth path. Set against this, the adjustment measures have, in the short term, had an adverse impact on activity which, along with bad weather, has led to a recession.

In Turkey, the need for corrective measures was the outcome of the overheating of the economy and of heavy dependence on external financing. This situation had arisen from the application over several years of lax fiscal and monetary policies, and the adoption of credit stimulus measures. Moreover, the dependence on external financing

---

6   See Banco de España (2016g) and Dieppe, Gilhooly, Han, Korhonen and Lodge (2018).

7   See Banco de España (2018m) and (2018g).

8   See Serra, Timini, Estefanía and Martínez Casillas (2018).

Chart 1.3

EMERGING ECONOMIES WERE HIT BY CONSIDERABLE FINANCIAL TENSIONS, ALBEIT DIFFERENTLY ACCORDING TO THEIR VULNERABILITIES

During the year emerging economies were subject to global trade tensions and a tightening of financial conditions, although the markets particularly penalised those emerging economies with greater external vulnerabilities, such as Turkey or Argentina, whose authorities had to adjust their macroeconomic policies sharply.

1 ARGENTINA: GDP, INFLATION AND POLICY INTEREST RATE
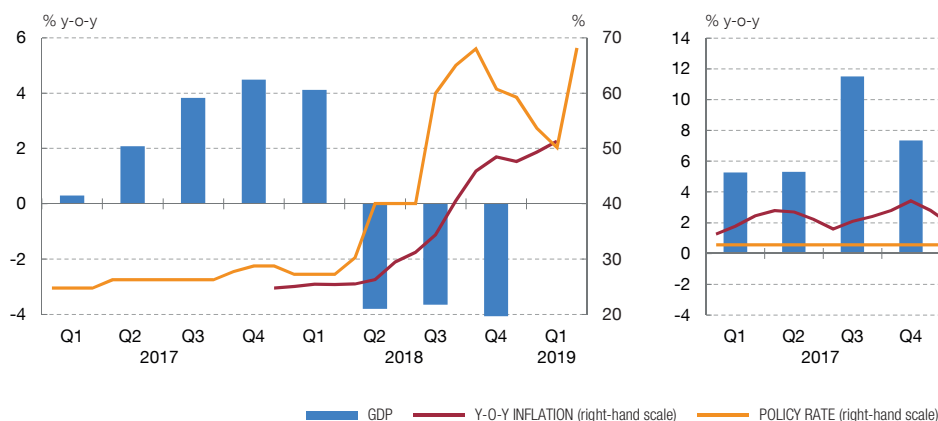
2 TURKEY: GDP, INFLATION AND POLICY INTEREST RATE

GDP   Y-O-Y INFLATION (right-hand scale)   POLICY RATE (right-hand scale)
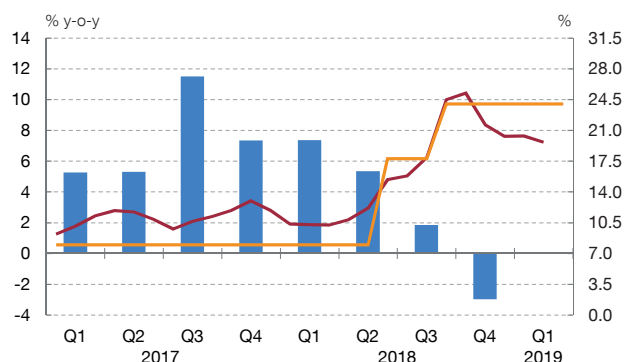
3 EXCHANGE RATE DEPRECIATION AND EXTERNAL VULNERABILITY
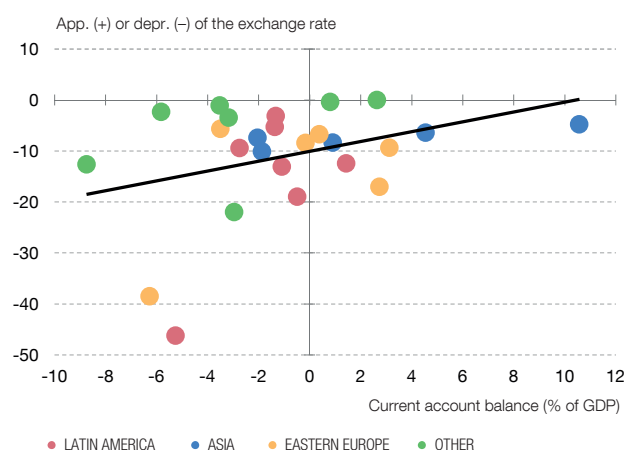
4 SOVEREIGN SPREADS (EMBI)

LATIN AMERICA   ASIA   EASTERN EUROPE   OTHER

LATIN AMERICA   ASIA   EASTERN EUROPE
AGGREGATE

DOWNLOAD
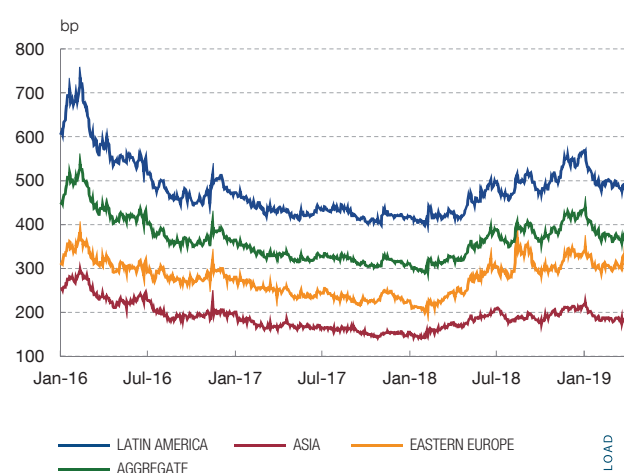
SOURCE: Thomson Reuters.

(with high foreign-currency-denominated private debt) and the low level of international reserves, along with growing government interventionism, led to a notable worsening of Turkish financial markets and to a strong depreciation of the lira. That obliged the authorities, as from the summer, to adopt restrictive monetary and fiscal policies in an attempt to stabilise the situation, giving rise to an acute slowdown in activity.[9]

---

9   See Banco de España (2018k).

In 2018, global inflation held at a moderate level, without the gradual increase in wage growth in the main advanced economies managing to pass through to core inflation. In the advanced economies, inflation moved on a mild rising path until October, reflecting the significant hike in oil prices, which was interrupted towards the end of the year. The sound behaviour of employment, which saw unemployment rates fall to historical lows in some cases, contributed to sharper wage rises. However, the acceleration in productivity (in the United States) and the easing in business mark-ups (in Japan) checked the pass-through of higher wage increases to prices. Indeed, inflation expectations have eased once again in the opening months of 2019, ahead of the downturn in economic prospects. In the emerging economies, inflation rates generally remain moderate, with the exception of those countries whose currencies depreciated, such as Argentina and Turkey.

The rise in oil prices to October was essentially the outcome of various supply-side factors. Specifically, the agreements of the Organization of the Petroleum Exporting Countries (OPEC) to cut their production, the decline in extraction activity in Venezuela and the impact of the sanctions on Iran led to a reduction in the supply of crude oil. However, in the final stretch of the year, the prospect of lower global demand and some easing in supply conditions reversed the initial rises and led to a notable fall in prices. Into 2019, OPEC has finalised a new deal with other producer members to restrict production. Among other supply-side factors, this has prompted a fresh rise in prices.

The Federal Reserve maintained its monetary policy normalisation plans in 2018. In 2019, however, this normalisation has been interrupted. Given that the United States is ahead in the cycle, its central bank raised its policy interest rate by 25 pp on four occasions in 2018, placing it in a range of 2.25%-2.50%. Further, it continued with the gradual reduction of its balance sheet, as scheduled. These decisions contributed to a tightening of financial conditions, with increases in long-term rates and the appreciation of the dollar. Yet fears of an economic slowdown gave rise in the final months of last year to a change in market expectations about future monetary policy movements. This was confirmed by the Federal Reserve with a shift in its communication policy towards a more neutral stance; it announced that it expects interest rates to hold in 2019, and that the balance-sheet reduction will conclude in September this year (see Chart 1.4).

The monetary policies of other central banks generally retained an expansionary stance. As set out below, the ECB finalised its net asset purchases in December. But it signalled that monetary policy would remain broadly accommodative and that the reinvestment of the principal on maturing securities will continue beyond the first rise in policy interest rates. The decisions of the Bank of England, against a backdrop of high uncertainty over Brexit, and of the Bank of Japan, having made scarcely any headway in attaining its inflation target, maintained a highly accommodative stance. In the emerging economies, many central banks responded up to the summer with

Chart 1.4

MONETARY POLICIES WILL BE LESS RESTRICTIVE THAN PREVIOUSLY FORECAST

Faced with the signs of a global economic slowdown and tensions in financial markets, monetary policies in the advanced economies are expected to be less restrictive than previously forecast. After raising policy interest rates on four occasions in 2018, the Fed adopted a more neutral stance in its communication policy and markets discounted fewer rate hikes. The monetary policy stance in the other economies is also expected to remain expansionary for longer.

1 UNITED STATES: POLICY INTEREST RATES. FOMC BASELINE PROJECTIONS AND FUTURES (a)
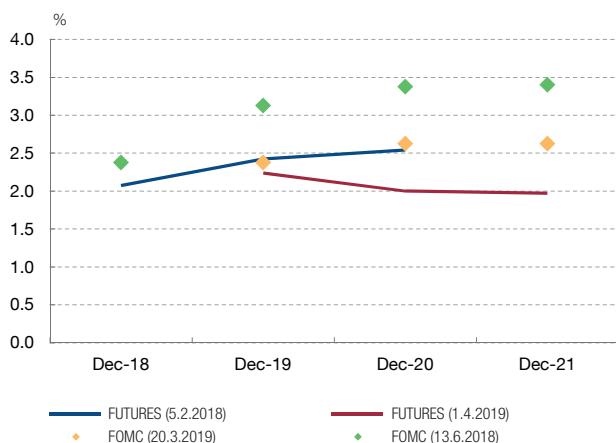
2 OTHER ADVANCED ECONOMIES: POLICY INTEREST RATES AND FUTURES

FUTURES (5.2.2018)   FUTURES (1.4.2019)
FOMC (20.3.2019)   FOMC (13.6.2018)

EURO AREA   UNITED KINGDOM   JAPAN
FUTURES AT 4.2.2018   FUTURES AT 1.4.2019

DOWNLOAD
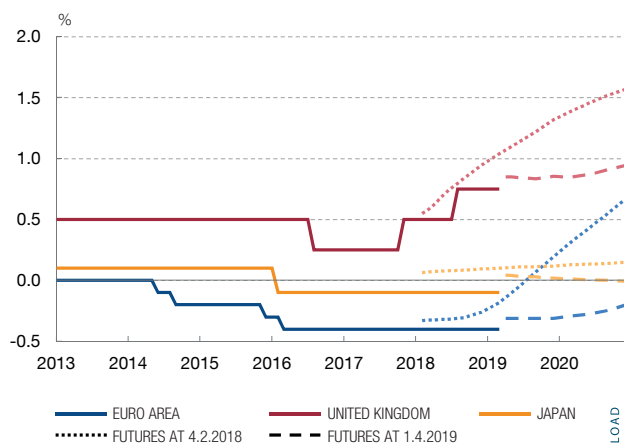
SOURCES: Thomson Reuters and Bloomberg.

a The core trend of the Federal Open Market Committee (FOMC) excludes the three highest and the three lowest projections.

rises in policy rates. This was in light of the risks to inflation and financial stability arising from the depreciation of their currencies, although these rises have also halted in recent months.

The financial markets experienced a bout of high volatility, centred on the emerging economies, towards the end of the first half of the year (see Chart 1.5). At that time, the combination of the strong dollar, the increase in US long-term interest rates and the growing trade tensions bore down negatively on the emerging markets. Until then they had trended positively, but notable stock market declines and an across-the-board depreciation of their currencies ensued. As indicated, investors clearly discriminated on the basis of the vulnerabilities of each country.

Over the year as a whole the main stock market indices in the advanced and emerging economies posted losses, after recording all-time highs in some cases. The biggest slump was on the Chinese stock market (-24.6%), while the EURO STOXX 50, the benchmark European index, underwent its biggest annual fall since 2012 (-14.3%). The US S&P 500, which posted a historical high in September, was down -6.2% at end-2018, reflecting the downturn in the macroeconomic outlook in the final stretch of the year. Evidencing the different cyclical moments of the United States and the euro area was the diverging trend of sovereign debt yields. These rose over the course of the year by 27 bp in the US economy, but declined by 18 pp in Germany.

Chart 1.5

GLOBAL FINANCIAL MARKETS

The financial markets experienced several bouts of volatility, which particularly impacted the main stock market indices, against a backdrop of monetary policy tightening in the United States and increasing trade tensions, among other factors. In summer, the instability centred on emerging markets, although the markets discriminated on the basis of the vulnerabilities of each country.

1 STOCK MARKET INDICES

100 = 1.1.2018

S&P 500
EMERGING MSCI
EURO STOXX-50
IBEX-35
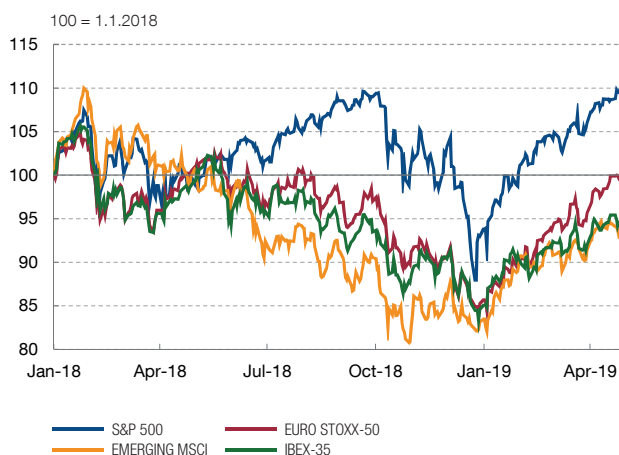
2 IMPLIED VOLATILITY

100 = 1.1.2018

S&P 500 (VIX)

3 FINANCIAL CONDITIONS IN THE UNITED STATES

FEDERAL FUNDS TARGET RATE
GOLDMAN SACHS FINANCIAL CONDITIONS INDEX (right-hand scale)
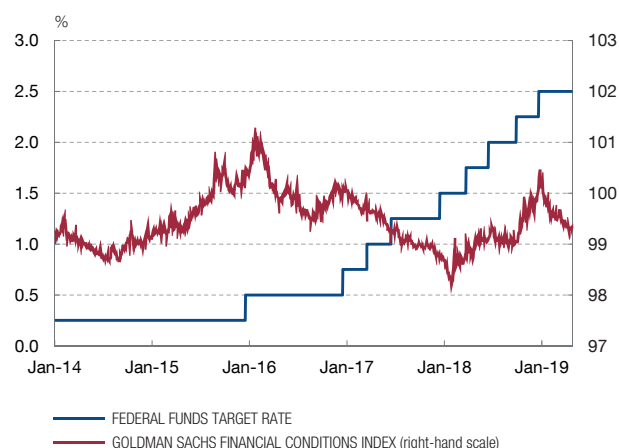
4 EXCHANGE RATES AGAINST THE DOLLAR

100 = 2.4.2018

FIVE VULNERABLE EMERGING ECONOMIES (a)
OTHER EMERGING ECONOMIES' CURRENCIES

DOWNLOAD
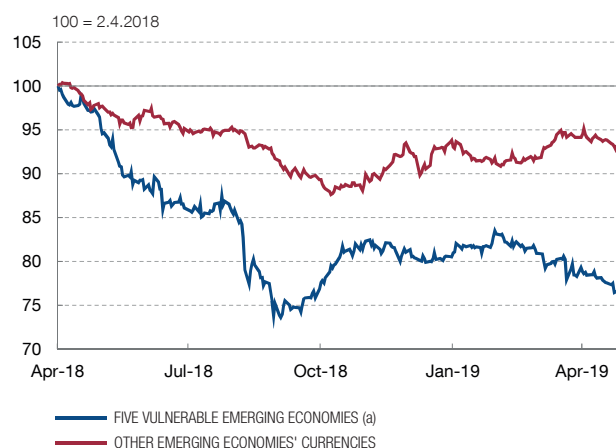
SOURCES: Thomson Reuters Datastream and Bloomberg Data License.

a Argentina, Tunisia, Nigeria, Brazil and Turkey.

While financial markets have picked up in early 2019, risks of further valuation adjustments persist. At the start of the year, several factors contributed to reversing the downturn on global financial markets in late 2018: the expectations of a less restrictive US monetary policy; the prospect of a potentially favourable outcome to the trade disputes; and the policies deployed by the Chinese authorities to counter the weakness of economic activity. However, the markets remain vulnerable to global financial conditions and the macroeconomic environment, and to the ups and downs

linked to factors such as trade tensions, the fiscal situation in Italy and the Brexit negotiations.[10]

Moreover, some emerging economies remain vulnerable. Admittedly, financial conditions in the emerging countries as a whole have stabilised in recent months. But the build-up in some of them of high foreign-currency-denominated debt by the non-financial private sector makes them particularly fragile to any increase in financing costs and to a depreciation of their currencies. Finally, the ultra-expansionary monetary policies in recent years have been conducive to the search by investors for returns on riskier assets, such as high-yield debt, leveraged loans and CLOs (collateralised loan obligations). The growing exposure to these market segments, which occasionally pose a significant liquidity risk, is a cause of concern in the current context. As explained, in this setting investors' degree of risk aversion is liable to fluctuate markedly.

In sum, the outlook for the world economy in 2019 is one of a moderate slowdown, but with significant downside risks. The recent weakness of the global economy points to a baseline scenario with lower growth, on which risks tilted clearly to the downside are weighing down. In the advanced economies, the responsiveness of the authorities to act in a hypothetical scenario in which these risks materialise is – although there are cross-regional differences – relatively low. This is due to monetary policy limitations in a very low interest rate setting and to the constraints that high levels of public debt impose on budgetary policy in a large number of countries. In the emerging economies, the room for manoeuvre varies notably from country to country in terms of their vulnerabilities. Where these are greater, an adverse scenario may require a tightening of their macroeconomic policies, with adverse consequences for growth.

2.2 The euro area has felt the impact of global shocks particularly acutely.

The euro area has particularly felt the increase in global uncertainty over the past year and the slowdown in worldwide demand. Following high growth in 2017, the expansion of economic activity progressively eased during 2018. This trend has continued into the opening months of the current year. On average last year, GDP grew by 1.8%, 0.7 pp down on 2017. Year-on-year growth in late 2018 and early 2019 fell to around 1% (see Chart 1.6).

The geographical and sectoral specialisation of euro area exports and the lagged effects of the appreciation of the euro in 2017 and 2018 made for a

---

10 For a discussion on the consequences of a no-deal Brexit, see, for example, Bank of England (2018) and Vega, J. L. (2019).

Chart 1.6

SIGNIFICANT MODERATION OF ECONOMIC GROWTH IN THE EURO AREA IN 2018

Economic activity in the euro area slowed during 2018 and in 2019 to date, with very low quarter-on-quarter growth rates at year-end. The gradual weakening was linked, essentially, to limited growth in euro area exports. By country, the economic slowdown is very marked in Italy (which technically went into recession in late 2018) and in Germany, which has been hard hit by developments in specific sectors such as the automotive sector.

1 EURO AREA. CONTRIBUTIONS TO YEAR-ON-YEAR GDP GROWTH
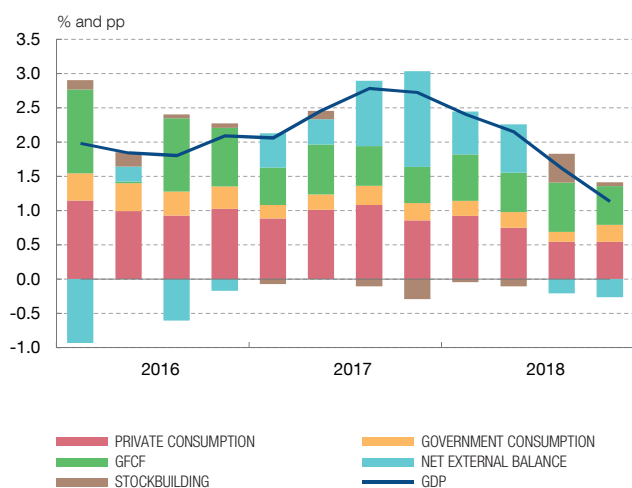
2 EURO AREA AND SELECTED COUNTRIES. QUARTER-ON-QUARTER CHANGE IN GDP
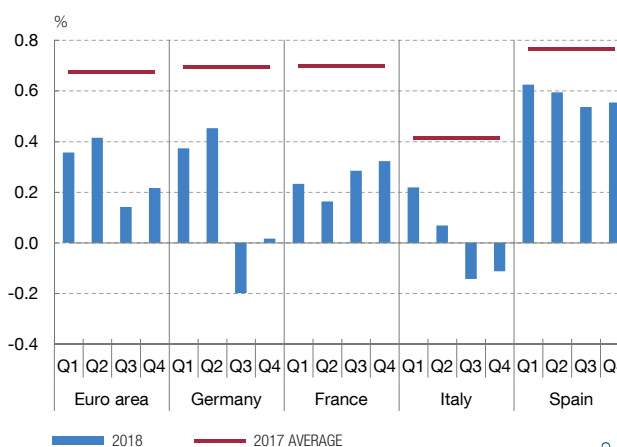
SOURCE: European Commission.

---

notable slowdown in euro area sales to the rest of the world. Some transitory factors aside, the progressive weakening of activity was thus rooted in the small increase in exports, given, in particular, the high degree of openness of the euro area economies (see Chart 1.7). The loss of momentum in the area's export markets was sharper than that in global trade, owing to the euro area's relative specialisation in countries and products whose performance trended more adversely. Along with the decline in sales to Turkey, there was a notable slowdown in investment goods exports to Asian markets (in particular to China), and a contraction in sales to the United Kingdom, markedly so in the case of cars. Conversely, exports to the United States remained more buoyant.[11] In addition, the estimates available suggest that the notable appreciation of the euro in nominal effective terms in 2017 against the developed countries, and in 2018 against the emerging economies, also affected exports last year.

The weakness progressively spread to domestic demand, despite continuing slack monetary conditions. As a result of the ECB's decisions, euro area financial conditions continued to be expansionary. Both short and long-term interest rates

---

11   See Banco de España (2019b).

Chart 1.7

THE EURO AREA ECONOMY WAS WEIGHED DOWN BY THE MODERATION IN THE GROWTH OF ITS EXPORT MARKETS AND BY THE SETTING OF HEIGHTENED UNCERTAINTY

The slowdown of euro area export markets was sharper than that of world trade as a result of the euro area's relative specialisation in countries and products whose performance trended more adversely in 2018.

1 ECONOMIC POLICY UNCERTAINTY INDEX
(3-MONTH AVERAGE)
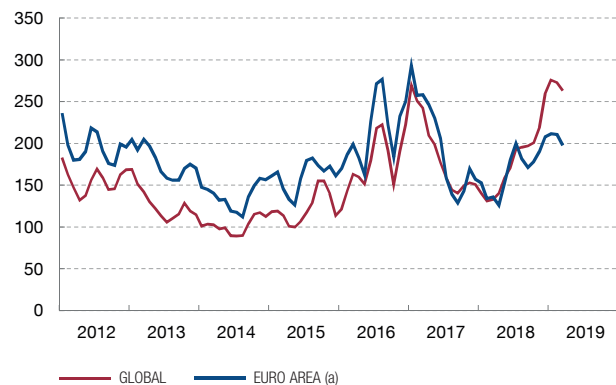
2 EXTRA-EURO AREA GOODS EXPORTS BY GEOGRAPHICAL DESTINATION
YEAR-ON-YEAR CHANGE (%) AND CONTRIBUTIONS (pp)

—— GLOBAL   —— EURO AREA (a)

■ UNITED STATES   ■ UNITED KINGDOM
■ OTHER EU   ■ CHINA
■ OTHER ASIA (b)   ■ TURKEY
■ REST OF THE WORLD   —— TOTAL
—— GLOBAL TRADE EXCLUDING THE EURO AREA
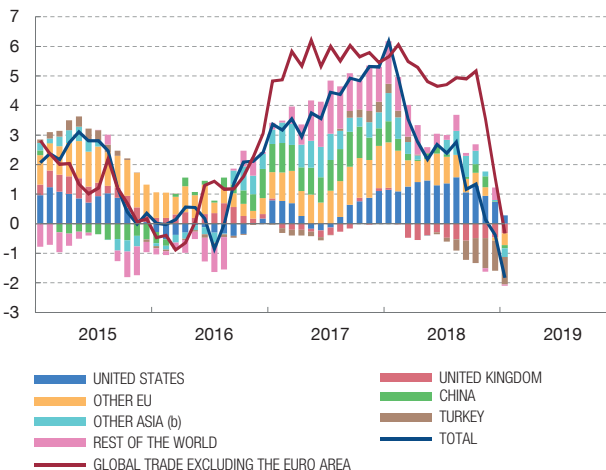
DOWNLOAD

SOURCES: Baker, Bloom and Davis (2016), Banco de España, European Commission and CPB Netherlands Bureau for Economic Policy Analysis.

a Average weighted by the GDP of the indices of Germany, France, Spain and Italy.
b Excluding Middle East.

held at low levels, without the financial tensions that arose in Italy – further to the heightened political uncertainty – spreading to other economies, except at specific times and on a limited scale.[12] The interest rates on new lending to businesses held at low levels, offering further support to the gradual pick-up in private-sector lending. However, business investment and consumption weakened over the course of the year, affected by the high uncertainty. In the case of investment, business spending plans were ultimately weighed down by the sluggishness of external demand, the doubts over the future UK/EU relationship and the moderation of business profits. Households reduced the pace of private consumption in the second half of the year. And given the increase in real income, that prompted a slight rise in the saving rate, which had reached a low in 2017.

Some transitory factors also contributed to the weakness of activity, which helps explain the differences across countries. The slowdown was particularly marked in Italy, which went into recession in late 2018. Factors bearing down on the country were the uncertainty over the course of its economic policies and the subsequent worsening in financing conditions and agents' confidence. Growth also

12   See Banco de España (2018i).

weakened notably in Germany. It was partly affected by the performance of some key productive sectors. Such was the case of the car industry, whose activity was temporarily disrupted by the entry into force of new emissions regulations, and perhaps more persistently by the structural transformation the sector is undergoing. Lastly, in France, social tensions left their mark on activity in late 2018.

Overall, euro area GDP posted a lower rate of increase at end-2018 than that of potential output. Hence the output gap, which proxies the pressures exerted by demand on prices, and which is estimated to have turned positive at the close of 2017, tended to narrow over the course of 2018 to close to zero. Indeed, it is estimated to have even turned slightly negative in early 2019. The ongoing weakness of activity at the start of the year has led to substantial downward revisions of the growth outlook for the year as a whole.

Employment also mirrored flatter activity. The number of jobs continued to grow in 2018. But they did so at lower rates than those observed in 2017 and moved on a declining trend, in line with the loss of momentum of activity throughout the year. This moderation in employment creation, which was particularly notable in manufacturing and in market services, did not prevent the euro area unemployment rate from continuing to fall. Unemployment ended the year at 7.8%. Despite the loss of dynamism in employment, wage rises were up on previous years. This was particularly so in those countries, such as Germany, whose labour market shows less slack. Thus, compensation per employee in the euro area increased by 2.2% in 2018 Q4, 0.6 pp up on the previous year. As a result, unit labour costs moved on a marked rising trend over the course of the year (see Chart 1.8), with the slowdown in productivity also contributing.

Overall inflation oscillated notably in 2018, shadowing the changes in crude oil prices. For the year as a whole, consumer prices increased by 1.8%. To date in 2019, inflation has turned down, growing by 1.4% in March. This movement was also linked to oil prices.

Core inflation, which excludes food and energy, grew by 1%, a similar rate to that in 2017. The trend both of this indicator and of its two components, services and non-energy industrial goods, held stable for most of the period (see Chart 1.8). Nor did the growth of domestic producer prices undergo any appreciable change in 2018. As a result, the rise in unit labour costs was offset by a narrowing of firms' mark-ups. This pattern, also seen in previous periods, might prove more persistent at the current juncture. The present circumstances are characterised by high uncertainty and some weakening in demand, which would make firms more reluctant to increase their final prices. Moreover, there are other, more permanent factors, and common to other countries and areas, which might be checking inflation. These include most notably heightened global competition, the emergence of new ways of marketing goods and services, and population ageing (see Chapter 2 of this Report

Chart 1.8
STABLE TREND IN CORE INFLATION AGAINST A BACKDROP OF QUICKENING LABOUR COSTS

Changes in oil prices were reflected in the large fluctuations in headline inflation, whereas core inflation held at around 1%. This stability was against a backdrop of quickening labour costs which was offset by a narrowing of profit margins.

1 EURO AREA. CONTRIBUTIONS TO YEAR-ON-YEAR CHANGE IN HICP
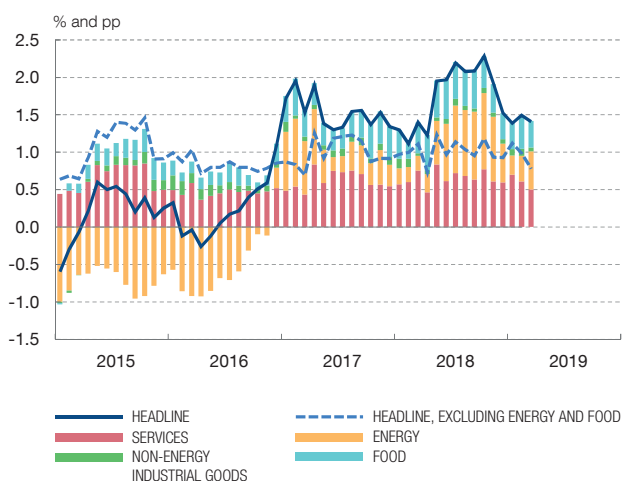
2 EURO AREA. GDP DEFLATOR AND UNIT LABOUR COSTS. YEAR-ON-YEAR CHANGE
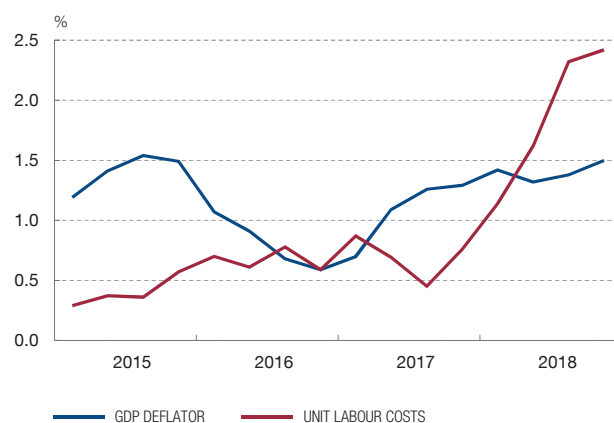
SOURCE: European Commission.

for a more detailed analysis). Against this backdrop, long-term inflation expectations have held at moderate levels, while at shorter horizons they slipped slightly towards the end of the year as global uncertainty influenced euro area activity.

The ECB continued to pursue an accommodative monetary policy. The interest rates on the main refinancing operations, the marginal credit facility and the deposit facility have held at their March 2016 low: 0%, 0.25% and -0.40%, respectively (see Chart 1.9). Moreover, the ECB set about gradually reducing its net purchases under its Asset Purchase Programme (APP), further to the decisions adopted in October 2017 and June 2018. Monthly purchases fell to €30 billion between January and September 2018, and to €15 billion between October and December, with net purchases concluding in the latter month.

At its meeting in early June 2018, the Governing Council pointed ahead to the end of the APP programme. Since mid-2014, the ECB has been implementing a very expansionary monetary policy. It has been underpinned by several extraordinary measures. Overall, it is estimated these will contribute almost 2 pp to the growth both of GDP and of consumer prices in the euro area between 2016 and 2020.[13] After a period of continuous asset purchases since March 2015, the

---

13   Véase Banco Central Europeo (2018).

Chart 1.9

MONETARY AND FISCAL POLICY UNDERPINNED ECONOMIC GROWTH IN THE EURO AREA

Monetary policy remained highly expansionary, even though net asset purchases ended in December 2018. Prospects of interest rate hikes were put on hold, in keeping with the ECB's indications and in view of the economic slowdown. Fiscal policy maintained its neutral stance; it is expected to be slightly expansionary in 2019.

1 OFFICIAL ECB INTEREST RATES AND EONIA

- MINIMUM BID RATE ON MROs
- MARGINAL LENDING FACILITY
- DEPOSIT FACILITY
- EONIA

2 ASSET PURCHASE PROGRAMME (APP)

23% of GDP

- GOVERNMENT SECURITIES
- GOVERNMENT SECURITIES MATURITY (a)
- PRIVATE SECURITIES
- PRIVATE SECURITIES MATURITY (a)
- NET MONTHLY PURCHASES
- APP TOTAL PORTFOLIO (right-hand scale)
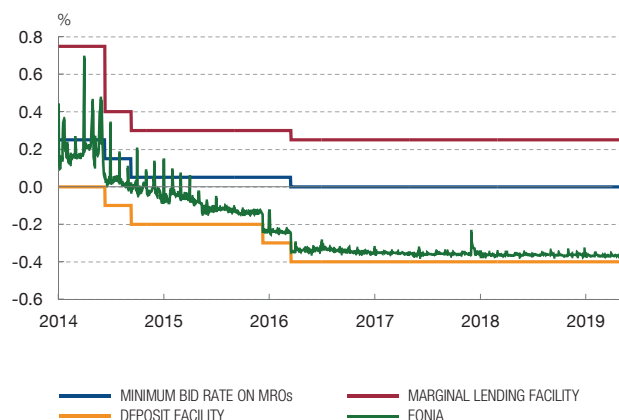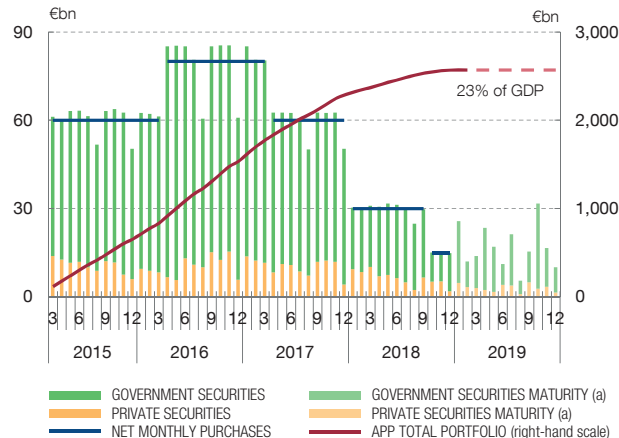
3 INSTANTANEOUS 1-DAY (OIS FORWARD RATE) EXPECTATIONS

- 13 JUNE 2018
- 15 JUNE 2018
- 26 APRIL 2019
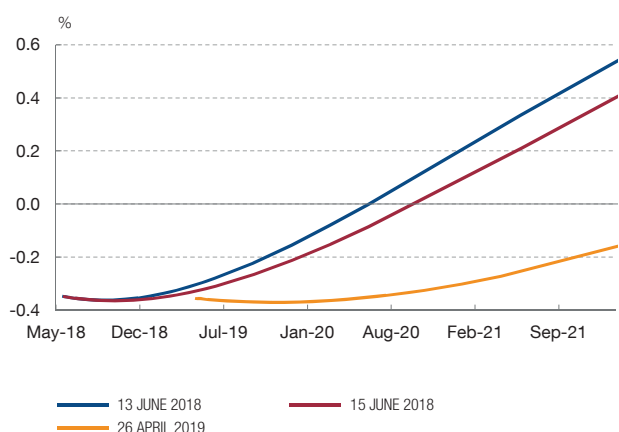
4 FISCAL POLICY STANCE AND PUBLIC DEFICIT (Wb)

- BUDGET BALANCE
- CHANGE IN PRIMARY STRUCTURAL BALANCE (c)
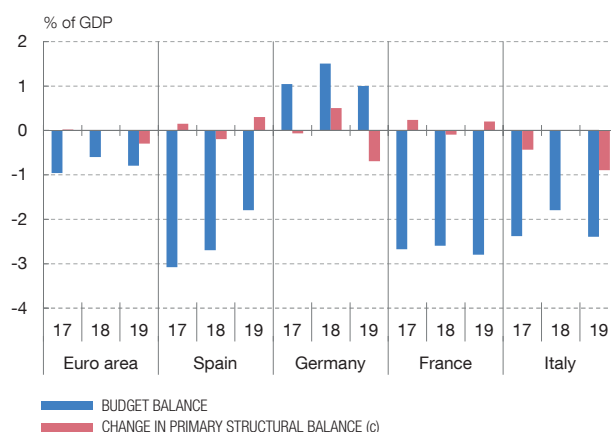
SOURCES: IFS Datastream, ECB, Banco de España and European Commission.

a Maturities expected after April.
b The 2018 and 2019 figures are those contained in the draft budgetary plans for 2019 presented to the European Commission in October 2018 within the framework of the European Semester.
c Percentages of potential GDP.

DOWNLOAD

size of the APP portfolio is over 20% of the area's GDP. While some of the targeted longer-term refinancing operations (TLTRO) were redeemed in 2018, the portfolio's outstanding balance continued to stand at over €700 billion. Moreover, with the aim of maintaining favourable bank lending conditions, the ECB announced a new series of quarterly TLTRO in March 2019. These operations will be instrumented between September 2019 and March 2021, and will have a maturity of two years.

Despite the end of net asset purchases, monetary policy remains broadly accommodative. The gradual reduction in purchases was carefully communicated so as to help ensure its progressive assimilation by the markets. In parallel, a change was announced in the signalling role of the central bank's different instruments and clear sequencing was introduced into future conduct. That will allow for the continuation of the accommodative stance needed to support the convergence of inflation towards the ECB's objective. As from June 2018, the ECB added in greater details on its expectations about policy interest rates. The ECB Council began referring to "at least through the summer of 2019" as the minimum indicative period in which it would maintain interest rate levels.

However, in March this year, given the weak macroeconomic data and the notable downward revision of growth and inflation prospects, this period was extended until end-2019 at least. In any event, as the Council has reiterated, rates will hold at current levels for as long as is needed to ensure the continuing and sustained convergence of inflation to lower levels, but close to 2% in the medium term. In the wake of this communication, short-term interest rate expectations have adapted to the ECB's indications and to the growing evidence of economic weakness in the euro area. The outcome has been a delay in expectations concerning the date of the first rise in policy rates (see Chart 1.9).[14] In this respect, markets have shown signs of understanding that the ECB's guidance concerning interest rates is conditional upon economic developments in the area and, in particular, upon the prospect of attaining in a sustained fashion inflation rates consistent with the definition of price stability. Consequently, further to the latest inflation figures, which have generally been lower than anticipated, the markets have factored in a cut in long-dated interest rates.

Furthermore, the Council has been progressively more explicit about the reinvestment policy for the assets accumulated on its balance sheet, which has become part of the future sequencing of the monetary authority's conduct. From June 2018, the Governing Council signalled its intention "to continue reinvesting, in full, the principal payments from maturing securities purchased under the APP for an extended period of time past the date when it starts raising the key ECB interest rates, and in any case for as long as necessary to maintain favourable liquidity conditions and an ample degree of monetary accommodation". In 2018 gross purchases amounted to €460 billion, of which approximately €140 billion were reinvested. In 2019, the maturities foreseen exceed €200 billion. Owing to reinvestments, the substantial size of the APP portfolio will remain stable for a prolonged period.[15]

---

14   For a more detailed analysis, see Banco de España (2019c).

15   The role that the new monetary policy instruments might play in the future, as part of the central bank toolbox, is analysed in Chapter 3 of this Report.

The public finances shortfall continued to be corrected in 2018. The favourable contribution of the economic cycle and a fresh reduction in the interest burden allowed for the continuing correction of the euro area budget deficit. At end-2018, the deficit stood at 0.5% of GDP. Public debt declined by 2 pp to 87.1% of GDP. On the figures provided by Governments to the European Commission, the fiscal policy stance was slightly contractionary in 2018, and is expected to become slightly expansionary in 2019, albeit with notable cross-country divergences (see Chart 1.9).[16] Of particular note is the projected expansion in Italy, which is running a high level of debt, and in Germany, which plans to increase spending in light of certain shortcomings detected in areas such as infrastructure investment.

Weak global demand, economic uncertainty and lower levels of business profitability are bearing down on the euro area's short and medium-term growth outlook. The European economies still have significant points of vulnerability. These include most notably the high levels of debt in some countries, the scant fiscal policy headroom in most of them and the weakness of certain banks. Consequently, the area's economy is liable to be acutely affected by any future external shocks. A possible case in point would be a disorderly no-deal Brexit, which might entail severe effects in terms of financial instability and the breakdown of international production chains.[17] It is worth recalling here that the euro area is, among the main global economies, that most exposed to international trade flows. Over the longer term, the demographic outlook and low productivity levels continue to pose major challenges for the European economies.

3 The Spanish economy in the recent period: underpinnings and factors of uncertainty

3.1 Stronger performance than that of the euro area

The Spanish economy expanded for the fifth consecutive year in 2018, albeit more slowly than in 2017. Specifically, GDP grew by 2.6%, down 0.4 pp on the previous year (see Table 1.1 and Chart 1.10). By component, the growth of activity was underpinned by the high domestic demand growth, which, as in 2017, was 3%. By contrast, exports weakened notably to 2.3%, nearly 3 pp less than a year earlier. Since this demand component has a high import content, purchases abroad also slowed significantly. As a result of these developments in trade flows, the net external

---

16   The neutral stance in 2018 is inferred from the budgetary plans of the euro area countries' Governments. However, according to estimates by other institutions, there may have been an increase last year of up to 0.5 pp in the structural primary balance.

17   See Vega (2019).

Table 1.1

MAIN INDICATORS OF THE SPANISH ECONOMY (a)

	2013	2014	2015	2016	2017	2018
Demand and output (b)						
Gross domestic product	-1.7	1.4	3.6	3.2	3.0	2.6
Private consumption	-3.1	1.5	3.0	2.9	2.5	2.3
Government consumption	-2.1	-0.3	2.0	1.0	1.9	2.1
Gross capital formation	-4.6	5.8	9.0	2.5	5.4	5.6
Investment in equipment	4.9	6.0	12.3	5.1	5.7	5.2
Construction investment	-8.6	4.2	3.6	1.1	4.6	6.2
Housing	-10.2	11.3	-0.9	7.0	9.0	6.9
Other construction	-7.3	-1.1	7.4	-3.7	0.6	5.5
Exports of goods and services	4.3	4.3	4.2	5.2	5.2	2.3
Imports of goods and services	-0.5	6.6	5.4	2.9	5.6	3.5
Contribution of national demand to GDP growth (pp)	-3.2	1.9	3.9	2.4	2.9	2.9
Contribution of net external demand to GDP growth (pp)	1.5	-0.5	-0.3	0.8	0.1	-0.3
Employment, wages, cost and prices (c)						
Total employment	-3.4	1.0	3.3	3.0	2.9	2.5
Employment rate (d)	55.6	56.8	58.7	60.5	62.1	63.4
Unemployment rate	26.1	24.4	22.1	19.6	17.2	15.3
Compensation per employee	1.4	0.1	0.8	-0.5	0.3	0.8
Apparent labour productivity	1.8	0.3	0.3	0.1	0.1	0.1
Unit labour costs	-0.4	-0.2	0.5	-0.6	0.2	0.8
GDP deflator	0.4	-0.2	0.5	0.3	1.2	1.0
Consumer price index (end of period)	0.3	-1.0	0.0	1.6	1.1	1.2
Consumer price index (annual average)	1.4	-0.2	-0.5	-0.2	2.0	1.7
Consumer price differential (HICP) with the euro area (pp)	0.2	-0.6	-0.8	-0.1	0.1	0.0
House prices	-10.6	0.3	3.6	4.7	6.2	6.7
Net lending (+)/net borrowing (–) and financial balance (e)						
Resident sectors: domestic net lending (+)/net borrowing (–)	2.1	1.5	1.7	2.4	2.2	1.5
General government	-7.0	-6.0	-5.3	-4.5	-3.1	-2.5
General government (excluding aid to financial institutions)	-6.7	-5.8	-5.2	-4.3	-3.0	-2.5
Household and NPISHs	4.0	3.4	2.4	1.7	-0.4	-1.2
Corporations	5.1	4.1	4.6	5.1	5.6	5.2
Financial institutions	2.2	2.3	1.8	2.1	2.3	2.5
Non-financial corporations	2.9	1.8	2.8	3.0	3.3	2.6
Net international investment position	-95.2	-98.0	-89.5	-85.3	-83.5	-77.1
General government gross debt	95.5	100.4	99.3	99.0	98.1	97.1
Monetary and financial indicators (f)						
ECB minimum bid rate on MROs	0.5	0.2	0.1	0.0	0.0	0.0
Ten-year government bond yield	4.6	2.7	1.7	1.4	1.6	1.4
Synthetic bank lending rate	4.1	3.8	2.9	2.7	2.5	2.4
Madrid Stock Exchange General Index (100 = Dec 1985)	879.8	1,066.6	1,080.5	879.2	1,034.5	971.4
Dollar/euro exchange rate	1.3	1.3	1.1	1.1	1.1	1.2
Nominal effective exchange rate vis-à-vis developed countries (g)	101.5	101.5	99.3	99.9	100.8	101.5
Real effective exchange rate vis-à-vis developed countries (h)	107.2	106.3	104.1	103.1	103.2	102.7
Real effective exchange rate vis-à-vis the euro area (h)	105.0	104.3	104.5	103.0	102.3	101.1
Households: total financing	-5.2	-3.6	-2.1	-2.0	-1.3	-0.6
Non-financial corporations: total financing	-6.1	-3.7	-0.4	-0.4	0.3	0.6

SOURCES: INE, IGAE, AMECO and Banco de España.

a Spanish National Accounts data, base year 2010.
b Volume indices. Annual rates of change.
c Rates of change, except employment and unemployment rates, which are in levels.
d Employment rate (16-64 years).
e Levels as a percentage of GDP.
f Annual average levels for the Madrid Stock Exchange General Index, interest rates and exchange rates, and rates of change for financial liabilities.
g 100 = 1999 Q1.
h 100 = 1999 Q1. Measured with unit labour costs.

Chart 1.10

GDP AND EMPLOYMENT GROWTH REMAINED HIGH, DESPITE THE DETERIORATION OF THE EXTERNAL ENVIRONMENT

Spanish GDP rose at a steady pace throughout the year, in contrast to the slowdown in activity in the euro area. Exports decelerated sharply, in keeping with the loss of momentum on the external markets. However, the contribution of domestic demand to GDP growth remained strong. Productivity growth was very low, as has been the case since the start of the recovery. Employment creation meant that the unemployment rate continued to head down, albeit at a slower pace among workers with longer spells of unemployment.

1 GDP: SPAIN AND EURO
Year-on-year rate of change in real terms
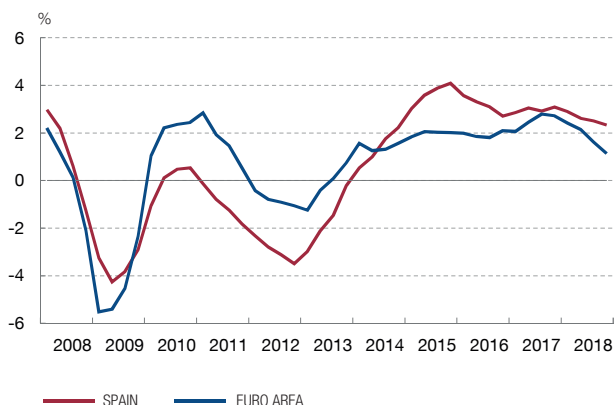
2 GDP, NATIONAL DEMAND COMPONENTS AND EXTERNAL DEMAND
Year-on-year rates of change and contributions to growth

SPAIN   EURO AREA

OTHER PRIVATE INVESTMENT
GOVERNMENT CONSUMPTION AND INVESTMENT
PRIVATE CONSUMPTION AND HOUSING
NET EXTERNAL DEMAND
GDP (Y-O-Y RATE OF CHANGE, %)
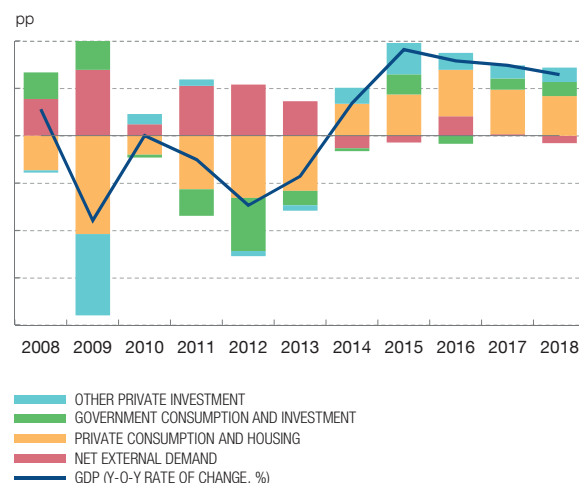
3 GROSS DOMESTIC PRODUCT AND EMPLOYMENT
Year-on-year rate of change
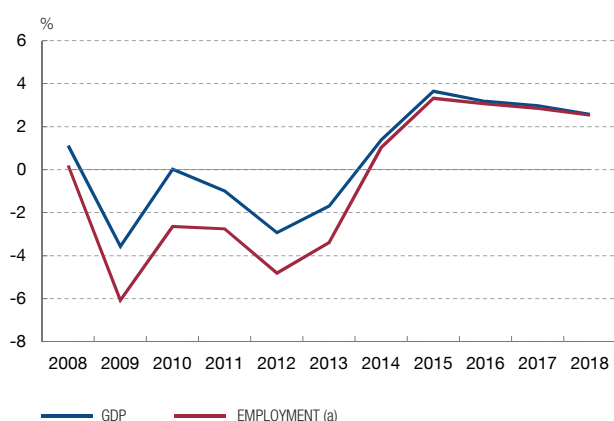
4 UNEMPLOYMENT AND LONG-TERM UNEMPLOYMENT RATE

GDP   EMPLOYMENT (a)

UNEMPLOYMENT RATE   LONG-TERM UNEMPLOYMENT RATE (b)
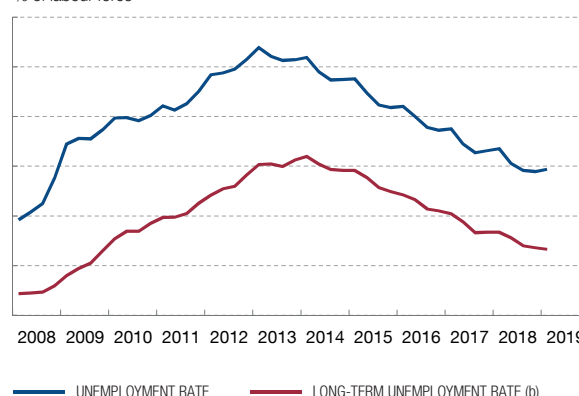
DOWNLOAD

SOURCES: INE and Banco de España.

a Employment on Quartertly National Accounts (QNA) data. Full-time equivalent jobs.
b Long-term unemployment: persons looking for work for a year or more.

balance made a negative contribution of 0.3 pp to output growth, the first of this sign since 2015.

The decrease in the rate of output growth was of a similar size to that expected before the beginning of the year. In fact, GDP growth in 2018 was 0.2 pp higher than anticipated in the Banco de España's December 2017 projections. However, the composition of its growth differed greatly from that predicted.

Specifically, the rate of change of domestic demand was 0.9 pp higher than expected, with a more dynamic performance of all of its components, while exports grew by 2.6 pp less, which, given that imports did not significantly depart from expectations, meant that the contribution of the external net balance was 0.7 pp worse than predicted.

In terms of average annual rates, the slowdown of the Spanish economy's output in 2018 differed little in size from that in the euro area. Specifically, the decrease of 0.6 pp in the euro area's GDP growth was 0.2 pp higher than in Spain. However, while in Spain the slowdown was anticipated, that of the euro area came as a surprise. From the standpoint of demand components, the downturn in exports came as a surprise in both cases. By contrast, unlike in Spain, the increase in domestic spending in the euro area was substantially lower than expected.

The differences between the performances of the Spanish and euro area economies in 2018 are easier to see in terms of the quarter-on-quarter profile of GDP growth. The rate of change of output in the last two quarters of 2017 was very similar in the two economies (around 0.7%). However, while in Spain that growth rate tended to hold steady in 2018, standing at 0.6% in each of the four quarters of the year (except in Q3, when it was 0.5%), the GDP of the euro area grew by 0.4% in Q1 and Q2, and by 0.1% and 0.2% in the following two quarters. Given these developments, Box 1.2 analyses in detail the factors which may explain why activity and, in particular, domestic demand performed better in Spain than in the euro area, against a background in which both economies were subject to a common external shock.

The deceleration abroad was reflected in the comparatively less favourable behaviour of industry. Specifically, in industry, 2018 saw slowdowns in value added and, above all, employment, a trend which has persisted unchanged into early 2019 (see Chart 1.11). This was partly a consequence of the difficulties besetting the automotive sector. Contrastingly, activity and employment rose strongly in construction, although their current levels are still far from those before the crisis. Noteworthy in services was the marked buoyancy of employment in the non-market branches, which rose to 3% and, in line with the information from the Labour Force Survey, reflected the strength of recruitment in the public sector.

The ability of the economy to continue growing at the high rate of recent quarters depends, however, on various factors. Box 1.2 concludes that the higher growth rate of household consumption than that of household income and the somewhat expansionary stance of fiscal policy (which are interrelated to some extent) contributed to explaining the strength of domestic demand and GDP in 2018. Looking forward, the ability of these factors to continue sustaining activity is limited because their prolongation in time may end up generating certain vulnerabilities in the financial position of households and general government.

Chart 1.11
AMONG THE PRODUCTIVE SECTORS, INDUSTRY FELT THE IMPACT OF THE DOWNTURN IN THE EXTERNAL ENVIRONMENT

The downturn in the world economy meant that industry, the productive sector most exposed to external competition, performed less strongly than other sectors, with stagnation of its value added and a backslide in employment, This was not so different from what happened in the main euro area economies. By contrast, value added in construction continued expanding apace, albeit from a still-low level, given the adjustment which took place in the crisis.

1 VALUE ADDED. TOTAL ECONOMY
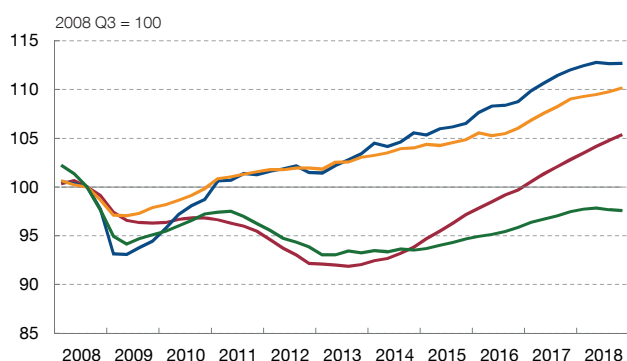
2 VALUE ADDED. SERVICES
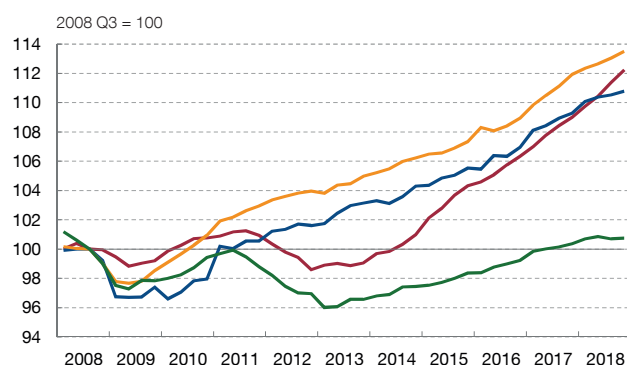
3 VALUE ADDED. INDUSTRY
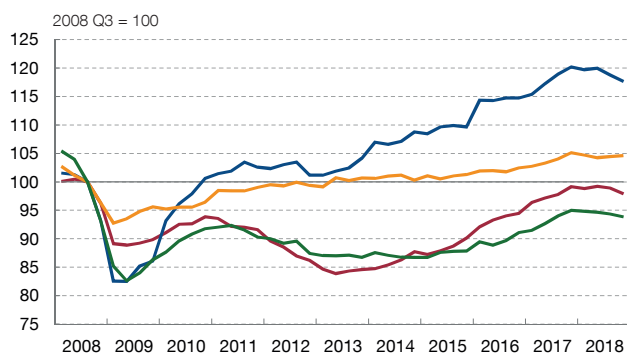
4 VALUE ADDED. CONSTRUCTION
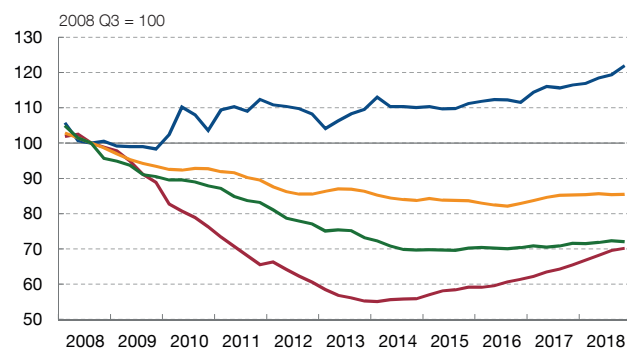
SPAIN ──── GERMANY ──── FRANCE ──── ITALY

SOURCES: Eurostat, INE and Banco de España.

DOWNLOAD

At the same time, the economy retains significant underpinnings to enable it to continue growing rapidly. There has been no correction of the imbalance in public finances and certain groups of households may be raising their spending more than their income prospects would advise, but the aggregate balance sheet of the private sector has continued to improve in the recent period. The lower indebtedness in recent years reduces the vulnerability of households and firms to shocks prompted by higher borrowing costs or falls in income. Meanwhile, the behaviour of relative costs vis-à-vis the rest of the world in 2018 continued to favour external competitiveness and hence the adjustment of the structural current account balance. Furthermore, the prospect that the ECB will maintain its expansionary monetary stance for a lengthy period provides certain additional slack in the financial position of indebted agents.

Short and medium-term growth ability is favoured by the existing room to increase the use of factors of production. On Banco de España estimates, the output gap of the Spanish economy, i.e. the difference between observed and potential GDP expressed as a percentage of the latter, may have turned positive in 2018. According to the most recent macroeconomic projections of the Banco de España,[18] the growth of the economy under the baseline scenario will amply exceed the potential growth rate (estimated at somewhat below 1.5%) over the next three years, standing at 1.7% on average in 2021.

3.2 Domestic demand as the mainstay of activity

The main determinants of household spending behaved favourably in 2018. The consumer and investment decisions of households were encouraged by the expansionary behaviour of their income, the improvement of the sector's financial position and the availability of funding on easy conditions.

As in previous years, households continue to enjoy access to bank financing on easy terms. The continuing accommodative stance of the ECB's monetary policy allowed the average interest rates applied to loans to remain at historically low levels. Further, according to the Spanish Bank Lending Survey (BLS), households' access to credit continued to improve in 2018, although signs of the exhaustion of this pattern began to appear in late 2018 and early 2019 (see Chart 1.12).

The accommodative financial conditions underpinned the increase in new lending. New lending grew particularly strongly in the consumer credit segment, where new credit flows continued to grow, as throughout the whole of the recovery, at double-digit rates. In this respect, it should be kept in mind that excessively rapid credit growth may increase the vulnerability of lenders and borrowers to adverse shocks.[19]

In any event, consumer credit slowed in the second half of the year. This moderation seemed to be linked to both supply and demand factors. On the supply side, the two most recent BLSs point, for the first time since the beginning of 2013, to a certain tightening of credit standards, which may be associated with the higher risk perceived by lenders in this segment in light of the upturn in bad loans in 2018 and the general economic outlook (see Chart 1.12). For its part, demand seems to have been curtailed due to the slowdown in consumption of durable goods following several years of high growth.

---

18 See Banco de España (2019a).

19 See Banco de España (2018d, 2018h and 2018j).

Chart 1.12

THE FINANCING CONDITIONS OF THE SPANISH ECONOMY CONTINUE TO BE LAX

Financing conditions continue to be lax, with low and stable costs, although there are signs that credit standards may be starting to tighten. The outstanding balance of household credit has shown positive increases since mid-2018 thanks to a moderation of the fall in house purchase lending, which has offset the deceleration in consumer credit. The overall balance of lending to non-financial corporations is also growing, since the contraction in lending by resident financial institutions has been offset by the dynamism of debt security issuance and lending to the rest of the world.

1 BANK LENDING INTEREST RATES. SPAIN

LENDING TO HOUSEHOLDS. HOUSING
LENDING TO HOUSEHOLDS. CONSUMER CREDIT AND OTHER LENDING
LENDING TO NON-FINANCIAL CORPORATIONS. UP TO €1 MILLION
LENDING TO NON-FINANCIAL CORPORATIONS. MORE THAN €1 MILLION
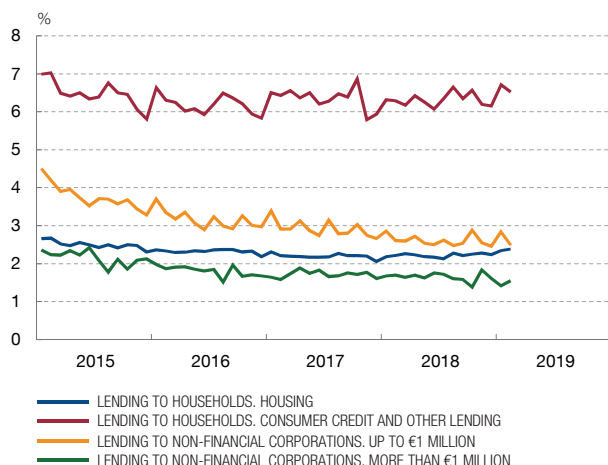
2 BLS. CHANGES IN BANK CREDIT STANDARDS (a)

HOUSEHOLDS. HOUSE PURCHASE LOANS
HOUSEHOLDS. CONSUMER CREDIT AND OTHER LENDING
NON-FINANCIAL CORPORATIONS
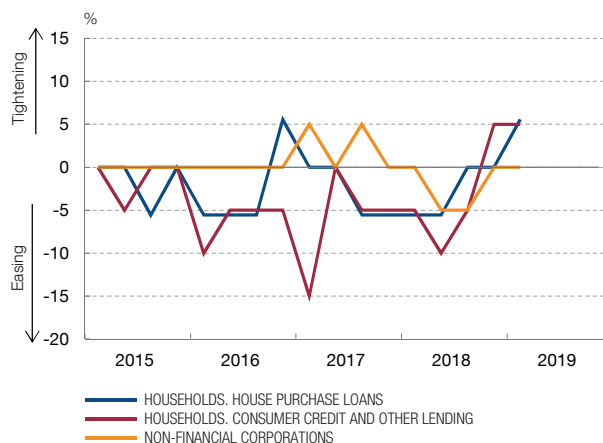
3 LENDING TO HOUSEHOLDS. YEAR-ON-YEAR GROWTH

TOTAL   HOUSING
CONSUMPTION   OTHER
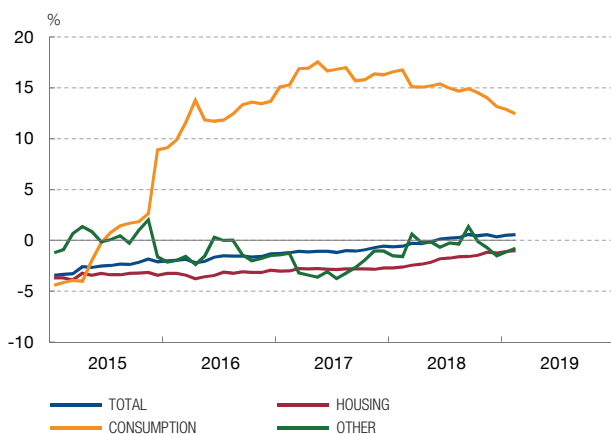
4 LENDING TO NON-FINANCIAL CORPORATIONS. GROWTH

TOTAL LENDING
LENDING BY RESIDENT CREDIT INSTITUTIONS AND SLIs
DEBT SECURITIES (b)
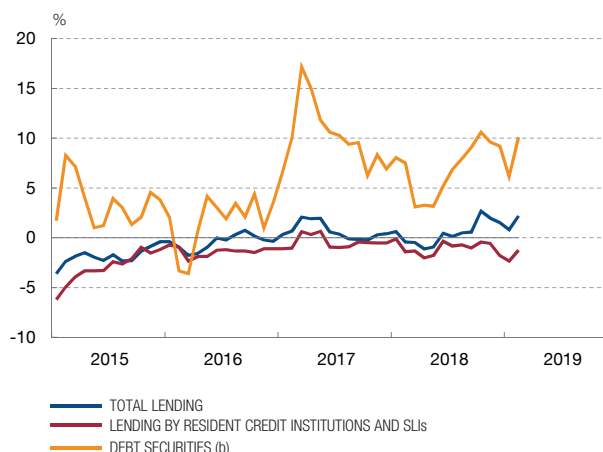
SOURCE: Banco de España.

a Bank Lending Survey. Indicator = percentage of banks that have tightened their credit standards or their margins considerably × 1 + percentage of banks that have tightened their credit standards or their margins somewhat × 1/2 – percentage of banks that have eased their credit standards or margins somewhat × 1/2 – percentage of banks that have eased their credit standards or margins considerably × 1.
b Including issuance by resident subsidiaries.

DOWNLOAD

The total stock of household credit increased for the first time since 2010.
Since mid-2018, the year-on-year growth rate of lending to this sector has been slightly positive. Along with the expansionary consumer credit described above, this development reflects the moderation of the rate of contraction of house purchase lending, in which segment new loan growth is being counteracted less and less by the volume of redemptions.

Chart 1.13

THE FINANCIAL POSITION OF HOUSEHOLDS AND NON-FINANCIAL CORPORATIONS CONTINUED TO STRENGTHEN

The debt ratios of households and non-financial corporations continued to decrease and now stand at levels near the euro area average (households) or below it (non-financial corporations). The net wealth of Spanish households continued to rise owing to property price appreciation, which offset the fall in the financial component basically due to a decline in equity security prices.

1 WEALTH. HOUSEHOLDS

2 DEBT RATIOS

PROPERTY (b)
NET TOTAL (b)
FINANCIAL ASSETS
LIABILITIES

HOUSEHOLDS. SPAIN
HOUSEHOLDS. EURO AREA
NON-FINANCIAL CORPORATIONS. SPAIN
NON-FINANCIAL CORPORATIONS. EURO AREA
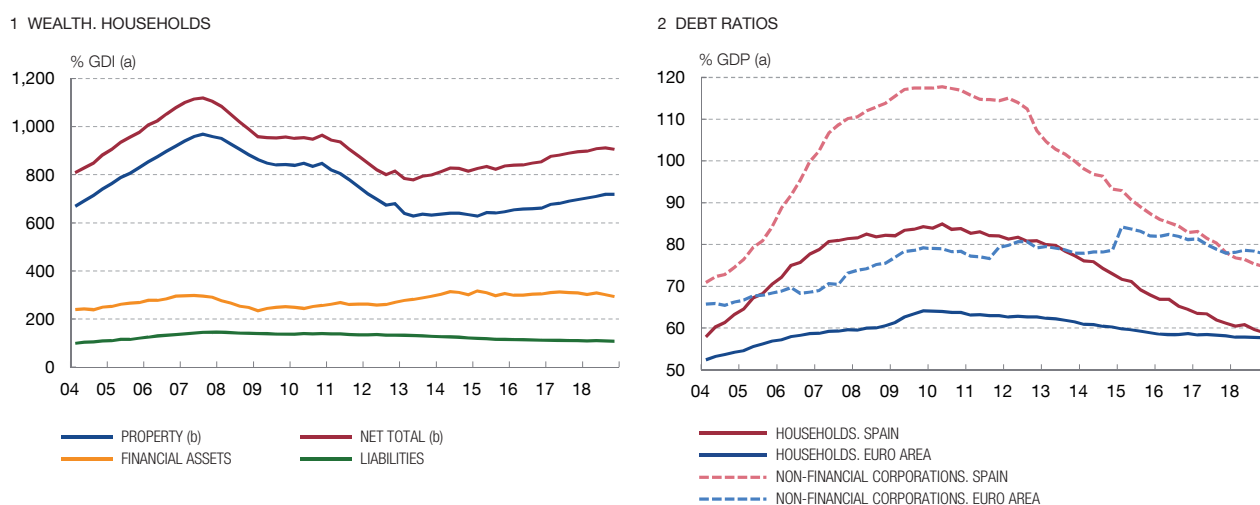
SOURCES: INE and Banco de España.

a Data in four-quarter cumulated terms.
b Estimate based on estimated changes in stock of housing, average floor space and price per square metre.

The improved financial position of households also helped to boost their spending. Spanish households continued to reduce their debt in 2018, although at a more moderate pace than in previous years. At the end of the year, the debt of this sector stood at 59% of GDP, 2 pp less than in the previous year and 26 pp below the peak reached in mid-2008. This level is now very near (barely 1 pp above) the euro area average (see Chart 1.13).

The net wealth of households continued to rise. This was a consequence of property price appreciation in a setting in which average residential prices increased by 6.7% in 2018. By contrast, the value of the financial component decreased in both gross and net (i.e. after deduction of debt) terms, due mainly to lower stock market prices (see Chart 1.13). In addition, the improvement in the aggregate financial position of the sector masks the existence of some groups of more vulnerable households.

The growth rate of household income increased significantly in 2018. In nominal terms, the gross disposable income of households rose by 3.2% in the year as a whole, 1.6 pp more than in 2017 (see Chart 1.14). Given that inflation, as measured by the rate of change of the private consumption deflator, stood, as in 2017, at 1.6%, the greater vigour of nominal income fed through to real income, which grew by 1.5% last year, compared with the zero growth of 2017.

Chart 1.14

PRIVATE CONSUMPTION STRONG AND HOUSEHOLD SAVING RATE AT RECORD LOWS
Rate of change

The rise in the growth rate of household nominal income was contributed to by higher wages, lesser income depletion by general government and higher dividend income. In real terms, household consumption grew more rapidly than household income, pushing the saving rate down further to its lowest level in the time series.

1 PRIVATE CONSUMPTION AND DISPOSABLE INCOME
  Annual percentage changes in real terms
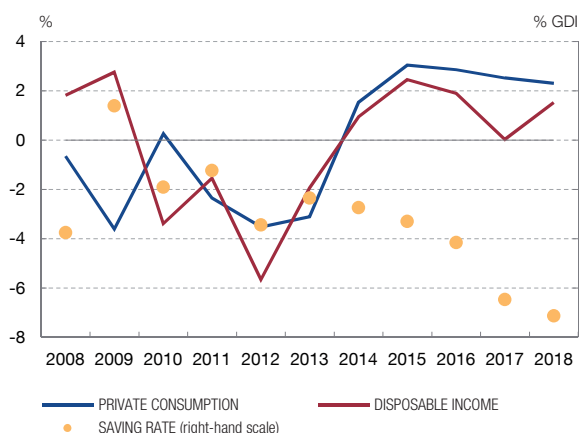
2 PRIVATE CONSUMPTION AND DISPOSABLE INCOME
  Contribution to annual percentage change in real terms

PRIVATE CONSUMPTION   DISPOSABLE INCOME
SAVING RATE (right-hand scale)

NUMBER OF EMPLOYEES   COMPENSATION PER EMPLOYEE
EFFECT OF GENERAL GOVERNMENT   OTHER INCOME
PRIVATE CONSUMPTION DEFLATOR   PRIVATE CONSUMPTION (%)
DISPOSABLE INCOME (%)

DOWNLOAD
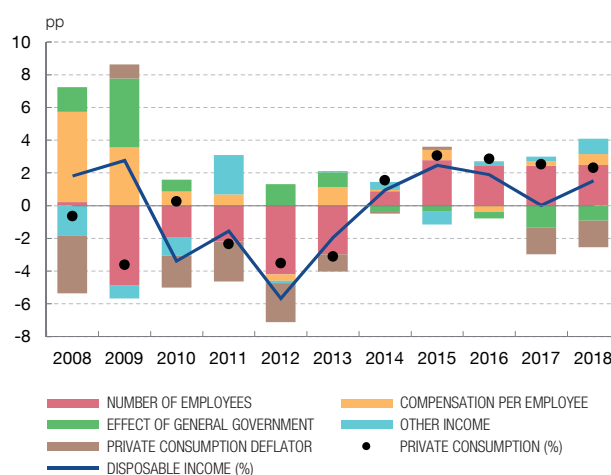
SOURCES: INE and Banco de España.

Contributing to this greater vigour were both labour income and net transfers from general government. Employees' wages showed notable dynamism. In nominal terms, labour income increased by 4.1%, 0.5 pp more than in 2017, as a result of the greater buoyancy of nominal wages (up by 0.8%, 0.5 pp more than in 2017). By contrast, the growth rate of employment declined (by 0.4 pp to 2.5%). Contributing to wage buoyancy was the increase in remuneration of public-sector employees. In addition, the pension revaluation approved in the State budget in mid-2018 and, to a lesser extent, the higher personal income tax threshold, i.e. the lowest amount of income for which the tax payable is positive, gave rise to a higher contribution of net current transfers from general government to household income.

Private consumption continued to show notable strength, similar to that a year earlier. In the aforementioned setting of households' higher income growth, improved financial position and favourable financial conditions, the spending of these agents on consumer goods and services grew in 2018 as a whole by 2.3% in real terms, a significantly higher rate than that expected at the beginning of the year. During the course of 2018, households' confidence tended to fall somewhat as a result of their worsening unemployment expectations, their weaker perception of the overall economic situation in the future and the lower declared intention to make big-ticket purchases in the coming months. Indeed, in the final stretch of the year the rate of durable goods purchases underwent a loss of momentum which may have

had many causes. These included the possible impact of the downturn in confidence, the exhaustion of the scope for re-absorbing the pent-up demand for goods of this type accumulated during the crisis,[20] and, in the case of automobiles, also some temporary factors.[21]

In line with the trend since the beginning of the recovery, the saving rate decreased again in 2018, although more moderately than in 2017. The decrease in the saving rate last year (by 0.6 pp) took this variable to 4.9% of disposable income, one of the lowest levels among the core European economies (see Chart 1.14). The decrease in the saving rate, in combination with the expansion of consumer credit, may reflect excessive risk-taking by some consumer groups.[22]

Investment in housing again showed high growth, albeit somewhat lower than in the previous two years. This demand component grew by 6.9% in 2018. Demand, spurred by the good performance of employment and by favourable financing conditions, continued to pass through to significant increases in (mainly used) housing transactions and in the number of new residential building permits. The latter were driven also by the fall in stocks of unsold new housing (particularly in those geographical areas where the market has been more buoyant). In any event, the number of housing starts in 2018 was in line with the creation of new households, in contrast with the situation at the peak of the previous real estate cycle, when in some years the former almost doubled the latter.

Against this background of buoyant housing demand, prices continued to recover. The level reached at the end of 2018 was, in real terms, 23% above the end-2013 low (see Table 1.1), but still approximately 18% below the high of 2007. According to the available indicators, the price rise throughout this expansionary period has, for the time being, not led to any appreciable overpricing.[23] Meanwhile, rental income has risen markedly during the recovery to levels significantly above those seen in the previous upturn.

The behaviour of the housing market is, in any event, notably uneven across regions. Specifically, the recovery has been stronger in Madrid, the Mediterranean coastal regions, and the Balearic and Canary Islands, which are areas of higher economic growth and population dynamism.[24] Compared with the significantly more

---

20 See González Mínguez, J. and A. Urtasun (2015) and Banco de España (2017d).

21 Specifically, the entry into force in September of the regulations on pollutant emissions may have given rise to a decrease in car purchases in the last part of the year due both to a certain bringing-forward of purchases to the preceding months and to a decrease in the number of vehicles for sale complying with the new regulations.

22 See Banco de España (2019e).

23 See section 1.2.2 of Banco de España (2019e).

24 See Alves and Urtasun (2019).

Chart 1.15

INVESTMENT BY NON-FINANCIAL CORPORATIONS CONTINUED TO BE SPURRED BY THE STRENGTH OF FINAL DEMAND, BY THE FAVOURABLE FINANCING CONDITIONS AND BY CORPORATE RESTRUCTURING

The internal generation of funds by firms was weakened by the slower growth of their operating surplus and, above all, by the bringing forward of taxation which may be reversed in 2019. This meant they had greater recourse to borrowing to finance their investment spending. Their strength remained unchanged thanks to the dynamism of final demand.

1 CORPORATE SAVING AND GROSS FIXED CAPITAL FORMATION
   Nominal growth and contributions
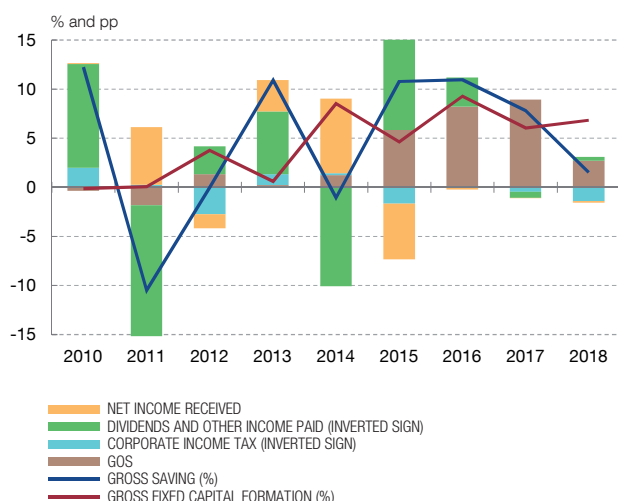
2 CORPORATE LENDING OR BORROWING
   % of GDP

NET INCOME RECEIVED
DIVIDENDS AND OTHER INCOME PAID (INVERTED SIGN)
CORPORATE INCOME TAX (INVERTED SIGN)
GOS
GROSS SAVING (%)
GROSS FIXED CAPITAL FORMATION (%)

INVESTMENT (INVERTED SIGN) (a)
GROSS SAVING
NET LENDING OR BORROWING
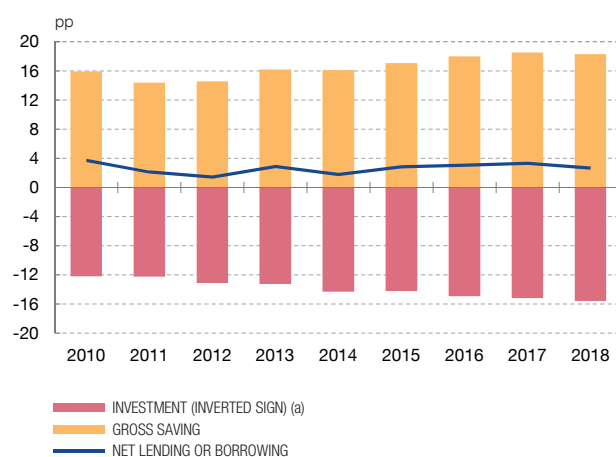
SOURCES: INE and Banco de España.

a Including net capital transfers.

moderate increases shown by the national averages, in some of these locations prices rose by nearly 50% from their lows, housing transactions doubled and building permits tripled.

The decrease in saving and the rise in housing investment meant that households had to borrow more. In net terms, their borrowing amounted to 1.2% of GDP, 0.8 pp more than a year earlier, making 2018 the second year running in which households are net borrowers from the other sectors of the economy.

The growth rate of funds generated internally by firms to finance their investment spending decelerated in 2018. On National Accounts data, the growth rate of the gross operating surplus of non-financial corporations (NFCs) decreased significantly to 2%, nearly 5 pp less than at the end of 2017 (see Chart 1.15). Meanwhile, firms' gross saving slowed even more sharply, due to a strong increase in corporate income tax payments.

As in the case of households, firms continued to enjoy easy access to borrowed funds, and this underpinned investment by NFCs. The cost of corporate finance remained low and even decreased further in the case of smaller loans, which are generally those extended to SMEs (see Chart 1.12). Regarding quantities, both the

Spanish Bank Lending Survey and the euro area Survey on the Access to Finance of Enterprises (SAFE) indicate that NFCs' access to credit improved during the year. In the most recent Spanish Bank Lending Survey (relating to 2019 Q1), banks reported that they expected NFCs' credit conditions to steady. Also, in the latest SAFE (for the period from April to September 2018), the percentage of firms reporting access to finance to be a factor of concern was 6%, the lowest value since the survey was launched nearly a decade ago, although some other results of the survey pointed to signs of exhaustion of the improvements.[25]

The total volume of external financing raised by NFCs grew further. Overall, the total financing to firms from securities issuance and credit from resident and non-resident banks quickened to 2.2% in February 2019, compared with 0.4% in December 2017 (see Chart 1.12). This acceleration was possibly the flipside of the slowdown in growth of internally generated funds. In any event, some changes were apparent in the composition by instrument. Specifically, despite the prevailing favourable conditions, the demand for new loans and, therefore, the growth of originations was very moderate, resulting in a slightly faster contraction of total credit. By contrast, the funds raised through debt securities issuance continued to grow quickly, reflecting the continuation of the process of bank disintermediation observed in recent years. This increase in financing through securities at the expense of that provided through credit seems to have continued to be fostered by the ECB's corporate sector purchase programme launched in mid-2016.[26]

The financial position of firms continued to strengthen as a result of ongoing deleveraging and this favoured the strong performance of investment. The continuation in 2018 of the financial restructuring effort by firms in recent years reduced the year-end debt ratio to 75% of GDP, 43 pp below its peak at mid-2010. Compared with firms from the euro area as a whole, the debt of Spanish firms is now somewhat more than 3 pp lower. In any event, as in the case of households, some corporate segments are in a situation of greater fragility.[27]

In the setting described above, corporate investment seems to have grown by 4.5% in real terms in 2018.[28] Against a background characterised by the sector's improving financial position, a favourable profitability performance and the persistence of benign financing conditions, corporate investment continued to perform strongly, in line with the strength of final demand. However, the last part of

---

25   See Banco de España (2018p).

26   See Arce, Gimeno y Mayordomo (2017), which confirms these effects for Spain.

27   See Banco de España (2019e).

28   The figure given is an estimate by the Banco de España after removing the effects of some economically insignificant accounting reclassifications between NFCs and general government, and taking into account that the National Accounts only consider firms' investment in nominal terms.

the year saw a weakening of this demand component, possibly linked to the downturn in the external sector. The strength of NFCs' investment in the year as a whole and the slight decline in their saving did not prevent the sector from continuing to be a net lender (see Chart 1.15).

3.3 Loss of external demand momentum

Compared with the strength of domestic demand, net trade flows with the rest of the world decelerated significantly in 2018. This loss of momentum was more pronounced on the export than the import side. In consequence, the contribution of net exports to GDP growth was negative (-0.3 pp), for the first time since 2015. As indicated in section 2.2, exports also weakened significantly in all the other main euro area economies.

The considerable moderation in sales abroad – whose average annual growth rate fell by 3 pp to 2.3% – responded to a number of factors. Both the weakness of Spain's export markets and the effects of the exchange rate appreciation in 2017-18 helped to explain the slowdown in sales to the rest of the world observed in 2018 (see Chart 1.16). The loss of momentum on the external markets is the key factor behind the slowdown in exports. In 2018, export markets for Spanish goods and services grew by 3.1%, 2 pp less than in 2017 (see Chart 1.16). In addition, the loss of this momentum was more marked than the loss of steam in world trade flows, which is explained by the fact that the different geographical areas do not hold the same weight in the two aggregates. Specifically, the countries of the EU – where the slowdown in imports was comparatively greater than that seen at a global level – make up two-thirds of Spain's export markets. In addition, the emerging Asian markets, which are those that held up best in 2018, make up a much smaller proportion of Spain's export markets than of world markets overall.

The euro exchange rate in the period 2017-18 also had a negative effect on export growth. In 2017, Spain's nominal effective exchange rate (NEER) appreciated by 7.4% against the non-euro area developed countries overall. This appreciation, which was concentrated in the first half of the year, gave rise to a loss of competitiveness that was only marginally offset by the fall in prices and in relative unit labour costs (ULCs) compared with the non-euro area developed countries (see Chart 1.16). In 2018 the NEER depreciated by 1.1%, thus helping to boost economic competitiveness. This effect was heightened by the favourable performance both of prices and relative ULCs compared with the non-euro area developed countries.

The lagged effect of the appreciation observed in 2017 had a strong negative impact on export sales in 2018. According to the Banco de España's Quarterly

Chart 1.16
EXPORTS DECELERATED SHARPLY

Growth in export sales was considerably lower than in previous years, partly because the slowdown in Spain's export markets was greater than that observed worldwide. The low export momentum was also due to the past appreciation of the euro, which prompted a loss of competitiveness compared with the non-euro area countries, with which, by contrast, the ULC correction continued. The number of regular exports continued to increase at a strong pace, which is a positive note for the future.

1 EXPORTS
Rates of change in real terms

EXPORTS OF SPANISH GOODS AND SERVICES
GLOBAL IMPORTS OF GOODS AND SERVICES
SPANISH EXPORT MARKETS
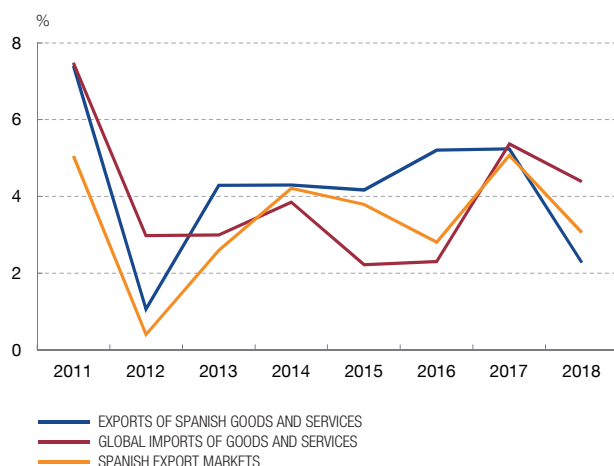
2 REAL EFFECTIVE EXCHANGE RATE AGAINST DEVELOPED COUNTRIES
(NON-EURO AREA)
100 = 1999 Q1

WITH MANUFACTURING PRODUCER PRICES
WITH UNIT LABOUR COSTS
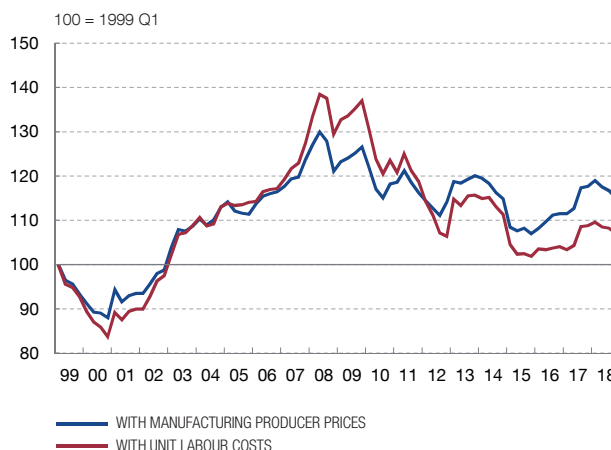
3 TOTAL-ECONOMY RELATIVE UNIT LABOUR COSTS
SPAIN/EURO AREA
Relative levels
100 = 1999 Q1

UNIT LABOUR COSTS   COMPENSATION PER EMPLOYEE
PRODUCTIVITY PER EMPLOYEE
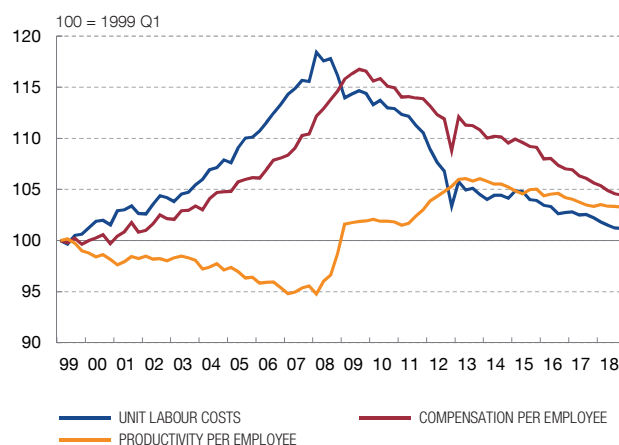
4 REGULAR EXPORTERS (a)
Rates of change

TOTAL   EUROPEAN UNION   REST OF EUROPE
LATIN AMERICA   UNITED STATES   ASIA
AFRICA
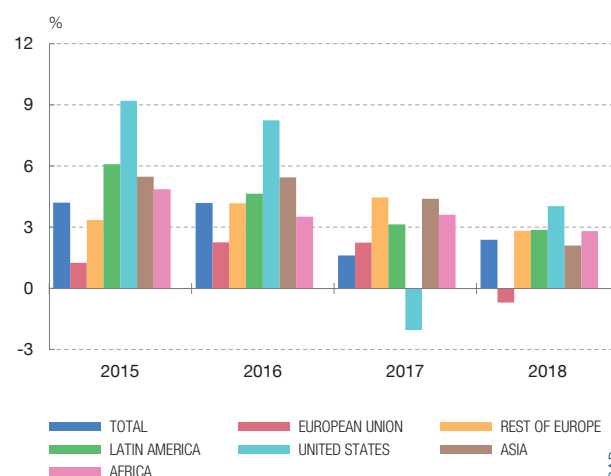
SOURCES: ECB, INE, ICEX and Banco de España.

a Regular exporters are those that have exported in the year in question and in each of the three immediately preceding years.

Macroeconometric Model, there is some lag in the materialisation of the effects on trade flows of NEER appreciation against the developed countries. In addition, nominal appreciation is greater and more persistent when the NEER is calculated against country aggregates that include emerging market economies. Thus, the NEER against a group of 38 non-euro area countries not only appreciated (by 6.7%) in 2017, but again by a further 5% in 2018.

In 2018 the competitiveness of the Spanish economy improved somewhat compared with that of the other euro area member countries. The competitiveness gains amounted to 1.1% in terms of total-economy relative ULCs (see Chart 1.16), and to more than 1.7% in terms of manufacturing sector ULCs. However, on the information available, the improvement in competitiveness indicators did not translate into an increase in euro area market share, which held steady following the increases recorded in the two previous years (most likely owing to competition from non-euro area countries whose currencies depreciated).

Regarding trade in goods, the effects of the exchange rate appreciation help to explain why the slowdown in sales to the rest of the world was especially marked in the case of extra-EU markets. Indeed, the information available suggests that growth in goods exports to non-euro area countries was lower in the case of Spain than it was in the case of the other large euro area economies, in keeping with the fact that Spanish export markets include a relatively higher proportion of markets that have seen the most deceleration. An additional explanation would be that Spanish exports specialise in products with medium-low technology content, which makes export volumes comparatively more sensitive to a fall in price competiveness.

By product type, the negative contribution of car exports to the deceleration in total goods exports stands out. In the second half of 2018 sales of cars (whose main market is the EU, with 86% of the total, in nominal terms) and intermediate products were adversely affected by the new European regulations on contaminating emissions. Although this was a mainly temporary shock, it has had a more persistent effect than was initially expected. In the medium and long term, auto manufacturing and exports are subject to uncertainties stemming from the technological changes currently under way in the industry, insofar as they may give rise to decisions to relocate production.

The slowdown in exports was particularly marked in the case of travel services. In real terms, the rate of growth of non-resident tourism, which was around 9% per annum in the period 2016-17, fell to 1.7% in 2018, with growth in foreign tourist arrivals that was, for the first time in six years, lower than the growth in total tourism flows worldwide. One factor behind this loss of momentum is the gradual return to normal in the geopolitical situation of the competitor destinations in the Mediterranean basin. Other causes of the slowdown observed are the weakening economic activity in the main euro area countries of origin, rising oil prices (which drive up transport costs) and appreciation of the euro against the currencies of some other countries of origin. Growth in the number of tourists was lower than the growth in tourist spending, which suggests that higher-priced services gained weight compared with the low-cost segment (probably because this segment has underpinned the above-mentioned recovery in other Mediterranean destinations). In any event, the latest indicators suggest that exports of travel services improved somewhat in the final stretch of 2018 and the start of 2019.

Other services remained quite dynamic. With a growth rate of 4.5%, as in 2017, the strong growth pattern recorded since 2008 has continued, encouraged by the combination of various structural factors, mostly shared with the other advanced economies. These include, in particular, technological progress in information and communications (which lowers the barriers to cross-border provision of services) and in the development of the services sector. At a domestic level, the competitiveness gains observed since the crisis and firms' search for new markets would also have played a part.[29]

Compared with the slowing export momentum, the growing external orientation of the productive system continued in 2018. Thus, the rate of growth of the number both of regular exporters (defined as those that have exported in at least four consecutive years) and total exporters was slightly higher than in 2017, although lower than in the previous years (see Chart 1.16). Stronger domestic demand, which may have lessened the incentive for firms to search for export growth, combined with the decline in the pace of cost competitiveness gains compared with the first stages of the present recovery, could have contributed to the easing of the rate of international growth of Spanish firms in the last two years. Moreover, the geographical diversification of regular exporters increased in 2018, thanks to the growth recorded in extra-EU markets.

The uncertainty surrounding Brexit appears to have had a limited impact to date on the bilateral trade flows between the United Kingdom and Spain. Since 2016, when the Brexit referendum was held, Spanish exports to the United Kingdom have levelled off, in nominal terms, in contrast to the strong growth observed in the four previous years. However, given that the pound has depreciated since the referendum, it is not easy to discern the source of this lower export momentum in nominal terms. It could be due to lower prices of exports in euro, with exporters keen to maintain their volumes, or to lower real volumes as a result of the higher price of exports in pounds, or even to the consequences of Brexit on firms' export decisions. In addition, in the second half of 2018, exports to the United Kingdom were affected by the idiosyncratic impact that the new regulations on contaminating emissions have had on auto manufacturing and sales, a sector that accounts for almost 20% of total nominal sales to the United Kingdom. Looking ahead, the potentially negative impact of Brexit on the Spanish business sector may be cushioned by the fact that, on average, the firms that trade with the United Kingdom have greater geographical diversification and higher efficiency levels.[30]

The rate of growth of imports also moderated quite sharply in 2018. Specifically, purchases from the rest of the world grew by 3.5%, 2.1 pp less than in 2017. The slowdown was concentrated on goods imports, which rose by 2.5%, 3.3 pp less

---

29 See Banco de España (2018a).

30 See Vega (2019).

Chart 1.17
IMPORTS ARE SLOWING, PARTLY AS A RESULT OF LOWER FINAL DEMAND MOMENTUM

The lower growth in final demand, owing to the loss of export momentum, gave rise to a lower rate of growth of purchases abroad. In any event, growth in imports was lower than their historical relationship with final demand would warrant.

1 IMPORTS AND FINAL DEMAND
  Rates of change
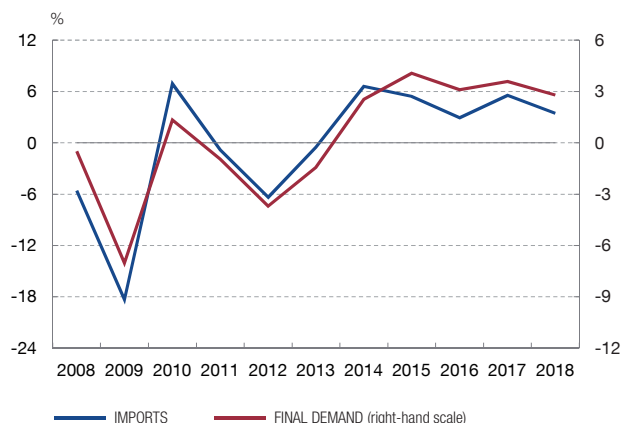
2 TOTAL IMPORTS: GROWTH AND CONTRIBUTIONS (a)

— IMPORTS — FINAL DEMAND (right-hand scale)

■ DOMESTIC DEMAND ■ PRICE COMPETITIVENESS
■ EXPORTS ■ RESIDUAL
— IMPORTS OF GOODS AND SERVICES (%)
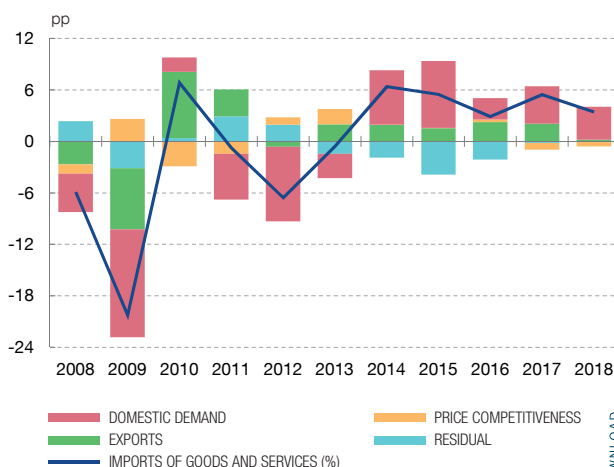
SOURCES: INE and Banco de España.

a Using the import equation of the Banco de España's satellite model for the foreign sector.

than in 2017. As has been the case throughout the recovery, imports grew at a slightly slower pace than their historical relationship with final demand would warrant (see Chart 1.17).[31] Also, given the growth in final demand, import growth was weaker than in 2017. This may possibly be explained by the loss of momentum in exports, not only because their import content is the highest among all demand components, but also because recently it has tended to increase.

As a result of the adverse performance of trade flows with the rest of the world and the deterioration of the terms of trade, the external surplus narrowed again in 2018. Specifically, the Spanish economy's net lending position stood at 1.5% of GDP, 0.7 pp less than in 2017 and which is, together with the 2014 figure, the lowest level in the present growth phase. This smaller trade surplus on the rest-of-the-world account, owing to the narrowing of the surplus in goods and services, is broadly consistent with the fact that final demand in Spain has continued to grow at a stronger pace than demand on Spain's export markets, and with the rise in oil prices in annual average terms.

Considering the different headings of the rest-of-the-world account, the widening of the energy goods deficit may be highlighted. A consequence of the

31 See Banco de España (2017c).

Chart 1.18
THE EXTERNAL SURPLUS IS NARROWING

The current account surplus narrowed in 2018 as a result of the adverse performance both of the energy goods balance and the non-energy goods and services balance. From agents' standpoint, the explanation lies in the deterioration of household and firm balances, offset in part by the improvement in the budget deficit.

1 CURRENT ACCOUNT BALANCE

% of GDP
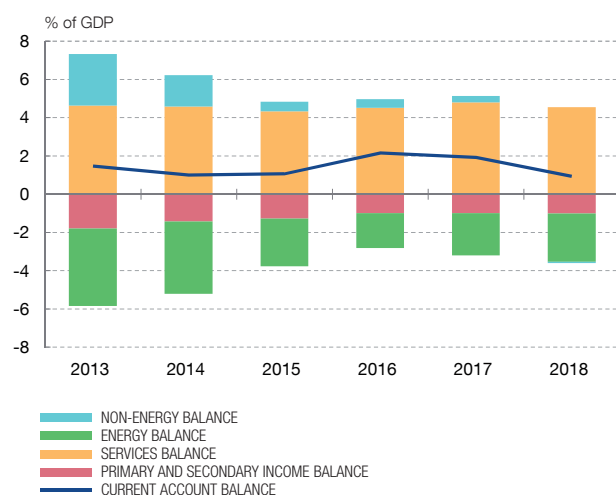
2 NET LENDING (+) / NET BORROWING (–) BY SECTOR

% of GDP

NON-ENERGY BALANCE
ENERGY BALANCE
SERVICES BALANCE
PRIMARY AND SECONDARY INCOME BALANCE
CURRENT ACCOUNT BALANCE

NON-FINANCIAL CORPORATIONS
GENERAL GOVERNMENT
TOTAL ECONOMY
FINANCIAL INSTITUTIONS
HOUSEHOLDS AND NPISHs
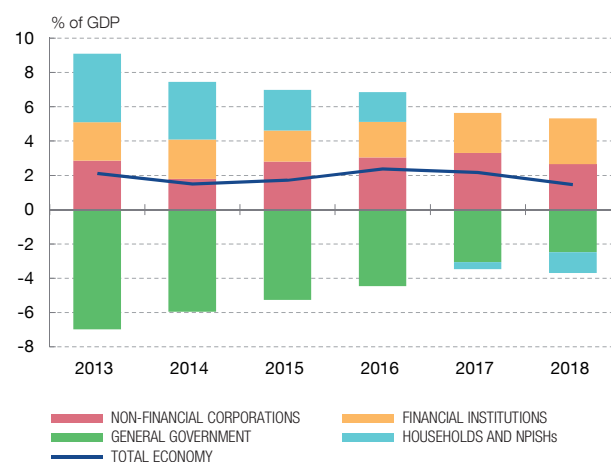
SOURCES: INE and Banco de España.

increase in oil prices, this explains almost 60% of the total narrowing of the external surplus since early 2017 (see Chart 1.18). Specifically, the Spanish economy's net energy bill rose by 0.3 pp of GDP in 2018 (and by 0.7 pp in the last two years). The rise in crude prices has meant that almost half of the deterioration observed is a result of trade with the OPEC countries, from which most oil purchases come. In any event, the energy deficit has tended to remain below the level observed in the years before the crisis, when oil prices were at similar levels to today, as a result of the improved energy efficiency of the Spanish economy.[32] In turn, the external trade balance on non-energy goods narrowed by 0.4 pp in 2018, becoming slightly negative. From a longer time standpoint, the overall balance on non-energy goods and services has held very steady since end-2015, narrowing by just 0.4 pp of GDP, despite strong economic growth in Spain.

The negative net international investment position (IIP) remains very high. Specifically, at end-2018 the negative net IIP stood at 77% of GDP (see Table 1.1), while gross external debt amounted to 167% of GDP. Even though the negative net IIP has decreased by 23 pp from the high recorded in 2014, it is still a source of vulnerability, which means that large external surpluses need to be maintained for a prolonged period. However, there are a series of circumstances that mitigate the

32   See Banco de España (2018ñ).

risks associated with this external debt position. First, portfolio and other investment – whose flows are more likely to experience sharp adjustments as a result of shifts in market sentiment – have decreased as a proportion of the net IIP from the peak of 45% in 2006 to 35% at end-2018, at the expense of an increase in the share of direct investment. Second, the breakdown of the IIP by institutional sector shows that the public sector, whose instruments entail lower rollover and liquidity risk and have longer maturities, makes up the majority share, whereas the resident private sector accounts for just 19% of the total. In any event, insofar as most of the economy's net external liabilities correspond to general government, it is essential to reinforce the sustainability of public finances, to reduce exposure to episodes of investor risk aversion and, therefore, the possibility of a reversal of external financing inflows.

The prospect of a sharp correction in Spain's high external debt has become somewhat less likely. The decline in the economy's net lending position, together with signs that the competitiveness gains observed since the start of the recovery may now be coming to an end, suggest that the rate of decline of the negative net IIP may be slightly lower in the future. From the standpoint of sales to the rest of the world, the external surplus should benefit, in the future, from the product angle, from growing exports by high technology content sectors. These contribute more value added and are competitive thanks not to labour costs but mainly to innovation and human capital and, from a geographical standpoint, from expansion into high-growth areas such as the Asian economies.

3.4   Inflationary pressures were again very modest over the past year.

The pattern of wage containment observed since 2014 eased in 2018. In the private sector compensation per employee rose 1%, 0.4 pp more than in 2017 and 0.9 pp above the average for the period 2014-2017 (see Chart 1.19). This upturn, slightly higher than that recorded for the economy as a whole, relied on the bigger wage increases agreed under collective bargaining which, as regards newly signed agreements, were influenced by the Employment and Collective Bargaining Agreement (AENC, by its Spanish abbreviation) for 2018-2020 entered into by the social agents in July 2018. Specifically, the wage increase recorded in the newly signed agreements was 2.1%, in line with the increases of around 2% per year, plus an additional variable component of up to 1%, which was promoted by the AENC. This rise in wage growth continued in the early months of 2019 with respect to the revised agreements, i.e. those signed in previous years, posting average increases of 2.2%. The information available about the newly signed agreements is still scarce.

Average compensation per employee continued to be curtailed by a negative wage drift. As in prior years, this is explained mainly by the negative composition effects resulting from the lower wage level of newly created jobs in comparison with

Chart 1.19

COMPENSATION PER EMPLOYEE AGAIN SHOWED MODEST GROWTH

Collectively agreed wages picked up moderately, but the contribution of wage drift to the growth of compensation per employee turned negative again, reflecting, among other factors, the lower pay levels of new employees. Measured in real terms, wages again declined in 2018.

1 COMPENSATION PER EMPLOYEE IN MARKET ECONOMY
  Growth and contribution of wage settlements, drift and social security contributions

2 REAL WAGES (a)
  Year-on-year rates of change

WAGE SETTLEMENTS   SOCIAL SECURITY CONTRIBUTIONS
DRIFT   COMPENSATION PER EMPLOYEE

TOTAL ECONOMY   MARKET ECONOMY
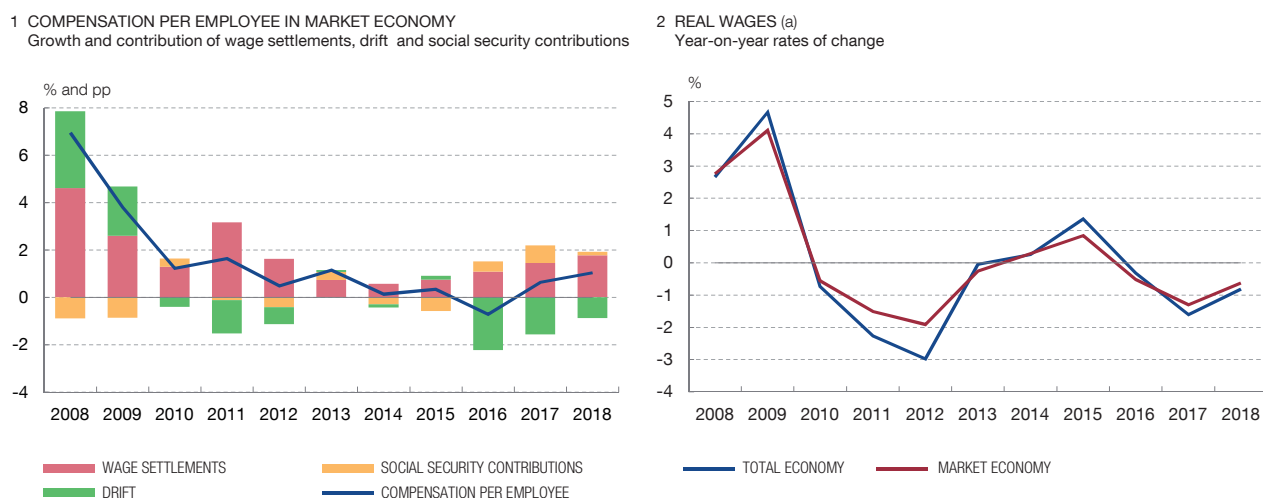
SOURCES: INE and Banco de España.

a The nominal wage is the compensation per employee in the QNA. The nominal wage deflator is the CPI.

those previously existing.[33] In any event, the magnitude of the drift decreased for the second year running and it is expected to continue on this path of moderation in the future.

Looking ahead, a more expansive performance of wages is expected to continue. The continuation of economic expansion is translating into a progressive recovery of employment and a gradual widening of the positive output gap which, together with the AENC's recommendations, favours the prospects of ongoing wage increases.

In early 2019 the national minimum wage was increased by 22.3% to €900 (in 14 monthly payments), a much higher percentage increase than any other ever approved previously. The measure will likely affect a much higher proportion of workers than on prior occasions precisely owing to the magnitude of the raise. Specifically, in 2018, 6% of employees received compensation equal to or lower than the national minimum wage in force since 1 January 2019, 22.4% in the case of new entrants in the labour market. This percentage is particularly high in certain population segments (particularly women, young adults, low-skilled workers and employees with a temporary contract). A simulation of the potential impact of this increase on

33   See Banco de España (2018e).

Chart 1.20
DOMESTIC AND EXTERNAL PRICES

The market economy value added deflator again rose slowly, showing a downward trend throughout the year due to the decline in the unit surplus, since ULCs accelerated. The growth of the final demand deflator moderated slightly over the year owing to the slowdown in both domestic and external prices (measured by the GDP and import deflators, respectively).

1 MARKET ECONOMY VALUE ADDED DEFLATOR
Contributions to year-on-year growth

UNIT GROSS OPERATING SURPLUS
UNIT LABOUR COSTS
VALUE ADDED DEFLATOR
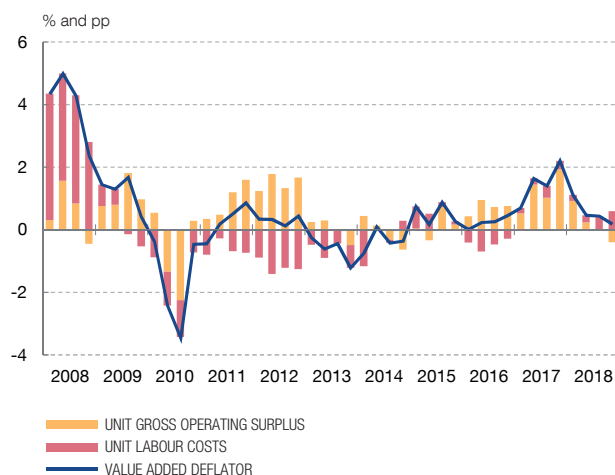
2 FINAL DEMAND DEFLATOR
Contributions to year-on-year growth

GDP   IMPORTS   FINAL DEMAND
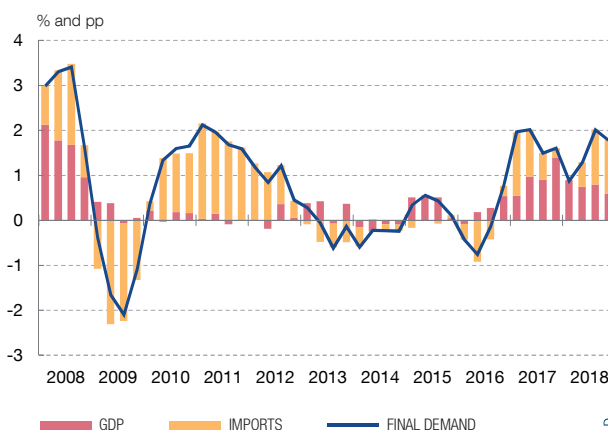
SOURCES: Eurostat, INE and Banco de España.

the national minimum wage using estimates based on the 8% increase in 2017 suggests that the negative effect on aggregate employment could clearly be higher than that observed on that occasion.[34] Therefore, the impact of the national minimum wage increase should be closely monitored in order to apply, if necessary, appropriate measures to enhance the employability of the workers affected.

Given the continuation of the low rate of increase in productivity, the higher wage increases recorded in 2018 translated into a progressive acceleration of unit labour costs (ULCs). Specifically, ULCs increased in the market economy by 0.6% on average in 2018, and by 1.1% in Q4, thus continuing the rising path of this variable since 2016 (see Chart 1.20). This trend will foreseeably become more pronounced in the future, in a setting of continued low increases in productivity and wage growth rebound.

Once again, domestic prices increased at moderate rates. Specifically, the value-added deflator in the market economy, which is a measure of domestic inflationary pressures, slowed by 1 pp to 0.5%. Their increase was therefore lower than that of ULCs, such that business mark-ups posted a small contraction, the

34   See Lacuesta, Izquierdo and Puente (2019).

Chart 1.21

CONSUMER PRICES FLUCTUATED STRONGLY, WHILE CORE INFLATION REMAINED LOW

The annual average rate of the HICP (1.7%) masks strong fluctuations due to oil price shifts. The deceleration in core inflation relative to 2017 was due to the behaviour of the services component, such that the differential with respect to the euro area was zero in annual average terms.

1 HICP. CONTRIBUTION TO YEAR-ON-YEAR RATE
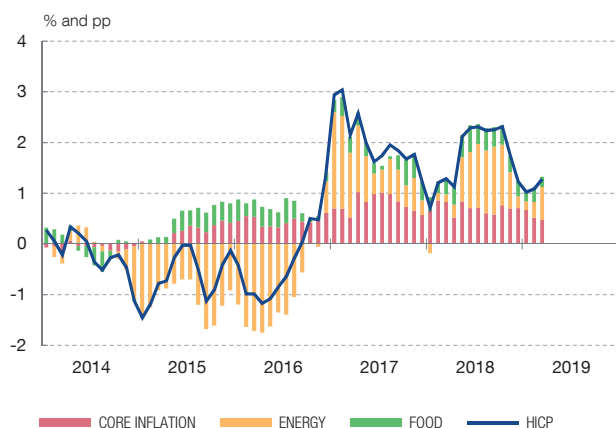
2 CORE INFLATION: SPAIN AND EURO AREA

CORE INFLATION   ENERGY   FOOD   HICP

DIFFERENTIAL   SPAIN   EURO AREA
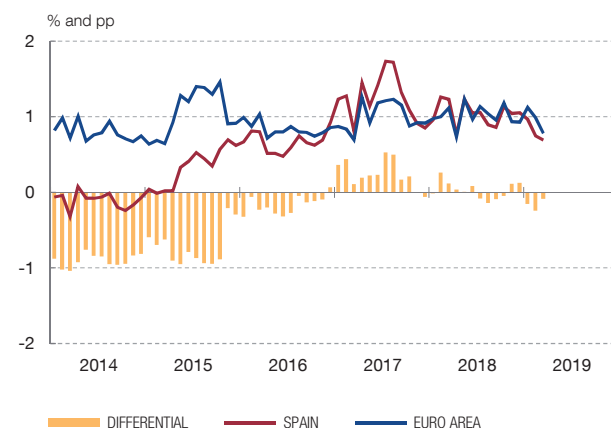
DOWNLOAD

SOURCES: European Commission, INE and Banco de España.

second largest since before the crisis.[35] For its part, the growth rate of the imports deflator was relatively high at 3.1%, very similar to that recorded in 2017 when, as in 2018, its performance was very conditioned by the severe increase in the euro price of oil (higher than 20% in each of these years in terms of annual average rates.

The final demand deflator and consumer prices recorded an acceleration over the course of 2018, which was corrected in the final stretch of the year. As a result of the changes in the external and internal components of the inflationary process, the final demand deflator increased by 1.5% in 2018, 0.3 pp less than in 2017 (see Chart 1.20). Consumer price growth, measured by the rate of change of the Harmonised Index of Consumer Prices (HICP) was, at 1.7%, very similar (and also 0.3 pp lower than in 2017) (see Chart 1.21). In any event, as in the two previous years, this annual average rate masks a trajectory marked by strong fluctuations which were mainly linked to the changes in oil prices. Thus, the slowing path which continued over the course of 2017 ended in January 2018 at a year-on-year low of 0.7%. From then on, the HICP posted increasing rates of growth during most of the past year, a trend which once again reversed from November, in line with the performance of its energy component. In March 2019 the HICP increased by 1.3%.

---

35   See Banco de España (2018e).

Core inflation remained low, at even slightly lower levels, on average, than those recorded in 2017. Despite the gradual widening of the positive output gap, which *a priori* should have prompted a heightening of domestic inflationary pressures, the rate of change of the underlying component – measured by the HICP excluding energy and fresh food – fluctuated around 1% during 2018, a figure slightly lower than that recorded in 2017, which on average stood at 1.2%. This slowdown was due to the behaviour of the services component, which grew 1.6%, 0.2 pp less than a year earlier. Given the high intensive use of the labour factor in this sector, this development contrasts with the rebound in ULCs. Non-energy industrial goods prices continued posting very modest growth (0.1%), as in 2017. Looking ahead, core inflation is expected to pick up, in line with the gradual widening of the positive output gap and the recent and forecast acceleration of ULCs. In any event, the prospects of an increase in inflation are subject to a high degree of uncertainty owing to the reasons set forth in detail in Chapter 2 of this report.

The inflation differential between Spain and the euro area, measured by the HICP, was zero in annual average terms. In 2017 the differential was 0.5 pp, mainly driven by the rise in the price of crude oil (with a greater impact on final fuel prices in Spain owing to the differences between the two areas in taxes on this product) and higher electricity prices. In 2018 the differential path was highly correlated with the changes in oil prices; it was negative at the start and end of the year and positive in Q2 and Q3. The annual average was zero both in the case of the rate of change of the overall indicator and in terms of core inflation (see Chart 1.21).

4 Some factors responsible for prolonging the current upturn

4.1 The key drivers of the recovery

Various processes set in motion in the first half of the present decade prompted the current recovery. First, the private sector has reduced its level of indebtedness significantly since 2010. As a result, the debt-to-GDP ratio of households and non-financial corporations had fallen by around 70 pp by the end of 2018, to stand somewhat below the euro area average, giving rise to a notable improvement in the financial position of these agents. Second, the Spanish banking system has undergone major restructuring. Capacity adjustment, along with reductions in non-performing assets, has had a positive impact on the capital ratios and income statements of credit institutions. Finally, although Spain's negative net international investment position remains high, it has been reduced by the external surpluses of the last six years, a notable development given the external deficits that have characterised previous cyclical upswings.

A set of policies adopted at both European and national level since the start of the current decade has reformed the institutional architecture of the euro area and driven the Spanish economic recovery. As regards the European institutional framework, the creation of the European Stability Mechanism (ESM), an instrument to resolve financial crises in the euro area, and the launch of the European Banking Union and the Single Supervisory Mechanism (SSM) and, subsequently, the Single Resolution Mechanism (SRM) were significant steps. The ECB also took relevant action to reduce segmentation in financial markets. At national level, the commencement of fiscal consolidation and the successive reforms to the pension system to ensure its long-term sustainability were notable. In the labour market, hiring was made more flexible and measures were introduced to foster the adjustment of working conditions to employers' circumstances, which helped improve their competitiveness and assisted the recovery in employment.

In addition to these factors, demand policies and certain factors of a more temporary nature, the so-called tailwinds, increased the strength of the recovery. As regards demand policies, the ECB has since 2012 deployed a broad set of standard and non-standard instruments in order to make its monetary policy stance highly expansionary. Turning to fiscal policy, from 2015 it ceased to be contractionary, so that the deficit reductions since then have basically reflected the cyclical improvement in the economy and the reduction in interest expenditure. The fall in oil prices in 2014-2015 and the favourable developments in external markets in 2017 were important additional external stimuli during the recovery.[36]

Together, these factors have enabled the Spanish economy to grow in 2018 for the fifth consecutive year at above its potential rate. Activity, as measured by real GDP, now exceeds its pre-crisis peak (of 2007) by 4.3% and the process of convergence with average euro area per capita income levels has been resumed. However, despite strong job creation since 2014, the level of employment is still 1.4 million lower than in 2008 and the unemployment rate remains very high.

During the recovery, the foundations have been laid for more balanced growth, with the consequent improvement in resilience to future shocks. The combination of all the above-mentioned factors facilitated the recovery in the confidence of economic agents in the euro area as a whole and, in particular, in Spain, which suffered a more severe recession than on average in the main euro area economies. Since 2013, aggregate demand has grown at a higher rate in these other countries and the high unemployment rate has been reduced very significantly. Moreover, the productive structure has undergone a notable transformation, with a significant increase in the weight of exports and equipment investment in GDP and a reduction in that of construction (see Chart 1.22).

---

36 For a quantification of the tailwinds in 2014-2016 see Banco de España (2017a).

Chart 1.22

THE SPANISH ECONOMY HAS LAID THE FOUNDATIONS FOR MORE BALANCED GROWTH

The high unemployment rate is decreasing significantly, the weight of exports in GDP has risen by more than 10 pp since the crisis, investment in capital goods has recovered more strongly than in the euro area as a whole, and the weight of investment in construction is in line with that of the other EU countries.

1 UNEMPLOYMENT RATE
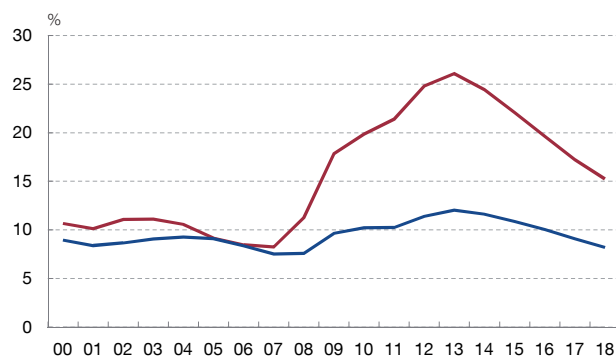
2 EXPORTS OF GOODS AND SERVICES
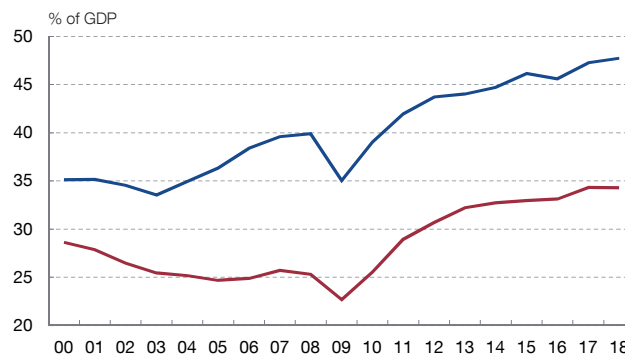
3 GROSS FIXED CAPITAL FORMATION IN CAPITAL GOODS
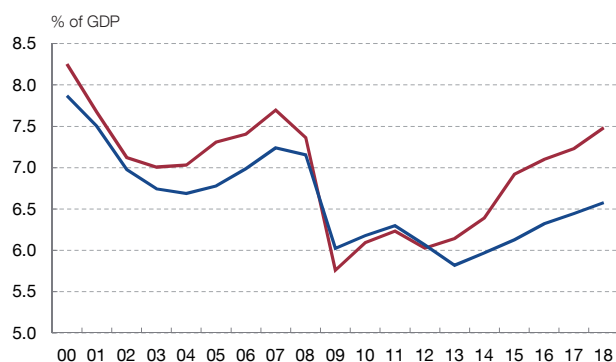
4 GROSS FIXED CAPITAL FORMATION IN CONSTRUCTION

—— SPAIN   —— EURO AREA

DOWNLOAD
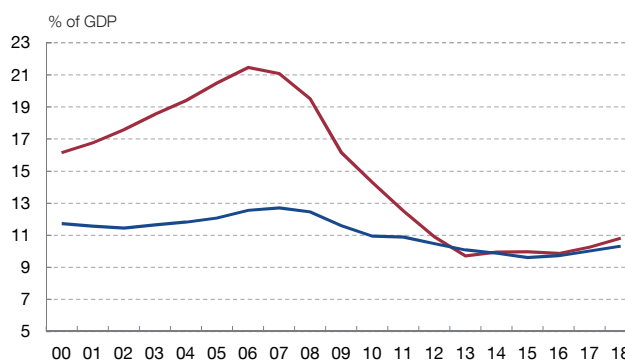
SOURCES: Eurostat, INE and Banco de España.

However, the deterioration in the external environment during 2018 and at the beginning of 2019 is having a negative effect on the pace and, above all, the composition of aggregate demand. As seen in Section 2, global trade and activity weakened last year, while in the euro area various idiosyncratic shocks have affected certain sectors and countries and had a negative impact on the confidence of agents. In Spain, as seen in section 3, the slowdown in trade, the appreciation of the exchange rate and the reduced strength of tourism flows led to a reduction in the current account surplus.

Also, there are certain external sources of uncertainty which suggest that the scenario of ongoing recovery is subject to downside risks. The projections

made by the Banco de España in March considered the recent slowdown in the euro area to be a temporary phenomenon that would be reversed in the second half of the year.[37] However, the recent slowdown may be more persistent.[38] Moreover, the lack of details regarding the conditions of the United Kingdom's departure from the EU, the possible adoption of new protectionist measures at global level or a possible misstep by the Chinese authorities in the process of correcting the Chinese economy's indebtedness could give rise to unfavourable developments.

On the domestic front, the need for structural reforms to help increase the economy's potential growth persists. The last five years have been characterised by the practical absence of significant measures to take over the burden from the expansionary demand policies of recent years. Also, the application of the main elements of the 2013 public pension system reform designed to shore up its sustainability was suspended in 2018, without, to date, any alternative mechanisms having been put in place to do this.

The achievement of more sustainable and balanced growth must be a priority economic policy objective. At European level, it is necessary to press ahead with the creation of common instruments to strengthen the resilience of the euro area as a whole to future shocks. Domestically, in the currently more uncertain environment and, given the tailing-off of the stimulus provided by demand policies and other temporary factors, greater emphasis should be placed on the application of policies designed to lay the foundations for more sustainable and balanced growth (see Figure 1.1). The following sections address some key domestic and European policies that could contribute to this objective.

4.2 Towards a more sustainable and balanced recovery

4.2.1 Employment quality, wage inequality and housing

Since the start of the recovery employment growth has been very strong and has generated 2.5 million jobs, in net terms. These developments reflect a fall in the rate of job destruction, following its sharp increase during the crisis, and a gradual recovery in the rate of job creation. During this period, job creation has generally been more buoyant in services, as in the last upturn, particularly in activities relating to hotels and restaurants, transport and property. Also, although the level of employment in construction is still well below its pre-2008 level, it has recovered strongly since 2014. Thus, there do not appear to be significant sectoral composition

---

37 See Banco de España (2019a).

38 in this respect, the latest data as of the cut-off date of this report seem to give some support to the view that the slowdown is temporary in nature.

Figure 1.1

ECONOMIC POLICIES TO PROLONG THE CURRENT GROWTH PHASE OF THE SPANISH ECONOMY

AIM: TO REDUCE VULNERABILITIES, TO INCREASE ROOM FOR MANOEUVRE
IN THE FACE OF HYPOTHETICAL FUTURE SHOCKS

Increase in global risk

— Threat of new protectionist measures
— Effects of Brexit
— Difficulties to redirect high debt levels in some countries
   (China, some emerging market countries)

Vulnerabilities

— Public debt verging on 100% of GDP
— High external debt

To reduce risks: policies that reduce vulnerabilities

• Spain:
   — Need for reforms to boost potential growth (maintaining the existing reforms)
   — Correction of fiscal imbalance

• Euro area: deepening of institutional architecture to permit risk-sharing and risk-mitigation

POLICIES FOR A MORE SUSTAINABLE AND BALANCED RECOVERY

Recovery to benefit society as a whole

— More and better quality employment (reducing
   temporary and involuntary part-time employment)
— Measures encouraging the supply of rental housing

Sustainability of public finances

— Medium-term fiscal consolidation programme
— In-depth review of composition of public revenue
   and expenditure

Addressing population ageing

Measures should be aimed at:
— Guaranteeing sustainability of public pension system
— Preserving intergenerational equity (which requires
   careful design in terms of revenue and expenditure)

Productivity growth

— Correction of educational system shortcomings
— Generation and dissemination of technological
   advances
— Review of regulations that curb competition

Challenges facing banking sector

— Improve asset quality and return on equity
— Strengthen capital levels
— Adaptation to technological changes

Institutional consolidation of euro area

— Complete Banking Union
— Create a risk-sharing budgetary instrument
— Provide a pan-European safe asset

SOURCE: Banco de España.

effects that would explain the low productivity growth, similar to that observed in the last upturn (see Box 1.3).

Job creation during the recovery has taken place against a background of wage moderation. The growth of compensation per employee in the market economy, in nominal terms, has been very low since 2013. During the initial phases of the recovery, wages were flat, while, in recent years, it has been possible to observe a rising trend, to 0.6% and 1% in 2017 and 2018 respectively. Moderate wage growth over the period considered as a whole can be explained by the high level of unemployment and the general under-use of labour (when broader indicators of cyclical labour market slack are taken into account), the low level of inflation and meagre productivity growth.[39] As a result, in real terms, wages fell by 0.8 pp in 2018 (see Chart 1.19).

Wage formation patterns during the current upswing have been comparable to those in previous cyclical growth phases. The measures included in the 2012 labour reform expanded the set of firm-level instruments available to employers to adjust wages and other employment conditions. Thus, in 2012 and 2013 there was a larger than expected downward wage adjustment, as firms in difficulty made extensive use of the various approved flexibility measures, including unilateral changes in employment conditions. This was conducive to an increase in the sensitivity of wages to economic conditions.[40] During the recovery, however, wage formation patterns remain in line with those in previous cycles. In particular, although there is a high degree of dispersion in productivity across firms and sectors, the level of heterogeneity in wage developments is low, indicating the lack of decentralisation in collective bargaining, despite the regulatory changes made (see Chart 1.23).

Among the structural deficiencies of the Spanish labour market the high level of unemployment and, in particular, of long-term unemployment continue to be notable. Robust job creation has reduced the unemployment rate by some 12 pp from its all-time high at the beginning of 2013, to 14.7% of the labour force in 2019 Q1 (see Chart 1.10). Unemployment is especially severe among the youngest workers (with a rate of over 25% for the under 30s) and among those with the lowest level of educational attainment (28%). Along with the over-55s, these are the groups of the population in which long-term unemployment is largely concentrated. The decline in the general level of unemployment since the beginning of the recovery has not prevented a situation in which 45% of the unemployed have currently been searching for a job for more than a year and 31% for more than two years.

---

39 See Cuadrado and Tagliati (2018) and Chapter 2 of this Report.
40 See Font, Izquierdo and Puente (2015).

Chart 1.23
THE STRUCTURAL WEAKNESSES OF THE LABOUR MARKET PERSIST

The dispersion of wage settlements per economic sector is much lower than that of productivity. The mismatch between the skills of unemployed persons and those required by firms remains very high.

1 DISPERSION OF WAGES AND PRODUCTIVITY GROWTH BY ECONOMIC SECTOR (a)

2 MISMATCH INDEX

WAGE SETTLEMENTS   LABOUR PRODUCTIVITY

UNIVERSITY
VOCATIONAL TRAINING
SPANISH BACCALAUREATE
SECONDARY EDUCATION
NO SCHOOLING, PRIMARY EDUCATION, INCOMPLETE LOWER SECONDARY EDUCATION
TOTAL

DOWNLOAD
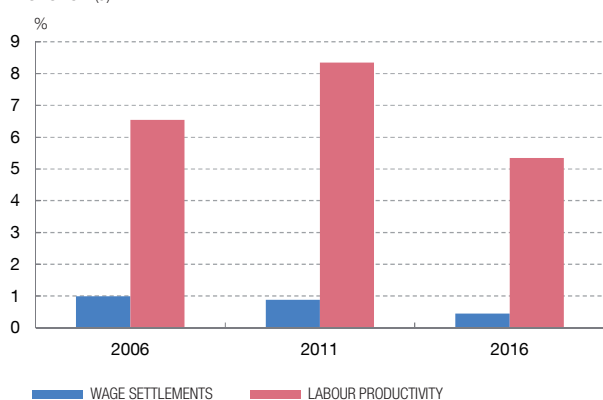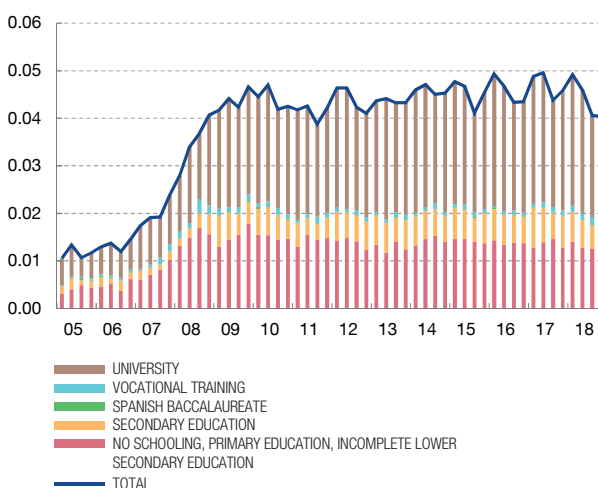
SOURCES: Eurostat and Banco de España.

a Standard deviation of the annual growth rates of each variable. NACE Rev. 2 two-digit sectors.

The excessive use of temporary hiring is another serious dysfunctionality of the Spanish labour market. In 2018, more than 22 million contracts were signed, of which almost 90% were temporary. The proportion of temporary employment at the end of 2018 (26.9%), is below the level observed in the last upturn (32.6% on average between 2002 and 2007), especially in the private sector, but already stands almost 5 pp above the cyclical trough of 2013. This increase reflects patterns of hiring and dismissal that have hardly changed from those seen in the last cycle, insofar as new hires and dismissals are basically concentrated in the group of workers with temporary contracts.[41] That said, it should be mentioned that the latest developments in this area are relatively positive, since the temporary employment ratio fell slightly in the private sector in 2018 and the increase that year was exclusively due to its rise in the public sector. At the same time, there has been some pick-up in flows from temporary to permanent employment. The reduction in the temporary employment ratio in Spain to levels comparable to those in other European countries would require new regulatory measures to increase the attractiveness to employers of permanent hiring, while providing the necessary flexibility to adjust labour costs in the event of negative shocks and thus avoid excessive job destruction in recessions (see Box 1.3).

41   See Banco de España (2019d).

The employment growth in recent years has reduced indicators of wage income inequality, although levels of disparity in total income are still at relatively high levels. In the period 2014-2017, inequality in terms of labour income decreased significantly. This is because the increase in this type of income was higher for low-wage groups, which is in turn the result of a relative increase in the number of hours actually worked by these agents, since there have been hardly any changes in hourly wages. However, new temporary contracts continue to have a very short duration and involuntary part-time working remains at high levels (specifically 54% of all employees working part-time on average in 2018, down 9 pp from its high in 2014, but still well above its level in 2007, of 32.3%). In terms of total income, developments have been less favourable, given the persistence of unemployment (which is naturally concentrated in the lower part of the household income distribution) and the fall in the coverage rate of total benefits (contributory, non-contributory, re-insertion income, etc.), to 58% of all the unemployed (as against 80% in 2010). In addition, despite the recent increase in pensions, the notable recovery in income from (financial and non-financial) assets, which largely affects the medium-high part of the income distribution, has tended to increase the disparity between the incomes of agents whose income arises from other non-wage income during the recovery. As a result, on data to 2017, the diverging trend in wage and non-wage income in recent years has meant that the inequality of total income per capita barely changed during the initial phases of the economic recovery see Box 1.4).

To reduce the rate of unemployment and per-capita income inequalities, it is crucial to improve the employability of the most disadvantaged groups. Among those who have not completed compulsory secondary education, the probability of being unemployed has fallen by 4.5 pp over the last four years. The reduction has been somewhat greater (7 pp) among those who did complete their compulsory education. Even so, the mismatch between the skills of the unemployed and those required by employers (approximated by the skills of employed persons) is at very similar levels to those reached during the crisis (see right-hand panel of Chart 1.23). In this respect, improving the human capital of unemployed persons with the lowest level of educational attainment is key to facilitating their reinsertion into the labour market. For this purpose, it would be desirable to maintain training contracts, with the greatest possible flexibility for young people and employers, and to assign funds to redesigning vocational training, as regards the combination of general training and work experience in industry, in order to facilitate the transition from education to the labour market. Finally, it is important to direct hiring incentives towards older job-seekers and those with low educational attainment, and to continuously evaluate their effectiveness so that their least satisfactory aspects can be redesigned.

Conditions of access to the housing market have tightened somewhat recently, particularly in the rental market. Also, access to housing is constrained to a greater extent by excessive labour market turnover and unemployment, which affect

Chart 1.24

THE LABOUR PROBLEMS OF CERTAIN GROUPS ARE AGGRAVATED BY HOUSING AFFORDABILITY

New rental contract prices have risen unevenly across municipalities in the recent expansion (in some places by more than 50%). Behind these developments lies an increase in the relative rental demand which could not be satisfied by changes in supply. Those most affected are young people, the less qualified groups and foreign nationals living in the cities with the fastest growing populations.

1 PRICE OF RENTAL HOUSING (a)
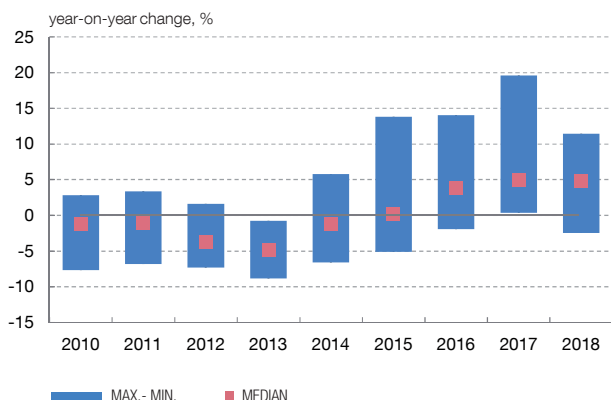
2 PERCENTAGE OF HOUSEHOLDS RENTING, BY AGE
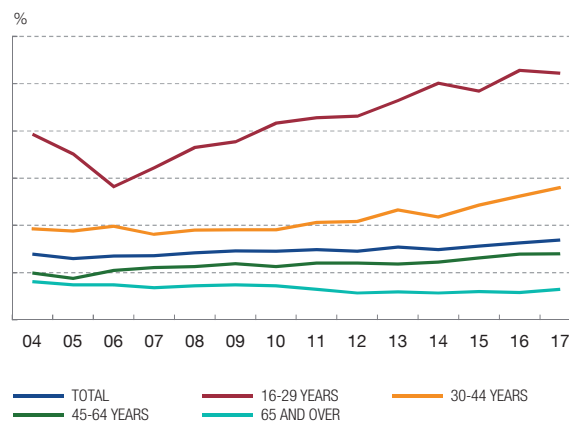
SOURCES: INE (Survey of Income and Living Conditions), Idealista and Banco de España.

a Year-on-year change in price per square metre in December.

some groups of workers, such as the young, more than others. In 2014 (the latest available data), the median expenditure on rent as a proportion of the income of renting households in the lowest income decile was over 50%. Since that year, the increase in rents has been large, although this is not reflected in the growth of the consumer price index (CPI) for rents, the moderate growth of which (average annual rate of 2.2%) is explained by the fact that this index does not include information on additions to the stock of rented housing. Other statistical sources, with greater coverage of newly signed agreements, have recorded substantially higher growth, albeit with a high level of heterogeneity at the local level (see Chart 1.24). For example, according to the property portal with the greatest national coverage, the prices at which properties are offered for rental display a very geographically uneven pattern, growth since 2014 having been especially high in Barcelona and in Madrid (38% and 42% respectively).[42] These developments are relevant when analysing the difficulty certain groups have accessing housing and the delay in the age at which young people leave the family home (see Chart 1.24).[43]

In this context, priority should be given to those public policies that aim to boost the supply of rented housing. In this respect, it would not seem to be

42   See Alves and Urtasun (2>019)

43   Se Barceló and Villanueva (2018)

appropriate to limit the price of rented housing. According to international evidence, rent restrictions not only reduce supply, but also may lead to a significant deterioration in rented properties. Likewise, it would be desirable to improve legal certainty so that property owners have appropriate incentives to offer their properties on the rental market.[44]

4.2.2   Public finances: the fiscal consolidation required and the challenges posed by population ageing

No significant progress has been made in reducing the structural public deficit since 2015. The general government deficit stood at 2.5% of GDP in 2018, below the limit of 3% of GDP, which would appear to confirm a scenario of exit from the excessive deficit procedure (EDP) that general government has been subject to since 2009, within the framework of the corrective arm of the EU's Stability and Growth Pact (SGP). That said, the structural deficit, according to Banco de España estimates, was at a similar level to recent years, which indicates that practically the whole of the reduction in the budget deficit during the recovery has been due to the effect of the business cycle and the reduction in the interest burden; the average cost of public debt stood at an all-time low of 2.5% in 2018 (see Chart 1.25). Likewise, although the government debt ratio remained on a path of gradual decline in 2018, reaching 97.1% of GDP, this reduction was basically due to the economy's favourable nominal growth performance. Moreover, the government debt ratio remains close to its all-time high and well above 60%, the reference value in the current framework of European fiscal rules and in the Organic Law on Budgetary Stability and Financial Sustainability (see panel 2 of Chart 1.25).

If the EU Council confirms, as it is expected to in July, that the situation of excessive deficit has been corrected, then Spain would automatically move to the so-called "preventive arm" of the SGP. In this new situation, Spain would remain subject to a set of rules restricting its fiscal policy action. First, the structural government deficit would have to be reduced in general terms by 0.5 pp of GDP each year until the medium-term objective of structural balance is achieved.[45] Second, the public debt-to-GDP ratio, while above the objective of 60%, would have to be reduced annually by 5% of the excess over 60%, which would involve on average a reduction of 1.5 pp of GDP each year for the next decade. Finally the annual growth rate of general government expenditure would have to be less than or equal to the economy's medium-term potential growth rate. According to the

---

44 See López and Matea (2019). (Forthcoming)

45 The requirement to reduce the structural deficit by 0.5 pp is a general reference, which in practice varies for each country according to whether it has achieved its medium-term objective, whether the debt ratio exceeds 60% of GDP and the size of the output gap.

Chart 1.25

IT IS URGENT TO ENSURE THAT THE PUBLIC FINANCES ARE SUSTAINABLE

It is necessary to correct the high government deficit, the structural deficit and the government debt ratio above the reference value of 60%. In addition, the Social Security System has posted significant deficits since 2011 and its revenues and expenses have to be reformed to address the progressive population ageing.

1 GENERAL GOVERNMENT STRUCTURAL BALANCE
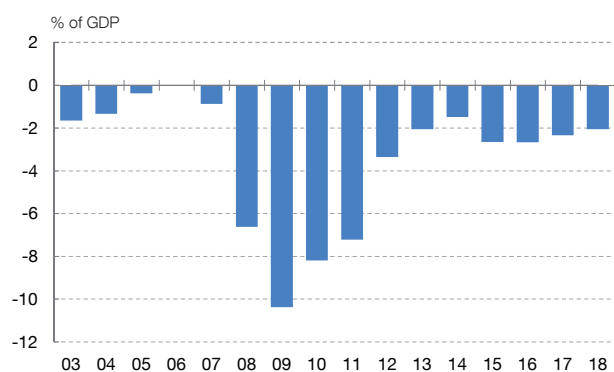
2 SIMULATED PATHS OF GOVERNMENT DEBT UNDER A SCENARIO OF CONVERGENCE WITH THE MEDIUM-TERM STRUCTURAL BALANCE

POTENTIAL GROWTH = 1.5%, AND FISCAL ADJUSTMENT 0.65% PER YEAR
POTENTIAL GROWTH = 2.5%, AND FISCAL ADJUSTMENT 0.65% PER YEAR
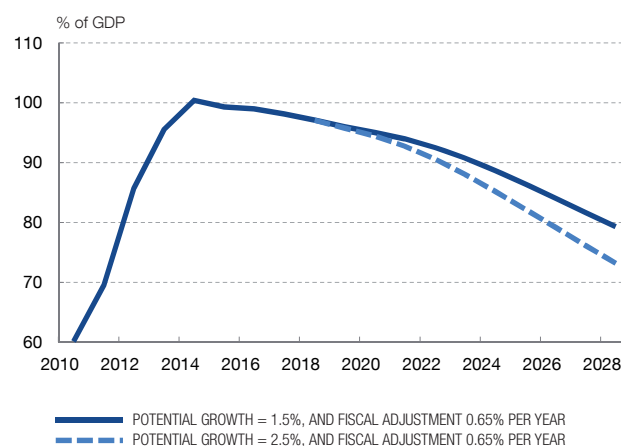
3 SOCIAL SECURITY NON-FINANCIAL BALANCE
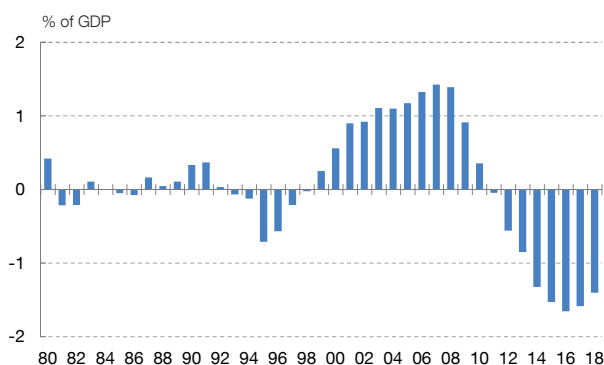
4 DEPENDENCY RATIO

AIReF   EUROSTAT   UN   INE
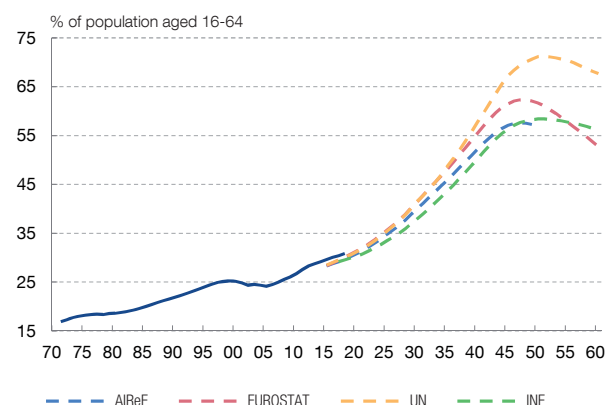
SOURCES: Autoridad Independiente de Responsabilidad Fiscal, Eurostat, United Nations, INE, Social Security system and Banco de España. The chart on debt simulation was prepared using the model described in P. Hernández de Cos, D. López Rodríguez and J. J. Pérez (2018), *The challenges of public deleveraging,* Occasional Paper 1803, Banco de España.

a Scenario of maximum annual fiscal effort (change in structural balance) of 0.65 pp per year, until the medium-term target has been achieved (structural balance = 0).

DOWNLOAD

European Commission, this set of rules would entail a requirement for 2019 of a reduction in the structural government deficit of 0.65 pp of GDP.[46]

Consequently, foreseeable application of the preventive arm of the SGP will require a considerable fiscal effort in the coming years. To assess the impact of

46   See Commission Opinion of 21.11.2018 on the Draft Budgetary Plan of Spain.

these requirements, Chart 1.25 shows various hypothetical scenarios illustrating the effect of compliance with these rules on the public debt-to-GDP ratio over the next decade, obtained from a model simulating the dynamics of this variable.[47] Specifically, achieving this target would require an average primary surplus of 1.5% of GDP, as against the primary balance of 2018, which would reduce public debt to slightly below 80% of GDP in 2028. GDP growth 1 pp higher, on average, than in this scenario would, keeping the rest of the assumptions unchanged, result in a public debt-to-GDP ratio of less than 75% by 2028.

In the context described, a medium-term programme for the correction of fiscal imbalances needs to be designed. A lasting reduction in the structural public deficit and general government debt would help to provide scope for fiscal policy to react to the consequences of a possible slowdown in activity and limit the impact of a hypothetical rise in the cost of financing for public and private agents. Such a strategy should be based on a detailed definition of budgetary targets and of the time frames and measures needed to achieve them, as well as a prudent projection of macroeconomic developments and a rigorous plan for early response in the event of deviations from target. In this respect, on 30 April, the government presented the Stability Programme Update for the period 2019-22. Given the national elections at the time, this update was based on the assumption that economic policies would remain unchanged. However, the caretaker government indicated some of the actions it planned to take in relation to taxation and pension spending in the next few years.

A review of the composition of government spending and revenue, in parallel with the necessary reduction in public debt, could contribute to economic growth. The process of reducing fiscal imbalances should be compatible with an improvement in the quality of public finances. In this respect, the composition of the revenue and expenditure adjustment is very important to minimise the adverse effects of fiscal consolidation on economic growth. A prerequisite for such an improvement is an in-depth analysis of the structure of general government spending and revenue. On the expenditure side, there seems to be scope for further efficiency gains and for a shift in composition towards items that have a greater impact on the accumulation of physical, technological and human capital. The results of the public spending review currently under way may be fundamental for progress in this regard.[48] On the revenue side, there is also scope to redefine the structure of the

---

47 See P. Hernández de Cos, D. López-Rodríguez and J. J. Pérez (2018), The challenges of public deleveraging, Occasional Papers,1803, Banco de España. The model takes the observed level of public debt and the structural government deficit estimated by the European Commission for 2018 as given and assumes average nominal economic growth over the next decade of 3% and implicit interest rates on public debt of 2.5%.

48 On 2 June 2017 the Council of Ministers requested the Independent Authority for Fiscal Responsibility (AIReF) to carry out a review of public spending, starting with a review of spending on subsidies, the results of which are to be published shortly.

basket of taxes in order to make it more favourable to potential growth.[49] In this context, an important aspect that could be reconsidered is the current high level of fiscal benefits, arising from the presence of numerous exemptions, deductions and special reduced rates which generate significant revenue losses and distort the efficiency and equity of the tax system.[50]

A review of regional government financing arrangements is also a priority. In such a decentralised administrative structure as exists in Spain, the involvement of regional and local government in the budget consolidation effort is essential. In this respect, there is broad consensus on the need for reform of the financing arrangements for these tiers of government, in order to adjust revenue, on the basis of an objective estimate of needs, to ensure that the distribution of resources is transparent and to increase the degree of joint fiscal responsibility.[51]

The high level of public debt raises some significant challenges. Empirical evidence shows that maintaining a very high level of public debt over a prolonged period can have a negative impact on economic growth. Also, a high level of debt reduces the stabilising capacity of fiscal policy in adverse situations and requires primary surpluses over lengthy periods, which may in turn require higher levels of distortionary taxation or lower levels of productive expenditure. At the same time, a high level of debt increases the vulnerability of the public finances to changes in investor sentiment on the financial markets, given the need to regularly roll over a large volume of maturities. Thus, for example, general government as a whole issued a total of €212 billion (17.5% of GDP) of debt in 2018.

Population ageing will have a very pronounced effect on public finances. The importance of the reduction in budgetary imbalances and public debt is all the greater when the long-term challenge of population ageing is taken into account. The latest estimates anticipate a significant increase in public spending on pensions, health and long-term care arising from the substantial increase in the dependency ratio (see Chapter 4), which even in the most optimistic demographic projections would rise from the current level of 25% to more than 50% by the middle of the century (see Chart 1.25).

To guarantee the sustainability of the public pension system, significant measures are required that will foreseeably affect both revenue and expenditure. As seen in Chapter 4 of this report, demographic trends pose significant challenges for the sustainability of the welfare state. In the case of the

---

49 For an in-depth discussion of the Spanish tax system see López-Rodríguez and García Ciria (2018).

50 On 14 December 2018 the Council of Ministers requested the AIReF to carry out the second phase of the public spending review, focusing on fiscal benefits and spending on hospitals.

51 See Ministerio de Hacienda y Función Pública (2017).

pension system, the 2011 and 2013 reforms included certain adjustments to significantly counteract the effect of the expected increase in the dependency ratio in the long term.[52] However, the latest measures in this area have partially suspended the application of these mechanisms, by postponing the application of the sustainability factor until 2023 and returning to a system of annual pension increases in line with the CPI. The reintroduction of this indexation system on a permanent basis would generate, according to the Banco de España's calculations, a further increase in spending of more than 3 pp of GDP in 2050.[53] Against this background, ensuring the financial sustainability of the public pension system will require additional measures on both the revenue and expenditure side, as well as the introduction of new incentives to favour greater alignment between the effective retirement age and the legal reference.

Population ageing will also put to the test intergenerational equity and the intertemporal sustainability of total public revenue and expenditure. As also explained in Chapter 4 of this report, population ageing raises a number of additional challenges for fiscal policy that must be taken into account within the framework of the above-mentioned strategy to improve the quality of public finances. As regards public spending, societies with older populations require greater social expenditure (for example, on health and pensions) directed at the eldest population groups. This increase in ageing-related expenditure may be at the expense of the expenditure needed to boost the economy's future dynamism, such as that on education or infrastructure investment. On the revenue side, in the absence of changes to the current design of the main taxes, population ageing leads to lower receipts from social contributions (given the lower weight of wage-earners) and a certain loss of progressivity and of revenue-raising capacity for the personal income tax, given the lower effective rates paid by older taxpayers. Moreover, the latter have a higher proportion of unearned income, which is taxed at lower rates than employment income. In addition, it should be noted that indirect tax receipts may also be reduced, insofar as the elderly tend to consume goods and services typically taxed at lower effective rates. Finally, the greater expenditure associated with ageing, especially when financed through borrowing, may lead to an increase in the taxation of younger generations, raising important issues of intergenerational equity.

4.2.3 Productivity: the key to a sustainable increase in well-being

Throughout the current recovery phase, competitiveness gains have arisen mainly from adjustments in labour costs, while genuine productivity gains

---

52 Véase Hernández de Cos, Jimeno y Ramos (2017).

53 Véase Banco de España (2018o).

Chart 1.26
MORE BALANCED RECOVERY, BASED ON PRODUCTIVITY IMPROVEMENTS

In the recovery, total factor productivity grew by 0.4% in annual average terms (2013-2018),and, as a result, the productivity differential with respect to the euro area widened, albeit more slowly than in the previous expansion. Factors of production were reallocated to more productive projects, which is consistent with the higher weight of total investment accounted for by investment in capital goods and intangibles.

1 TOTAL FACTOR PRODUCTIVITY

2001 = 100

— SPAIN — EURO AREA
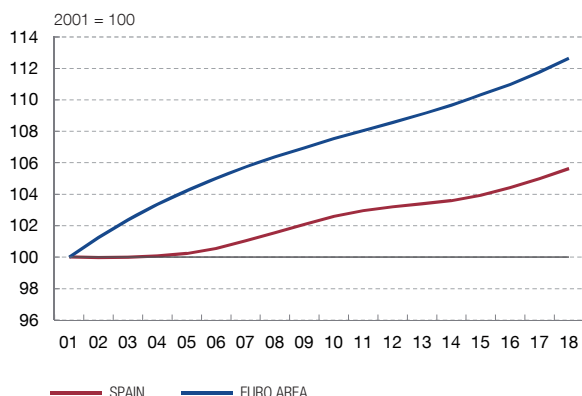
2 STRUCTURE OF GROSS FIXED CAPITAL FORMATION

%

OTHER BUILDINGS AND CONSTRUCTIONS
HOUSING
INVESTMENT (EXCLUDING CONSTRUCTION)

DOWNLOAD
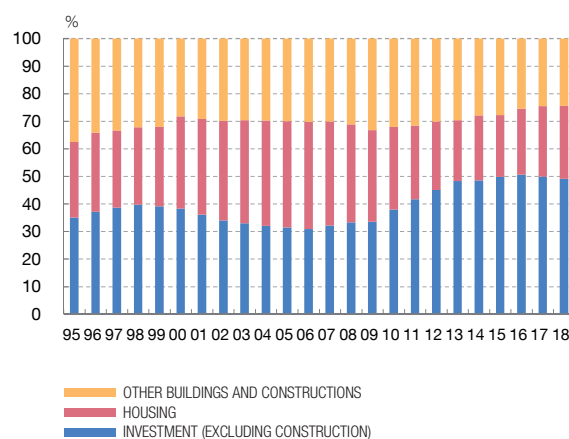
SOURCE: INE, European Commission and Banco de España.

have been more modest. Competitiveness lost relative to the other euro area countries in the previous expansionary phase (measured through relative unit labour costs) was restored, in the initial stages of the crisis, through severe job destruction, but in subsequent stages through wage moderation. Accordingly, although some progress has been observed in total factor productivity (TFP) since the onset of the crisis, there is still no well-established growth model fostering activities with high productivity levels and high value-added. Thus, on European Commission figures, TFP rose by 0.4% in Spain in annual average terms between 2013 and 2018, compared with growth of 0.6% in the euro area. In consequence, the productivity gap in terms of TFP between Spain and the rest of the euro area countries, observed since the launch of the single currency, has continued to widen, albeit at a slower pace (see Chart 1.26).

The modest productivity growth in recent years stems mainly from a shift in investment towards business projects with higher technology content. The low productivity momentum in aggregate terms that characterised the Spanish economy from when it joined the euro area up to the start of the crisis was essentially the result of a composition effect, with the allocation of resources biased, especially in the case of investment, towards projects with low productivity levels. In the most recent period, the firms that have used the largest share of the resources available in the economy are those with higher productivity levels, so the above-mentioned

composition effect would now be working in favour of higher aggregate productivity.[54] Indeed, since 2013 investment in capital goods and intangible assets has grown as a proportion of total investment (by more than 4 pp), to the detriment of investment in real estate assets (see Chart 1.26).

Part of that positive reallocation of factors stems from the destruction of firms with low productivity levels. According to the Central Companies Directory (DIRCE), fewer new firms have been created during the recovery than during the earlier growth phase, while the number of firms destroyed remains high, reflecting the disappearance of firms with low productivity levels. Since the crisis, the number of firms in the industry and construction sectors has decreased; this has been partially offset by the increase in the number of firms created in the services sector. In any event, this less dynamic business environment in net terms, which is not unique to Spain but is also observed in other developed economies, could be associated with an increase in the market power of certain companies in some sectors.

There continues to be no significant surge in the average productivity of Spanish firms. Specifically, this variable is 10% to 40% lower than the average productivity of European firms, with a wider gap among smaller firms (see Chart 1.27). In addition, the differences –which are especially notable in the services sector – remain even taking into account the sectoral composition of the Spanish economy.[55]

As a result of the improvement in human capital in the Spanish economy the gap with the rest of Europe has narrowed, but it remains large in terms of technological capital. The economic literature identifies the presence of a human and technological capital deficit as one of the main determinants of low average productivity levels at firms.[56] In recent years, educational attainment levels have improved markedly, as a result of the generational shift and the fact that, following the crisis, young people have acquired more education. However, despite this convergence towards the EU average in terms of human capital stock, the Spanish education system still faces key challenges, such as the high proportion of early leavers from education and training (18.3% between 18 and 24 years). Moreover, this educational improvement has still not passed through to technological capital. Indeed, investment in R&D activities is still very low both in the public and the private sector (0.8% and 1.4% of GDP, respectively, in 2016), which means that the technological capital gap with the EU has continued to widen (see Chart 1.27). Lastly, the structural weaknesses of the labour market referred to in section 4.2.1 – especially the marked dual structure between temporary and permanent contracts – place a constraint on productivity growth, insofar as the high proportion of

---

54   See Banco de España (2017b), and Fu and Moral-Benito (2018).

55   See Banco de España (2016b).

56   See Schivardi and Schmitz (2018) for evidence in southern European firms.

Chart 1.27
THE AVERAGE PRODUCTIVITY OF SPANISH FIRMS, EVEN THE LARGE ONES, IS LOW

The average productivity of Spanish firms is lower than that of French, German and Italian firms, whatever the size. This is partly because of Spanish firms' lesser human capital and technology. Although the crisis spurred convergence in the former factor, there continues to be a significant deficit in the latter.

1 SPANISH COMPANIES' RELATIVE PRODUCTIVITY (a)
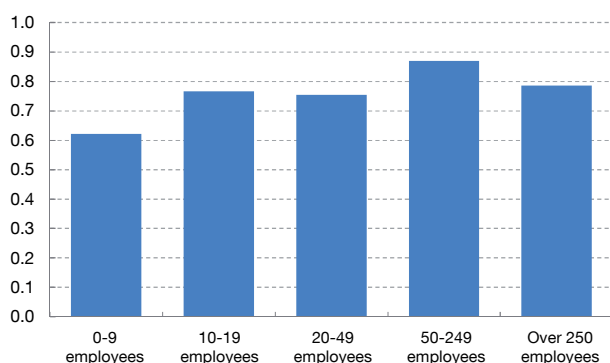
2 SPANISH HUMAN AND TECHNOLOGICAL CAPITAL FOR EU-19 (b)

TECHNOLOGICAL CAPITAL ——— HUMAN CAPITAL (right-hand scale) ———
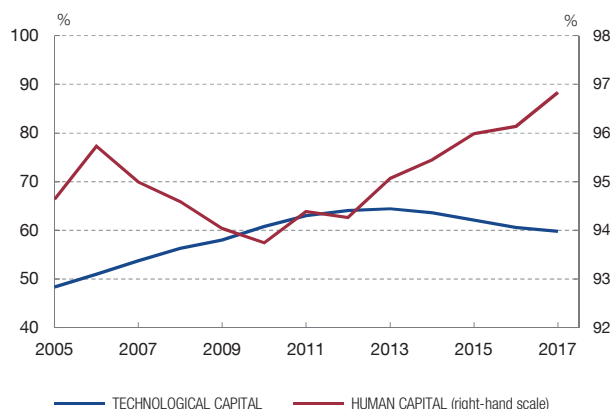
SOURCE: Eurostat.

a Apparent productivity ratio between Spanish firms and the average in France, Germany and Italy (average = 1). Year of estimate: 2016.
b The technological capital series are obtained by accumulating the flow of expenditure in R+D by the economy. The depreciation rate used is 15%. The deflator used is that of GFCF in capital goods. The human capital time series can be interpreted as the equivalent percentage of the working-age population with tertiary education [see S. Puente and M. Pérez (2004), "Las series de stock de capital humano y tecnológico en los indicadores de convergencia real", *Boletín Económico,* December, Banco de España].

DOWNLOAD

temporary employment has a negative impact both on workers' and firms' decisions to invest in human and technological capital.[57]

4.2.4   The banking sector's challenges

The process of strengthening the financial position of the Spanish banking sector continued in 2018 in terms of both the quality of its portfolio and profitability, although the CET1 capital ratios continue to be the lowest in the euro area. The recovery of asset quality was notable, with a decrease in the volume of NPLs to the resident private sector of 29% in 2018 which led to a decline in the NPL ratio by 2.1 pp to 5.8% (see Chart 1.28). The amount of foreclosed assets declined by more than 30%, to a total volume of €43 bn. The average return on equity rose 1.2 pp, up to 7.3% in December 2018, mainly driven by a reduction in impairment losses associated with an improvement in asset quality (see Chart 1.28). The common equity Tier 1 (CET1) capital ratio decreased by 43 bp in the past year to 12.2%, although this change is largely explained by the disappearance of the

---

57 See Dolado, Ortigueira and Stucchi (2016) on the effect of temporary employment on TFP growth at Spanish firms, or Albert, García-Serrano and Hernanz (2005) on the impact on training decisions.

Chart 1.28
ASSET QUALITY AND PROFITABILITY OF DEPOSIT-TAKING INSTITUTIONS

The non-performing loans ratio grew sharply between 2008 and end-2013, when it started to decrease gradually. Nevertheless, at present it is still well above the levels before the crisis. The average profitability of the Spanish banking sector, expressed as ROE, has been recovering in recent years and now stands above the average for the euro area, albeit below its pre-crisis level.

1 RESIDENT PRIVATE SECTOR NON-PERFORMING LOANS RATIO
  Individual data. Business in Spain
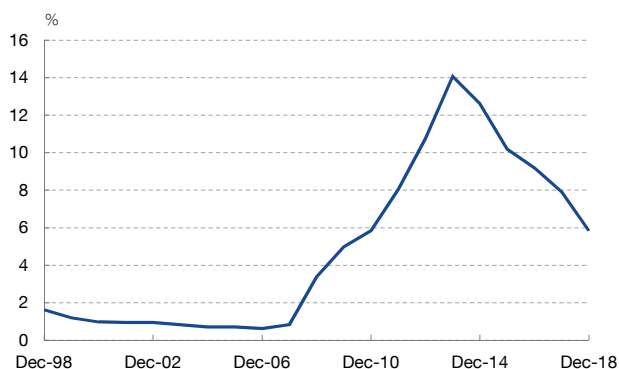
2 ROE (a)
  Consolidated data

SPAIN   EURO AREA (b)
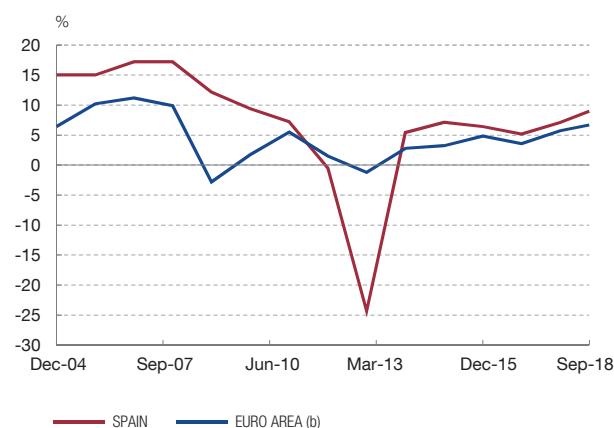
SOURCES: Banco de España, ECB and BIS.

a Until 2016, data taken from a report by the BIS Committee on the Global Financial System *(Structural changes in banking after the crisis)*. Data for 2017 and September 2018 drawn from the ECB *(Consolidated Banking Data)*.
b Weighted average of the available countries.

DOWNLOAD

transitory adjustments in capital deductions introduced by European regulations in the setting of the implementation of the Basel III Accord (see Chart 1.29).[58]

The clean-up of the financial position was favoured both by the continuation of the expansionary cyclical phase and by the troubled asset transfer and sale transactions carried out by the sector. Economic growth and easy monetary and financial conditions have contributed to improving borrowers' ability to pay and to sustain asset value, limiting the lending portfolio's entry into non-performance. Also, deposit institutions have taken advantage of the favourable cyclical moment to transfer unproductive assets to other agents. Specifically, last year the main banking institutions announced asset sale transactions of this kind for a gross book value in excess of €70 bn (of which €55 bn were recorded in 2018, the highest figure after the onset of the 2008 crisis). In the sector as a whole, these transactions were carried out with companies in which the sellers had minority shareholdings.

The international activity of Spanish banks has contributed to support the sector's profitability, although it is not free of risks. Activity abroad has a very

---

58   The purpose of these adjustments was to smooth over time the impact on the level of capital deriving from the deductions (or items that are subtracted in the eligible capital calculation).

Chart 1.29

SOLVENCY OF DEPOSIT-TAKING INSTITUTIONS. COMPARISON WITH EUROPE

The Tier 1 capital ratio has grown gradually in the last ten years, both in Spain and in the euro area as a whole. Spain has stood below the European average. The average CET1 ratio of Spanish banks has barely increased since 2014, and in 2018 it was below the values in other euro area countries, where it has grown by 2 pp on average.

1 TIER1 RATIO

SPAIN   EURO AREA

2 CET1 RATIO

DECEMBER 2014   SEPTEMBER 2018

DOWNLOAD
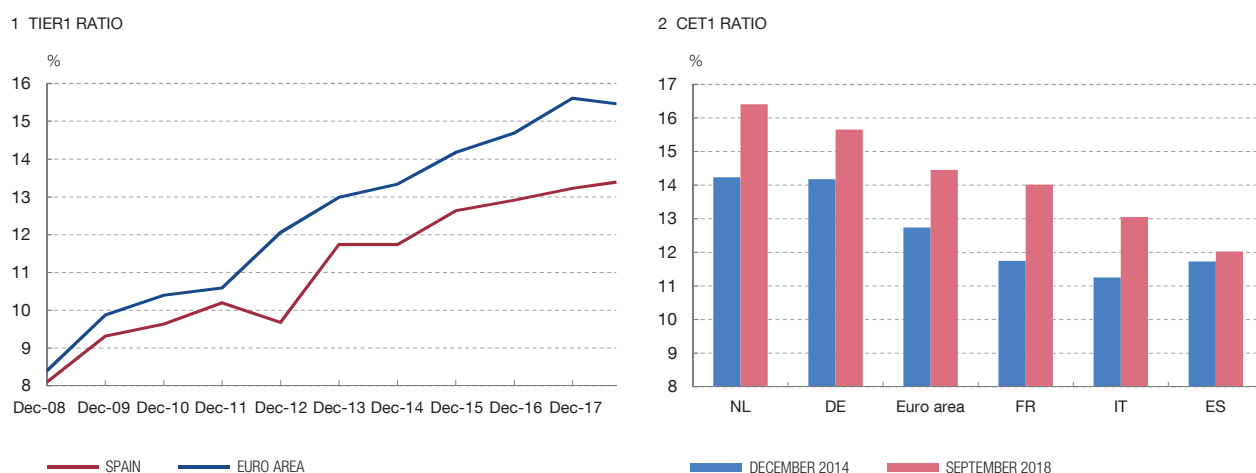
SOURCE: ECB.

substantial weight in total business (close to 48% of total consolidated financial assets at December 2018) and is concentrated in the larger entities. However, these exposures are not exempt from risks, including most notably those relating to geopolitical uncertainty in certain areas and countries (such as Turkey and Argentina), trade tensions, the possible tightening of financing conditions in the international financial markets or volatility in foreign exchange markets. Spanish institutions' business abroad is mostly denominated in local currency and is conducted under a decentralised management model, which mitigates, but does not completely eliminate, some of these elements of vulnerability. Thus, for example, the risk to the business in the United Kingdom for Spanish institutions operating there in the event of a hypothetical disorderly Brexit mainly derives from the possible deterioration of the British economy. This circumstance could be significant, given that the United Kingdom is the country in which the Spanish banking sector abroad is most present (nearly 30% of loans abroad).

The sector is facing important challenges, which in many cases are shared with other European banking systems. Certain challenges persist in connection with fully overcoming the legacy problems which arose from the latest crisis. Thus, despite having increased in recent years to a level above the average for the euro area, return on equity is significantly lower than the pre-crisis levels, against a background where the outstanding balance of lending in Spain declined significantly, mainly as a result of the private sector's intense deleveraging process. Also, the

volume of troubled assets, which has decreased notably from its peak in 2013, is still relatively high from a historical perspective. In this connection, deposit-taking institutions should take advantage of the favourable cyclical moment to further reduce these assets. In addition to improving the quality of its average assets, these efforts will foreseeably lead to the recovery of profitability in the medium and long term. Streamlining operating expenses through improvements in efficiency would also contribute to this end.

The regulatory framework will oblige Spanish institutions to adapt to the new regulatory changes in the next few years. In particular, Spanish credit institutions will be required to adapt to the changes in the different components of the European regulatory framework (the Single Rulebook) for the financial sector: the Capital Requirements Directive (CRD), the Capital Requirements Regulation (CRR), the Bank Recovery and Resolution Directive (BRRD) and the Single Resolution Mechanism Regulation (SRMR).[59] The changes relate most notably to capital requirements that are more risk-sensitive, leverage and net stable funding ratio requirements, implementing the European regulations on requirements for loss-absorbing instruments in the event of resolution, i.e. the minimum requirement for own funds and eligible liabilities (MREL), and a harmonised regime applicable to non-preferred debt instruments.

Against this regulatory backdrop, Spain's banking sector faces the need to continue strengthening its capital levels. Capital ratios have risen progressively in recent years to levels clearly above the regulatory requirements during the process of implementing in the European Union a harmonised regulatory framework for the financial sector. However, the average CET1 capital ratio of Spanish institutions has hardly increased since the entry into force of Basel III in 2014 and stands at low values in comparison with the other European banking systems (see Chart 1.29). This highlights the need for institutions to strengthen their capital levels in order to improve their resilience to adverse shocks.

The sector's average liquidity ratios are above the regulatory requirements introduced for short-term funding. However, implementing the resolution regulations will foreseeably require a greater adaptive effort in the issuance of certain funding instruments. The position of Spanish institutions in terms of the new liquidity coverage ratio (LCR) is comparatively favourable, as its average level is slightly above that for the euro area, although they still significantly tap the Eurosystem for funding facilities. The upcoming adaptation to the binding MREL targets set by the Single Resolution Board (SRB) will also be an important challenge. To meet the MREL targets, institutions need to issue debt instruments with different degrees of

---

59 Implementation is scheduled to commence in 2019 and to extend for most reform elements to 2021. There are, however, regulatory developments, whose implementation schedule extends beyond 2021, such as the leverage buffer for global systemically important institutions (2022).

subordination and, therefore, with costs that are higher than those of senior debt or secured instruments such as covered bonds. In this connection, it should be borne in mind that issuance costs for these types of instruments are usually higher for institutions with lower CET1 capital ratio levels.

In common with other European countries, the Spanish banking sector also faces certain challenges relating to the changes in the financial system's structure. In recent years, an increase in the weight of financial business channelled through non-banking intermediaries, including both traditional agents (such as investment funds) and new agents, has been seen at national and international level. These include FinTech firms (whose business model consists of innovating financial services based on the application of new technologies) and, probably more significantly, BigTech firms (large technological firms that are starting to provide financial services and products to their customers), although their relative importance in Spain is still limited. Underlying this pattern are not only conjunctural factors, but also other more structural ones, such as regulatory changes and the introduction of new technologies. This suggests that the trend towards greater competition will likely persist in the future. Institutions will have to adjust to this new environment, making changes that improve efficiency by incorporating the opportunities offered by technological innovations.

In the coming years, the Spanish banking sector, as is the case for the global financial system as a whole, should assess and adapt to the risks which climate change involves for their activity. Climate change and the transition towards a more sustainable economy might affect the activity of credit institutions and financial stability through two types of risks: "physical risks" associated with the direct effect of climate change and "transition" risks connected with the process of technological and regulatory transition to a more sustainable economy.[60] Identifying, quantifying and mitigating these risks are the responsibility of regulators and supervisors and of financial institutions and will require a substantial effort in coming years to reduce the current shortcomings in terms of governance and the data and methodologies underpinning the analysis. In Spain the draft Climate Change and Energy Transition bill approved in February 2019 stresses the need to make progress on these fronts and establishes that credit institutions and national supervisors should prepare reports periodically assessing financial risks for their activity arising from climate change.

The final challenge which Spanish deposit institutions face is to improve their reputation. Following the crisis, customers' perception of the banking system

---

60 Physical risks would include, for example, those derived from sea-level rise or the proliferation of natural hazards that reduce the value of assets recorded as collateral in banks' credit portfolios. Transition risks would be connected, for example, to a sharp and structural fall in the profitability of a specific firm (and, therefore, in its credit quality) caused by the introduction of a regulatory measure aiming to address climate change.

deteriorated, in part owing to certain inappropriate practices applied by some banks. At the same time litigation rose significantly, leading in certain specific cases to economic losses for some financial institutions and to greater uncertainty about possible additional legal costs arising from such proceedings. These problems could also possibly lead to lower demand for services in this sector. Therefore, recovering their reputation is key for banking intermediaries to be able to successfully face the more competitive environment described above.

In an economy such as Spain's, where the banking sector continues intermediating most financial flows, overcoming all of these challenges is crucial for the sector to contribute to economic growth. Specifically, individual strengthening of the economic and financial position of deposit institutions would lead to the sector's greater resilience in the hypothetical case that the economic cycle goes into recession. Also, the improvements in efficiency recorded in recent years, in a setting of greater competition between institutions, should result in lower intermediation costs, with positive effects on the economy as a whole.

The recent creation in early 2019 of the Macroprudential Authority Financial Stability Board (AMCESFI by its Spanish abbreviation) represents an important institutional development in Spain.[61] The new authority will contribute to promoting coordination and the exchange of information between the Banco de España, the Ministry of Economy and Enterprise, the Spanish National Securities Market Commission and the Directorate-General of Insurance and Pension Funds. The AMCESFI is geared to analysing risks to the stability of the financial system and discussing macroprudential policy measures aimed at preventing and mitigating such risks. By setting up the AMCESFI, Spain endows itself with a structure similar to that set up by other EU member States, in line with the recommendations issued by the European Systemic Risk Board and the IMF. The Banco de España plays a prominent role in the AMCESFI by providing the positions of Vice-Chair of the Board and Chair and Secretary of the Technical Committee.

In parallel, the regulation of the financial system was reinforced by the extension of the range of macroprudential tools available to the sectoral supervisory authorities.[62] In particular, the Banco de España is authorised to require banking institutions to establish, for reasons of systemic risk, countercyclical capital buffers by credit segment, limits on concentration in relation to economic activity sectors, and limits and conditions on the granting of new loans (in terms of, for instance, loan-to-value and loan-to-income ratios, and repayment periods for

---

61 Royal Decree 102/2019 of 1 March 2019 creating the Macroprudential Authority Financial Stability Board, establishing its legal regime and implementing certain aspects on macroprudential tools.

62 Royal Decree-Law 22/2018 of 14 December 2018 establishing macroprudential tools. These new instruments complement those already available to the Banco de España through Regulation (EU) No 575/2013 and Directive 2013/36/EU on capital requirements.

new loan contracts). Some of these new macroprudential tools, in particular those based on borrowers' ability to pay, have already been introduced in other EU member States' national legislation and are being actively employed to prevent excessive easing of credit standards by banks and to contribute to the sustainability of household and corporate debt.

4.3 Regulatory and institutional development of the euro area

Various measures were taken in 2018 to strengthen the European governance framework and make it more resilient to future crises. These include, in particular, the reform of the ESM that was agreed at the meeting of the Eurogroup in December and comprises broadening its functions and its role in European policy oversight. In the sphere of economic policy oversight, an agreement was reached between the European Commission and the ESM for cooperation in overseeing macro-financial imbalances and analysing debt sustainability in the euro area. It was agreed that the ESM should act as the financial backstop for the Single Resolution Fund (SRF), by means of a credit line that can be used to address exceptional situations, where the SRF's own resources are not sufficient for resolution of some credit institutions. The backstop will have a limit of 1% of all euro area deposits guaranteed. It will come into force in 2024 at the latest and must be fiscally neutral in the medium term, so resources committed will subsequently be recovered through banking sector contributions. In addition, the introduction of the financial backstop will eliminate the ESM's tool for direct recapitalisation of banks.

The eligibility criteria for access to the ESM's precautionary credit lines were also redefined. These credit lines aim to ensure that liquidity problems arising in countries that have sound fundamentals and respect European governance rules do not trigger a solvency crisis. To access these credit lines, countries must comply, in the two years prior to the request, with the Stability and Growth Pact's deficit and debt criteria and must not be running excessive imbalances or be subject to the Excessive Deficit Procedure. In general, the new eligibility criteria are stricter than the previous ones; this will make it difficult for these instruments to come into play to address financial stress situations. A change was also made to the collective action clauses, aiming to facilitate the process of restructuring, where necessary, of an economy's sovereign debt. By contrast, consensus was not reached on speeding up the processes for approval of decisions by the ESM, which currently require in almost all circumstances the unanimous vote of all countries in the event that one of them needs financial assistance.

Despite these advances, the progress made in recent years in the reform of the euro area's economic and financial architecture is still insufficient. The new European Commission that will be formed following the recent elections to the European Parliament should address the reform process more ambitiously, to

prevent the single currency from continuing to be exposed to significant stress in the event of serious adverse shocks.

In particular, Banking Union should be completed without delay, by means of the introduction of a European deposit insurance scheme (EDIS). Even though risks have been reduced at national level, the experience acquired during the crisis revealed that individual countries' deposit insurance schemes were not sufficient to substantially reduce the risk of loss of confidence episodes that might prompt a run on deposits. The Commission's proposal, which suggests introducing lending arrangements between the respective national funds, would increase the power to intervene, but it might not be sufficient if the loss of confidence were to extend to a significant number of countries. Accordingly, it remains essential that a broad common deposit insurance scheme be established to complete Banking Union, to ensure that all euro area depositors enjoy the same level of protection, irrespective of where they are located.

Progress in capital market integration remains slow. Euro area capital markets permit a much lower level of risk-sharing than other monetary unions, such as the United States. In consequence, the Capital Market Union project seeks to diversify and broaden European firms' funding sources and to increase capital market integration. Although European institutions gave a boost to some of these measures in early 2019, major barriers to capital market integration still exist in areas such as regulatory harmonisation and market oversight, insolvency proceedings and elimination of the debt bias in some countries' tax systems.

The Eurogroup has decided to make headway in the design and introduction of a budgetary instrument to foster competitiveness and convergence, but consensus has still not been achieved on a cyclical stabilisation function. Insofar as the design of the instrument to foster competitiveness and convergence is concerned, there is agreement on its function: to support public investment needs and the structural reforms identified in the European Semester. However, the political consensus needed to make headway in the case of the proposed cyclical stabilisation instrument has still not been achieved. This instrument is needed to smooth the differential impact of asymmetric shocks and increase the capacity for risk-sharing among euro area countries.

The existence of a genuinely pan-European safe asset is key to ensuring the correct functioning of the euro area. The day-to-day operations of markets and financial intermediaries require that a wide range of benchmark assets with high liquidity and minimum counterparty risk are available; these are commonly known as "safe assets". At the same time, the sovereign debt crisis that hit several euro area countries in the first half of the current decade underlined the fact that, in situations marked by high uncertainty, investors have a high propensity to accumulate assets that are perceived as low-risk as safe-haven assets. Given that, within the euro area,

only a relatively small group of issuers are deemed to be sufficiently safe (generally the sovereign issuers of the core euro area countries), the supply of safe or safe-haven assets is too small. In consequence, these safe assets become scarce and over-priced and financial fragmentation ensues within the euro area. In this setting, mechanisms such as those mentioned above (the common deposit insurance scheme, capital market integration and a degree of budgetary stabilisation capacity in the euro area), need to be designed and introduced to enhance diversification, sharing and reduction of risk within the euro area. In turn, this would encourage a broader and more stable supply of safe assets and a less distorting and more equitable distribution of the associated rewards among the euro area members.

In short, deepening of the reform of the euro area's institutional architecture and of the instruments available to its economic and supervisory authorities is needed, without undue delay. Taking a broad view, significant progress has been made in the reform of European governance since the sovereign debt crisis was unleashed at the start of the decade. But there are still many elements outstanding for achievement of a more robust institutional architecture. In particular, mechanisms that provide for greater risk-sharing and risk-mitigation in the euro area are needed and this will necessarily imply further transfers of power by national authorities in different spheres. In a setting such as the present one, where there is limited room for significant further stimulus via demand policies across the euro area, the institutional architecture needs to be promptly strengthened to reinforce the whole of the euro area's macro-financial resilience in the event of a potential downturn.

REFERENCES

Albert, C., C. García Serrano and V. Hernanz (2005). "Firm provided training and temporary contracts", *Spanish Economic Review,* vol. 7, no. 1, March, pp. 67-88.

Arce, Ó., R. Gimeno and S. Mayordomo (2017). *Making room for the needy: the credit reallocation effects of the ECB's corporate QE*, Working Papers, no. 1743, Banco de España.

Alvés, P., A. Urtasun (2019). "Recent housing market developments in Spain", Banco de España, *Economic Bulletin* 2/2019, Banco de España.

Banco de España (2019a). "Macroeconomic projections for Spain (2019-2021)", Box 1 of the "Quarterly report on the Spanish Economy", *Economic Bulletin,* 1/2019.

— (2019b). "The impact of the slowdown in world trade on euro area exports", Box 2 of the "Quarterly report on the Spanish Economy", *Economic Bulletin,* 1/2019.

— (2019c). "Market expectations about the eruro area benchmark interest rate", Box 4 of the "Quarterly report on the Spanish Economy", *Economic Bulletin,* 1/2019.

— (2019d). "Job creation and destruction flows by type of contract during the recovery", Box 6 of the "Quarterly report on the Spanish Economy", *Economic Bulletin,* 1/2019.

— (2019e). "Financial Stability Report", 5/2019.

— (2018a). "Net exports of non-tourism services in Spain since 2008", Box 7 of the "Quarterly report on the Spanish Economy", *Economic Bulletin,* 1/2018.

— (2018b). "An estimate of the impact of the recent protectionist measures", Box 1 of the "Quarterly report on the Spanish Economy", *Economic Bulletin,* 2/2018.

— (2018c). "Distributive effects of the personal income tax reform in the State Budget for 2018", Box 6 of the "Quarterly report on the Spanish Economy", *Economic Bulletin,* 2/2018.

— (2018d). "Consumer credit: analysis of recent performance", Box 2.1 of the *Financial Stability Report*, 5/2018.

— (2018e). "The recovery in the Spanish economy: the limits of demand-side policies and future challenges", chapter 1 of the *Annual Report 2017.*

— (2018f). "The behaviour of mark-ups during the crisis and the recovery", Box 1.2 of the *Annual Report 2017*.

— (2018g). "Recent turbulence in emerging markets", Box 2 of the "Quarterly report on the Spanish Economy", *Economic Bulletin,* 3/2018.

— (2018h). "Recent developments in the consumer credit market in Spain", Box 7 of the "Quarterly report on the Spanish Economy", *Economic Bulletin,* 3/2018.

— (2018i). "The political and fiscal uncertainty in Italy and the repercussions on financial markets", Box 1.2 of the *Financial Stability Report*, 11/2018.

— (2018j). "Recent developments in consumer credit", Box 2.2 of the *Financial Stability Report*, 11/2018.

— (2018k). "Economic and financial situation in Turkey", Box 2.1 of the *Financial Stability Report*, 11/2018.

— (2018l). "The US economy: cyclical position and role of demand-side policies", Box 1 of the "Quarterly report on the Spanish Economy", *Economic Bulletin,* 4/2018.

— (2018m). "Vulnerabilities in the emerging market economies", Box 2 of the "Quarterly report on the Spanish Economy", *Economic Bulletin,* 4/2018.

— (2018n). "Some implications of the announced expansionary stance of China's macroeconomic policies", Box 3 of the "Quarterly report on the Spanish Economy", *Economic Bulletin,* 3/2018.

— (2018ñ). "Recent developments adn outlook for the Spanish economy's rest of the world account", Box 5 of the "Quarterly report on the Spanish Economy", *Economic Bulletin,* 4/2018.

— (2018o). "Recent pension system measures: analysis of impact on public finances", Box 6 of the "Quarterly report on the Spanish Economy", *Economic Bulletin,* 4/2018.

— (2018p). "Recent changes in access of Spanish SMEs to external financing in accordance with the ECB's half-yearly survey", Box 7 of the "Quarterly report on the Spanish Economy", *Economic Bulletin,* 4/2018.

— (2017a). "The possible effects of a reversal of globalisation", Box 1.1 of the *Annual Report 2016*.

— (2017b). "Financing and investment decisions of Spanish non-financial corporations", chapter 2 of the *Annual Report 2016*.

— (2017c). "Current Account Adjustment", Chapter 3 of the *Annual Report 2016*.

— (2017d). Reabsortion of the pent-up demand for consumer durables, Box 4 of the "Quarterly report on the Spanish Economy", *Economic Bulletin,* 4/2017.

— (2016a). "Situación y perspectivas de la economía mundial a principios de 2016", *Boletín Económico*, March.

— (2016b). "Business dynamics in Spain: characteristics, determinants and implications", Chapter 4 of the *Annual Report 2015.*

European Central Bank (2018). *Annual Report 2017.*

Bank of England (2018). *EU withdrawal scenarios and monetary and financial stability - A response to the House of Commons Treasury Committee*, November.

Barceló, C., and E. Villanueva (2018). *The risk of job loss, household formation and housing demand: evidence from differences in severance payments*, Working Paper 1849, Banco de España.

European Commission (2018). *European semester country reports - Spain.*

Cuadrado, P., and F. Tagliati (2018). "Wage moderation in Spain and in the euro area", *Analytical Articles*, *Economic Bulletin,* 4/2018, Banco de España.

Dieppe, A., R. Gilhooly, J. Han, I. Korhonen and D. Lodge (eds.) (2018). *The transition of China to sustainable growth - implications for the global economy and the euro area*, ECB Occasional Papers, no. 206.

Dolado, J. J., S. Ortigueira and R. Stucchi (2016). "Does dual employment protection affect TFP? Evidence from Spanish manufacturing firms", *SERIEs,* vol. 7, no. 4, pp. 421-459.

Font, P., M. Izquierdo and S. Puente (2015). *Real wage responsiveness to unemployment in Spain: asymmetries along the business cycle*, Working Papers 1504, Banco de España.

Fu, C., and E. Moral-Benito (2018). *The evolution of Spanish total factor productivity since the global financial crisis*, Occasional Papers, no. 1808, Banco de España.

González Mínguez, J., and A. Urtasun (2015). "Consumption dynamics in Spain by product type", *Economic Bulletin,* September, Banco de España.

Hernández de Cos, P., J. F. Jimeno and R. Ramos (2017). *The Spanish public pension system: current situation, challenges and reform alternatives*, Occasional Paper 1701, Banco de España.

International Monetary Fund (2018). «Scenario Box 1. Global Trade Tensions", World Economic Outlook: Challenges to Steady Growth, October, pp. 33-35.

Lacuesta, A., M. Izquierdo and S. Puente (2019). *An analysis of the impact of the rise in the national minimum wage in 2017 on the probability of job loss*, Occasional Paper 1902, Banco de España.

López-Rodríguez, D., and LL. Matea (2019). "El alquiler en España", Analytical Article, *Economic Bulletin,* 2/2019, Banco de España. Forthcoming.

López-Rodríguez, D. and C. García Ciria (2018). *Estructura impositiva de España en el contexto de la Unión Europea*, Documentos Ocasionales, no. 1810, Banco de España.

Menéndez, Á., and M. Mulino (2019). "Results of non-financial corporations to 2018 Q4: preliminary year-end data", Analytical Article, *Economic Bulletin,* 2/2019, Banco de España.

Ministerio de Hacienda y Función Pública (2017). *Informe de la Comisión de Expertos para la revisión del modelo de financiación autonómica*, July.

Schivardi, F., and T. Schmitz (2018). The IT Revolution and Southern Europe's Two Lost Decades, CEPR Discussion Papers, 12843.

Serra, X., J. Timini, J. Estefanía and E. Martínez Casillas (2018). "Argentina: economic challenges in an adverse international setting", *Analytical Articles*, *Economic Bulletin,* 4/2018, Banco de España.

Vega, J. L. (coord.) (2019). *Brexit: current situation and outlook*, Occasional Paper 1905, Banco de España.

Box 1.1
THE GLOBAL IMPACT OF A HYPOTHETICAL ECONOMIC SLOWDOWN IN CHINA

As a result of China's strong growth between 2000 and 2011, exceeding 10% in annual average terms, its economy has become the second-largest in the world, only behind that of the United States. This expansionary phase was underpinned by a government-directed economic model based on investment and on the external sector. However, this model, increasingly reliant on credit and fiscal stimuli, began to show signs of waning at the start of this decade, prompting the government to shift away from short-term growth towards sustainable growth in the medium and long term. To this end, the political authorities initiated an economic rebalancing process, set out in the 12th Five-Year Plan (2011-2015), which sought to promote private consumption over investment, domestic demand over external demand and services over industry.

The implementation of the plan has resulted in a significant slowdown in activity, with growth rates falling to close to 6.5% in 2018. This downturn in output has been compounded in the last two years by the authorities' efforts to reduce the high level of corporate and local government debt, given the risks they pose to financial stability, which have led to credit constraints, particularly aimed at controlling the shadow banking sector.

More recently, these domestic developments have been accompanied by new trade disputes between the United States and China, further curtailing growth. Given that sales to the United States account for almost 23% of total Chinese exports and close to 4.2% of the country's GDP, the possibility of escalating tariff disputes could seriously damage economy activity.[1] Specifically, an increase in trade barriers would further weaken profits and employment in the manufacturing industry and would have a negative impact on confidence, with the consequent adverse effects on private income, investment and consumption. In the longer term, a slowdown in trade and the displacement of Chinese firms in the global production chains could affect total factor productivity and potential growth.

The Chinese economy has come to represent a very significant share of global GDP (almost one-fifth of the total, in terms of purchasing power parity), and its contribution to GDP growth is also substantial, at close to 1 percentage point (pp) in annual average terms since 2005. Moreover, the country's interconnectedness with other geographical regions is rapidly increasing. As a result, the global repercussions of developments in the Chinese economy are increasingly important. A possible further slowdown in activity in China would be transmitted to the rest of the world through various direct and indirect channels.

Direct channels include those that operate through the international trade in final goods and services, and the demand for commodities (particularly oil and metals), areas in which China plays a dominant role. A third direct channel, that of financial exposures, is less significant, since capital account liberalisation in China remains limited. Indirect channels, whose impact would be all the greater the more unexpected, abrupt and persistent the slowdown of China's economy, include higher uncertainty and a decline in global confidence which could give rise to episodes of risk aversion in the international financial markets, entailing stock market falls and rising risk premia. Lastly, trade tensions with the United States may lead to changes in the location of global production chains, in which China has a dominant position, affecting activity in third countries, positively or negatively, depending on its degree of complementarity or substitutability with respect to China's production.

To assess the impact on the rest of the world of a possible sharp slowdown of the Chinese economy, a simulation was conducted using the NiGEM general equilibrium model, which takes into account interdependencies between economies.[2] This hypothetical scenario includes a series of permanent shocks associated with the aforementioned transmission channels, which have a simultaneous impact starting in 2019. Specifically, the

---

1 Following the initial phase of tariff rises imposed by the United States on its imports from China in July 2018 (which affected a volume of purchases of USD 50 billion), the Trump Administration placed a 10% tariff on another group of Chinese imports (with a value of USD 200 billion). This tariff could rise to 25% if the negotiations currently under way between the two countries are not successfully concluded. Moreover, the United States has threatened to impose tariffs on the remaining USD 267 billion of Chinese imports. Before these measures, the average tariff imposed by the United States on Chinese products was of around 3%. In response to the US tariffs, China has imposed tariffs on US imports amounting to USD 110 billion.

2 A number of assumptions are used in the simulation. Specifically, it is considered that expectations are adaptive, nominal exchange rates remain constant, monetary policy follows (in most countries) a Taylor rule and fiscal policy acts as an automatic stabiliser (simultaneously maintaining a medium-term budgetary target).

Box 1.1
THE GLOBAL IMPACT OF A HYPOTHETICAL ECONOMIC SLOWDOWN IN CHINA (cont'd)

Table 1
IMPACT ON REAL GDP GROWTH (%) IN THE EVENT OF DIFFERENT SHOCKS (in pp)

	Combined shock				Trade channel 1 pp fall in potential growth and rebalancing of final demand				Commodities channel −6.9 % in oil prices and −7.8 % in metal prices				Financial channel 10 % fall in stocks, 50 bp rise of equity risk premium and 60 bp rise in long-term interest rates in emerging economies			
	China	Adv. eco.	Emer. eco.	World	China	Adv. eco.	Emer. eco.	World	China	Adv. eco.	Emer. eco.	World	China	Adv. eco.	Emer. eco.	World
t+1	-0.69	-0.27	-0.52	-0.41	-0.60	-0.07	-0.27	-0.19	0.07	0.08	-0.04	0.01	-0.09	-0.25	-0.15	-0.19
t+2	-0.68	0.14	-0.29	-0.11	-0.72	-0.04	-0.31	-0.20	0.15	0.18	0.15	0.16	-0.01	-0.02	-0.03	-0.02
Average	-0.68	-0.06	-0.40	-0.26	-0.66	-0.06	-0.29	-0.20	0.11	0.13	0.05	0.08	-0.05	-0.14	-0.09	-0.11

Table 2
CHANGE IN INFLATION (%) IN THE EVENT OF DIFFERENT SHOCKS (in pp)

	Combined shock				Trade channel 1 pp fall in potential growth and rebalancing of final demand				Commodities channel −6.9 % in oil prices and −7.8 % in metal prices				Financial channel 10 % fall in stocks, 50 bp rise of equity risk premium and 60 bp rise in long-term interest rates in emerging economies			
	China	Adv. eco.	Emer. eco.	World	China	Adv. eco.	Emer. eco.	World	China	Adv. eco.	Emer. eco.	World	China	Adv. eco.	Emer. eco.	World
t+1	-0.48	-0.34	-0.98	-0.71	0.00	-0.02	-0.10	-0.07	-0.45	-0.25	-0.72	-0.52	-0.02	-0.07	-0.14	-0.11
t+2	-0.27	-0.40	-1.11	-0.82	0.02	-0.05	-0.22	-0.15	-0.17	-0.11	-0.41	-0.29	-0.01	-0.05	-0.09	-0.07
Average	-0.37	-0.37	-1.04	-0.77	0.01	-0.04	-0.16	-0.11	-0.31	-0.18	-0.56	-0.41	-0.02	-0.06	-0.11	-0.09

SOURCE: Banco de España.
NOTE: Simulations conducted using the quarterly macroeconomic model NiGEM. Shocks begin to have an impact in 2019 Q1.

Further slowdown in China would lead to a significant decline in world growth. While the expansionary effect of commodity prices would curb the effects of other shocks in advanced economies, the contraction in activity in emerging economies would be more marked among commodity producers and Asian economies.

Chart 1
IMPACT ON REAL GDP GROWTH - FIRST YEAR
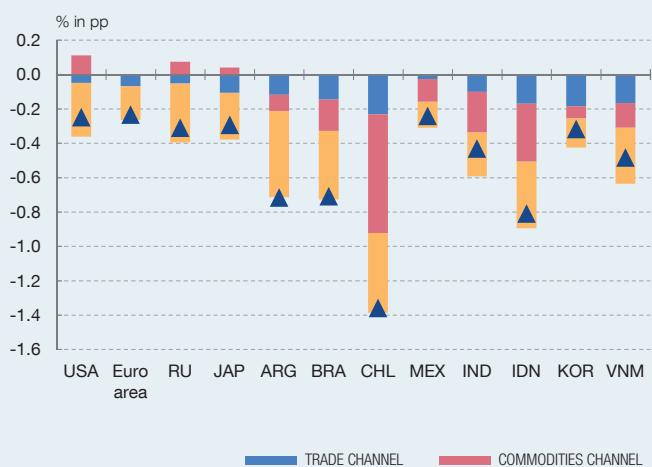
Chart 2
IMPACT ON ANNUAL INFLATION - FIRST YEAR
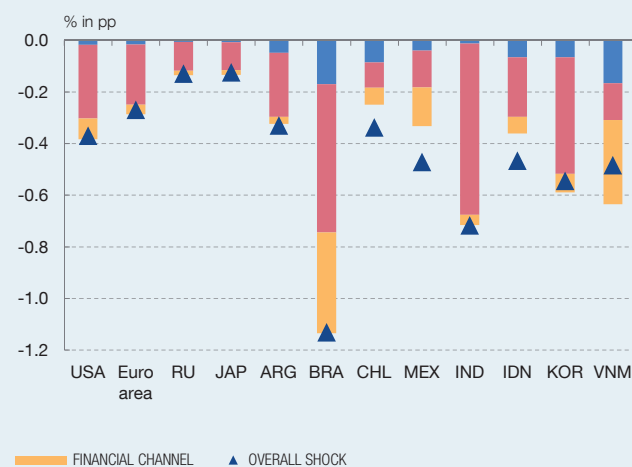
SOURCE: Banco de España.

scenario has three types of ingredients: i) a 1 pp fall in China's potential growth and a drop of the same magnitude in its domestic demand, to which investment contributes 80% (activating the "trade channel"); ii) a reduction of 7% in oil prices and of 8% in metal prices, associated with the slowing growth in China, which translates into a decline in final demand in commodity-producing economies (impacting on the "commodity channel"), and iii) adverse effects on financial markets, reflecting a decline in confidence ("financial channel"). These effects would hypothetically give rise to a stock market correction of 10% in China, Europe, Japan and the United States, an increase of 50 basis points (bp) in the equity risk premium and a rise of 60 bp in long-term interest rates in emerging economies.[3] To assess the significance of each of the three channels, combined and individual simulations were conducted.[4]

The results of the exercise are shown in Table 1 and Chart 1. The combined scenario would result in a decline in global growth of 0.4 pp after one year. This impact is delivered in equal measure by the trade and financial channels, with the channel of lower commodity prices being less relevant at global level. In fact, in advanced economies, the latter channel would have an expansionary effect, due to cheaper imports of commodities, curbing the effects of other shocks, so that the combined impact on the GDP would be -0.3 pp. The contraction in activity would be more pronounced in emerging economies (-0.5 pp), mainly affecting

commodity producers and some Asian economies that have strong ties with China. This scenario would generate disinflationary pressures, more pronounced in emerging economies and, particularly, in commodity-producing countries. Broadly, the effects of the simulations are greater than those obtained in an exercise conducted recently by the European Central Bank (ECB),[5] in which the commodity price channel predominates and the financial channel is absent.

There are, however, a number of factors which could mitigate these effects. First, the exercise does not take into account the foreseeable expansionary reaction of monetary and fiscal policy in China, although, admittedly, the effects could even be amplified if one of the consequences of monetary expansion was a substantial depreciation of the renminbi. Second, the simulation carried out may have underestimated the recent transformation in China's productive, trade and financial structure. Despite the fact that China has become a major driver of the global trade in goods in recent years (it is currently the largest exporter and the second-largest importer), its potential for spillovers is declining for various reasons. On one hand, economic development has in itself led to a more diversified productive structure and thus to a lower import content of Chinese exports. On the other, the decrease in import intensity is also reinforced by changes in China's economic structure, with a shift away from investment towards a greater weight of consumption and a growing tertiary sector.

---

3   The calibration was based on various papers: Asian Development Bank (2016), "Structural Change and Moderating Growth in the People's Republic of China: Implications for Developing Asia and Beyond" (trade channel); A. Ghoshray and M. Pundit (2016), *The impact of a People's Republic of China slowdown on commodity prices and detecting the asymmetric responses of economic activity in Asian countries to commodity price shocks,* ADB Economics Working Paper Series, no. 493, Asian Development Bank (ADB), Manila (impact on oil and metal prices); World Bank and *International Council on Mining and Metals*, Caldara, Cavallo and Iacoviello (2018) and Stuermer (2017) (effects of changes in those prices on final demand in producing countries), and L. Metelli and F. Natoli (2017), "The effect of a Chinese slowdown on inflation in the euro area and the United States", *Economic Modelling,* no. 62, pp. 16-22 (rise in the risk premium). Finally, the rise in the EMBI (emerging markets bond index) is similar to that observed during the financial turbulence of early 2016, caused by the uncertainties surrounding the slowdown in China at the time.

4   Owing to the presence of non-linearities, the impact obtained in the combined simulation is somewhat greater than the sum of the effects obtained in the individual simulations. However, the difference is not quantitatively very relevant.

5   A. Dieppe, J. Han, R. Gilhooly, L. Korhonen and D. Lodge (eds.) (2018), *The Transition of China to Sustainable Growth – Implications for the Global Economy and the Euro Area,* Occasional Papers, no. 206, ECB.

Box 1.2

THE RESILIENCE OF THE SPANISH ECONOMY TO THE DOWNTURN IN THE EXTERNAL ENVIRONMENT

In 2018, Spain's GDP growth (2.6%) was not very different from the Banco de España's December 2017 projection (2.4%) (see Charts 1 and 2). However, its composition did differ notably from the expected one. Specifically, the contribution of net exports to GDP growth was 0.7 pp less than expected, while domestic demand contributed 0.8 pp more, a surprise to which private consumption and public consumption contributed 0.2 pp each, and to which investment in capital goods, in housing, in other

construction and in stockbuilding contributed 0.1 pp each. By contrast, in the euro area, to the more-negative-than-expected behaviour of exports was added a surprise of the same sign in domestic demand, which gave rise to GDP growth of 1.9%, down 0.4 pp from the projection.[1]

There are many possible explanations of why activity and domestic demand held up more strongly in Spain, while weakening in the euro area. It is useful to group them into

Chart 1
SPAIN (ES) AND EURO AREA (EA):
GDP AND DEMAND COMPONENTS IN 2018
Annual average growth rates and contributions
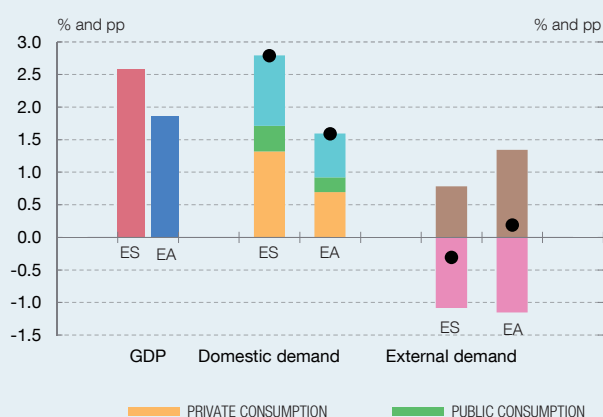
Chart 2
SPAIN (ES) AND EURO AREA (EA):
DIFFERENCES BETWEEN OBSERVED GDP AND DEMAND COMPONENTS
AND THEIR DECEMBER 2017 PROJECTIONS
Annual average growth rates and contributions
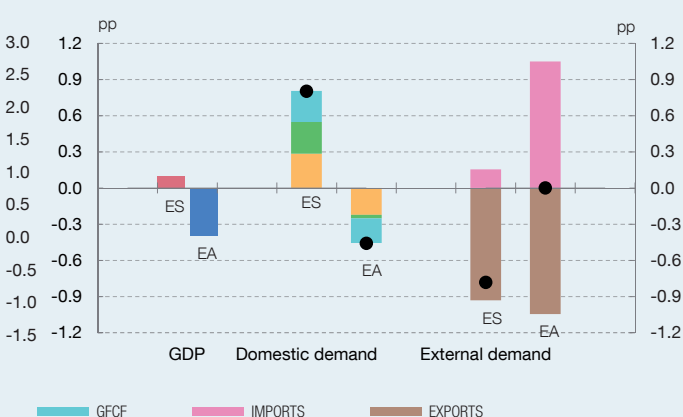
Chart 3
SPAIN AND EURO AREA: BEHAVIOUR OF VARIOUS VARIABLES
Growth rates and levels as a percentage of gross disposable income and of GDP
Real year-on-year rates of change
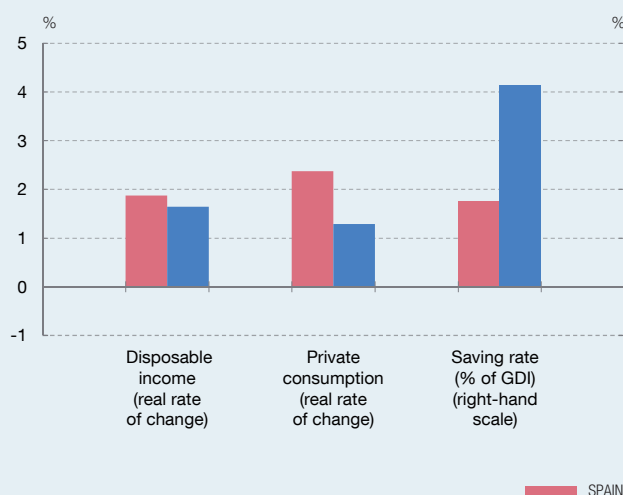
Chart 4
SPAIN AND THE EURO AREA:
DIFFERENCES BETWEEN OBSERVED VALUES AND THE DECEMBER 2017
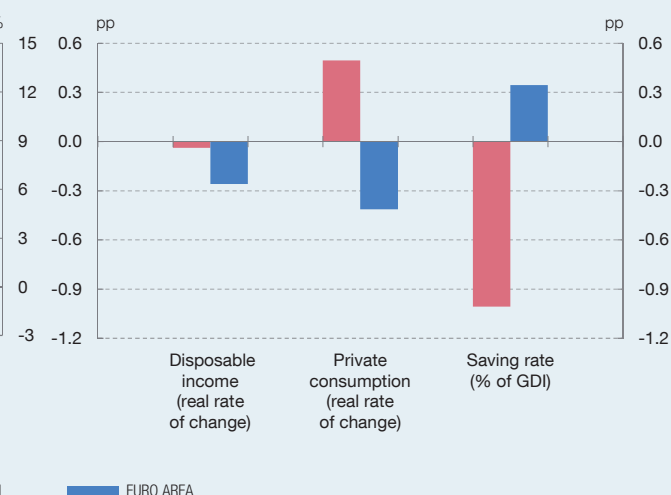
SOURCES: INE, ECB and Banco de España.

1 See ECB (2019), *ECB staff macroeconomic projections for the euro area, March 2019*, and ECB (2017), *December 2017 Eurosystem staff macroeconomic projections for the euro area*.

two categories. First, the two economies may have been affected asymmetrically by common shocks. Second, idiosyncratic factors of various types may have acted only on one of them.

Starting with the first type of factors, the observed divergences might be explained partly because the surprises in the set of common assumptions made in the projections affected Spain differently from the euro area as a whole. Among these surprises, last year there was a notable unexpected deceleration in the external markets which, although detrimental to both economies, may have had more severe effects on one of them, either because its exports were comparatively affected to a greater extent or because the internal component of its demand was impacted more severely.

In 2018, Spain's export markets grew 1.9 pp less than projected in December of the previous year (see Table 1). Taking the average of the three largest euro area countries (Germany, France and Italy), that difference was smaller (1.2 pp). This is explained by the greater relative weight, within the Spanish external markets as a whole, of those which surprised by the greater extent of their slowdown. Furthermore, according to the simulations conducted using the models of the related national central banks, the impact on GDP growth of a 1% fall in external demand would be 0.18 pp at the end of one year, both in Spain and in the case of the average of the three countries considered. Therefore, given this elasticity, the worse behaviour of the respective external demands would have given rise to a

decrease in the rate of change of GDP of 0.3 pp in the case of Spain and of around 0.2 pp in the average for the other three countries.[2] In addition, the negative impact on GDP and domestic demand of the higher oil prices with respect to those anticipated at the end of 2017 was very similar in the four countries considered (see Table 2), while the overall effect of the other surprises on the variables conditioning the projections was practically zero in all cases. Consequently, the asymmetric effects of the common shocks do not seem to be able to explain why GDP and domestic demand were subjected to positive surprises in Spain, in contrast to those of negative sign in the three largest countries of the euro area.

The idiosyncratic factors constitute, by their very nature, a highly heterogeneous category. First, throughout 2018 various unforeseen circumstances crystallised which, in an unexpected and mainly temporary manner, adversely impacted the main economies of the euro area, but did not directly affect Spain.[3] Second, Spain's fiscal policy was more expansionary than expected in December 2017. Specifically, the most recent estimates, made in the context of the formulation of the March 2019 macroeconomic projections, point to a worsening of the primary structural balance between 2017 and 2018, compared with the zero change expected in December 2017.

According to the simulations made using the Banco de España quarterly model, the size of the contribution of the expansionary discretionary measures to GDP growth in 2018 was roughly between 0.2 pp and 0.3 pp.[4]

---

2   Additionally, the more-unfavourable-than-expected behaviour of the export markets seems to have had a negative impact of 0.1 pp on the growth of domestic demand both in Spain and in the average of Germany, France and Italy.

3   At the beginning of the year, these factors included bad weather, flu epidemics in northern and central Europe and some sectoral strikes in this specific case of Germany (see Box 2, "Has the slowdown in economic activity in the euro area been a result of permanent or temporary factors?", *Economic Bulletin*, 2/2018, Banco de España). From spring, Italy was affected by uncertainties over the course of its economic policies, the consequence of which was to raise the cost of financing of that economy. Immediately after summer, the difficulties of automobile manufacturers in adjusting their supply to the new pollutant emissions regulations gave rise to a weakening of this industry's production (see Box 4, "Impact of the new emissions regulation on the automobile market", *Economic Bulletin*, 4/2018, Banco de España). However, Spain has not been immune to this latter circumstance, which particularly harmed Germany, while, by contrast, its impact on France was comparatively smaller. In the final stretch of the year, social unrest seems to have lowered GDP growth of the French economy by a few tenths of a percentage point.

4   These estimates are sensitive to the assumption made about the propensity to consume of the households which most directly benefitted from the measures to increase employment, wages and public transfers and to reduce certain taxes, included in the 2018 State budget. In any event, an accurate estimate of the impact of the budgetary policy stance on activity in the short term is subject to a high degree of uncertainty, since it depends on numerous factors, including the specific circumstances of the economy. Specifically, the literature reports that the value of the fiscal multipliers tends to be higher in the vicinity of an effective floor on interest rates and tends to be lower in a cyclical upturn. Both these circumstances existed in the Spanish economy in 2018, although it is not easy to determine the net impact of them.

Third, the behaviour of households in Spain in 2018, in terms of their spending and saving decisions, differed significantly both from that expected before the year began and from that observed in the euro area. Specifically, the private consumption growth of 2.3% in real terms exceeded by 0.8 pp that of income, giving rise to a decrease in the saving rate of 0.6 pp (see Chart 3). These developments contrast notably with the projections made in December 2017, which predicted that the saving rate would rise in 2018 by 0.1 pp, against a background of lower consumption growth (see Chart 4).[5] By way of

illustration, an exercise using the Banco de España quarterly model – which simulates less expansionary household spending replicating the initially projected increase of 0.1 pp in their saving rate – leads to GDP growth which is around 0.4 pp lower in 2018.

The decrease in the saving rate in Spain, its unanticipated nature and the different behaviour of this variable from that in the euro area may have many distinct causes, some of which suggest the presence of certain limits on the ability of households to maintain in the future the

Table 1
EXTERNAL MARKETS IN 2018: IMPACT ON GDP GROWTH AND CONTRIBUTION OF DOMESTIC AND EXTERNAL DEMAND

	Market growth in 2018 (%)			Impact (pp) on…		
	Expected in December 2017 (1)	Observed in March 2019 (2)	Difference (pp) (2) – (1)	GDP	Domestic demand (contrib.)	External demand (contrib.)
Spain	5.0	3.1	-1.9	-0.3	-0.1	-0.2
Average (Germany, France and Italy)	4.8	3.5	-1.2	-0.2	-0.1	-0.1
Germany	4.5	3.5	-1.0	-0.4	-0.1	-0.3
France	4.9	3.6	-1.3	-0.1	-0.1	-0.1
Italy	4.9	3.5	-1.4	-0.1	-0.1	-0.1

SOURCES: INE, ECB and Banco de España.

Table 2
IMPACT (IN PERCENTAGE POINTS) OF VARIOUS FACTORS ON GDP GROWTH AND CONTRIBUTIONS OF DOMESTIC AND EXTERNAL

	Oil prices			Other variables (a)		
	GDP	Domestic demand (contrib.)	External demand (contrib.)	GDP	Domestic demand (contrib.)	External demand (contrib.)
Spain	-0.06	-0.10	0.04	0.02	0.00	0.02
Average (Germany, France and Italy)	-0.06	-0.09	0.03	0.01	-0.01	0.03
Germany	-0.09	-0.13	0.04	0.03	0.00	0.03
France	-0.03	-0.05	0.02	0.01	0.00	0.01
Italy	-0.06	-0.10	0.04	0.01	-0.03	0.03

SOURCES: INE, ECB and Banco de España.

a Including exchange rates, interest rates and stock market prices.

---

5 Although the income growth of households in the three main economies of the euro area was similar to that in Spain, their consumption was much lower, giving rise to an increase of 0.4 pp in their saving rate, somewhat higher than the projection a year earlier.

dynamism recently shown by their consumer spending.[6] Moreover, the decrease in the saving rate throughout the recovery has been accompanied by an increase in the proportion of consumption financed by credit[7] and hence paid for out of future income. This points to the possibility that some agents may perhaps be overestimating somewhat their future income, which in turn increases their vulnerability to potential adverse shocks.

In conclusion, the factors underpinning growth in Spain in 2018 included an expansionary budgetary policy stance and a high household propensity to spend. This analysis

thus advises caution in extrapolating to the future the stronger behaviour of the Spanish economy relative to its main partners in the euro area. First, the achievement of higher short-term growth at the expense of putting off the required consolidation of public finances (observable basically from 2015) may entail certain additional costs in the future, as noted in Section 4.2.2 of this chapter. Second, the low saving rate, the fact that the household sector is a net borrower (i.e., its saving is insufficient to finance its investment) and the high growth of consumer borrowing point to a possible future moderation in the rate of growth of household spending.

---

6 The more benign explanations include a possible greater impact in Spain of the composition effects. These are associated with the fact that new labour market entrants have a higher propensity to consume or the possibility that the persistence of the process by which the pent-up demand during the crisis was being satisfied may be higher than had been supposed. These factors probably have a lower impact in other economies of the euro area. See Chapter 1 of the *2017 Annual Report* of the Banco de España for a description of the factors explaining the behaviour of the household saving rate in the past decade.

7 See Box 7, "Recent developments in the consumer credit market in Spain", *Economic Bulletin*, 3/2018, Banco de España.

Box 1.3
EMPLOYMENT AND SECTORAL PRODUCTIVITY IN THE RECOVERY

Since the start of the economic recovery in the second half of 2013, job creation has been very strong. According to National Accounts figures, 2.4 million jobs have been created since 2014 Q1. This amounts to cumulative growth of 14.9%, above the growth rate observed in the similar period of the last upturn (see Charts 1 and 2). However, the level of employment at end-2018 was still 8% lower than the pre-crisis level.

From the sectoral standpoint, the rise in employment from the cyclical trough is quite similar to that observed in the cycle that began in 1993. Above average growth has been recorded in construction and in market services. By contrast, the recovery has been more moderate in industry (which has also seen a recent slowdown) and in non-market services. At a greater level of disaggregation, on Spanish Labour Force Survey figures, most notable in the current cycle is the increase in employment in accommodation and food service activities (31.5%) and in transport (21.4%). In turn, within industry, job creation has been particularly strong in some branches of manufacturing, such as textiles (49.5%), leather goods and footwear (48.8%) or waste collection, treatment and disposal (40.1%), above the increases observed in the construction sector (29.3%).

Comparing employment levels by sector with those observed pre-crisis gives a very uneven picture. At end-2018, employment had returned to the 2008 level in market services and was 11% above that level in non-market services. But it was still very far from the 2008 levels both in industry (77%) and construction (48%), and it was still 8% lower in agriculture. These changes reflect a heightening of the long-term tendency, shared with other advanced economies, for services sectors to gain weight as a proportion of the total. By contrast, the industrial sectors, and especially construction, have shrunk as a proportion of the Spanish economy in the 10-year period.

Over the course of the recovery, employment and economic activity have risen at a very similar pace. This has given rise, as it did in the previous upturn, to very low labour productivity growth. Specifically, since 2014 it has risen by just 0.2% in annual average terms, and in 2018 labour productivity even recorded zero growth. By sector, value added has performed quite similarly to employment, with above average growth in construction (27.5%) and market services (14.4%) and high growth (15.5%) in industry where productivity has improved. Indeed, the correlation, at a greater level of sectoral disaggregation,

between the level of productivity at the start of the recovery and the changes in the weight of employment in each branch of activity has been slightly positive (see Chart 3). In other words, employment growth, albeit very modest, has been somewhat stronger in the sectors that had higher productivity levels to start with.

Chart 4 decomposes productivity growth into the effects of the changes in sectoral weight (composition effects) and sector-level productivity (other). It was this latter factor that gave rise to the sharp increase in productivity during the crisis, associated with high job destruction. But this increase has not continued in the recovery phase, in keeping with the usual pattern in upturns in the Spanish economy.

By employment type, half of the employment created in the upturn, in net terms, was temporary employment, although this percentage is clearly heading down. Thus, while in 2014, at the start of the recovery, temporary employment accounted for 80% of the increase in employment, this figure has gradually declined since then, down to 31% in 2018 (see Chart 5). Although it is still high (and similar to the average observed in the 1995-99 recovery phase), it has allowed the ratio of temporary to total employment to stabilise in 2018, following the successive increases recorded in the previous four-year period. In addition, the changes observed were slightly more positive taking the private sector alone, where the share of permanent employment created, in net terms, rose from 55.4% of the total in the period 2014-18 overall to 80.5% in 2018. By contrast, all employment created, in net terms, in the public sector since 2014 has been temporary employment. In consequence, since 2013, the ratio of temporary to total employment has risen by 3.7 pp overall (3.1 pp in the private sector; 5.9 pp in the public sector), up to 26.8% in 2018 (see Chart 5). This is much higher than the European average, but below the average of 32.6% observed in the period 2002-07. This increase in temporary employment, associated with the low level of productivity of new hires, would also explain the low rate of productivity growth in each sector in the recent recovery phase (see Chart 4).

Lastly, a key characteristic of employment patterns during the crisis that began in 2008 was the marked relative increase in the number of part-time hires. This drove up the incidence of part-time employment by 4 pp to 15.8% in the period 2008 to 2013. By contrast, during the recovery that started in 2014, the vast majority of employment created (94.2%) has been full-time. In

Box 1.3

EMPLOYMENT AND SECTORAL PRODUCTIVITY IN THE RECOVERY (cont'd)

Chart 1
LEVEL OF EMPLOYMENT ON QNA DATA, BY LARGE SECTOR, SINCE THE START OF THE PRESENT RECOVERY (a)

Level = 100 in 2014 Q1
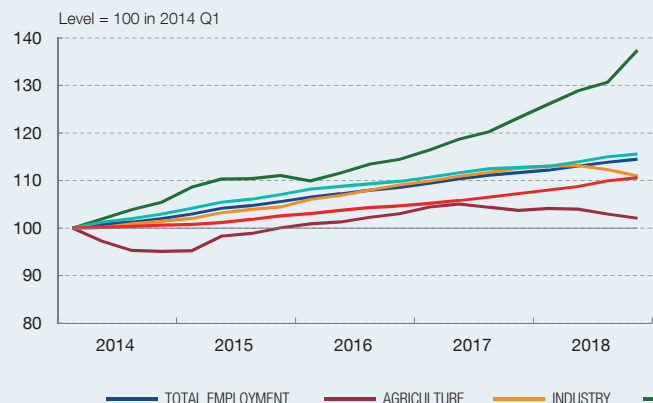
Chart 2
LEVEL OF EMPLOYMENT ON QNA DATA, BY LARGE SECTOR, SINCE THE START OF THE RECOVERY IN 1993 (a)

Level = 100 in 1993 Q4

— TOTAL EMPLOYMENT — AGRICULTURE — INDUSTRY — CONSTRUCTION — MARKET SERVICES — NON-MARKET SERVICES
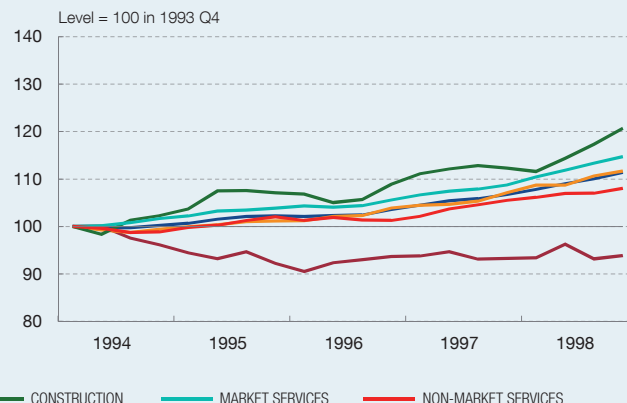
Chart 3
CHANGES IN SHARE OF EMPLOYMENT IN 2014-18, BY SECTOR, AND PRODUCTIVITY LEVEL (b)
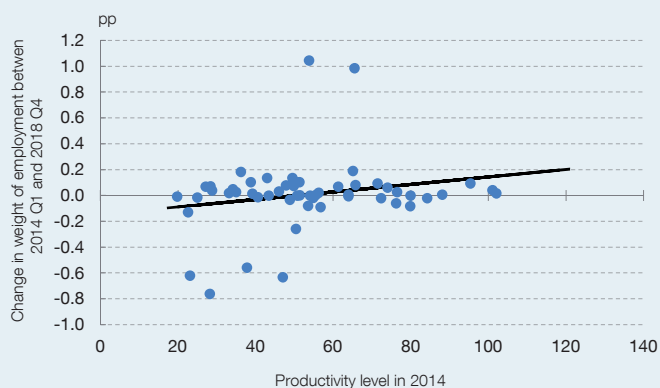
Chart 4
RATE OF CHANGE OF GVA APPARENT PRODUCTIVITY AND COMPOSITION EFFECT (a)

— COMPOSITION EFFECT — OTHER — GVA PRODUCTIVITY
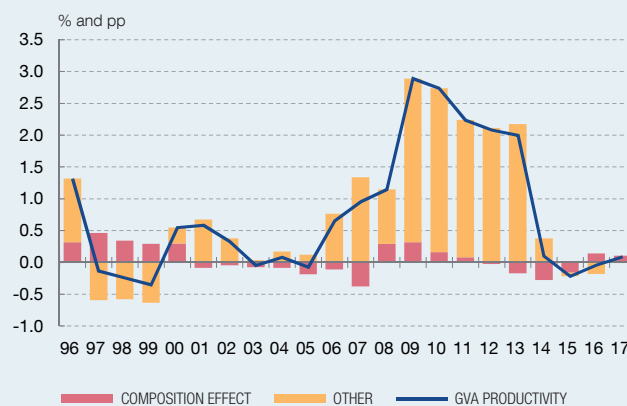
Chart 5
ANNUAL CHANGE IN TOTAL EMPLOYMENT ATTRIBUTABLE TO PERMANENT HIRES

— TOTAL — PRIVATE SECTOR
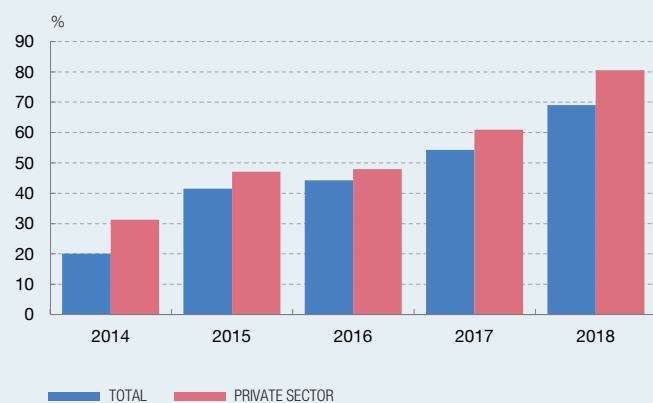
Chart 6
RATIO OF TEMPORARY TO TOTAL EMPLOYMENT

— TOTAL — PRIVATE SECTOR — PUBLIC SECTOR
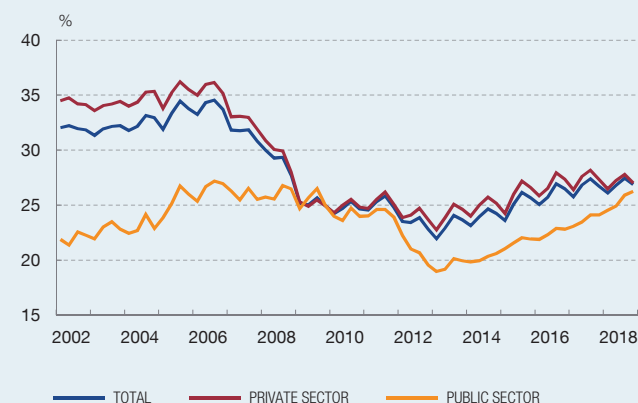
SOURCE: INE (Quarterly National Accounts (QNA) and Labour Force Survey (LFS)).

a QNA data. Employment measured in full-time equivalent jobs.
b Sectors according to 2-digit National Classification of Economic Activities (CNAE-2009). Change in share of employment according to LFS data. Eight sectors are excluded because of outliers.

Box 1.3
EMPLOYMENT AND SECTORAL PRODUCTIVITY IN THE RECOVERY (cont'd)

consequence, the incidence of part-time employment has declined, down to 14.6% in 2018.

To conclude, strong employment growth has gone hand in hand with growth in activity at a sectoral level and this, as in previous upturns in the Spanish economy, has resulted in low labour productivity growth. The temporary employment pattern is also similar to that observed in previous recoveries, although temporary employment is still below the highs reached pre-crisis and the most recent developments in the private sector reflect a decline in temporary employment contracts as a proportion of total contracts in 2018.

Box 1.4
WAGE AND TOTAL INCOME INEQUALITY IN THE ECONOMIC RECOVERY (2014-2017)

This box analyses changes in the inequality of households' wage and total income in Spain during the period 2014-2017.[1] Drawing on data from the Spanish Labour Force Survey (LFS), the wage income inequality of full-time workers (which is estimated to be closely related to the performance of hourly earnings)[2] remained relatively stable in the period under review (see the left-hand panel of Table 1).[3] For instance, the value of the P90/P10 ratio[4] was the same in 2017 (3.4 times) as it was in 2014, which is only 0.1 pp higher than in 2008. This stability was observed across all the wage income distribution.

When analysing the monthly wages of all workers, including part-time workers who display greater procyclicality in terms of hours and days worked, it can be seen that the inequality indicators declined significantly from 2014 to 2017 (the P90/P10 ratio fell from 5.12 to 4.7 during those years, see the right-hand panel of Table 1). These developments mean that almost half of the increase in wage income inequality according to this ratio, which was observed in the recession, was reversed. The reduction in inequality was sharper at the lower end of the wage distribution, which is the segment that was also affected most during the crisis. The results are qualitatively similar if the Continuous Sample of Working Histories is used (MCVL by its Spanish abbreviation) (see Chart 1).

The developments observed in 2017 were set in a context where the quality of new jobs showed similar patterns to those seen in the period 2014-2016. Thus, a high proportion of employment inflows continued to be temporary and brief, and to have a greater impact on part-term employment than in the pre-crisis period (see Charts 2 and 3). In any event, certain aspects of job creation have improved somewhat during 2017. In particular, the decline

in the impact of part-time employment observed since 2014 has persisted, the conversion of temporary to permanent contracts has recovered and the temporary employment ratio in the private sector has decreased slightly, although historically this ratio has tended to rise during upturns. These factors mainly benefit lower-paid workers and, consequently, should contribute to improving inequality indicators at the lower end of the wage distribution. Against this, the average duration of temporary contracts continues to decline, essentially as a result of the higher proportion of those of a shorter duration (see Chart 4). Although sufficiently detailed information on wages is not available for 2018, the quality of new jobs continued to improve in terms of fewer short-term jobs and more permanent ones and, consequently, wage inequality is expected to have decreased even more last year. The duration of new temporary contracts has continued to decrease.

According to the 2017 Living Conditions Survey (LCS), inequality in terms of households' total per capita gross income (labour and non-labour income) held at similar levels to those in 2014 (see Table 2). Specifically, the P90/P10 ratio, which stood at 6.30 in the 2014 LCS, rose to 6.35 in the 2017 LCS.[5] This is applicable to the different brackets of the distribution of gross income per capita. Likewise, these developments were similar irrespective of whether household income per capita is measured in net or gross terms, since there were no fiscal changes in this period which altered income distribution.

The income of households at the lower end of the per capita income distribution is mainly from labour, unemployment benefits and pension benefits. Although unemployment has fallen notably in the period of

---

1   Using information from 2017, this box updates the findings presented in Section 5 of B. Anghel, H. Basso, O. Bover, J. M. Casado, L. Hospido, M. Izquierdo, I. A. Kataryniuk, A. Lacuesta, J. M. Montero and E. Vozmediano (2018), "Income, consumption and wealth inequality in Spain", *SERIEs*, 9(4), pp. 351-387.

2   The LFS and the Continuous Sample of Working Histories (MCVL by its Spanish abbreviation) do not have the information necessary to calculate hourly earnings accurately.

3   The wage income information in the LFS refers to the year of the survey. Thus, the 2017 LFS has information on wage income in 2017.

4   The P90/P10 ratio is defined as the ratio of the income level of the 90th percentile to that of the 10th percentile of the distribution. The 10% of individuals with the lowest income are found below the 10th percentile. The 10% of individuals with the highest income are found above the 90th percentile.

5   The information on income of the LCS for a specific year refers to the previous year. Thus, the 2017 LCS has information on wage income in 2016

economic recovery, it remains very high, especially among groups with a low level of educational attainment, which are concentrated at the lower end of the per capita income distribution (see Chart 5). The possibilities of individuals in this group increasing their income level are constrained by their low relative level of employability, given the high decoupling of the skills supplied by the unemployed and those in demand among employers.

Table 1
MONTHLY WAGE INEQUALITY INDICATORS (LFS)

	Monthly wage - full-time employees				Monthly wage - total employees			
	2008	2014	2016	2017	2008	2014	2016	2017
Gini	0.28	0.28	0.28	0.28	0.31	0.33	0.32	0.33
P90/P10	3.27	3.43	3.38	3.43	4.24	5.12	4.67	4.70
P50/P10	1.58	1.72	1.69	1.67	2.04	2.45	2.25	2.22
P75/P25	1.83	1.92	1.89	1.90	1.91	2.15	2.10	2.10
P90/P50	2.07	2.00	2.00	2.06	2.08	2.09	2.08	2.12

Table 2
MONTHLY WAGE INEQUALITY INDICATORS (MCVL) (a)

	Monthly wage - full-time employees				Monthly wage - total employees			
	2008	2014	2016	2017	2008	2014	2016	2017
Gini	0.32	0.33	0.33	0.33	0.36	0.38	0.38	0.38
P90/P10	3.52	3.71	3.69	3.61	4.84	5.87	5.70	5.54
P50/P10	1.64	1.74	1.73	1.69	2.19	2.62	2.53	2.48
P75/P25	1.92	1.96	1.96	1.94	2.04	2.25	2.23	2.19
P90/P50	2.14	2.13	2.14	2.13	2.21	2.24	2.25	2.23

Table 3
HOUSEHOLD GROSS AND NET INCOME INEQUALITY INDICATORS (SILC) (b)

	Household gross income per capita				Household net income per capita			
	2008	2014	2016	2017	2008	2014	2016	2017
Gini	0.36	0.38	0.38	0.38	0.33	0.35	0.34	0.34
P90/P10	5.27	6.30	6.07	6.35	4.54	5.40	5.28	5.35
P50/P10	2.30	2.65	2.57	2.71	2.17	2.56	2.53	2.56
P75/P25	2.46	2.63	2.61	2.64	2.22	2.29	2.30	2.33
P90/P50	2.29	2.37	2.36	2.35	2.09	2.11	2.09	2.09

	Household gross income				Household net income			
	2008	2014	2016	2017	2008	2014	2016	2017
Gini	0.40	0.41	0.41	0.41	0.37	0.38	0.38	0.38
P90/P10	7.62	7.20	7.17	7.38	6.42	6.23	6.00	6.26
P50/P10	3.14	2.79	2.80	2.92	2.86	2.65	2.60	2.72
P75/P25	2.86	2.92	2.90	2.95	2.62	2.67	2.66	2.69
P90/P50	2.42	2.58	2.56	2.54	2.25	2.35	2.31	2.30

SOURCES: INE (LFS and SILC) and Ministerio de Trabajo, Migraciones y Seguridad Social (MCVL).

a Monthly wage calculated on the basis of the fiscal module for workers working a full month.
b Household income per capita is adjusted with the OECD equivalence scale. 2014 income in euro.

Box 1.4

WAGE AND TOTAL INCOME INEQUALITY IN THE ECONOMIC RECOVERY (2014-2017) (cont'd)

Chart 1
CHANGE IN REAL MONTHLY WAGE BETWEEN 2014 AND 2017 (a)

— REAL MONTHLY WAGE (MCVL)
---- REAL MONTHLY WAGE - FULL-TIME EMPLOYEES (MCVL)
— REAL MONTHLY WAGE (LFS)
---- REAL MONTHLY WAGE - FULL-TIME EMPLOYEES (LFS)
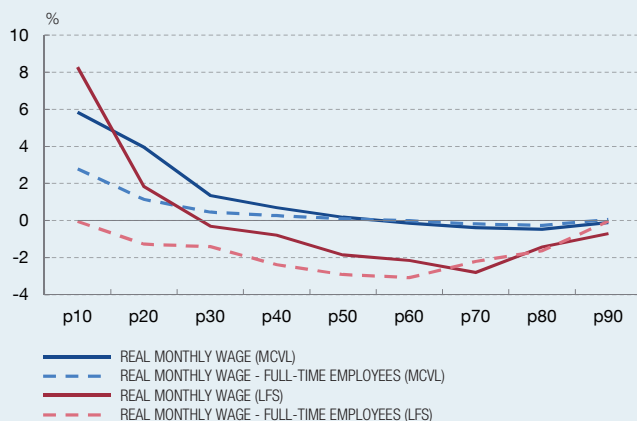
Chart 2
REGISTERED CONTRACTS (b)

INITIAL PERMANENT CONTRACTS (right-hand scale)
TEMPORARY CONTRACTS (right-hand scale)
— TEMPORARY CONTRACTS AS A % OF TOTAL INITIAL CONTRACTS

Chart 3
RATIO OF PART-TIME AND NON-VOLUNTARY PART-TIME WORK

NON-VOLUNTARY PART-TIME (c)   — PART-TIME
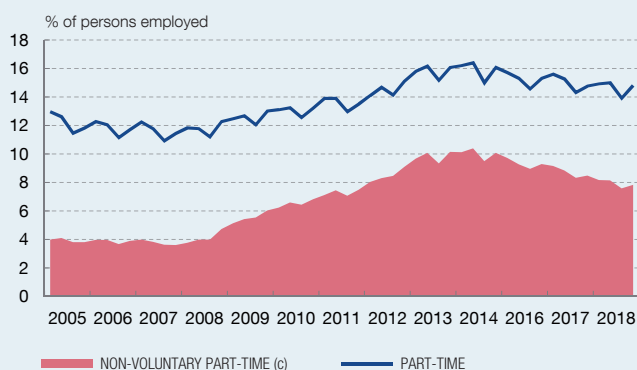
Chart 4
AVERAGE JOB TENURE OF TEMPORARY WORKERS (d)

— 20TH PERCENTILE
— 80TH PERCENTILE (right-hand scale)
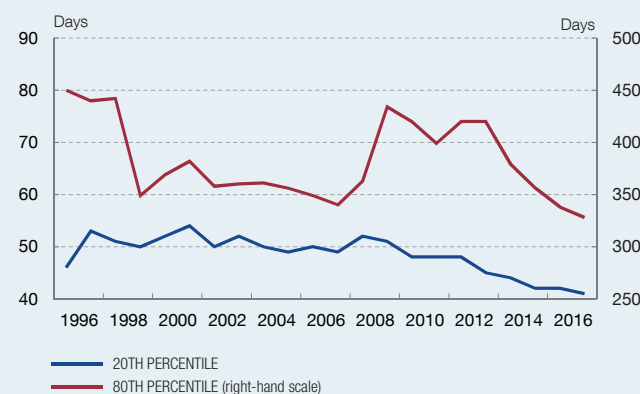
Chart 5
UNEMPLOYMENT RATE ACCORDING TO EDUCATIONAL ATTAINMENT LEVEL (e)

— LOW LEVEL OF EDUCATIONAL ATTAINMENT
— MEDIUM LEVEL OF EDUCATIONAL ATTAINMENT
— HIGH LEVEL OF EDUCATIONAL ATTAINMENT
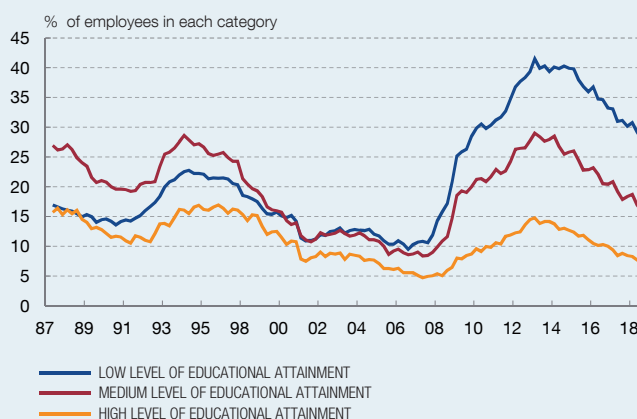
Chart 6
GINI INDEX OF HOUSEHOLDS' TOTAL WAGE INCOME AND OTHER INCOME (f)

— WAGE INCOME   — OTHER INCOME
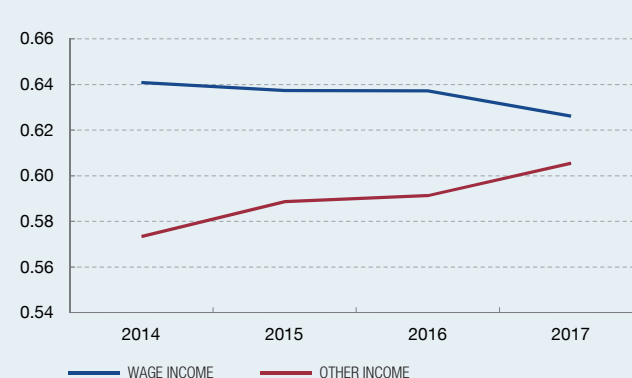
SOURCES: Servicio Público de Empleo Estatal, Ministerio de Trabajo, Migraciones y Seguridad Social (MCVL), INE (LFS) and Banco de España.

a MCVL (Continuous Sample of Working Histories): monthly wage calculated on the basis of the fiscal module for workers working a full month. LFS: monthly wage associated with the main employment in the survey reference week.
b Including domestic service contracts only since October 2012.
c Employed persons who say they are working part-time because they were unable to find full-time work.
d Calculated based on MCVL data.
e Low: no or only primary education, or having failed to complete, or to successfully complete, lower secondary education. High: tertiary education.
f "Other income" includes: self-employed income, capital income, income of children under 16, old age and survival pension benefits, other social benefits, unemployment benefits and transfers from other households.

Furthermore, small increases in pension benefits from 2014 to 2017 contributed to modest growth in the non-wage income for the group with lower per capita income (see Chart 6). By contrast, self-employed and capital income recovered, which are income sources that are overrepresented in the middle and at the higher end of the distribution. This set of factors explains that the reduction in wage income inequality has not fed through to total per capita income. The inequality of total per capita income could be expected to have fallen more since 2017 as wage inequality has continued to decline and unemployment levels among individuals with a low level of educational attainment have improved. However, uncertainty persists about the role that changes in non-wage income in the different brackets of the total income distribution could play.

In conclusion, the recovery experienced by the Spanish economy since 2014 has helped reduce the indices of wage income inequality. These developments, nevertheless, have not resulted in a proportional decrease in per capita income inequality on account of the persistently high numbers of unemployed with a low level of educational attainment concentrated at the lower end of the distribution, and on account of the increase in recent years in non-wage income in the middle and, especially, at the upper end of the total income distribution.

2

THE DETERMINANTS OF LOW INFLATION IN THE EURO AREA AND IN SPAIN

THE DETERMINANTS OF LOW INFLATION IN THE EURO AREA AND IN SPAIN

Summary

Most of the advanced economies' central banks have an institutional mandate to maintain price stability, characterised by a medium-term inflation target. There is broad consensus that accomplishing this mandate contributes to the sustainable development of economies.

Yet during the crisis and, in particular, over the past six years, the euro area inflation rate has long stood below the ECB objective. This is largely due to the prolonged effects of transitory factors, both of a cyclical nature and related to the downward fluctuations of energy prices. Also, the extension over time of this situation may have contributed to its greater persistence, through its impact on economic agents' long-term inflation expectations. The robust monetary policy measures pursued in the past decade have contributed to mitigating the slippage in inflation relative to the ECB objective. The duration of the situation of less dynamic prices may, moreover, have been influenced by several structural factors (population ageing, globalisation and new technologies). And these may be having a bearing on the maintenance of more moderate inflation rates in the advanced economies.

In terms of the euro area countries, the recent "low inflation" phenomenon is chiefly linked to the dynamics of economies such as Spain, Italy, Ireland, Portugal and Greece. It has by contrast been less marked – on average, and in historical terms – in the rest of the countries that formed the euro area in 1999. Moreover, the process has run in parallel with an across-the-board reduction in price changes in the more stable inflation components. This has particularly been the case in services, which might be partly linked to the greater influence of the external openness of this sector. The current lesser dynamism of the more stable components of the HICP has meant that inflation rate fluctuations are now determined to a greater extent by energy, against a background in which the influence of the exchange rate on euro area inflation is estimated to have increased in recent years.

Some further avenues of analysis help add to the explanation of the persistence over time of this situation of lower inflation rates. First, several euro area economies made structural reforms and pursued competitiveness and fiscal processes during the crisis. That is estimated to have contributed to more contained price dynamics, affecting the more labour-intensive sectors, such as services, to a greater extent. And second, the diminished cyclical sensitivity of inflation in the euro area partly explains why the current upturn has not been accompanied by greater inflationary pressures. Also, the low-inflation environment contributed to fewer wage pressures, the recent acceleration in which has been mitigated by the moderation in business mark-ups.

Figure 2.1

DETERMINANTS OF THE LOW INFLATION IN THE EURO AREA AND IN SPAIN

In the past six years, inflation has frequently stood below the 2% objective defining price stability, against a background of lower inflation in recent decades.

EXPLANATORY FACTORS

Transitory factors, which may have prolonged effects

The cyclical situation (negative output gap)	Energy (downward pressures, in particular in 2014-2017)	Prolongation of the low-inflation episode: agents lower their expectations, increasing the duration of the episode

More structural factors, which operate over the longer term

Less inflationary patterns of demand for goods and services and of supply of labour	Globalisation and new technologies and forms of trade exert downward pressure on global inflation	Economies are more synchronised, meaning that global shocks have greater effects

MONETARY POLICY HAS ACTED ROBUSTLY TO INFLUENCE THE CYCLICAL POSITION OF THE EURO AREA AND ECONOMIC AGENTS' INFLATION EXPECTATIONS

CONTEXT OF CHANGES IN THE COMPOSITION OF EURO AREA INFLATION

The inflation rates of euro area members are similar now, after two decades of the single currency

The traditionally more inflationary "peripheral" euro area countries (Spain, Portugal, Greece, Italy and Ireland) now posting inflation levels similar to or below the other members	The recent low-inflation situation is much less marked, on average and in historical terms, in the "core" euro area countries

Inflation is now lower in the more stable components (services, non-energy industrial goods)

Services: of note is the lower inflation (across the board in terms of components) in the past decade, owing partly, perhaps, to growing internationalisation	The lesser dynamism of the HICP in its more stable components leads euro area inflation to be affected to a greater extent by energy fluctuations

SOME ADDITIONAL FACTORS BEARING ON THE PROLONGATION OF THE LOW-INFLATION SITUATION

— **Reforms and demand-side factors** (including fiscal policy) largely account for the greater moderation of inflation in Spain (and other peripheral countries) — Moderation in **wage costs** during crisis and (start of) recovery -recent across-the-board acceleration in the euro area	— **The responsiveness of inflation to the cyclical situation** in the euro area is, in general, low — Fewer inflationary pressures in **the current context of a positive output gap** — However, this relationship is non-linear	— **The influence of exchange rate movements** on inflation has increased in recent years — In particular via the **fluctuations** in energy prices	— **Business mark-ups:** the recent acceleration in labour costs has coincided with a containment of mark-ups -moderation of the impact on inflation — The prolongation of this containment depends on firms' degree of competition and manoeuvrability

SOURCE: Banco de España.

1 Introduction: The importance of price stability and the inflation target

Most of the advanced economies' central banks have an institutional mandate to maintain price stability. This is defined as a situation in which, on average, and in the medium term, consumer price increases are moderate and stable. Currently, there is broad consensus that price stability contributes to raising economic well-being and the economy's growth potential.[1]

The ECB price stability objective is set in terms of annual increases in the euro area HICP[2] close to – but below – 2% in the medium term. The ECB has a strategy and a set of monetary policy instruments to accomplish its mandate.[3] Moreover, without prejudice to its main objective, and in keeping with it, the European System of Central Banks (ESCB) supports the EU's economic policies and its objectives. These include, inter alia, the sustainable development of the EU based on balanced economic growth and price stability, and a highly competitive social market economy, aiming at full employment and social progress.[4]

Since 2013, euro area inflation has been persistently lower than the medium-term objective. Specifically, euro area inflation averaged 0.9% from 2013 to 2018, a significantly lower figure than the average for the first decade of its existence[5], namely 2.1%, more closely in line with the medium-term objective. This recent situation of persistent below-target inflation has come about, moreover, against a background of economic recovery, one due largely to the extraordinarily expansionary ECB monetary policy stance.[6]

Diagnosing the determinants of the current "low inflation" scenario is crucial for monetary policy conduct. A very active debate is currently under way on whether this situation reflects: i) the presence of transitory or cyclical factors, which would gradually be reversed as the cyclical situation improved; or ii) other, more structural factors that would operate over the longer term and push the inflation rate persistently down. This chapter reviews the main arguments in this debate. It also provides empirical evidence for the euro area as a whole – and for the Spanish economy in particular – on inflation determinants in the recent period, aiming to identify the main risks to price stability in the medium term.

---

1   See ECB (2011) y https://www.bde.es/bde/en/areas/polimone/politica/Los_beneficios_d/Los_beneficios__33560642abac821.html.

2   See Álvarez and Sánchez (2018).

3   See ECB (2011).

4   According to the Treaty on the European Union.

5   1999-2007 period.

6   See Banco de España (2016).

The following section characterises the most recent low-inflation situation. It shows how it can largely be explained by the prolonged effect of transitory (cyclical, energy) factors and how the extension over time of this situation may have contributed to its greater persistence, through its impact on agents' expectations. There is also a review of a set of longer-term (structural) factors, which might be exerting downward pressure on inflation rates globally. Section 3 shows how the "low-inflation" phenomenon, in terms of the euro area economies, is chiefly linked to the so-called "peripheral" countries. Conversely, it is less marked on the whole in the "core" countries. The process has, moreover, run in parallel with an across-the-board reduction in price changes in the more stable inflation components, in particular in services. Section 4 discusses certain elements bearing on these recent inflation dynamics, providing explanatory and analytical factors. Finally, Section 5 offers thoughts on the current inflation outlook, in light partly of the matters discussed in the chapter.

2 Recent inflation developments and inflation expectations

2.1 Inflation is currently at historically low levels

Inflation rates have fallen significantly in recent decades in the main advanced economies.[7] The 1970s and early 1980s saw marked dynamism in prices, associated largely with the oil crisis. Since then, inflation has fallen continuously in the main euro area economies, and in other advanced economies, to stand in the past decade at a 50-year low (see Chart 2.1). In the specific case of the euro area, the process has been accompanied by the adoption of a price stability-oriented monetary policy regime.

Since the launch of the single currency, inflation has stood at around the ECB objective, though it has shown persistent downward deviations in the most recent period. Specifically, from 1999 to 2007, the average rate of increase of the euro area's overall HICP was 2.1%, down to 1.8% if the energy component is excluded (see Chart 2.2.1). In that period core inflation, i.e. that associated with the most stable components of the HICP (services and non-energy industrial goods), stood at 1.7%.[8] Taking the full 1999-2018 period, however, the figures are lower: 1.7% and 1.4% for the overall and core HICP, owing mainly to the substantial easing over the past six years (0.9% and 1.0%, respectively).[9]

---

7   For a broad perspective see, inter alia, Cogley, Morozov and Sargent (2005) and Stock and Watson (2007).

8   HICP, excluding the energy and fresh food components.

9   Álvarez, Gadea and Gómez Loscos (2019a) characterise the 2013-2017 period as one of "low inflation" for the euro area in their study using time series data for a broad set of advanced countries.

Chart 2.1
LONG-TERM INFLATION

Inflation rates have fallen significantly in recent decades in the main advanced economies.

ANNUAL INFLATION (AVERAGE FOR EACH PERIOD)
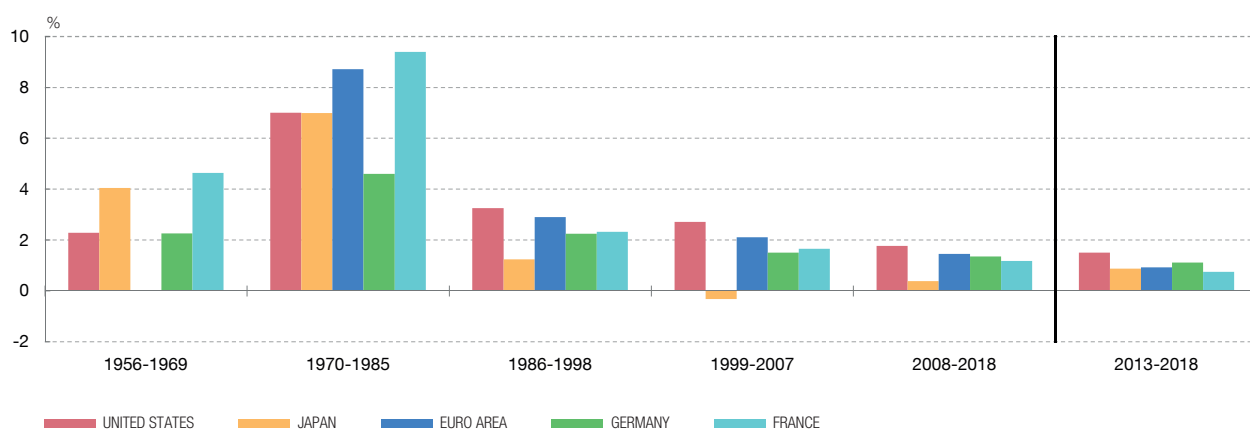
SOURCES: OECD economic indicators, ECB, INE and Banco de España.

Agents' long-term inflation expectations have, since the euro area came into being, stood on average at levels compatible with the ECB objective. That said, since 2013 they have turned down somewhat. An habitually used measure of expectations are the long-term break-even inflation rates obtained from inflation swap prices[10] (Chart 2.2.1). As from the start-up of the monetary union, this indicator stood slightly above 2% expected inflation. This might reflect agents' confidence in the fact that, even with periods of marked slippage from target, inflation would, in the medium term, revert to values compatible with the target. In the 2013-2018 period, long-term inflation expectations measured by this indicator stood persistently at levels below 2% (1.8% on average), marking a low of 1.4% in 2016 Q3.

The credibility of the monetary policy regime influences the formation of agents' inflation expectations.[11] If expectations are soundly anchored around the medium-term inflation objective, temporary macroeconomic shocks will tend to have a less durable effect on inflation and, generally, they will require a less energetic response by the monetary authority. Monetary models broadly show that, under

---

10 Five-year forward break-even inflation rate five years ahead. This represents the average value of the compensation to cover the risk of inflation with swaps over a given horizon. What is involved is a forward break-even inflation rate with a constant maturity, estimated on the basis of curves of swaps prices at different terms in the euro area. See Gimeno and Ortega (2018).

11 See Bems, Caselli, Grigoli, Gruss and Lian (2018) and Mishkin (2007).

Chart 2.2

INFLATION IN THE EURO AREA

The credibility of the monetary policy regime influences the formation of agents' inflation expectations. However, deviations by inflation from its long-term value may be persistent.

1 INFLATION AND INFLATION EXPECTATIONS

ACTUAL ─── HICP EXCL. ENERGY ─── ECB OBJECTIVE ─── LONG-TERM EXPECTATIONS (a)

2 DEVIATIONS FROM TREND (b)

TREND DEVIATIONS BY OIL AND OTHER ─── ECONOMIC CYCLE ─── DEVIATIONS FROM TREND
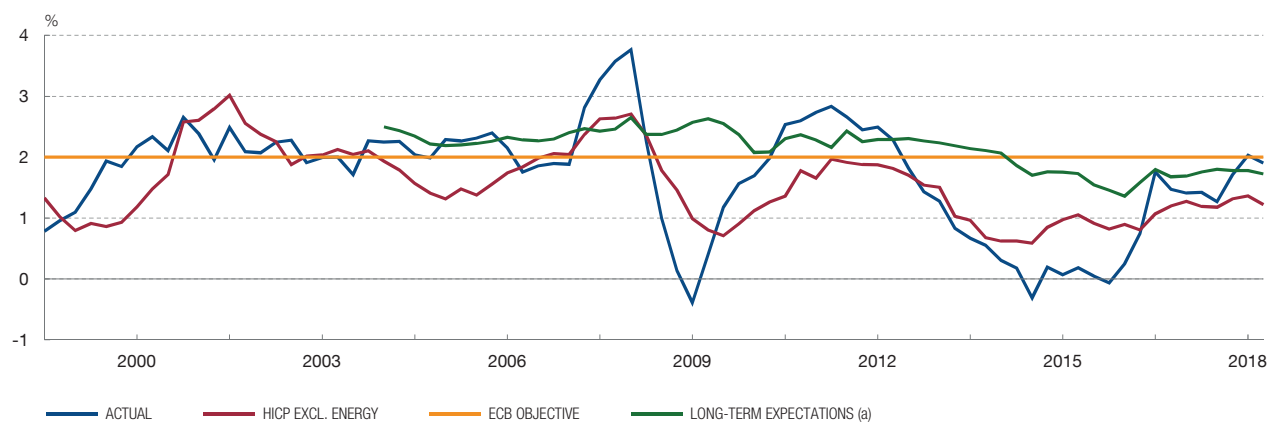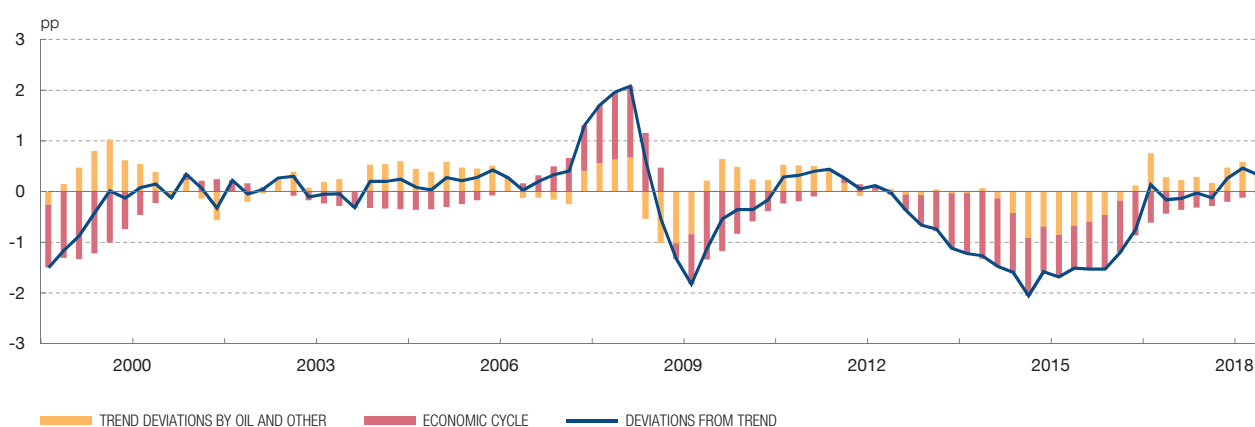
3 SENSITIVITY OF INFLATION EXPECTATIONS TO RECENT INFLATION (c)

EURO AREA (AVERAGE 1999-2017)   UNITED STATES (AVERAGE 1999-2017)
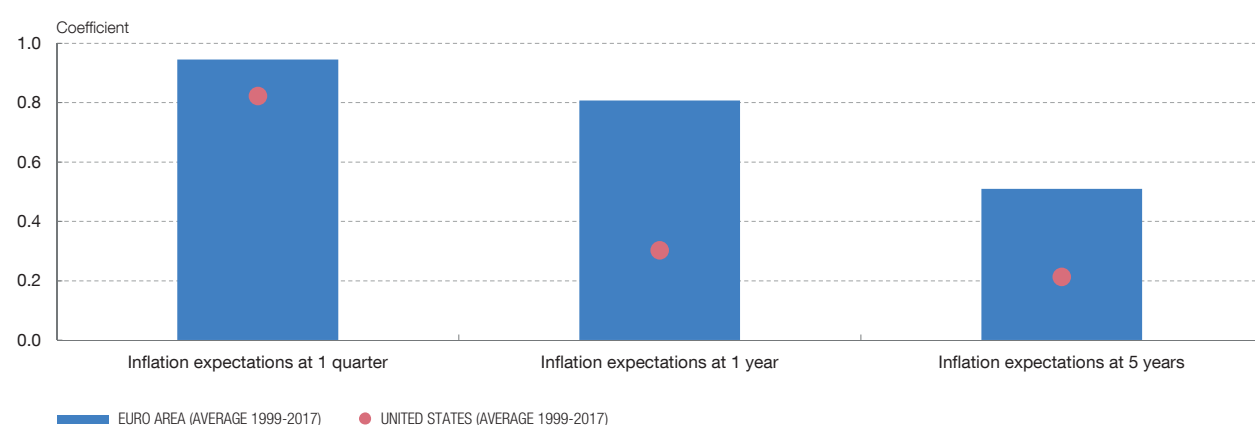
SOURCES: Eurostat and Area Wide Model Database.

a Based on Gimeno and Ortega (2018). Five-year forward break-even inflation rate five years ahead.
b This model includes a set of basic economic relationships (trend-cycle decomposition of growth, Phillips curve, Okun's Law), which are jointly estimated, a set of explicitly modelled parametric instabilities and controls for temporary changes in the volatility of output and of inflation (stochastic volatility). The decomposition is presented by way of illustration.
c Calculations performed using the Aguilar and Vázquez (2018) model.

DOWNLOAD

regimes in which inflation targets are clearly defined, inflation should in fact be a fundamentally forward-looking variable.[12] This is not incompatible, in any event, with the fact that current inflation may deviate from the medium-term objective, in particular owing to the effect of transitory factors.

2.2 The economic cycle and energy explain the recent slippage by inflation from its long-term reference values

In the past six years, cyclical conditions and the downward impact of short-term oil fluctuations have given rise to a prolonged period of inflation rates recurrently below the medium-term objective. Chart 2.2.2 illustrates this, tracking euro area inflation deviations from an estimated trend path, which proxies agents' long-term expectations.[13] These transitory deviations reflect two elements. First, the effect that fluctuations in economic activity have on inflation. In the expansionary phase of the economic cycle, there would be inflationary pressures when capacity utilisation were high. Meantime, in the downturn, idle resources and the lack of demand would push prices downwards. Second, this transitory component would be affected by the short-term swings in commodity prices, principally oil.

Thus, deviations by inflation from its long-term value may be persistent and prolonged over time. Three factors helped hold the euro area inflation rate below its trend value for most of the 2013-2018 period: the effect of the double-dip recession in the euro area, in particular in 2012-2013; the persistence of a negative output gap throughout the period; and the downward effect of energy prices, mainly between the second half of 2014 and 2016.[14]

2.3 Transitory but persistent deviations by inflation from its objective may ultimately affect long-term expectations

A prolonged low-inflation situation over time may lead to long-term expectations ultimately reflecting the fluctuations in current inflation. Should

---

12 See Benati (2008). Coibion and Gorodnichenko (2015) argue that recently, and in particular since the Great Recession, the long-term expectations component is the fundamental one for explaining inflation dynamics.

13 See Correa-López, Pacce and Schlepper (2019) for a detailed discussion on the link between trend inflation measures and long-term inflation expectations. The decomposition of the chart is based on the modelling strategy of Leiva-Leon, Pérez, Pérez-Quirós and Urtasun (2019), which includes a set of basic economic relationships (endogenous trend-cycle decomposition of growth, Phillips curve with external prices, Okun's Law) that are jointly estimated, a set of explicitly modelled parametric instabilities and controls for temporary changes in the volatility of output and of inflation (stochastic volatility). The model includes the three usual variables suggested by neo-Keynesian open-economy models, i.e. inflation expectations (proxied by a trend inflation measure), the cyclical position and external prices.

14 Along these lines see, inter alia, Ciccareli and Obstat (2017), for the period to 2016.

this occur, persistently low inflation might prompt a downward revision in agents' expectations, with mutually reinforcing low-inflation expectations and moderate short-term price growth increasing the duration of the low-inflation episode. These dynamics would cause a transitory misalignment or "de-anchoring" of agents' expectations relative to the medium-term target rate.[15]

How this transitory de-anchoring of inflation expectations operates can be illustrated using a model in which agents form their expectations on the basis of both forward- and backward-looking elements. Estimating a general equilibrium model of these characteristics[16] for the euro area shows indeed that the weight agents assign to past inflation may be higher than that they attribute to forward-looking elements. Hence after a negative shock that substantially and persistently reduces inflation, the return to target will be slower in those periods in which the backward-looking elements of expectations carry more weight. In the longer term, however, the forward-looking factors would become more preponderant, according to the model. Indeed, on the model's estimates for the euro area (see Chart 2.2.3), the weight agents assign to past inflation falls by somewhat more than 40% when inflation expectations are formulated at five years, compared with when they are set out one quarter ahead. In any event, in the long term and in the absence of fresh shocks, an inflation level similar to that prior to the shock would be attained according to this model.

The speed at which the transitory misalignment of agents' expectations relative to the target is corrected depends on the structure of the economy. In this model, the structure of the economy influences the weight of past inflation in expectations formation. This weight is all the greater the higher the degree of wage inertia and the higher the rigidities in price-setting processes[17], these being the factors that lead low-inflation phases, in particular, to prove more persistent. A euro area/US comparison shows how in America's economy, which shows lower wage inertia and greater price flexibility, inflation expectations rest to a greater extent on trend inflation than on recent inflation (see, once again, Chart 2.2.3).

---

15 A broad body of work addresses the idea of high persistence as the main explanation for the recent global phenomenon of inflation rates holding lower than central bank targets over prolonged periods [see, inter alia, Ciccareli and Obstat (2017) and the authors they cite]. From a more general standpoint, see Orphanides and Williams (2005), Williams (2006), Angeloni, Aucremanne and Cicarelli (2006) and Altissimo, Bilke, Levin, Matha and Mojon (2006).

16 See Aguilar and Vázquez (2018).

17 According to some recent papers, changes in the sectoral structure of the economy (in particular, the greater weight of the services sector) might entail greater inflation persistence. That is due to the relative higher inertia in price-setting in the services sector [see Bils and Klenow (2004) and Galesi and Rachedi (2019)]. The median duration of prices in the manufacturing sector is three months, while that of prices in the services sector is 10 months.

Monetary policy can affect long-term inflation expectations. In the case of the euro area, monetary policy measures have sought to keep long-term inflation expectations in line with the medium-term reference of 2%. In the recent period, given a negative natural interest rate, as analysed in Chapter 3 of this Report, the ECB has resorted intensely to unconventional monetary policy measures to provide the expansionary stimuli needed to raise actual inflation towards its objective[18] (see Box 2.1).

2.4 Several structural factors exert downward pressure on inflation rates at the global level

The discussion in the previous section should be framed in a setting in which several structural factors might be pushing inflation downwards in the advanced economies. Among these factors, the economic literature particularly highlights the economic dynamics and the structural change wrought by population ageing (see also Chapter 4 of this Report), globalisation (with greater trade openness and exposure to international competition) and the impact of new technologies (digitalisation and new forms of trade). Box 2.2 discusses the channels – direct and indirect alike – through which these factors affect inflation.

Moreover, the advanced countries' inflation rates are increasingly more interconnected and show a high degree of synchronisation. That might amplify the (downward) impact of macrofinancial shocks on price developments.[19] The influence of some of the factors mentioned in the previous paragraph might have contributed to this greater synchronisation (see the discussion in Box 2.3). For one thing, the prices of many commodities are determined on global markets. As a result, their fluctuations may feed through to many countries' consumer prices simultaneously. Furthermore, the considerable external openness of economies reinforces the interconnectedness of inflation rates, largely through the greater global synchrony of economic and financial cycles. Finally, it is worth mentioning that the degree of interdependence of inflation rates may also be affected by the similarity of monetary policy strategic frameworks across countries.

In the specific case of the euro area, movements in inflation common to the member countries are higher, and have tended to increase over time. Generally, moreover, the empirical measures of interdependence are higher between countries' overall inflation rates than between more stable measures that exclude energy and food. This is in light of the overall effect exerted by shocks relating to the prices of oil and other commodities.

---

18   See Banco de España (2016).

19   See Álvarez, Gadea and Gómez Loscos (2019b) and Carney (2015).

Chart 2.3
INFLATION DISPERSION

The peripheral countries have converged in recent decades towards average levels of inflation in line with the core euro area members.

1 CORE INFLATION (a)

2 STANDARD DEVIATION OF ANNUAL INFLATION

OBJECTIVE
PERIPHERY AVERAGE (b)
CORE AVERAGE (c)

EURO AREA COUNTRIES
SPANISH REGIONS
GERMAN STATES
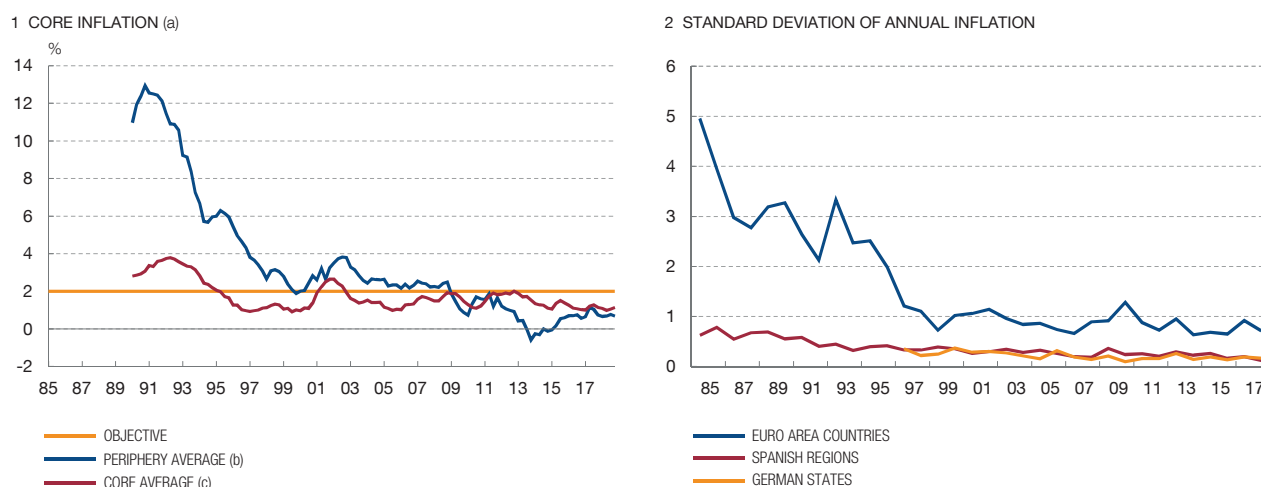
DOWNLOAD

SOURCES: INE and Eurostat.

a HICP excluding energy and food.
b Spain, Italy, Greece and Portugal.
c Germany, France, Netherlands, Belgium, Austria, Finland and Luxembourg.

3 Changes in the composition of inflation in the euro area, by country and sector

3.1 The traditionally more inflationary peripheral euro area countries have recently been posting lower average inflation levels than the other members

The recent situation of lower inflation has been particularly acute in the euro area countries that had traditionally posted higher rates. In the past two decades, the inflation rates of the peripheral euro area countries have switched to levels more in line with the core members, even standing below these. Chart 2.3.1 depicts this trend in the average core rates of Spain, Italy, Portugal and Greece compared with the other countries that formed the euro area in 1999.[20] In these latter nations inflation is, in fact, only slightly lower at present than during the decade following the launch of the euro. Specifically, the average core inflation rate of this group of countries was 1.5% in 1999-2007 and 1.4% in 2008-2018, and, in this latter period, 1.3% in the last six years (2013-2018). Conversely, in the peripheral countries,

_____

20   Excluding Ireland.

the related rates in these periods were 2.6%, 0.9% and 0.4%, respectively. Taking individual countries in each of the two groups, Germany's rates were 0.9%, 1.2% and 1.3%, respectively, while Spain's stood at 2.7%, 1.0% and 0.7% in the same periods.

The more recent low-inflation situation is, therefore, much less marked on average, and in historical terms, for the core euro area countries[21]. The lower inflation environment, on the contrary, is especially marked in Spain, Italy, Portugal and Greece, particularly in the services prices component, as will be discussed in the following section. Further ahead (in Section 4.1) some explanatory evidence for this fact, centred on Spain, will be shown.

The process of convergence[22] **of the euro area countries' inflation rates has been manifest in a reduction in the dispersion of these rates.** However, the degree of dispersion in price increases across the euro area countries continues to be greater than that observed for the regions of two countries – namely Spain and Germany – with highly decentralised territorial arrangements (see Chart 2.3.2).

In the euro area there will not only have been convergence by inflation rates, but also some alignment in cross-country price levels. Specifically, a bigger reduction in price dispersion was recorded from 1995, accelerating as from 1999, among the countries that adopted the single currency, when compared with the EU countries not forming part of the Eurosystem.[23] The reduction in dispersion, in general, depends on the extent to which the good is tradable. Apart from progress in the creation of the single market in the EU, the reduction in transaction costs and the disappearance of exchange rate risk would help explain this process of (partial) convergence in price levels. Convergence in prices, in turn, would limit the divergences among euro area countries' inflation rates derived from catching-up processes in price levels.[24]

---

21 Comprising the following countries: Germany, France, Netherlands, Belgium, Austria and Finland.

22 There is evidence in the literature on ongoing convergence in inflation rates among the countries in the euro area, and in the EU in general. In particular, convergence made headway in the run-up to the Maastricht Treaty, prior to 1999, and this continued in the period following the launch of EMU; it quickened from the onset of the financial crisis and it saw no changes in the period of unconventional monetary policy. See, inter alia, López and Papell (2012) and Brož and Kočenda (2018).

23 Allington, Kattuman and Waldman (2005).

24 On this matter see Estrada, Galí and López-Salido (2013). International comparisons of price levels, however, show a high degree of complexity associated with the limitations of the databases available. To surmount these difficulties, some studies focus on specific markets on which detailed and comparable information is available. For example, Dvir and Strasser (2018), for the automobile market, document a convergence process in price levels among the EU countries that extended to 2003, but which, however, was interrupted thereafter. Meanwhile, Fisher (2012) focuses on the washing machine market and finds no evidence of convergence.

3.2 The current, lower-inflation situation can be seen in all the components of core inflation

The overall trend towards lower inflation has been across the board in terms of products, but has proven particularly acute in services. The change in the dynamics of this sector has played a notable role in reducing inflation since 2009, particularly in Spain and Italy among the larger euro area economies, more intensely so over the last six years (see Chart 2.4.1). The easing in services prices has been across the board in terms of product types (see Chart 2.4.3). The other component of core inflation – that of non-energy industrial goods – also eased recently.

This effect is of particular significance in countries which, like Spain, posted a marked positive differential relative to the rest of the area, owing largely to services inflation. The buoyancy of services prices in Spain in the pre-crisis period, along with their high weight in the household consumption basket, explains why they were responsible for almost 40% of the inflation differential with the euro area as a whole during the first decade following the launch of the euro. In that period the difference stood, on average, at 1.1 pp (see Chart 2.5.1). Non-energy industrial goods, exposed to a greater extent to international competition, showed more moderate inflation than in services, and contributed to the tune of around 20% (0.2 pp), on average, to the total differential with the euro area. Finally, the rest of the differential from 1999 to 2007 was due to the contribution of food (0.5 pp), while that of energy, on average, was zero.

In the past decade this situation has been reversed. From 2008 to 2018, inflation in Spain was, on average, lower than that of the euro area as a whole. As a result, the average differential during this period stood at -0.14 pp, with a negative contribution of services in most of the years (see Chart 5.2). The sharp adjustment in the relative prices of services, which is a particularly labour-intensive sector, might be related to the reduction in unit labour costs in that period. In those years, then, whereas in the euro area the average growth of unit labour costs in market services was slightly higher than 1.5%, in Spain it scarcely exceeded 0.5%.

In services, the disinflationary process in terms of components was across the board. Chart 2.6 depicts the percentage of components (weighted by their share in households' total consumer spending) of non-energy industrial goods and services, based on the year-on-year rate of inflation in each of these categories for the euro area and for Spain. The chart illustrates the recent ongoing reduction in inflation rates in services. Specifically, it can be seen in Spain that, in the pre-crisis years, the prices of most services components rose at a pace in excess of 2% per annum, and practically none of them became cheaper. Conversely, in the case of non-energy industrial goods, the respective proportions of articles showing high rises (of over 2%) in prices and those undergoing declines or moderate rises (of less than 1%) were more balanced. Yet in the past decade, the weight of expenditure on

Chart 2.4
EURO AREA NON-ENERGY GOODS AND SERVICES INFLATION

The overall trend in inflation towards lower values has been across the board in terms of products, but particularly so in services.

1 SERVICES INFLATION: AVERAGE RATE
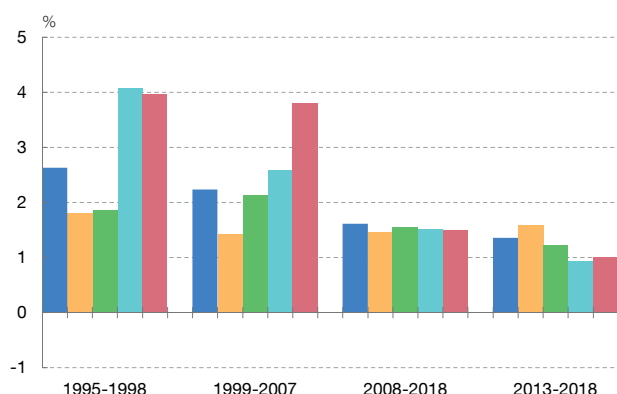
2 NON-ENERGY INDUSTRIAL GOODS INFLATION: AVERAGE RATE

EURO AREA   GERMANY   FRANCE   ITALY   SPAIN
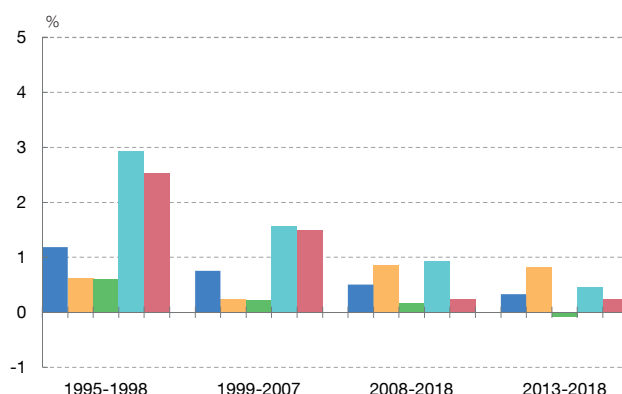
3 SERVICES INFLATION BY COMPONENT

4 NON-ENERGY INDUSTRIAL GOODS INFLATION BY COMPONENT

GERMANY   FRANCE   ITALY   SPAIN

SOURCES: Eurostat and Banco de España.

DOWNLOAD

services items showing high price increases has fallen considerably, both in Spain and in the euro area as a whole.

The ongoing internationalisation of a substantial portion of services might have contributed to easing inflation in this sector. From a global standpoint, the weight of services in total goods and services exports more than doubled from 1970 to 2014, rising to 20% in this latter year. The weight of services in global value chains has also increased. These developments have made for an increase in this sector's degree of exposure to global competition-related factors, and they have added

Chart 2.5

SERVICES INFLATION IN SPAIN

The reduction in services inflation is of particular significance in countries, like Spain, which posted a positive differential with the rest of the euro area, largely on account of services.

1 CONTRIBUTIONS TO THE SPAIN/EURO AREA INFLATION DIFFERENTIAL
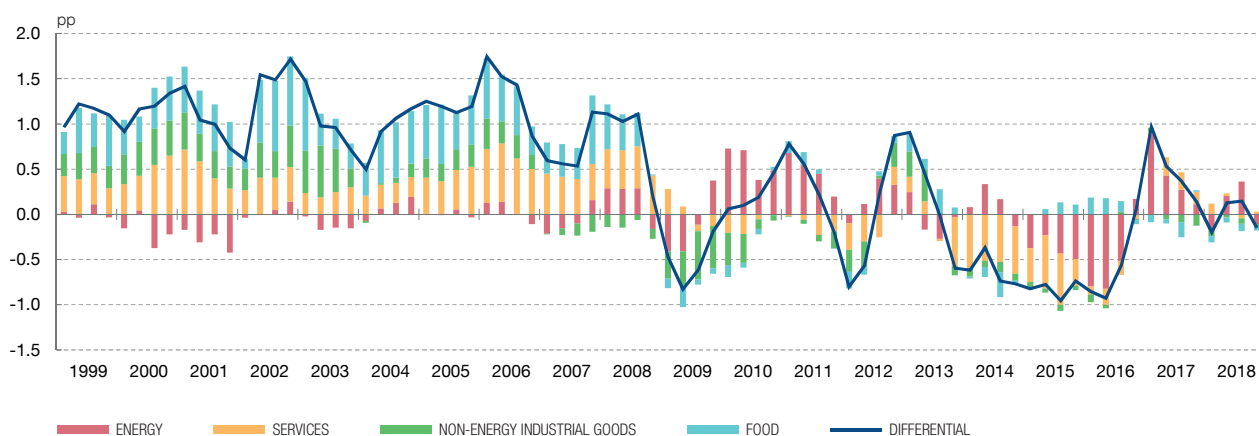
2 CONTRIBUTION OF THE SERVICES COMPONENT TO THE SPAIN / EURO AREA INFLATION DIFFERENTIAL (a)
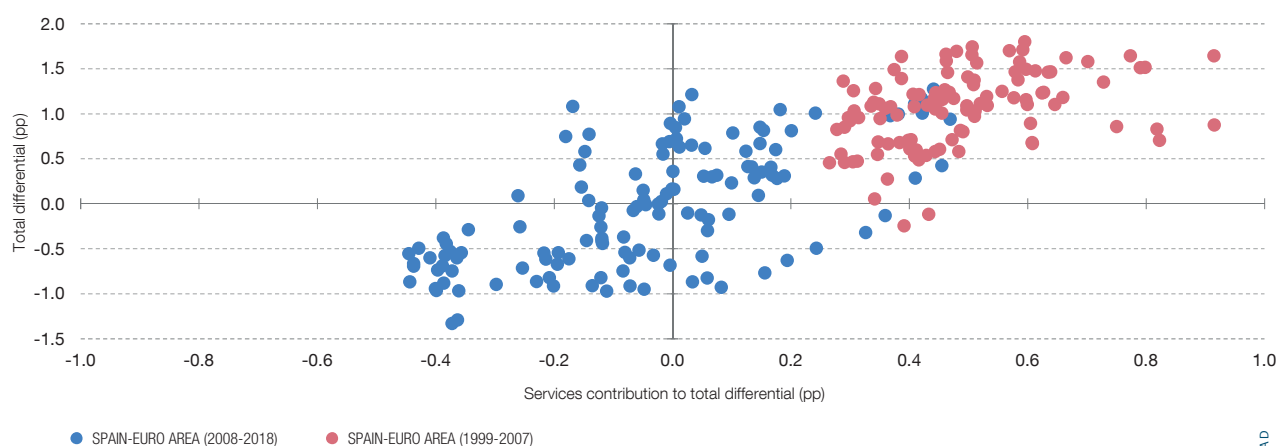
SOURCES: Eurostat and Banco de España.

a Monthly data.

downward pressure to the rate of increase of prices not only in the services sector itself, but also in the economy as a whole.[25]

The Spanish economy has been no exception as far as the internationalisation of the services sector is concerned. The weight of services sector value added in total exports stood at slightly over 55% in 2015[26], marginally up on 2005, in line with

---

25 See Loungani, Mishta, Papageourgiu and Wang (2017).

26 Drawing on the information in the OECD's Trade in Value Added (TiVA) database, published in December 2018.

Chart 2.6
NON-ENERGY INDUSTRIAL GOODS AND SERVICES COMPONENTS

Under services, disinflation by component was across the board.

1 NON-ENERGY INDUSTRIAL GOODS. SPAIN
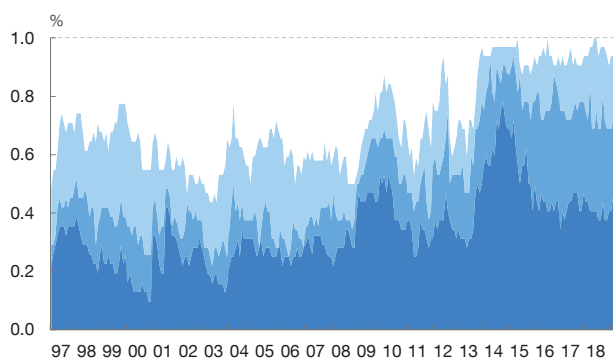
2 SERVICES. SPAIN
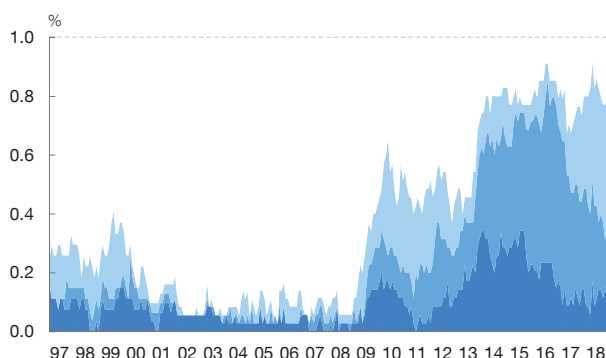
3 NON-ENERGY INDUSTRIAL GOODS. EURO AREA
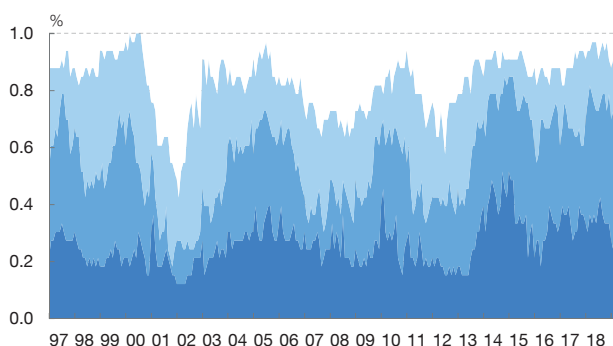
4 SERVICES. EURO AREA
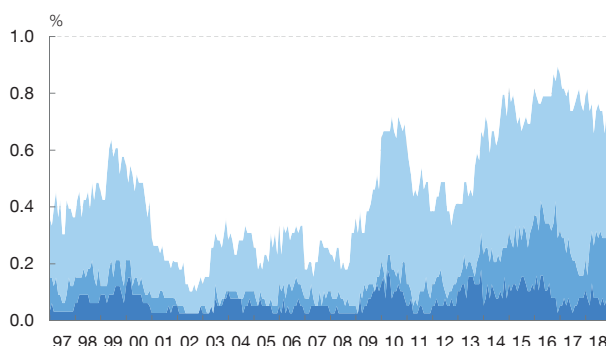
<0   0-1   1-2   > 2

SOURCES: INE, Eurostat and Banco de España.

the trend observed in the euro area as a whole (see Chart 2.7.1). Further, manufacturing exports include around 35% of services in their production, and there has been some increase in the value added of services of domestic origin, which may be indicative of improved competitiveness in this sector. Regarding the import facet (Chart 2.7.2), the data also point to a growing internationalisation of the services sector, which is responsible for 30% of the intermediate goods imports of the economy in total. These imported inputs are part both of the services earmarked for the Spanish market and of those provided abroad. This latter component is gaining significantly in importance.

Against this background, the composition effects in the consumption basket take on importance, given the progressive increase in the weight of services. Both in Spain and in the euro area as a whole, services and energy have gained

Chart 2.7
THE ROLE OF SERVICES IN EXPORTS AND IMPORTS

The ongoing internationalisation of a major portion of services might have contributed to alleviating inflationary processes in this sector.

1 WEIGHT OF VALUE ADDED OF SERVICES IN EXPORTS
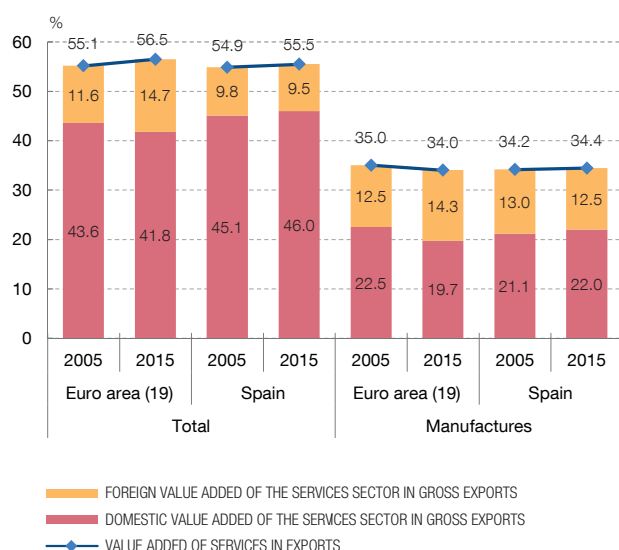
2 THE ROLE OF SERVICES IN INTERMEDIATE GOODS IMPORTS

FOREIGN VALUE ADDED OF THE SERVICES SECTOR IN GROSS EXPORTS
DOMESTIC VALUE ADDED OF THE SERVICES SECTOR IN GROSS EXPORTS
VALUE ADDED OF SERVICES IN EXPORTS

INTERMEDIATE GOODS AND SERVICES ABSORBED IN DESTINATION
INTERMEDIATE GOODS AND SERVICES RE-EXPORTED TO A THIRD COUNTRY
WEIGHT OF INTERMEDIATE GOODS IMPORTS
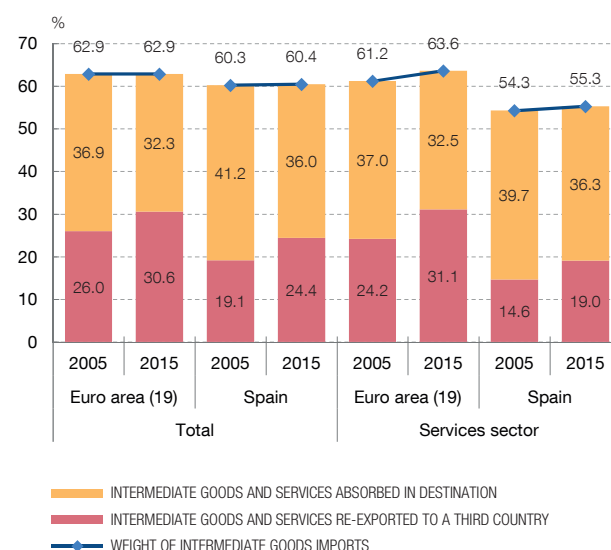
SOURCE: OECD, [Trade in Value Added (TiVA), December 2018].

weight in the consumption basket in recent decades, at the expense of other goods (see Chart 2.8.1). Services have risen from accounting in 1999 for 31% and 36% of total spending in Spain and in the euro area, respectively, to 43% and 45% in January 2019. The increase has been more marked in Spain than in the rest of the large euro area economies (see Chart 2.A.3). Accordingly, less inflationary pressure in services would lead through this composition effect to less aggregate dynamism in prices. Energy, for its part, has gained weight in the past two decades, particularly in Spain: it rose from 7% to 12% between 1999 and 2019, while in the euro area as a whole its increase was more limited (from 9% to 10% over the same period).

3.3 The fluctuations in the inflation rate are now determined to a greater extent by energy

The lesser dynamism of core HIPC at present means that euro area inflation is affected to a greater extent by oscillations in energy prices. As Charts 2.9.1 and 2.9.2 show, the influence of this component on aggregate inflation dynamics in the euro area has increased significantly. In the case of the Spanish economy, the volatility of the contribution of energy to the inflation differential with the euro area

Chart 2.8
CHANGES IN THE WEIGHTS OF THE DIFFERENT COMPONENTS

The composition effects in the consumption basket have taken on greater importance, given the progressively greater weight of services.

1 WEIGHT OF HICP SPECIAL GROUPS IN SPAIN AND THE EURO AREA

SPAIN 1999   SPAIN 2007   SPAIN 2019   ● EURO AREA
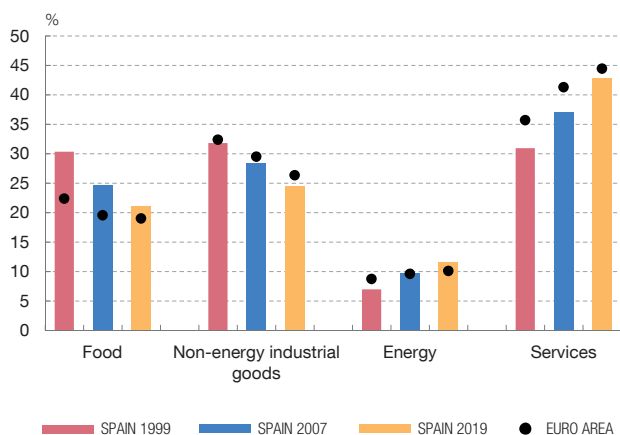
2 EFFECT OF THE CHANGE IN WEIGHTS: CONTRIBUTION OF SERVICES
   TO OVERALL INFLATION

SPAIN: ACTUAL   SPAIN: WEIGHTS 1999
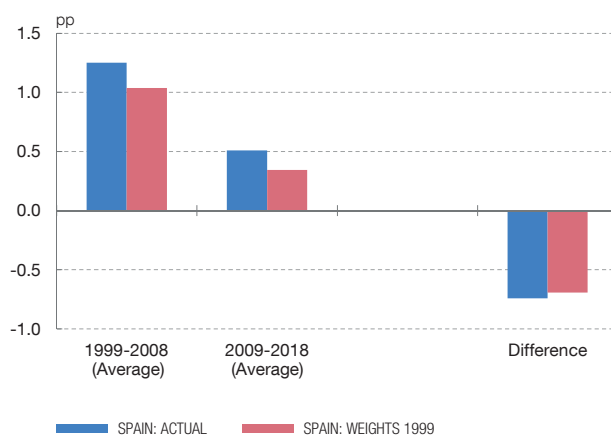
3 WEIGHT OF SERVICES IN THE OVERALL INDEX

ITALY   FRANCE   GERMANY   SPAIN
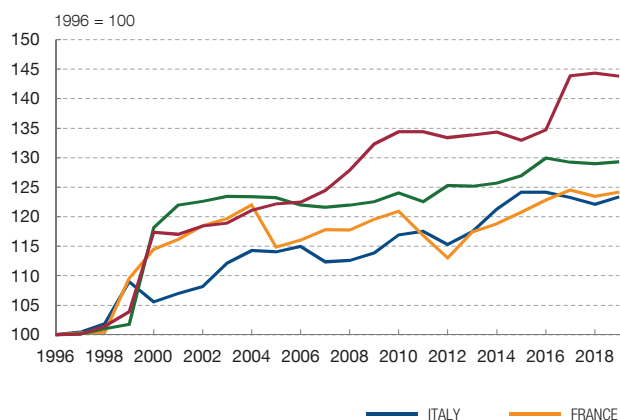
4 WEIGHT OF NON-ENERGY INDUSTRIAL GOODS IN THE OVERALL INDEX
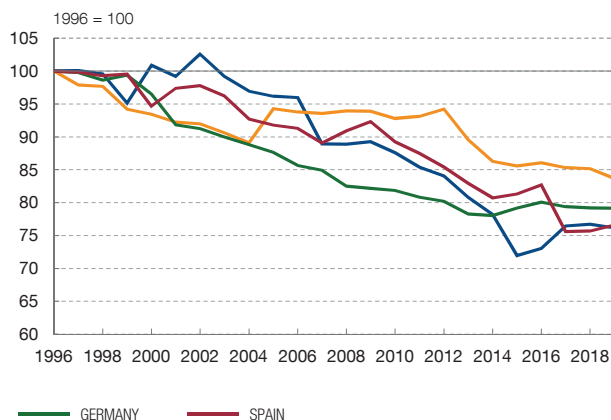
5 WEIGHT OF DIFFERENT COMPONENTS IN THE OVERALL INDEX. SPAIN
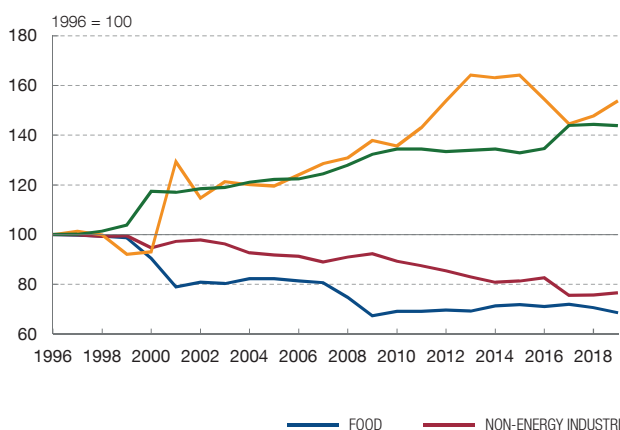
6 WEIGHT OF DIFFERENT COMPONENTS IN THE OVERALL INDEX. EURO AREA

FOOD   NON-ENERGY INDUSTRIAL GOODS   ENERGY   SERVICES

SOURCES: INE, Eurostat and Banco de España.

DOWNLOAD
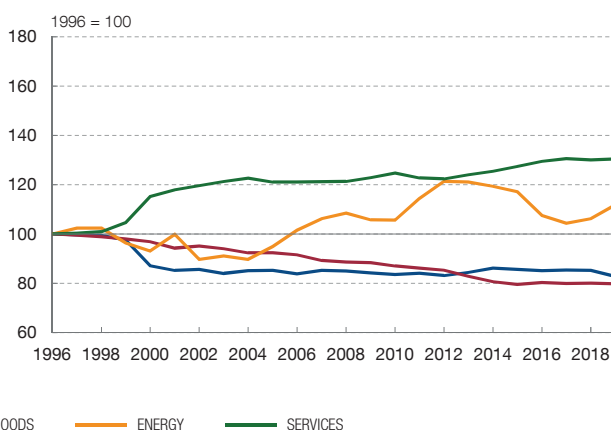
Chart 2.9

THE ROLE OF ENERGY IN INFLATION DYNAMICS

The euro area HICP is now determined to a greater extent by energy fluctuations.

1 CONTRIBUTIONS OF THE ENERGY COMPONENT TO THE INFLATION
DIFFERENTIAL WITH THE EURO AREA (1999-2007)

Monthly data, energy contribution to the total differential (pp)

2 CONTRIBUTIONS OF THE ENERGY COMPONENT TO THE INFLATION
DIFFERENTIAL WITH THE EURO AREA (2008-2018)

Monthly data, energy contribution to the total differential (pp)
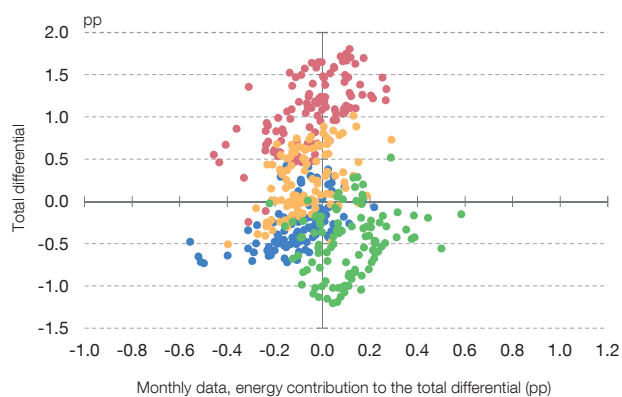
● SPAIN-EURO AREA   ● FRANCE-EURO AREA   ● ITALY-EURO AREA   ● GERMANY-EURO AREA
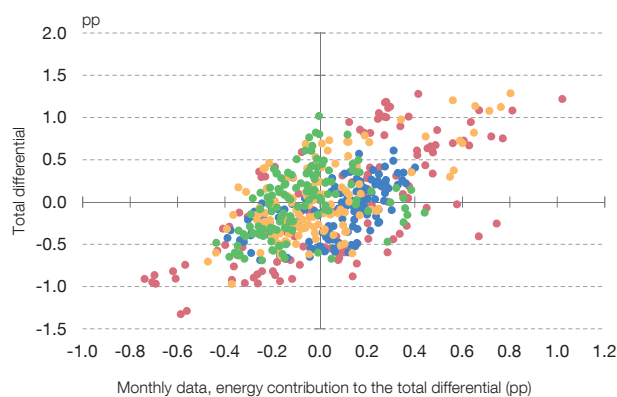
3 CONTRIBUTIONS TO THE SPAIN / EURO AREA INFLATION DIFFERENTIAL
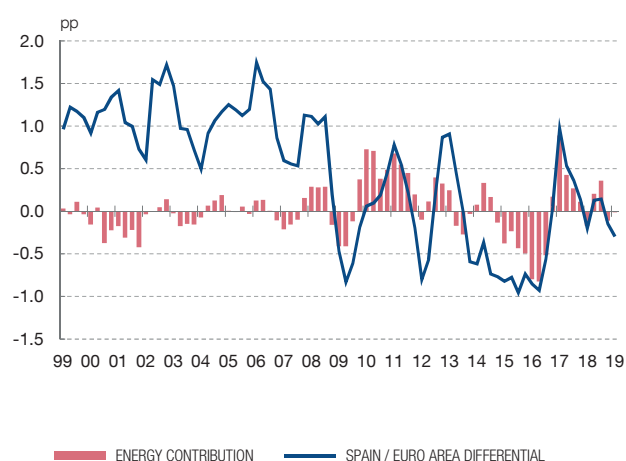
■ ENERGY CONTRIBUTION   — SPAIN / EURO AREA DIFFERENTIAL

4 COUNTRY-BY-COUNTRY CONTRIBUTIONS TO THE INFLATION DIFFERENTIAL
WITH THE EURO AREA

■ OTHER   ■ ENERGY
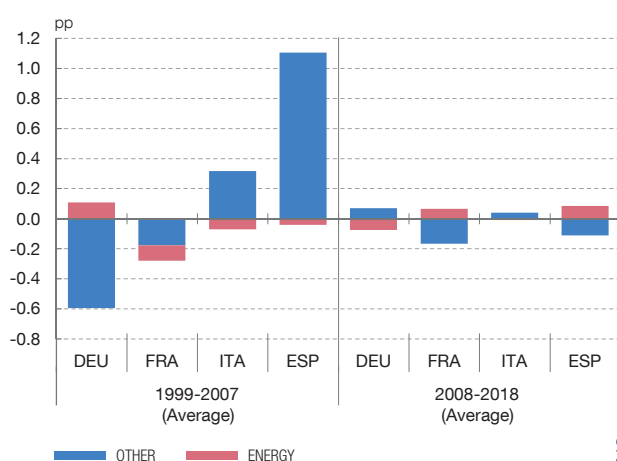
SOURCES: Eurostat and Banco de España.

has increased 2.4 times in the past decade compared with the previous one (see Chart 2.9.3), a slightly higher multiple than that of Italy (2.3), and higher than Germany and France (1.4 and 1.3, respectively).[27]

---

27   There have been changes in recent years in the international energy market that have limited the rise in oil prices, particularly those related to the greater presence of renewable energies and the introduction of fracking extraction techniques.

In Spain's case, in addition to the greater weight of energy in the aggregate, there are idiosyncratic reasons that lead the volatility of this component to feed through more acutely to the overall index. The tax rates of vehicle fuel excise duties are lower in Spain than those in force in most euro area countries. That means that the responses to changes in oil prices are greater in the Spanish economy. Moreover, following the introduction of auctions for the setting of wholesale electricity prices in 2007, these prices have shown much greater volatility. This, too, affects fluctuations in the inflation differential vis-à-vis the euro area.

4   Some conditioning factors of recent inflation dynamics

4.1   Reforms and demand-side factors (including fiscal policy) account for the greater easing in inflation in Spain (and other peripheral countries)

During the crisis several euro area economies introduced structural reforms and undertook competitive adjustment processes, which are expected to have contributed to more contained price dynamics. Specifically, the countries that showed a higher level of macrofinancial vulnerability during the first half of the current decade, such as Portugal, Greece, Ireland and Spain, posted average inflation from 2013 to 2018 of 0.4%, compared with 0.9% for the euro area as a whole. And that despite the more frequent and higher increases in indirect taxation in those countries during that period. Within this group of countries, taking Spain as a reference, the macroeconomic model known as JoSE (Joint Spain-Euro area model)[28] can be used to analyse the relative contribution of inflation determinants in relation to the euro area. This model decomposes the deviations in inflation in the 2008-2018 period in respect of their long-term value in Spain and in the euro area, in terms of the contribution of a set of structural and transitory shocks (see Chart 2.10).

Wage containment dynamics have played a significant role in explaining lower inflation in Spain compared with the euro area in the most recent period. Wages made a clearly inflationary contribution in the first phase of the financial crisis (2008-2009), with a persistent impact, given the high inertia in price-setting processes. There was a turnaround in this trend as from 2010-2013 (see Chart 10.3), whereafter negative wage shocks became central to explaining the downward deviations in inflation in relation to its average. This wage moderation came about against the background of the competitive adjustment in the economy. Contributing to this were the labour market reforms that came into force over that period, and the

---

28   See Almeida, Hurtado and Rachedi (2019).

Chart 2.10
STRUCTURAL BREAKDOWN OF INFLATION IN SPAIN AND IN THE EURO AREA (a)

Inflation in Spain eased more than in the euro area owing to the greater influence of labour costs and of demand (including fiscal)

1 PRIVATE DEMAND

2 PUBLIC DEMAND

SPAIN ▬▬ EURO AREA ▬▬

3 MARK-UP IN WAGES

4 CONVENTIONAL MONETARY POLICY

SPAIN ▬▬ EURO AREA ▬▬

5 EXTERNAL: SPAIN

6 EXTERNAL: EURO AREA

EURO AREA ▬▬ REST OF THE WORLD ▬▬
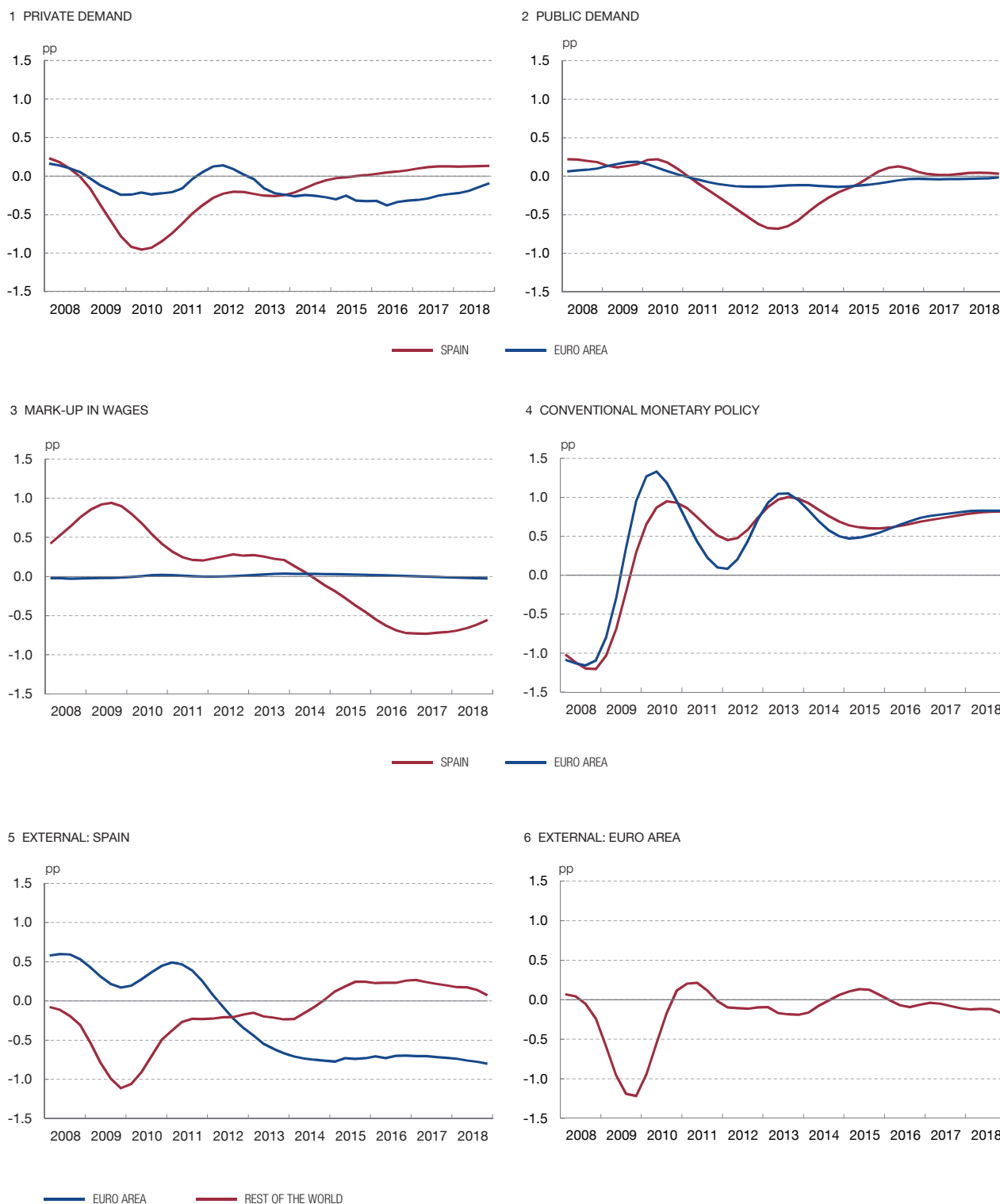
SOURCE: Banco de España.

a Inflation, excluding energy and foods. The contributions of the inflation determinants in Spain and in the euro area are presented using the JoSE model.

DOWNLOAD

fiscal consolidation measures that adversely affected civil servants' wages. Both factors explain a considerable portion of the reduction in the average differential between Spain and the euro area in recent years, since wage moderation in the area as a whole was much less during this phase.

In the economies most acutely affected by the sovereign debt crisis, fiscal policy played a more contractionary role, which contributed to lower inflation. This is the case for Spain, in particular, as Chart 2.10.2 shows. The need to control public finances imbalances against a background of government debt market instability led contractionary budgetary policies to be implemented at recessive cyclical junctures (i.e. procyclical policies), which partly explains the lower growth of activity and prices in the 2011-2014 period. In the euro area as a whole, the effects of the fiscal measures adopted in that period were comparatively smaller.

Monetary policy contributed positively to the rise in inflation and in output, during the crisis and the current upturn. Its contribution has been positive both in Spain and in the euro area as a whole, practically since the onset of the recession (see Chart 2.10.4). The ECB's monetary policy has provided a notable stimulus in recent years. It has kept policy interest rates at historically low levels, and has applied unconventional measures, including quantitative easing (asset purchase programme and long-term refinancing operations) and forward guidance. All these measures have helped ease financial conditions. They have become one of the underpinnings of the economic recovery in the euro area, thus contributing to checking deflationary trends.[29]

Private domestic demand shocks are another relevant factor. In the initial phase of the crisis these shocks, potentially reflecting negative confidence effects, contributed notably to easing inflation, especially in Spain. Indeed, compared with the rest of the euro area as a whole, the crisis had a more lasting and acute effect on Spain. From 2014 onwards, the Spanish economy began to pick up sharply. That saw the negative contribution progressively peter out, to the point of contributing positively to the rise in prices in the more recent period.

Finally, the dynamics of the shocks originating abroad prompted negative deviations in Spain's inflation relative to its trend throughout the crisis and the recovery. Chart 2.10.5 shows how, during the initial phase of the crisis, these external deflationary shocks stemmed principally from the rest of the world and were linked to an across-the-board decline in aggregate demand. As from 2012, by contrast, the shocks were primarily from the other euro area countries. In the case of the euro area, external flows have exerted limited influence on inflationary dynamics in the economic upturn. Hence, the influence of shocks originating in the rest of the euro

---

29 See Banco de España (2016) for estimates of the impact of monetary policy on economic growth and inflation, throughout the crisis and the recovery, in Spain and in the euro area.

area are estimated to have contributed to narrowing the inflation differential between Spain and the euro area as a whole.

4.2 The cyclical sensitivity of inflation in the euro area is generally low

The responsiveness of inflation to cyclical conditions depends on the structure of each economy and may vary over time.[30] As discussed in the first section, a portion of the inflation deviations relative to the long-term trend is on account of economic fluctuations. Their responsiveness, or cyclical sensitivity, will be greater in situations in which firms more frequently change prices (a lesser degree of "nominal stickiness"). That, in turn, will depend on the degree of market competition (related, in part, to the degree of economic openness), and on wage-formation processes (see Box 2.4). Furthermore, the information available from surveys points to the presence of asymmetries in the response by inflation to activity. These arise, for instance, from differing behaviour by firms in the face of changes in their demand, depending on the cyclical position of the economy.[31]

The empirical studies available show high heterogeneity in the estimates of the cyclical sensitivity of inflation. However, there is at the same time consensus as to this sensitivity having diminished in the advanced economies in the past two decades, and being particularly low at present.[32] Some papers highlight the growing importance of foreign economic cycles to explain this lower value, given that an economy's inflation depends on the national and global cyclical positions alike (see, once more, Box 2.3[33]). It is also often pointed out that, in low-inflation situations, agents do not consider inflation as a first-order factor in their decision-making.[34]

The low level of cyclical sensitivity may also be due to the presence of non-linear factors in the relationship between inflation and economic activity. Sensitivity may, in particular, depend on the state of the economy (e.g. if it is in recession or expanding)[35] and on the specific characteristics of this state (e.g. the depth of the recession). Some papers argue that the relationship between capacity utilisation and the inflationary process only operates when the level of inflation

---

30 On the possible asymmetries in the response of inflation to the cycle, see Álvarez, Gómez Loscos and Urtasun (2015) and Cicarelli and Obstat (2017).

31 For example, Álvarez and Hernando (2007) find that Spanish firms respond to a greater extent to the declines in demand proper to recessions than they do to increases in upturns.

32 See, inter alia, Gilchrist and Zakrajšek (2019), Jordà, Marti, Nechio and Tallman (2019) and Luengo-Prado et al. (2018).

33 See also Gilchrist and Zakrajšek (2019) and Berganza, Del Río and Borrallo (2016).

34 See Blanchard (2018).

35 See, in this respect, the evidence for Spain provided by Álvarez, Gómez Loscos and Urtasun (2015), and the references in Cicarelli and Obstat (2017).

Chart 2.11
NON-LINEAR RELATIONSHIP BETWEEN INFLATION AND OUTPUT GAP

The relationship between the output gap and the infaltionary process only operates when the output gap exceeds certain thresholds.
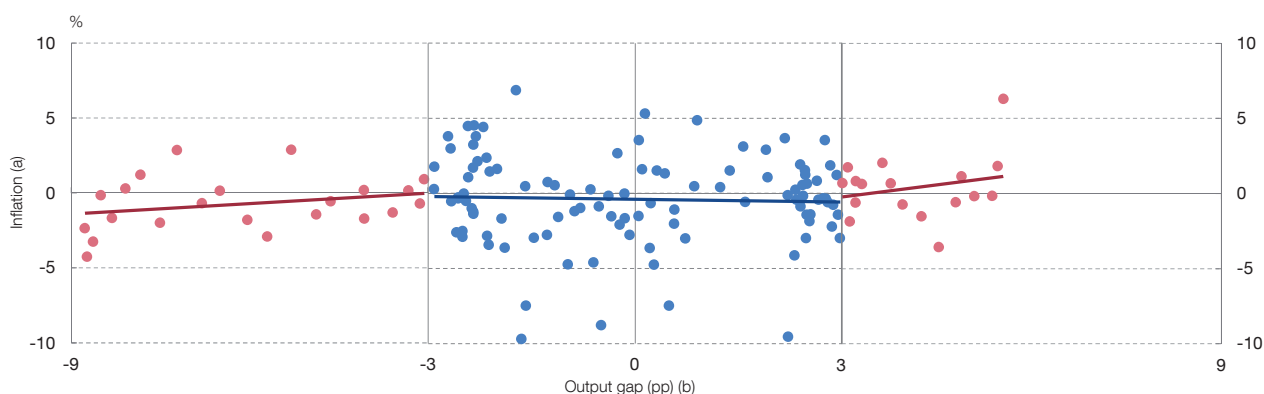
SOURCES: INE and Banco de España [Cuadrado and Moral-Benito (2016)].

a Year-on-year change in the inflation rate.
b Percentage difference between actual and potential GDP level, in relation to potential GDP.

DOWNLOAD

exceeds certain thresholds. This is especially so in the case of expansionary phases, in which the output gap reaches very high figures (see Chart 2.11, for the case of Spain). According to the empirical evidence supporting this hypothesis, the progressive closing of the output gap seen in the current upturn would be compatible with the absence of inflationary pressures, insofar as this gap is still some distance off the estimated thresholds for the positive relationship with inflation to be significant.[36]

Some studies for the euro area have tested the possibility that there is time variability in the cyclical sensitivity of inflation. According to these papers[37], at the height of the financial crisis there would have been an increase in this sensitivity, which might be compatible with a reduction in the nominal rigidities potentially linked to the depth of the recession[38] (see Chart 2.12). However, the sensitivity of domestic cyclical conditions would have subsequently lessened[39], to rise again to values consistent with its historical average in the most recent period.[40] This latter

---

36   See Cuadrado and Moral-Benito (2016) for the Spanish case, and the references cited therein for further examples.

37   See Leiva-Leon, Pérez, Pérez-Quirós and Urtasun (2019).

38   See also Álvarez, Gómez Loscos and Urtasun (2015).

39   Luengo-Prado et al. (2018) document the existence of a structural break in the slope of the Phillips curve around 2009-2010. According to the evidence based on CPI sectoral data for the United States, these authors show how the co-movement between inflation rates and the degree of labour market slack, by sector, weakened substantially and turned to practically zero, in general, in the years immediately following this structural break.

40   The results presented for the case of the euro area are practically identical to those provided by Stevens and Wauters (2018).

Chart 2.12
INFLATION RESPONSE TO THE OUTPUT GAP

The cyclical sensitivity of inflation in the euro area is lower at present, although estimating it is subject to much uncertainty.

1 EURO AREA

2 SPAIN
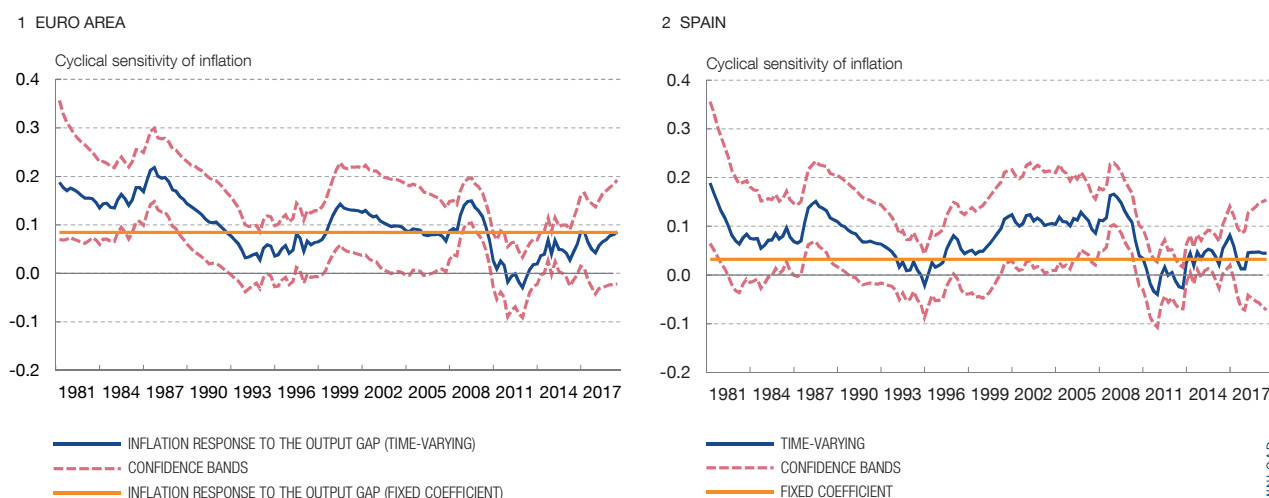
SOURCES: ECB and Banco de España, Leiva-León, Pérez, Pérez-Quirós and Urtasun (2019).

observation might be related to the effects of reforms in some euro area countries – in particular in the labour market – that may have affected the economy's degree of nominal rigidity.[41] . Finally, the apparent lower cyclical sensitivity of inflation in Spain's case, relative to the euro area (Chart 2.12) may be due to the greater relative rigidity of price and wage-setting in the Spanish economy[42], despite the introduction of several new elements in recent years aimed at making the determination of these two variables more flexible.[43]

4.3 The influence of the exchange rate on euro area inflation has increased in recent years

A currency's depreciation exerts upward pressures on imported prices, with this passing through to the entire price chain and, ultimately, to the overall

---

41 The evidence for the case of Spain discussed in Box 2.4 would partially support this explanation. Specifically, it is estimated that the response of wages in Spain to cyclical movements in the unemployment rate increased in the phase immediately following the 2012 labour market reform, probably reflecting the impact of the different measures of internal flexibility approved. Regarding the recent period of recovery, the estimated wage elasticity is somewhat higher than that observed in similar cyclical phases, although the difference is not statistically significant.

42 See, for instance, Cuadrado, Hernández de Cos and Izquierdo (2011).

43 Among the main reforms in this respect are those pertaining to the labour market, which added further flexibility to firms' possibilities of adjusting labour costs in recessive periods, and the law on deindexation.

Chart 2.13
INFLATION RESPONSE TO THE EXCHANGE RATE

The pass-through of exchange rate shocks to euro area inflation is higher at present.

1 BREAKDOWN OF THE GROWTH OF THE NOMINAL EXCHANGE RATE
   OF THE DOLLAR AGAINST THE EURO
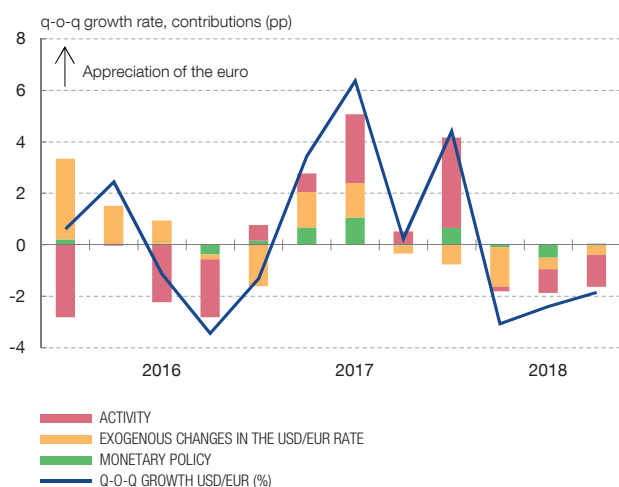
2 SPAIN: EFFECT OF EXOGENOUS EXCHANGE RATE SHOCKS ON INFLATION
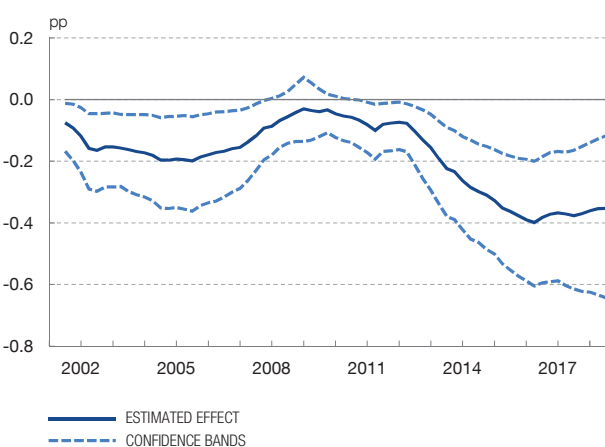
SOURCE: Leiva-León, Martínez-Martín and Ortega (2019a).

level of consumer prices. The pass-through to consumer prices of changes in the exchange rate of the euro depends on a broad set of structural and cyclical factors.[44] Structural factors include most notably: the degree of trade openness and integration into the global value chains of production; the influence of competition on international markets and on the market power of exporting firms; the currency in which international trade is billed; and price stickiness. Influential among the cyclical factors are the situation of the economy in terms of growth and inflation, and monetary policy measures.

Exchange rate developments are determined by the effect of economic shocks. These may be domestic or external, or demand-side or supply-side. And they may also stem from monetary policy action or some other factors related to changes in the confidence of agents that operate on foreign exchange markets in favour of one economy against another. As Chart 2.13.1 shows, the depreciation of the euro against the dollar in the last three quarters of 2018, on average, might have been due, according to this analysis[45], mainly to the lower growth of the euro area relative to the United States. Along with this factor, others, not necessarily relating to

---

44   See Leiva-León, Martínez-Martín and Ortega (2018).

45   See Leiva-León, Martínez-Martín and Ortega (2018). On the determinants of the pass-through of the exchange rate to prices, see Forbes (2016).

fundamentals regarding economic activity or monetary policy, also played a relevant role. As a result, the capital markets placed relatively less confidence in the euro. Finally, to a lesser extent, the ECB's monetary policy was perceived to have become somewhat more lax – in relative terms – than the previous year, which also contributed to the depreciation in question.

The empirical evidence shows that, in particular, the effect on inflation of exchange rate movements due to factors not based on fundamentals has increased in the main euro area countries. These dynamics can be seen in Chart 2.13.2 for the Spanish economy, although the pattern is similar in Germany, France and Italy. In particular, it is the energy component in overall inflation – which is more volatile and has a high import content (and which is therefore more exposed to exchange rate fluctuations) – that would react most sharply to a change in the exchange rate.[46] Hence, an exchange rate movement due to exogenous factors, i.e. not based on fundamentals relating to economic activity or monetary policy, would currently have a greater impact on inflation than at the start of this century.

4.4 Prices, wage costs and mark-ups in the Spanish economy and the euro area

As earlier indicated, wage moderation has been a determinant of the lesser dynamism of domestic prices in Spain, in both absolute and relative terms vis-à-vis the euro area.[47] During the crisis, the containment of ULCs initially rested on apparent labour productivity gains, linked to the high rate of job destruction. But subsequently, the moderation in wage growth contributed to prolonging the path of compression of labour costs. The small increases in labour costs, however, were not unconnected to the low inflation environment in which wage bargaining unfolded, especially as from 2010 (see Box 2.4).

The pass-through of the reduction in labour costs to prices has been partial, as the behaviour of business mark-ups also plays a pivotal role in price-setting. Mark-ups reflect producers' capacity to pass through changes in costs to their sale prices. The trend of mark-ups during the crisis was markedly countercyclical in Spain, compared with the cyclical pattern seen in other European countries. From the standpoint of the behaviour of Spanish firms, the increase in mark-ups during the early years of the recession is largely due to their responding to more restrictive

---

46   See Leiva-León, Martínez-Martín and Ortega (2019).

47   In the foregoing sections, price developments have been analysed through the HICP. This measures the prices of a basket of goods and services intended for consumption, and includes both domestically produced and imported goods and services. Yet for other purposes it is useful to analyse a basket of goods intended also for investment or for export, and the role of the decisions of agents, workers and firms in price-setting. In this case, it is necessary to resort to the implicit GDP or value added deflator.

financing conditions, even at the risk of undergoing lasting losses in market share.[48] Continuing high mark-ups in the recovery period, from 2014, in a setting marked by much more favourable financial conditions both euro area-wide and in Spain, might point to competition problems in certain sectors.[49]

More recently, however, the quickening in labour costs has coincided with an easing in business mark-ups. As a result, inflation has held at very moderate rates in Spain and in the euro area. Against a backdrop of economic recovery, the partial pass-through by firms of the increase in labour costs to prices would be due to their intention not to lose market share in the medium term.[50] This effect might be more persistent in those countries, such as Spain, in which the decline in labour costs did not feed through fully to prices in the initial years of the crisis. That provided for a substantial increase in business mark-ups in that period and, in the recent circumstances, they might act as a buffer for absorbing cost rises without significantly affecting prices.

The analysis by productive sector confirms the diagnosis of the differences in the inflationary trend of industrial goods and of services. Chart 2.14 shows the recent trend of the determinants of the value added deflator, labour costs and mark-ups (the latter proxied by the unit surplus), in different sub-periods, compared with the euro area. In the pre-crisis period, the higher relative increases in ULCs in Spain contributed significantly to creating Spain's positive inflation differential vis-à-vis the euro area, in particular in the case of services. During the 2008-2013 period the differences in inflation between both areas narrowed, essentially owing to the lesser dynamism in Spain of ULCs in both sectors. However, the relatively more expansionary behaviour of mark-ups in Spain contributed to lessening the intensity of the relative adjustment of prices. Thereafter, these two sectors have retained a negative inflation differential vis-à-vis the euro area, which is attributable to the lower growth of ULCs in services and of business mark-ups in industry.

5 Inflation outlook

Core inflation forecasts for the euro area have been systematically revised downwards in the past two years. Overall inflation forecasts have, for their part, followed a course greatly influenced by the profile of changes in energy prices.

---

48   See Montero and Urtasun (2014).

49   For a more detailed discussion on the macroeconomic implications of the latest dynamics of mark-ups and business competition, see, inter alia, IMF (2019) and Autor, Dorn, Katz, Patterson and Van Reenen (2017), and the references cited in these articles.

50   See Gilchrist, Schoenle, Sim and Zakrajšek (2017) and Roldán and Gilbukh (2018).

Chart 2.14
DEFLATORS AND COSTS: SPAIN AND EURO AREA

The analysis by productive sector confirms the diagnosis on the differences in inflation for industrial goods and for services.

1 INDUSTRY AND ENERGY (a)
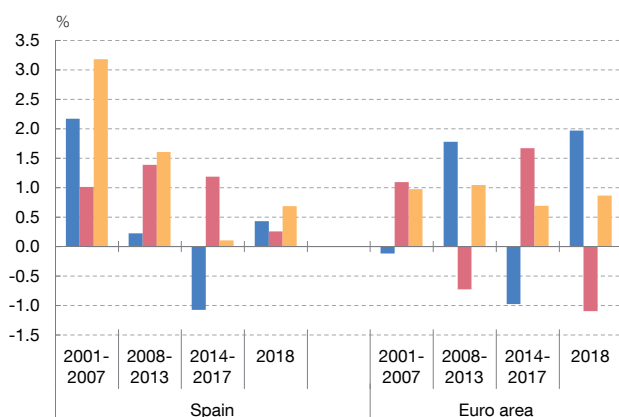
2 MARKET SERVICES (a)
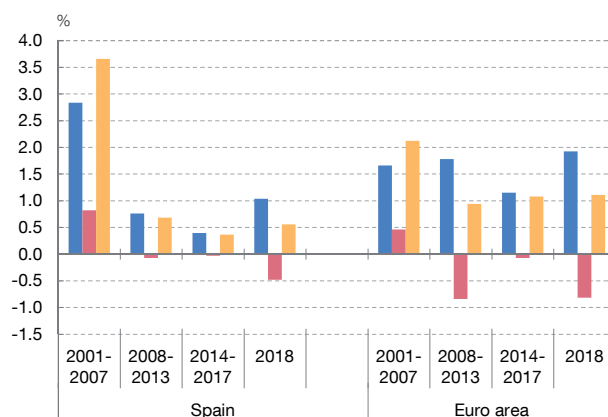
ULCs   UNIT SURPLUS   GVA DEFLATOR

SOURCES: INE and Eurostat.

a Average of several periods.

DOWNLOAD

Charts 2.15.1 to 2.15.3 illustrate both variables. They show how the forecasts for Spain and the euro area for 2018 and 2019 – published quarterly by the ECB and the Banco de España as part of their macroeconomic projections exercises – have been progressively revised. These revisions have come about in a context in which, taking the entire reference period (2017-2018), the GDP growth forecasts for the euro area and for Spain were revised upwards. According to the analysis provided in this chapter, this recent evidence would be consistent with a weak cyclical sensitivity of inflation.

In the specific case of 2018, the downward revisions of the core inflation rate were across the board in terms of countries and sectors, particularly in services. The more recent easing in services inflation, documented in this chapter, might hold over time. That would lessen the inflationary pressures in a sector that has historically contributed to rises in inflation at times of economic recovery, especially in countries such as Spain. Also, from the standpoint of composition by country, the current situation of low euro area inflation might be extended if the ongoing convergence of HICP rates of change in the traditionally more inflationary countries (Spain, Portugal, Greece and Italy) on those of the core countries were eminently permanent in nature. As described in Section 3.1, for this latter group of countries the recently observed core inflation levels are, on average and in historical terms, not in significant contrast to those posted in the first decade of EMU.

Chart 2.15

HICP INFLATION FORECASTS FOR SPAIN AND FOR THE EURO AREA

The core inflation forecasts have been revised systematically downwards in the past two years.

1 EURO AREA OVERALL INFLATION, 2018 AND 2019
2017 and 2018 forecasts
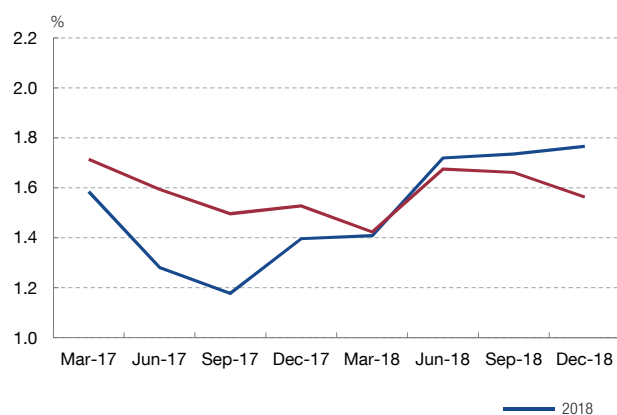
2 SPAIN OVERALL INFLATION, 2018 AND 2019
2017 and 2018 forecasts
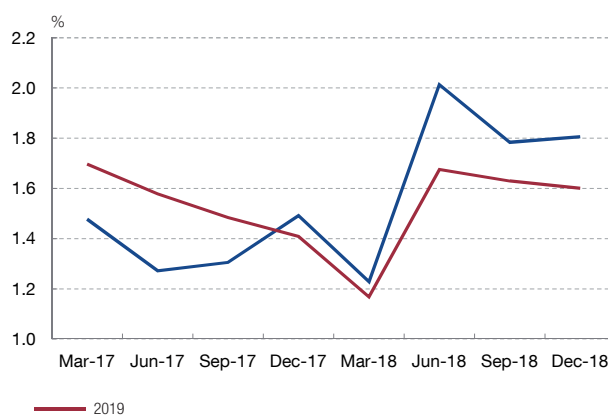
2018 —— 2019 ——

3 CORE INFLATION 2018
2017 and 2018 forecasts

EURO AREA —— SPAIN ——
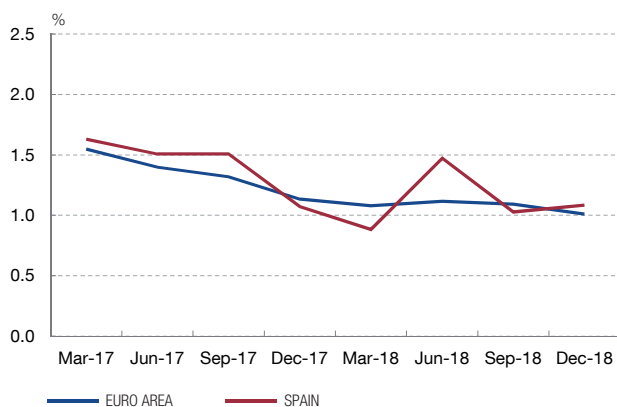
4 EURO AREA: ACTUAL INFLATION AND MARKET EXPECTATIONS (a)

ACTUAL —— 1.3.2019 ——
31.5.2018 (SAPI) —— 3.12.2018 ——

5 EURO AREA INFLATION. REVISION OF FORECASTS (b)

OVERALL INFLATION 2018 Q4 —— 2019 Q1 ——
CORE INFLATION 2018 Q4 —— 2019 Q1 ——
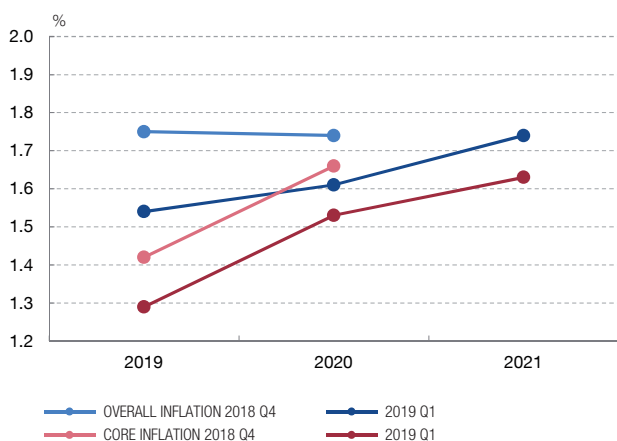
6 EURO AREA: PROBABILITY DISTRIBUTION OF INFLATION FORECASTS
FOR 2020 (b)

2018 Q2 ■ 2019 Q1 ■
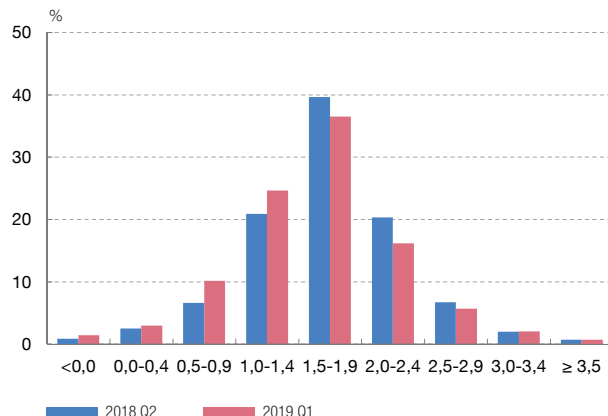
SOURCES: INE, ECB and Banco de España.

a Instantaneous forward inflation rate obtained from inflation swap prices. Each point indicates the annual inflation to be observed at each future moment so that inflation swap agreements entered into on a specific day should not entail any transfer of money between the contracting parties. Given that in these agreements one of the parties offers protection to the other, these rates – in addition to expectations – include a premium for the transfer of the risk.

b Data from the ECB's SPF survey.

DOWNLOAD

Chart 2.16
EFFECTS OF AN INCREASE IN WAGES ACCORDING TO THE MTBE AND JoSE MODELS

In both models an increase in wages generates very moderate inflation effects.

1 WAGES

2 CORE INFLATION

JoSE - (EURO AREA)   JoSE - (SPAIN)   MTBE (SPAIN)
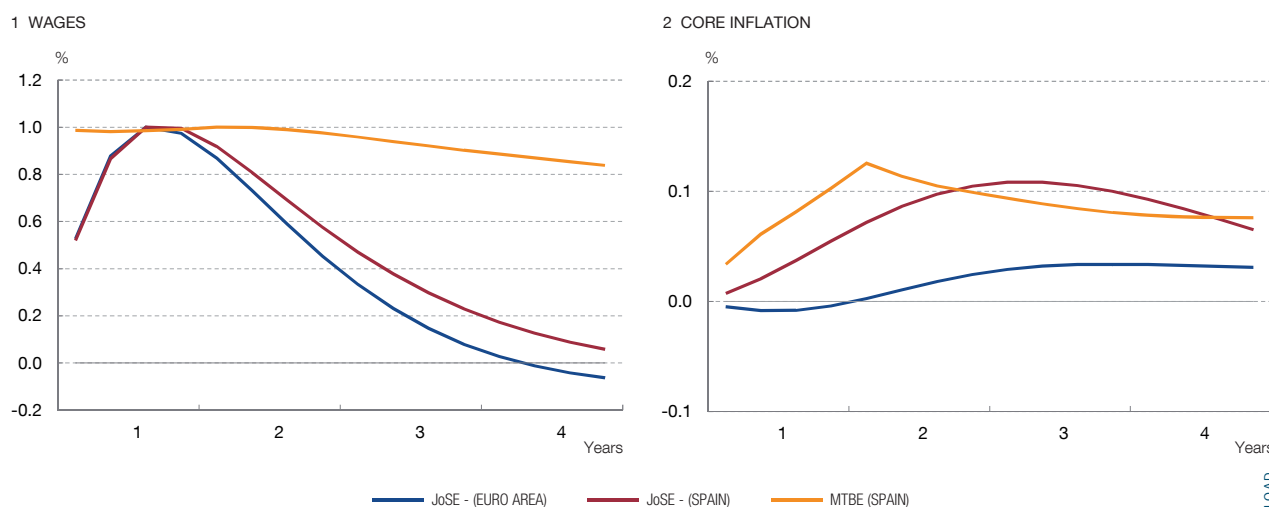
SOURCES: Almeida, Hurtado and Rachedi (2019) and Arencibia, Hurtado, De Luis and Ortega (2017).

The recurrent underestimation of inflation in recent years might reflect a significantly higher than expected degree of persistence in deviations from target. In recent months, inflation expectations at different terms in the euro area as a whole, measured by break-even inflation rates obtained from inflation swap prices, have held clearly below the ECB's objective of 2% (see Chart 2.15.4). This circumstance has also come about in the rates for member countries taken individually. As for other indicators of long-term expectations, trend inflation measures[51] averaged 1.5% for the euro area in 2018, with a degree of cross-country heterogeneity. Specifically, last year the average trend inflation rate for Spain, Italy, Portugal and Greece was estimated at 1.1%, while for the core euro area members (proxied by Germany, France, the Netherlands, Belgium, Austria, Finland and Luxembourg) it stood at 1.6%.

The latest results of the ECB Survey of Professional Forecasters (SPF)[52] are along these same lines. Specifically, for 2019 Q1, the SPF shows downward revisions of inflation expectations for the 2019-2021 period (see Chart 2.16.5), but

---

51   Calculated using the models of Correa-López, Pacce and Schlepper (2019) and Leiva-Leon, Pérez, Pérez-Quirós and Urtasun (2019).

52   The SPF is conducted quarterly and captures expectations relating to the rates of inflation, real GDP growth and unemployment in the euro area for various time horizons, along with a quantitative assessment of the uncertainty surrounding these expectations. Survey participants are experts belonging to financial or non-financial institutions located in the EU.

also in its longer-dated expectations.[53] Chart 2.15.6 shows how, over the past year (comparing the 2018 Q2 survey with the current one), a larger amount of analysts assigned a higher probability of the inflation rate being lower in 2020, whereby the aggregate probability distribution shifted leftwards. At the same time, the probability distributions now show greater breadth, by historical standards, meaning that analysts differ more in their projections than a year ago. This suggests that uncertainty over the future course of inflation (measured by the disagreement in agents' outlook) has risen.

The rise in wages in the euro area, in the past few years, and in Spain, more recently, does not appear to be exerting a significant effect on inflation rates. As analysed, the containment of wage costs played a significant role when it comes to explaining the low inflation during the last crisis, especially in the peripheral euro area economies. Foreseeably, the better current labour market conditions will ultimately be reflected in prices. However, the pass-through to inflation of wage shocks is very weak, according to the models available (*JoSE* and MTBE[54]) (see Chart 2.16). Based on the discussion presented in the previous section, the dynamics of mark-ups may be offsetting some of the possible wage pressures on prices.

In this setting, moreover, supply-side factors might be operating. Their quantification in the short term is, however, very uncertain. According to the analysis in the chapter, the persistence of inflation at levels below the reference of 2% might also reflect, in part, the downward pressures on price stability arising from supply-side factors. These include the impact of digitalisation, globalisation and changes in labour supply linked to population ageing, as analysed in Chapters 3 and 4 of this Report. In sum, the different information sources about the foreseeable course of consumer prices suggest that agents expect the recent moderate pattern of inflation to continue in the near future.

---

53 For further details see the press release summarising the SPF findings.

54 See Arencibia, Hurtado, De Luis and Ortega (2017).

REFERENCES

Aguilar, P., and J. Vázquez (2018). *Term structure and real-time learning*, Working Papers, No. 1803, Banco de España.

Allington, N. F. B., P. A. Kattuman and F. A. Waldman (2005). "One market, one money, one price?", *International Journal of Central Banking,* 1, pp. 73-115.

Almeida, G., S. Hurtado and O. Rachedi (2019). *JoSE: Joint Spain Euro area model,* Occasional Papers, Banco de España, forthcoming.

Altissimo, F., L. Bilke, A. Levin, T. Matha and B. Mojon (2006). "Sectoral and aggregate inflation dynamics in the euro area", *Journal of the European Economic Association,* 4, pp. 585-593.

Álvarez, L. J., L. Gadea y A. Gómez Loscos (2019a). *Low inflation in advanced economies,* Working Papers, Banco de España, forthcoming.

— (2019b). *Inflation interdependence in advanced economies,* Working Papers, Banco de España, forthcoming.

Álvarez, L. J., A. Gómez Loscos y A. Urtasun (2015). "Asymmetries in the relationship between inflation and activity", *Economic Bulletin*, November, Banco de España, pp. 47-53.

Álvarez, L. J., and I. Hernando (2007). "The Pricing Behavior of Spanish Firms", in S. Fabiani, C. Loupias, F. Martins and R. Sabbatini (eds.), *Pricing Decisions in the Euro Area: How Firms Set Prices and Why,* Oxford University Press.

Álvarez, L. J., and I. Sánchez (2018). "Reference variables for analysing inflation in Spain", Economic Notes, *Economic Bulletin,* 3/2018, Banco de España.

Angeloni, I., L. Aucremanne and M. Cicarelli (2006). *Price setting and inflation persistence: did EMU matter?,* European Central Bank Working Papers, no. 597.

Arencibia, A., S. Hurtado, M. de Luis and E. Ortega (2017), *New Version of the Quarterly Model of Banco de España (MTBE)*, Occasional Papers, no. 1709, Banco de España.

Autor, D., D. Dorn, L. F. Katz, C. Patterson, y J. Van Reenen (2017). "Concentrating on the Fall of the Labor Share", *American Economic Review,* no. 107, pp. 180–85.

Ball, L. (1992). "How does inflation raise inflation uncertainty", *Journal of Monetary Economics,* no. 29, pp. 371-388.

Banco de España (2016). "The effect of the ECB's monetary policies in the recent period", Chapter 3 of *Annual Report 2015*.

Bems, R., F. Caselli, F. Grigoli, B. Gruss and W. Lian (2018). *Expectations' anchoring and inflation persistence,* IMF Working Papers, 18/280.

Benati, L. (2008). "Investigating inflation persistence across monetary regimes", *The Quarterly Journal of Economics,* no. 123, pp. 1005-1060.

Berganza, J. C., P. del Río and F. Borrallo (2016). "Determinants and implications of low global inflation", *Economic Bulletin,* November, Banco de España, pp. 54-70.

Bils, M., and P. Klenow (2004). "Some Evidence on the Importance of Sticky Prices", *Journal of Political Economy,* no. 112, pp. 947-985.

Blanchard, O. (2018). "Should we reject the natural rate hypothesis?", *Journal of Economic Perspectives,* no. 32, pp. 97-120.

Brož, V., and E. Kočenda (2018). "Dynamics and factors of inflation convergence in the European Union", *Journal of International Money and Finance,* no. 86, pp. 93-111.

Caporale, G. M., L. Onorante and P. Paesani (2010). *Inflation and inflation uncertainty in the euro area,* European Central Bank Working Papers, no. 1229.

Carney, M. (2015). "Inflation in a globalised world", Economic Policy Symposium, Jackson Hole.

Cicarelli, M., and C. Obstat (eds.) (2017). *Low inflation in the euro area: causes and consequences,* European Central Bank Occasional Papers, no. 181.

Cogley, T., S. Morozov and T. J. Sargent (2005). "Expectations, learning and monetary policy", *Journal of Economic Dynamics and Control*, 29(11), pp. 1893-1925.

Coibion, O., and Y. Gorodnichenko (2015). "Information rigidity and the expectations formation process: a simple framework and new facts", *American Economic Review,* no. 105, pp. 2644-2678.

Correa-López, M., M. Pacce and K. Schlepper (2019), "Exploring trend inflation dynamics in Euro Area countries", Working Papers, no. 1909, Banco de España.

Cuadrado, P., and E. Moral-Benito (2016). "Thresholds in the relationship between inflation and economic activity", *Economic Bulletin,* December, Banco de España, pp. 47-52.

Cuadrado, P., P. Hernández de Cos and M. Izquierdo (2011). "Wage adjustment to shocks in Spain", *Economic Bulletin,* February, Banco de España, pp. 45-55.

Dvir, E. and G. Strasser (2018). "Does marketing widen borders? Cross-country price dispersion in the European car market", Journal of International Economics 112, pp. 134-149.

ECB (2011). *The monetary policy of the ECB*, Frankfurt am Main.

Elding, C., and R. Morris (2018). "Digitalisation and its impact on the economy: insights from a survey of large companies", *Economic Bulletin*, no. 7/2018, European Central Bank.

Estrada, A., J. Galí, and D. López-Salido (2013). "Patterns of Convergence and Divergence in the Euro Area", IMF Economic Review, 61, pp. 601-630.

Evans, M., and P. Wachtel (1993). "Inflation regimes and the sources of inflation uncertainty", *Journal of Money, Credit and Banking,* no. 25, pp. 475-511.

Fischer, C. (2012), "Price convergence in the EMU? Evidence from micro data", European Economic Review, 56, pp. 757-776.

Forbes, K. (2016). "Much ado about something important: how do exchange rate movements affect inflation?", *The Manchester School*, no. 84, pp. 15-41.

Friedman, M. (1977). "Nobel Lecture: Inflation and Unemployment", *Journal of Political Economy,* no. 85, pp. 451-472.

Galesi, A., y O. Rachedi (2019). "Services Deepening and the Transmission of Monetary Policy", *Journal of the European Economic Association,* forthcoming.

Gilchrist, S., R. Schoenle, J. Simy and E. Zakrajšek (2017). "Inflation Dynamics during the Financial Crisis", *American Economic Review,* no. 107, pp. 785-823.

Gilchrist, S., and E. Zakrajšek (2019). *Trade exposure and the evolution of inflation dynamics,* Finance and Economics Discussion Series 2019-007, Washington, Board of Governors of the Federal Reserve System.

Gimeno, R., and E. Ortega (2018). "Euro area inflation expectations", Analytical Articles, Economic Bulletin, 1/2018.

Helbling, T., F. Jaumotte and M. Sommer (2006). "How has globalization affected inflation?", *World Economic Outlook,* Chapter III, International Monetary Fund.

International Monetary Fund (2019). "The rise of corporate market power and its macroeconomic effects", Chapter 2 of the *World Economic Outlook* (April 2019).

Jordà, O., C. Marti, F. Nechio and E. Tallman (2019). *Inflation: Stress-Testing the Phillips Curve,* FRBSF Economic Letter 2019-05.

Leiva-Leon, D., J. Martínez-Martín and E. Ortega (2018). "Recent movements in the euro exchange rate and the impact on inflation in the Spanish economy", Analytical Articles, *Economic Bulletin*, 4/2018, Banco de España.

— (2019). *Exchange Rate Shocks and Inflation Comovement in the Euro Area,* Working Papers, Banco de España, forthcoming.

Leiva-Leon, D., J. J. Pérez, G. Pérez-Quirós and A. Urtasun (2019). *Structural Instabilities in the euro area: Okun vs. Phillips,* Working Papers, Banco de España, forthcoming.

López, C., and D. H. Papell (2012). "Convergence of euro area inflation rates", *Journal of International Money and Finance,* no. 31, pp. 1440-1458.

Loungani, P., S. Mishta, C. Papageourgiu and K. Wang (2017). *World Trade in Services: Evidence from A New Dataset,* IMF Working Paper WP/17/77.

Luengo-Prado, M. J., N. Rao and V. Sheremirov (2018). "Sectoral inflation and the Phillips curve: What has changed since the Great Recession?", *Economics Letters*, no. 172, pp. 63-68.

Mishkin, F. (2007). *Inflation dynamics,* NBER Working Papers, no. 13147.

Mojon, B., and X. Ragot (2019). *Can an ageing workforce explain low inflation?,* BIS Working Papers, no. 776.

Montero, J. M., and A. Urtasun (2014). *Price-Cost Mark-ups in the Spanish Economy: a Microeconomic Perspective*, Working Papers, no. 1407, Banco de España.

Orphanides, A., and J. Williams (2005). *Monetary policy with imperfect knowledge,* Finance and Economic Discussion Series, 2005-51, Federal Reserve Board.

Risksbank (2015). *Digitalisation and inflation,* Monetary Policy Report, February, pp. 55-59.

Roldán, P., and S. Gilbukh (2018). *Firm dynamics and pricing under customer capital accumulation,* Working Papers, no. 1838, Banco de España.

Rosas, E., and T. López (2018). "Inflación e incertidumbre inflacionaria: la postura del Banco de México, 1969-2017", *Revista Finanzas y Política Económica*, 10, pp. 348-372.

Stevens, A., and J. Wauters (2018). *A time-varying parameter Phillips curve model,* National Bank of Belgium.

Stock, J., and M. Watson (2007). "Why has US inflation become harder to forecast?", *Journal of Money, Credit and Banking,* no. 39, pp. 3-33.

Williams, J. (2006). *Monetary policy in a low inflation economy with learning,* Working Paper Series, 2006-30, Federal Reserve Bank of San Francisco.

Box 2.1
THE EFFECT OF RECENT ECB MONETARY POLICY MEASURES ON LONG-TERM INFLATION EXPECTATIONS

Inflation expectations play a key role in the price and wage setting process. Inflation-linked financial assets, which include a price for the protection they provide against future inflation, and which are available daily, are a valuable source of information for estimating agents' future inflation expectations. Inflation swaps are financial contracts in which one party undertakes to pay a multiple of inflation up to a certain date, in exchange for a set amount paid by the other party. This set amount can be understood as compensation for protection against future inflation, and as such contains important information on investor expectations. However, the information content of the price of these assets is clouded by the fact that, like any other form of insurance, it includes a premium for transfer of the risk and a liquidity premium. One alternative for measuring inflation expectations are the various surveys drawing on private analysts' expectations. The advantage of these surveys is that they avoid the problem of the risk and liquidity premia. The drawback is that they are less frequent, generally quarterly, which limits their usefulness for analysing monetary policy.

A recent Banco de España article[1] proposed a measure for long-term euro area inflation expectations combining both sources of information, i.e. surveys and financial market data. The surveys used are the Consensus Forecast surveys, the ECB's Survey of Professional Forecasters and the inflation flash estimate. Chart 1.1 depicts long-term euro area inflation expectations (five-year forward inflation five years ahead, or in other words, in between six and ten years' time), from which the estimated risk premium has been excluded. The chart shows that inflation expectations have remained clearly below 2% since 2005 (the first date from which the data availability permits this analysis) to date.

Over the course of the period studied, there were two notable dips in these inflation expectation indicators. The first, in 2008-09, during the global financial crisis following the collapse of Lehman Brothers, was very marked. The second, between 2013 and early 2015, was much more gradual and gave rise to growing concern regarding a possible deanchoring of expectations in the euro area. In both cases the ECB introduced non-standard monetary policy measures to reverse the downward inflation trajectory. These measures generally proved effective, reversing the change observed. In particular, the launch of the ECB's asset purchase programme (the public sector purchase programme or PSPP) in early 2015 marked a turnaround in the long-term expectations, which have risen gradually since then, fortified by the subsequent extensions to the programme. Accordingly, in mid-2018, long-term inflation expectations were similar to those observed between 2005 and 2007 (and in 2011-12).

However, during 2018 Q4 long-term inflation expectations declined, against a backdrop of marked deterioration of euro area economic growth forecasts. This downturn in inflation expectations is still too incipient for firm conclusions to be drawn on its degree of persistence. In any event, the change observed demands that closer attention be paid to the possible signs emanating from these indicators, in order to correctly calibrate the future monetary policy stance.

Chart 1.2 presents a similar analysis for the United States. Here, long-term inflation expectations are much higher than in the euro area: around 2.5% before the crisis and around 2.3% since the start of monetary normalisation. This difference is consistent with the US economy's more advanced cyclical position, although there may also be other contributory factors. The chart shows that in the United States also, the various non-standard monetary policy measures introduced had varying impacts on inflation expectations. The slump in inflation expectations following the global financial crisis was successfully offset by the quantitative easing (QE) programmes.[2] Moreover, as is now happening in the euro area, when the net asset purchases came to an end inflation expectations also declined, although they ultimately reversed, so that expected inflation has steadied at just over 2.3%.

To conclude, following the crisis the monetary policies of the main economies have had to offset certain downward moves in inflation expectations, using measures not until then included among central banks' tools, in order to steady this key component of the price and wage setting process.

---

1 See R. Gimeno and E. Ortega (2018), "Euro area inflation expectations", *Economic Bulletin*, 1/2018, Banco de España.

2 See R. Reis (2016), *Funding Quantitative Easing to Target Inflation,* CEPR Discussion Paper No. DP11505.

Box 2.1

THE EFFECT OF RECENT ECB MONETARY POLICY MEASURES ON LONG-TERM INFLATION EXPECTATIONS (cont'd)

Chart 1
MARKET INFLATION EXPECTATIONS IN THE EURO AREA AND THE UNITED STATES

The Eurosystem's non-standard monetary policy measures proved effective in reversing the downward path of long-term inflation expectations in the euro area, both when they fell sharply during the global financial crisis in 2008-09 and when they declined much more gradually between 2013 and early 2015, when concerns arose regarding a possible deanchoring of expectations in the euro area. In the United States, non-standard monetary policy measures also shaped long-term inflation expectations, to a varying extent.

1 EURO AREA
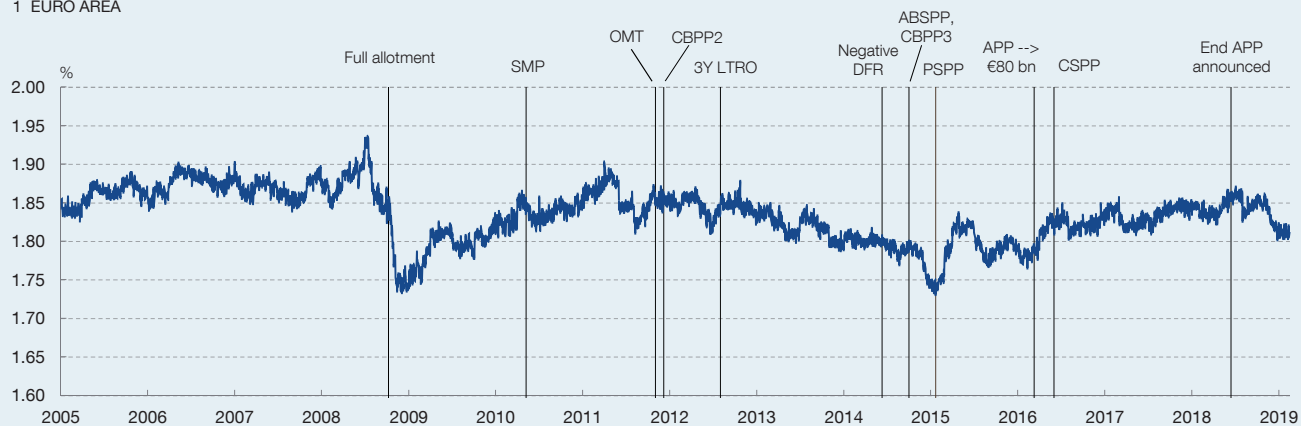
2 UNITED STATES

SOURCE: Banco de España, based on swap rates at different terms supplied by Datastream.

Box 2.2

STRUCTURAL FACTORS AND INFLATION DYNAMICS

Recent literature has identified a set of factors that could be pushing global inflation rates persistently downwards, particularly in advanced economies. Noteworthy among these factors are the structural consequences of population ageing, the globalisation process (with greater trade openness and exposure to international competition) and the impact of new technologies (digitalisation and new forms of trade).

In particular, the process of population ageing in advanced economies could contribute to a more reduced trend inflation through several channels, as described in Chapter 4 of this report. First, the weight in the older population's consumption basket of the more inflationary goods and services is, overall, comparatively lower than for other age groups, leading to lower general price increases owing to a composition effect. Also, since the accumulation of net

Chart 1
FACTORS CONDITIONING INFLATION IN THE LONG TERM

Demographic changes and globalisation may affect inflation dynamics. The so-called "digital revolution" is also one of the global factors that might be inducing downward pressure on prices.

1 WORLD TRADE IN GOODS AND SERVICES (REAL)
Volume index

2 IMPORT PRICES IN REAL TERMS (a)
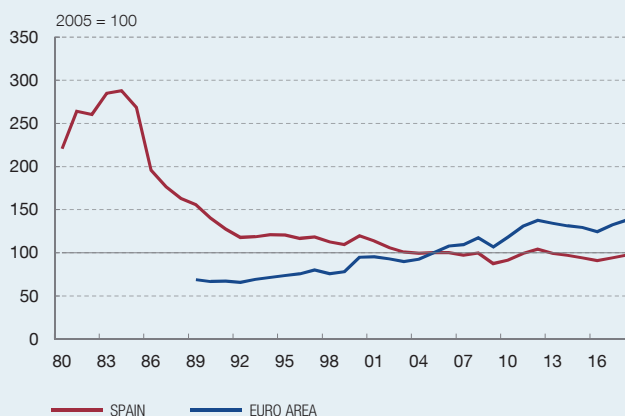
3 ANNUAL TECHNOLOGICAL PRODUCT INFLATION IN SPAIN AND IN THE EURO AREA (b)

4 CONTRIBUTION OF TECHNOLOGICAL PRODUCTS TO OVERALL INFLATION IN SPAIN AND IN THE EURO AREA
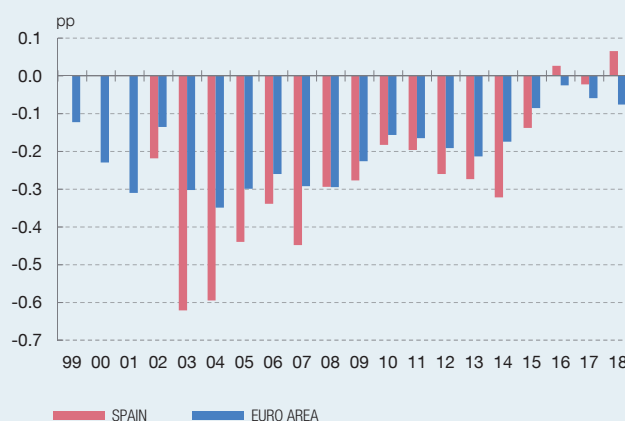
SOURCES: ECB Digitalisation Survey, Eurostat and ECB calculations.

a Unit value indices of imported goods.
b Technological products: telephone and fax equipment and services, and audiovisual, photographic and information processing equipment.

Box 2.2
STRUCTURAL FACTORS AND INFLATION DYNAMICS (cont'd)

wealth generally increases with age, a larger proportion of elderly people could lead to a greater counter-inflationary bias in society and, therefore, to more support for counter-inflationary monetary policies. Population ageing may drive average wage growth downwards, given that wages tend to grow at the start of a person's working life and are relatively steady towards the end. Additionally, there is recent evidence that the greater labour supply for workers between 55 and 64 years old generates downward pressures on wage growth.[1]

Population ageing also affects the natural rate of interest by lowering it, since it induces people to save more during their working life to be able to finance their retirement. A very low natural rate of interest conditions the effectiveness of monetary policy by making it more difficult, in a low inflation environment, for the real interest rate to stand at levels aligned with the natural rate. Chapter 3 of this report examines in detail the role played by the natural rate of interest in monetary policy strategies and the importance of demographic factors for its determination. Also, according to the estimates presented in that chapter, the natural rate of interest was negative in the euro area during the past decade, hindering the ability of conventional monetary policy to combat low inflation, since in such a situation nominal interest rates aligned with their lower bound with very limited room for further reductions would not suffice to generate the inflationary effects desired. In this situation, unconventional monetary policy was what provided expansionary stimuli to try to approximate the inflation observed to its medium-term target.

Globalisation also contributed to reducing global inflation rates, through several channels. Specifically,[2] both greater trade openness (see Chart 1) and the development of global value chains – reflected in an increase in the weight of trade in intermediate goods and services in the total – contributed to reducing inflation sensitivity to internal supply and demand conditions against a background of more synchronised world economic activity. Additionally, globalisation limited price and wage increases, mainly in those sectors more exposed to international competition.

The so-called "digital revolution" is another global factor that could be giving rise to downward pressures on price changes.[3] First, the development of information and communication technologies leads to direct cost savings in the production of genuinely digital consumer goods and services (such as software or communication services), and to indirect cost savings through the use of the latter as intermediate consumption in the production of other consumer goods and services. Second, aside from the cost channels, increasingly widespread electronic trading may affect consumer prices through both direct channels (owing to lower operating costs for internet-based firms) and indirect channels (owing to greater price transparency and a higher degree of competition in goods and services purchased online). A recent ECB survey of non-financial corporations in the euro area confirms that the new technologies provide firms with more flexibility for reducing costs.[4]

The decrease in the level of inflation in recent decades was accompanied by a significant fall in uncertainty over price changes. Chart 2 shows that it is estimated that inflation volatility in the euro area has declined since the 1980s.[5] This lower uncertainty can be largely associated

---

1   See B. Mojon and X.Ragot (2019), *Can an Ageing Workforce Explain Low Inflation?;* BIS Working Paper 776.

2   See, among others, T. Helbling F. Jaumotte and M. Sommer (2006), "How has globalization affected inflation?", *IMF World Economic Outlook,* Chapter 3.

3   See C. Elding and R. Morris (2018), "Digitalisation and its impact on the economy: insights from a survey of large companies", *ECB Economic Bulletin* 7/2018.

4   See C. Elding and R. Morris (2018), "Digitalisation and its impact on the economy: Insights from a Survey of Large Companies", *ECB Economic Bulletin* 7/2018.

5   Estimated in the context of the decomposition model presented in D. Leiva-León, J. J. Pérez, G. Pérez-Quirós and A. Urtasun(2019,) *Structural Instabilities in the Euro Area,* Banco de España Working Paper (forthcoming). Similar results for the aggregate euro area can be found in G. M. Caporale, L. Onorante and P. Paesani (2010), *Inflation and Inflation Uncertainty in the Euro Area,* ECB Working Paper 1229. The results for the euro area countries taken individually corroborate the estimation for the euro area as a whole [see, in particular, M. Correa-López, M. Pacce and K. Schlepper (2019), *Exploring Trend Inflation Dynamics in Euro Area Countries,* Banco de España Working Paper 1909]. In J. Stock and M. Watson (2007), "Why Has US Inflation Become Harder to Forecast?, *Journal of Money, Credit and Banking,* 39, pp. 3-33, evidence is provided that a similar process took place in the United States.

Box 2.2
STRUCTURAL FACTORS AND INFLATION DYNAMICS (cont'd)

with the preparation and launch of the monetary union, which involved a step towards a monetary policy regime more geared towards price stability than the preceding regime, especially in periphery countries.[6] A similar phenomenon also occurred in most advanced economies.

The literature suggests that there is a positive relationship between the degree of inflation uncertainty and the level of inflation.[7] In an environment of low inflation uncertainty, a shock impacting this variable (upwards or downwards)

allows for a more precise response from the monetary authority, which therefore generates certainty about future developments in the pace of price changes. In this connection, a central bank with a commitment to price stability may also reduce this uncertainty. However, some analyses also suggest that, in this environment of lower uncertainty over inflation the effectiveness of monetary policy could be hampered because a central bank's ability to generate inflation surprises would be lower.

Chart 2
STOCHASTIC VOLATILITY IN EURO AREA INFLATION

The decline in the level of inflation has been accompanied by a significant decrease in uncertainty over price changes.

INFLATION VOLATILITY IN THE EURO AREA
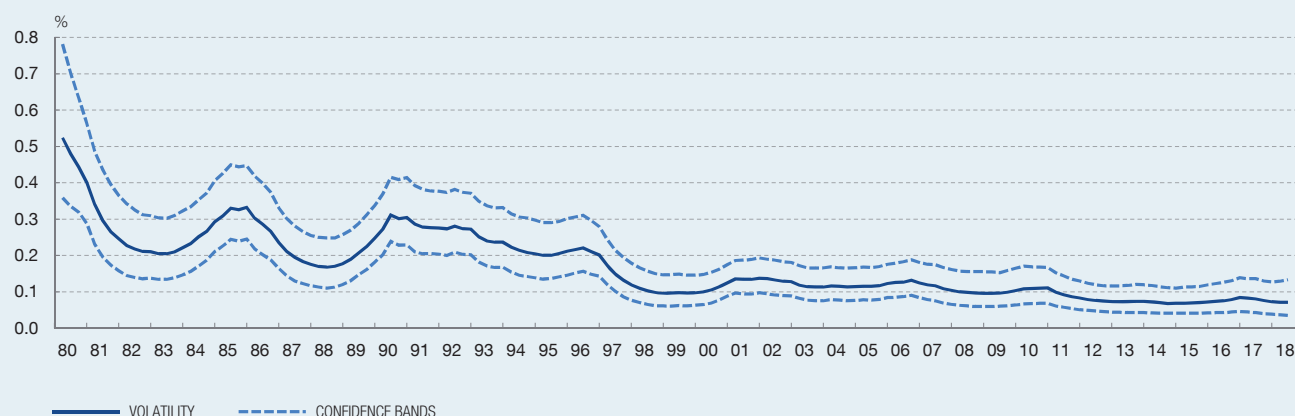
SOURCES: ECB and Banco de España [Leiva-León, Pérez, Pérez-Quirós and Urtasun (2019b)].

6   See M. Evans and P. Wachtel (1993), "Inflation Regimes and the Sources of Inflation Uncertainty", *Journal of Money, Credit and Banking,* 25, pp. 475-511.

7   This relationship is called the Friedman-Ball hypothesis [see M. Friedman (1977), "Nobel Lecture: Inflation and Unemployment", *Journal of Political Economy,* 85, pp. 451-472, and L. Ball (1992), "How Does Inflation Raise Inflation Uncertainty", *Journal of Monetary Economics,* 29, pp. 371-388]. In connection with theoretical arguments and empirical evidence in favour of this hypothesis, see the revisions of economic references about these issues in Caporale, Orante and Paesani (2010) *op. cit.* and E. Rosas and T. López (2018), "Inflación e incertidumbre inflacionaria: la postura del Banco de México, 1969-2017", *Finanzas y Política Económica* no. 10, pp. 348-372. Nonetheless, the literature is inconclusive about the existence of a causal relationship between the two variables, as it depends on the institutional framework in which monetary policy is conducted.

Box 2.3
GLOBAL FACTORS AND THE INTERDEPENDENCE OF INFLATION

Recent decades have witnessed an increase in the degree of interdependence among the various economies, which is associated with growing economic and financial integration between countries. This globalisation process is impacting not only real but also nominal macroeconomic variables, such as inflation.

There are different factors which prompt some interdependence between the different countries' inflation rates:

Fluctuations in commodity prices which are determined in global markets and affect many countries simultaneously.

Since inflation rates are connected, inflation expectations in the different economies and monetary policies will also be connected.

The global synchronisation of the different economies' business cycles results in some interrelationship of inflation fluctuations through the Phillips curve mechanism, which relates inflation to national business cycles.

The above-mentioned mechanism is strengthened when the inflation of an economy not only hinges on national business cycles but also on the global business cycle.

Some technological innovations may simultaneously bring about productivity gains in different economies.

To illustrate changes in the interdependence of inflation rates, Chart 1 shows a measure of this interconnection for a broad range of advanced economies and for the euro area economies.[1] The upper bound of this measure is 1 and the lower bound is 0 and, the higher its value, the

Chart 1
THE INTERDEPENDENCE OF INFLATION

The interdependence of inflation between countries is estimated to have increased significantly in the post-crisis period and would be higher for headline inflation than for core inflation. The interdependence could be attributed to comovements of inflation expectations, the economic cycle, external prices and unit labour costs.

1 GLOBAL INTERDEPENDENCE OF INFLATION RATES (a)
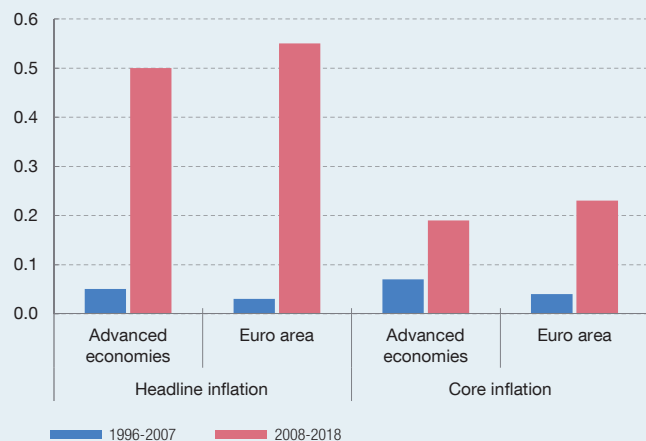
2 DETERMINANTS OF THE INTERDEPENDENCE OF INFLATION (b)
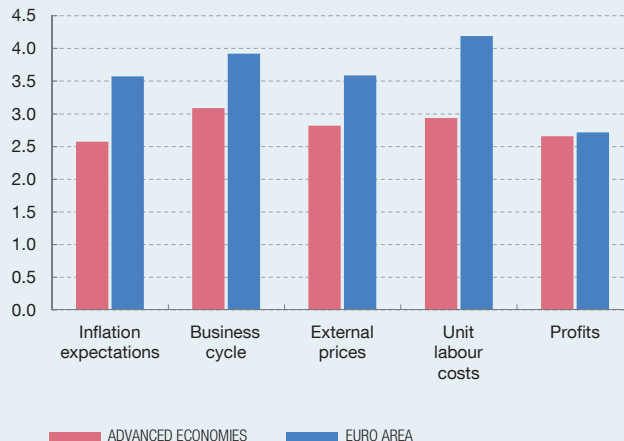
SOURCES: Eurostat, OECD and Banco de España.

a Estimates for different sample periods.

1   For more details see L. J. Álvarez, L. Gadea and A. Gómez-Loscos (2019b), *Inflation Interdependence in Advanced Economies,* Banco de España Working Paper (forthcoming). A sample of 24 advanced economies is used for the period 1996-2018. The measure of interdependence used is that proposed in J. Stock and M. Watson (2018), "The Evolution of National and Regional Factors in US Housing Construction", in T. Bollerslev, J. Russell and M. Watson (Eds.), *Volatility and Time Series Econometrics: Essays in Honor of Robert F. Engle,* Oxford University Press. See also M. Carney (2017), Globalisation and Inflation", speech given at the *2017 IMF Michel Camdessus Central Banking Lecture.*

Box 2.3
GLOBAL FACTORS AND THE INTERDEPENDENCE OF INFLATION (cont'd)

greater the degree to which the inflation rates are interconnected. As the chart shows, interdependence in the period before the global financial crisis was very small, both in the advanced economies as a whole and in the euro area countries. However, in the post-crisis period, the interdependence of inflation between countries has increased significantly. In addition, a reflection of the greater trade and financial integration of euro area countries is that the degree to which they are interconnected is higher than in the advanced economies as a whole. Also, the degree of interdependence observed is higher for headline inflation than for core inflation since the former includes food and energy product prices, which are more closely linked to prices in global commodity markets.

To shed some light on the macroeconomic variables which explain the degree of interdependence, Chart 1

shows the findings of a statistic which determines whether the interdependence between the variables is similar to that observed in headline inflation. Specifically, the findings obtained identify five significant variables, which include the three usual variables in neo-Keynesian open-economy models (i.e. inflation expectations, slack and external prices), together with unit labour costs and profit margins. Similarly, it can be seen that these variables explain the interconnection of inflation in euro area countries more accurately than in advanced economies as a whole.

As regards the significance of global factors in explaining national inflation rates, the globalisation hypothesis assumes that, as countries increase their economic integration, the global business cycle may be an increasingly important factor in determining national inflation.[2] In order to take into account the impact of

Chart 2
IMPACT OF GLOBAL FACTORS ON PHILLIPS CURVE

Global output gap measures have gained relatively more importance with respect to the domestic output gap in determining inflation, especially since the beginning of the 21st century. The impact is greater when we calculate the global output gap weighted by the PPP based GDP weights, which suggests that large emerging low-cost economies are gaining importance in determining domestic inflation.

1 COEFFICIENTS OF OUTPUT GAP AND CONFIDENCE BANDS (a)

GLOBAL OUTPUT GAP (GDP WEIGHTS)
DOMESTIC OUTPUT GAP

2 COEFFICIENTS OF OUTPUT GAP AND CONFIDENCE BANDS (a)

GLOBAL OUTPUT GAP (TRADE WEIGHTS)
DOMESTIC OUTPUT GAP
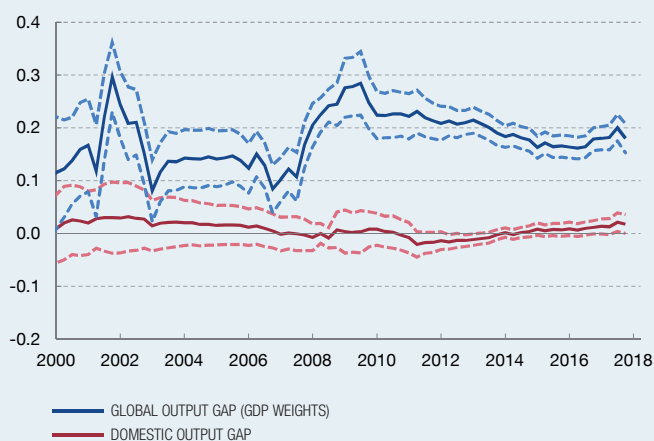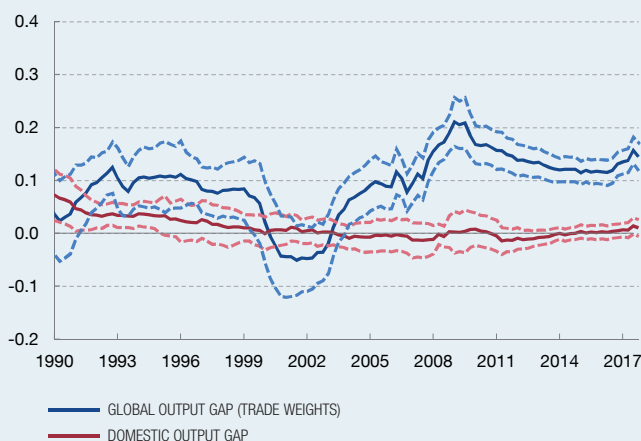
SOURCES: Datastream and Banco de España.

a The coefficients are estimated on the basis of a sample of 22 OECD countries and China.

2   See J. Ha, M. A. Kose and F. Ohnsorge (2018), *Inflation in Emerging and Developing Economies: Evolution, Drivers and Policies,* World Bank; C. Borio and A. Filardo (2007), *Globalisation and Inflation: New Cross-country Evidence on the Global Determinants of Domestic Inflation,* BIS Working Paper, 227; and I. Mikolajun and D. Lodge (2016), *Advanced Economy Inflation: the Role of Global Factors,* ECB Working Paper, 1948.

Box 2.3

GLOBAL FACTORS AND THE INTERDEPENDENCE OF INFLATION (cont'd)

global phenomena, Phillips curves have been estimated[3] considering measures of global output gaps and external prices (see Chart 2). Specifically, measures of global output gaps specific to each economy are used. The weights are derived from the breakdown of foreign trade by country,[4] and, alternatively, from the importance of each country in the global economy, in terms of GDP expressed in purchasing power parities. The results obtained show that global slack measures are significant for determining short-term inflation and that their importance in comparison with the domestic output gap has increased over the present century. In addition, the relative importance of global slack measures for inflation increases when the second weighting method is used

(based on the weights in global GDP), which suggests that competition from large emerging low-cost economies, such as China or India, might be exerting downward pressure on global inflation.

It should be noted that the importance of global factors such as those presented in this box has implications for monetary policy. On the one hand, the importance of these factors requires monetary authorities to pay increasing attention to activity and to international prices. On the other, in a world where economies are increasingly interconnected and where inflation largely responds to global factors, the effectiveness of the different central banks' monetary policies in controlling national inflation might be hampered.

---

3   The specification is a Phillips curve with adaptive expectations where the dependent variable is quarter-on-quarter percentage changes in the CPI and our variables of interest are the domestic and global output gaps, the latter with weights deriving both from trade relationships and from GDP weights in the purchasing power parity. Regressions are estimated using a ten-year window and country fixed effects. Quarter-on-quarter percentage changes of import, food and energy prices, the real and nominal exchange rate and four inflation lags, which were selected based on information criteria, were introduced as control variables. The sample used comprises 23 countries and the sample period ranges from 1980 to 2017.

4   See Borio and Filardo (2007), *op. cit.*

Box 2.4

WAGE FORMATION IN A LOW INFLATION ENVIRONMENT

Wage formation is driven, among other factors, by inflation expectations. Insofar as the latter have been influenced by the low inflation rates in the Spanish economy in recent years, the result will have been lower upward pressure on nominal wages. This mechanism is more important in countries, like Spain, in which the coverage of collective bargaining is greater.

In particular, the low inflation of recent years may have been a key factor in explaining the lesser degree of indexation of wages to price developments, which has been a very notable change in the wage formation process in recent years. Traditionally, the system of collective bargaining in Spain was highly linked to past

inflation through two channels. First, the wage increases under multi-year agreements were highly indexed to past inflation. Second, approximately three-quarters of collective agreements had indexation clauses providing for compensation for deviations of actual inflation from the inflation forecast at the time the agreement was signed. Recently, however, there has been a very significant reduction in the use of these clauses, which have been present in less than 20% of the collective agreements signed over the last four years (see Chart 1).

Of the various factors that may explain this steep reduction, low inflation seems to stand out, according to

Chart 1
WORKERS WITH INFLATION INDEXATION CLAUSE

WORKERS WITH CLAUSE — CPI (right-hand scale)
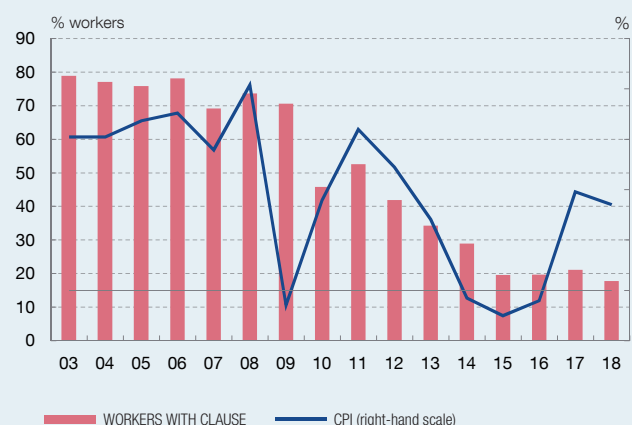
Chart 2
MODEL-BASED PHILLIPS CURVE BREAKDOWN
Deviations from period average

UNEMPLOYMENT   INFLATION EXPECTATIONS
PRODUCTIVITY   RESIDUAL
COMPENSATION PER EMPLOYEE
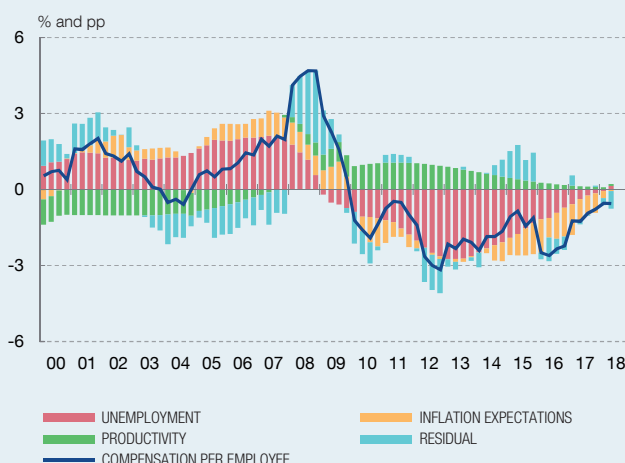
Chart 3
DISTRIBUTION OF WAGE GROWTH IN 2008
Full-time employees working two years running for the same firm
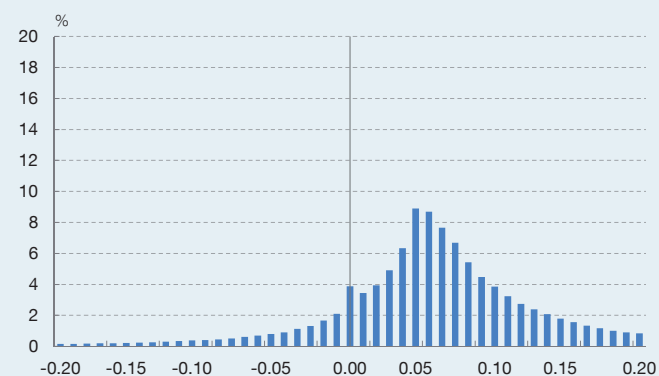
Chart 4
DISTRIBUTION OF WAGE GROWTH IN 2015
Full-time employees working two years running for the same firm
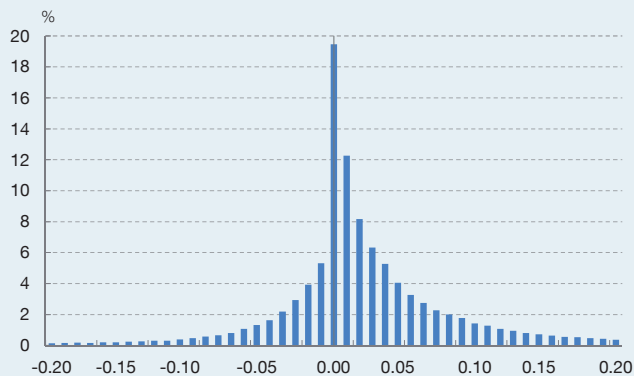
SOURCES: Ministerio de Trabajo, Migraciones y Seguridad Social, INE, Continuous Sample of Working Histories and Banco de España.

Box 2.4
WAGE FORMATION IN A LOW INFLATION ENVIRONMENT (cont'd)

the latest wave of the survey conducted by the Wage Dynamics Network.[1]

One of the effects of low inflation rates is that they may hamper downward wage adjustment in response to adverse shocks. The empirical evidence available points to the existence of nominal rigidities that make it difficult for nominal wages to fall. In a persistently low inflation environment, this means that wages cannot be reduced in real terms. Indeed, since the start of the crisis and in the context of very low inflation, there has been a growing incidence of wage freezes. Charts 3 and 4 show that between 2008 and 2015 the proportion of workers whose wages grew at 0% increased very significantly, to 25%. This may be indicative of the presence of obstacles that have limited the possibility of negative rates of change in compensation during this period.

Chart 2 shows the factors that explain actual wage developments, according to a breakdown based on a Phillips curve model. This model relates wage growth in the economy as a whole to a number of determinants, including inflation, productivity and indicators of labour market slack. As can be seen, the high level of unemployment was the main factor restraining wage rises between 2008 and 2012. However, from 2014, low inflation played a very significant role in explaining the low growth of compensation per employee, against a background of gradual economic recovery and declining unemployment. This factor contributed significantly (along with the high degree of slack that continues to characterise the labour market) to the fact that observed wage growth from that year onwards has been two percentage points lower than on average since the year 2000.[2]

In the latest period, negative residuals have begun to appear in the estimated wage equation, i.e. wages have grown somewhat less than would have been expected given the behaviour of their usual determinants. However, these residuals tend to disappear when broader measures of cyclical slack are used that take into account, in addition to the unemployed, those working part-time involuntarily and discouraged job-seekers who have withdrawn from the labour market as a result of their inability to find a job. In any event the reaction of wages to unemployment or, more generally, the cyclical conditions of the economy is low in Spain, as testified by the scant dispersion of wage growth observed across sectors of activity, which is well below that seen in employment and productivity.[3]

These findings on the wage determination process can be usefully supplemented by an analysis of individual worker data, since at this level, unlike at the aggregate level, possible changes in employment composition can be controlled for. In particular, research has been carried out

Table 1
ELASTICITY OF REAL WAGES WITH RESPECT TO UNEMPLOYMENT (SEVEN PHASES)

	Recession low unemployment (1)	Recession high unemployment pre-2009 (2)	Recession high unemployment 2009-2012 Q1 (3)	Recession high unemployment post-2012 Q2 (4)	Expansion high unemployment pre-2013 (5)	Expansion high unemployment post-2013 (6)	Expansion low unemployment (7)
Coefficients	0.097 (0.077)	0.053 (0.068)	-0.084* (0.046)	-0.260*** (0.038)	-0.104* (0.060)	-0.159*** (0.041)	-0.063 (0.087)

SOURCES: Labour Force Survey (INE) and Continuous Sample of Working Histories.
NOTE: *, **, *** statistically significant at 0.10, 0.05 and 0.01, respectively.

---

1   See M. Izquierdo and J. F. Jimeno (2015), *Employment, Wage and Price Reactions to the Crisis in Spain: Firm-level Evidence from the WDN Survey,* Occasional Paper 1503, Banco de España.

2   See P. Cuadrado and F. Tagliati (2018), "Wage moderation in Spain and in the euro area", *Economic Bulletin,* 4/2018, Banco de España.

3   See, for example, Box 5 of the "Informe trimestral de la economía española", *Boletín Económico,* December 2014, Banco de España.

Box 2.4

WAGE FORMATION IN A LOW INFLATION ENVIRONMENT (cont'd)

to see whether the cyclical response of real wages to unemployment has changed during the recent period of low inflation, taking into account, moreover, whether the unemployment rate is above or below average.[4] In addition, the reaction of wages during the crisis has been distinguished for the periods before and after 2012, in order to investigate the possible effects of the labour reform of that year. Finally, the current phase of economic recovery has been compared with a similar expansionary period in the past, in which unemployment was high, but decreasing.

The main results of these exercises are shown in Table 2.1. First, the responsiveness of wages in Spain to cyclical changes in unemployment is generally found to be low (and below that estimated for other countries with similar data). That said, it increased in the stage immediately after the 2012 labour market reform, probably reflecting the impact of the various measures approved to increase firm-level flexibility. As regards the recent period of recovery, the elasticity of wages with respect to the business cycle (-0.16) is somewhat higher than in similar cyclical phases in the past (-0.10), although the difference is not statistically significant. Thus, it may be concluded that, at least on the basis of the information available to end 2017, wage formation patterns have not changed significantly, as regards their traditionally relatively low level of cyclical sensitivity.

---

4   Following P. Font, M. Izquierdo and S. Puente (2015), "Real Wage Responsiveness to Unemployment in Spain: Asymmetries along the Business Cycle", *IZA Journal of European Labor Studies*, (2015) 4(13).

3

MONETARY POLICY DESIGN IN THE MEDIUM AND LONG TERM

Summary

The response to the global financial crisis of the main advanced economies' central banks has significantly impacted both their interest rates and their balance sheets. At the onset of the crisis central banks reduced their interest rates to historically low levels. These were even negative in some cases, such as in the euro area. Interest rates in the advanced economies currently remain at or near their record lows, a situation which could persist in the future. Also, as the leeway for further cuts in interest rates narrowed, the main central banks initiated a policy of balance sheet expansion, reaching historically high levels. This chapter analyses the possibilities, challenges and dilemmas posed by these two aspects (low interest rates and a large balance sheet) for a monetary policy design in the medium and long term.

Interest rates may fluctuate in the future around levels that are lower than before the crisis and, therefore, closer to the effective lower bound (ELB). And in this respect, central banks will have less room to cut rates in response to future crises. This chapter shows that the current low interest rate environment in the advanced economies is linked to structural factors, such as the progressive ageing of the population and moderate productivity growth. Indeed, the situation could continue – or even be compounded – in the future if current demographic projections are confirmed. This has led some central banks to discuss possible alternatives to the current monetary policy strategy (consisting of inflation targets with a 2% reference level), responding to the ELB constraint by, for instance, raising the numerical inflation target or setting a goal in terms of price levels. The analysis conducted in this chapter shows that these strategies may prove useful in alleviating the ELB constraint on monetary policy, while noting their costs and limitations.

In the medium and long term, central banks face the strategic decision of maintaining the size of their balance sheets at levels similar to those at present or of bringing them back to the pre-crisis trend, and of choosing the appropriate composition of the assets and liabilities in their balance sheets. This chapter analyses the pros and cons of maintaining a large balance sheet and of preserving the current "floor" system with money market yields very close to the remuneration of reserves. In particular, the advantages of a floor system, in terms of better control of market interest rates, are noted. However, in the case of the Eurosystem, in principle it would be possible to maintain such a system with a lower volume of reserves than at present. The possibility of changing the term structure of the balance sheet (especially important in the case of a large balance sheet) by reducing (lengthening) average asset (liability) terms is also analysed.

1 Introduction

In response to the global crisis, the main central banks reduced their interest rates to historically low and even negative levels. The global financial crisis and the ensuing economic recession in the main advanced economies had notable implications for economic policy. As to monetary policy, the severity of the crisis led central banks to drastically cut their benchmark rates as from 2008, reaching levels close to zero (see Chart 3.1.1). In recent years, monetary authorities such as the European Central Bank (ECB) and the Bank of Japan have lowered their benchmark rates to levels which are even negative.

Also, as the leeway for further cuts in interest rates narrowed, the main central banks initiated a policy of balance sheet expansion, reaching historically high levels. As interest rates came closer to their ELB,[1] central banks began to use a series of unconventional tools, such as forward guidance and quantitative easing to achieve a higher degree of monetary expansion.[2] Forward guidance polices aim to guide economic agents' expectations about future changes in short-term interest rates in order to maintain medium- and long-term interest rates at moderate levels. Quantitative easing measures, such as large-scale asset purchases and liquidity- and financing-providing operations for banks, have given rise to an unprecedented expansion of the liquidity provided to credit institutions and of the size of the main central banks' balance sheets (see Chart 3.1.2).

The current low interest rate environment, which could persist in the future, poses a significant challenge for monetary policy. Central banks face a new scenario where their interest rates will probably fluctuate at lower levels than in the past and, therefore, closer to their lower bound. Should this scenario be confirmed, the scope for reducing interest rates in response to future crises would be restricted. The unconventional measures adopted as a result of the crisis have shown some effectiveness in responding to situations in which conventional monetary policy is restricted by the ELB.[3] However, insofar as the scenario of recent years persists, with inflation systematically lower than the medium-term price stability references, considering alternative monetary policy strategies might be advisable.

---

1 The effective lower bound on interest rates is a consequence of the fact that if the remuneration of deposits is sufficiently negative, economic agents may prefer to withdraw them in cash (with zero remuneration). The ELB is below zero owing to intrinsic costs and risks associated with banknote storage (security, risk of loss or theft, etc.).

2 For a detailed analysis of the monetary policy response to the crisis in the euro area, see Banco de España (2016).

3 In the case of the ECB, the end of net purchases under the asset purchase programme (APP) at end-2018 led to a phase of reinvestment of the principal payments from maturing securities for the purpose of maintaining the programme portfolio constant and prolonging the programme's monetary stimulus. These reinvestments, together with the forward guidance on the future path of interest rates, have become one of the ECB's main stimulus tools. For a detailed analysis of the role of these two tools in providing monetary accommodation in the current setting, see Arce, Nuño and Thomas (2019).

Chart 3.1

THE CRISIS FORCED CENTRAL BANKS TO NAVIGATE "UNCHARTED WATERS"

The main central banks reduced their interest rates to close to zero or even negative levels; at the same time, they increased the size of their balance sheets through asset purchase programmes.

1 POLICY INTEREST RATES

2 CENTRAL BANK BALANCE SHEETS

EUROSYSTEM   FEDERAL RESERVE
BANK OF ENGLAND   BANK OF JAPAN

EUROSYSTEM   FEDERAL RESERVE
BANK OF ENGLAND   BANK OF JAPAN (right-hand scale)

DOWNLOAD
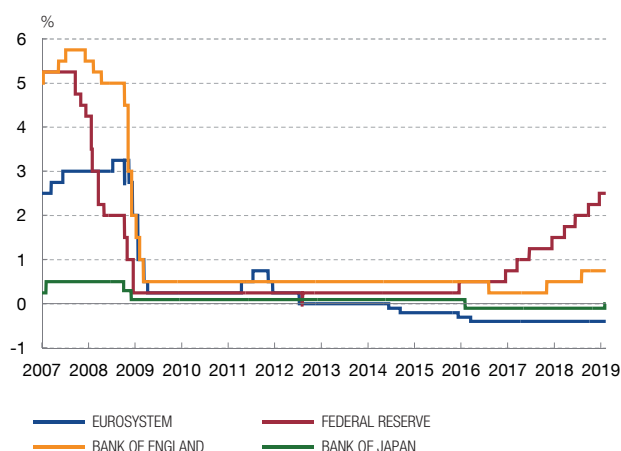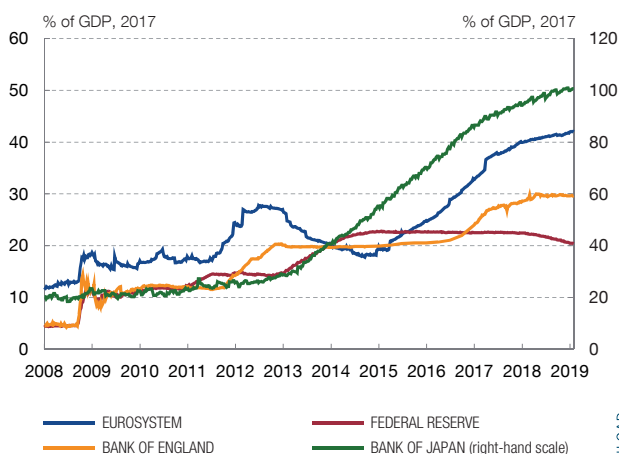
SOURCES: Datastream, ECB and Banco de España.

Central banks also face the dilemma of maintaining the size of their balance sheets at levels similar to current ones or of reducing them to pre-crisis levels. In the short term, the main central banks' decisions about their balance sheets (particularly those relating to their current asset purchase programmes or to bank refinancing) will be determined by the changes in their inflation and growth forecasts. In the medium and long term, however, central banks face the strategic decision of maintaining the size of their balance sheets at current levels (or at least at substantially higher levels than before the global crisis) or of bringing them back to sizes consistent with the pre-crisis trend. In parallel, there is debate about the appropriate composition of the balance sheet's assets and liabilities.

The foregoing challenges are currently the subject of an incipient debate about the design of monetary policy in the medium and long term in what has been called the "new normal" in monetary policy after the crisis. This chapter aims to show the guiding principles of that debate, including the main theoretical and empirical arguments.

The next section reviews in depth the issues relating to the scenario of persistently low interest and inflation rates and how the monetary authorities can tackle them in the future. The third section addresses the issue of size and the composition of central banks' balance sheets, analysing different arguments for and against maintaining size at levels similar to current ones and about the most desirable

Chart 3.2
MARKETS EXPECT LONG-TERM INTEREST RATES FAR BELOW THE HISTORICAL AVERAGE

In the context of fixed-income securites, such as government bonds, the yield curve is the relationship between the term to maturity of the securities (for example, one month, one year, two years, etc.) and the return (annualised) offered for this maturity. The yield curve generally has two components: the "expectations" component (that is, the average expected short-term interest rate over a given horizon) and the "term premium" component, which reflects the compensation demanded by investors for "term risk", that is, the risk of holding medium/long-term fixed-income securities in light of the fluctuations in their market price over their life. The chart suggest that, in the case of the euro area, the markets expect the EONIA indicator (considered to be the ECB's implicit operational target) to remain at below 1% in the coming decades, clearly below the average for this indicator up to 2008 Q3 (3.1%).

1 OIS YIELD CURVE (AT 29.2.2019) AND EXPECTATIONS COMPONENT (a)
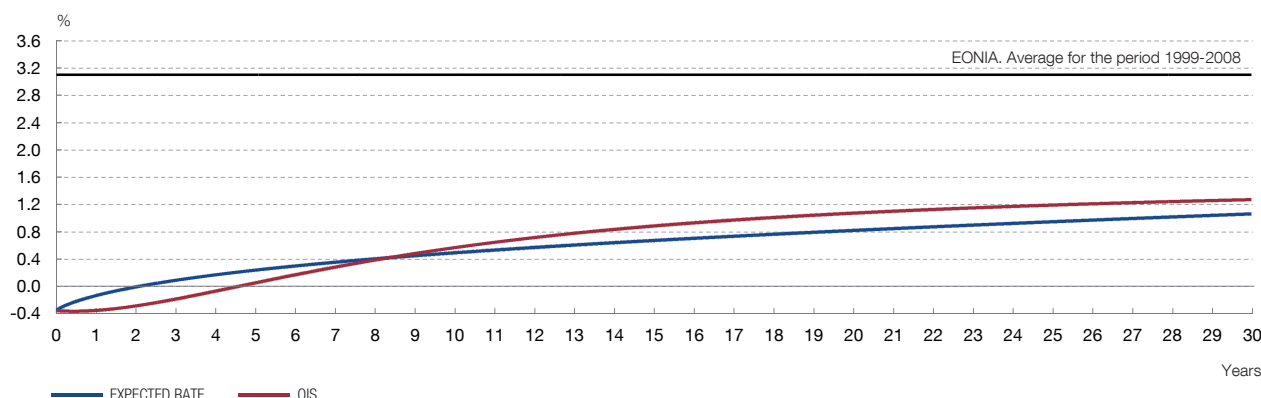
SOURCE: Banco de España.

a The instantaneous forward yield curve of the OIS is calculated on the basis of the prices negotiated in the OIS contracts, which represent the EONIA rate that should be applicable at any future time for these contracts not to imply payment between the parties concerned. The interest rate expectations were obtained from a term structure model in which the parameters follow an ARFIMA-type structure.

composition of the asset- and liability-sides of the balance sheet. The last section draws conclusions and describes some possible monetary policy lessons for the future.

2 Monetary policy strategies in a low interest rate environment

Central bank interest rates in the main advanced economies are currently very low, a situation that could persist for some time. In some economies, such as the euro area and Japan, interest rates remain at historically low levels. In others, such as the United Kingdom and, particularly, the United States, interest rates have normalised somewhat, but remain at relatively moderate levels. Looking ahead, the information contained in the term structure of interest rates (or "yield curve") of different currencies suggests that, according to market expectations, short-term interest rates will, in the coming years, continue to be substantially lower than the average values before the economic crisis (see Chart 3.2 for the euro area). Should these projections be confirmed, central bank rates will, in the coming years, fluctuate around levels that are closer to their respective lower bound, entailing less leeway

Figure 3.1
MONETARY POLICY AND THE NATURAL RATE OF INTEREST

With inflation targeting, monetary policy aims to maintain inflation at a certain level, for which purpose the central bank manages the nominal interest rates.

RELATIONSHIP BETWEEN NOMINAL, REAL AND NATURAL INTEREST RATES

Real interest rate = *Nominal* interest rate – Expected inflation rate	Expected real interest rate affects saving and investment decisions of families and firms
Natural rate of interest = Real rate of interest that would be obtained in a hypothetical equilibrium scenario in which prices and wages are flexible	Natural rate of interest is determined by structural factors and does not depend on monetary conditions
Real interest rate is *above* its natural level	— Aggregate demand is too low in relation to the economy's production capacity — A negative **output gap** arises between the GDP and its natural level resulting in deflationary pressures
Real interest rate is *below* its natural level	— Aggregate demand is too high in relation to the economy's production capacity — The economy **overheats,** generating inflationary pressures

For inflation to be maintained at the targeted level, the real interest rate must be equal to its natural level, in other words, the nominal interest rate must be equal to the natural rate of interest plus the inflation target

The central bank must therefore adjust the nominal rate in line with the fluctuations of the natural rate

SOURCE: Banco de España.

for central banks to cut interest rates in response to future economic crises. This section analyses the possible determinants behind low interest rates, and the monetary policy strategies that could be adopted to alleviate the ELB constraint.

In order to understand why nominal interest rates are so low, it is useful to look at the concept of the *natural rate of interest* (see Figure 3.1). The interest rate that is important for the savings and investment decisions of households and firms is the expected real rate of interest, which is the difference between the nominal interest rate and expected inflation. In the framework of the macroeconomic models used by most central banks, and which are based on the neo-Keynesian paradigm, *the natural rate of interest* is the real rate of interest that would be observed in a hypothetical equilibrium scenario in which prices and wages are flexible (also referred to as the "natural equilibrium"). The importance of this concept stems from the fact that when the real interest rate rises above its natural level, aggregate demand is too low in relation to the economy's production capacity; in other words,

a negative "output gap" arises between the GDP and its "natural" level, resulting in deflationary pressures. Conversely, when the real interest rate falls below the natural rate, the economy "overheats", generating inflationary pressures. Thus, to ensure that inflation is equal to its target at all times, the real interest rate must always reproduce the behaviour of the natural interest rate. That is to say, the nominal interest rate must be equal to the natural interest rate plus the inflation target, so that the central bank adjusts the nominal rate in line with the fluctuations of the natural rate.[4]

In general, the estimated natural rate of interest is an important reference for monetary policy strategies based on an inflation target. In practice, the relationship between the interest rate, aggregate demand and inflation is far more complex than in the standard neo-Keynesian model. However, the natural rate of interest is an important reference when determining central banks' interest rate policy. Consequently, the central banks that have managed to stabilise inflation around the target have, to a certain extent, adjusted their nominal interest rates in line with the estimated behaviour of the natural rate in their respective economies.[5] In this respect, the natural rate is a major determinant of changes in the benchmark nominal interest rates.

Most estimates of the natural rate of interest show a significant decline in the recent period. By definition, the natural rate of interest is not observable, but is defined in terms of a hypothetical equilibrium where prices and wages are flexible which, in practice, cannot be observed either. But it is possible to proxy the behaviour of the rate using econometric models (albeit with a notable degree of uncertainty in most cases). In general, these models find that the natural rate of interest has declined significantly in recent decades, to historically low, even negative, levels.[6]

By way of example, Chart 3.3 shows the changes in the natural rate in the main advanced economies, estimated using one of these models (see Box 3.1 for a description of the model and its estimates of the natural rate of interest in several advanced economies). In the euro area, the current natural rate is probably negative and even below -1%. If this situation persists, given the ECB's medium-term inflation target (below, but close to, 2%), the nominal policy rate would converge in the future towards average levels of less than 1% and would leave relatively little room to cut interest rates to respond to future crises. In the euro area, although the ECB's interest

---

4   For a detailed analysis of the natural rate of interest and its implications for monetary policy, and a description of the relationship between the natural rate of interest and inflation in the context of the basic neo-Keynesian model, see Galesi, Nuño and Thomas (2017).

5   See, for example, Cúrdia, Ferrero, Ng and Tambalotti (2017).

6   Holston, Laubach and Williams (2017), for example, estimate that the natural rate in 2016 was positive but very close to zero in the United States, and *negative* in the euro area. Brand, Bielecki and Peñalver (2018) present various estimates with similar results.

This chart shows the changes in the natural rate in the economies of Japan, United States, United Kingdom and the euro area, including the confidence bands of the euro area estimate.
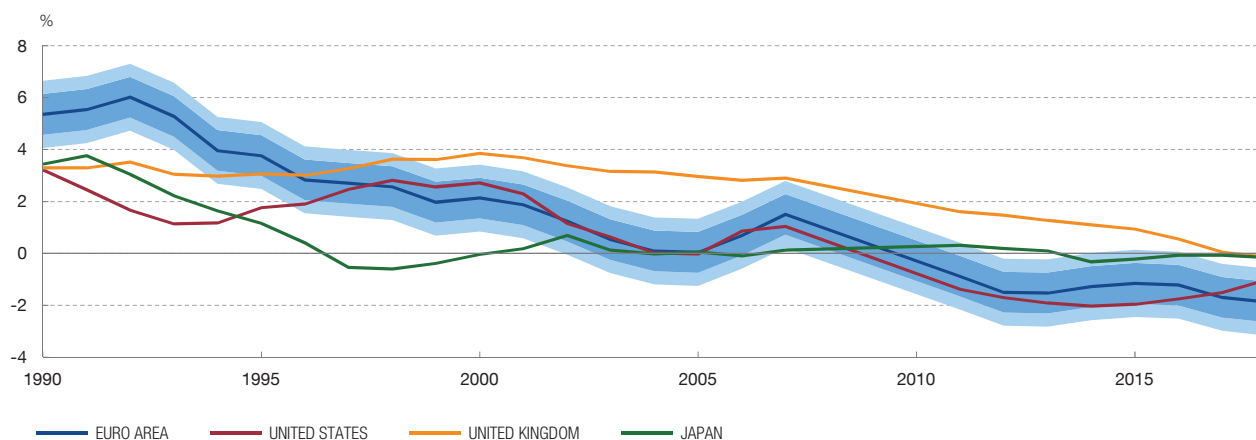
SOURCE: Banco de España, based on the model of Fiorentini, Galesi, Pérez-Quirós and Sentana (2018). The bands for the euro area refer to confidence levels of 68% and 90%.

rate policy has shown that the lower bound is not zero, but a negative value,[7] it is reasonable to assume that this bound is not distant from the current level of the interest rate on the ECB's deposit facility [-40 basis points (bp)]. This means that if the lower bound is below 1%, the leeway for cutting interest rates would most likely be less than 150 bp.

The economic literature mentions several reasons for the sustained decline of the natural rate in recent decades (see Figure 3.2).[8] Various papers agree on the essential role played by ageing in advanced economies, as analysed in Chapter 4. Specifically, factors such as the gradual increase in life expectancy and the falling birth rate are thought to have pushed down the real rate of interest. The increased life expectancy prompts current employees to save for their retirement, while the lower birth rate increases the capital intensity per employee and, consequently, reduces the return on capital. Both these factors would lead to a reduction in the real return on savings.[9] Other authors attribute the drop in the natural rate to a secular

---

7   In particular, the ELB is below zero owing to the costs and the risks associated with banknote storage (security, risk of loss or theft, etc.).

8   See Summers (2014) for a seminal discussion of the possible determinants of the fall in the natural interest rate and the implications for monetary policy in relation to the lower bound of interest rates. For two extensive analyses of the natural interest rate and the factors determining its historical trends, see Rachel and Smith (2015) and Brand, Bielecki and Peñalver (2018).

9   For modelling of the demographic effects on the natural rate, see Eggertsson and Mehrotra (2014), Eggertsson, Mehrotra and Robbins (2019) and Carvalho, Ferrero and Nechio (2016).

Figure 3.2
RECENT DEVELOPMENTS IN THE NATURAL RATE OF INTEREST

The natural rate of interest is unobservable and is therefore estimated using econometric models. Chart 3.3 shows changes in the natural rate of interest in the main advanced economies, estimated using one of these models (see Box 3.1 for a description of the model). In recent years, the natural rate of interest has gradually declined and is currently estimated to be negative in the euro area.

FACTORS UNDERLYING THE DECLINE IN THE NATURAL RATE OF INTEREST

DEMOGRAPHIC FACTORS	ECONOMIC FACTORS
— The gradual increase in life expectancy encourages current employees to save for their retirement — Falling birth rates increase the capital intensity per employee and, consequently, reduces the return on capital	— A secular decline in the productivity growth rate — Excess demand for financial assets in emerging economies — Widespread shortage of assets that are perceived to be safe, against a background of strong aversion to risk

SOURCE: Banco de España.

decline in the productivity growth rate, to excess demand for financial assets in emerging economies or to a widespread shortage of assets that are perceived to be safe, against a background of strong aversion to risk, partly due to the latest global financial crisis.[10]

Some of the determinants of current low interest rates may be of a temporary nature. In part, the (recent) drop in the natural rate may be a temporary phenomenon (which will foreseeably persist), linked to the private-sector deleveraging process triggered by the financial crisis and the consequent scant demand for credit. As this process subsides and gives way to a new phase of credit and investment growth, the natural rate may return to values that are higher than the present ones.[11]

Looking ahead, the factors mentioned above will play a key role in the future path of the natural rate of interest. There is considerable uncertainty about future behaviour of factors such as productivity growth or the shortage of safe assets.

---

10   Regarding the secular decline in productivity, see Gordon (2015). The excess demand for assets in emerging economies is discussed, for example, in Bernanke (2005) and Caballero, Farhi and Gourinchas (2008). The shortage of safe assets is analysed in Caballero and Farhi (2017). Although it is difficult to quantify the relative significance of each of these factors, it is important to note that demographic developments do not sufficiently explain the behaviour of natural interest rates, since in countries with lower birth rates and older populations, such as Japan, natural rates tend to be similar to those of other economies with more favourable population dynamics, such as the United States.

11   See Rogoff (2015).

However, demographic developments are more predictable. In this regard, the outlook among the advanced economies is, on the whole, unfavourable and points to further falls in the natural rate in coming decades.[12] In Box 3.2, a macroeconomic model is used to simulate the future path of the natural rate of interest in the euro area, conditional on demographic patterns in the model which are consistent with those observed in recent years, and with several official projections.[13] This analysis which, by its very nature, is subject to a high degree of uncertainty, suggests that the worsening demographic prospects may have reduced the natural rate by close to 2 percentage points (pp) since 2007, and may drive it down further, by almost 1 pp, by 2030.

While natural rates remain at low levels, monetary policy will have less room than in the past to cut rates in response to adverse shocks in the future. The foregoing analysis suggests that if the fall in the natural rate is not reversed or becomes more pronounced in the future, central bank interest rates will tend to fluctuate around levels that are lower and, therefore, closer to their ELB. The central bank cannot reduce interest rates to levels below the ELB, since this would intrinsically entail the widespread withdrawal of cash deposits by economic agents (with the consequent negative impact on the financial system). This could represent a major obstacle for the stabilising capacity of conventional monetary policy instruments. When, in a low inflation scenario (following an economic recession, for example), a central bank cannot further reduce its interest rate because it already stands at its lower bound, the real rate of interest tends to rise above its natural level, generating deflationary pressures which further increase the real rate. In turn, this tends to depress aggregate demand and, by further reducing inflation, makes it even more difficult to return to the target set by the monetary authority.[14]

In recent years there has been an intense debate as to how the basic monetary policy strategy might be modified so as to reduce the impact of the ELB for the interest rate (see Figure 3.3). In most of the advanced economies, the monetary policy strategy is based on the existence of a numerical inflation target (a strategy known as inflation targeting).[15] Some authors consider that the new instruments adopted during the recent crisis by central banks, such as large-scale asset purchase programmes and forward guidance, mean that the effective lower bound

---

12 For an analysis of the future behaviour of the theoretical determinants of the natural rate of interest, such as demographics and productivity growth, see Jimeno (2015).

13 Specifically, it uses the model proposed by Basso and Rachedi (2018).

14 In addition to the drop in the natural rate and the constraint of the ELB, there are other structural factors that would be exerting downward pressure on inflation in the euro area and other advanced economies. For a detailed analysis of these structural factors, see Chapter 2 of this Report.

15 In some cases, such as that of the US Federal Reserve, there is a dual mandate, which requires the achievement of full employment, in addition to the stabilisation of inflation.

Figure 3.3
MONETARY POLICY STRATEGIES IN A LOW INTEREST RATE ENVIRONMENT

LIMITS OF CONVENTIONAL MONETARY POLICY WHEN NATURAL INTEREST RATES ARE LOW

Households and businesses can save in cash if the interest rates on deposits are too low

The central bank cannot lower nominal interest rates below the effective lower bound (ELB)

In a low natural interest rate environment conventional monetary policy will have less room to respond to adverse shocks

MONETARY POLICY STRATEGIES TO REDUCE THE IMPACT OF THE ELB

INFLATION TARGETING WITH QUANTITATIVE EASING (QE) AND FORWARD GUIDANCE (FG)

This is the current strategy of the main central banks

QE = Using the central bank's balance sheet to influence medium and long-term interest rates

FG = Communicating the details of future monetary policy to influence inflation expectations

RAISING THE INFLATION TARGET

Raising the inflation target from the current level of 2% to 3% or 4%

— Equivalent to raising the nominal interest rate in the long term and, thus, its distance from the ELB

PRICE-LEVEL TARGET (PLT)

Settting the monetary policy target in terms of a path for the price level (instead of its rate of change, i.e. inflation)

— This means that below-target inflation rates must be offset for a time by above-target inflation rates

— Temporarily higher inflation expectations reduce the real interest rate and boost aggregate demand

TEMPORARY PLT

Operating a PLT only during episodes in which the ELB is binding and inflation falls below target

— Inflation targeting continues to be applied in normal times

SOURCE: Banco de España.

for interest rates is not such a pressing problem and that the current monetary policy framework can be kept broadly unchanged.[16] Indeed, as explained below, the discussion has generally focused on proposed modifications to key aspects of the current strategy.

16   See, for example, Swanson (2018).

One possibility is to raise the numerical inflation target. Raising the inflation target from its current level in the main advanced economies of 2% to, for example, 3% or 4%, would have the advantage of increasing the nominal interest rate in the long term and, thus, its distance from the ELB.[17] The current 2% reference rate was, in many cases, set at a time when interest rates had been fluctuating at levels substantially higher – and therefore more distant from their lower bound – than the present ones. Thus, a priori, the selected target entailed sufficient scope for any necessary interest rate cuts.[18] This latter consideration has been widely called into question as a result of the experience of recent years and the evidence mentioned above of a secular decline in the natural rate of interest.

However, the inflation target cannot be raised without costs and distortions, which means that the optimal level of inflation is the subject of intense debate. In a standard neo-Keynesian model, in the absence of the ELB constraint, the optimal inflation target is zero. This is because non-zero inflation generates distortions owing to the inefficient dispersion in the relative prices of consumer goods.[19] When the possibility that monetary policy may be constrained by the ELB is taken into account positive inflation targets can be justified. In the past, studies of this type have prescribed relatively low inflation rates, typically of less than 2%.[20] However, more recent studies have questioned this conclusion, using various arguments. First, according to the evidence provided by microeconomic data, the models employed tend to overestimate the impact of inflation on relative price dispersion.[21] Second, the optimal inflation rate depends on the level of the natural rate of interest. Specifically, the lower the natural rate of interest the higher the optimal inflation rate, since more room for manoeuvre is needed above the ELB. Recent studies that take into account the empirical evidence on price dispersion and the recent decline in the natural rate tend to prescribe higher inflation targets than those currently in force.[22]

Apart from those deriving from price dispersion, there are other costs associated with raising the inflation target. These costs include the increase in the opportunity cost of holding cash (i.e. the nominal interest rate) and distortions arising from taxes

---

17 See, for example, Blanchard, Dell'Ariccia and Mauro (2010) and Ball (2014).

18 In the case of the ECB, the 2003 decision to set a target of «below, but close to, 2%» was based on an analysis that weighed the benefits of higher inflation - in terms of alleviation of the ELB constraint - against the associated costs (ECB, 2003). This analysis was based on the assumption of a natural interest rate of between 2% and 3%, well above the current estimates of the natural rate in the euro area (see, once again, Chart 3.3).

19 See Woodford (2003).

20 See, for example, Coibion, Gorodnichenko and Wieland (2012).

21 See, for example, Nakamura, Steinsson, Sun and Villar (2018) for an empirical analysis of the costs of inflation.

22 For example, Blanco (2018) finds that the optimal inflation rate would be around 3%. Andrade *et al.* (2018) study the optimal inflation target as a function of the long-term natural rate of interest.

and subsidies that are not inflation-indexed.[23] Also, a rise in the average level of inflation may lead to higher inflation volatility and, ultimately, to a deanchoring of inflation expectations.[24] In any event, raising the inflation target means that the costs of higher inflation must be borne at all times, even when interest rates are far from the ELB, a less efficient outcome than under other strategies that only entail relatively high inflation around episodes of a binding ELB, which are discussed below.

Another option currently being analysed by academics and central bankers is to use the price level as the target variable rather than the inflation rate (so-called price-level targeting (PLT)).[25] To understand how this strategy works, consider a situation in which the price level falls below the trend set as target for this variable or, what amounts to the same, in which the inflation rate falls temporarily below the rate consistent with that trend.

This will typically occur in a scenario like that of recent years, in which, as a result of a sufficiently severe recession, interest rates are temporarily constrained by the ELB and the central bank has difficulty preventing inflation from falling below its "target" (understood here as the rate of increase of the target path around which the price level is to be stabilised). As the PLT regime requires that the price level return to its announced path, the negative deviation of inflation from target must subsequently be offset by above-target inflation rates for a time (see Chart 3.4). By contrast, once inflation has returned to target there is no need for such offsetting under inflation targeting. While interest rates are constrained by the ELB, a PLT strategy automatically generates expectations of the high future inflation required to return the path of prices to the target trend. Such expectations reduce real interest rates, which stimulates aggregate demand and, consequently, reduces the duration of the ELB episode.[26]

Given that it operates through agents' expectations, the effectiveness of a PLT strategy depends crucially on its credibility. Under PLT, periods of above-target inflation will subsequently be offset by periods of below-target inflation. In so far as the latter require, in certain circumstances, a contractionary monetary

---

23 See, for example, Feldstein (1997).

24 See e.g. Ascari, Florio and Gobbi (2017). A further challenge involved in raising the inflation target relates to its credibility in the current low inflation environment. In an environment characterised by inflation rates persistently below the 2% reference rate in the euro area and other advanced economies, economic agents may doubt the ability of central banks to achieve higher inflation targets, which might hamper the achievement of the new target.

25 For a discussion of the PLT strategy, see, for example, Williams (2017).

26 The stabilising advantages of PLT are endorsed by the fact that, in the standard neo-Keynesian model, a flexible PLT strategy (which permits temporary deviations from the target path and also takes into account output gap stabilisation) is very similar to the optimal monetary policy, and in particular to the optimum in the context of a binding ELB. See Eggertsson and Woodford (2003).

Chart 3.4
PRICE OR INFLATION TARGET?

Description of the differences between a strategy of inflation targeting and a strategy of price-level targeting. The chart shows how inflation and prices should react to an unexpected fall in inflation in year 1.

1 INFLATION TARGET

1.1 INFLATION
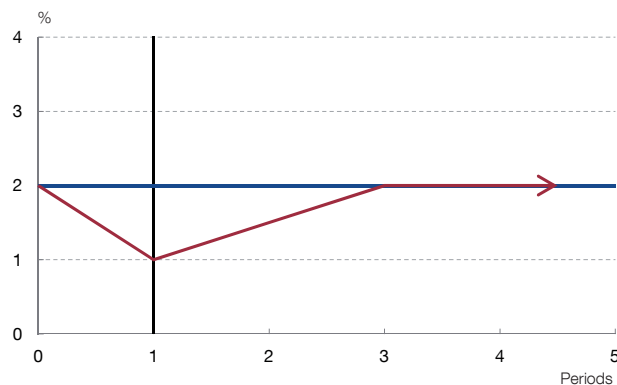
2 PRICE-LEVEL TARGET

2.1 INFLATION
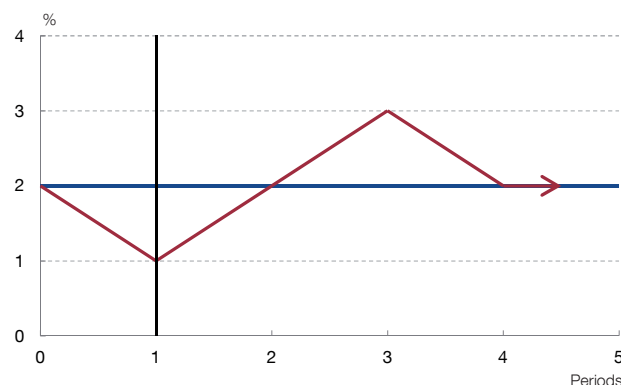
1.2 PRICE LEVEL
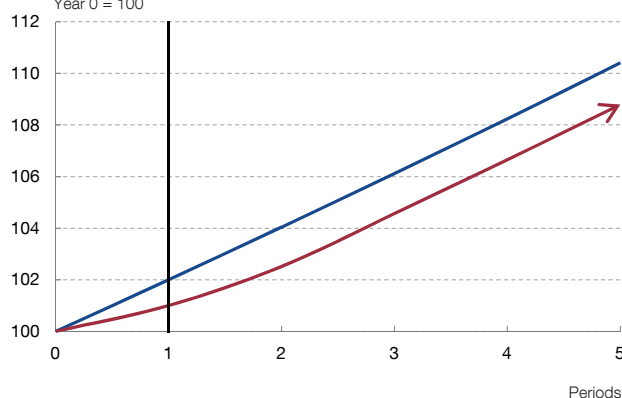
2.2 PRICE LEVEL
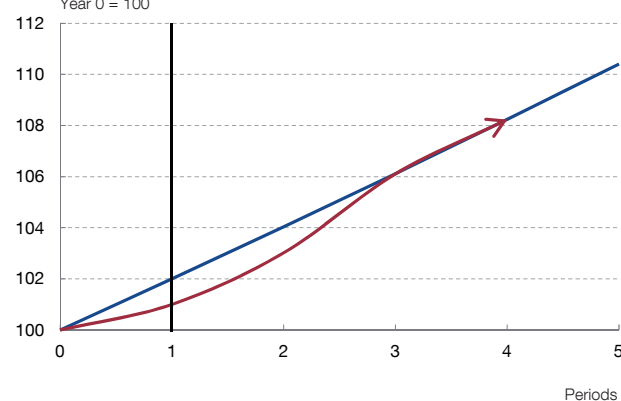
SOURCE: Banco de España.

policy with negative consequences for output and employment, the credibility of this commitment may be questioned. Heeding this criticism, some authors have proposed a "temporary" or asymmetric PLT regime, which would only be applied in episodes in which inflation falls below target owing to a binding ELB episode. Thus, the central bank would commit to maintaining an above-target inflation rate in future, until the price level converges with the path prior to this episode.[27] In

27   See Bernanke (2017b).

"normal" times, this regime operates in the same way as conventional inflation targeting.[28]

Box 3.3 uses a macroeconomic model to simulate the effects of the strategies described above, in a context in which, as a result of recurrent negative shocks, monetary policy is frequently constrained by the ELB.[29] The analysis shows that raising the inflation target may indeed reduce both the frequency and duration of binding ELB episodes and the losses of economic activity associated with such episodes. However, as already mentioned, this strategy is not cost-free. By contrast, a PLT regime has similar benefits to those of raising the inflation target, without incurring the costs associated with this latter strategy. The temporary PLT strategy operates in a very similar way to permanent PLT around periods with a binding ELB, but outside such periods it behaves similarly to the current inflation targeting regime, giving rise on average to a certain inflationary bias. Finally, it is shown that policies involving balance sheet expansion by means of asset purchases, of comparable size to that of the programmes implemented in the Eurosystem, may also reduce the frequency and severity of binding ELB episodes.

In conclusion, the current monetary policy strategy, with inflation targets of 2% in most advanced economies, is facing a growing challenge from the interest rate lower bound constraint. The non-standard monetary policy measures applied since 2008 (balance sheet expansion, forward guidance, etc.) may help to alleviate the effects of this constraint in future crises. However, if the apparent process of decline in the natural interest rate continues (as a consequence of adverse demographic developments and other structural factors referred to above) and, therefore, the ELB becomes an increasingly frequent obstacle for monetary policy, it may be necessary to consider possible changes in the basic strategy of central banks. In the case of the euro area, the evidence on the natural rate of interest and the projections of this rate suggest that a debate on possible changes to the ECB's monetary policy strategy may need to be held soon.

Irrespective of the possibility of changing the monetary policy strategy, one way of addressing the ELB problem involves the issue of digital currency by central banks, along with the gradual elimination of cash. The issue of central bank digital currency (CBDC) would involve extending the possibility – available at present to credit institutions and the public sector – of holding deposits at the central

---

28 It is important to highlight that implementation of the temporary PLT regime may involve significant challenges, especially as regards its communication if two different strategies (IT and PLT) are alternated according to whether or not interest rates are at the ELB.

29 The model is based on the work of Almeida, Hurtado and Rachedi (2019), who build a general equilibrium model of a monetary union with two regions (Spain and the rest of the euro area). The model is estimated econometrically with data for both regions, which makes it especially appropriate for conducting a quantitative analysis of the effects of different economic policies.

bank to other economic agents: non-bank financial institutions, non-financial corporations and households. In a cashless economy, the CBDC interest rate would set the floor for interest rates.[30] In this hypothetical situation, the central bank would not be constrained by the ELB, so that, in principle, it would be able to reduce interest rates below zero if necessary. However, the introduction of CBDC could give rise to problems of a different kind, including some potentially large ones relating to financial stability. In this scenario, commercial banks would suffer, to a greater or lesser extent, outflows of deposits to the central bank. As a result they would need to resort to more costly and possibly more volatile sources of financing, reducing their profitability and potentially increasing the probability and severity of financial crises.

In any event, raising the natural rate of interest is mainly the task of structural policies. To conclude this section, it is important to stress the role that other policies can play in relation to the natural rate. As mentioned above, this rate is largely determined by demographic changes and productivity growth. Since it is difficult to influence the first factor in the short term, the possibility of raising the natural rate largely depends on achieving higher productivity growth. As a result, structural reforms and supply-side policies to achieve this objective are particularly desirable in the current context, since they would provide greater scope for monetary policy action.[31]

Fiscal policy can also alleviate the effects of the binding ELB. Here, there are two issues to consider: the effects of fiscal policy when the economy is in a liquidity trap and its ability to increase the natural rate of interest. In relation to the first question, the literature has emphasised that the efficacy of fiscal policy is greater when monetary policy is constrained by the ELB. The reason is that the inflationary effects of an expansionary fiscal policy are not counteracted by rising interest rates because, during the binding ELB episode, the monetary authority would wish to reduce the interest rate even further. Moreover, in the context of a monetary union, fiscal expansions in part of the union may have significant positive spillover effects on the rest of the union.[32] On the other hand, to the extent that the low interest rates reflect a shortage of safe assets, fiscal expansions financed by an increase in public debt may increase the natural rate of interest, provided that such debt continues to

---

30 There are other CBDC proposals, in which it is not remunerated. For a discussion of the impact of CBDC on the conduct of monetary policy, see Nuño (2018).

31 Andrés, Arce and Thomas (2017) analyse the role of structural reforms when providing a macroeconomic stimulus in a context in which monetary policy is unable to do so.

32 This is particularly true of fiscal stimuli based on increases in public spending, as they are more inflationary than comparable tax reductions. See Christiano, Eichenbaum and Rebelo (2011), Woodford (2011) and Eggertsson (2011) for an analysis of the effectiveness of fiscal expansions when interest rates are at the ELB; and Blanchard, Erceg and Lindé (2016) and Arce, Hurtado and Thomas (2016) for an analysis of such effectiveness and the associated spillovers in the context of a monetary union.

be perceived as safe (a requirement that may, in practice, limit the possibility of raising the natural rate by this means).[33]

3 The size and composition of the central bank's balance sheet

Quantitative easing has led to an unprecedented increase in the size of central bank balance sheets. In the case of the euro area, the Eurosystem balance sheet expanded from 13% of GDP in 2006 to 41% as at end-2018. On the asset side, the expansion reflected an increase in the holdings of monetary policy assets, at first mainly in the form of long-term refinancing operations (LTROs) for banks and subsequently, from early 2015, primarily in the form of large scale purchases of financial securities through the APP programme. On the liabilities side, these transactions have led to an expansion of excess bank reserves, i.e. the liquidity deposited by euro area commercial banks at the ECB and at the Eurosystem banks (see Chart 3.5.2). This latter phenomenon has been widely experienced by the other central banks of the main advanced economies.[34]

Before the crisis, the ECB conducted its monetary policy by means of a "corridor system". Since commencing operations, the ECB has guided the economy's interest rates by influencing the short-term interbank market interest rate. Specifically, the EONIA (Euro Overnight Index Average) index of interest rates on overnight loans is usually considered to be the ECB's implicit target. As seen in Chart 3.5.1, before 2008 the EONIA fluctuated within the corridor made up of the ECB's lending and deposit facility interest rates, i.e. the interest rates at which the ECB allows euro area commercial banks to borrow overnight or to deposit their reserves, respectively. In fact, these two rates are the ceiling and floor, respectively of the corridor in which the EONIA moves, since the banks have no incentive to borrow at a higher rate (or to lend at a lower rate) than they can obtain from the ECB for the same maturity.[35] In a context of very limited excess reserves (beyond the regulatory requirement), the EONIA fluctuated close to the middle of the corridor, so that this regime was known as the "corridor system".

---

33 See, for example, Caballero, Farhi and Gourinchas (2017). According to Jimeno (2015), an over-expansionary fiscal policy, against a background of high public debt and doubts regarding the future transfers to be received from the pension system, may lead households to increase their saving, which would exert downward pressure on the equilibrium interest rate.

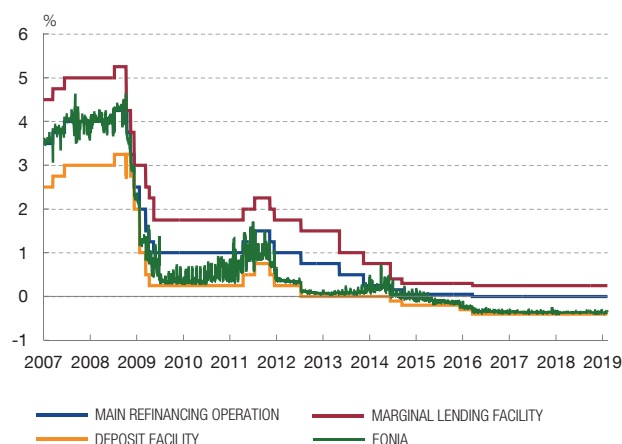34 See, for example, Reis (2016).

35 Another ECB instrument is the interest rate on main refinancing operations (MROs), which is typically equal to the mid-point between the lending and deposit facility rates. MROs are one-week loans tendered on a weekly basis, unlike the overnight loans of the marginal lending facility, which are always available on business days.

Chart 3.5
THE ECB HAS SWITCHED FROM A CORRIDOR SYSTEM TO A FLOOR SYSTEM

The increase in the Eurosystem balance sheet has led the ECB to switch from a corridor system, with EONIA in the centre of the band formed by the interest rate on lending facilities and the deposit rate, to a floor system, with EONIA close to the deposit rate.

1 ECB POLICY INTEREST RATES AND EONIA

2 EUROSYSTEM BALANCE SHEET

MAIN REFINANCING OPERATION
DEPOSIT FACILITY
MARGINAL LENDING FACILITY
EONIA

OTHER FACTORS NET
LIQUIDITY FACILITIES
CASH
SECURITIES
RESERVES
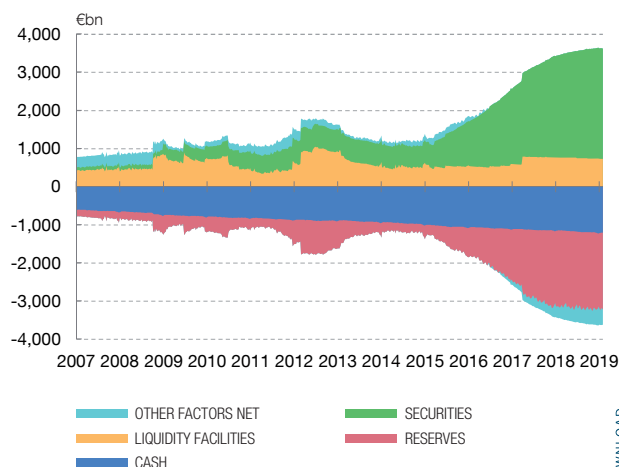
SOURCES: Datastream and ECB.

The expansion of the volume of reserves has meant that the ECB now uses a floor system, like most major central banks today. The increase in the volume of reserves and the consequent increase in excess liquidity in the interbank market have meant that the EONIA and other similar indicators of very-short-term interbank yields have moved very close to the ECB's deposit facility interest rate (DFR), the minimum remuneration lending banks are willing to accept (see Chart 3.5.1). The ECB has thus, de facto, switched to operating a floor system, so called because the EONIA now normally stands very close to the floor for overnight interbank yields, i.e. the DFR. This transition to a floor system has also occurred at many of the other central banks of the largest advanced economies, such as the United States, Japan and the United Kingdom.[36]

Looking ahead, as they take steps to normalise their monetary policies, the ECB and other central banks face the dilemma of whether to maintain the current floor system or to revert to the pre-crisis corridor system. In terms of balance sheet size, the first option involves maintaining a relatively large balance sheet, while the second involves reducing it to levels directly related to households' and firms' demand for cash and banks' demand for reserves and, thus, returning to the pre-crisis corridor system. The main arguments explored in the economic literature for and against these two systems are analysed below (see Figure 3.4).

36   See Arce, Nuño, Thaler and Thomas (2018).

ADVANTAGES AND RISKS OF A LARGE BALANCE SHEET

QUANTITATIVE EASING HAS SIGNIFICANTLY INCREASED THE SIZE OF CENTRAL BANK BALANCE SHEETS

The ECB uses its lending and deposit facilities to provide and absorb liquidity:

— Commercial banks that need liquidity can borrow from the ECB at the interest rate on the lending facility

— Commercial banks that have excess liquidity can deposit it at the ECB and earn the interest rate on the deposit facility

Before the financial crisis, banks did not on aggregate have excess liquidity	The interbank interest rate fluctuated in the middle of the corridor formed by the interest rates of the ECB's two facilities (lending and deposit)
During the crisis, central banks: — Refinanced commercial banks at relatively long maturities — Purchased financial assets on a large scale	The amount of commercial bank reserves has been multiplied, which has generated a sharp increase in aggregate excess liquidity — The ECB has switched to a floor system: the interbank interest rate has fallen from the middle of the corrridor to its lower limit (the interest rate on the deposit facility)

THE DEBATE ON THE SIZE OF THE CENTRAL BANK BALANCE SHEET: SHOULD IT REMAIN LARGE OR BE REDUCED TO PRE-CRISIS LEVELS?

IN FAVOUR OF A LARGE BALANCE SHEET	AGAINST A LARGE BALANCE SHEET
— Low volatility of short-term interest rates — Provision of safe and liquid short-term assets to the private sector, which may improve financial stability — More room, relative to the ELB, to respond to future adverse developments	— Unjustified distortion of the yield curve — Deterioration in central bank solvency

SOURCE: Banco de España.

A large balance sheet may lead to an excessively flat yield curve. An initial argument in favour of returning the size of the balance sheet to its pre-crisis trend is that a large balance sheet may lead to an undesired distortion of the yield curve.[37] This occurs when the central bank's balance sheet, as in the case of the Federal Reserve's and the ECB's, includes large quantities of medium and long-term assets. By reducing the supply of long-term assets available to the private sector, term premia are compressed and, therefore, medium and long-term yields fall. This may be beneficial when monetary policy has exhausted its conventional room for manoeuvre and, indeed, this has been one of the main transmission channels for

---

37 See Bullard (2017).

asset purchase programmes; by reducing long-term interest rates they stimulate investment and, thus, aggregate demand. However, in a context of normalisation of the economic outlook, with interest rates no longer constrained by their lower bound, the flattening of the yield curve may be less justified.

Second, the larger the balance sheet, the greater the financial risk for the central bank itself, especially when the maturities of its assets and liabilities differ. The price of assets, such as medium and long-term government bonds, may vary due to changes in risk and term premia, or in the risk-free short-term nominal interest rate. The liabilities (basically cash and bank reserves), on the other hand, are short-term, and their nominal value is very stable. Thus, the larger the size of the central bank balance sheet (and the longer the maturity of its assets) in relation to its capital, the greater the risk of imbalance between the value of the assets and the value of the liabilities on the central bank's balance sheet. From an economic perspective, the importance of a possible situation in which the book value of the central bank's assets falls below that of its liabilities is debatable; by definition, most central bank liabilities are not callable (as in the case of cash) or can be settled in cash (as in the case of bank reserves), the creation of which is controlled by the central bank itself.

Potentially more problematic is a situation of so-called "intertemporal insolvency" of the central bank, which occurs when its balance sheet deficit exceeds the net present value of future seigniorage flows and it cannot rely on automatically receiving additional capital injections from the relevant fiscal authority. In this situation, the ability of the central bank to stabilise inflation may be compromised.[38] Moreover, the discretionary capital injections from the fiscal authorities needed to avoid this situation may put the central bank's financial independence in doubt. It is important to stress, however, that a hypothetical situation of intertemporal insolvency of the central bank requires an extreme scenario for the size of the balance sheet, far removed from the current situation.[39]

Against the above line of argument, there are several reasons for maintaining the size of central banks' balance sheets at their current levels or, at least, significantly above their pre-crisis levels.

First, according to some authors a large balance sheet may contribute to financial stability.[40] Currently, there is a high demand from the private sector for

---

38 See, for example, Sims (2016), Hall and Reis (2015) and Del Negro and Sims (2015). It should be noted, however, that central banks usually hold medium and long-term financial assets to maturity (i.e. they do not sell them earlier), which is why they value them at amortised cost, instead of market price. In this respect, it is possible to distinguish between the accounting rules of central banks and the economic analysis regarding the intertemporal solvency of central banks in the aforementioned studies.

39 For a quantitative analysis applied to the case of the United States, see Cavallo et al. (2018).

40 See Greenwood, Hanson and Stein (2016).

short-term, safe and liquid assets, as reflected in a "scarcity premium" for such assets (i.e. their remuneration is unusually low). This premium gives financial institutions a strong incentive to issue liabilities with these characteristics. Insofar as this short-term funding is used to finance long-term investment, it may lead to excessive maturity transformation by the financial sector, which may compromise financial stability. In fact, when a financial institution's assets are long-term and therefore, relatively illiquid, while its liabilities are short-term and, therefore, have to be continuously refinanced, the risk that such an institution may have difficulty renewing its funding and making payments increases, with the consequent liquidity risk and, possibly, insolvency risk. The central bank may counter excessive maturity transformation risk by issuing large amounts of bank reserves, which are more liquid and safer assets than the securities issued by private agents. On the other hand, in order for private institutions to be able to benefit from a larger supply of reserves, the deposit (or similar) facilities of central banks need to be available to institutions without a banking licence, such as investment funds. The creation of the ON RRP (Overnight Reverse Repurchase) programme in the United States, under which non-bank entities can deposit their liquidity at the Federal Reserve, goes precisely in this direction.

With a large balance sheet, the banking sector has a large amount of liquidity. A second argument in favour of a large balance sheet is that, since the cost of creating reserves is basically zero, it may be desirable to expand their supply (and, therefore, the size of the central bank's balance sheet) until banks' demand for them is sated.[41] This will be so, to the extent that bank reserves perform socially useful functions, such as facilitating payments and financial transactions. Sating the banking systems demand from reserves requires that their opportunity cost be zero, i.e. that the rate of interest on excess reserves (the DFR in the case of the ECB) is basically equal to the return on assets with the same maturity; for example, overnight interbank loans (summarised in indicators such as the EONIA). The logic of this argument is the same as that of the so-called "Friedman rule" for cash, but applied to reserves: an asset that has a zero cost of production does not need to have a positive price (opportunity cost) either.

Although it is in practice difficult to determine the level beyond which the demand for reserves is saturated, the relationship observed between excess reserves and the spread between the EONIA and the deposit facility rate in the euro area suggests that maintaining the spread at its present level (of close to zero) does not necessarily require maintaining the volume of reserves at their current levels. In fact, the evidence presented in Chart 1 of Box 3.4 shows that there may even be room to reduce the current level of excess reserves (and therefore the size of the Eurosystem balance sheet), while preserving the floor system.

---

41 See Cúrdia and Woodford (2011).

A large balance sheet permits greater control over interest rates, and a gain in space above the ELB. Two further advantages of a large balance sheet derive from the above discussion. First, in so far as it entails a floor system, a large balance sheet permits the central bank to directly control short-term interbank yields, by setting the remuneration of reserves, which isolates such yields from temporary shocks in the interbank market. This may be particularly relevant in the current situation, characterised by a notable level of uncertainty regarding how the demand for reserves has changed since the crisis (owing to factors such as changes in bank regulation and, in the case of the euro, the persistence of a certain financial fragmentation) and, therefore, of how advisable it is to return to a corridor system.[42]

Second, the floor system may provide the central bank with more space to cut rates if necessary, for the following reason. It is plausible to assume that, in the long run, given the central bank's inflation target, nominal market interest rates, such as interbank rates, are independent of the size of the balance sheet. This means that in a floor system the interest rate on reserves will on average be *higher* (as it is linked to market yields), than in a corridor system. Consequently, the central bank will have more space, above the lower bound, to cut this rate in response to future crises.[43] This argument is developed in Box 3.4 and the stabilising properties of these two regimes are compared, within the framework of a macroeconomic model, when the ELB constrains interest rate policy.

Some central banks have already decided to preserve the floor system for the time being. The Federal Reserve began to reduce the size of its balance sheet in October 2017, by not reinvesting all of the securities in the portfolio of its quantitative easing programme upon their maturity, and ruling out the possibility of maintaining it at the maximum level reached in October 2014. However, in January 2019 it communicated its intention to maintain a floor system, so that the target balance sheet size will be sufficiently large for the resulting volume of reserves to allow the system to be preserved.

In parallel with the above discussion on the desirable size of the balance sheet, there has been a debate regarding the composition of the central bank's balance sheet, a particularly important question in the case of a large balance sheet. Some of the arguments made in relation to the size of the balance sheet are

---

42 See, for example, Quarles (2019). Bernanke (2016, 2017) contributes a further argument to the debate on the size of the balance sheet. The demand for cash has increased partly for exogenous reasons, which justifies a larger balance sheet. This argument, however, is specific to the case of the United States and does not appear to apply to the euro area.

43 See Arce, Nuño, Thaler and Thomas (2018). Note that this argument applies to conventional interest-rate policy. In the case of unconventional monetary policy, such as asset purchase programmes, a balance sheet that is large in normal times may limit the scope to increase its size through additional asset purchases, if this becomes necessary. This is particularly relevant in the euro area, where the parameters of the APP restrict the capacity to expand the Eurosystem's balance sheet through the acquisition, for example, of government bonds.

based on the fact that, in practice, its expansion has been generated mainly through the issue of very short-term liabilities (reserves) and the acquisition of medium and long-term assets. However, looking ahead, a particular size of balance sheet is compatible with a different maturity structure both on the assets and on the liabilities side. Likewise, the proportions of public and private assets on the central bank's balance sheet can also vary.

As regards the asset maturity structure, the relatively long duration of the assets held by central banks represents a source of risk for their balance sheets. In this respect, for a given balance sheet size, the central bank may reduce its risk by shortening the average maturity of its portfolio of assets.[44] This would in turn reduce the above-mentioned yield curve distortions, to which a large balance sheet may give rise in a scenario in which conventional interest rate policy is, in principle, sufficient to achieve the desired monetary policy stance.

On the liabilities side, the expansion of the balance sheets of the main central banks has, up until now been reflected in the issue of overnight reserves. Some authors suggest the possibility of lengthening the maturity of bank reserves by, for example, issuing debt certificates with longer maturities.[45] To the extent that interbank market yields at such maturities are linked to the remuneration of such certificates, the central bank would have greater control over the longer end of the yield curve.

As for the proportions of public and private assets, recent studies suggest that, under normal conditions, central bank assets should consist mainly of government bonds and that only in situations in which the financial sector is sufficiently disrupted should the central bank also invest in private assets.[46] The argument is twofold: first, for the central bank too it is relatively costly to intermediate such private assets, as it has to invest in credit risk evaluation tools, possible NPL management, etc.: second, private asset purchases are especially effective when the financial markets are tighter. Thus, only in these situations would it be justified to acquire such private assets and incur the associated costs.[47] Moreover, as regards

---

44 See Greenwood, Hanson and Stein (2016). This argument could be considered contradicted by the one explained above, offered by the same authors, in favour of expanding the volume of reserves (in so far as they are short-term and safe assets) to boost financial stability. In fact, to the extent that the central bank creates reserves to finance the acquisition of short-term assets that are similarly safe and liquid, the net effect on the total volume of such assets held by the private sector will be practically non-existent. However, the authors argue that the Federal Reserve could reduce the average duration of its bonds to a range of 2 to 6 years (as compared with the current average duration of 8.6 years) and basically achieve the same positive effect on financial stability.

45 See, for example, Reis (2016).

46 See Cúrdia and Woodford (2011).

47 Gertler and Kiyotaki (2010) suggest that, in a financial crisis, purchasing private assets is more effective than purchasing government debt, because the former has a greater impact in terms of easing financial tensions.

the solvency of the central bank (discussed above), a higher proportion of private assets usually entails greater credit risk than government debt. In this respect, the Federal Reserve, in its internal deliberations, suggested the possibility of gradually modifying the composition of its portfolio so that it is mainly made up of public debt assets.

Finally, in addition to public and private securities, central bank assets can also be made up of medium and long-term loans to banks, like those granted by the ECB within the framework of its long-term refinancing programmes (LTRO, VLTRO and TLTRO). As well as providing liquidity to the banking sector, these operations give central banks greater control over long-term interest rates, especially in a relatively banked economy like the euro area's.

4 Conclusions

This chapter has examined two basic aspects of the future setting in which monetary policy will be designed and applied in the main advanced economies. First, central banks will face a scenario in which their interest rates will foreseeably fluctuate around average levels which are relatively low and therefore close to their lower limit, leaving scant room for rate cuts in response to future crises and recessions. This phenomenon is closely related to the fall in the so-called "natural interest rate" in recent decades, mainly as a result of adverse demographic developments. These factors, should they persist in the future, will continue to put downward pressure on the natural interest rate and, given the inflation targets of central banks, on nominal rates.

The chapter explores to what extent changes in basic monetary policy strategy may help to alleviate the lower bound constraint on interest rates. This matter will be particularly important if the fall in the natural interest rate persists in the future and the non-standard tools used since 2008 in the current strategic framework (such as large-scale asset purchases and guidance on the future course of the various instruments) are not sufficiently effective.

Although the various alternative strategies have notable theoretical advantages, their probable costs, associated risks and, in particular, the absence of practical experience with them mean that their possible effects must continue to be analysed in greater depth. In any event, it should be noted that a reassessment of monetary policy strategy (as by the ECB in 2003, or by the US Federal Reserve in 2012 and periodically by the Bank of Canada) is relatively common among central banks of the advanced economies, and that the available evidence on the secular fall in the natural interest rate argues strongly for reconsidering this strategy in the future. A final important point is that it is the responsibility of other areas of economic policy

to take measures to help natural interest rates to recover, such as the implementation of structural reforms to increase productivity growth.

The size of the balance sheets of the main central banks has reached record levels as a result of the various quantitative easing measures adopted since the beginning of the global crisis. Looking forward, these central banks face the dilemma of maintaining their balance sheet size at its current level or returning to the trend before the crisis. A key factor emerging from the debate is the following. To the extent that central bank liabilities continue to consist mainly of (short-term) bank reserves, the choice between a large balance sheet and a small balance sheet is substantially equivalent to that of whether to retain the current floor system (with interbank market returns tied to the remuneration of reserves) or return to the pre-crisis corridor system (with a small volume of reserves and short-term interbank returns fluctuating within a corridor formed by the rates on the central bank's credit and deposit facilities). In this respect, preserving the floor system has certain benefits in terms of improved control over short-term market interest rates, more leeway to reduce interest rates in response to a crisis, etc. However, in the case of the Eurosystem, it would in principle be feasible to keep this system with a volume of excess reserves below the present level.

REFERENCES

Almeida, G., S. Hurtado and O. Rachedi (2019). JoSE: Joint Spain Euro Area Model, Working Paper, Banco de España, forthcoming.

Andrade, P., J. Galí, H. Le Bihan and J. Matheron (2018). *The Optimal Inflation Target and the Natural Rate of Interest,* Working Papers, No. 670, Banco de Francia.

Andrés, J., Ó. Arce and C. Thomas (2017). "Structural reforms in a debt overhang", *Journal of Monetary Economics,* 88(C), pp.15-34.

Arce, Ó., S. Hurtado and C. Thomas (2016). "Policy Spillovers and Synergies in a Monetary Union", *International Journal of Central Banking,* 12(3), pp. 219-277.

Arce, Ó., G. Nuño, D. Thaler and C. Thomas (2018). *A Large Central Bank Balance Sheet? Floor vs Corridor Systems in a New Keynesian Environment,* Working Paper 1851, Banco de España.

Arce, Ó., G. Nuño and C. Thomas (2019). "The Eurosystem's monetary policy following the end of net asset purchases", Analytical Articles, *Economic Bulletin,* 1/2019, Banco de España.

Ascari, G., A. Florio and A. Gobbi (2017). "Transparency, expectations anchoring and inflation target", *European Economic Review*, 91(C), pp. 261-273.

Ball, L. (2014). *The Case for a Long-Run Inflation Target of Four Percent,* IMF Working Papers, No. 14-92, International Monetary Fund.

Banco de España (2016) "The effect of the ECB's monetary policies in the recent period", Chapter 3, *Annual Report, 2015.*

Basso, H., and O. Rachedi (2018). *The Young, the Old and the Government: Demographics and Fiscal Multipliers,* Working Paper 1837, Banco de España.

Bernake, B. (2005). "The global saving glut and the U.S. current account deficit", Sandridge Lecture, Virginia Association of Economists, Richmond, Virginia.

— (2016). "Should the Fed keep its balance sheet large?", 2 September.

— (2017a). "Shrinking the Fed's balance sheet", 26 January.

— (2017b). "Temporary price-level targeting: An alternative framework for monetary policy", 12 October.

Blachard, O., G. Dell'Ariccia and P. Mauro (2010). "Rethinking Macroeconomic Policy", *Journal of Money, Credit and Banking,* No. 42, pp. 199-215.

Blachard, O., C. J. Erceg and J. Lindé (2016). "Jump-Starting the Euro Area Recovery: Would a Rise in Core Fiscal Spending Help the Periphery?", *NBER Macroeconomics Annual 2016,* No. 31, pp. 103-182.

Blanco, A. (2018). *Optimal Inflation Target in an Economy with Menu Costs and Zero Lower Bound,* forthcoming.

Brand, C., M. Bielecki and A. Penalver (2018). *The natural rate of interest: estimates, drivers, and challenges to monetary policy,* ECB Occasional Paper Series, No. 217.

Bullard, J. (2017). "The Role of the Fed's Balance Sheet for the US Monetary Policy Outlook in 2017", Spring 2017 GWU Alumni Lecture in Economics, George Washington University, Washington, DC, 28 February.

Burstein, A., and C. Hellwig (2008). "Welfare Costs of Inflation in a Menu Cost Model", *American Economic Review,* No. 98, pp. 438-443.

Caballero, R. J., and E. Farhi (2017). "The safety trap", *The Review of Economic Studies,* No. 85, pp. 223-274.

Caballero, R. J., E. Farhi and P. O. Gourinchas (2008). "An equilibrium model of "global imbalances" and low interest rates", *American Economic Review,* No. 98, pp. 358-393.

— (2017). "The Safe Assets Shortage Conundrum", *Journal of Economic Perspectives,* 31(3), pp. 29-46.

Carvalho, C., A. Ferrero and F. Nechio (2016). "Demographics and real interest rates: inspecting the mechanism", *European Economic Review,* No. 88, pp. 208-226.

Cavallo, M., M. Del Negro, W. S. Frame, J. Grasing, B. A. Malin and C. Rosa (2018). *Fiscal Implications of the Federal Reserve's Balance Sheet Normalization,* NY Fed Staff Report, No. 833.

Christiano L., M. Eichenbaum and S. Rebelo (2011). "When Is the Government Spending Multiplier Large?", *Journal of Political Economy,* 119(1), pp. 78-121.

Coibion, O., Y. Gorodnichenko and J. Wieland (2012). "The Optimal Inflation Rate in New Keynesian Models: Should Central Banks Raise Their Inflation Targets in Light of the Zero Lower Bound?", *Review of Economic Studies,* 79(4), pp. 1371-1406.

Cúrdia, V., A. Ferrero, G. C. NG and A. Tambalotti (2015). "Has U.S. monetary policy tracked the efficient interest rate?", *Journal of Monetary Economics,* No. 70, pp. 72-83.

Cúrdia, V. and M. Woodford (2011). "The central-bank balance sheet as an instrument of monetary policy", *Journal of Monetary Economics,* Elsevier, 58(1), pp. 54-79.

Del Negro, M., and C. Sims (2015). "When does a central bank's balance sheet require fiscal support?", *Journal of Monetary Economics,* 73(C), pp. 1-19.

ECB (2003). Background Studies for the ECB's Evaluation of its Monetary Policy Strategy, Otmar Issing (ed.).

Eggertsson, G. (2011). "What Fiscal Policy is Effective at Zero Interest Rates?", *NBER Macroeconomics Annual 2010,* No. 25, pp. 59-112.

Eggertsson, G., and N. Mehrotra (2014). *A model of secular stagnation,* NBER Working Papers, No. 20574.

Eggertsson, G., N. Mehrotra and J. Robbins (2019). *A model of secular stagnation: theory and quantitative evaluation,* American Economic Journal: Macroeconomics, 11(1), pp. 1-48.

Eggertsson, G., and M. Woodford (2003). "The Zero Bound on Interest Rates and Optimal Monetary Policy", *Brookings Papers on Economic Activity,* 34(1), pp. 139-235.

Feldstein, M. (1997). "The Costs and Benefits of Going from Low Inflation to Price Stability", in C. Romer and D. Romer (eds.), *Reducing Inflation: Motivation and Strategy*, pp. 123–56.

Fiorentini, G., A. Galesi, G. Pérez-Quirós and E. Sentana (2018). *The Rise and Fall of the Natural Interest Rate,* Working Paper 1822, Banco de España.

Galesi, A., G. Nuño and C. Thomas (2017). "The natural interest rate: concept, determinants and implications for monetary policy", Analytical Articles, *Economic Bulletin,* 1/2017, Banco de España.

Gertler, M., and N. Kiyotaki (2010). "Financial Intermediation and Credit Policy in Business Cycle Analysis", in B. Friedman and M. Woodford (eds.), *Handbook of Monetary Economics,* 1(3), Chapter 11, pp. 547-599.

Gordon, R. (2015). "Secular Stagnation: A Supply-Side View", *American Economic Review,* 105(5), pp. 54-59.

Greenwood, R., S. Hanson and J. Stein (2016). "The Federal Reserve's Balance Sheet as a Financial-Stability Tool", Jackson Hole Economic Policy Symposium: Federal Reserve Bank of Kansas City, August.

Hall, R., and R. Reis (2015). *Maintaining Central-Bank Financial Stability under New-Style Central Banking,* NBER Working Papers, No. 21173.

Holston, K., T. Laubach and J. Williams (2017). "Measuring the natural rate of interest: international trends and determinants", *Journal of International Economics,* No. 108, pp. 59-75.

Jimeno, J. (2015). *Long-lasting consequences of the European crisis,* Working Paper 1522, Banco de España.

Nakamura, E., J. Steinsson, P. Sun and D. Villar (2018). "The Elusive Costs of Inflation: Price Dispersion during the U.S. Great Inflation", *The Quarterly Journal of Economics,* 133(4), pp. 1933-1980.

Nuño, G. (2018). "Monetary policy implications of central bank-issued digital currency", Analytical Articles, *Economic Bulletin,* 3/2018, Banco de España, pp. 1-8.

Quarles, R. K. (2019). "The Future of the Federal Reserve's Balance Sheet", speech at the U.S. Monetary Policy Forum, 22 February.

Rachel, L., and T. Smith (2015). *Secular drivers of the global real interest rate,* Bank of England Working Paper, No. 571.

Reis, R. (2016). "Funding Quantitative Easing to Target Inflation", in Designing Resilient Monetary Policy Frameworks for the Future, Jackson Hole Economic Policy Symposium: Federal Reserve Bank of Kansas City, August.

Rogoff, K. (2015). "Costs and benefits to phasing out paper currency", *NBER Macroeconomics Annual,* No. 29, pp. 445-456.

Sims, C. (2016). "Fiscal policy, monetary policy and central bank independence", Jackson Hole Economic Policy Symposium: Federal Reserve Bank of Kansas City, August.

Summers, L. (2014). "US economic prospects: secular stagnation, hysteresis, and the zero lower bound", *Business Economics,* No. 49, pp. 65-73.

Swanson, E. (2018). *The Federal Reserve Is Not Very Constrained by the Lower Bound on Nominal Interest Rates,* NBER Working Papers, No. 25123.

Williams, J. (2017). "Preparing for the next storm: Reassessing frameworks and strategies in a low R-Star world", speech to the Shadow Open Market Committee, New York, 5 May.

Woodford, M. (2003). *Interest and Prices: Foundations of a Theory of Monetary Policy,* Princeton University Press.

– (2011). "Simple Analytics of the Government Expenditure Multiplier", *American Economic Journal: Macroeconomics,* 3(1), pp. 1-35, January.

Box 3.1

THE ESTIMATED NATURAL RATE OF INTEREST

The natural rate of interest (hereafter denoted r*) is defined as the real rate of interest which would be observed in an equilibrium scenario in which prices and nominal wages are perfectly flexible. Thus defined, it is not a directly observable variable and the economic literature reports various ways to estimate r* from observed data. The most commonly used method is to estimate an econometric model inspired in the neo-Keynesian theoretical framework, consisting of an aggregate demand equation (IS curve), according to which the gap between observed output and its natural level (output gap) depends on the gap between the observed real rate of interest and the natural rate of interest, and of a Phillips curve relating inflation to the output gap.[1]

Although this model has been widely used in the literature, it is recognised that it tends to produce inaccurate estimates of the natural rate of interest.[2] Chart 1 illustrates this problem for the United States: the confidence bands (at a confidence level of 90%) around the estimated r* are very wide (around eight percentage points in total). In addition, recent work demonstrates that the accuracy of the standard model estimates declines significantly when the IS and Phillips curves are relatively flat.[3] The reason is that, when the slopes of both curves are equal to zero, the path of the natural interest rate cannot be identified from the available data, and the model is defined as *unobservable.*[4] In practice, the literature estimates of the slopes of the IS and Phillips curves often tend to be near zero, which gives rise to inaccurate estimates of r*.

A recent study by Fiorentini, Galesi, Pérez-Quirós and Sentana proposes an alternative methodology for measuring r* more accurately, based on a model which decomposes the observed real rate of interest as the sum of a transitory component and a permanent one, where the second component is identified as the natural rate of interest (such that the transitory component is the gap between the observed and natural rates of interest).[5] The underlying idea in this approach is that the natural rate of interest is that which would prevail in a hypothetical situation of the economy in which all temporary shocks are dissipated. This methodology allows more reliable estimates of r*, even when the IS and Phillips curves are flat.

It can be seen in Chart 2 that the estimates of this model, obtained from annual data for the period 1891-2018 in 17 advanced economies show a decrease in the average natural rate of interest from the beginning of the 20th century to the decade starting in 1960. Subsequently, from the mid-1970s there is an increase which lasts until the end of the 1980s. This was followed by a gradual fall from the early 1990s which has continued almost uninterruptedly to the present, so that an average natural rate of interest for the economies analysed now seems to be negative.

What factors explain the rise and subsequent fall in the natural rate of interest? Fiorentini *et al.* estimate an error correction model with panel data which postulates a long-term relationship between the observed real rate of interest and a set of indicators of the historical behaviour of the main theoretical determinants of r*: i) changes in productivity growth, which affect the propensity to invest; ii) demographic changes, which affect the aggregate propensity to save or the labour force participation rate of the economy, and iii) risk factors, which may increase

1   See T. Laubach and J. C. Williams (2003), "Measuring the natural rate of interest", *Review of Economics and Statistics,* No 85, pp. 1063-1070, and K. Holston, T. Laubach and J. C. Williams (2017), "Measuring the natural rate of interest: international trends and determinants", *Journal of International Economics,* No 108, pp. 59-S75. Also, the model assumes that r* is the sum of two non-stationary unobserved components: the trend growth of the economy and a second component unrelated to trend growth.

2   See, for example, T. E. Clark and S. Kozicki (2005), "Estimating equilibrium real interest rates in real time", *The North American Journal of Economics and Finance,* No 16, pp. 395-413, and R. C. M. Beyer and V. Wieland (2017), *Instability, imprecision, and inconsistent use of equilibrium real interest rate estimates,* Institute for Monetary and Financial Stability, Working Paper Series 110, Goethe University Frankfurt.

3   See G. Fiorentini, A. Galesi, G. Pérez-Quirós and E. Sentana (2018), *The rise and fall of the natural interest rate,* Working Paper 1822, Banco de España.

4   See R. E. Kalman (1960), "On the general theory of control systems", Proc. First International Congress on Automatic Control, Moscow.

5   See Fiorentini *et al.* (2018), *op. cit*.

Box 3.1
THE ESTIMATED NATURAL RATE OF INTEREST (cont'd)

uncertainty and thus affect r* by changing the propensity to save.[6]

This panel model predicts an increase and subsequent fall in the natural rate of interest from the 1960s, as can be seen in Charts 3 and 4 for the United States and the euro area, respectively. Upon decomposing the individual contribution of each factor, the demographic change proves to be most significant in explaining the rise and fall in the natural rate of interest. However, the

The charts show the natural rate of interest for the advanced economies using various econometric models.

Chart 1
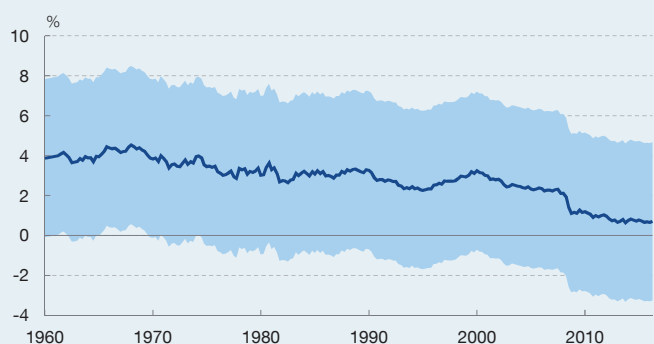US NATURAL RATE OF INTEREST. STANDARD MODEL (a)

Chart 2
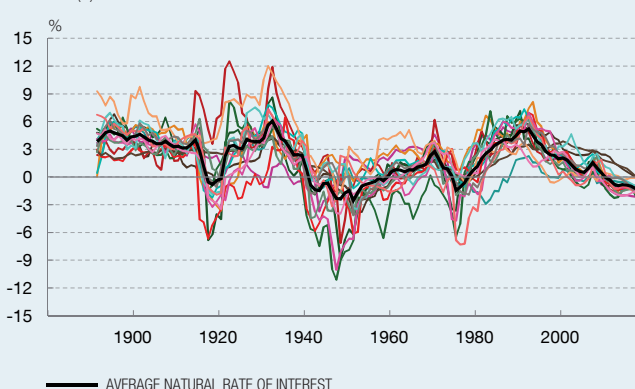HISTORICAL BEHAVIOUR OF THE NATURAL RATE OF INTEREST. "LOCAL LEVEL" MODEL (b)

—— AVERAGE NATURAL RATE OF INTEREST

Chart 3
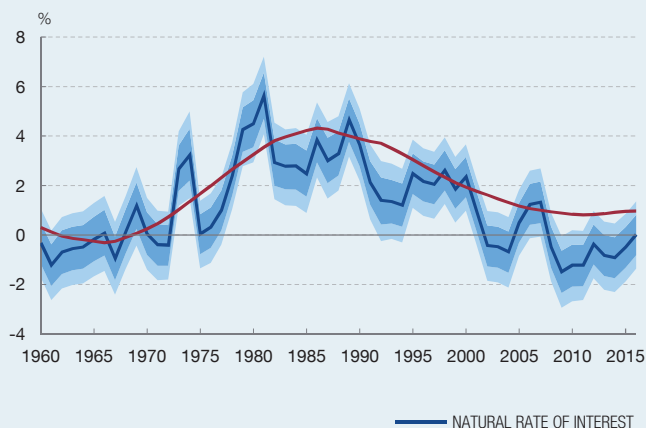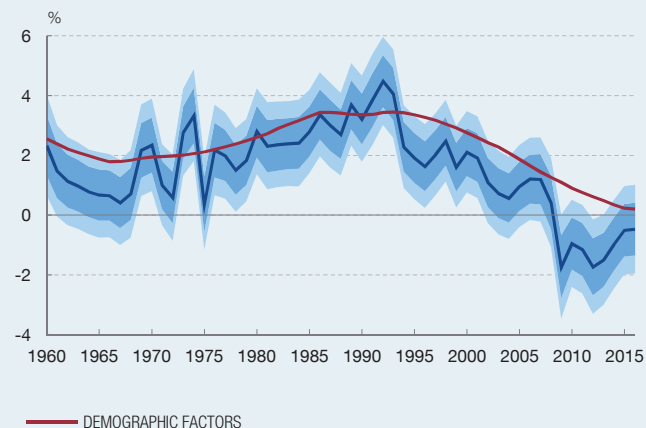US NATURAL RATE OF INTEREST. ERROR CORRECTION MODEL (c)

Chart 4
EURO AREA NATURAL RATE OF INTEREST. ERROR CORRECTION MODEL (c)

—— NATURAL RATE OF INTEREST   —— DEMOGRAPHIC FACTORS

SOURCES: Banco de España, based on the model of Holston, Laubach and Williams (2017), and Fiorentini, Galesi, Pérez-Quirós and Sentana (2018).

a The bands indicate a confidence level of 90%.
b The black line is the average of the countries.
c The bands indicate confidence levels of 68% and 90%.

---

6   For studies which relate the natural rate of interest to productivity growth, demographics and risk factors, see, respectively, R. J. Gordon (2015), "Secular stagnation: a supply-side view", *American Economic Review,* No 105, pp. 54-59, and G. B. Eggertsson and N. R. Mehrotra (2014), *A model of secular stagnation,* National Bureau of Economic Research Working Paper 20574, and E. Fahri and F. Gourio (2018), "Accounting for macro-finance trends: market power, intangibles, and risk premia", mimeo

Box 3.1

THE ESTIMATED NATURAL RATE OF INTEREST (cont'd)

other factors have also contributed persistently to the decrease observed in r* since the 1990s. These results suggest that the initial increase is due to the population growth prompted by the post-war baby boom, which brought a significant, albeit temporary, increase in the participation of young people in the labour market.

When the baby boom ended, the ensuing gradual population ageing seems to have pushed the natural rate of interest down in both economies. This result is consistent with recent studies which have emphasised the role of demographics in explaining the behaviour of the natural interest rate.[7]

---

7   See, for example, E. Gagnon, B. K. Johannsen and D. López-Salido (2016), *Understanding the new normal: the role of demographics,* Finance and Economics Discussion Series 2016-080, Board of Governors of the Federal Reserve System.

Box 3.2
DEMOGRAPHICS, PRODUCTIVITY AND THE NATURAL INTEREST RATE

Demographics takes pride of place in the debate on the structural transformations that will affect the economy in coming decades. In turn, productivity growth has been persistently low since the last downturn. This box uses an economic life cycle model[1] to illustrate the effects of both these factors on the natural rate of interest.

Since the start of the century, in most euro area countries there have been major changes in the share of population of the different age groups (see Chapter 4). According to Eurostat projections, these changes will continue in coming decades (see Chart 1). Thus, throughout this period, the proportion of young adults has decreased and is expected to continue to decrease, while the proportion of adults, which was stable in the first decade of the century, has fallen since 2010 and is expected to continue to fall in coming decades. Lastly, it is estimated that the proportion of over-65s will increase, from 22% in 2000 to 31% in 2030.

The model used combines a standard production framework and households across three stages of the life cycle: young adults (20-29 years), adults (30-65 years) and retirees (65+). The share of each age group in the population depends on fertility and mortality rates, which evolve to give the population structure depicted in Chart 1. In the model, labour income depends on age: young adults command lower wages than older ones, while the over-65s also receive labour income (although they work fewer hours than the other age groups), as well as public pensions.[2] Individuals can save either by accumulating productive capital or by buying (government or corporate) bonds.

The model is calibrated using data on wages and hours worked by age group taken from the European Household Community Panel and the OECD. These data show that labour income peaks during the adult stage (30-65 years) of the life cycle. According to European Commission estimates (2018 Ageing Report), the benefit ratio (average pension to average wage) is expected to fall from 45% to 40% for the EU countries over the next two decades. Lastly, the annual average rate of growth of total factor productivity (TFP) was 0.9% in the euro area in its first decade of existence. Since the onset of the crisis it has declined considerably, to 0.3% in annual average terms. The following simulations assume, as a conservative estimate, that TFP growth will gradually decrease, from 0.9% in 2007 to 0.6% in 2040.[3]

Chart 2.2 depicts the natural rate of interest that would result, according to the model, from these demographic patterns and productivity growth, taking as the starting point the real interest rate observed in 2007 (2.1%).[4] Lower total factor productivity growth translates into a decline in the return on investment in productive capital, which implies a drop in the natural rate of interest. In turn, the effect of demographics on the labour supply and the supply of savings affects the natural rate of interest. On the one hand, a decline in the labour supply associated with a lower birth rate drives down the labour to capital ratio, further moderating the return on capital. On the other, the sustained increase in life expectancy prompts adults to save more for their retirement (which drives down the consumption to GDP ratio, as shown in Chart 2.1), generating a further fall in the natural rate of interest. Overall, according to these simulations, the natural rate of interest would fall by 3 pp - 4 pp between 2007 and 2030.[5]

---

1 H. S. Basso and O. Rachedi (2018), *The young, the old, and the government: demographics and fiscal multipliers,* Banco de España Working Paper 1837.

2 To incorporate wage differences by age into the model, it is assumed that adults are more productive than young adults and than the over-65s.

3 The figure of 0.6% is calculated as the midpoint between TFP growth observed in the last ten years and the rate of growth used in the European Commission's projections up to 2050, presented in European Commission (2018), *The 2018 Ageing Report: Economic and Budgetary Projections for the 28 EU Member States (2016-2070)*, Institutional Paper 079.

4 Under the simplifying assumption that the economy was stationary in 2007, the real interest rate (r) in that year is equal to the natural interest rate (r*), such that r* = r = 2.1%. The real interest rate is calculated as the difference between the 3-month EURIBOR and core inflation (i.e. excluding energy prices) in the euro area. The paths of the real and natural interest rates in these simulations are very similar, and practically identical in the medium and long term, as the nominal rigidities that prevent the two interest rates from coinciding have only temporary effects.

5 G. Eggertsson, N. Mehrotra and J. Robbins (2019), in "A Model of Secular Stagnation: Theory and Quantitative Evaluation", *American Economic Journal: Macroeconimics,* 11(1), pp. 1-48, perform a similar exercise for the United States for the period 1970-2015, estimating a decline of more than 400 bp in the natural rate of interest. Y. Aksoy, H. S. Basso, R. Smith and T. Grasl (2019), in "Demographic Structure and Macroeconomic Trends", *American Economic Journal: Macroeconomics,* 11(1), pp. 193-222, using an estimated empirical model drawing on OECD country data, conclude that the natural rate of interest could fall by up to 400 bp in the United States between 2000 and 2030 owing to demographic change.

Box 3.2
DEMOGRAPHICS, PRODUCTIVITY AND THE NATURAL INTEREST RATE (cont'd)

To measure the contribution of demographics and productivity to the projected fall in the natural rate of interest two further simulations are made: the first considers that only productivity growth changes, and the second includes only demographic changes. By comparing the two it may be concluded that more than 65% of the fall in the natural rate of interest estimated in the previous exercise is due to demographic change, in keeping with the empirical findings presented in Box 3.1. The impact of demographic change is also analysed by comparing the baseline scenario with alternative scenarios

Chart 1
OFFICIAL DEMOGRAPHIC PROJECTIONS SHOW PROGRESSIVE POPULATION AGEING

The chart depicts population changes in three age brackets: i) young people (under 20); ii) adults (20 to 65); and iii) old people (over 65).
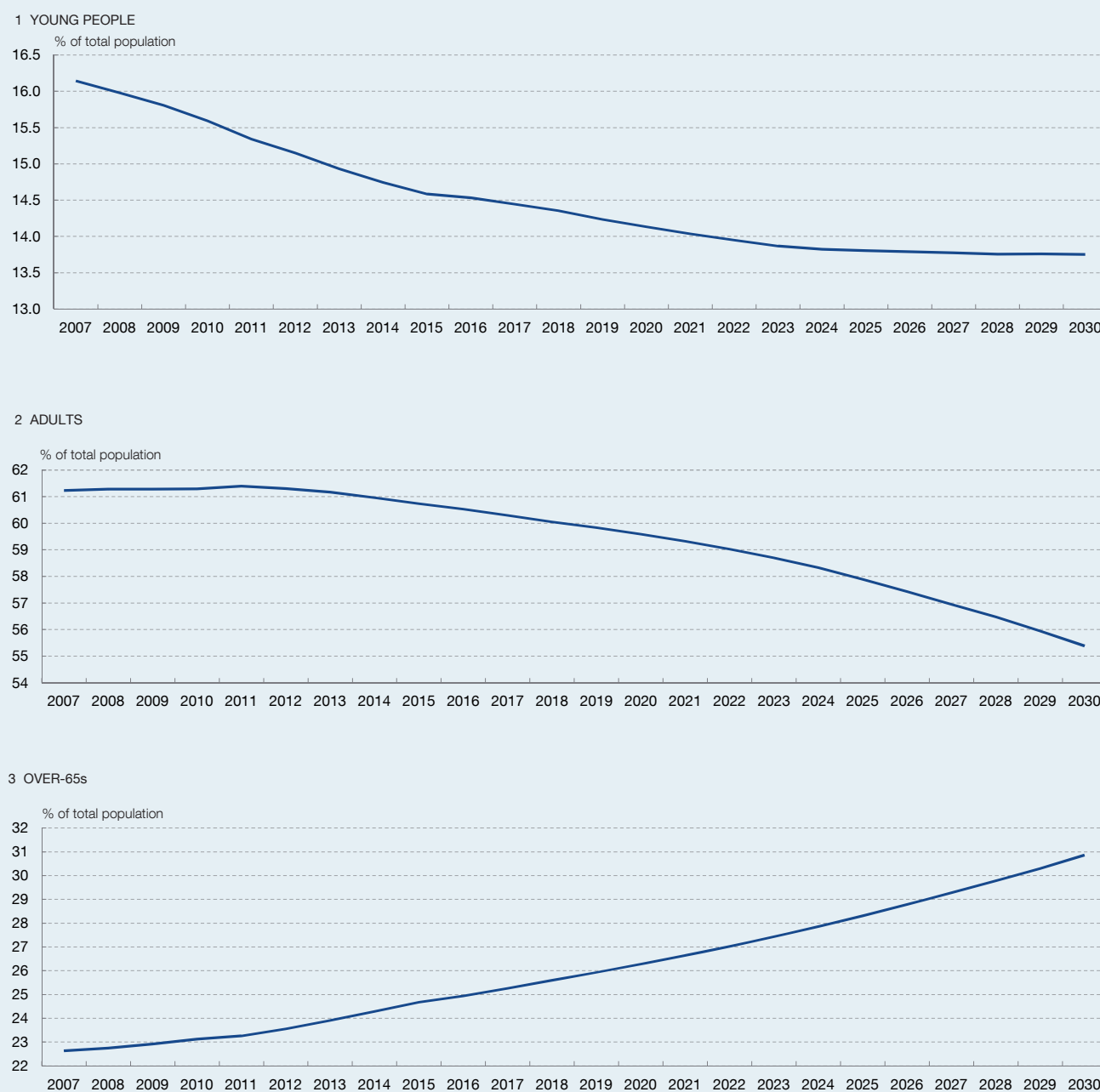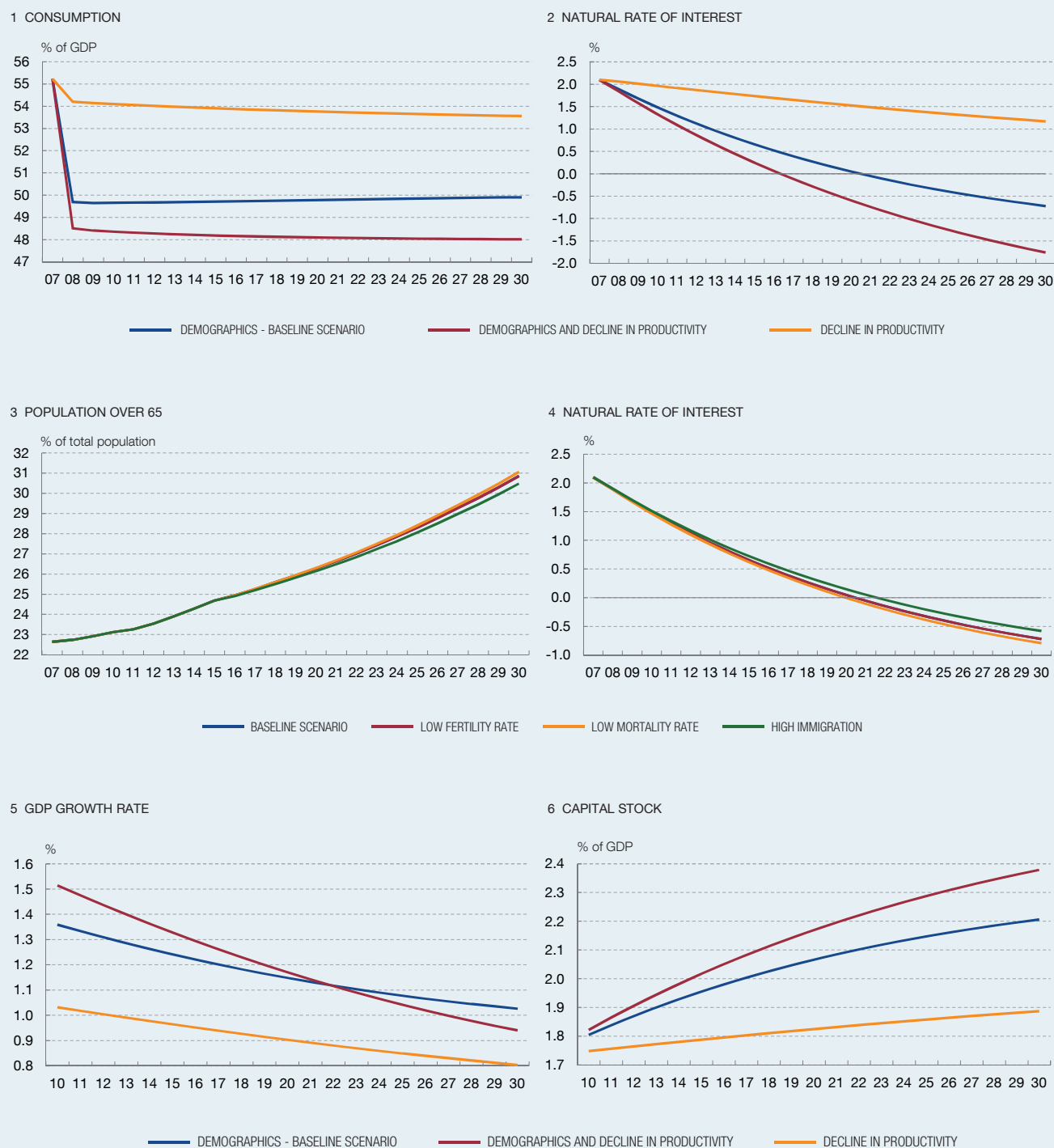
1 YOUNG PEOPLE

2 ADULTS

3 OVER-65s

SOURCE: Eurostat.

Chart 2
MACROECONOMIC IMPACT OF DEMOGRAPHIC CHANGE AND DECLINE IN PRODUCTIVITY

The chart depicts the simulation of the impact of demographic change in the euro area using the Basso and Rachedi model (2018).

1 CONSUMPTION

% of GDP

2 NATURAL RATE OF INTEREST

%

DEMOGRAPHICS - BASELINE SCENARIO   DEMOGRAPHICS AND DECLINE IN PRODUCTIVITY   DECLINE IN PRODUCTIVITY

3 POPULATION OVER 65

% of total population

4 NATURAL RATE OF INTEREST

%

BASELINE SCENARIO   LOW FERTILITY RATE   LOW MORTALITY RATE   HIGH IMMIGRATION

5 GDP GROWTH RATE

%

6 CAPITAL STOCK

% of GDP

DEMOGRAPHICS - BASELINE SCENARIO   DEMOGRAPHICS AND DECLINE IN PRODUCTIVITY   DECLINE IN PRODUCTIVITY

SOURCE: Banco de España, drawing on the Basso and Rachedi model (2018).

that envisage lower fertility and mortality rates and higher immigration (see Charts 2.3 and 2.4).[6] These simulations show that, in general, the sensitivity of natural interest rates to the different demographic scenarios considered in 2030 is quite low (25 bp at most).

Lastly, aside of the impact on the natural rate of interest, it is important to examine the effects on GDP growth and capital accumulation (see Charts 2.5 and 2.6). The lower natural rate of interest coincides with an increase in capital accumulation, on account of higher savings and lower labour supply. Yet despite the higher level of capital, GDP growth falls continuously over the entire simulation horizon, owing to the lower growth in TFP and the labour supply.

---

6 Specifically, the assumptions used in each alternative scenario are as follows: 1) lower fertility: a 20% decline in fertility rates across all the projections; 2) lower mortality: a gradual decline in mortality rates by age and sex; and 3) higher migration: a 33% increase in net immigration throughout the projection period.

Box 3.3
ASSESSMENT OF THE ALTERNATIVE MONETARY POLICY RULES USING THE JoSE MODEL

This Box uses the JoSE (Joint Spain-EuroArea[1]) model to study the quantitative implications of various monetary policy strategies for the frequency, duration and associated costs of ELB (Effective Lower Bound) episodes. JoSE is a dynamic general equilibrium model of a monetary union with two economies (Spain and the rest of the euro area) which incorporates the usual nominal, real and financial frictions in models used by central banks. The model is estimated through the use of Bayesian econometric techniques and macroeconomic series of both economies.

To assess effectiveness in terms of reduction of the prevalence and cost of the ELB of each of the monetary policy rules considered, the behaviour of the economy (over a large number of quarters) is simulated in the model under each of these rules.[2] Table 1 shows the results in terms of the percentage of quarters in which the common monetary authority is constrained by the ELB, the average duration of each episode, and the losses in terms of GDP and inflation (at Monetary Union level) associated with

those episodes. Chart 1 shows the distribution of the inflation simulated for each monetary policy rule.

The reference point with respect to which the various alternatives are assessed is the standard inflation targeting (IT) rule included in the estimated version of the model, specifically a Taylor rule in which the nominal interest rate responds to deviations in the year-on-year inflation from its target of 2%. This rule approximately replicates the monetary policy regime in the euro area.[3] Model simulations indicate that under this rule the economy would be at the ELB 9% of the time, and the average duration of each ELB episode would be 4.2 quarters. This generates a cost in terms of lost GDP and inflation of -0.13% and -0.11%, respectively (average of the total of the quarters).[4]

Within the inflation targeting framework, a modification usually proposed to reduce the frequency of ELB episodes is to raise the inflation target. The simulations indicate that increasing this target to 3%, for example, would

Table 1
ELB FREQUENCY AND LENGTH FOR DIFFERENT MONETARY POLICY STRATEGIES

	Percentage of quarters in ELB	Average length of ELB episodes (quarters)	GDP loss associated with ELB (%)	Inflation loss associated with ELB (%)
Inflation targeting (2%) (a)	9.0	4.2	-0.13	-0.11
Price-level targeting	4.2	2.7	-0.03	0.00
Temporary price-level targeting	6.1	3.4	0.00	0.10
Inflation targeting on 4-year average inflation	6.4	3.3	-0.09	-0.04
Inflation targeting (3%) (a)	2.2	3.1	-0.03	-0.02
Inflation targeting (2%) with quantitative easing (a)	7.0	3.6	-0.04	-0.03
Inflation targeting (2%) with stronger quantitative easing (2x) (a)	6.1	3.3	0.01	0.01

SOURCE: Banco de España, based on JoSE model.

a Coefficients of inflation targeting rules: inertia, 0.85; inflation, 2.00; GDP growth, 0.10.

---

1   The JoSE model has been developed and estimated by G. Almeida, S. Hurtado and O. Rachedi (2019), *JoSE: the Joint Spain Euro-Area DSGE of the Banco de España,* Occasional Paper, Banco de España, forthcoming.

2   For more details on the exercise, see G. Almeida, S. Hurtado and O. Rachedi (2019), *Monetary Policy in the New Normal: Evidence on the Euro-Area from JoSE,* Occasional Paper, Banco de España, forthcoming.

3   See S. Gerlach and G. Schnabel (2000), "The Taylor Rule and Interest Rates in the EMU Area", *Economic Letters,* 67, pp.165-171.

4   These simulations are based on the assumption of a long-term natural interest rate of 1%, which is higher than the current estimates of this rate in the euro area (see Chart 3.3 in the main text). The results should thus be taken as *lower* limits of the impact and average duration of binding ELB episodes.

Box 3.3

ASSESSMENT OF THE ALTERNATIVE MONETARY POLICY RULES USING THE JoSE MODEL (cont'd)
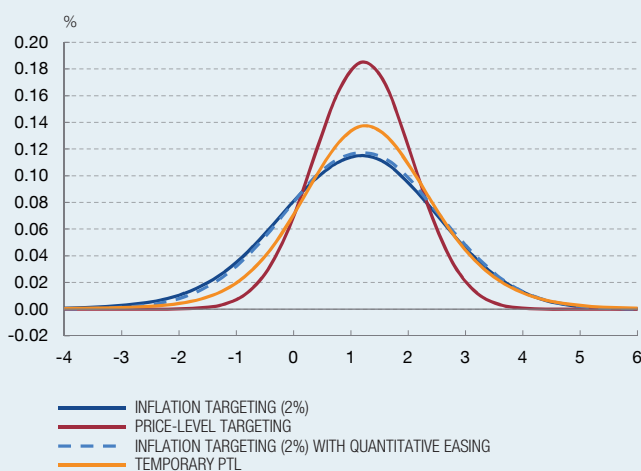
Chart 1
INFLATION RATE DISTRIBUTION ACCORDING TO MONETARY POLICY RULE

Raising the inflation target by 1 pp appreciably reduces the probability of low inflation, but the probability of inflation above 4% increases fourfold. Alternatively, a price-level targeting (PLT) rule gives a more more constrained distribution, since it reduces the probability of low inflation without raising the probability of high inflation. Quantitative easing reduces the probability of strongly negative inflation.

1 EFFECT OF INCREASING THE INFLATION TARGETING ON INFLATION
  DISTRIBUTION IN THE EURO AREA
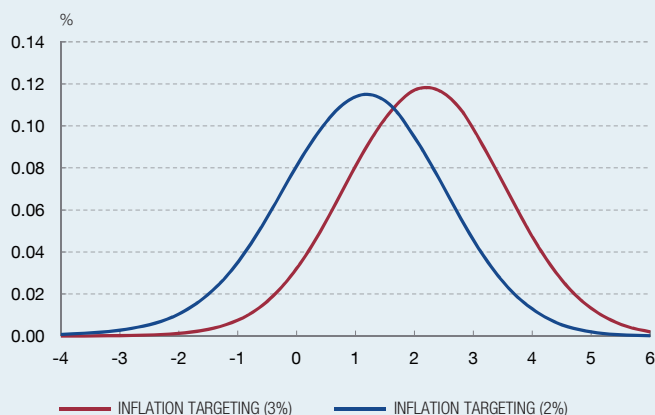
2 EFFECT OF ALTERNATIVE MONETARY POLICY STRATEGIES ON INFLATION
  DISTRIBUTION IN THE EURO AREA

INFLATION TARGETING (3%)   INFLATION TARGETING (2%)

INFLATION TARGETING (2%)
PRICE-LEVEL TARGETING
INFLATION TARGETING (2%) WITH QUANTITATIVE EASING
TEMPORARY PTL

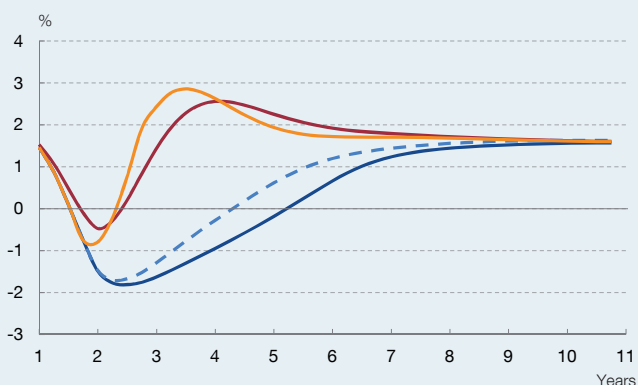SOURCE: Banco de España, based on JoSE model.

Chart 2
RESPONSE TO A FALL IN DEMAND FOR DIFFERENT MONETARY POLICY STRATEGIES

The implementation of QE along with a 2% target rule is only effective in reducing deflationary pressure when the cumulative size of the purchase programme is high. By contrast, a price-level targeting rule directly avoids the ELB through the promise of higher future inflation.

1 NOMINAL INTEREST RATE

2 INFLATION

INFLATION TARGETING (2%)   INFLATION TARGETING (2%) WITH QUANTITATIVE EASING   PRICE-LEVEL TARGETING   TEMPORARY PLT
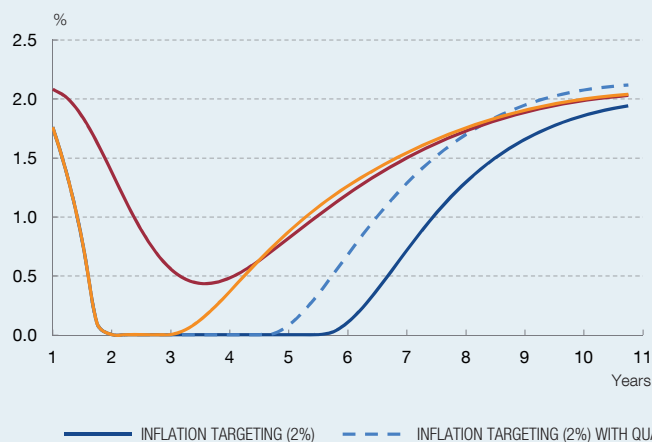
SOURCE: Banco de España, based on JoSE model.

substantially reduce the frequency with which the ELB is reached from 9% to 2%. However, as shown by Chart 1.1, the reduction of the probability of very low inflation (typically associated with ELB episodes) is achieved at the cost of a significant increase in the probability of very high inflation.

An alternative to the inflation targeting regime would be a price-level targeting (PLT)[5] rule, in which the interest rate responds to price-level deviations from a target path, instead of responding to inflation deviations. The simulations of the model show that this rule is effective in reducing the percentage of quarters in which the economy reaches the ELB, in mitigating almost completely the associated costs in terms of GDP falls and inflation, and in substantially decreasing the variance of inflation. The mechanism through which this rule operates is that expectations of high future inflation (and thus lower real interest rates) are generated in ELB episodes in which the price level falls below its target trend due to excessively low inflation.

As noted in the main text, the PLT strategy may be difficult to apply in practice due to a possible lack of credibility of the monetary authority's commitment to offset high inflation with low inflation (and a consequent contraction in economic activity and employment) in the future.[6] In response to this criticism, Ben Bernanke[7] proposed a *temporary* PLT regime which only applies when inflation is too low as a result of a binding ELB episode (the rest of the time an IT regime prevails). According to the model used in this box, under a rule of this type the reduction in the percentage of quarters at the ELB is not as large as under the previous alternatives, but the almost total elimination of costs in terms of GDP and inflation is maintained.[8]

Another alternative somewhere between IT and PLT would be a Taylor rule responsive to inflation deviations but in terms of a relatively long moving average of, for example, four years.[9] This rule yields a reduction in the percentage of quarters at the ELB similar to that with PLT, but is less effective in eliminating the costs derived from persistent falls in GDP and from inflation when the economy hits the ELB.

Lastly, the role played by non-standard policies within the current IT framework is considered. Specifically the model combines the 2% inflation target rule with the implementation of asset purchase programmes (quantitative easing, QE), when conventional interest rate policy is constrained by the ELB. For this purpose, two different asset purchase rules are considered: one which replicates the size and duration observed in the ECB asset purchase programme (APP), and another in which the volume of asset purchases is doubled. The simulations show that these measures scarcely reduce the number of ELB episodes, but do substantially reduce their duration and, above all, the associated GDP and inflation costs: with the calibration which replicates the size of the APP, these costs are reduced to levels similar to those which would be achieved by raising the inflation target to 3%. Although this rule does not substantially reduce the probability of moderate negative inflation, it does prove effective in preventing highly negative inflation (see Chart 1.2). The most aggressive rule (which doubles the rate of purchases compared with the observed value) could potentially totally eliminate the GDP and inflation costs associated with the ELB.

---

5   See L. Svensson (1999), "Price-Level Targeting versus Inflation Targeting: A Free Lunch?", *Journal of Money, Credit and Banking,* 31, pp. 277-295, and V. Gaspar, F. Smets and D. Vestin (2007), *Is Time Ripe for Price Level Path Stability?,* ECB Working Papers, 818.

6   Another view on the advisability of adopting PLT can be found in R. Barnett and R. Engineer (2000), "When is price-level targeting a good idea?", in *Price Stability and the Long-run Target for Monetary Policy,* Bank of Canada, Proceedings of a conference held at the Bank of Canada, June, pp. 101-136. The authors argue that the advantages of this regime are smaller when the inflation expectations of economic agents are aligned with recently observed inflation (backward-looking expectations).

7   B. Bernanke (2017), *Monetary Policy for a New Era,* Peterson Institute for International Economics, Washington.

8   The fact that this rule produces a negative GDP and inflation cost is made possible by the asymmetry of this policy: it responds differently to strongly negative and strongly positive shocks, which, as shown in Chart 1.2, is reflected in a reduction of the density of the left-hand tail which scarcely affects the right-hand tail of the distribution.

9   M. Nessén and D. Vestin (2005), "Average Inflation Targeting", *Journal of Money, Credit and Banking,* 37, pp. 837-863, refer to this strategy as «average inflation targeting». At the limit, a rule which responded to an infinitely long moving average of inflation would be equivalent to a PLT rule.

To help explain more clearly the functioning of the various monetary rules, Chart 2 shows the response of the nominal interest rate and inflation to a combination of negative demand shocks which, under the 2% inflation target rule, push the economy to the ELB for four years. The introduction of QE of a size similar to that of the APP reduces the duration of the ELB and the deflationary pressures, but its effectiveness is initially small and only increases as the size of the central bank balance sheet grows. The PLT rule, through a promise of higher future inflation and the consequent lower ex ante real interest rates, manages to

keep the economy from hitting the ELB. Lastly, the temporary PLT regime does not prevent the ELB constraint from being reached, but it does allow a rapid exit.

In summary, the aforementioned simulations suggest that rules specifically designed to address ELB episodes, such as permanent or temporary PLT, or the implementation of asset purchase programmes have an effectiveness in reducing the impact and costs of such episodes which is similar to that of other potentially more inefficient strategies such as raising the inflation target.

Box 3.4
MONETARY POLICY IMPLEMENTATION AFTER THE CRISIS: A COMPARISON OF THE CORRIDOR AND FLOOR SYSTEMS

As indicated in the main text, the expansion of the main central banks' balance sheets has prompted a *de facto* transition from an operational framework characterised by limited bank reserves (relative to minimum requirements) and by money market yields, which fluctuated within the corridor formed by the interest rates on the deposit and lending facilities, to a situation of ample reserves and yields close to their floor (the deposit facility rate). The prospect of a gradual normalisation of monetary policy confronts these central banks with the dilemma of whether to maintain the current floor system or revert to the previous corridor system. This box uses the macroeconomic model of Arce, Nuño, Thaler and Thomas (2018) to compare the stabilising properties of both systems where monetary policy is restricted by the lower bound of interest rates.[1]

Arce *et al.* propose a neo-Keynesian general equilibrium model with a detailed characterisation of the banking sector. Banks have heterogeneous investment opportunities in the model, which give rise to an interbank market where banks lend each other money. To capture this bilateralism in practice, the model assumes that in the interbank market banks which ask for and offer credit have to actively seek each other out. If they do not find a counterparty, they may use the central bank's deposit or lending facilities (as appropriate). Thus, the interbank rate always stands within the corridor formed by the interest rates on the two facilities. The exact position of the interbank rate within this corridor depends on the liquidity conditions of that market: the higher credit supply relative to demand, the closer the interbank rate will be to the floor set by the interest rate on the deposit facility. The other interest rates in the economy are linked to the interbank rate, with the result that fluctuations in this rate are passed through to the interest rates on households' deposits and firms' loans.

In the model the central bank has two ways of influencing market rates. On one hand, the central bank alters the rate on deposit and lending facilities through conventional monetary policy. Thus, for example, when it effects a downward shift in the corridor, it prompts the interbank

rate to fall and, consequently, causes other market rates to decline. On the other, the central bank can have a bearing on liquidity conditions in the interbank market and, therefore, on the position of the interbank rate within the corridor through quantitative easing (asset purchase policies). For example, when the monetary authority buys sovereign bonds owned by the banks, those banks with poorer investment opportunities attempt to lend their newly obtained liquidity on the interbank market. The attendant increase in the supply of interbank credit has two consequences. First, the lending banks which manage to find counterparties are forced to accept lower interest rates. Second, the proportion of lender banks which *do not* find counterparties increases and, consequently, they are forced to deposit their funds at the central bank in the form of reserves. The model therefore explains how asset purchase programmes by the central bank push the volume of reserves higher and shift the interbank rate towards the floor, in line with the international experience described above. Chart 1 shows, for the euro area, the relationship between the amount of reserves (as a percentage of GDP) and the spread between the interbank rate (in particular, the Eurepo index of interbank yields) and the remuneration of reserves, together with the relationship as predicted by the model (the black line).

Next the model is used to compare the stabilising capacity of a floor system and a corridor system. Consider a situation in which the economy is in a steady or long-term state. In this situation, the interest rate on households' deposits and the interbank rate only depend on real factors – such as households' discount rate – and the level of the central bank's inflation target, but they *do not* depend on the monetary policy operating system (floor or corridor).[2] The interest rate on reserves in the long term does depend on this system. If the central bank uses the corridor system, the interbank rate is in the middle of the corridor and, consequently, the reserve rate is *below* the interbank rate. Conversely, if it uses a floor system, the interbank rate is the same as the reserve rate. Therefore, in the long term, the floor system means a *higher* level of the interest rate on reserves than in the corridor system

1   Ó. Arce., G. Nuño, D. Thaler and C. Thomas (2018). *A Large Central Bank Balance Sheet? Floor vs Corridor Systems in a New Keynesian Environment,* Banco de España, Working Paper 1851. As discussed in the main text, this was the fundamental mechanism for monetary policy conduct before the crisis.

2   In the model, for plausible calibrations the remuneration of households' deposits is always very close to the interbank rate and, in the floor system, it is exactly the same as the interbank rate.

and, consequently, there will be more scope to cut it when faced with negative shocks. The magnitude of this additional headroom is equivalent to half the width of the symmetrical corridor. For example, the difference between the European Central Bank's pre-crisis deposit and lending facility rates was 200 basis points (bp); in this case, the gain in terms of room in a floor system would be 100 bp.

The red and blue lines in Charts 2, 3.1 and 3.2 exemplify this comparison by showing the economy's response to a negative demand shock in a version of the model which is calibrated for the euro area. In a corridor system scenario, where the central bank maintains its balance sheet size at low levels (the blue lines in Charts 2 and 3.1), the deflationary effect of the shock is strong enough to make the central bank reduce the rate on the deposit facility to its lower bound and hold it there for several quarters.[3] The red lines in Charts 2 and 3.2 show the same situation, but starting out from a steady state with the floor system, i.e. with a central bank balance sheet which is large enough

for the reserve rate to be equal to the interbank rate at any given time and, therefore, it starts out from a higher initial level. In this case, the central bank has more room (100 bp in this example) to lower the deposit facility rate. This results in a greater fall of the interbank rate and, by extension, of other market rates. As a result of this greater stimulus, the impact of the crisis is mitigated – by reducing the decline in activity and prices – to such an extent that the central bank does not actually consider it necessary to reduce the remuneration of reserves to its lower bound.

The above comparison assumes that in the corridor system the central bank does not introduce any measures to expand its balance sheet. The dark blue broken lines in Chart 2 and the solid lines in Chart 3.3 depict a third scenario, where the central bank starts out with a corridor system but expands its balance sheet through a temporary government bond purchasing programme implemented contemporaneously with the recessionary shock. This situation would roughly mirror the recent experience of central banks in the main advanced economies. Using

Chart 1
RELATIONSHIP BETWEEN SURPLUS RESERVES AND THEIR OPPORTUNITY COST IN THE EURO AREA (a)

The chart shows the historic relationship between surplus bank reserves deposited at the ECB and the opportunity cost of these reserves, defined as the difference between the collateralised interbank interest rate (Eurepo) and the deposit facility rate (DFR). The line shows the results obtained by the economic model used.
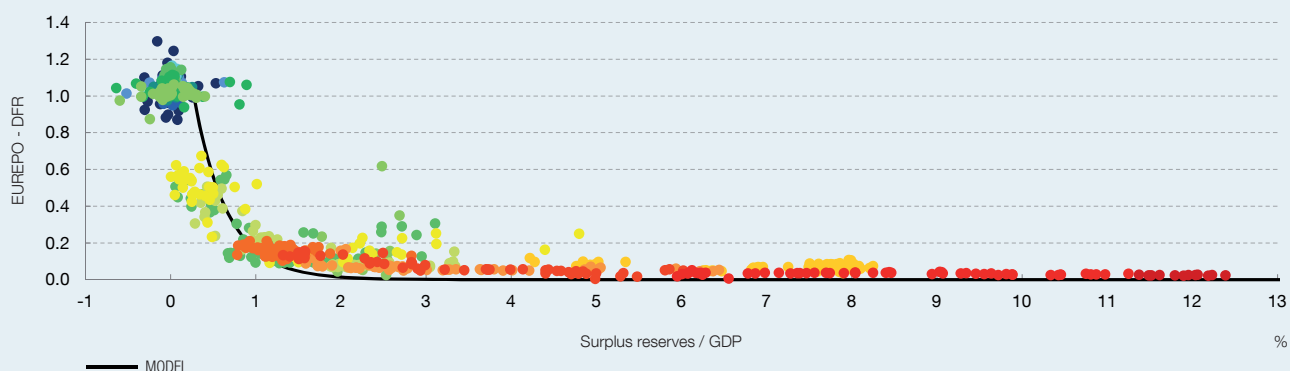
MODEL

SOURCE: Banco de España, based on the model of Arce, Nuño, Thaler and Thomas (2018).

a The colours indicate the year, from dark blue which corresponds to the beginning of the sample (1999) through to red (2019).

---

3 Arce *et al.* (2108) op. cit. In the model, the central bank adjusts its interest rates (assuming a constant distance between the upper and lower bounds of the corridor) so that the interbank rate, that is the central bank's operating target, follows a simple Taylor rule which responds to deviations in inflation from its target. This is so *except* when the rate on the deposit facility implementing the desired interbank rate collides with its lower bound; in this case, the central bank loses its ability to continue reducing rates to return inflation to its target.

Box 3.4

MONETARY POLICY IMPLEMENTATION AFTER THE CRISIS: A COMPARISON OF THE CORRIDOR AND FLOOR SYSTEMS (cont'd)
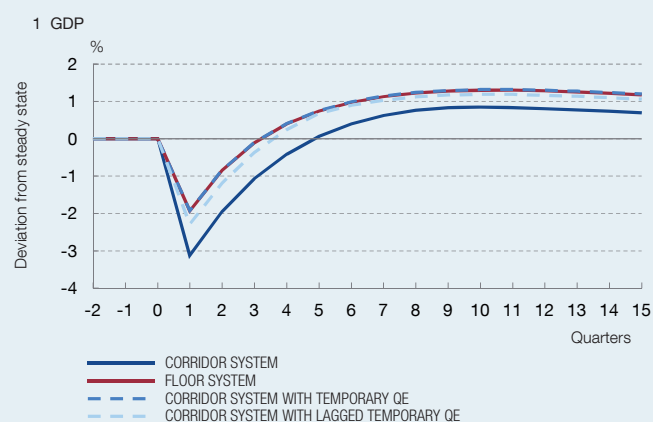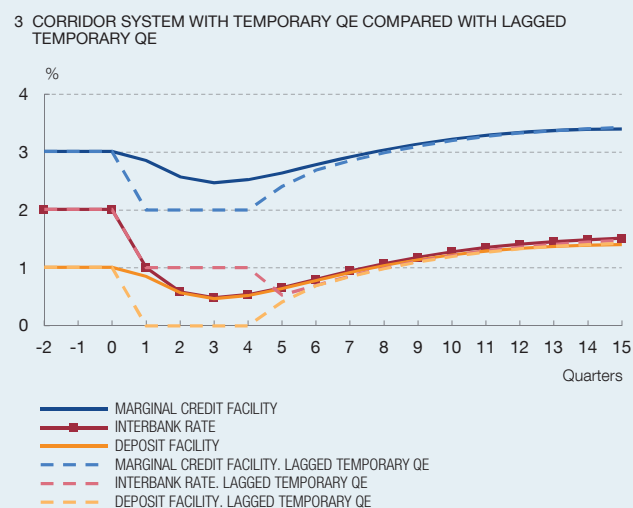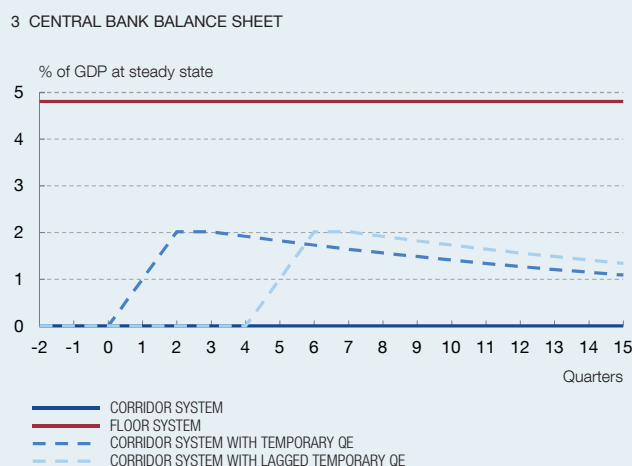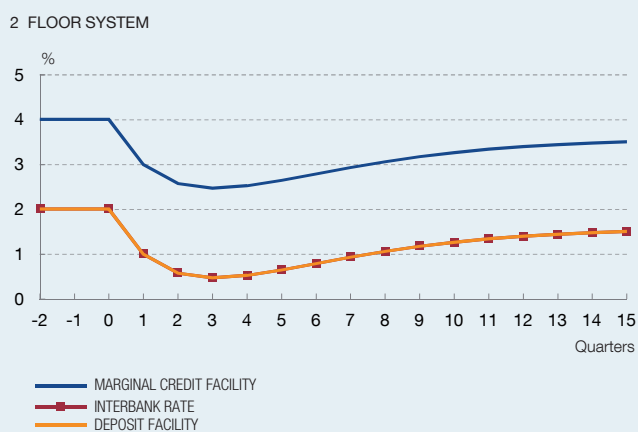
Chart 2
MAIN MACROECONOMIC VARIABLES

Chart 3
POLICY AND INTERBANK INTEREST RATES IN A CORRIDOR/FLOOR SYSTEM

1 GDP

CORRIDOR SYSTEM
FLOOR SYSTEM
CORRIDOR SYSTEM WITH TEMPORARY QE
CORRIDOR SYSTEM WITH LAGGED TEMPORARY QE

1 CORRIDOR SYSTEM

MARGINAL CREDIT FACILITY
INTERBANK RATE
DEPOSIT FACILITY

2 INFLATION

CORRIDOR SYSTEM
FLOOR SYSTEM
CORRIDOR SYSTEM WITH TEMPORARY QE
CORRIDOR SYSTEM WITH LAGGED TEMPORARY QE

2 FLOOR SYSTEM

MARGINAL CREDIT FACILITY
INTERBANK RATE
DEPOSIT FACILITY

3 CENTRAL BANK BALANCE SHEET

CORRIDOR SYSTEM
FLOOR SYSTEM
CORRIDOR SYSTEM WITH TEMPORARY QE
CORRIDOR SYSTEM WITH LAGGED TEMPORARY QE

3 CORRIDOR SYSTEM WITH TEMPORARY QE COMPARED WITH LAGGED TEMPORARY QE

MARGINAL CREDIT FACILITY
INTERBANK RATE
DEPOSIT FACILITY
MARGINAL CREDIT FACILITY. LAGGED TEMPORARY QE
INTERBANK RATE. LAGGED TEMPORARY QE
DEPOSIT FACILITY. LAGGED TEMPORARY QE

SOURCE: Banco de España.

this measure, the central bank manages to squeeze the spread between the interbank and reserve rates and, therefore, achieves an additional decline in the interbank rate and in other market rates. As a result of the attendant additional stimulus the stabilisation of GDP and inflation is similar to that in the floor system. However, this equivalence hinges crucially on the central bank having the ability to trigger its asset purchases as soon as the adverse shock arises, something which may be complex in practice (for example, for operating or institutional reasons). The light blue broken lines in Chart 2 and the broken lines in Chart 3.3 show an alternative scenario where the central bank starts to purchase assets a year after the recession has begun. In this case, the stimulus is

smaller and, consequently, GDP and inflation fall more than in the two above-mentioned cases.

In short, a floor system provides direct control of market interest rates and more room to cut benchmark rates in response to negative shocks. Although a corridor system which implements temporary asset purchase programmes can achieve very similar monetary stimulus, these programmes must be expedited. In practice, however, the triggering and implementation of asset purchase programmes may be delayed, which reduces their effectiveness. The opposite is the case with interest rate policy, which is, operationally speaking, generally less complicated to change.

4

ECONOMIC CONSEQUENCES OF DEMOGRAPHIC CHANGE

Summary

Two structural trends will shape the macroeconomic context in coming decades: demographic changes and technological advances. Three factors - the numerous population cohorts born after the Second World War that are reaching retirement age, the low fertility rate over the last four decades, and the continued increase in longevity – are driving down the proportion of the working-age population in the developed countries, and particularly in Spain. These demographic changes will accelerate in coming years, while new technological developments (partly related to them) will reshape the macroeconomic context.
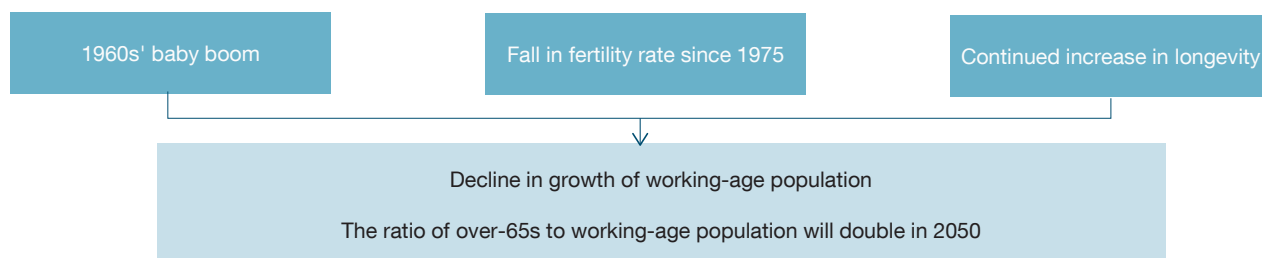
Population ageing has important consequences for aggregate supply and demand in an economy, and for macroeconomic policy. There are rigorous theoretical grounds and empirical evidence to maintain that demographic changes will affect consumption (and its composition), as well as investment, employment, productivity and wage and price setting. This in turn will affect the effectiveness of monetary and fiscal policies: first, because the lower rate of growth of the working-age population makes it more likely that interest rates will remain low; and second, because both the level and composition of public expenditure and tax revenue and the transmission of fiscal impulse to economic activity depend on the population age structure.

The pension system and other social policies will have to be reoriented to meet the needs of an older population, taking into account financial sustainability and intergenerational equity considerations. A very large portion of the expenditure needs of the pension and the health and long-term care systems is directly related to the size of the elderly population. As this population cohort grows, their benefit coverage and its funding will have to be redefined. Given that this expenditure is funded mainly via intergenerational income transfers, reforms on both fronts will affect the well-being of present and future generations and must, therefore, be undertaken considering the intergenerational distribution of costs and benefits.
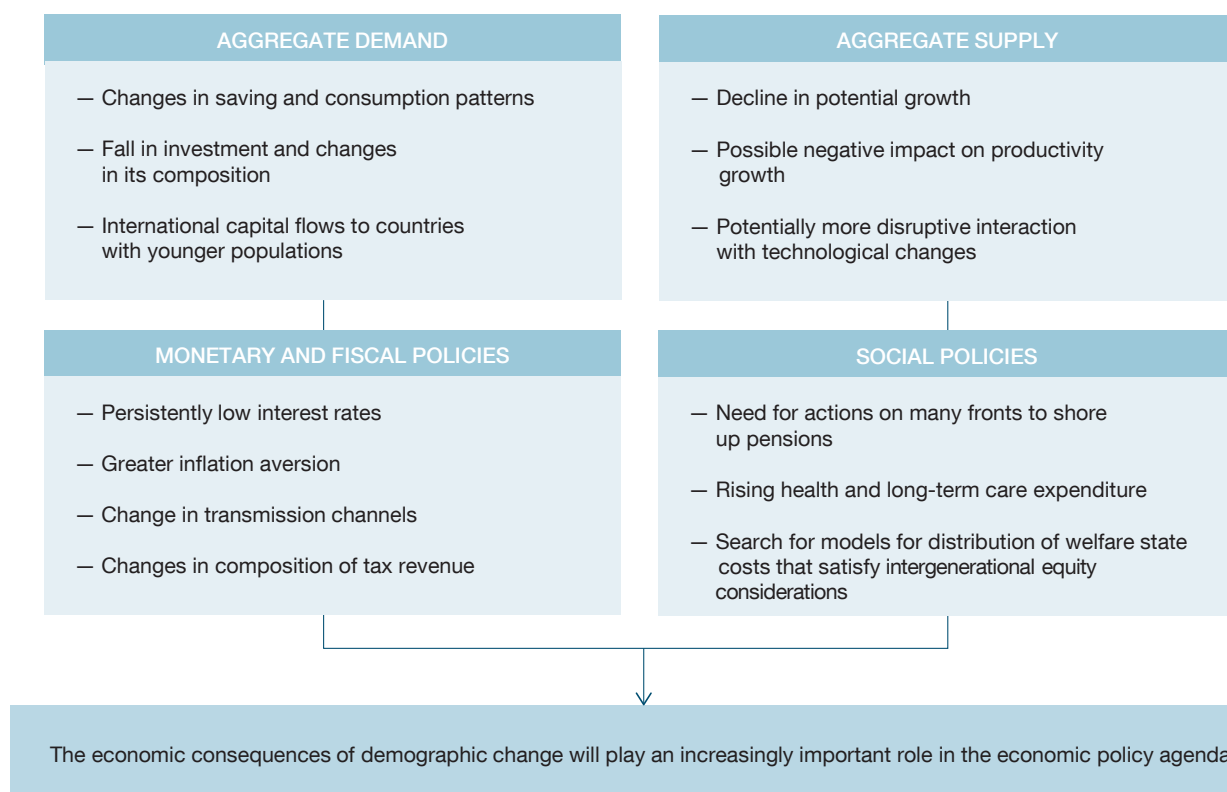
Figure 4.1
ECONOMIC CONSEQUENCES OF DEMOGRAPHIC CHANGES

THE POPULATION AGE STRUCTURE WILL CHANGE OVER COMING DECADES

| 1960s' baby boom | Fall in fertility rate since 1975 | Continued increase in longevity |

Decline in growth of working-age population

The ratio of over-65s to working-age population will double in 2050

THE ECONOMIC EFFECTS OF THE DEMOGRAPHIC CHANGE WILL BE SEEN IN MANY AREAS

AGGREGATE DEMAND

— Changes in saving and consumption patterns

— Fall in investment and changes in its composition

— International capital flows to countries with younger populations

AGGREGATE SUPPLY

— Decline in potential growth

— Possible negative impact on productivity growth

— Potentially more disruptive interaction with technological changes

MONETARY AND FISCAL POLICIES

— Persistently low interest rates

— Greater inflation aversion

— Change in transmission channels

— Changes in composition of tax revenue

SOCIAL POLICIES

— Need for actions on many fronts to shore up pensions

— Rising health and long-term care expenditure

— Search for models for distribution of welfare state costs that satisfy intergenerational equity considerations

The economic consequences of demographic change will play an increasingly important role in the economic policy agenda

SOURCE: Banco de España.

1 Introduction

Three demographic patterns are altering the socio-demographic fabric: the retirement of baby boomers, the decrease in fertility and the increase in longevity. Demographic developments in advanced countries show certain common factors. First, all of them benefited from the birth of a very numerous generation after the Second World War, although this happened some years later in Spain. Second, there has been a significant decrease in the fertility rate in all of them, which has been sharper in Spain than in other countries. Finally, longevity continues to rise and life expectancy in Spain is among the highest in the world. Consequently, the population projections available for Spain indicate that over the coming decades the working-age population will probably decrease, even if immigration inflows remain at high levels. Similarly, the population age composition is certainly expected to change substantially. The proportion of the population aged over 66 is expected to be 12 pp higher half-way through this century than it is at present (i.e. 29.2% compared with 17.1%, according to the INE's demographic projections).

This chapter analyses the economic consequences of these demographic changes as regards the functioning of the economy and certain key economic policies. The main objectives of this chapter are to describe and analyse the varied economic effects of the new socio-demographic fabric. Thus, the main issues addressed below are the chief determinants of the demographic shifts, how they affect macroeconomic variables (employment, inflation, output, etc.) and their implications for economic policies.

2 The demographic outlook: fertility, longevity and immigration

A notable widening of the middle age groups in Spain's current population pyramid is visible. In western countries, the most numerous population cohorts are currently among the 45-65 age group (see Chart 4.1). This is due to the higher fertility rates recorded after the Second World War (the baby boom), which occurred slightly later in Spain than in other countries (in 1960-1975, instead of in 1945-1965). Developments in the population aged over 66 during the coming decades are mostly determined by the relative size and time of the baby boom. In the case of Spain, these two factors will have a particularly high impact on the population age composition.

Longevity continues to rise persistently. A second contributory factor to the rapid population growth of older cohorts is the increase in longevity (see Chart 4.2). Life expectancy at birth in Spain has risen since 1975 at a rate of 2.2 years per decade (1.4 years per decade in the case of life expectancy at 65). A larger share of each
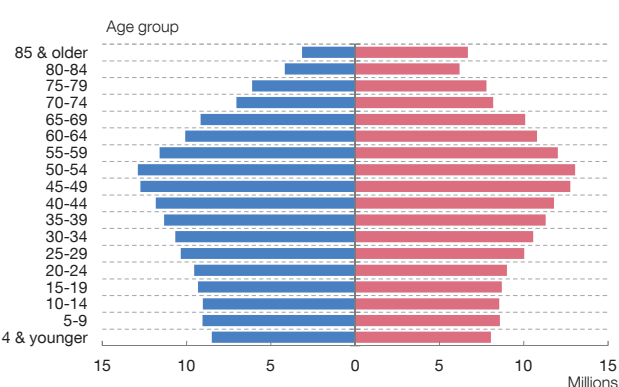
Chart 4.1

DEVELOPED COUNTRIES' POPULATION PYRAMIDS ARE WIDENING IN THE MIDDLE AGE GROUPS (a)

Moreover, as this widening is more evident in Spain than in other developed countries, the gradual increase in the older population in coming years will be more marked in the case of Spain.
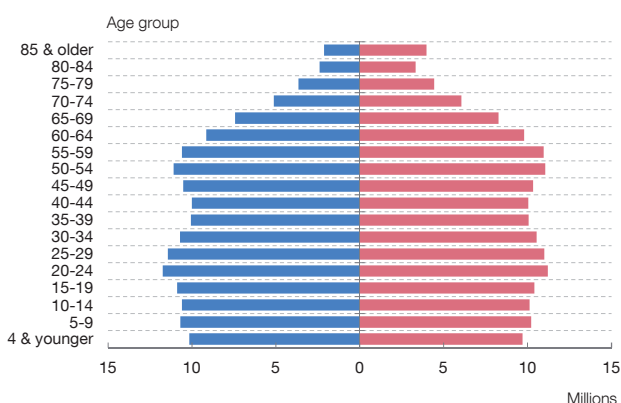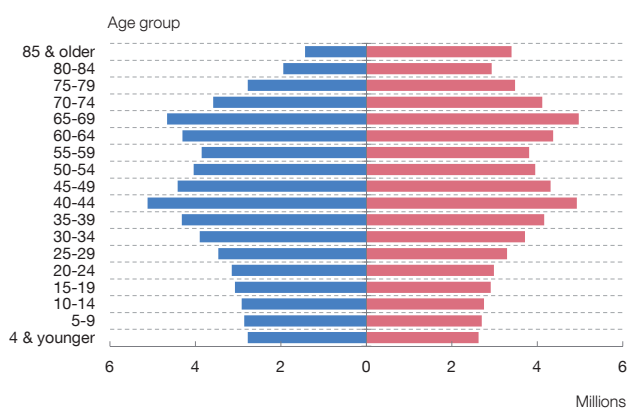

1 SPAIN
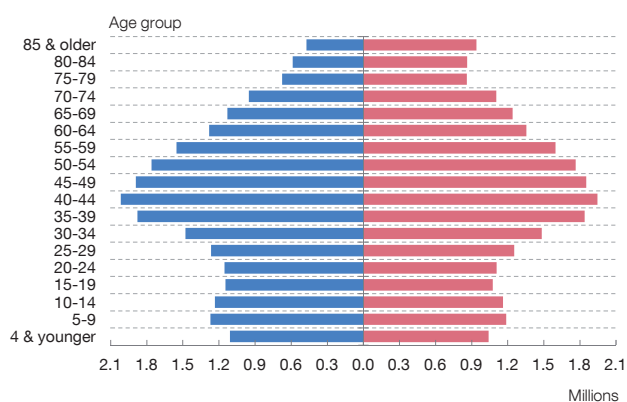
2 EURO AREA

3 UNITED STATES

4 JAPAN

MEN   WOMEN

SOURCES: European Commission, UN and Banco de España.

a For Spain and the euro area, figures at 1 January 2017; for the United States and Japan, figures at 1 July 2015.

generation lives into old age, and survival rates of older cohorts are increasingly higher. At the same time, as a result of technological advances in the health system and health-related behaviour patterns, longevity may continue to increase, at least at rates similar to those observed in the past. If this is the case, the proportion of older population cohorts could increase to a greater degree than has been envisaged in demographic projections currently available.[1]

---

1 For longevity and health of older people by socio-demographic group, see Bohacek, Bueren, Crespo, Mira and Pijoan-Mas (2018).

Chart 4.2
SPAIN IS ONE OF THE WORLD LEADERS IN LONGEVITY

The continuing increase in longevity is one of the causes of population ageing. In Spain, life expectancy at birth and at 65 is above the European average, and shows no sign of levelling off. There is a gradual increase in the percentage of each generation that reaches old age. In addition, the numbers of years they survive in old age continues to rise.

1 LIFE EXPECTANCY IN SPAIN
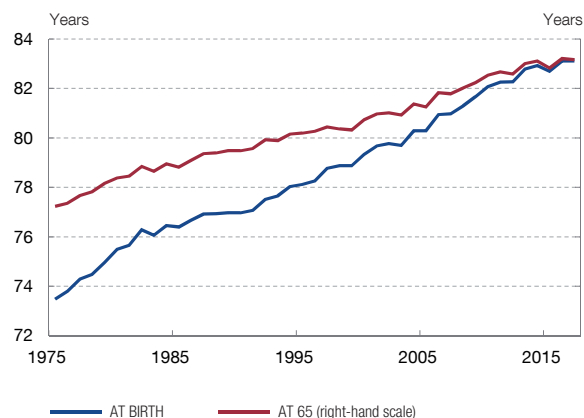
2 LIFE EXPECTANCY BY COUNTRY (a)
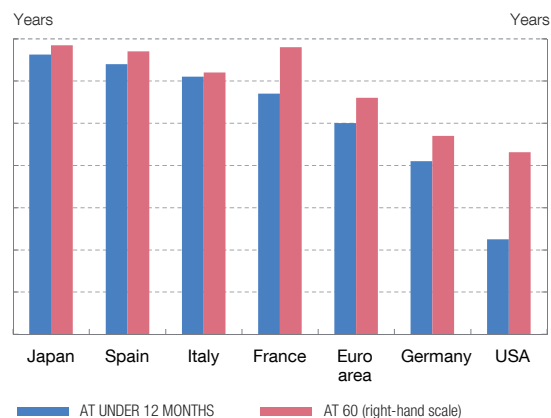
SOURCES: European Commission, UN and INE.

a Figures for 2017, except for the United States and Japan where the figures are for 2015.

Lower fertility rates will trigger a decrease in the working-age population. Since the baby boom, fertility rates in advanced countries have decreased notably (see Chart 4.3). The fall in the number of children per woman of child-bearing age in Spain has been more pronounced than in other countries (from 2.8 in the mid-1970s to around 1.3 in 2017) and the fertility rate continues to be especially low, despite the contribution from the immigrant population (which initially has higher fertility rates than the population in Spain). As a result, the child population and the population cohort at the first stage of their working lives are small relative to the middle age population.

Immigration has helped to increase the size of the working-age population. The robust immigration recorded in the period 1995-2008 decreased during the crisis when there was also a rise in the numbers of residents who migrated abroad. At present, net inward migration amounts to 0.4% of the population in Spain (see Chart 4.4). Although there is a high degree of uncertainty over how this inward migration may develop in future, the most probable scenario, according to the most commonly used models, is population growth due to migratory flows of approximately 200,000 individuals per year over the next three decades.[2] The immigrant population is younger than the population in Spain and, therefore, these arrivals increase the


2   See, for example, Fernández-Huertas Moraga and López-Molina (2018).

Chart 4.3

THE FERTILITY RATE IN SPAIN, WHICH IS AMONG THE LOWEST IN THE WORLD, WILL REDUCE THE SIZE OF THE WORKING-AGE POPULATION

The fall in the fertility rate has been very pronounced in Spain, more so than in the other developed countries. In consequence, the child and young population is small compared to the middle age population.

1 FERTILITY RATE IN SPAIN
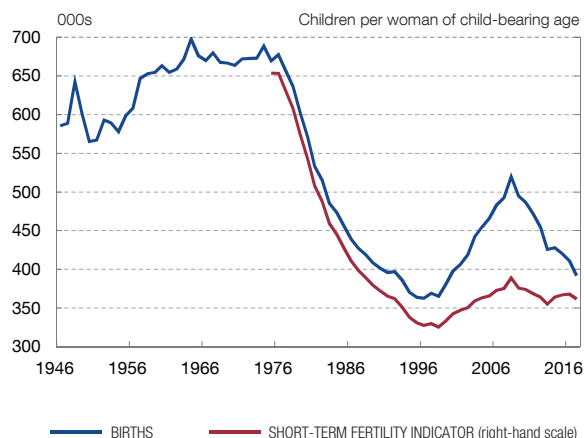
2 TOTAL FERTILITY RATE BY COUNTRY (a)

BIRTHS   SHORT-TERM FERTILITY INDICATOR (right-hand scale)
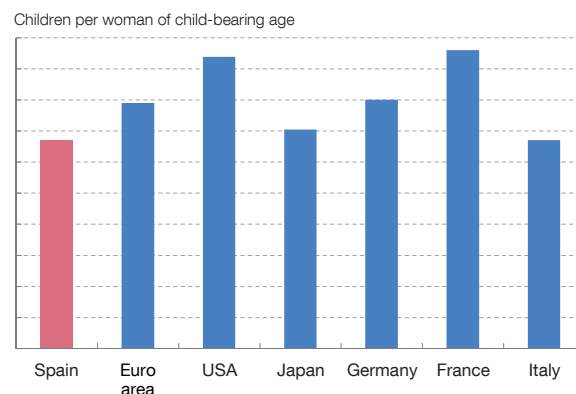
SOURCES: European Commission, UN and INE.

a Figures for 2016, except for the United States and Japan where the figures are for the period 2010-15.

proportion of younger population. However, this effect will last only to the extent that immigrant flows increase in future.

Work-life balance policies and policies to boost birth rates may contribute to achieving more balanced demographics. Over a longer time horizon the fertility rate needs to increase in order to achieve a more balanced population breakdown by age. However, in coming years, even if the fertility rate were to rise significantly, the number of births would remain low since the current cohort of women of child-bearing age is small. Only if it were to rise very strongly, quickly and permanently would it be possible, over a broader horizon, for first the number of births and then, two decades later, the cohort of young adults of working age to increase significantly. Consequently, measures are urgently needed to bolster pro-work/life balance and pro-natalist policies that, while ensuring effective equality between sexes, prompt a significant and permanent rise in the birth rate[3] as soon as possible.

The population projections show that over coming decades there will be a highly significant increase in the proportion of the population over 66.

---

3   Which are the most effective measures for accomplishing this objective is a matter that has not been resolved by economic literature. In this field, there are examples of measures which seem to produce the opposite results to those intended (see, for example, Farré and González (2018)).

Chart 4.4
INWARD MIGRATION CAN ONLY OFFSET DEMOGRAPHIC AGEING IN THE SHORT TERM

Immigration could mitigate demographic ageing, at least in part, by increasing the size of the working-age population, as it did in the decade before the crisis. But beyond the short term this effect will fade, and the impact will be to further increase the older population.

1 EXTERNAL MIGRATION BALANCE IN SPAIN
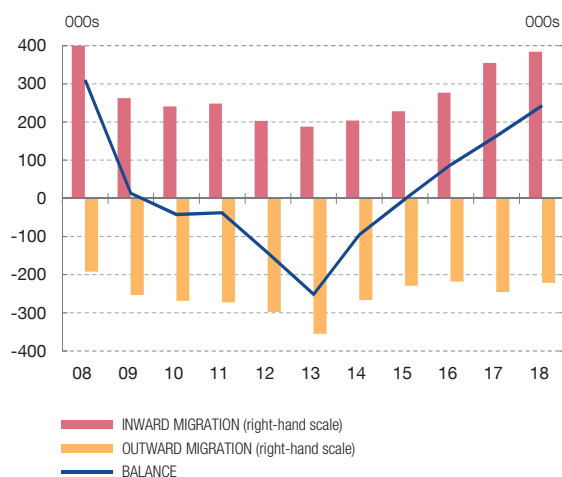
2 PERCENTAGE OF FOREIGN-BORN POPULATION, BY COUNTRY, IN 2017

INWARD MIGRATION (right-hand scale)
OUTWARD MIGRATION (right-hand scale)
BALANCE
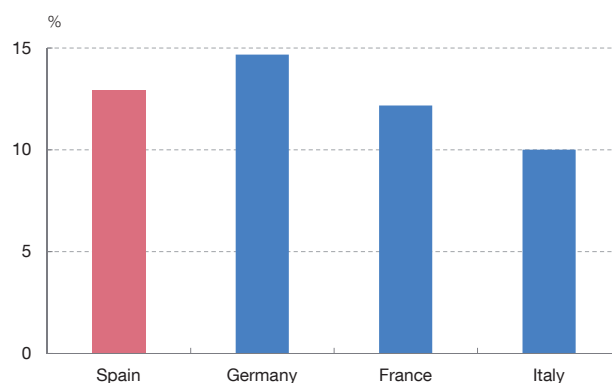
SOURCES: European Commission, INE and Banco de España.

Despite uncertainty about developments in demographic variables (especially migratory flows), it seems inevitable that there will be a strong increase in the proportion of the population over 66 (the greater the rise in longevity, the higher it will be). As Box 4.1 shows, even despite the considerable differences in the fertility and immigration rate assumptions underlying the population projections of several bodies, the ratio of the population aged over 66 to the population aged 16-66 will rise significantly over the next three decades to at least double current values (up from 25.6% at present to 51.3% in 2050, according to the INE's demographic projections, and up to similar levels according to the other projections).

The average age of the population in Spain and of the median voter will continue to climb. Aside from its direct economic consequences, the change in the population age structure is also significant for many economic policy decisions. As a knock-on effect of this change, the average age of the population in Spain will increase by at least five years (from 43 to 48) between 2018 and 2050 (see Chart 4.5). If historical patterns of electoral participation by age group remain constant (higher participation of older people), public support for policies financed by income transfers to older people could rise, to the detriment of other policies which reduce the – currently already high – weight of the debt burden on future generations.

Chart 4.5

THERE IS A CLEAR POSITIVE RELATIONSHIP BETWEEN AGE AND ELECTORAL PARTICIPATION, INTERRUPTED ONLY AMONG THOSE WHO ARE 65 AND OVER

The spread between median voter age and the median age of the population will possibly widen, increasing public support for measures funded by intergenerational income transfers to the older population.

1 AVERAGE AGE IN SPAIN
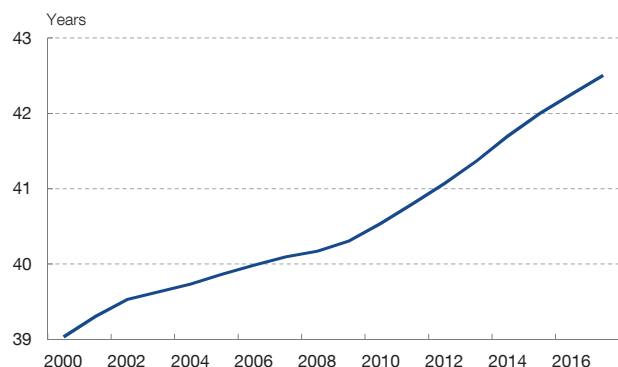
2 ELECTORAL PARTICIPATION, BY AGE (a)
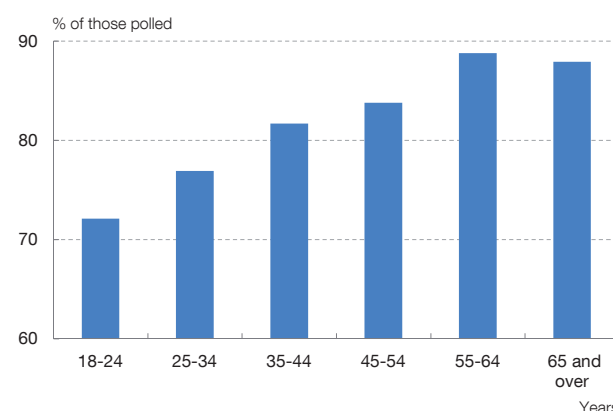
SOURCE: Centro de Investigaciones Sociológicas (CIS) and Banco de España.

a Percentages by age group of persons indicating, in the post-electoral poll conducted by the CIS, that they had voted in the general election held on 26 June 2016.

DOWNLOAD

3 Population ageing and aggregate supply and demand

The size of the working-age population and the population age composition play a fundamental role in developments in the economy's aggregate supply and demand. This section highlights the main mechanisms whereby demographic variables influence consumption, saving, investment, employment, productivity and price and wage setting. They all have important implications for the implementation of economic stabilisation policies and social programmes.

3.1 Effects on consumption, saving and investment: savings rate and financial position over the life cycle

Consumption and saving patterns and the composition of wealth vary over the life cycle. Future income expectations, which for obvious reasons vary over the life cycle, have a decisive impact on households' consumption, saving and investment decisions. Thus, on average, young adults tend to borrow, since the longer the remainder of their working life, the higher their expected income flow. By contrast, older people usually have positive net worth which they consume during retirement, to a greater or lesser degree, depending on whether they prefer to pass on their wealth to their heirs.

Real estate assets make up a high proportion of the wealth of Spanish households. A key characteristic of the financial position of Spanish households is the high proportion of real estate assets, especially in households where the reference person is older. In Spain 83.1% of households own their main residence (compared with 66.2% in the euro area) and ownership rates for households with an older reference person increase to 87.5% (for 55-64 year olds), 90.3% (for 65-74 year olds) and 88.7% (for those aged 75 and over), whereas in the euro area these rates stand at 70.5%, 71.9% and 68%,[4] respectively. In households with an older reference person, the median net wealth is similar to the median value of their main residence.[5]

However, the proportion of saving for retirement is not particularly large. Spain ranks eighth in terms of households with voluntary pension funds (24.5% compared with the euro area average of 30%),[6] with a slightly higher volume than countries such as Italy, Portugal, Austria or Finland, but below the euro area average, among the twenty European countries for which there is comparable information.[7] In addition, the growth of individual and occupational pension schemes and funds seems to have slowed recently.[8] Nevertheless, as described in Box 4.2, in order to assess the extent to which Spanish households' asset portfolios may vary in the future, it must be considered that the saving patterns and composition of asset portfolios of the new generations may differ from those of past generations.

The retired population's disposable income mainly depends on public pensions and its consumption expenditure is particularly sensitive to this source of income. The high proportion of illiquid assets in the wealth of older households means that, in many cases, their disposable income essentially depends on the revenue obtained through transfers from the public pension system. The relationship between pension amount and consumption can be estimated on the basis of a series of legislative changes in public pensions adopted in Spain between 1979 and 1997. It can be concluded from this estimate that changes in pensioners' disposable income translate into similar variations in their consumption expenditure, especially in the case of spending on durable goods by retirees in the higher wealth bracket and of spending on non-durable goods and food by those at the lower end of the income distribution.[9] It should also be noted that, in Spain, retirees' disposable income quite frequently acts as insurance to cover the economic needs of younger generation family members who are unemployed or experiencing job insecurity.

---

4 Data from the Household Finance and Consumption Survey, second wave, April 2017.

5 Median wealth is the level at which half of households are below that level and half are above.

6 See the Household Finance and Consumption Survey.

7 This comparison refers to the median amount accumulated in voluntary pension funds multiplied by the probability of having a pension fund divided by the median income.

8 See Fuentes (2016).

9 See Párraga Rodríguez (2019).

Intergenerational transfers of wealth through bequests have a high value in Spain. According to data of the OECD,[10] around 35% of Spanish households receive bequests with a median value of approximately €115,000. While the proportion of households receiving bequests in Spain does not vary much over the household income distribution, the median value of bequests is approximately four times higher in the top quintile of this distribution than in the bottom quintile. Nevertheless, bequests represent a similar percentage of household net wealth in the two groups of households (around 30% in the bottom quintile, compared with approximately 25% in the top quintile).

In short, population ageing will trigger substantial changes in households' savings patterns and wealth portfolios. For the life cycle reasons described above, the greater the proportion of older population, the higher the average propensity to consume and the lower the savings rate. Thus, merely on account of a "composition effect", population ageing would mean a lower savings rate in the long term, although during the transition towards an older society aggregate saving will tend to increase due to the expectation of higher future consumption needs. However, future cohorts will not necessarily repeat the consumer and savings patterns of previous generations, and the uncertainty over how long they will live as well as the benefits they will receive during retirement may prompt the older population to reduce its savings rate to a lesser degree than did previous generations. Also, following a period of a very sharp drop in fertility and a high level of uncertainty about the amount of their pension income and their longevity, households may possibly show less propensity to transfer their wealth in the form of bequests. If this were the case, their demand for financial instruments that could extract life-long income flows from their illiquid assets during retirement could increase.

Investment in capital goods and in housing also depends on growth of the working-age population and income expectations. There are several reasons why growth in investment in capital goods and housing may decline relative to previous periods:

— First, lower growth of the employed population and more moderate expectations for consumption growth prompt a reduction in the structural factors driving investment.[11]

— Second, technological changes linked to new information technologies, communication and automation are more conducive to investment in

---

10   See Balestra and Tonkin (2018).

11   The factors driving investment demand and its recent performance in the Spanish economy were analysed in Chapter 3 of the Banco de España's *2017 Annual Report*.

intangible capital than in capital goods. This means that human capital is more important (than physical capital), which generally requires lower funds for investment.[12]

— Third, the relative price of investment goods shows a secular declining trend which may become even stronger with the new technological developments arising from robotics and artificial intelligence, given that these developments rely essentially on algorithms and programming codes which are easy to replicate at a low cost. Thus, even if investment projects were to increase, the expenditure needed to undertake them could decrease.

— Lastly, growth in residential investment will be weaker on account of lower household formation, which is associated with a small young population relative to a large housing stock with a high proportion of newly built homes.[13]

Population ageing occurs at different rates across countries and, consequently, the balance between savings and investment will be achieved through changes in international capital flows. International capital flows respond to differences in yields and investment opportunities across countries. Countries where the return on capital and the productivity growth rate are higher will tend to receive more capital flows. Consequently, there will be capital outflows from and current account surpluses in countries where the population is ageing more quickly which, in principle, will be those experiencing faster and sharper decreases in the return on capital and in productivity. This may aggravate external imbalances, which will require greater international coordination for the implementation of economic stabilisation policies.[14]

3.2 Potential growth, labour market and productivity: new technological changes and the importance of professional skills at all ages

Demographic changes impact the potential growth of the economy through several channels. Lower growth of the working-age population results in lower employment growth, provided that the participation rate does not increase and the unemployment rate does not decrease. At constant employment rates, working-age population growth plus productivity growth determines the potential growth of the

---

12 See Döttling and Perotti (2017) and Haskel and Westlake (2018).

13 See Matea and Sánchez (2015).

14 See Barany, Coeurdacier and Guibaud (2018).

economy. However, participation and unemployment rates also vary over the life cycle and, therefore, a change in the population age composition would affect the aggregate employment rate. In principle, since that rate is lowest at the beginning and at the end of individuals' working lives, with the ageing of the population the employment rate increases first and then decreases, as the more numerous population cohorts come close to retirement. There are also reasons to think that the population age composition determines the professional skills of persons in employment as well as innovation and business activity and, therefore, productivity growth. Thus, the available evidence suggests that with a working-age population in which older workers make up a higher proportion, the skills for performing physical and numerical tasks and those related to new technologies decrease to a greater degree, whereas other skills (for example planning skills or those requiring more experience) may increase. Similarly, innovation and business initiative are lower in older populations, which tends to dampen productivity growth.[15]

There are very pronounced differences between participation and employment rates by age. Over the latest cycle of the Spanish economy, participation and employment rates have increased significantly for all age groups, except for the younger ones (the participation rate for those aged 16 to 30 and the employment rate for those aged 16 to 40). Nevertheless, the differences in these rates by age group remain very high, especially in the transition from working life to retirement (see Chart 4.6). For example, the employment rate is around 15 pp higher in the 40-44 age group than in the 55-59 age group, and 20 pp higher in the 55-59 age group than in the 60-64 cohort. Consequently, as the working-age population ages, there is downward pressure on the aggregate employment rate. Insofar as individuals' working lives should be lengthened to attune them to higher longevity, the employment rates of the older population will need to increase.

Over the life cycle professional and working skills vary, with consequences for labour productivity. The available evidence in a broad sample of countries on cognitive skills and those needed to use new technologies confirms that fewer older workers have such skills (see Chart 4.7).[16] This is due to two factors: human capital depreciation, which increases with age, and cohort effects whereby previous generations of workers built up less human capital than current generations. Nevertheless, as human capital depreciation is lower and human capital accumulation is higher than in the past, future population ageing would not necessarily mean that there would be fewer workers available with the cognitive skills needed by the labour market. Similarly, evidence exists that such cognitive skills are also built up through work experience and that their use in jobs changes over the life cycle.[17] Thus,

---

15   See Aksoy, Basso, Smith and Grasl (2019) and Liang, Wang and Lazear (2018).

16   See, for example, Desjardins and Warnke (2012) and Barrett and Riddell (2016).
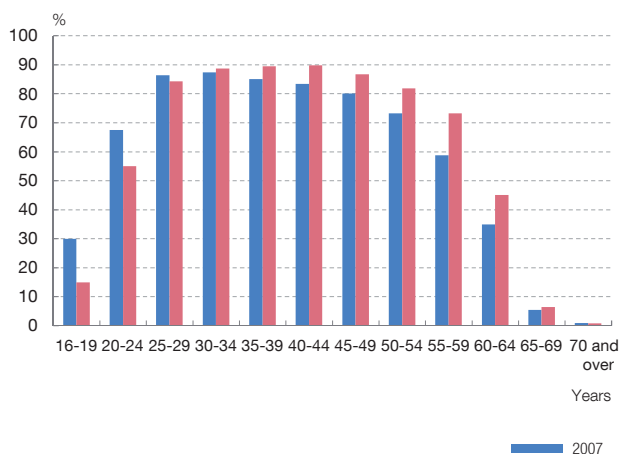
17   See Jimeno, Lacuesta, Martínez-Matute and Villanueva (2016).

Chart 4.6

LABOUR-MARKET PARTICIPATION AND EMPLOYMENT RATES IN SPAIN ARE LOWER AMONG THE OLDER POPULATION

As the more numerous cohorts reach close-to-retirement ages, employment rates will decline if there is no improvement in job opportunities for elderly workers.

1 PARTICIPATION RATE BY AGE GROUP (a)

2 EMPLOYMENT RATE BY AGE GROUP (a)

2007   2018
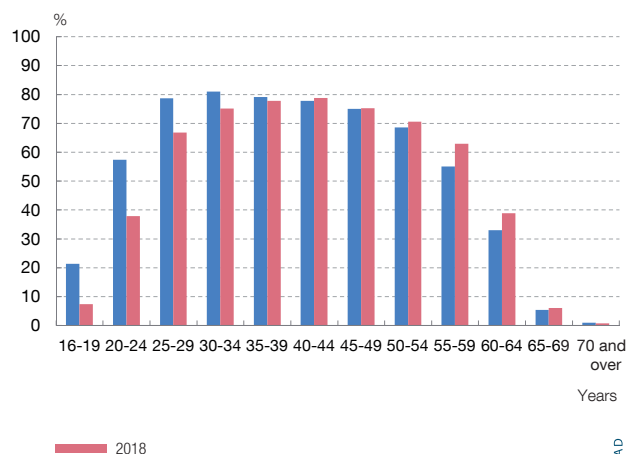
SOURCE: INE.

a As a proportion of the total population in each age bracket.

DOWNLOAD

employment policies which reduce excessive labour turnover caused, for example, by a high proportion of temporary contracts (especially at young and intermediate ages) may help mitigate the slowdown in the growth of human capital linked with ageing.
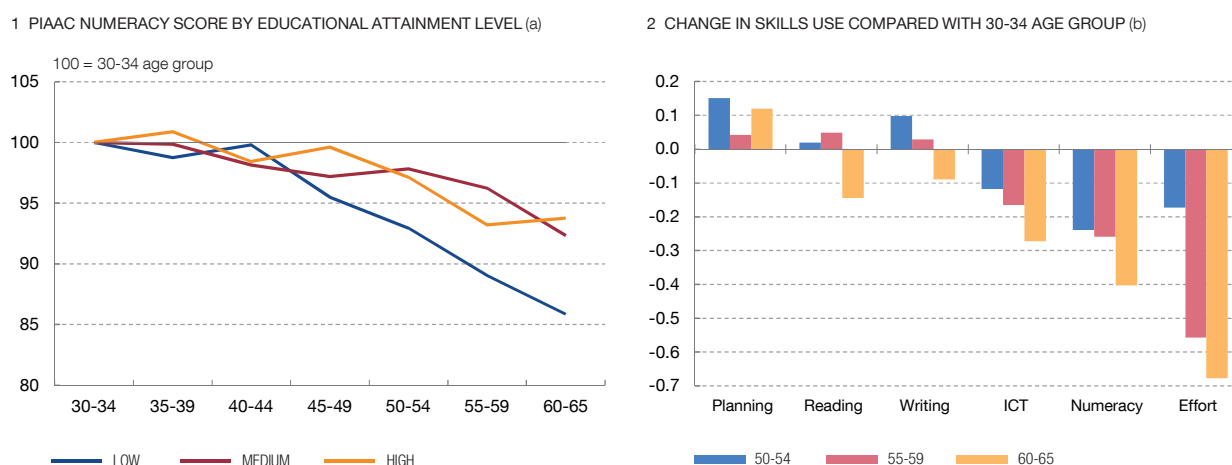
Conversely, other skills, such as those needed for planning, are used to a greater degree at more advanced ages. Work experience promotes the development of organisational and planning skills to a greater degree. Therefore, it is likely that workers who are close to retirement are relatively more qualified to continue their working lives in jobs with more demand for such skills. Generally, recent developments in the occupational distribution of employment show a higher proportion of numerical and ICT skills. However, in Spain, there is a more notable presence of older workers in occupations and sectors with a higher proportion of physical tasks – for example, construction, transport, and accommodation and food service activities – than in the rest of the euro area (see Chart 4.8).

A smaller working-age population provides incentives for automation, whereas ageing of the working-age population does not promote technological innovation. Technological changes have three immediate effects: higher productivity (due to the introduction of more efficient production processes); the displacement of workers who lose their jobs (due to the mechanisation of certain tasks); and the return of workers who rejoin the labour market in new jobs generated by technological

Chart 4.7
COGNITIVE SKILLS AND HOW THEY ARE USED CHANGE OVER THE LIFE CYCLE

Older workers have fewer of the cognitive skills needed to use new technologies. This is because they have built up less human capital than subsequent generations and also because human capital depreciation increases with age.

1 PIAAC NUMERACY SCORE BY EDUCATIONAL ATTAINMENT LEVEL (a)

100 = 30-34 age group

LOW   MEDIUM   HIGH

2 CHANGE IN SKILLS USE COMPARED WITH 30-34 AGE GROUP (b)

50-54   55-59   60-65

SOURCE: OECD (PIAAC, 2013).

a Low educational attainment level = lower secondary education or less; medium educational attainment level = upper secondary education; high educational attainment level = university education or more.
b The bars denote the estimated coefficients of an indicator for each of the age groups (50-54, 55-59 and 60-65) of a regression that includes other control variables. Skills use at work is the dependent variable. The regression includes sex, educational attainment level and dummy variables: for economic sector, occupation and each age group.

DOWNLOAD

developments. The relative magnitude of these three effects and how and which groups of workers are affected depends on the nature of the technological changes. Typically, these changes are most beneficial for workers with high educational attainment levels and, consequently, displaced workers rejoin the labour market in new jobs by means of investment in education and training that provides them with the occupational skills favoured by technological progress. However, the development of robotics and artificial intelligence may lead to more disruptive technological developments, insofar as they displace occupational skills across the board. The effects of these changes essentially hinge on the demographic setting in which they take place. Box 4.3 estimates this interplay, showing that demographic changes encourage, to a greater or lesser degree, automation and technological innovation and, therefore, determine productivity growth. The findings suggest that, although population ageing fosters robotisation and, therefore, generates productivity gains, the reduction in the labour force and population ageing delay technological innovation and, consequently, in the long term, potential growth may also decline. The box also presents empirical evidence which shows that, in recent decades, population ageing in advanced countries has generally been associated with lower potential growth, which has been partly offset, in several countries, by raising the retirement age.

In this scenario, education and occupational skills policies become crucial. Given the technological developments on the horizon, it is vital to develop education and

Chart 4.8

SPAIN HAS A HIGH PERCENTAGE OF ELDERLY WORKERS IN SECTORS INVOLVING HIGH USE OF PHYSICAL CAPABILITIES

Given that work experience improves organisation and planning capabilities, workers of close-to-retirement age should be more present in sectors requiring the use of these skills. However, the proportion of workers aged 55-64 in jobs in sectors mainly requiring physical attributes – construction, transport, and hotels and restaurants – is higher in Spain than in the euro area countries on average.

1 SECTORAL DISTRIBUTION OF EMPLOYMENT OF WORKERS AGED 55-64
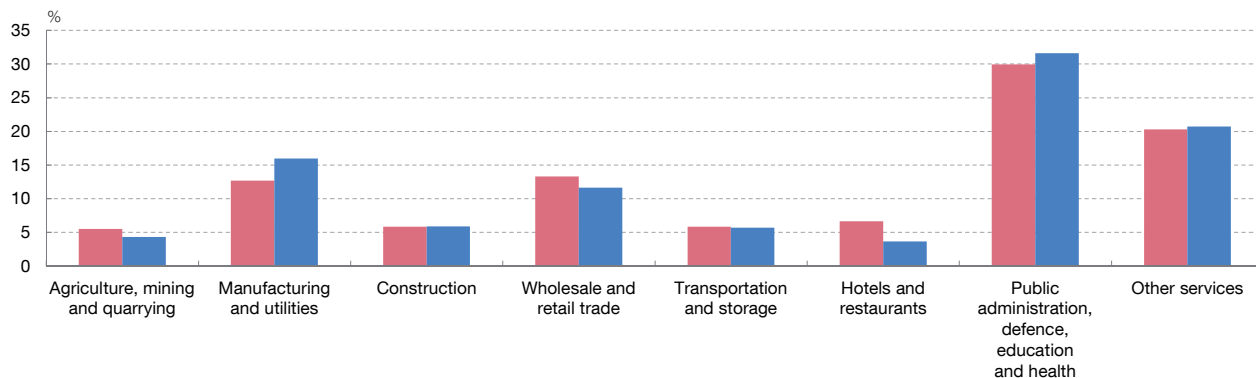
2 PROPORTION OF WORKERS AGED 55-64/WORKERS AGED 15-64 RATIO, BY SECTOR

■ SPAIN   ■ EURO AREA (a)

SOURCE: Eurostat Labour Force Survey.

a The euro area includes Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Slovakia, Slovenia and Spain.

DOWNLOAD

occupational skills policies, both to ensure that workers can acquire the skills needed to complement new technologies and to foster innovation and the creation of new jobs. Among the needs to be taken into account in the development of these policies, three seem particularly important: i) the ability to interact with robots and to understand the algorithms underpinning new technological developments (thus focusing on education in science, technology, engineering and mathematics (STEM)); ii) encouraging versatility and exploitation of the possibilities that new technologies offer for self-employment; and iii) focus on the skills needed to pursue R&D activities. In addition, since the available evidence shows that work experience also helps people acquire some of

these skills, even in the case of workers with lower educational attainment levels, job stability needs to be encouraged so as to facilitate human capital accumulation.[18]

Moreover, increased longevity should prompt a rebalancing between the duration of working life and retirement, raising the age at which workers finally retire. Accordingly, labour market measures are needed that will encourage older workers to continue working and make it easier for them to switch between jobs rather than to take retirement. Economic incentives to replace these older workers with younger ones often entail a considerable cost for the pension system and are not especially conducive to creating work opportunities for the younger population. Alternatively, it may be better to develop active labour market policies that will help improve occupational skills throughout the life cycle, especially after a period in which expenditure on such policies has been cut and has become less efficient.[19]

4 Demographic changes and economic stabilisation policies

Demographic changes shape the cyclical behaviour of the economy and the effects of stabilisation policies. Economic fluctuations are the result of shocks that are transmitted according to the structural characteristics of the economy and the economic policy response (especially the monetary stabilisation and fiscal policy response). In general, shock transmission mechanisms and the effectiveness of stabilisation policies are both affected by demographic factors.

4.1   Monetary policy: low interest and inflation rates

Demographic change affects two basic pillars of monetary policy: the natural rate of interest and the determinants of inflation. The role played by the natural rate of interest in monetary policy strategies has been examined in detail in Chapter 3 of this report and its main determinants – including demographic factors – have been identified. Yet this is not the only transmission channel through which demographic change shapes the implementation and effects of monetary policy.

Changes in the relative demand for goods and services and in the labour market can curb inflationary pressure. The consumption basket of young adults includes a higher proportion of expenditure on durable goods and services than that

---

18 See Börsch-Supan and Weiss (2016) and Jimeno, Lacuesta, Martínez-Matute and Villanueva (2016).

19 Other measures (such as, for example, subsidies for employing older workers, which entail high costs) would not appear to achieve the aim of increasing the employment rate among the older population (see Font, Izquierdo and Puente (2017)).

Chart 4.9

THE COMPOSITION OF CONSUMPTION SPENDING BY TYPE OF GOOD VARIES THROUGHOUT THE LIFE CYCLE

Population ageing will change consumption patterns. Non-durable goods and non-market services consumption, which are generally characterised by lower relative prices than the other segments, will increase.

DISTRIBUTION OF SPENDING BY TYPE OF CONSUMPTION, BY AGE GROUP, IN 2015

DURABLE GOODS   NON-DURABLE GOODS   SERVICES

DOWNLOAD
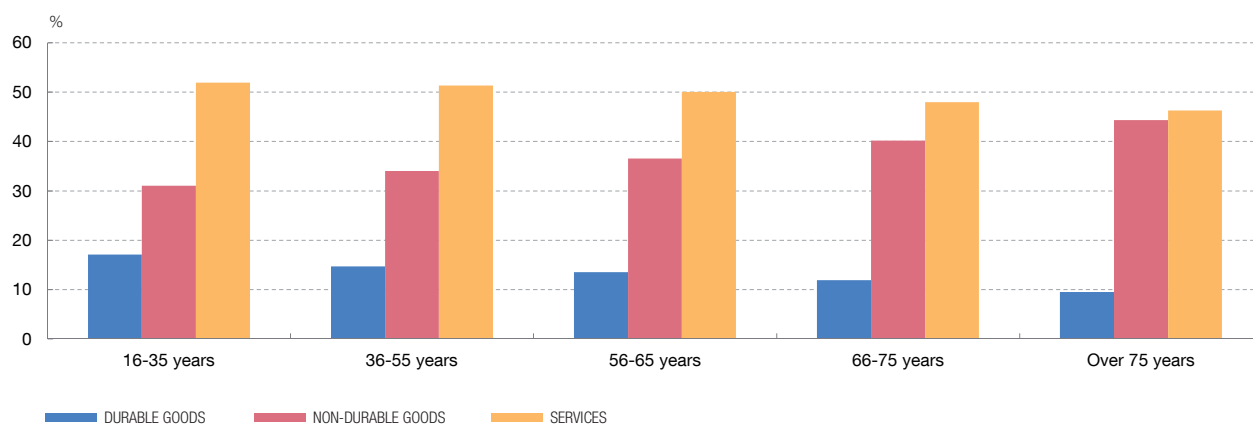
SOURCE: INE Household Expenditure Survey.

of the older age groups, whose consumption basket includes higher expenditure on non-durable goods and lower expenditure on services, as many of the services they consume are non-market services (see Chart 4.9). More detailed studies of these consumption patterns conclude that population ageing will prompt changes in the relative demand for goods and services. If that is the case, and this higher demand is concentrated on goods and services with lower price growth, population ageing would put a certain degree of downward pressure on inflation.[20] Moreover, these consumption patterns would give rise to changes in the sectoral and occupational composition of employment, increasing the share of employment both in low and highly-skilled occupations and reducing it in medium-skilled occupations, as this is the skills pattern required to produce the goods and services in growing demand. Accordingly, demographics could also accelerate the trend towards the polarisation of employment that has been observed since the early 1990s and is usually attributed to technological advances resulting from the automation of routine tasks.[21]

Population ageing tends to increase inflation aversion and reduce wage growth. There are three ways by which the demographic changes described may give rise to lower pressure on inflation:

---

20 See Aguiar and Hurst (2013) and Luengo-Prado and Sevilla (2013). Chapter 2 of this report analyses other causes of persistently low inflation.

21 See Sebastián (2018).

— First, as older people have accumulated more wealth, and are therefore generally net creditors, they are more averse to inflation, and for this reason monetary policies that are more counter-inflationary act in their favour.[22]

— Second, the employment changes described in the previous paragraph may also give rise to lower wage pressure, as employment growth will be higher among lower paid skills.

— Third, over the life cycle, wage growth is generally very fast at the start of a person's working life, and then quite steady towards the end. In consequence, it will tend to lessen as the share of the employed population approaching retirement age increases.

However, the empirical evidence on the effects of demographic change on the inflation rate is not yet conclusive. The importance of the role played by the three factors listed above in reducing trend inflation, and of the role of other mechanisms through which demographic change affects the economy, is being estimated and assessed, with data that are as yet initial and incomplete and do not envisage the scale of population ageing up to the end of the century. Accordingly, it is difficult to forecast the extent to which these mechanisms may ultimately pose an additional challenge and a significant constraint on the effectiveness of expansionary monetary policies. But they should, however, be taken into account in macroeconomic analysis and monitoring of developed countries.

4.2 Fiscal policy: some constraints on its revenue-raising powers and transmission mechanisms

In terms of stabilising economic fluctuations, population ageing affects both fiscal policy resources and its revenue-raising capacity. Public revenue and expenditure and their impact on economic activity all depend on population growth and age structure. As income sources and consumption patterns change over the life cycle, the different tax treatment of different kinds of income and consumption expenditure will affect tax revenue. The same is true of how funds associated with the automatic stabilisers (unemployment and other benefits) are obtained and used. Lastly, public revenue and expenditure programmes have different effects on aggregate demand, according to the marginal propensity to consume and labour supply elasticity of the persons receiving the income stimuli associated with those programmes.[23]
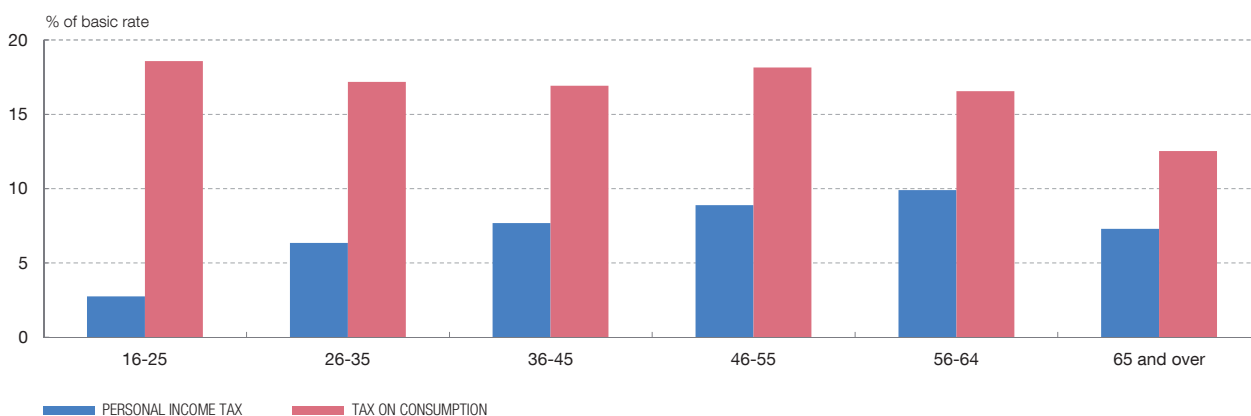
---

22 See Bullard, Garriga and Walker (2012).

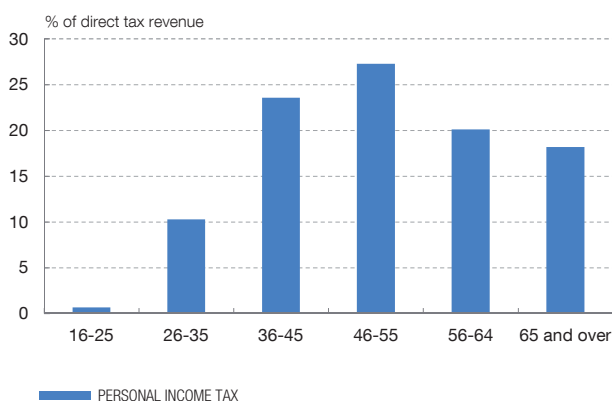23 See Anderson, Inoue and Rossi (2016) and Ferraro and Fiori (2018).

Chart 4.10
TAX REVENUE AND THE COMPOSITION THEREOF DEPEND ON DEMOGRAPHIC FACTORS

Population ageing will reduce tax revenue from both income and capital, and also from consumption.
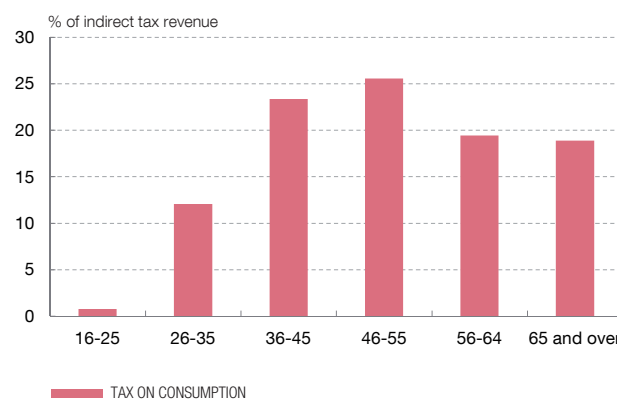
1 AVERAGE EFFECTIVE TAX RATES BY AGE GROUP

2 DISTRIBUTION OF DIRECT TAX REVENUE, BY AGE GROUP

3 DISTRIBUTION OF INDIRECT TAX REVENUE, BY AGE GROUP

SOURCE: Banco de España.

DOWNLOAD

The volume and composition of tax revenue depend on demographic factors.
One trend associated with population ageing, and which also has roots in technological
advances, is the decline in wages as a proportion of national income. As a result,
revenue from social security contributions declines, as does the contribution from the
progressive element of personal income tax, as older taxpayers pay tax at effectively
lower rates (see Chart 4.10).[24] In addition, the fact that people accumulate wealth as
they age (documented in section 3.1 above) also dilutes this contribution, since
implicit tax rates on investment income are lower than those on labour income,

---

24   On the composition of tax revenue in Spain, see López-Rodríguez and García Ciria (2018).

although the end impact depends on the composition of that wealth (financial or real estate assets). Indirect tax revenue depends on the composition of consumption. Since the older population consumes more goods and services that are taxed at lower effective rates (for example, more healthcare services and fewer goods subject to excise duties such as alcohol, tobacco, fuel, etc.), population ageing will push down indirect tax revenue. This could present an added difficulty for further fiscal consolidation for countries with structural budget deficits and/or high debt ratios.

How effective fiscal policy is in accommodating economic shocks depends on the revenue and expenditure programmes in place; these programmes affect different age groups differently. How much GDP grows as a result of variations in public revenue and expenditure (the so-called "fiscal multipliers") determines how effective fiscal policy is in stabilising economic activity. The size of these multipliers depends on numerous factors: the fiscal instrument in question, the stage of the economic cycle and the level of public debt, among others.[25] The way in which these programmes are passed through to households' spending power (through labour income or via transfers), and the differences between marginal propensity to consume and labour supply elasticities by age group, are also fundamental to determine their macroeconomic impact. In this respect, there are some empirical findings and theoretical reasons to support the view that fiscal multipliers associated with certain public investment and consumption programmes may diminish in the future (see Box 4.4).

5 Consequences of demographic change on social policies

Population ageing demands reform of the public pension, health and long-term care systems. As a result of the growth in the retired population, if benefits per capita remain constant, transfers through the public pension system will increase. Moreover, as indicated earlier, the lower the working-age population as a proportion of the total population, the lower, in relative terms, the revenue from social security contributions that are used to fund contributory social benefits. In addition, as the population ages, the demand for public health and long-term care services increases. This section highlights the main effects of population ageing on the public pension system and on public expenditure on public health and long-term care services.

5.1 Public pension system: financial sustainability and sufficiency

The Spanish public pension system comprises contributory and non-contributory pension benefits funded by social security contributions and

---

25 See Hernández de Cos and Moral-Benito (2013).

general taxes. The public pension benefit system in Spain covers a set of contingencies relating to ageing (retirement), death (widow(er)s, orphans, family members) and illness (permanent disability). It is split into two types of benefits: one that is contributory and compulsory; and the other, in the form of assistance, which is secondary to the first and designed to meet the needs of those who are not entitled to contributory pension benefits and whose income and wealth are below certain thresholds. Contributory pension benefits are calculated on the basis of a person's working life (contribution years and bases), according to defined-benefit criteria, and are funded by (a portion of the) social security contributions. There are also minimum contributory pension benefits (with minimum pension top-ups funded through general taxes) and maximum contributory pension benefits, set on a discretionary basis each year in the State Budget Law. In Spain, voluntary private pension funds and schemes are very limited.[26]

Pension expenditure is determined by demographic, employment, economic and institutional factors. Pension expenditure, expressed as a percentage of GDP, depends positively on the ratio of the population receiving benefits to the working-age population or dependency ratio (the demographic factor), negatively on the employment rate, which is the ratio of employed population to working-age population (the employment factor), and positively on the share of wages in GDP (the economic factor), and on the benefit ratio, which is the ratio of average pensions to average wages (the institutional factor). This relationship may be expressed as follows:

Pension expenditure/GDP = Dependency ratio * Share of wages in GDP * Benefit ratio/Employment rate

In recent decades, the demographic factor and the increase in the benefit ratio have contributed most to the growth in expenditure on contributory pension benefits (see Chart 4.11.1). In 2018, this expenditure amounted to 10% of GDP, with a dependency ratio of 29.8% (defined as the ratio of population over 64 to the population aged 16 to 64), an employment rate of 58.5% (referring to the population aged 16 to 64 who are employed), a share of wages in GDP of 47.3%, and a benefit ratio of 41.5%. Expenditure on non-contributory pension benefits amounted to around 1% of GDP.

Revenue from social security contributions depends on the effective rate of contributions and on the share of wages in GDP. Revenue from social security contributions, expressed in terms of GDP (see Chart 4.11.2) is determined by multiplying the share of wages in GDP by the effective tax rate of social security contributions. The latter is the result of the statutory rates set (23.6% of the contribution

---

26 Table 4.1 sums up the main characteristics of the public retirement pension system in Spain. For more details, see Hernández de Cos, Jimeno and Ramos (2017).

Table 4.1

CHARACTERISTICS OF DIFFERENT COUNTRIES' PENSION SYSTEMS

	Public pensions expenditure (a) 2016	Statutory retirement age (b) 2016	Actual retirement age (b) 2017	Dependency ratio (c) 2016	Replacement ratio (d) 2016	Accrual rate (e) 2016	Type of pension system (f)
Belgium	12.1	65.0	61.8	38.2	41.8	1.4	Defined benefit
Bulgaria	9.6	63.8	63.8	46.8	31.2	1.1	Defined benefit
Czech Republic	8.2	63.1	63.5	41.7	39.9	1.4	Defined benefit
Denmark	10.0	65.0	65.2	36.4	41.7	—	Defined benefit
Germany	10.1	65.5	64.6	41.7	42.0	—	Points system
Estonia	8.1	63.0	65.2	48.9	33.1	0.5	Defined benefit
Ireland	5.0	65.4	65.0	30.3	26.8	—	Flat-rate benefit
Greece	17.3	67.0	62.3	37.9	77.0	1.9	Flat-rate benefit
Spain	12.2	65.3	63.4	31.0	57.7	2.3	Defined benefit
France	15.0	66.3	61.9	46.4	50.5	1.5	Defined benefit
Croatia	10.6	65.0	62.4	44.8	31.6	1.0	Points system
Italy	15.6	66.6	63.9	38.6	58.9	1.9	Notional accounts
Cyprus	10.2	65.0	64.5	26.0	62.9	1.3	Defined benefit (points)
Latvia	7.4	62.8	61.7	44.7	24.0	1.0	Notional accounts
Lithuania	6.9	63.3	63.6	47.9	31.4	0.5	Points system
Luxembourg	9.0	65.0	60.4	47.3	51.8	1.8	Defined benefit
Hungary	9.7	63.1	62.5	38.6	40.4	2.4	Defined benefit
Malta	8.0	62.0	62.5	29.6	49.2		Flat-rate benefit
Netherlands	7.3	65.5	65.4	36.3	35.7		Flat-rate benefit
Austria	13.8	65.0	64.0	40.5	50.5	1.3	Defined benefit
Poland	11.2	65.0	64.0	35.4	48.5	1.0	Notional accounts
Portugal	13.5	66.2	64.8	40.4	57.5	2.1	Defined benefit
Romania	8.0	64.8	64.0	39.0	35.5	—	Points system
Slovenia	10.9	65.0	60.9	44.9	31.8	1.5	Defined benefit
Slovakia	8.6	62.0	61.9	35.9	46.6	1.2	Points system
Finland	13.4	66.0	63.9	41.8	53.5	1.6	Defined benefit
Sweden	8.2	67.0	65.9	40.2	38.6	0.9	Notional accounts
United Kingdom	7.7	65.4	65.0	31.2	27.8	—	Flat-rate benefit
Norway	10.7	67.0	65.9	35.3	50.6	0.9	Notional accounts

SOURCE: European Commission (2018).

a As a percentage of GDP.
b For men. Actual retirement age is calculated as the average age at which people leave the workforce.
c Number of pensioners as a proportion of the population aged 15 to 64.
d Defined as average pension to average wage. In some countries, where the replacement ratio is comparatively low (the United Kingdom, the Netherlands, Sweden or Denmark), private pensions have much more weight than in other countries.
e Rate of accrual of pension rights (new pensions).
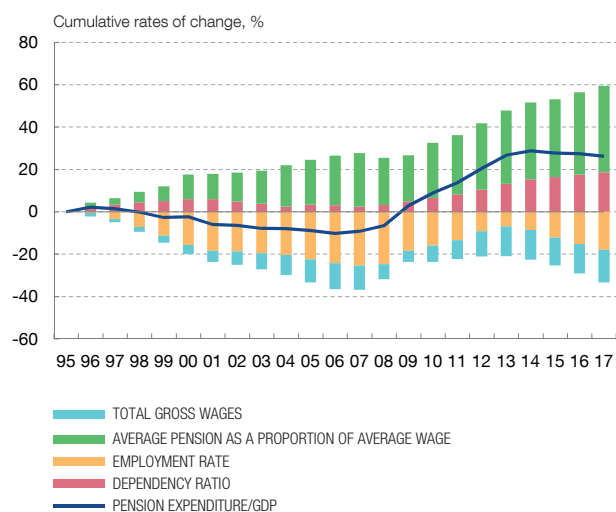f Retirement pensions, main system.

base for the employer's contribution and 4.7% of the contribution base for the employee's contribution, in the case of contributions for common contingencies in the General Social Security Regime), the existence of minimum and maximum contribution bases, and wage distribution. At present, the effective rate is around 25.2%, while the contribution of general taxes to the pension system to cover the
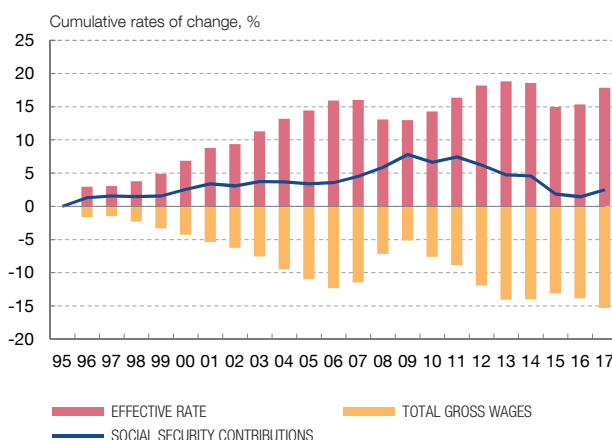
Chart 4.11
SOCIAL SECURITY SYSTEM EXPENDITURE DEPENDS ON DEMOGRAPHIC FACTORS TO A GREATER EXTENT THAN REVENUE

In recent decades, the increase in the dependency ratio and in the average pension/average wage ratio explains the rise in pension expenditure as a proportion of GDP. On the revenue side, the share of social security contributions as a percentage of GDP has fallen slightly.

1 DETERMINANTS OF PENSION EXPENDITURE

Cumulative rates of change, %

2 DETERMINANTS OF SOCIAL SECURITY CONTRIBUTIONS

Cumulative rates of change, %

TOTAL GROSS WAGES
AVERAGE PENSION AS A PROPORTION OF AVERAGE WAGE
EMPLOYMENT RATE
DEPENDENCY RATIO
PENSION EXPENDITURE/GDP

EFFECTIVE RATE
SOCIAL SECURITY CONTRIBUTIONS
TOTAL GROSS WAGES

DOWNLOAD

SOURCES: Social Security System and INE.

funding of minimum pensions (top-ups) amounts to 0.6% of GDP. Overall, the contributory pension benefit system currently has a deficit of 1.5% of GDP, which is being covered by the Social Security Reserve Fund and, primarily, by Treasury loans to Social Security.

Pension expenditure will increase significantly if the current determinants remain the same. According to the demographic projections discussed in section 2, the ratio of the population receiving retirement benefits (over-66s) to the working-age population (16-66 years) will double between 2020 and 2050. In consequence, maintaining in the future the current level of pension expenditure, as a proportion of GDP, in the absence of additional revenue, would demand an increase in the employment rate or a decrease in the benefit ratio. For illustration purposes, Table 4.2 shows recent pension expenditure projections drawn up by different bodies.[27] These projections confirm that if the benefit ratio were to remain at current levels, pension expenditure would increase very significantly.

27 See AIReF (2019), European Commission (2018) and De la Fuente, García Díaz and Sánchez Martín (2018). The "AIReF without reforms" scenario is built without either the 2011 reform measures or the Pension Revaluation Index introduced in the 2013 reform, but with the sustainability factor included in the 2013 reform.

Table 4.2

PENSION SYSTEM EXPENDITURE: ALTERNATIVE SCENARIOS

Percentages	2018	2048		2050	2070	2050	
	Baseline scenario	AIReF with reforms (a)	AIReF without reforms (a)	AWG (b)	AWG (b)	FEDEA with reforms (c)	FEDEA without reforms (c)
Expenditure on contributory pensions (% of GDP)	10.6	13.4	16.7	13.8	10.8	12.7	17.5
Dependency ratio (d)	29.8	51.6	51.6	61.9	46.6	68.1	68.1
Employment rate (d)	58.5	61.3	61.3	71.0	71.0	79.0	79.0
Wage share of GDP	47.3	47.3	47.3	47.3	47.3	47.3	47.3
Benefit ratio (average pension/average wage) (e)	44.0	33.7	41.9	33.5	34.8	31.1	42.9

SOURCES: AIReF, European Commission, FEDEA and Banco de España.

a AIReF (2019).
b European Commission (2018).
c De la Fuente, García Díaz and Sánchez Martín (2018).
d Relating to the population aged 16 to 64, save for the AIReF projections which refer to the population aged 16 to 66.
e Defined using compensation per employee measured in National Accounts terms and not considering an eligibility rate (i.e. including all the retirement-age population, whether or not they are receiving pension benefits, in the average pension calculation). In other projections [(for example AIReF (2019)], the benefit ratio refers to a different wage measure and is conditional on an eligibility rate that varies over time.

Adapting the public pension system to the new demographic context requires action on several fronts. Even if the employment rate were to grow significantly, in order to maintain the present benefit ratio there would have to be a huge increase in revenue from social security contributions. This suggests that to guarantee the social and financial sustainability of the pension system, action needs to be taken on several fronts, foreseeably both on the revenue and the expenditure side.

One important aspect to be reconsidered is the relationship between benefits provided by the system and pension age. The financial sustainability and sufficiency of contributory retirement pensions depend both on pension amount and retirement age. One way to satisfy both objectives – sustainability and sufficiency – is to tailor retirement age to increased longevity. In Spain the first steps to increase the retirement age were taken in 2011, and will be completed in 2027 when it will be 67 (for workers with less than 38.5 years' contributions). However, the actual retirement age is still under 65 and there is no clearly upward pattern (see Chart 4.12). Moreover, differences in working life circumstances and in the effects of different occupations on health demand a certain degree of flexibility when it comes to determining when workers should retire.

In addition, policies should be explored that reinforce the link between contributory pension benefits received and working-life contributions made, **and life expectancy at the time of retirement, and that strengthen the transparency and predictability of the benefits**. Without abandoning the current distribution and defined benefit system, the contributory nature of the

Chart 4.12
RETIREMENT AGE IS A SIGNIFICANT ASPECT OF THE SUSTAINABILITY OF THE PENSION SYSTEM IN SPAIN

The average retirement age is around 64, and has held more or less constant in recent years. Ordinary and early (voluntary) retirement ages will rise to 67 and 65, respectively, in 2027.

AVERAGE AGE BY TYPE OF RETIREMENT

ORDINARY RETIREMENT (a)   EARLY RETIREMENT (b)   AVERAGE RETIREMENT AGE
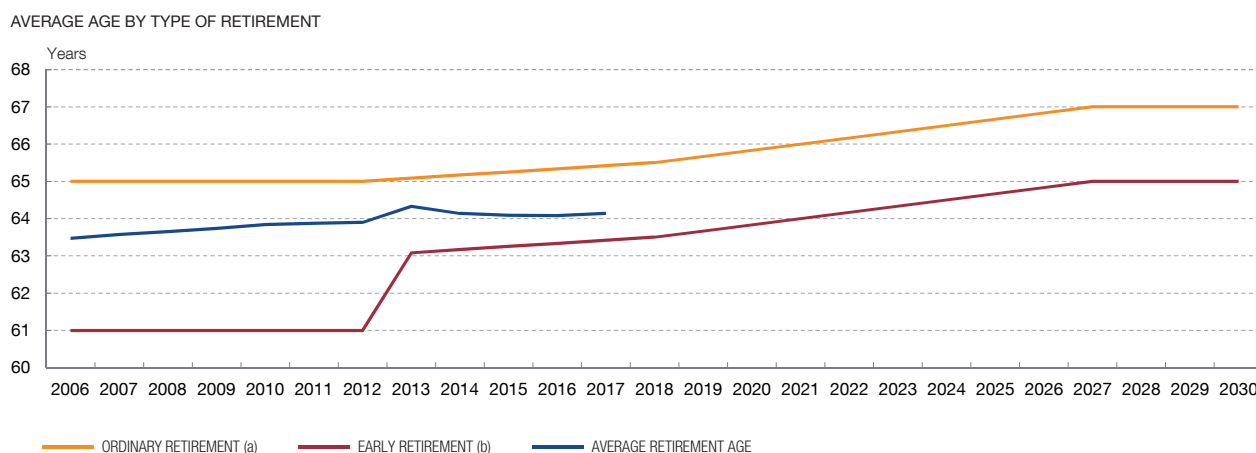
DOWNLOAD

SOURCE: Social Security System.

a When social security contributions have spanned a long working period, the ordinary retirement age holds at 65.
b Before 2013, age related to early retirement for causes not attributable to the worker.

system may be shored up by incorporating sustainability factors that adjust the pension amount to increased life expectancy and GDP growth (as is the case in Germany, or as envisaged in the sustainability factor introduced in the 2013 reform, which was recently suspended and will not be implemented until 2023). In turn, introducing transparency, drawing on notional account models in which contributions are recorded in individual accounts to which a revaluation factor is applied according to certain demographic and economic variables (as in Sweden), would help make information on accumulated pension rights more accessible. This is essential to allow workers to take the most appropriate retirement savings decisions, according to their spending needs, income and wealth, sufficiently in advance.

Growth in retirement savings may complement current public pension system benefits. The Spanish public pension system co-exists with a voluntary pillar based on funded retirement savings (pension funds and schemes). At present this pillar is only small and is fed largely by contributions resulting from personal income tax incentives.[28] In 2017, total pension fund assets in Spain amounted to 13.6% of GDP (slightly more than in Italy, France or Germany, with 10.1%, 9.8% and 6.9%, respectively), compared with the OECD average of 50.6%.[29]

---

28   See Fuentes (2016).

29   Average not weighted by country size. See OECD (2018).

Moreover, transforming accumulated wealth into income flows during retirement demands financial innovation, to offer products tailored to greater and more uncertain longevity. Transforming illiquid assets into income flows over long periods and at a reasonable cost, when the length of the periods is highly uncertain and against a backdrop of low interest rates, poses considerable challenges. At present, transformation of wealth into annuities via the financial markets is quite uncommon among Spanish households, which maintain high rates of ownership of their main residence after retirement (see Box 4.2). In consequence, much of Spanish households' wealth is passed down to the next generation via bequests, while the consumption of the retired population depends largely on their disposable income, most of which is obtained from public pensions.

Reform of the public pension system should guarantee, not only the financial sustainability and sufficiency of pensions, but also equitable distribution of pension costs and benefits between present and future generations. Reforms of the public pension system generally affect how pensions are distributed between individuals, according to the design and form of implementation of the reforms. In particular, the way in which the changes in the pension system are phased in will affect how the cost of the reform is distributed between generations. In this respect, delaying the necessary reform of the public pension system could contribute to this distribution having to be made in a less equitable manner and at the expense of greater uncertainty, with an adverse effect on the savings and labour supply decisions of present generations.

5.2 Population ageing, health and long-term care: funding growing expenditure and the need for efficient service provision

Expenditure on healthcare services and long-term care programmes is closely linked to population ageing. Healthcare expenditure is concentrated on the older population. Long-term care programmes are also, by their very nature, essentially focused on the older population. In consequence, an increase in the proportion of this age group will have a considerable impact on health and long-term care expenditure needs.

Nevertheless, there are other factors, in addition to longevity, that also determine health and long-term care expenditure. First, as the healthcare system becomes more efficient, more services can be offered at less cost. Second, there is evidence, albeit not fully conclusive, linking increasing longevity to better health among the older population, so not all the increase in longevity translates into greater demand for healthcare services.[30] Moreover, demand for healthcare


30   See Bohacek, Bueren, Crespo, Mira and Pijoan-Mas (2018).

Chart 4.13

AGEING WILL INCREASE HEALTH EXPENDITURE IN SPAIN

Admittedly, the efficiency of the health system and possible improvements in the health of the elderly associated recently with increased longevity may offset the pressure of ageing on health spending. But other factors, such as the emergence of new high-cost treatments or the increased demand for health services arising from higher income, will exert upward pressure.

1 EXPENDITURE PROFILE, BY AGE AND GENDER GROUPS, IN 2016
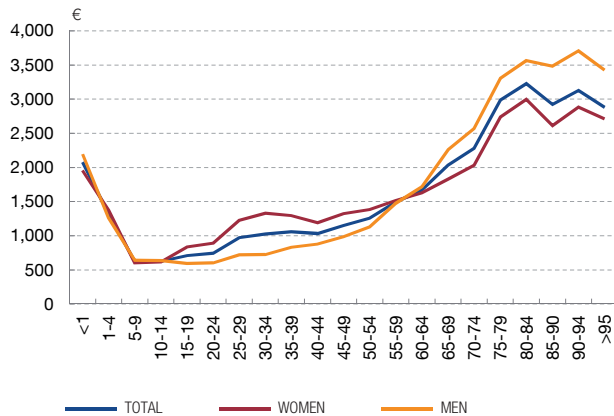
2 ALTERNATIVE SCENARIOS FOR 2070 (a)
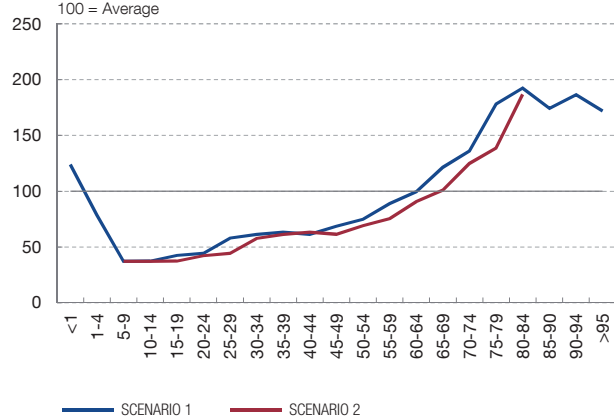
SOURCES: Eurostat, Ministerio de Hacienda and Banco de España.

a Scenarios based on the assumptions of the European Commission's "The 2018 Ageing Report", and relating to two alternative extreme hypotheses. In scenario 1, the expenditure profile by age remains identical to that of the baseline year (2016), which means that the assumed increase in life expectancy is not accompanied by any improvement in the level of health for each age. Conversely, in scenario 2 the increase in life expectancy corresponds in full to an improvement in health, whereby the expenditure profile shifts rightwards by the amount of this increase.

DOWNLOAD

services rises as aggregate income increases and new high-cost treatments become available, so expenditure on healthcare services and long-term care is expected to increase significantly in coming decades, even taking into account possible efficiency gains in the healthcare system and improved health among the older population. Indeed, recent trends point to an increase in expenditure that cannot be fully explained by either demographic factors or higher demand for healthcare services linked to higher household income. This suggests that the impact of technology on the healthcare industry is driving up expenditure. This is a trend that may become more pronounced as population ageing intensifies, according to the extent to which increased longevity is accompanied by good health among the older population or by the need for more health and long-term care (see Chart 4.13).

Expenditure on long-term care is lower than healthcare expenditure. Long-term care is defined as a variety of activities carried out by formal or informal carers to give those who are not fully able to look after themselves the best quality of life possible. The system of health accounts includes as long-term care a total healthcare expenditure item (long-term care services) and other items not included in that category (supply of social services in kind and supply of social services in cash for the ill or disabled). In Spain, provision of the two types of

Chart 4.14
AGEING WILL ALSO EXERT UPWARD PRESSURE ON DEPENDENCY-RELATED EXPENDITURE

Dependency-related expenditure accounts in Spain for somewhat over 2% of GDP, of which almost three-quarters is provided by general government. In future, health and long-term care expenditure is projected to grow in step with population ageing.

1 HEALTH EXPENDITURE

2 HEALTH AND LONG-TERM CARE EXPENDITURE PROJECTIONS
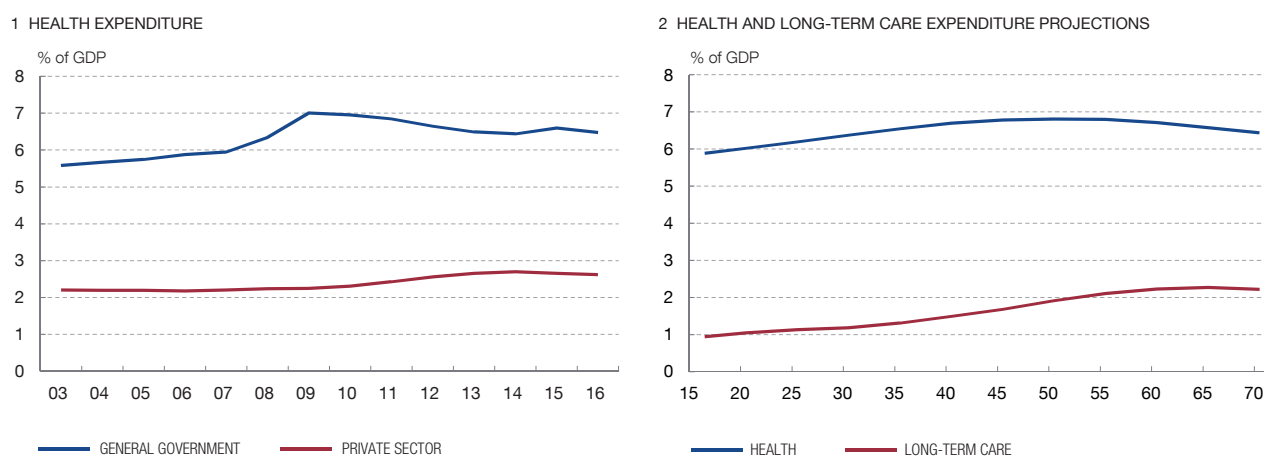
SOURCES: Ministerio de Sanidad, Consumo y Bienestar Social and European Commission (2018).

services combined amounts to 0.94% of GDP and is mostly public provision. However, much of the care provided to persons with a certain degree of disability is not recorded in the health accounts as it is provided on an informal basis at home.[31]

As in the case of pensions, the pressure on expenditure on health and long-term care demands an overhaul of how it is funded and of the level of care provided and the efficiency of its provision. Despite the high uncertainty surrounding expenditure projections of this kind, in view of all the factors mentioned above, it is estimated that by mid-century healthcare expenditure could rise to 6.4% and expenditure on long-term care services to 2.2% of GDP (see Chart 4.14). This last figure could be even higher if, as the result of an increase in the labour force participation rate, the informal provision of these services at home were to decrease, driving up public demand for long-term care. In consequence, it is vital not only to ensure that there is adequate funding in place for the expected increase in expenditure, but also to identify and introduce good practice in hospital and clinic management and in public procurement and the supply of pharmaceutical products on prescription.

---

31   See Verbakel (2017) and Braczyk and Kredler (2018).

6 Final comments

Over the course of this century, the working-age population in developed countries will level off and will decrease dramatically as a proportion of the total population. The economic and social consequences of these demographic changes will be far-reaching, affecting not only the social policies designed to protect the older population (pension benefits, health and long-term care) but also the functioning of the goods and services markets, the labour and financial markets and the macroeconomic (monetary and fiscal) policy transmission mechanisms.

One likely outcome is that the potential growth of developed countries will decelerate, on account of the lower growth in the working-age population and the possible adverse effects of the demographic changes on productivity growth, despite the new wave of technological advances based on robotics and artificial intelligence. This, together with the high build-up of global debt in recent decades, poses major challenges in several key economic dimensions, such as those relating to growth potential, the functioning of the welfare state or intergenerational wealth transfers.

It is, therefore, an essential and pressing requirement that the various economic policy instruments in place – aimed at stabilising the economy or boosting economic growth – take into account the demographic changes. Policy-makers must anticipate the consequences of these changes and implement measures to reduce their negative effects, ensuring at all times that the distribution of the associated costs is equitable from both the intra- and intergenerational standpoint.

REFERENCES

Aguiar, M. and E. Hurst (2013), "Deconstructing Life Cycle Expenditure", *Journal of Political Economy*, 121(3), June, pp. 437-492.

AIReF (2019), "Opinión sobre la sostenibilidad de la Seguridad Social", *Opinión*, 1/2019.

Aksoy, Y., H. S. Basso, R. P. Smith and T. Grasl (2019), "Demographic Structure and Macroeconomic Trends", *American Economic Journal: Macroeconomics,* Vol. 11, No. 1, January, pp. 193-222.

Alloza, M. and C. Sanz (2019), *Jobs multipliers: evidence from a large fiscal stimulus in Spain*, Banco de España Working Paper 1912.

Anderson, E., A. Inoue and B. Rossi (2016), "Heterogeneous Consumers and Fiscal Policy Shocks", *Journal of Money, Credit and Banking*, 48(8), December.

Balestra, C. and R. Tonkin (2018), *Inequalities in household wealth across OECD countries: Evidence from the OECD Wealth Distribution Database,* OECD Working Paper No. 88.

Barany, Z., N. Coeurdacier and S. Guibaud (2018), *Capital Flows in an Aging World,* CEPR Discussion Papers, No. 13180.

Barceló, C., O. Bover, N. Guner, G. Kocharkov and E. Villanueva (2019), *Housing over the Life Cycle: Expectations, Inheritance and Policy,* Banco de España Working Paper, forthcoming.

Barrett, G. and C. Riddell (2016), Ageing and Literacy Skills, IZA Discussion Papers, No. 10017.

Basso, H. and J. F. Jimeno (2019), *From Secular Stagnation to Robocalypse? Implications of Demographic and Technological Changes,* Banco de España Working Paper, forthcoming.

Basso, H. and O. Rachedi (2018), *The young, the old, and the government: demographics and fiscal multipliers,* Banco de España Working Paper 1837.

Bohacek, R., J. Bueren, L. Crespo, P. Mira and J. Pijoan-Mas (2018), *Inequality in life expectancies across Europe,* CEPR Discussion Papers, No. 13184.

Börsch-Supan, A. and M. Weiss (2016). "Productivity and age: evidence from work teams at the assembly line", *The Journal of the Economics of Ageing,* 7(C), pp. 30-42.

Braczyk, D. and M. Kredler (2018), "Long-Term Care across Europe and the US: The Role of Informal and Formal Care", Universidad Carlos III de Madrid, mimeo.

Bullard, J., C. Garriga and C. J. Walker (2012), "Demographics, Redistribution, and Optimal Inflation", *Federal Reserve Bank of St. Louis Review*, 94(6), November/December, pp. 419-439.

De la Fuente, A., M. Á. García Díaz and A. R. Sánchez Martín (2018), *La salud financiera del sistema público de pensiones español: proyecciones de largo plazo y factores de riesgo*, FEDEA Policy Papers, No. 2018-03.

Desjardins, R. and A. J. Warnke (2012), *Ageing and Skills: A Review and Analysis of Skill Gain and Skill Loss Over the Lifespan and Over Time,* EconStor Preprints, No. 57089, ZBW - Leibniz Information Centre for Economics.

Döttling, R. and E. Perotti (2017), *Secular Trends and Technological Progress,* CEPR Discussion Papers, No. 12519, December.

European Commission (2018), *The 2018 Ageing Report. Economic & Budgetary Projections for the 28 EU Member States (2018-2070)*, Institutional Papers, No. 0791, May.

Farré, L. and L. González (2018), "Does paternity leave reduce fertility?", *Journal of Public Economics*, Vol. 172, April, pp. 52-66.

Fernández-Huertas Moraga, J. and G. López Molina (2018), *Predicting Spanish Emigration and Immigration,* AIReF Working Papers

Ferraro, D. and G. Fiori (2018), "The Aging of the Baby Boomers: Demographics and Propagation of Tax Shocks", mimeo.

Font, P., M. Izquierdo and S. Puente (2017). *Subsidising mature age employment or throwing coins into a wishing well: a quasi-experimental analysis*, Banco de España Working Paper 1740.

Fuentes, I. (2016), "*Evolución reciente de los planes y fondos de pensiones en España*", *Boletín Económico*, December, Banco de España.

Haskel, J. and S. Westlake (2018), *Capitalism without capital: The rise of the intangible economy*, Princeton University Press.

Hernández de Cos, P., J. F. Jimeno and R. Ramos (2017), *The Spanish public pension system: current situation, challenges and reform alternatives,* Banco de España Occasional Paper 1701.

Hernández de Cos, P. and E. Moral-Benito (2013), *Fiscal multipliers in turbulent times: the case of Spain,* Banco de España Working Paper 1309.

Jimeno, J. F., A. Lacuesta, M. Martínez-Matute and E. Villanueva (2016), *Education, labour market experience and cognitive skills: evidence from PIAAC*, Banco de España Working Paper 1635.

Liang, J., H. Wang and E. P. Lazear (2018), "Demographics and Entrepreneurship", *Journal of Political Economy,* October, pp. S140-S196.

López-Rodríguez, D. and C. García Ciria (2018), *Estructura impositiva de España en el contexto de la Unión Europea*, Banco de España Occasional Paper 1810.

Luengo-Prado, M. J. and A. Sevilla (2013), "Time to Cook: Expenditure at Retirement in Spain", *The Economic Journal*, No. 123, pp. 764-789.

Matea, M. Ll. and M. C. Sánchez (2015), "*Household formation and the need for new primary dwellings in the medium term*", *Economic Bulletin,* October, Banco de España.

OECD (2018), *OECD Global Pension Statistics and Pension Markets in Focus*, Paris.

Párraga Rodríguez, S. (2019), *The effects of pension-related policies on household spending*, Banco de España Working Paper 1913.

Sebastián, R. (2018), "Explaining job polarisation in Spain from a task perspective", *SERIEs*, 9(2), pp. 215-248.

Verbakel, E. (2017), "How to understand informal caregiving patterns in Europe? The role of formal long-term care provisions and family care norms", *Scandinavian Journal of Public Health*, 46(4), pp. 436-447.

Box 4.1

POPULATION PROJECTIONS FOR SPAIN: COMPARISONS AND UNCERTAINTIES

In October 2018, the INE published the latest population projections for the period 2018-2068.[1] The starting point for these projections are the provisional population figures at 1 January 2018, which reflect an increase of almost 220,000 persons on the figure projected for that year in October 2016. In the new projections, the INE estimates continued growth of the total population, to a record high bordering on 50 million inhabitants in 2048, after which moderate declines are expected. The new projections represent a strong upward revision vis-à-vis the INE's estimates for 2016, with around seven million more inhabitants at the end of the projection horizon (see Chart 1). In the shorter term, the INE estimates an increase in the total population of almost 4% between 2018 and 2028, which is also well above the previously projected figures. This upward revision also applies to the working-age population (see Chart 2).

Other organisations, such as Eurostat or the Independent Authority for Fiscal Responsibility (AIReF), prepare their own population projections.[2] A comparison of these projections reveals that the INE projections are very similar to those of the AIReF in the first ten years, but then drop below them, as the projection horizon progresses. The difference in population in 2050 is of almost six million inhabitants. Compared with Eurostat, although the INE's population projections are higher over most of the projection horizon, its estimates are somewhat more pessimistic at the end of the horizon, with around 1.5 million fewer inhabitants.

These differences are mainly due to the disparities between the initial underlying assumptions (specifically, those referring to migratory flows and fertility rates, since those relating to mortality rates are very similar) (see Charts 3 to 6). As regards migration, the INE envisages net positive migratory flows over the entire projection horizon, well above the assumptions made in 2016 and in keeping with the recently observed trend in these flows, and also above those projected in the short run by the AIReF, which would be clearly below the most recently published data.[3] In contrast, in the long run, while the INE projects that migration will gradually move towards a net inflow of around 200,000 persons per year, the net migratory flows envisaged by the AIReF[4] are much higher (more than 400,000 persons in 2050). A comparison of Eurostat and INE projections shows that the differences are concentrated in the first 15 years, subsequently converging towards very similar levels.

The INE projects that fertility rates will rise very modestly, from 1.3 children per woman in 2018 to close to 1.5 children which, albeit a slight improvement, is not an abrupt change with respect to the levels observed in Spain in recent years. Both Eurostat and the AIReF make a more optimistic fertility assumption, estimating the average number of children per woman at very close to 2, assuming convergence towards the European average.

Despite the differences in the total population estimates in the various projections analysed, they all envisage gradual and substantial population ageing, which will entail an ongoing increase in the dependency ratio, which is expected to at least double between 2018 and 2050 (see Chart 7). The dependency ratios estimated by the INE and the AIReF are similar for 2050, despite the different fertility and immigration assumptions used. This is explained by the fact that the AIReF assumes a substantially older age distribution of net migration inflows than that underlying the INE projection, which offsets the increase in the working-age population as a result of higher fertility. These differences and similarities indicate that, although long-term population projections are subject to a high degree of uncertainty (in 2050, the 95% confidence bands may widen to nearly 20 pp of the median value, according to

---

1   The methodology used in this projection exercise assumes a continuation of current demographic trends in fertility and mortality rates and migratory flows. However, some methodological changes have been introduced with a view to obtaining reference values, in the medium and long run, for the relevant demographic parameters (birth rate, mortality rate and migratory flows), on the basis of a survey of a group of experts in demography.

2   The latest Eurostat projections, from February 2017, serve as the basis for *"The 2018 Ageing Report"*, and those of the AIReF were published on 4 October 2018.

3   Corresponding to the first half of 2018, revealing a net positive balance of 121,564.

4   According to the AIReF, its immigration forecasts are based on a gravity model developed by J. Fernández-Huertas Moraga and G. López-Molina (2018), *Predicting Spanish Emigration and Immigration,* AIReF Working Papers, which estimates bilateral migration flows for all countries in the world in the very long run.

Box 4.1

POPULATION PROJECTIONS FOR SPAIN: COMPARISONS AND UNCERTAINTIES (cont'd)

Chart 1
TOTAL POPULATION
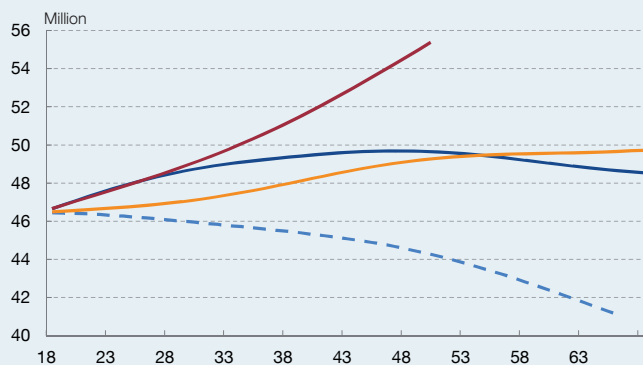
Chart 2
POPULATION AGED 16 TO 66
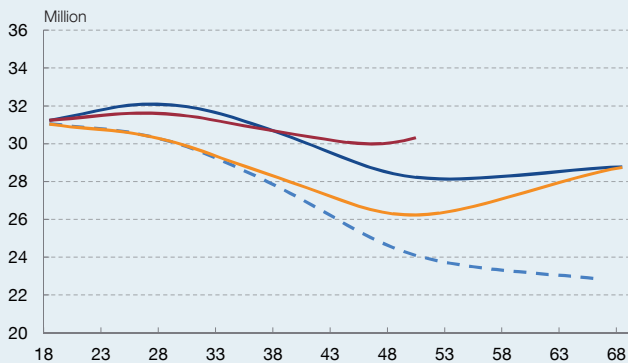
Chart 3
NET MIGRANT INFLOWS
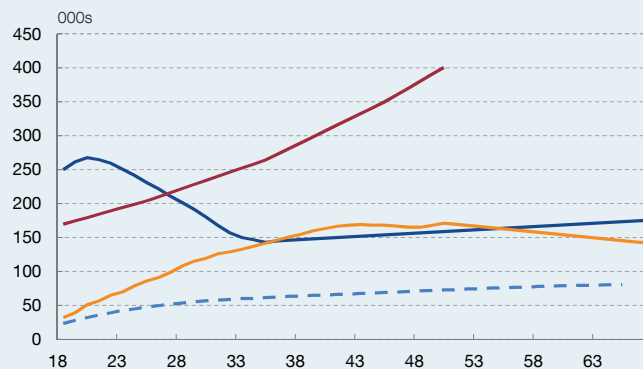
Chart 4
FERTILITY RATE
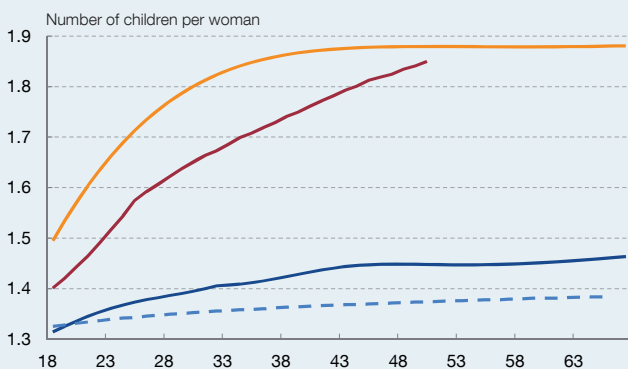
Chart 5
LIFE EXPECTANCY AT BIRTH (MEN)
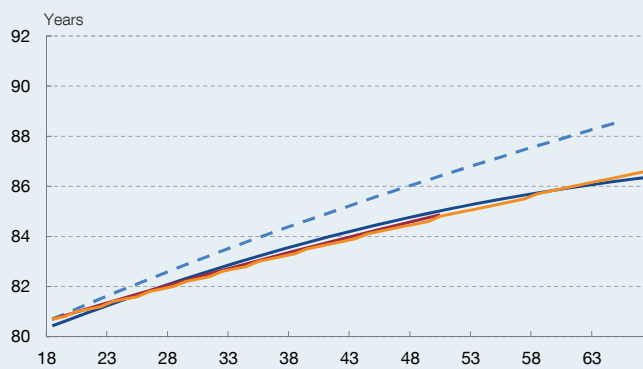
Chart 6
LIFE EXPECTANCY AT BIRTH (WOMEN)
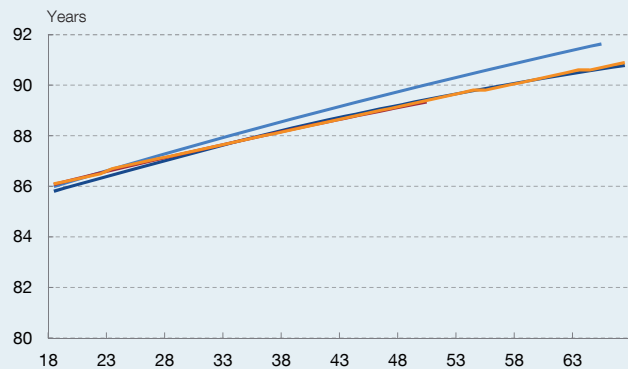
INE 2018 — — — INE 2016 — AIReF — EUROSTAT 2017

SOURCES: Eurostat, AIReF, INE and Banco de España.

Box 4.1

POPULATION PROJECTIONS FOR SPAIN: COMPARISONS AND UNCERTAINTIES (cont'd)

the World Population Prospects of the United Nations) (see Chart 8), the envisaged demographic trends based

on a broad range of assumptions all clearly point to substantial population ageing in the medium and long run.
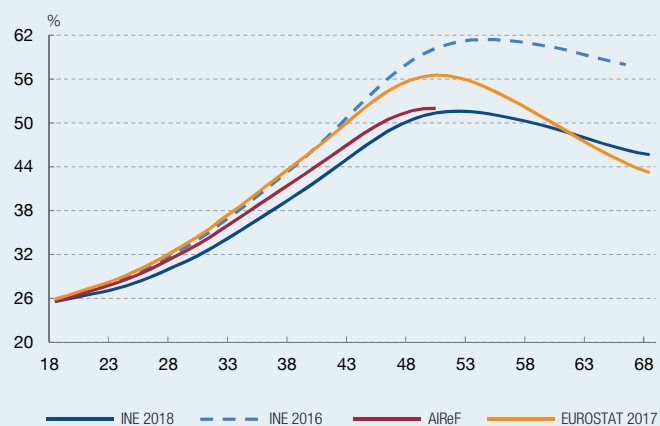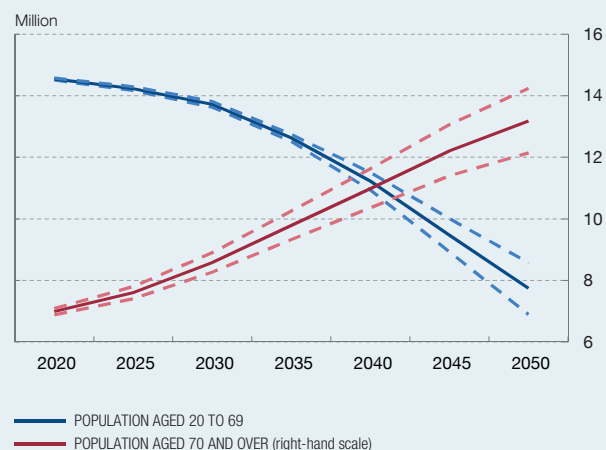
Chart 7
DEPENDENCY RATIO (a)

Chart 8
UNCERTAINTY ASSOCIATED WITH POPULATION PROJECTIONS (b)

INE 2018 — — — INE 2016 — AIReF — EUROSTAT 2017

POPULATION AGED 20 TO 69
POPULATION AGED 70 AND OVER (right-hand scale)

SOURCES: Eurostat, AIReF, INE, UN and Banco de España.

a Defined as the ratio of the population aged over 66 to the population aged 16 to 66. The 2011 pension system reform established a gradual increase in the statutory retirement age, from 65 to 67 in 2027, at the rate of one month per year between 2013 and 2018, and of two months per year from 2018 to 2027. Given that this box contains projections beyond 2027, the dependency ratio used is consistent with that change.
b The chart depicts the median population projection for each population group. The dotted lines represent the respective 95% confidence intervals.

Box 4.2
CHANGES IN THE PORTFOLIOS OF SPANISH HOUSEHOLDS OVER THEIR LIFE CYCLE

The life-cycle theory predicts that individuals expect their income to decrease after retirement, and so they accumulate financial assets during their working lives to be able to sustain their spending in old age. According to this theory, the volume of savings would increase during a person's working life, and then decrease after retirement and, therefore, changes in the demographic breakdown of the population would entail changes in aggregate savings.

When determining whether household wealth increases during a person's working life and decreases after retirement, it is important to bear in mind that savings decisions are taken by individuals of different ages in diverse financial environments. Accordingly, the financial asset holdings of a given generation at a specific age are not necessarily those that might be expected of younger people. By way of example, it has been documented in both the United States and the euro area that, compared with other generations, those that have lived through stock market crashes have a lower propensity to own shares during their lifetime.[1] Thus, households with members of different ages may have different levels of wealth for reasons that do not only relate to the life cycle.

This box analyses the real and financial assets held by Spanish households throughout their life cycle, and groups them according to the date of birth of the reference person.[2] To this end, it uses information from the first five waves of the Spanish Survey of Household Finances, covering the period 2002-2014.[3]

The results suggest that, as predicted by the life-cycle theory, ownership of a main residence rises by 40 pp between the ages of 25 and 45; by 45, 80% of households own their main residence (see Chart 1). This age profile indicates that households are not able to purchase their home until they have saved enough for the down payment, and that the possibility of saving increases as household income rises. However, the percentage of home owners does not drop after retirement, as discussed below.

By contrast, the holding of risk-bearing financial assets does show a profile of accumulation during a person's working life and subsequent dissaving.[4] At around the age of 30, one in five households has risk-bearing financial assets, and this percentage rises throughout their working lives, up to the ages of 45-50, when approximately one in every two households owns this type of asset (see Chart 4). However, in the over-65 age group, the proportion of households owning a risk-bearing financial asset drops to one in ten, owing to the fact that people redeem their pension schemes once they retire.[5]

The amount of saving amassed in the form of a main residence basically reflects the changes in house prices between 2002 and 2014. Thus, for all the generations analysed, the median market value of the main residence rose by between €50,000 and €100,000 in the period 2002-2008 and then fell on a similar scale from 2008 to 2014 (the figures are expressed in 2014 euro). In 2014, the median market value of the main residence was €120,000 for all age groups, similar in real terms to that observed in 2002 (see Chart 2). The fact that the median value of the main residence increased and then decreased across all age groups (and that the decrease was not particularly pronounced among retirees) suggests that older households do not "dissave" by selling their main residence to move to one that has a lower value.

1   See M. Ampudia and M. Ehrmann (2017), "Macroeconomic Experiences and Risk Taking of Euro Area Households", *European Economic Review,* 91(C), pp. 146-156, and U. Malmendier and S. Nagel (2009), "Depression Babies: Do Macroeconomic Experiences Affect Risk-Taking?", *Quarterly Journal of Economics,* 126(1), pp. 373-416.

2   The year of birth is shown in groups of three years.

3   These results are based on C. Barceló, O. Bover, N. Guner, G. Kocharkov and E. Villanueva (2019), *Housing over the Life Cycle: Expectations, Inheritance and Policy*, Banco de España Working Paper (forthcoming).

4   This box analyses two forms of ownership of risk-bearing financial assets. The first includes ownership of shares (listed or unlisted) and of investment funds in which shares have a predominant weight (see Chart 3). The second (see Chart 4) includes, apart from the aforementioned assets, pension funds, life insurance (unit-linked and mixed) and managed accounts, excluding deposits and fixed-income securities.

5   When examining the ownership of risk-bearing financial assets including only shares and investment funds in which shares have a predominant weight, the decline following retirement is substantially lower, between 10 pp and 20 pp (compare Charts 4 and 5).

Box 4.2

CHANGES IN THE PORTFOLIOS OF SPANISH HOUSEHOLDS OVER THEIR LIFE CYCLE (cont'd)

Chart 1
DISTRIBUTION OF HOUSEHOLDS THAT OWN THEIR MAIN RESIDENCE, BY AGE
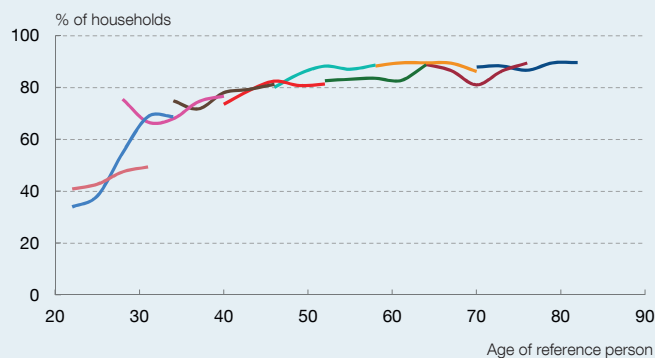OF HOUSEHOLD REFERENCE PERSON

Chart 2
MEDIAN REAL VALUE OF MAIN RESIDENCE OWNED BY HOUSEHOLDS, BY AGE
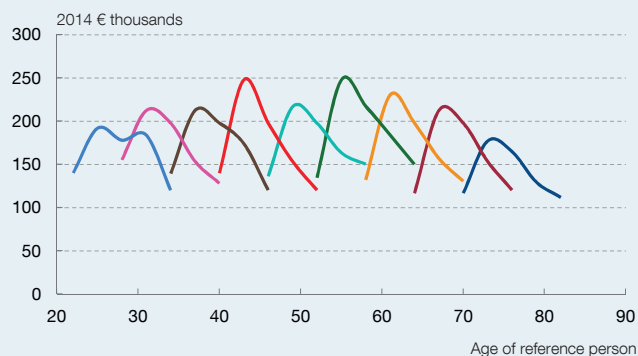OF HOUSEHOLD REFERENCE PERSON (a)

Chart 3
DISTRIBUTION OF HOUSEHOLDS HOLDING RISK-BEARING FINANCIAL
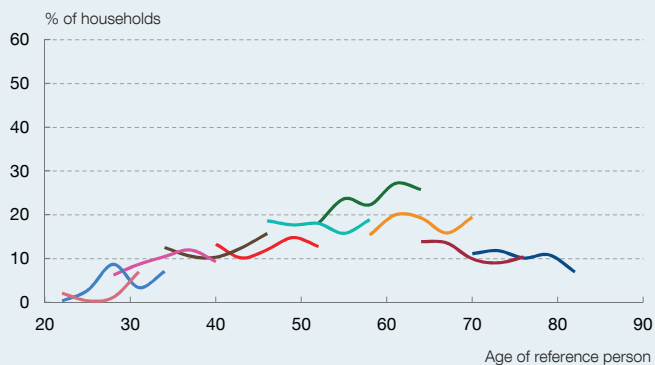ASSETS, BY AGE OF HOUSEHOLD REFERENCE PERSON (b)

Chart 4
DISTRIBUTION OF HOUSEHOLDS HOLDING FINANCIAL ASSETS, EXCLUDING
FIXED-INCOME AND DEPOSITS, BY AGE OF HOUSEHOLD REFERENCE PERSON (c)
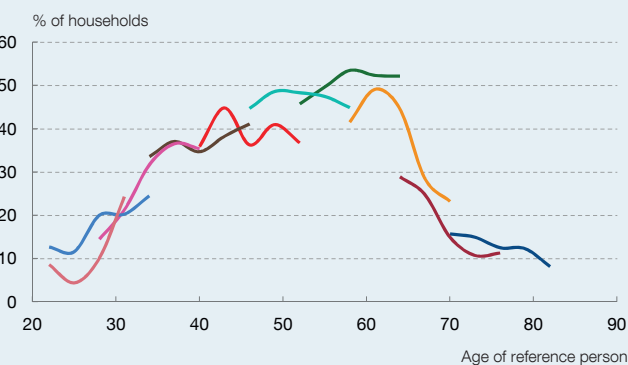

Chart 5
MEDIAN REAL VALUE OF WEALTH OF HOUSEHOLDS HOLDING FINANCIAL
ASSETS EXCLUDING FIXED-INCOME AND DEPOSITS, BY AGE OF HOUSEHOLD
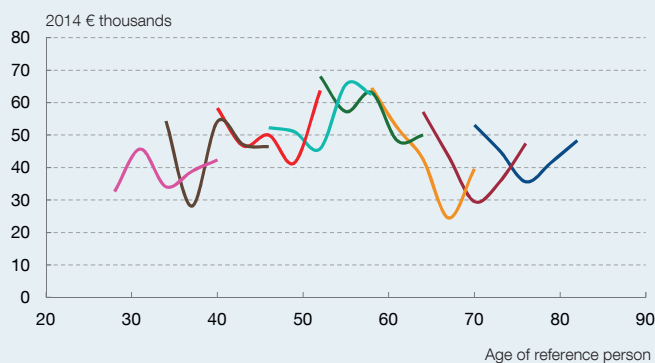REFERENCE PERSON (a)

Chart 6
MEDIAN REAL VALUE OF NET WEALTH OF HOUSEHOLDS HOLDING REAL
AND FINANCIAL ASSETS, BY AGE OF HOUSEHOLD REFERENCE PERSON (a)
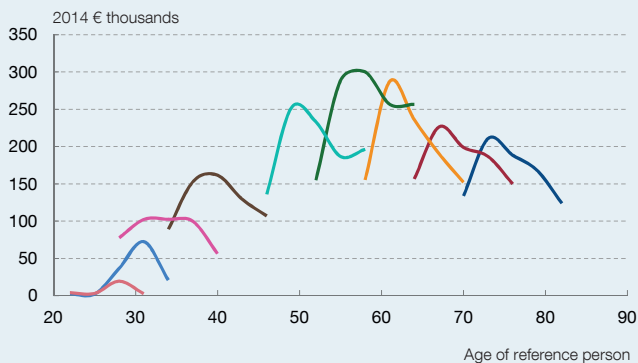
COHORTS BORN BETWEEN

1932-1934	1938-1940	1944-1946	1950-1952	1956-1958
1962-1964	1968-1970	1974-1976	1980-1982	1983-1985

SOURCE: Barceló *et al.* (2019).

a In real 2014 terms.
b Shares, listed or unlisted, and international or mixed capital equity investment funds.
c International or mixed equity capital securities investment funds, shares (listed or unlisted), pension funds, life insurance (unit-linked or mixed capital) or managed portfolios.

The median amount invested in risk-bearing financial assets among individuals who own this type of asset increases from €35,000 in the 35-45 age group (observed for generations born after 1970) to around €60,000 in the 50-60 age group (observed for generations born in the 1950s). As Chart 5 shows, the median amount invested in these assets drops to €30,000 after retirement. As explained earlier, this decline is due to the fact that households redeem their pension plans after retirement and place their investments in fixed-term deposits or bank accounts, or in other risk-free financial vehicles.

To analyse total household wealth, it is useful to look at the changes, over the life cycle, in median net wealth, defined as the sum of all household assets minus the amount of debts (see Chart 6). Median net wealth is below €100,000 between the ages of 20 and 35 (observed for generations born after 1970), but above €200,000 at around the age of 60 (for the generation born in the 1950s). After retirement, this figure is around €150,000 (observed for the generation born in the 1930s). It should be noted that in 2014, the net wealth of generations born in the 1950s was €250,000, far higher than the median value of their main residence, suggesting that this cohort owns financial and other real assets in addition to their main residence. However, among the generations born in the 1940s and earlier, the median net wealth in 2014 was similar to the median value of their main residence, indicating that they own practically no other types of assets.

The pattern of wealth accumulation during a person's working life and the shedding of wealth following retirement can be determined by comparing the median net wealth each generation had in 2014 and in 2002. The amount of wealth accumulated during their working life by those born in the 1950s is substantial, but lower for generations born after the 1970s. Median wealth therefore increases during a person's working life and decreases somewhat after retirement. Although both these features conform to the life-cycle theory, the high rate of ownership of the main residence and the absence of dissaving by down-sizing housing following retirement suggest that there are other factors affecting the savings patterns of Spanish households. As mentioned in section 3.1, possible factors include the wish to leave the main residence as inheritance, caution regarding selling the main residence in order to rent another, or the dearth of financial products, such as reverse mortgages, which would allow the accumulated housing wealth to be converted into liquid assets.

To what extent can the behaviour observed for generations born before 1960 be expected from generations born later? Comparisons of net wealth suggest that generations born after 1970 have a lower level of median net wealth than earlier cohorts had at the same age. For example, the generation born around 1974 had median net wealth of around €100,000 between the ages of 20 and 35, while the median wealth of generations born in 1980 or later is less than €75,000. These differences are partly due to the fact that the proportion of households owning their main residence and whose reference person was born after 1980 is 20 pp lower than that of preceding generations at the same age. Moreover, the median debt-to-wealth ratio among the under-35s rose from 51.7% in 2008 to 86.4% in 2014.[6] This increase suggests that the house price slump observed during those years might explain the decline in net wealth among those born in the 1980s that owned their main residence. The differences between ownership and amount of savings according to the year of birth advise caution when extrapolating the behaviour of one generation to subsequent generations.

---

6   See Banco de España (2017), "Survey of Household Finances (EFF) 2014: methods, results and changes since 2011", *Economic Bulletin,* 1/2017, and Banco de España (2014), "Survey of Household Finances (EFF) 2011: methods, results and changes since 2008", *Economic Bulletin,* January.

Box 4.3

THE EFFECTS OF DEMOGRAPHIC AND TECHNOLOGICAL CHANGES ON LONG-TERM GROWTH

The demographic changes which will accelerate population ageing are going to happen along with a new wave of technological progress arising from developments in robotics and artificial intelligence. Questions arise in this scenario about the relationship between demographics and technology and its consequences for long-term economic growth.

An assumption which should be considered is that, as a result of technological progress, productivity gains will offset the reduction in the working-age population so that per capita GDP growth will rise as the population ages. Acemoglu and Restrepo (2017)[1] find evidence of a positive association between per capita income growth and the ratio of the population over 50 to the population between 20 and 49 in a broad sample of countries (including less developed countries) during the last 25 years. However, Aksoy et al. (2019),[2] who analyse a panel of OECD countries, reach the opposite conclusion (see Chart 1). They attribute the negative impact of demographic change on economic growth to the fact that the effectiveness of technological innovation is affected as the young working-age population decreases.

To analyse the mechanisms possibly relating demographics, innovation and economic growth in the long term, Basso and Jimeno (2019)[3] use an overlapping generation model with two stages in the life cycle (working life and retirement). In this model the technological innovation sector has two components: the production of new products/tasks and the automation of these tasks through the introduction of robots which replace human labour in the production of certain goods and services, whose relative weight is determined on the basis of their individual rates of return on investment.

The model has three characteristics which make the analysis especially important: i) a demographic structure which determines the labour supply and saving rate of the economy and, therefore, the available resources for capital accumulation, the production of new ideas and the robotisation of production; ii) a production function where certain tasks are performed exclusively through the combination of capital and robots (without human labour); and iii) a relationship of subsidiarity between technological innovation (whose efficiency decreases as the population ages) and robotisation. Accordingly, in the long term the productivity gains from the robotisation of production can only continue insofar as new products are created, i.e. it is assumed that before a production task can be performed by robots, it has to be invented and performed by humans.

Chart 2 shows the results of feeding into the model the demographic projections of the United States and Europe (understood as the aggregation of Germany, Italy, France and Spain), relative to the projected paths of per capita GDP growth and other macroeconomic variables.[4] First, it is interesting to highlight that, since population ageing will occur more quickly in Europe than in the United States, the results of the simulations predict that robotisation will grow more rapidly in Europe. Consequently, the decreases of the weight of labour in production and of the share of wages in GDP are estimated to be higher in Europe than in the United States. In any event, in this simulation, in which the technological innovation sector does not experience any efficiency improvement and it is assumed that the economy converges on a path where the weights of the labour-intensive and robot-intensive production sectors remain constant, long-term economic growth would be affected in both areas due to the ageing effect. In short, the potential productivity gain from automation would not be sufficient, based on these simulations, to offset the lower economic growth associated with demographic decline.

1 D. Acemoglu and P. Restrepo (2017), "Secular Stagnation? The Effect of Aging on Economic Growth in the Age of Automation", *American Economic Review,* 107(5), pp. 174-179.

2 Y. Aksoy, H. S. Basso, R. P. Smith and T. Grasl (2019), "Demographic Structure and Macroeconomic Trends", *American Economic Journal: Macroeconomics,* Vol. 11, No 1, January, pp. 193-222.

3 H. Basso and J. F. Jimeno (2019), *From Secular Stagnation to Robocalypse? Implications of Demographic and Technological Changes,* Banco de España Working Paper, forthcoming.
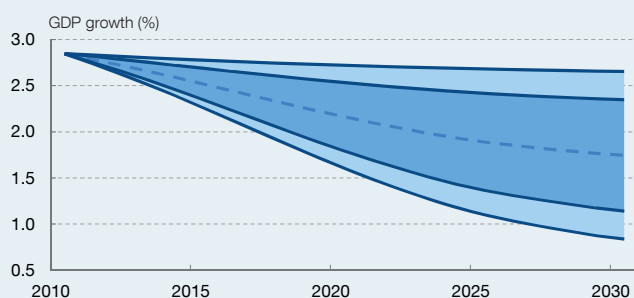
4 The demographic projections of the United Nations Population Division are used.

Box 4.3

THE EFFECTS OF DEMOGRAPHIC AND TECHNOLOGICAL CHANGES ON LONG-TERM GROWTH (cont'd)

Chart 1
EFFECTS OF DEMOGRAPHIC AND TECHNOLOGICAL CHANGES ON GDP GROWTH, CALCULATED WITH HISTORICAL DATA

1 UNITED STATES

GDP growth (%)

2 JAPAN

GDP growth (%)

3 ITALY

GDP growth (%)

4 FRANCE

GDP growth (%)

5 CANADA

GDP growth (%)

6 AUSTRALIA

GDP growth (%)

7 GREECE

GDP growth (%)

8 SPAIN

GDP growth (%)
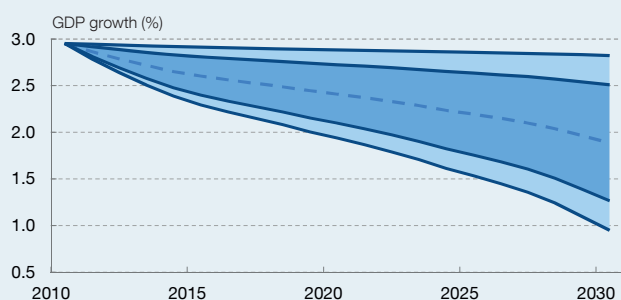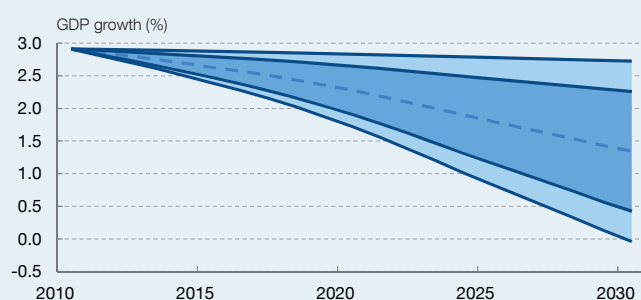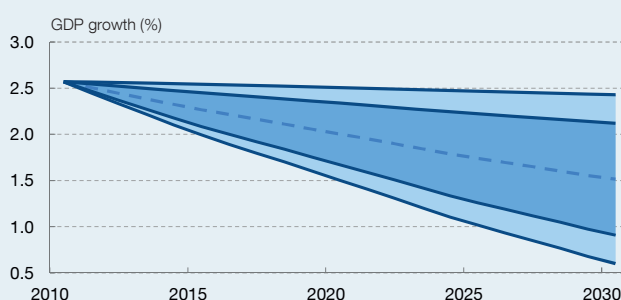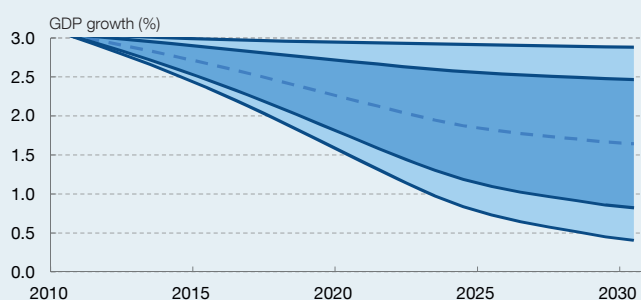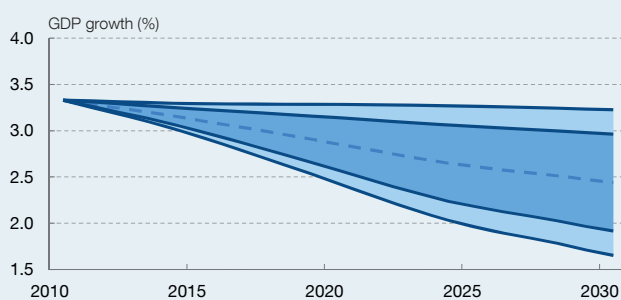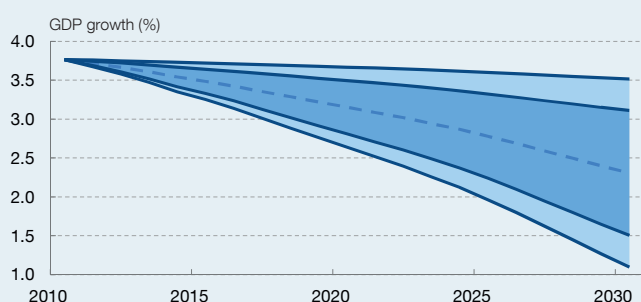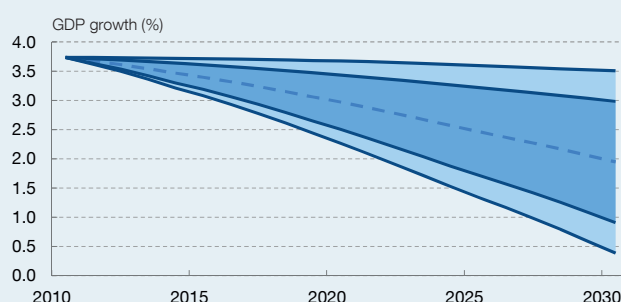
SOURCE: Aksoy, Basso, Smith and Grasl (2019).
NOTE: The two confidence bands in Charts 1.1 to 1.8 refer to the statistical significance of the estimates with a confidence level of 60% and 80%.

Box 4.3

THE EFFECTS OF DEMOGRAPHIC AND TECHNOLOGICAL CHANGES ON LONG-TERM GROWTH (cont'd)

Chart 2
SIMULATIONS OF SOME MACROECONOMIC VARIABLES BASED ON DEMOGRAPHIC PROJECTIONS

1 CHANGE IN GDP GROWTH PER CAPITA
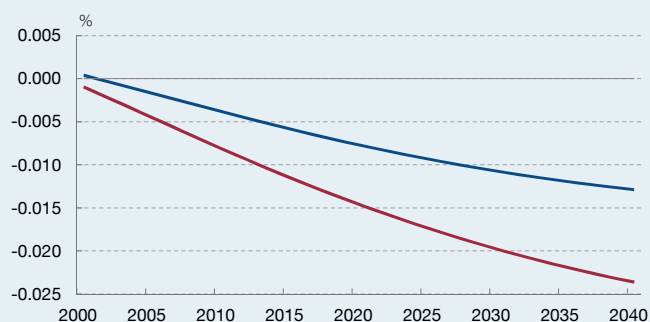
2 CHANGE IN RELATIVE WEIGHT OF ROBOTICS SECTOR
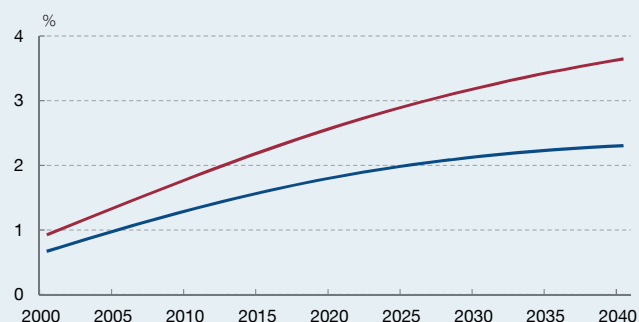
3 CHANGE IN EMPLOYMENT RATE (a)
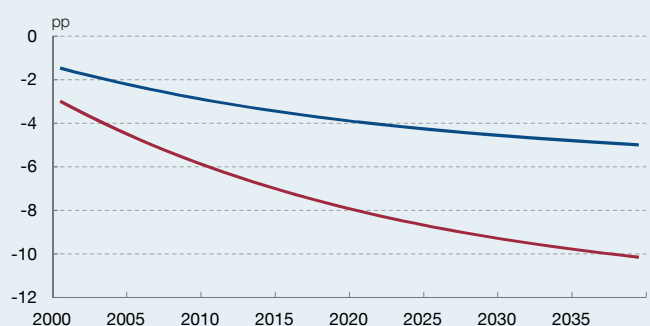
4 RELATIVE CHANGE IN WAGE SHARE OF GDP
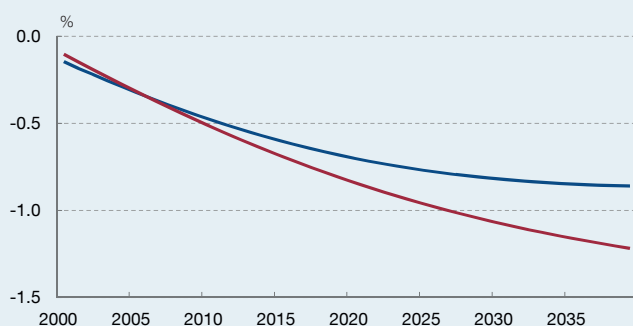
5 CHANGE IN REAL WAGE GROWTH
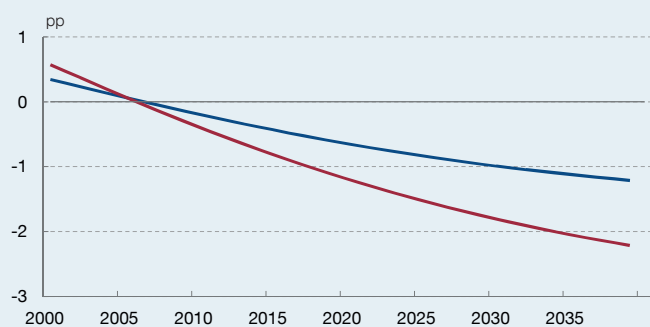
6 CHANGE IN RELATIVE WEIGHT OF CONSUMPTION IN GDP
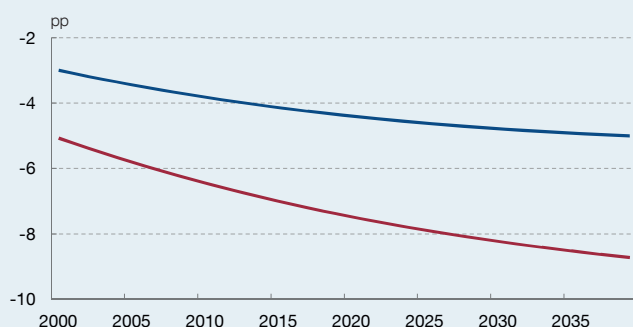
CORE EUROPE (b) ———   UNITED STATES ———

SOURCE: Basso and Jimeno (2019).

a Defined as the ratio of persons employed to the working-age population.
b Aggregation of Germany, Spain, France and Italy.

Box 4.4

THE EFFECTS OF DEMOGRAPHIC CHANGES ON THE FISCAL MULTIPLIERS OF PUBLIC CONSUMPTION AND INVESTMENT PROGRAMMES

Fiscal policy, whether it is implemented through discretionary decisions on expenditure and taxation or in the form of automatic stabilisers, can contribute to stabilising macroeconomic fluctuations. To do this, it should help to sustain economic activity during downturns and restrain public spending during booms. Its effectiveness in achieving these objectives depends above all on how fiscal measures affect household consumption expenditure and firms' investment decisions or, in other words, on the fiscal multiplier of the measure in question. In this respect, not all public spending and revenue programmes affect economic activity in the same way. In particular, public consumption and investment programmes boost the labour income of workers employed in the sectors benefiting from this consumption and investment. By contrast, programmes involving direct transfers to households entail a stimulus to household disposable income. The fiscal multiplier associated with each spending programme depends, therefore, on the marginal propensity to consume and labour supply elasticities of the workers benefitting from the stimulus measures.

Insofar as the marginal propensity to consume and labour supply elasticities vary according to age, as a result of a change in the population age composition, the pass-through of counter-cyclical fiscal measures to consumption and, finally, to the level of aggregate demand and economic activity (for example, the value of the fiscal multipliers) varies according to the weight of younger population cohorts with respect to older ones. This happens in particular in the case of public consumption and investment programmes which pass through the stimulus measures essentially via changes in the labour income of the workers affected by these programmes.

In a recent Banco de España Working Paper,[1] evidence is found for the United States which shows that the fiscal multipliers associated with higher public consumption and investment have lower multiplier effects in states with older populations. The possible channels behind these empirical findings are analysed using a neo-Keynesian life-cycle model comprising three stages (youth, maturity and retirement). The combined duration of the last two stages is approximately 60 years and individuals accumulate assets by taking optimum decisions on their labour supply and consumption. The model includes standard monetary policy decision-making (represented through a Taylor rule) and a government which finances its expenditure by collecting taxes, issuing debt and earmarking a portion of its resources to finance a pension system with a set benefit ratio.

By extending the same model to a scenario comprising two areas (Spain and the rest of the euro area), calibrated using data that provide the best possible approximation of its findings to actual observations, it is possible to anticipate the extent to which the demographic shift envisaged in coming decades changes the fiscal multiplier

Chart 1
CHANGES IN THE FISCAL MULTIPLIER ASSOCIATED WITH HIGHER PUBLIC SPENDING
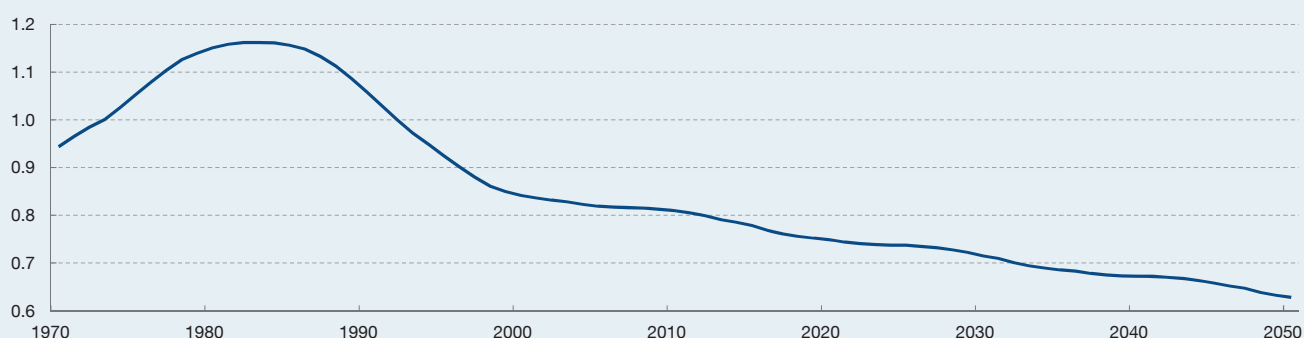
SOURCES: European Commission and Banco de España.

---

1   H. Basso and O. Rachedi (2018), *The young, the old, and the government: demographics and fiscal multipliers,* Banco de España Working Paper 1837.

associated with higher public consumption and investment in Spain.[2] Chart 1 shows the changes in this fiscal multiplier over time. As can be seen, following a period of relatively high fiscal multipliers which coincided with baby boomers reaching working age, the effectiveness of changes in public consumption and investment for stabilising the economy trended downwards. Thus, for example, the value of this fiscal multiplier is estimated to have decreased by 35% from 1985 to 2015 (from 1.2 to 0.78) and is expected to fall a further 21% (from 0.78 to 0.62) from now until 2050.

Nevertheless, the above findings refer to the effects of fiscal policies implemented through changes in public consumption and investment. Consequently, of particular importance for the value of the fiscal multiplier associated with those programmes is knowing in which sectors and occupations the higher demand for labour needed to implement them is concentrated. Another recent paper shows evidence of the demographic profile of workers who benefit after a fiscal stimulus in Spain based on public investment projects at municipal level.[3] The findings (see Chart 2) suggest that the fiscal policy effect on the reduction in unemployment is different according to the age of the groups impacted. Thus, for example, the response to this fiscal programme seen in the numbers unemployed in an average municipality during the first

three months would be 2.5 times larger for workers aged between 25 and 45 than for older workers. These differences reflect the greater labour elasticity of certain groups and the fact that the fiscal stimulus has a different effect on different economic sectors that have labour forces with different demographic compositions. And, the lower the marginal propensity to consume of the groups of workers affected by the stimulus measures, the lower the associated fiscal multiplier.

Furthermore, if the fiscal policy stimulus measures were implemented through direct transfers of income to households, the fiscal multipliers might be higher, based on the ages of the households receiving them and on how these transfers were financed. Thus, for example, income transfers from cohorts of intermediate age to younger and older cohorts, which have a greater marginal propensity to consume, would be a greater stimulus to economic activity than the fiscal multipliers shown in Chart 1. Nevertheless, aside from the intergenerational income transfers through the public pension system, which in future will be limited by the reduction in the size of the intermediate-age population, it is complicated to design other mechanisms for intergenerational transfers (based solely on age differences) which might be used for economic stabilisation purposes.

Chart 2
AVERAGE EFFECT OF A FISCAL STIMULUS ON UNEMPLOYMENT, BY AGE GROUP (a)
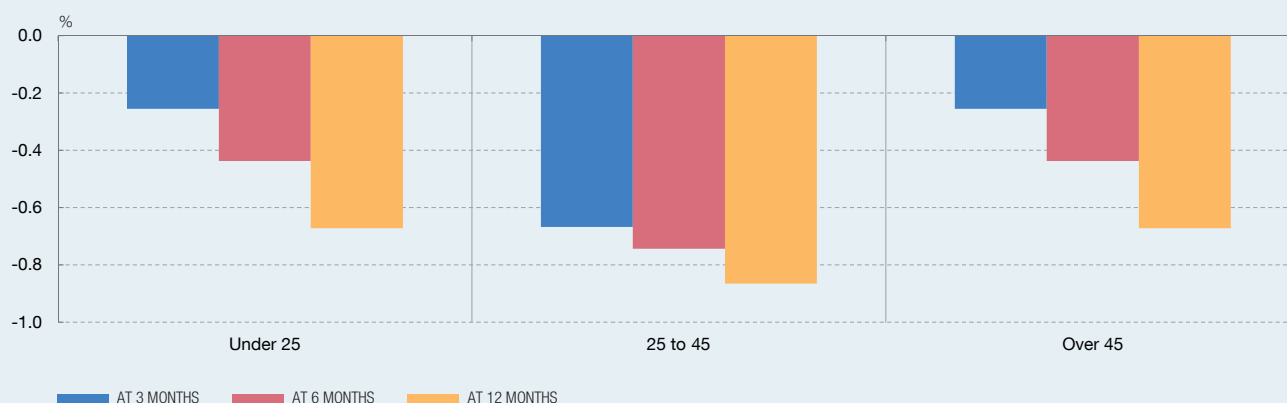
SOURCE: Banco de España.

a Effect in an average municipality after receiving a €1 million fiscal stimulus.

_____

2   Eurostat's population projections for the 19 euro area countries were used for this quantitative exercise.

3   See M. Alloza and C. Sanz (2019), *Jobs multipliers: evidence from a large fiscal stimulus in Spain,* Banco de España Working Paper 1912.

COMPOSITION OF THE GOVERNING BODIES
OF THE BANCO DE ESPAÑA

ORGANISATION CHART OF THE BANCO DE ESPAÑA

Governing Council

Audit Committee

Executive Commission

Governor
Pablo Hernández de Cos

Deputy Governor
Margarita Delgado

Internal Audit
Luis E. Pardo

Communication
Víctor Márquez

Governor's Office
Fernando Navarrete

Institutional Relations
and Protocol

Directorate General Economics, Statistics and Research *Óscar Arce*	Structural Anal. and Microec. Studies *Olympia Bover*
	Macro-financ. Anal. and Monetary Pol. *Carlos Thomas*
	Economic Developments *Javier Pérez García*
	Internat. Economics and Euro Area *Pilar L'Hotellerie-Fallois*
	Statistics *Juan Peñalosa*
	International and European Relations *Paloma Marín*
	Counsellor-EU Permanent Repres. *José Luís Malo de Molina*
Directorate General Cash and Branches *Concepción Jimenez*	Banknote Production Control *Manuela Sebastian*
	Cash and Issue *Helena Tejero*
	Branch Offices *Guillermo U. Pérez Cortés*
Directorate General Financial Stability, Regulation and Resolution *Jesús Saurina*	Financial Stability and Macrop. Pol. *Ángel Estrada*
	Financial Reporting and CCR *Eloísa Ortega*
	Regulation *Daniel Pérez Cid*
	Bank Resolution *Alberto Casillas*

Directorate General Operations, Markets and Payment Systems *Juan Ayuso*	**Associate Directorate General Financial Innovation and Market Infrastructures** *Carlos A. Conesa*	Operations *Emiliano González Mota*
		Financial Risks *Luis González Mosquera*
		Payment Systems *Carlos A. Sanz*
Directorate General Services *Alejandro Álvarez*	**Associate Directorate General Services** *Antonio Pérez Ocete*	Procurement and General Services *María Luisa de la Cruz*
		Information Systems *Jaime Razquin*
		Control, Budget and Accounting *Javier Pacios*
		Human Resources and Organisation *Monica Beltrán de Heredia*
Directorate General Banking Supervision *Mercedes Olano*	**Associate Directorate General Banking Supervision I** *Francisco Monzón*	Supervision I *José Antonio Gracia*
		Supervision II *Antonio Morillo*
		Supervision III *Javier del Río*
	Associate Directorate General Banking Supervision II *Alberto Ríos*	Supervision IV *Agustín Pérez Gasco*
		Supervision V *Bárbara Olivares*
General Secretariat *Javier Priego*	**Associate Directorate Deputy General Secretariat** *Jaime Herrero*	Market Conduct and Claims *Fernando Tejada*
		Legal *Lucía Arranz*

GOVERNING COUNCIL

GOVERNOR	Pablo Hernández de Cos
DEPUTY GOVERNOR	Margarita Delgado
COUNCIL MEMBERS	Carmen Alonso
	Paz Andrés
	Rafael Castejón
	Fernando Eguidazu
	Núria Mas
	Soledad Núñez
SECRETARY-GENERAL OF THE TREASURY AND INTERNATIONAL FINANCE	Carlos San Basilio
VICE CHAIRPERSON OF THE NATIONAL SECURITIES MARKET COMMISSION	Ana María Martínez-Pina
DIRECTORS-GENERAL *(With right to speak but not vote)*	Alejandro Álvarez
	Óscar Arce
	Juan Ayuso
	Concepción Jiménez
	Mercedes Olano
	Jesús Saurina
SECRETARY *(With right to speak but not vote)*	Francisco Javier Priego
REPRESENTATIVE OF THE PERSONNEL *(With right to speak but not vote)*	Mariano Serrano

EXECUTIVE COMMISSION

GOVERNOR	Pablo Hernández de Cos
DEPUTY GOVERNOR	Margarita Delgado
COUNCIL MEMBERS	Fernando Eguidazu
	Soledad Núñez
DIRECTORS-GENERAL *(With right to speak but not vote)*	Alejandro Álvarez
	Óscar Arce
	Juan Ayuso
	Concepción Jiménez
	Mercedes Olano
	Jesús Saurina
SECRETARY *(With right to speak but not vote)*	Francisco Javier Priego

INDEX OF PHOTOGRAPHS

BANCO DE ESPAÑA PUBLICATIONS

The Banco de España publishes various types of documents providing information on its activity (economic reports, statistics, research papers, etc.). The full list of Banco de España publications can be found on its website at http://www.bde.es/f/webbde/Secciones/Publicaciones/Relacionados/Fic/Catalogopublicaciones.pdf.

Most of these documents are available in pdf format and can be downloaded free of charge from the Banco de España website at http://www.bde.es/webbde/en/secciones/informes/. Requests for others should be addressed to publicaciones@bde.es.

Data cut-off date: 26 April 2019.

ACRONYMS AND ABBREVIATIONS

AIReF	Independent Authority for Fiscal Responsibility	GDP	Gross domestic product
AMCESFI	Macroprudential Authority Financial Stability Board	GFCF	Gross fixed capital formation
APP	Asset Purchase Programme	GNP	Gross national product
BCBS	Basel Committee on Banking Supervision	GOP	Gross operating profit
BE	Banco de España	GVA	Gross value added
BIS	Bank for International Settlements	HICP	Harmonised Index of Consumer Prices
BLS	Bank Lending Survey	IASB	International Accounting Standards Board
BOE	Official State Gazette	ICO	Official Credit Institute
CBA	Central Balance Sheet Data Office Annual Survey	IFRSs	International Financial Reporting Standards
CBQ	Central Balance Sheet Data Office Quarterly Survey	IGAE	National Audit Office
CBSO	Central Balance Sheet Data Office	IIP	International Investment Position
CCR	Central Credit Register	IMF	International Monetary Fund
CDSs	Credit default swaps	INE	National Statistics Institute
CESR	Committee of European Securities Regulators	LTROs	Longer-term refinancing operations
CNE	Spanish National Accounts	MFIs	Monetary financial institutions
CNMV	National Securities Market Commission	MREL	Minimum requirement for own funds and eligible liabilities
CPI	Consumer Price Index	MROs	Main refinancing operations
CSPP	Corporate sector purchase programme	MTBDE	Banco de España quarterly macroeconomic model
DGF	Deposit Guarantee Fund	NAFTA	North American Free Trade Agreement
EBA	European Banking Authority	NAIRU	Non-accelerating-inflation rate of unemployment
ECB	European Central Bank	NCBs	National central banks
ECOFIN	Council of the European Communities (Economic and Financial Affairs)	NFCs	Non-financial corporations
		NiGEM	National Institute Global Econometric Model
EDP	Excessive Deficit Procedure	NPISHs	Non-profit institutions serving households
EFF	Spanish Survey of Household Finances	OECD	Organisation for Economic Co-operation and Development
EFSF	European Financial Stability Facility	ONP	Ordinary net profit
EMU	Economic and Monetary Union	OPEC	Organisation of Petroleum Exporting Countries
EONIA	Euro overnight index average	PER	Price/earnings ratio
EPA	Official Spanish Labour Force Survey	PMI	Purchasing Managers' Index
ESA 2010	European System of National and Regional Accounts	PPP	Purchasing power parity
ESCB	European System of Central Banks	QNA	Quarterly National Accounts
ESFS	European System of Financial Supervisors	SAFE	ECB Survey on the Access to Finance of Enterprises
ESM	European Stability Mechanism	SDRs	Special Drawing Rights
ESRB	European Systemic Risk Board	SEPA	Single Euro Payments Area
EU	European Union	SGP	Stability and Growth Pact
EURIBOR	Euro interbank offered rate	SMEs	Small and medium-sized enterprises
EUROSTAT	Statistical Office of the European Communities	SRM	Single Resolution Mechanism
FASE	Financial Accounts of the Spanish Economy	SSM	Single Supervisory Mechanism
FDI	Foreign direct investment	TFP	Total factor productivity
FROB	Fund for the Orderly Restructuring of the Banking Sector	TLTROs	Targeted longer-tem refinancing operations
FSB	Financial Stability Board	ULCs	Unit labour costs
FSF	Financial Stability Forum	VAT	Value Added Tax
GDI	Gross disposable income	WTO	World Trade Organization

COUNTRIES AND CURRENCIES

In accordance with the protocol order, the EU Member States are listed using the alphabetical order of the country names in the national languages.

BE	Belgium	EUR (euro)
BG	Bulgaria	BGN (Bulgarian lev)
CZ	Czech Republic	CZK (Czech koruna)
DK	Denmark	DKK (Danish krone)
DE	Germany	EUR (euro)
EE	Estonia	EUR (euro)
IE	Ireland	EUR (euro)
GR	Greece	EUR (euro)
ES	Spain	EUR (euro)
FR	France	EUR (euro)
IT	Italy	EUR (euro)
HR	Croatia	HRK (Croatian kuna)
CY	Cyprus	EUR (euro)
LV	Latvia	EUR (euro)
LT	Lithuania	EUR (euro)
LU	Luxembourg	EUR (euro)
HU	Hungary	HUF (Hungarian forint)
MT	Malta	EUR (euro)
NL	Netherlands	EUR (euro)
AT	Austria	EUR (euro)
PL	Poland	PLN (Polish zloty)
PT	Portugal	EUR (euro)
RO	Romania	RON (New Romanian leu)
SI	Slovenia	EUR (euro)
SK	Slovakia	EUR (euro)
FI	Finland	EUR (euro)
SE	Sweden	SEK (Swedish krona)
UK	United Kingdom	GBP (Pound sterling)
JP	Japan	JPY (Japanese yen)
US	United States	USD (US dollar)

CONVENTIONS USED

M1	Notes and coins held by the public + sight deposits.
M2	M1 + deposits redeemable at notice of up to three months + deposits with an agreed maturity of up to two years.
M3	M2 + repos + shares in money market funds and money market instruments + debt securities issued with an agreed maturity of up to two years.
Q1, Q4	Calendar quarters.
H1, H2	Calendar half-years.
bn	Billions (10^9).
m	Millions.
bp	Basis points.
pp	Percentage points.
...	Not available.
—	Nil, non-existence of the event considered or insignificance of changes when expressed as rates of growth.
0.0	Less than half the final digit shown in the series.