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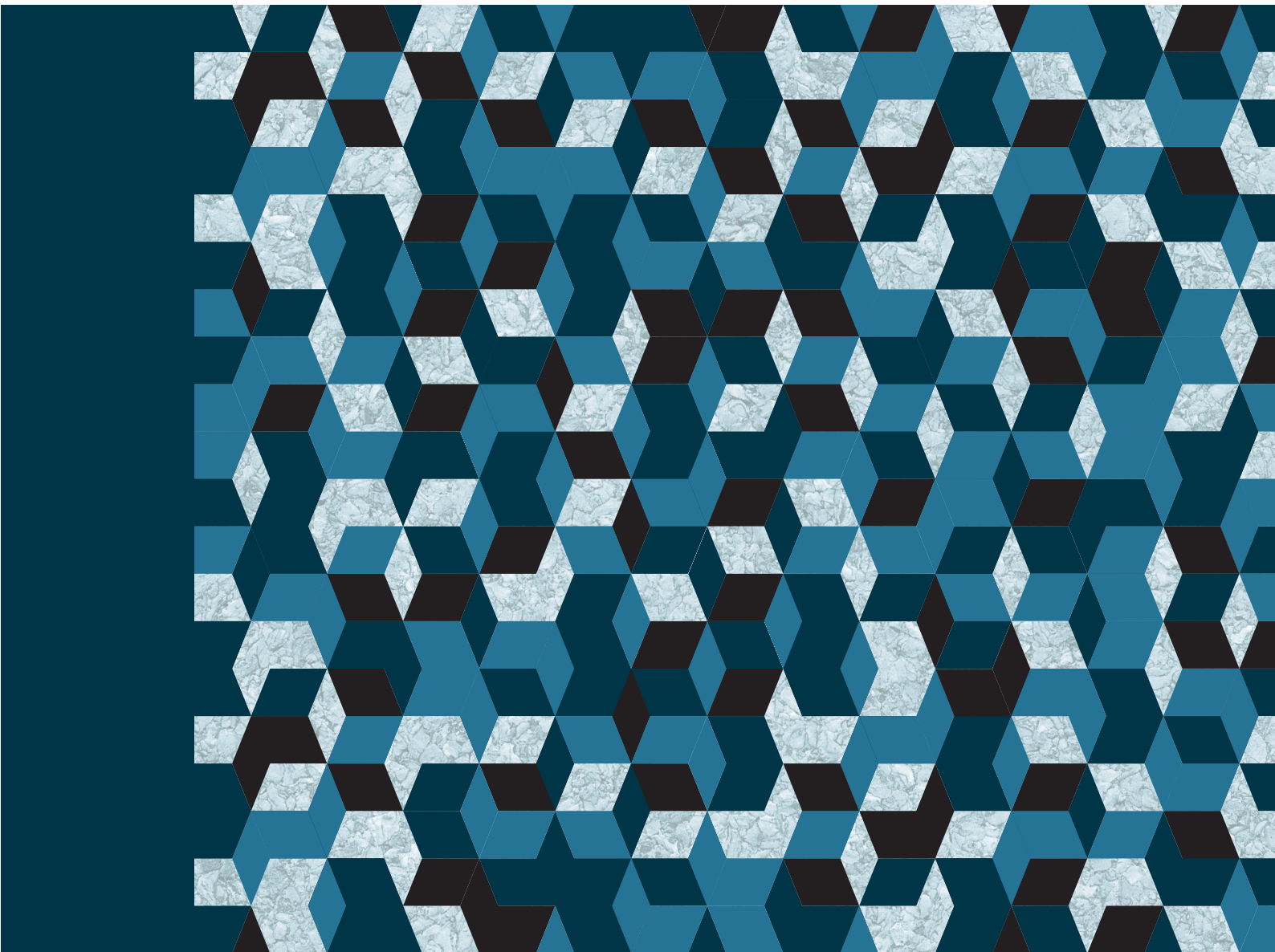
Economic Bulletin

May 2017



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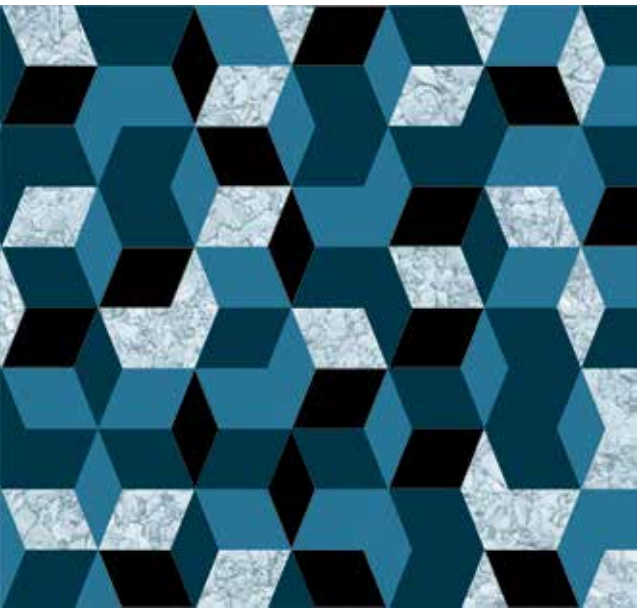


I
The Portuguese economy in 2016

1. Overview

In 2016 output growth in the Portuguese economy stood at 1.4 per cent, which compares with 1.6 per cent in the previous year. Albeit moderate, these GDP developments had a marked intra-annual profile, accelerating strongly in the second half of the year, signalling that the recovery process of the economy is expected to continue. In 2016 Portuguese output growth stood 0.3 percentage points below that observed in the euro area, and its level is still 4 per cent below that registered in 2008, the year that marked the outbreak of the latest international economic and financial crisis.

In terms of the fundamental macroeconomic balances, there was a slight increase in the current and capital account surplus (0.5 p.p.) and a significant decline in the total general government deficit (2.3 p.p.), against a background of stabilisation of the structural balance and decline in the structural primary balance (0.3 p.p.). The improvement in these balances is a prerequisite to ensure macroeconomic stability and the credibility of the Portuguese economy among international investors, and should therefore be a guideline for economic policy decisions adopted at the national level. In effect, the high indebtedness levels prevailing in the different institutional sectors make the Portuguese economy particularly vulnerable to any developments implying an increase in the interest rates applied to external financing.

The deleveraging process of the Portuguese economy continued in 2016, reflecting a decline in households' and corporations' indebtedness ratios, which nonetheless continued to be very high. Public debt ratio, in turn, virtually stabilised in net terms, in parallel with a reduction of external indebtedness in the total economy. In this context, there was an improvement in the international investment position of 7 percentage points (p.p.) of GDP, which nonetheless stands at a negative level of 105 per cent of the product.

In the case of non-financial corporations, the contribution to the decline in debt due to the exit of firms has been important, especially for small firms and for those with activity in the construction sector (Box 3.2.1. 'Market dynamics and the deleveraging of Portuguese firms'). Although the exit of firms is part of a natural process of restructuring and reallocation of productive factors in the economy, the potential non-recovery of debts raises difficulties to credit institutions, especially in terms of profitability and impact on own funds.

The continued reduction of the indebtedness levels of the Portuguese economy requires the creation of favourable conditions to economic growth, against a background of social cohesion and sustained improvement of citizens' living conditions. Investment is one of the key variables for Portuguese economic growth. In 2016 this variable declined in volume by 0.8 per cent, after an increase of 4.7 per cent in 2015, although with an intra-annual recovery profile and an acceleration in the business component. However, investment developments, are insufficient, not only because the fall during the crisis period was very sharp, but also because capital per employee in the Portuguese economy is still at low levels, when compared with the euro area average (Box 5.1 'Capital per worker and productivity'). The low capital levels contribute to the under-performance of labour productivity in the Portuguese economy, which declined again in 2016.

The resident population and the labour force continued to decline in 2016. These declines maintain the trend observed since 2011, although slightly less marked than in previous years. In 2016 resident population in the 25-34 age group declined by 2.5 per cent, while the labour force declined by 2.7 per cent. The sharp demographic trends in the Portuguese economy are not easily revertible and are aggravated by migration phenomena. Although the ageing of the population is evident in several European countries, this situation is an important constraint to Portuguese economic growth and puts greater pressure on

the dynamics of public expenditure with pensions and health.

In 2016 labour market developments were characterised by an increase in employment, exceeding that of Gross Value Added and maintaining the recovery profile observed since the second quarter of 2013. Moreover, although remaining at very high levels, the unemployment rate declined by 1.3 p. p., in a context of stronger wage dynamics than in past years. This may have contributed to the slight increase in the inflation rate in the course of 2016, via an increase in unit labour costs. The inflation rate in Portugal, measured by the change in the Harmonised Index of Consumer Prices, stood at 0.6 per cent in 2016, with zero price growth in goods and 1.5 per cent price growth in services.

The fall in investment contributed to less robust growth of domestic demand than that observed in 2015. Also, private consumption increased slightly less than in the previous year, as a result of less buoyant consumption of non-food current goods and durable goods. In turn, public consumption, determined by the dynamics of compensation of employees and consumption of goods and services in the general government, increased slightly less in 2016 than in 2015.

Developments in investment and consumption took place in a context of gradual improvement of the financing conditions of private economic agents, in line with the maintenance of an expansionary stance of the monetary policy in the euro area. This improvement, visible in the course of 2016, was reflected in a decline of the interest rate spread between Portugal and the euro area, for both corporations and households. New loans to households reinforced the growth trend observed in early 2016, especially in consumption. Notwithstanding the increase in new credit, the households' deleveraging process continued.

The annual rate of change of total credit to corporations was also positive at the end of the second half of 2016. Relevant, however, was the important contribution of credit from non-resident entities, almost exclusively focusing on the issue of debt securities. Therefore, it was possible to offset the new decline of the stock of bank loans granted by resident banks, which indicates an alternative means to finance investment projects.

The less buoyant economic activity in 2016 also reflected the deceleration in exports of goods and services, against a background of lower growth of the external demand directed towards the Portuguese economy. The deceleration in exports of goods and services in 2016 reflected a lower growth of exports of non-tourism services and chiefly the fall in exports of energy. Excluding this category, growth of exports of goods was 1.8 percentage points higher than in 2015. In turn, the buoyancy of exports of tourism services continued to be high, in tandem with the significant increase in nights spent by non-residents in Portuguese hotels.

The performance of Portuguese exports in 2016 translated into a new gain in market share, which underlines the competitive capacity of Portuguese firms in international markets. The stance of the Portuguese economy, gradually turning towards the production of goods and services tradable abroad is a very positive feature of the adjustment in the productive structure, which was started before the latest international economic and financial crisis. Only by strengthening its export capacity may the Portuguese economy accommodate growth of imports resulting from a desirable strengthening of the investment rate and an increase in consumption levels. The re-emergence of current account deficits, even if financed via foreign investment, may be perceived as a return to imbalances, which will tend to adversely affect refinancing conditions of existing debt. The relevance of exports performance for developments in the Portuguese economy and the prevailing high indebtedness levels highlight the importance of developments in the international economy.

In 2016 world economic activity decelerated, reaching the lowest growth since the latest

international economic and financial crisis. In turn, growth in the euro area was slightly lower than in 2015, with an increase in output more based on domestic demand than in the past. In 2016 financial market developments were conditioned by the UK referendum in June and the US presidential election in November, with volatility peaks and an increase in uncertainty following both events. Stock market indices, however, registered gains, chiefly in the second half of the year and in the banking sector, partly reflecting the strong liquidity creation via non-standard monetary policies.

In a context of low economic growth, the existence of high volatility and strong valuations in financial markets may lead to disturbances in the international economy, which will tend to be amplified in most indebted economies. In addition, the rise in inflation in the euro area from mid-year onwards, triggered by energy prices, as well as the increase in the federal funds rate target contribute to maintain concerns regarding the development of the interest rate at which the Portuguese economy is financed.

The Portuguese economy has shown a remarkable macroeconomic adjustment capacity and a sectoral restructuring based on the internationalisation of Portuguese firms. Continuing economic growth and increasing citizens' well-being require the strengthening of firms' productive investment and the availability of skilled human resources, in a context of financial stability and legal and fiscal certainty. In this context, the obstacles created by the low savings rates in the Portuguese economy and the unfavourable demographic developments, as well as cyclical difficulties associated with the high indebtedness levels and the elevated uncertainty in the international framework, require a consistent and forward-looking approach to economic policies.

The discussion on the deepening of European integration, which has always been a catalyst for reforms in the Portuguese economy, allowing for gains through intensified capital flows and trade in goods and services, shall be complementary to internal debate on strengthening growth conditions. The future of the Portuguese economy depends heavily on its external partners, either as destination of exports and source of productive investment, or within the scope of the ongoing financial integration process. This stresses the need to increase national agents' standards regarding the improvement of the country's competitiveness. Only in this vein shall it be possible to resume convergence towards European Union's average levels of well-being.

Box 1 | Assessment of projections for 2016

This box analyses the gap between Banco de Portugal's projection for GDP in 2016 and the actual figures, trying to identify the main factors explaining that gap. The analysis is based on the projection published in March 2016, which contains for the first time comprehensive information for 2015.[1]

The above-mentioned projections for the Portuguese economy are based on Banco de Portugal's quarterly econometric model ('M' Model). In addition to this main model, other satellite models are considered, such as the MIMO model for inflation projection, and bridge models of short-term activity developments.[2] Forecasts depend on a range of assumptions regarding the external environment and a set of rules for the incorporation of fiscal variables. In the first case, as usually mentioned in the projection articles of the *Economic Bulletin*, assumptions correspond to those of the Eurosystem's projection exercises. Fiscal variables follow the rule used within the scope of these exercises, i.e., incorporating the policy measures that have already been approved (or that are highly likely to be approved) and that have been specified in detail. As mentioned in the note published in March 2016, the projection incorporates most measures included in the State Budget for 2016, which are sufficiently detailed.

Projection errors are the result not only of the fact that assumptions incorporated in the forecast exercise have not materialised, but also of factors related to the model and judgement elements incorporated in the projection.

Comparing the annual growth rate of real GDP in 2016 published in the Quarterly National Accounts by Institutional Sector of 24 March with the projection published by Banco de Portugal in early 2016, it may be concluded that the projection error was -0.1 p.p., i.e., Banco de Portugal projected GDP growth at 1.5 per cent, while actual GDP growth was 1.4 per cent.

Based on elasticities implied in the 'M' model, it is possible to analyse the contributions to projection errors made by changes in assumptions, in particular financial conditions, foreign exchange rates, and the international scenario (external demand, oil prices and external prices). In this context, Table 1 presents the revisions of the external environment assumptions – defined as the difference between the actual value and the value underlying the March exercise – and their impact on the annual GDP growth rate in 2016.

Table 1 • Revisions on the external environment and its impact on the real annual growth rate of GDP in 2016 | Revision on the annual growth rate in p.p., except interest rate, compared to the projection of March 2016

	Revisions on the external environment	Impact on GDP
Interest rate	0.0	0.0
Euro effective exchange rate	-0.3	0.0
Competitors' prices in national currency	-1.0	0.0
Oil prices in euros	18.2	-0.1
External demand	-1.9	-0.4
Impact of revisions on the external environment		-0.5

Source: Banco de Portugal.

Note: A '-' sign in the effective euro exchange rate corresponds to a higher depreciation or a lower euro appreciation than expected in March.

Expectations in early 2016 pointed to a more favourable international scenario than that subsequently observed. In particular, external demand for Portuguese goods and services was anticipated to have an annual average growth of 3.9 per cent, i.e., 1.9 p.p. above that actually registered in 2016. This significant downward revision of external demand was due to both intra-euro area countries and third countries (Section 2: 'International environment') and implied a downward revision of the GDP growth rate projected at 0.4 p.p. for 2016. In addition, the technical assumption for developments in the effective exchange rate of the euro, which assumes the maintenance, over the projection horizon, of the average levels observed in the two weeks prior to the cut-off date, was revised slightly downwards, implying an appreciation of the euro slightly below that expected in March 2016. This was reflected in a slight improvement in the price competitiveness of the Portuguese economy against the main competitors located outside the euro area. There was also a slight decline in competitors' prices in external markets, with a negative impact on the price competitiveness of Portuguese exports. The impact on the GDP projection of the revision of exchange rates and external prices is negligible.

The deterioration of the international scenario in the course of 2016 was offset by a more favourable than anticipated behaviour of the export market share in 2016. The very significant gains of the Portuguese export market share were registered in both goods and services, particularly in the second half of the year (Section 6: 'Demand'). Therefore, contrary to any conclusion that might be withdrawn from the broadly downward revision of the international environment assumptions, exports of goods and services were higher than projected in the March exercise.

As regards monetary and financial conditions, the technical assumption for the 3-month Euribor rate remained virtually unchanged from March projection (Section 3.1: 'Monetary and financial conditions in the euro area'). The increase in oil prices in the course of 2016 was higher than that expected and implied an upward revision from the assumption considered in the March exercise, with a negative impact of approximately 0.1 p.p. on the GDP growth rate. Therefore, taking into account the multipliers implied in the 'M' model, revisions of the external environment led to a significant downward revision of GDP by around 0.5 p.p.

Table 2 presents the projection errors in GDP and its components, as well as the respective gross and net contributions of the imported content. Analysing the components net of imports, it may be concluded that the projection error of -0.1 p.p. in GDP was due to the overestimation of the public finance variables, in particular to the lower growth of public consumption and to the stronger fall of public investment (Box 4.2: 'Analysis of deviations of budget execution in 2016'). These effects were partly offset by the underestimation of exports, largely reflecting the already mentioned unanticipated gains in market share. In spite of an underestimation of private consumption of 0.3 p.p. in gross terms, the contribution of this component net of the imported content for the GDP error was virtually zero, given that the projection error of this variable largely reflected car purchases.

Moreover, the annual average growth rate of GDP and its components in 2016 implied a sharp intra-annual profile from the first to the second half of the year. The first half of the year was characterised by low growth, with quarter-on-quarter rates of change of 0.2 per cent, whereas in the second half there was an acceleration in economic activity, with quarter on quarter rates of change of 0.9 and 0.7 per cent in the third and fourth quarters respectively.

The projection published in March 2016 did not anticipate these intra-annual GDP dynamics, and projected a smoother profile, with a slight acceleration in the second half of the year. In this

context, there was an overestimation of GDP and its main components in the first half of the year and an underestimation in the following half year.

Table 2 • Projection error in real GDP growth rate and in major components in 2016
| Observed– projected in March 2016

	Weights 2015 in % GDP	Projection error	Gross contributions to GDP growth	Net contributions to GDP growth
GDP	100.0	-0.1	-0.1	-0.1
Private consumption	65.6	0.5	0.3	0.0
Public consumption	18.2	-0.6	-0.1	-0.1
Investment	15.5	-1.0	-0.2	-0.2
Exports	40.6	2.2	0.9	0.3
Imports	39.8	2.3	-0.9	

Source: Banco de Portugal.

Note: The demand aggregates net of imports are obtained by subtracting an estimate of the imports needed to meet each component. The calculation of import contents was based on data for 2005. For more information, see the Box entitled 'The role of domestic demand and exports in economic activity developments in Portugal', in the June 2014 issue of the *Economic Bulletin*.

2. International environment

World economic activity and trade decelerated further in 2016, dropping to the lowest level since the last international economic and financial crisis

In 2016 world economy decelerated, recording the lowest growth since the last international economic and financial crisis (Table 2.1 and Chart 2.1). This slow recovery from the crisis has been different across regions. In 2016 as a whole, contrary to the previous year, advanced economies slowed down and emerging market and developing economies decelerated slightly.

After recovering from its major collapse, world trade growth has been weakening since 2012. Taking the pre-crisis period as reference (2002-07), international trade recorded an average growth much higher than global activity (around 8 and 5 per cent respectively), while world trade and GDP grew by around 3 per cent, on average, from 2012 to 2016, i.e. a decline in world trade elasticity of around 0.7 p.p. (Chart 2.2). This decrease in world trade elasticity is expected to be associated, inter alia, to slower developments in global value chains and a geographical change in trade benefiting emerging market economies, which have shown a slower response of trade to changes in output.

In 2016 developments in financial markets were affected by the referendum in the United Kingdom in June and the presidential election in the United States in November, which were followed by volatility peaks and increased uncertainty.

Table 2.1 • Gross Domestic Product – Real year-on-year rate of change | Percentage

	2002-07	2013	2014	2015	2016
World	**4.8**	**3.4**	**3.5**	**3.4**	**3.1**
Advanced economies	**2.6**	**1.3**	**2.0**	**2.1**	**1.7**
USA	2.7	1.7	2.4	2.6	1.6
Japan	1.4	2.0	0.2	1.2	1.0
Euro area	2.0	-0.2	1.2	1.9	1.7
Germany	1.4	0.6	1.6	1.5	1.8
France	1.8	0.6	0.7	1.2	1.1
Italy	1.1	-1.7	0.2	0.7	1.0
Spain	3.5	-1.7	1.4	3.2	3.2
United Kingdom	2.7	1.9	3.1	2.2	1.8
Emerging and developing economies	**7.2**	**5.1**	**4.7**	**4.2**	**4.1**
Emerging and developing Europe	5.9	4.9	3.9	4.7	3.0
Commonwealth of Independent States	7.6	2.1	1.1	-2.2	0.3
Russia	7.1	1.3	0.7	-2.8	-0.2
Emergind and developing Asia	9.0	6.9	6.8	6.7	6.4
China	11.2	7.8	7.3	6.9	6.7
Latin America and the Caribbean	4.1	2.9	1.2	0.1	-1.0
Brazil	3.9	3.0	0.5	-3.8	-3.6

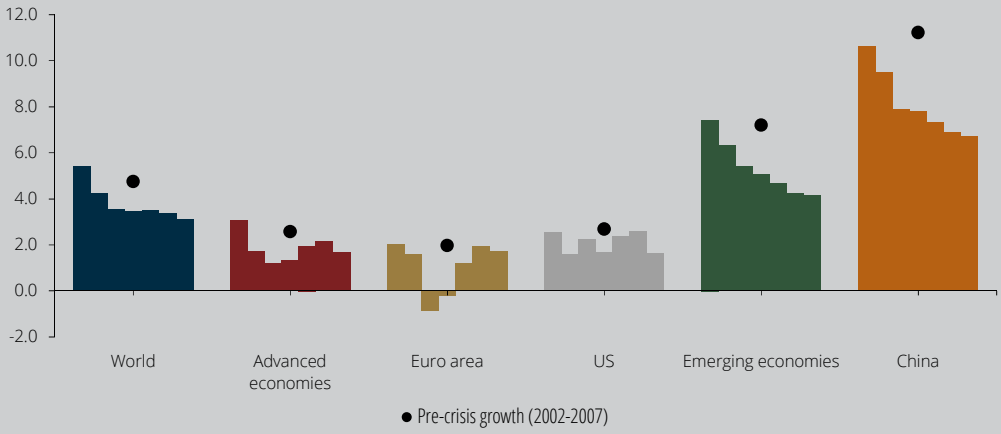
Sources: Eurostat, IMF and Thomson Reuters.

In June, the result of the referendum raised concerns about the UK's economic outlook, and, in November, the result of the US elections signalled shifting expectations regarding the new administration's policies. In the first half of the year, long-term interest rates followed a downward trend in the United States, the United Kingdom and Germany, amid doubts about growth in global economic activity, the situation in the euro area financial sector and continued (or strengthening) accommodative monetary policies by major central banks (Chart 2.3). In contrast, long-term interest rates began increasing from July onwards, reflecting reduced concerns about the world economy outlook, the perception that monetary authorities might be less reactive to the first signs of an inflation hike, and the anticipation of a more expansionary fiscal policy and an increase in investment in infrastructures after the US elections.

At the start of the year, equity indices recorded losses, given the more negative outlook for the world economy, particularly in China, which were followed by a recovery, amid rising oil prices. After reaching a trough of 28 USD/barrel in January, oil prices increased gradually, before

Chart 2.1 • Gross Domestic Product - annual growth between 2010 and 2016

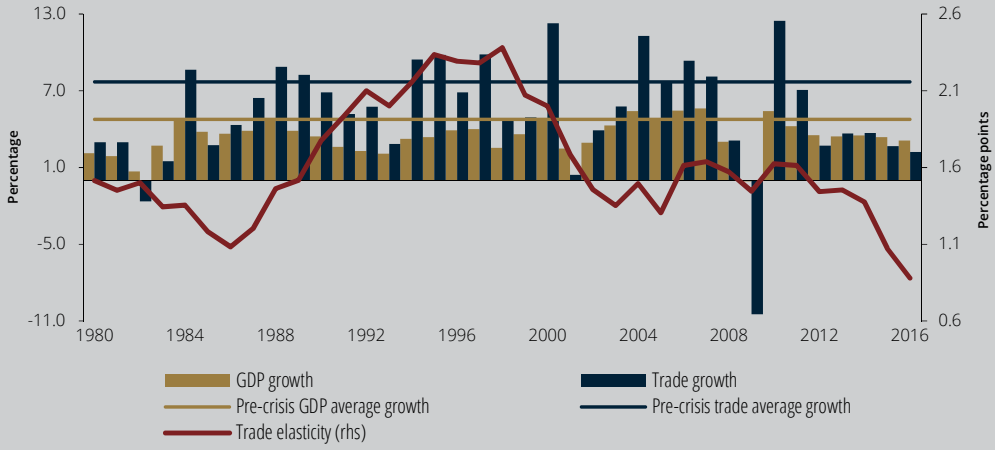
| Percentage



Sources: Eurostat, IMF and Thomson Reuters.

Chart 2.2 • Growth of world GDP and trade volumes

| Percentage and percentage points



Sources: IMF and Banco de Portugal calculations.

Note: Trade elasticity is calculated over 5-year periods. Pre-crisis period: 2002-2007.

stabilising at around 50 USD/ barrel at the end of the summer. At the end of the year, the stock market in the United States reached historical highs due to the anticipation of expansionary policies, which influenced the various sectors, in particular banks (Chart 2.4).

Advanced economies grew less strongly, while emerging economies accelerated slightly, despite differences across countries

Advanced economies grew by 1.7 per cent in 2016, compared with 2.1 per cent in 2015, improving in the second half of the year. For most economies, domestic demand and, in particular, private consumption continued to be the drivers of growth. Investment, as measured by gross fixed capital formation (GFCF), continued to grow moderately and accelerated in the second half of 2016, making a marginal contribution to GDP.

In the United States, economic activity slowed down in 2016, with GDP growing by 1.6 per cent, i.e. 1 p.p. less than in the previous year. The US

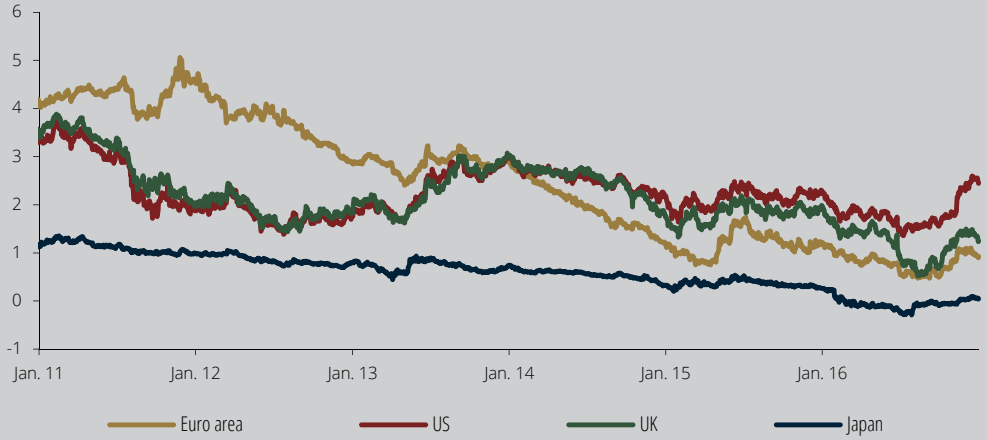


Chart 2.3 • 10-year sovereign debt rates
| Percentage

Sources: Thomson Reuters and ECB.

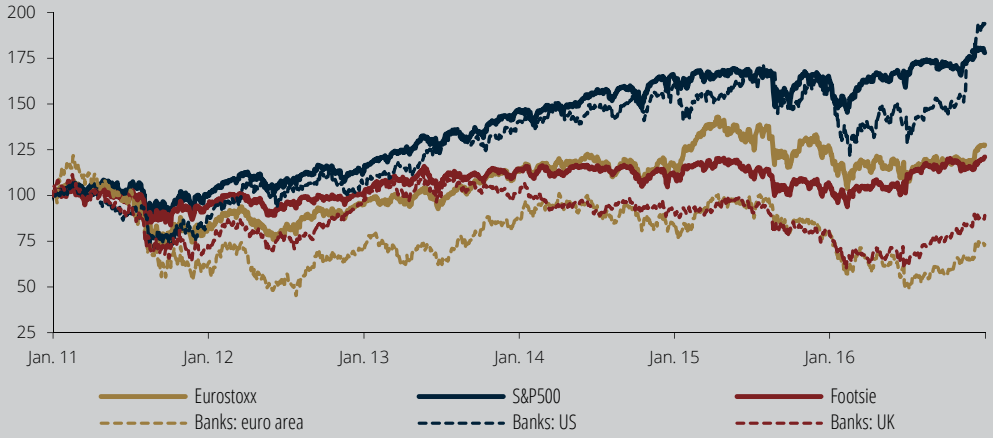


Chart 2.4 • Major stock markets indexes, total and banks
| Index Jan. 2014=100

Source: Thomson Reuters.

economy recorded weak growth during the first half of the year, largely due to developments in private business investment, recovering in the second half of the year owing to private consumption. At the same time, labour market conditions remained favourable, with the unemployment rate remaining below 5 per cent, for the first time since 2007. Inflation increased, in particular from the middle of the year onwards, due to an increase in commodity prices, but continued below the Federal Reserve's target. In terms of the average annual rate of change, inflation reached 1.3 per cent (0.1 per cent in 2015), while inflation excluding food and energy remained slightly above 2 per cent. Against this background, in December 2016, the Federal Reserve decided to increase the target for the federal funds interest rate to a 0.50-0.75 per cent range.

The United Kingdom grew above the forecasts released after the June referendum, which resulted in the United Kingdom leaving the European Union. Economic activity grew by 1.8 per cent in 2016, i.e. 0.4 p.p. less than in 2015, supported by private consumption, which, contrary to expectations, did not show signs of slowing down. However, in the next few years, real household income may decelerate, negatively affecting private consumption, amid moderating wage growth and higher import prices associated with the depreciation of the pound sterling. The year-on-year rate of change in the Harmonised Index of Consumer Prices (HICP) remained below 2 per cent, but increased over the year, reaching 1.6 per cent (0.2 per cent in December 2015), as a result of the depreciation of the pound sterling, which was more pronounced immediately after the referendum's unexpected result. In this context, in August, the Bank of England adopted a package of measures to support the economy, which included a cut in the Bank Rate, an increase in the stock of purchased UK government bonds, a programme to purchase non-financial investment-grade corporate bonds and a Term Funding Scheme for eligible institutions to reinforce the pass-through of monetary policy to the real economy.

Japan gradually recovered throughout 2016, owing to domestic demand and supported by accommodative monetary and fiscal policies and favourable financial conditions. The Japanese GDP grew by 1.0 per cent, compared with 1.2 per cent in 2015. In 2016, the Bank of Japan made two changes to its Quantitative and Qualitative Monetary Easing programme, by introducing a negative interest rate to banks' current accounts in January, and by conditioning the purchase of Japanese government bonds, in September, so that 10-year interest rates would remain close to zero. In addition, the Bank committed itself to expanding the monetary base until the observed inflation rate exceeds the target (inflation-overshooting commitment).

The situation of emerging market and developing economies continued to be quite mixed. In China, economic activity remained robust in 2016, with GDP growing by 6.7 per cent year-on-year (6.9 per cent in 2015), benefiting from the economic policy stimulus. Nevertheless, economic activity was weaker than expected in a number of Latin American countries, which have been in a recession since 2015, specifically Brazil. In Russia, economic growth was slightly better than expected, partly owing to developments in oil prices.

Euro area economic activity continued to recover gradually, with a greater support from domestic demand than in the past

Euro area GDP grew at a relatively stable rate throughout the year. Growth of 1.7 per cent reflected a positive contribution from domestic demand and a negative contribution from net exports. Above all, this pattern was driven by consumption, associated with favourable developments in households' real disposable

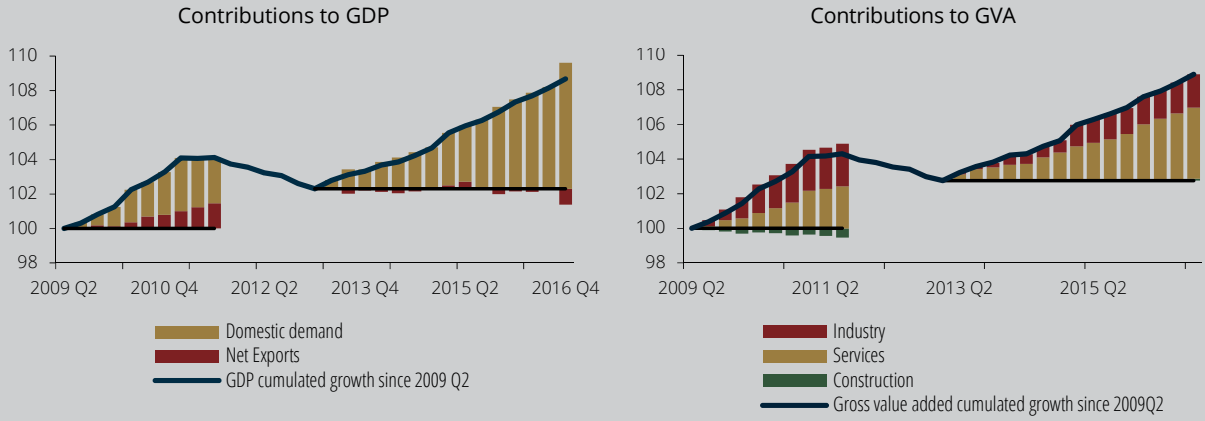
income, amid growing employment and declining oil prices. The recovery in activity in the current economic cycle has a greater support from domestic demand than in the previous cycle, with services playing a greater role (Chart 2.5). The recovery seen after 2013 is also more broadly-based across countries, with particularly positive developments in Spain (3.2 per cent growth) (Chart 2.6). GDP grew by 1.8 per cent in Germany and slightly above 1 per cent in France. In turn, GDP growth stood at 1.0 per cent in Italy, standing considerably below pre-crisis levels.

Unemployment continued to decline in the euro area, with some cross-country differences. The larger economies experienced declines, with the exception of Italy. In parallel, employment continued to grow moderately, above the levels observed in 2015.

External demand for Portuguese goods and services decelerated

External demand for Portuguese goods and services decelerated in 2016, growing by 2 per

Chart 2.5 • Euro area two latest economic recoveries – contributions by sector | Index 2009 Q2=100



Sources: Eurostat, CEPR and Banco de Portugal calculations.

Note: Two latest economic recoveries - since the 2009 Q2 and 2013 Q1 troughs, according to the CEPR Dating Commitee.

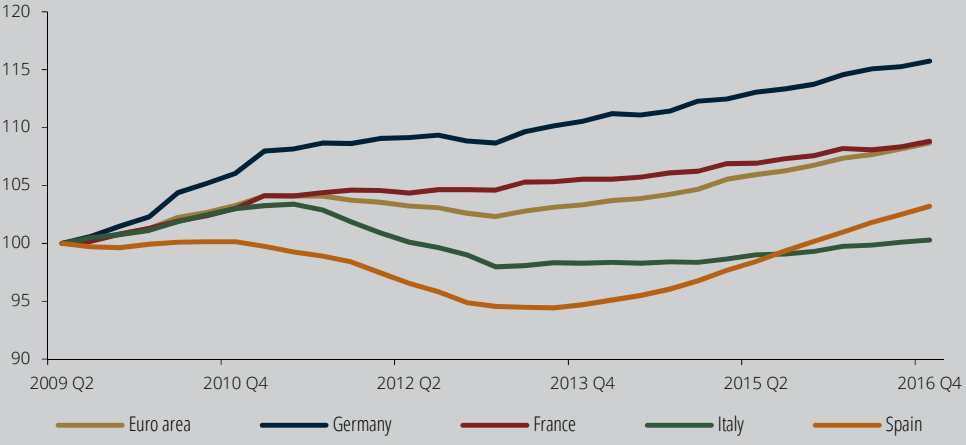


Chart 2.6 • GDP evolution since trough | Index 2009 Q2=100

Sources: Eurostat, CEPR and Banco de Portugal calculations.

cent year-on-year, after around 4 per cent in 2015 (Table 2.2). These developments resulted from lower growth in demand from euro area trade partners (3.5 per cent, compared with 5.6 per cent in 2015), and a contraction in external demand from economies outside the euro area (-0.4 per cent, after 1.1 per cent in 2015). When external demand from Angola is taken into account, the effect is even more pronouced.[3] External demand for goods and services is expected to have grown by 1.3 per cent in 2016, compared with 2.6 and 5.4 per cent in 2015 and 2014 respectively.

Increase in euro area inflation from the middle of the year

In 2016 developments in HICP inflation mostly reflected the path of energy prices (Chart 2.7). This influence translated into a low or negative inflation in the first months of the year and subsequent increases, which were heightened by the base effect of the falls observed in 2015 and related to an increase in energy prices.

Table 2.2 • External demand of goods and services – Real year-on-year rate of change | Percentage

	Weights[(b)]	2013	2014	2015	2016
External demand (ECB)[(a)]	100.0	1.9	5.0	3.9	2.0
Intra euro area external demand	66.3	0.9	5.2	5.6	3.5
of which:					
Spain	27.1	-0.5	6.5	5.6	3.3
Germany	13.7	3.2	4.0	5.0	3.6
France	12.5	2.2	4.8	6.4	3.6
Italy	3.9	-2.3	3.1	6.7	3.1
Extra euro area external demand	33.7	3.7	4.6	1.1	-0.4
of which:					
United Kingdom	5.6	3.4	2.5	5.5	2.8
USA	3.5	1.1	4.4	4.6	1.1
Memo:					
Goods and services imports from Angola [(c)]		9.0	11.4	-21.8	-27.8
Adjusted external demand [(d)]		2.3	5.4	2.6	1.3
Comércio mundial de bens e serviços (FMI)		3.7	3.7	2.7	2.2
Importações mundiais de mercadorias (CPB)		2.0	2.6	1.9	1.2

Sources: ECB, CPB, IMF, Thomson Reuters and Banco de Portugal calculations.

Notes: (a) External demand is computed as weighted average of the imports volume of Portugal's main trading partners. Each country/region is weighted by its share in Portuguese export. (b) Shares computed using 2012-2014 data. (c) The weight refers to the weight of nominal goods and services exports to Angola on portuguese exports. (d) External demand indicator adjusted for the importance of the foreign trade with Angola. Corresponds to the weighted average (by the exports weight) between the external demand indicator calculated by the ECB and the volume of the goods and services imports of the Angolan economy. The IMF forecasts (*Word Economic Outlook*) for the growth of the volume of imports of Angola in 2016 are used.

The year-on-year rate of change in HICP excluding energy and food remained stable at relatively low levels, ranging between 0.7 and 1.0 per cent throughout the year (Chart 2.7). Since mid-2016, the increase in euro area inflation was boosted by energy prices and broadly-based across countries. As in the past, differentials between groups of countries reflected divergences in inflation excluding energy and food (Charts 2.8 and 2.9). At the end of the year, the year-on-year rate of change in HICP excluding energy and food stood at 1.4 per cent in Germany, 0.9 and

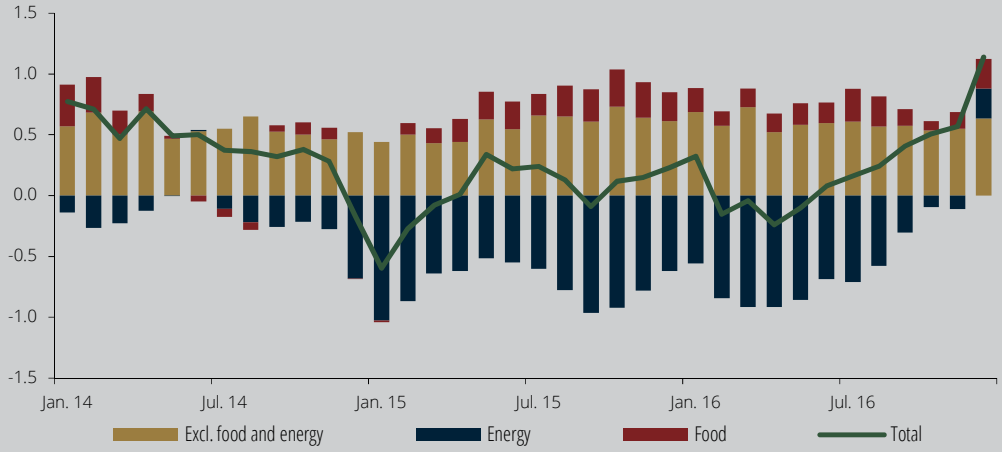


Chart 2.7 • Contributions to year-on-year HICP rate of change in the euro area

| Percentage points

Source: Eurostat.

Chart 2.8 • Inflation differentials between high-rated and low-rated countries

| Percentage points

Sources: Eurostat, ECB and Banco de Portugal calculations.

Note: High rated countries: Austria, Belgium, France, Finland and Germany. Low rated countries: Cyprus, Greece, Ireland, Italy, Portugal and Spain.

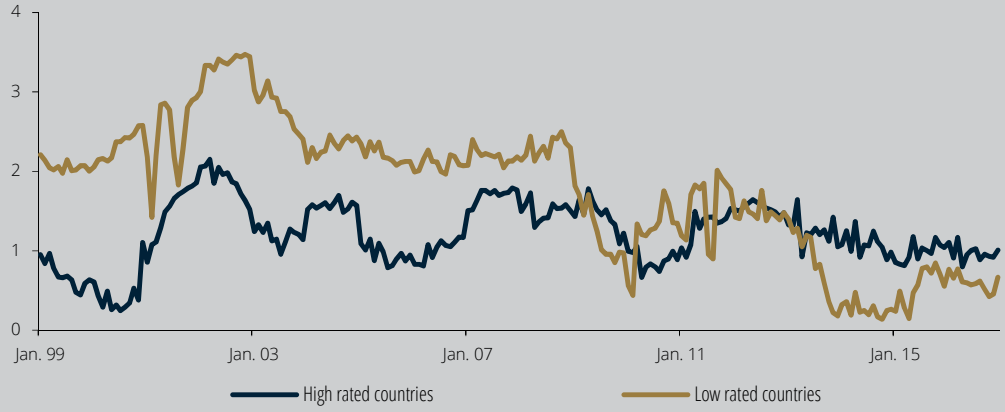


Chart 2.9 • Euro area HICP

| Year-on-year rate of change

Sources: Eurostat, ECB and Banco de Portugal calculations.

Note: High rated countries: Austria, Belgium, France, Finland and Germany. Low rated countries: Cyprus, Greece, Ireland, Italy, Portugal and Spain.

0.7 per cent in Spain and Italy respectively, and 0.4 per cent in France.

Since 2013, the inflation differential between high rated countries and lower rated countries has been negative, in contrast to the pre-crisis period. This reflects lower growth in prices in the services component in lower-rated countries, associated with wage adjustments. Since the second half of 2015, the differential has decreased, reflecting continued low growth in services prices in high rated countries and a slight acceleration in lower rated countries. Long-term inflation expectations increased from September onwards, standing above the levels seen at the start of 2015, but below historical averages. Long-term inflation expectations seem to have become rather more sensitive to changes in short-term expectations and oil prices both in the euro area and in the United States and the United Kingdom (Chart 2.10).

Chart 2.10 • Euro area inflation expectations and oil prices

| Percentage and USD dolars per barrel

Sources: Thomson Reuters and Banco de Portugal calculations.

Note: Expectations implicit in inflation swaps. Vertical line indicates the APP anouncement.

3. Monetary and financial conditions

3.1. Euro area

The Eurosystem maintained an accommodative monetary policy in 2016

2016 saw the adoption of non-standard monetary policy measures on the part of the ECB in March and December. At the start of the year, economic and financial conditions deteriorated and downside risks to inflation increased, leading the Governing Council to reduce the rates on the main refinancing operations, the deposit facility, and the marginal lending facility to 0 per cent, -0.4 per cent and 0.25 per cent respectively, and to adopt a number of other measures. This package included expanding the monthly purchases under the Expanded Asset Purchase Program (APP) from €60 billion to €80 billion, and extending it until March 2017, and expanding the purchase programme to debt securities issued by non-bank corporations established in the euro area (Box 3.1.1: 'The impact of the Corporate Sector Purchase Programme'). The ECB also announced a new series of targeted longer-term refinancing operations (TLTRO II), to support lending to the economy. These operations are different from previous TLTROs mostly because the bank will pay a rate equal to the deposit facility rate if it grants loans above a specific limit. At the end of the year, the Governing Council considered there was a need for further substantial monetary stimulus to the economy in order to ensure a sustained adjustment in the path of inflation towards the inflation aim. The Governing Council therefore decided to extend the APP until December 2017, but to reduce the purchases from €80 billion to €60 billion.

Monetary and financial conditions in the euro area continued to evolve favourably

Euro area financial markets were influenced by the accommodative monetary policy stance. The downward path in euro area government bond yields reflected the effect of the APP purchases and other monetary policy measures taken by the ECB. Overall effects were also relevant, in particular an increase in uncertainty about the outlook for global growth at the start of the year and the result of the UK referendum in June. From the summer onwards, a decline in concerns about developments in the global economy and the incorporation of an inflation risk premium led to a partial reversal in the decline seen in interest rates.

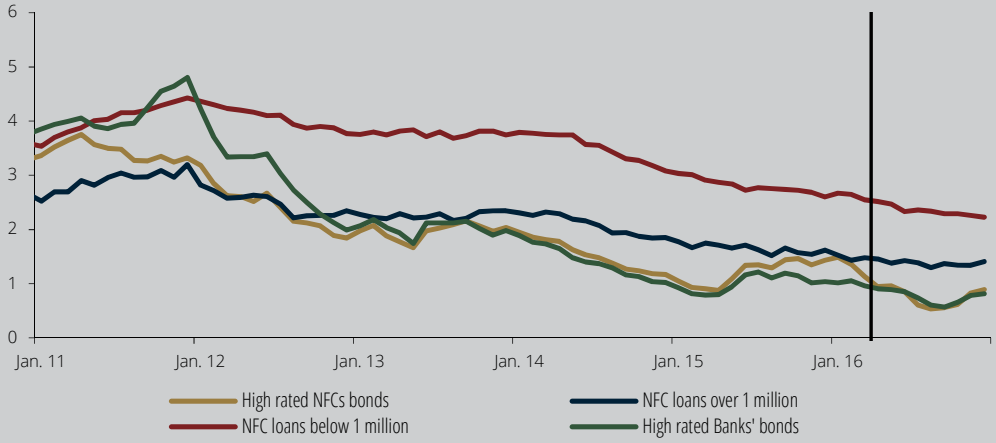
Euro area equity indices improved slightly throughout the year, although the intra-annual pattern showed marked movements, consistent with the previously mentioned factors. Equity prices in the European financial sector fell by around 8 per cent in 2016, amid prospects of lower yields in the future and the negative impact of non-performing loans on bank profitability.

In foreign exchange markets, the euro appreciated slightly, in effective terms, in the course of the year, reflecting in particular the result of the UK referendum, the world economic outlook and monetary policy differences across jurisdictions. The effective appreciation of around 2 per cent was the result of an appreciation of 17 per cent against the pound sterling and 4 per cent against the Chinese renminbi, and a depreciation of 3 per cent against the US dollar and 6 per cent against the Japanese yen. Money market interest rates continued to decline, but, since the summer of 2016, the differential has been widening between the EONIA and deposit facility rates *vis-à-vis* the secured money market rates and rates on government debt, which might indicate a less effective transmission of monetary policy decisions (Box 3.1.2: 'Dispersion of interest rates in the euro area money market').

Firms' financing costs continued to decline in 2016. In particular, the negative deposit facility rate and the new TLTRO II announced in March are expected to have helped reduce the interest rates on bank loans to firms. In addition, the introduction of a purchase programme for investment-grade bonds issued by corporations established in the euro area might also partly explain the decline in the respective interest rates, which have stood at levels similar to those of highly-rated banks' bonds since June (Chart 3.1).

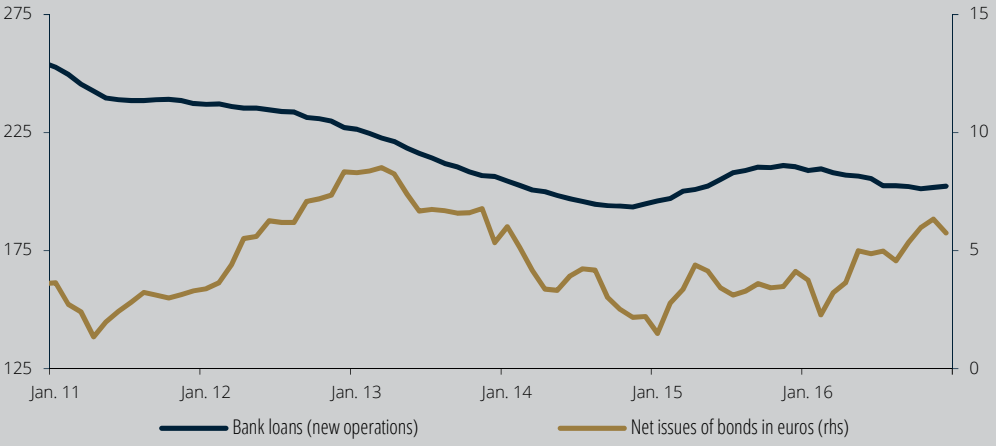
Against this background, the net issuance of euro-denominated bonds increased considerably from the second quarter of 2016 onwards (Chart 3.2). The cost of bank loans to firms decreased by around 30 b.p. throughout the year, slightly below the decline seen in loans to households for house purchase, standing at around 1.8 per cent in both cases. In addition, the differential between the cost of loans to firms in lower rated and high rated countries returned to the levels observed at the start of 2011.

Chart 3.1 • NFC's financing costs
| Percentage



Sources: ECB, Bank of America Merrill Lynch, Blooomberg and Banco de Portugal calculations.
Note: Vertical line indicates the announcement of CSPP and TLTRO II.

Chart 3.2 • External financing of NFC in the euro area
| Billion euros



Source: ECB.
Note: 12-month moving average.

Bank lending to firms grew considerably in the first half of the year both for high rated countries and lower rated countries (Chart 3.3). In annual average terms, loan growth stood at 2.3 per cent in December 2016, compared with 0.5 per cent in December 2015, accelerating 1.4 p.p. up to June. Loans to households recovered more slowly, particularly in high rated countries, from 1.4 to 2.0 per cent during the same period. The improvement in financial and monetary conditions is in line with the results of the euro area Bank Lending Survey, which have indicated an improvement in lending conditions for firms and households in 2016. Banks have also reported an increase in demand for loans to both firms and households, which was broadly-based across all loan categories. Banks have used the liquidity obtained from the APP for granting loans, for refinancing purposes and, to a lesser extent, for purchasing assets. As regards the negative deposit facility rate, banks have indicated a positive impact on lending volumes, but a negative impact on net interest income and loan margins.

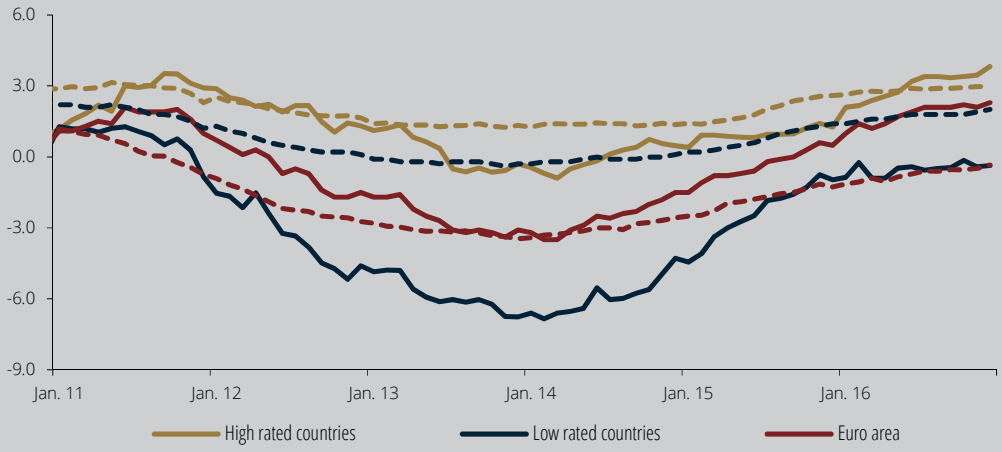


Chart 3.3 • Anual rate of change of bank loans in the euro area
| Percentage

Source: ECB.

Note: Loans adjusted for sales and securitization. Full lines represent firms and dashed lines represent families.

Box 3.1.1 | The impact of the Corporate Sector Purchase Programme

The *Corporate Sector Purchase Programme* (CSPP) was announced by the Governing Council of the European Central Bank on March, 10 2016 as an extension of the *Expanded Asset Purchase Programme (APP)*[4] to the purchase of debt securities issued by non-financial corporations established in the euro area. The programme aims to further strengthen the pass-through of the Eurosystem's asset purchases to the financing conditions of the economy, to provide further monetary policy accommodation, and to contribute to a return of inflation rates to levels below, but close to, 2 per cent in the medium term. As the CSPP is part of the APP, these purchases are expected to continue until the end of 2017[5] or beyond, if necessary, and in any case until the Governing Council of the ECB sees a sustained adjustment in the path of inflation consistent with its inflation aim. This box describes the CSPP and analyses its impact on the funding costs of euro area non-financial corporations and on their funding structure.

Following the announcement of the programme, the technical parameters were published on April, 21 2016 and purchases began on June 8. Eligible bonds under the CSPP have a minimum remaining maturity of 6 months and a maximum remaining maturity of 30 years and 364 days at the time of the purchase. The lower limit was established in order to ensure that bonds issued by smaller firms, usually with shorter maturities, were included in the purchases. Moreover, bonds must be denominated in euros and they must have high credit quality (rating of BBB or higher), obtained from an external credit assessment institution. Finally, bonds must be marketable instruments eligible as collateral for Eurosystem liquidity-providing operations. Bonds must be issued by an institution established in a euro area Member State which is not a credit institution, does not have a parent undertaking which is a credit institution, and is not an eligible issuer under the public sector purchase programme (PSPP) in secondary markets. When the technical parameters of the programme were announced, the purchase of bonds with negative yields was permissible provided these were above the deposit facility rate. At the December 2016 meeting, the Governing Council of the ECB announced that purchases below the deposit facility rate would also be permitted.

In order to limit risk exposure and to ensure the diversification of the Eurosystem's portfolio, a number of restrictions are applied on the amounts and on issuer entity' groups. Regarding the amount, the purchase of any type of bond may not exceed 70 per cent of its outstanding amount. Nevertheless, this limit may be lower for bonds issued by public undertakings. Lastly, the programme is coordinated by the ECB, but only six Eurosystem central banks carry out the purchases in both primary and secondary markets. Each central bank is responsible for purchases of a particular geographical allocation of the euro area and is responsible for publishing a list of all purchased bonds at the end of each week, as these will become available in the securities lending market.

At the end of 2016, the Eurosystem had purchased a total of €51,069 million under the CSPP, of which 86.4 per cent were purchased in the secondary market and 13.6 per cent in the primary market. At that time, the CSPP accounted for 3.3 per cent of total purchases under the APP. Even though the programme is small in volume, its importance within the APP has been increasing since its implementation. This is particularly relevant in a context where, historically, firms tend to fund themselves through bank loans, as is the case of the euro area. Overall, the CSPP seems to have helped reduce debt issuance financing costs of non-financial corporations and to increase the use of this type of funding.

A preliminary assessment shows that apparently the programme had some impact on corporate bond yields and on the yields of bonds issued by other sectors. Economic literature assessing the APP has identified the impact of its announcement as the most significant event. The same seems to apply to the CSPP. The first vertical line in Chart 1 marks the date of the CSPP announcement and it is clear that, at that moment, bond yields dropped considerably for both non-financial corporations and banks. In the case of non-financial corporations, this downward trend continued, being only interrupted by some volatility in May and June, as a consequence of the outcome of the UK referendum on leaving the European Union. Following the start of the programme (second vertical line in Chart 1), developments in yields resumed the downward trend. Simultaneously, interest rates on long-term government bonds remained fairly constant, contributing to the perception that the implementation of the programme has helped reduce bond yields. High-yield bonds and yields on bonds issued by financial corporations also declined immediately after the announcement of the programme, particularly in peripheral countries (Table 1).

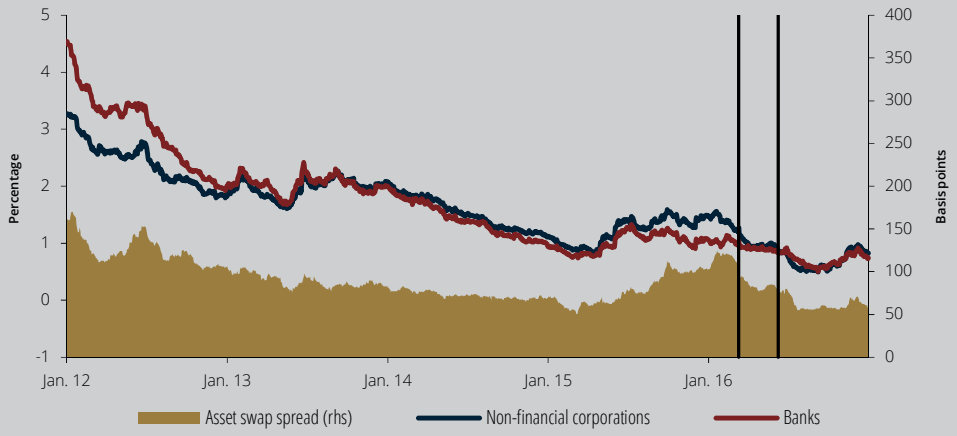
Table 1 • Change in yields following the CSPP announcement | Basis points

	Investment-grade bonds		High yield bonds issued by non-financial corporations
	Non-financial corporations	Banks	
Euro Area	-14	-8	-58
Germany	-14	-4	-56
France	-13	-8	-72
Italy	-19	-17	-63
Spain	-19	-16	-73
Portugal	-65	-	-64

Sources: Bloomberg, Bank of America Merril Lynch and Banco de Portugal calculations

Notes: Event study: change in yields within a 3-day window following the CSPP announcement on 10 March 2016.

Chart 1 • Euro area bond yields



Sources: Bloomberg, Bank of America Merril Lynch and Banco de Portugal calculations.

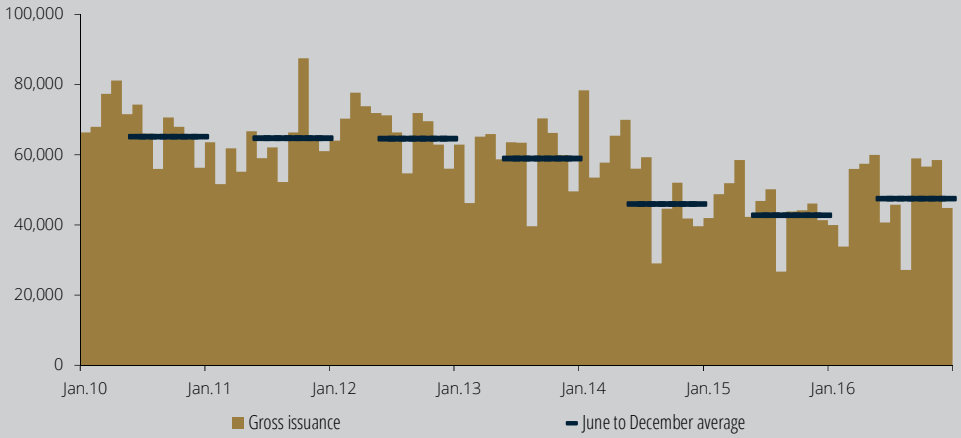
Note: Effective yields on euro-denominated investment-grade bonds. Asset swap spread: difference between the bond yield and a low-risk swap rate of the same maturity. Vertical lines: CSPP announcement; start of the program.

The programme must also be assessed in terms of volume. Financing of non-financial corporations through debt issuance has been increasing since the first quarter of 2016. In addition, after a slow down that began in 2013, the average gross issuance of bonds between June and December recovered in 2016 despite remaining at levels below those of previous years (Chart 2). This period is particularly interesting as it compares the issuance during the months when the programme was already being carried out with the same period in previous years. This suggests that the CSPP may have led firms to be more likely to prefer funding via debt securities.

Although other factors may have influenced the financing costs of non-financial corporations and were possibly taken into consideration when choosing between debt issuance and bank loans, the developments described above seem to indicate that the CSPP has had the intended effect on the financing conditions of the economy. On the one hand, the financing costs of debt issuance have declined and remain low by historical standards. On the other hand, since the start of the programme, activity in this market seems to have gained some momentum.

Chart 2 • Gross issuance of debt securities by euro area non-financial corporations

| Millions of euros



Sources: Thomson Reuters and Bloomberg.

Box 3.1.2 | Dispersion of interest rates in the euro area money market

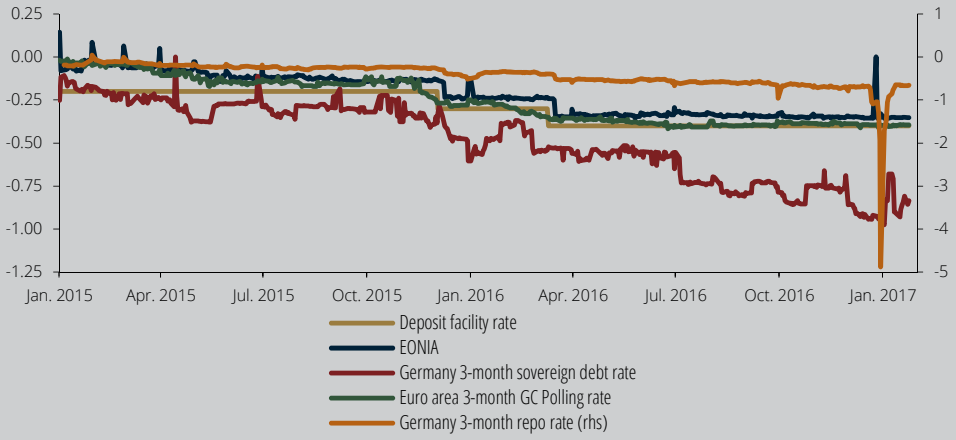
In a money market operating perfectly, interest rates on all financial instruments should fully reflect the central bank's reference rate – perceived as a risk-free interest rate – plus premia associated, inter alia, with credit and liquidity risk. Money market interest rates should therefore stand at a level close to the central bank reference rate and, ceteris paribus, any change in this rate resulting from monetary policy decisions should mostly pass through to negotiated rates for granting and obtaining short-term funding.

At present, in the euro area, the deposit facility rate, which stands at -0.4 per cent since March 2016, would be expected to represent the effective lower bound of money market interest rates, and assets perceived to be safe and liquid would be expected to provide a yield close to this benchmark. However, since the start of 2015, the downward trend seen in the interest rates of short-term secured instruments and sovereign bonds with a high credit quality has been more marked than the declines in the deposit facility rate and the EONIA (Chart 1). This spread widened from the summer of 2016 onwards, contributing to greater dispersion around the ECB's monetary policy interest rate, which should provide an anchor for euro area money market interest rates, under normal circumstances.

High dispersion of interest rates in the money market may indicate market segmentation, which, as a result of the lower importance given to the central bank's rate, translates into difficulties in the monetary policy transmission. Against this backdrop, it is crucial to analyse the reasons behind the evidence illustrated in Chart 1.

First, the downward trend in interest rates on short-term instruments with a high credit quality may reflect anticipation by financial market participants of further cuts in the ECB's policy rates. Nonetheless, since the summer of 2016, agents' expectations about further reductions in

Chart 1 • Evolution of representative euro area money market rates since 2015
| Percentage



Sources: Thomson Reuters and Bloomberg.

the deposit facility rate were rather contained and consequently insufficient to explain the movement verified in some short-term interest rates in the euro area market.

Furthermore, the increase in the dispersion of euro area money market interest rates occurred at the time of the referendum on whether the UK should remain in the European Union. Once the results were known, behaviours typical of a decline in risk appetite were observed, such as a search for safe and liquid assets (safe havens), which exerted downward pressure on their interest rates. However, most of these movements were reversed the following weeks, which was not the case with euro area money market interest rates.

In addition, the misalignment of short-term interest rates and the ECB's deposit facility rate may signal the existence of arbitrage opportunities that agents are not exploiting. In effect, to carry out a direct arbitrage operation on the basis of the current levels of short-term interest rates in the euro area, at least two conditions must apply: (i) accessing to the deposit facility rate[6] and (ii) holding securities with yields lower than the deposit facility rate. This fact leads to two considerations.

On the one hand, the persistence of potential arbitrage opportunities may indicate that monetary financial institutions (hereinafter called banks) in the euro area, which have access to the ECB's deposit facility rate, face constraints in their capability to explore the apparent opportunities for profit persisting in the euro area money market. For example, the need to hold securities which may be used as collateral may justify why arbitrage operations are not conducted. Similarly, the fact that banks face non-negligible costs in adjusting their balance sheets may discourage changes to the composition of their portfolios.

On the other hand, the importance of non-bank institutions in the euro area has increased over the past few years. Likewise, a significant share of Eurosystem purchases under the expanded asset purchase programme (APP) comes from the non-bank sector and non-resident investors. Taking into account that, in the euro area, only banks may make deposits (without risk) with the ECB and assuming agents who do not belong to the banking sector may be unwilling to keep large amounts deposited (among other reasons, large amounts are not covered by a deposit insurance), these investors will tend to look for safe alternatives for their funds. In this context, an investment possibility would be to purchase instruments with high credit quality, which exerts downward pressure on their yields and may help explain the dispersion of interest rates in the euro area money market.

In parallel, in the recent past, there has been an increasing scarcity of short-term securities with low credit risk and high liquidity, which adds to the downward pressure on the level of their interest rates. This trend may be justified by at least three factors: (i) agents' concerns arising from the considerable uncertainty patterns at international level; (ii) lesser availability of securities owing to the implementation of non-standard monetary policy measures on the part of the Eurosystem, namely the APP; and (iii) growing demand for liquid and safe securities, driven by regulatory requirements.

The scarcity of short-term securities is more visible in instruments associated with jurisdictions which are perceived as having a high credit quality. Specifically, in the past few years, German sovereign bonds have strengthened their status as a safe haven, are considered special,[7] and therefore strongly sought after by financial market participants.

In addition to these arguments, the dispersion of short-term interest rates in the euro area may also reflect regulatory issues. In particular, the Basel III requirements may be affecting the smooth functioning of the money market. Admittedly, in the current regulatory framework, banks must

comply with a set of requirements which have an impact on liquidity deposited with the central bank. These guidelines tend to influence money market activity as a whole, thereby influencing short-term interest rates, and ultimately monetary policy transmission. Moreover, a stricter regulatory framework also leads to higher balance sheet adjustment costs.[8] Consequently, the reversal of positions taken during times of lower risk appetite is harder than in the past and, in this sense, the correction of certain atypical phenomena, such as those resulting for the UK referendum, tends to be more gradual.

To sum up, greater dispersion of interest rates in the euro area money market may be the result of a set of conditions interacting with each other, such as (i) greater uncertainty in global financial markets privileging low-risk assets; (ii) lower interbank activity on the part of euro area banks, which, in a demanding regulatory framework, do not take advantage of potential arbitrage opportunities and face higher costs in adjusting their portfolios, which, in turn, may lead to temporary shocks having a more prolonged effect in time; (iii) growing importance of non-bank institutions which do not have access to the deposit facility rate and seek to allocate their resources to assets with a high credit quality; and (iv) increasingly lower availability of short-term securities perceived as safe havens. Although all of these factors may contribute to downward pressure on short-term interest rates, additional analysis is needed to assess their relative importance.

In this vein, it is relevant to continue to tackle the scarcity of liquid and safe securities, which might be accomplished, for example, through the Security Lending Scheme by Eurosystem central banks. Similarly to the initiative for reverse repurchase agreement operations, proposed by the US Federal Reserve, broadening the base for counterparties with access to the deposit facility rate might, in a context of ample liquidity, strengthen the role of the ECB's policy interest rate. Hence, from the perspective of the stance and transmission of monetary policy and aspects related to financial stability, it is crucial to ensure the smooth functioning of the euro area money market, by avoiding distortions in price formation.

3.2. Portugal

Monetary and financial conditions continued to improve throughout 2016

Monetary and financial conditions in the non-financial private sector improved in 2016, helped by the impact of the non-standard monetary policy measures adopted by the ECB (Section 3.1: 'Monetary and financial conditions in the euro area'). In the course of 2016, the differential between interest rates in Portugal and the euro area decreased both for firms and households. The current differentials are comparable to those seen in the period before 2009 (Chart 3.4).

Interest rates on new loans to households remained on a downward trend

Interest rates on new loans to households for house purchase and consumption remained on the downward path observed since 2012 (Chart 3.5). In addition, December 2016 figures for these segments correspond to minimum levels in the series (which started in 2003). These developments are associated with the negative levels seen in interbank reference rates, which continued to decline throughout 2016.

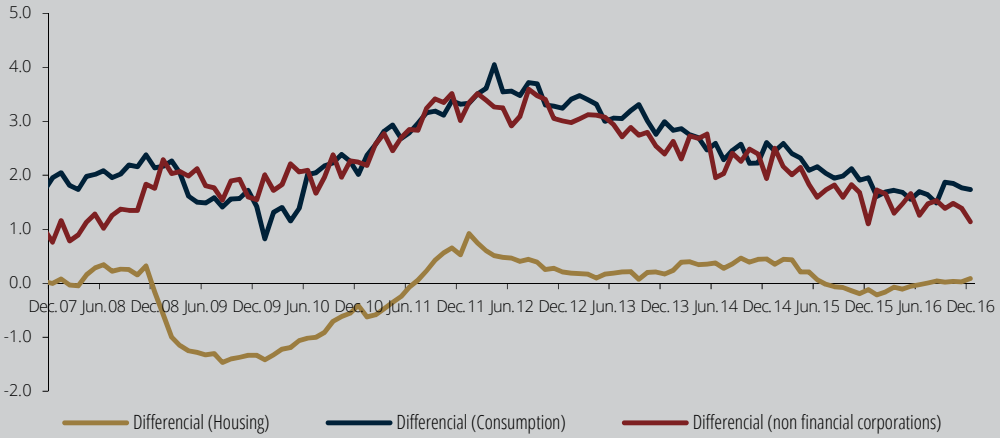
New loans to households reinforced the growth trend seen at the start of 2016, particularly in consumer credit

The growth rate of new bank loans to households increased in the second half of 2016. Monthly volumes of new loans for house purchase continued to increase, despite remaining at levels far from those seen in the period before the financial crisis (Chart 3.6). The share of loans with an initial rate fixation over 1 year continued to grow, accounting for more than 40 per cent of new loans granted in this segment at the end of 2016. This trend occurs amid very low interest rates – with the accommodative conditions expected to continue for an extended period – and the existence of longer-term financing instruments for banks.

The recovery in new loans for consumption continued both in personal loans and loans for car purchase, with loans for the purchase of used cars gaining importance in this segment (Chart 3.7).

On the basis of the results of the Bank Lending Survey throughout 2016, the recovery in loans

Chart 3.4 • Interest rate differencials between Portugal and the average of the euro area | In percentage



Sources: Consesus Economics, Thomson Reuters and Banco de Portugal.

to households for house purchase and consumption was in line with a sustained increase in demand, supported, in particular, by improvements in housing market prospects and the general level of interest rates. According to the survey, although credit standards are relatively stable, competitive pressure between banks and improvements in housing market prospects contributed to an easing of credit standards for loans to households. In addition, several banks reported a positive effect of TLTROs on an increase in loans to households across segments.

Household deleveraging continued, particularly in the housing segment

At the end of 2016, households' total indebtedness stood at 75.4 per cent of GDP, compared with 79.4 per cent one year earlier, continuing the deleveraging process that started in mid-2011. The annual rate of change in loan stocks for house purchase increased slightly, but nevertheless remained at negative levels. In consumer credit, the upward trend continued, with a rate

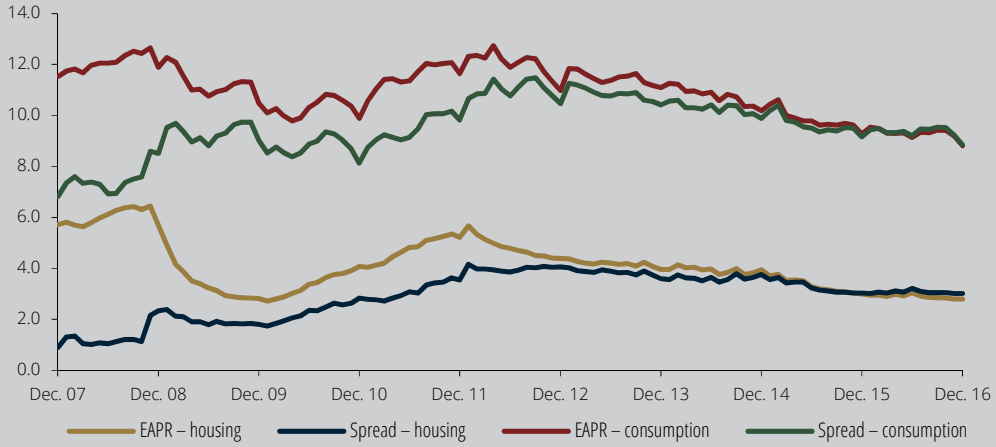


Chart 3.5 • Interest rates on new loans granted by resident banks to households | Percentage and percentage points

Sources: Thomson Reuters and Banco de Portugal.

Notes: Average interest rates are based on new loans by initial fixation period and weighted by new loan amounts in each period. In the case of loans for consumption, the 6-month Euribor, the 1-year Euribor and the 5 year swap rate were considered as reference interest rates for loans with initial fixation period of less than 1 year, 1 to 5 years and more than 5 years, respectively. In the case of housing, the reference interest rate is the 6-month Euribor.

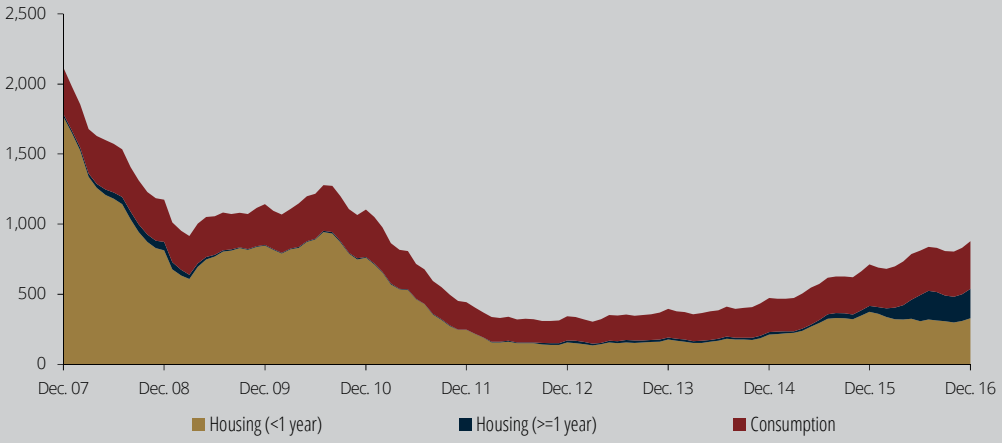


Chart 3.6 • New loans granted by resident banks to households | 3-month moving average, EUR millions

Source: Banco de Portugal.

Note: In the case of housing, new loan amounts are disaggregated by interest rate fixation period.

of change of 5.7 per cent at the end of 2016. In loans for other purposes, the loan stock continued to decline at a rate of around 2.5 per cent for the year as a whole (Chart 3.8).

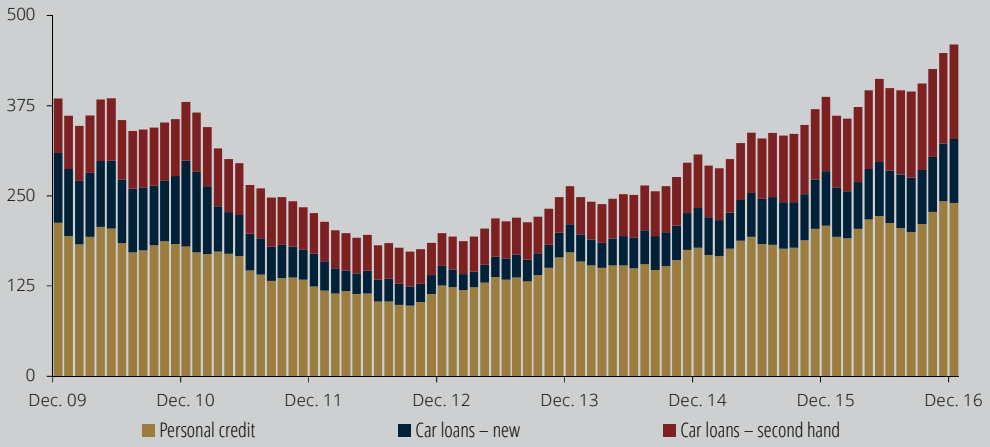
Interest rates on new loans to firms reached new lows at the end of 2016

Interest rates on new loans to firms remained on a downward trend in 2016, reaching a new historical low of 2.8 per cent in December (Chart 3.9). Nevertheless, the differential against the EURIBOR stabilised over the course of the year. Together, these factors show the considerable impact of the ECB's monetary policy on the reduction in bank interest rates.

The distribution of interest rates on new loans shows a gradual increase in risk differentiation

On the basis of estimates on the probability of default for Portuguese non-financial corporations

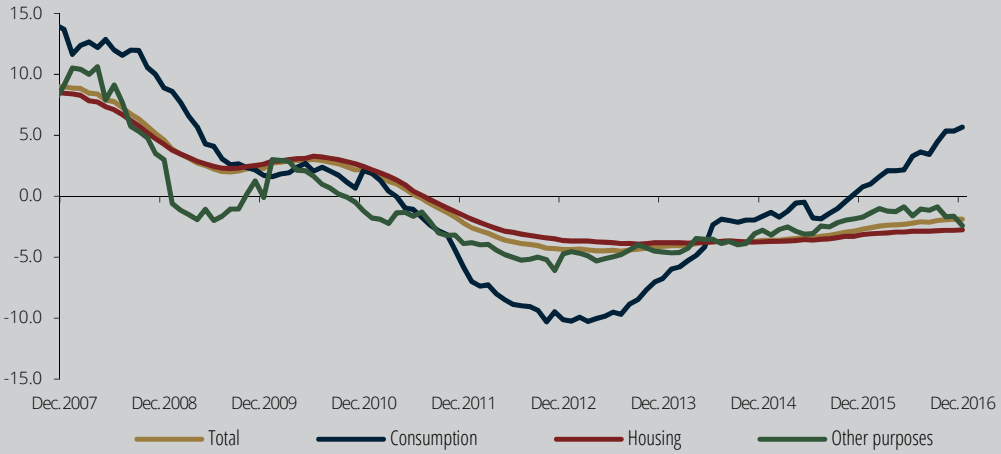
Chart 3.7 • New loans to households for consumption by credit category | 3-month moving average, EUR millions



Source: Banco de Portugal.

Notes: New loan amounts for consumption granted by financial institutions. The analysis excludes credit cards, current accounts, and overdraft facilities.

Chart 3.8 • Loans granted by resident banks to households | Annual rate of change, percentage



Source: Banco de Portugal.

Notes: Annual rates of change are based on the relation between end-of-month outstanding amounts (adjusted for securitisation operations) and monthly transactions. Monthly transactions correspond to the difference in the end-of-month outstanding amounts adjusted for reclassifications, write-offs/write-downs, exchange rate and price revaluations, and any other variations that do not correspond to financial transactions. Whenever relevant, figures are additionally adjusted for sales of credit portfolios.

in 2016, the distribution of interest rates on new loans to lower-risk firms continued to move to lower levels, particularly through the reduction in the volume of loans with high interest rates for the low risk profile of this class (Chart 3.10).[9] Panel b) in Chart 3.10 shows that interest rates on new loans to risky firms continue to show a considerable dispersion. Nevertheless, a comparison of the distribution of interest rates in the last quarter of 2016 with those of the same period in 2015 in the segment for risky firms shows a greater concentration of new loans with interest rates close to the average. This analysis may suggest the market is close to stabilising, with no further reductions expected in interest rates.

The annual rate of change in total credit to firms recorded positive levels in the second half of 2016

The annual rate of change in total credit to non-financial corporations recorded a positive level of 0.5 per cent at the end of 2016 (Chart 3.11).[10]

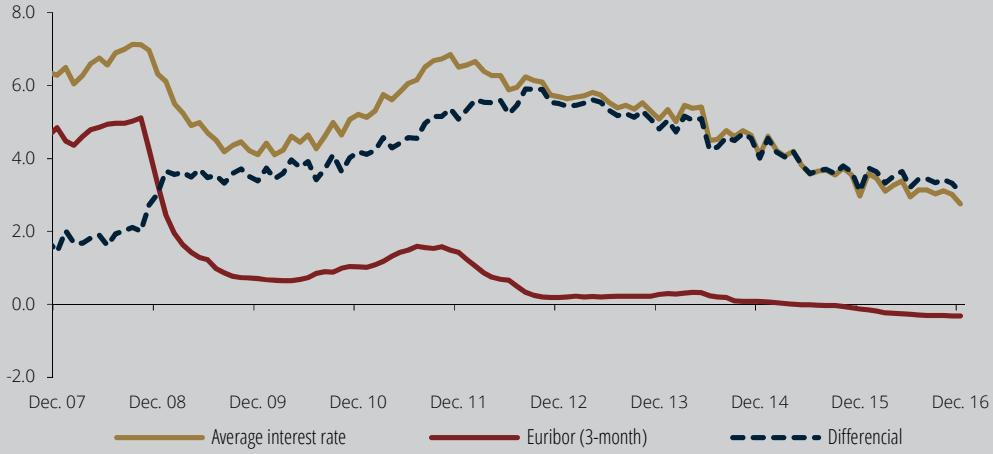
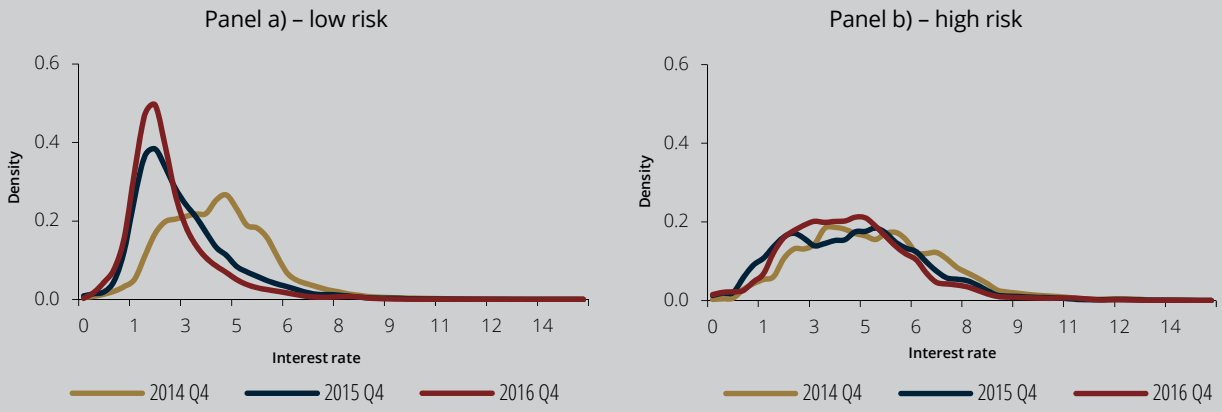


Chart 3.9 • Interest rates on new loans granted by resident banks to households | Percentage and percentage points

Sources: Consesus Economics, Thomson Reuters and Banco de Portugal.

Notes: Average interest rates are based on new loans by initial fixation period, weighted by new loan amounts in each period.

Chart 3.10 • Density distribution of interest rates on new loans granted by banks to private corporations by credit risk profile



Source: Banco de Portugal.

Note: Interest rates weighted by loan amounts. The sample includes pro-profit corporations. High (low) risk firms lie in the first (last) two deciles of the credit risk distribution. Credit risk is measured by the Z-score estimated according to Antunes, Gonçalves and Prego, 'Firm default probabilities revisited', Banco de Portugal *Economic Studies*, Vol. 2, No 2, April 2016.

These developments were affected by a considerable increase in credit from non-resident entities, which contributed with 3.2 p.p. to the annual rate of change. This increase in credit was concentrated almost exclusively in debt securities issuance. Conversely, the annual rate of change in the *stock* of credit granted by resident banks remains negative, worsening slightly in the last quarter of 2016. In the resident financial sector, lending experienced a particularly marked contraction, with holdings of debt securities by resident entities recording a slightly positive rate of change in 2016.

Developments in lending by resident and non-resident institutions are also asymmetric when breaking down developments in credit by firm size (Chart 3.12). This asymmetry became more marked in the last quarter of 2016. During this period, lending to large firms and holding companies posted a rate of change of 0.4 per cent, as these entities have greater access to non-resident financial institutions, and lending to micro, small and medium-sized firms recorded a rate of change of -1.8 per cent. This is consistent with the results of the January 2017 Bank Lending Survey, which indicate a slight increase in loans to large firms and a narrowing of margins on average loans.

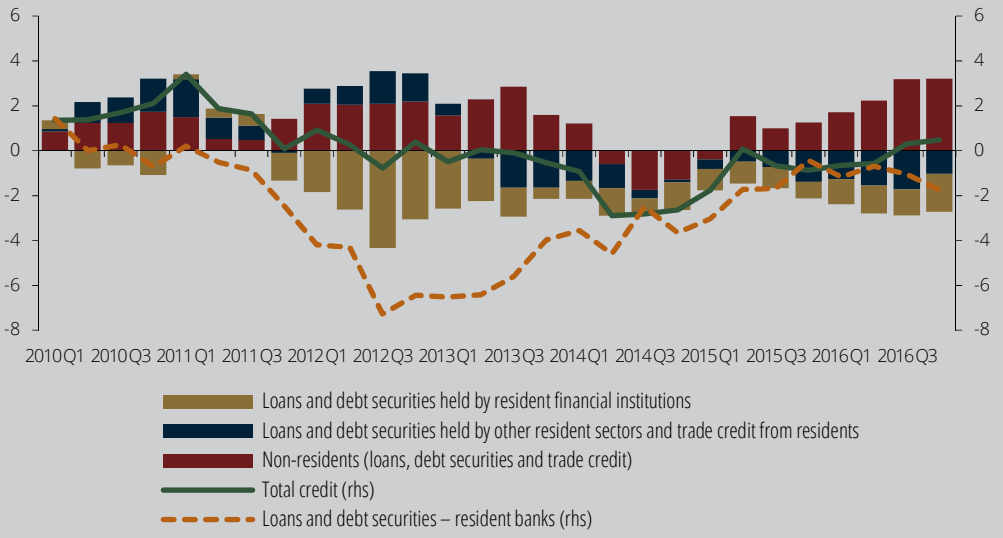
Conversely, in the second half of 2016, differing loan dynamics observed across economic sectors diminished, mainly explained by a stabilisation in the rate of change in lending to retail and wholesale trade, which fell in line with manufacturing figures (Chart 3.13). Finally, lending to construction and real estate continued to experience a contraction, with an annual rate of change of almost -7 per cent.

Bank loans continue to be channelled to firms with a better risk profile

Bank loans by resident banks to firms continue to show mixed developments, according to risk profile (Chart 3.14). Only firms in the lower risk quartile continue to show positive rates of change of loans. However, although experiencing a decline, the total stock of non-performing loans accounts for 18 per cent of the total stock of loans in 2016 (Chart 3.15).

Chart 3.11 • Total credit granted to non-financial corporations

| Annual rate of change and contributions, percentage and percentage points



Source: Banco de Portugal.

Notes: Annual rates of change are based on the relation between end-of-month outstanding amounts (adjusted for securitisation operations) and monthly transactions. Monthly transactions correspond to the difference in the end-of-month outstanding amounts adjusted for reclassifications, write-offs/write-downs, exchange rate and price revaluations, and any other variations that do not correspond to financial transactions. Whenever relevant, figures are additionally adjusted for sales of credit portfolio.

Different credit standards according to risk profile have helped reduce the concentration of loan stocks in certain sectors. For example, the share of (performing) loans to construction and real estate continued to decline (from a peak of 40.4 per cent of the total in 2007 to 24.6 per cent in 2016).

In terms of the stock of non-performing loans, construction and real estate contributed with around 0.6 p.p. in 2016 to the decline in non-performing loans (Chart 3.16). By contrast, other services contributed with nearly 0.2 p.p.

Contrary to 2015 and in particular 2014, loans granted to large firms with a credit event in the past again posted a negative rate of change during 2016 (Chart 3.17). As for loans granted to micro, small and medium-sized firms with a credit event in previous years, the decline in loans remained stable during the course of 2016.

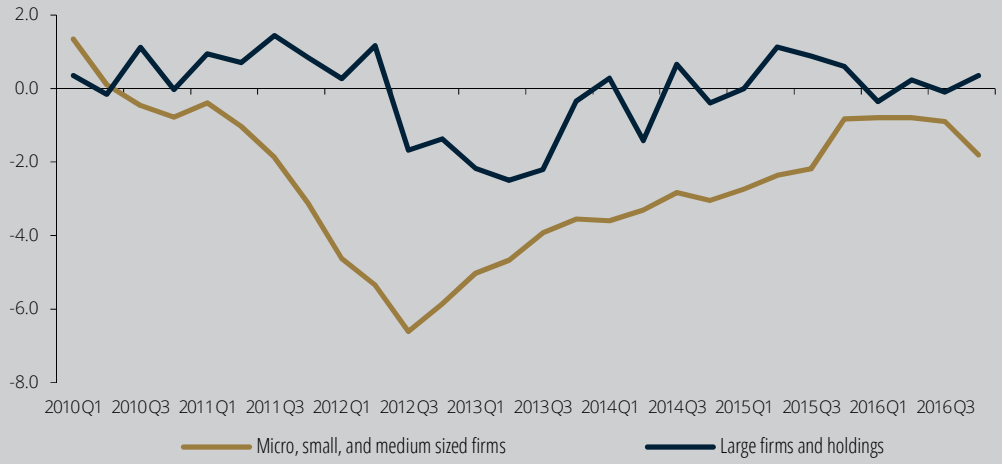


Chart 3.12 • Credit granted by resident banks to non-financial corporations by firm size | Annual rate of change, percentage

Source: Banco de Portugal.

Notes: Credit includes bank loans and debt securities held by resident banks. Figures are adjusted for securitisation operations, reclassifications, write-offs/write-downs, and exchange rate and price revaluations. Whenever relevant, the figures are additionally adjusted for sales of credit portfolio.

Chart 3.13 • Loans granted by resident banks to non-financial corporations by sector of activity | Annual rate of change, percentage

Source: Banco de Portugal.

Notes: Annual rates of change are based on the relation between end-of-month outstanding amounts (adjusted for securitisation operations) and monthly transactions. Monthly transactions correspond to the difference in the end-of-month outstanding amounts adjusted for reclassifications, write-offs/write-downs, exchange rate and price revaluations, and any other variations that do not correspond to financial transactions. Whenever relevant, figures are additionally adjusted for sales of credit portfolio.

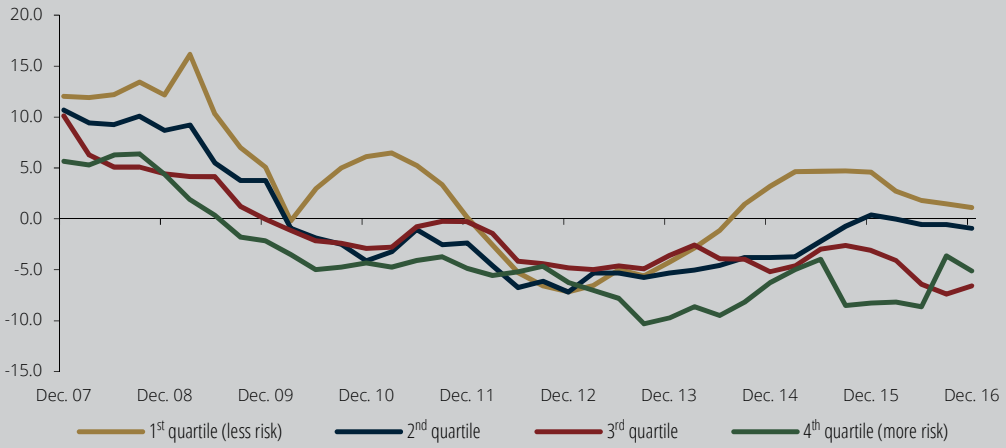
Average risk for firms declined further in 2016

Average risk for firms with performing loans declined further in 2016, with an aggregate probability of default of 5.9 per cent, slightly below the level observed in 2007 (Chart 3.18). After growing in 2012 and 2013, average risk posted a decline, in 2016, for the third year in a row, in line with the recovery in the Portuguese economy. Although the decline in 2016 was smaller in size, all economic sectors made a positive contribution, in particular wholesale and retail trade, and electricity, gas and water.

Corporate indebtedness decreased slightly, in parallel with a recovery in profitability

Chart 3.14 • Loans granted by resident financial institutions to private non-financial corporations by credit risk quartile

| Year-on-year rate of change, percentage

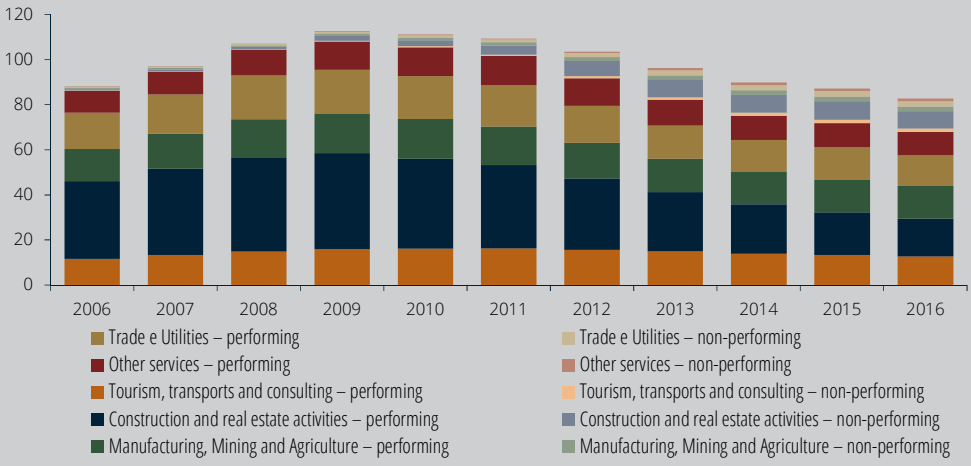


Source: Banco de Portugal.

Notes: Credit risk is measured by the Z-score estimated according to Antunes, Gonçalves and Prego, 'Firm default probabilities revisited', Banco de Portugal *Economic Studies*, Vol. 2, No 2, April 2016. The year-on-year rate of change is the annual rate of change of outstanding amounts in each month.

Chart 3.15 • Performing and non-performing loans stock

| Thousands millions euros



Source: Banco de Portugal.

Notes: Credit risk is measured by the Z-score estimated according to Antunes, Gonçalves and Prego, 'Firm default probabilities revisited', Banco de Portugal *Economic Studies*, Vol. 2, No 2, April 2016. The year-on-year rate of change is the annual rate of change of outstanding amounts in each month. Annual rates of change are based on the relation between end-of-month outstanding amounts and monthly transactions.

The deleveraging process of non-financial corporations continued in 2016, with the level of indebtedness standing at 105.5 per cent of GDP at the end of the year, compared with 109.6 per cent in the previous year.[11] Although international comparisons of indebtedness ratios face statistical challenges, Portuguese firms have deleveraged more strongly than their euro area counterparts.

Statistics on non-financial corporations in the Central Balance Sheet Database, for 2015 as a whole, confirm that their indebtedness ratio continued to improve (Chart 3.19). With the exception of services and accommodation, this decline was broadly-based across economic sectors and is partly explained by firms exiting the market (Box 3.2.1: 'Market dynamics and the deleveraging of Portuguese firms'). In parallel,

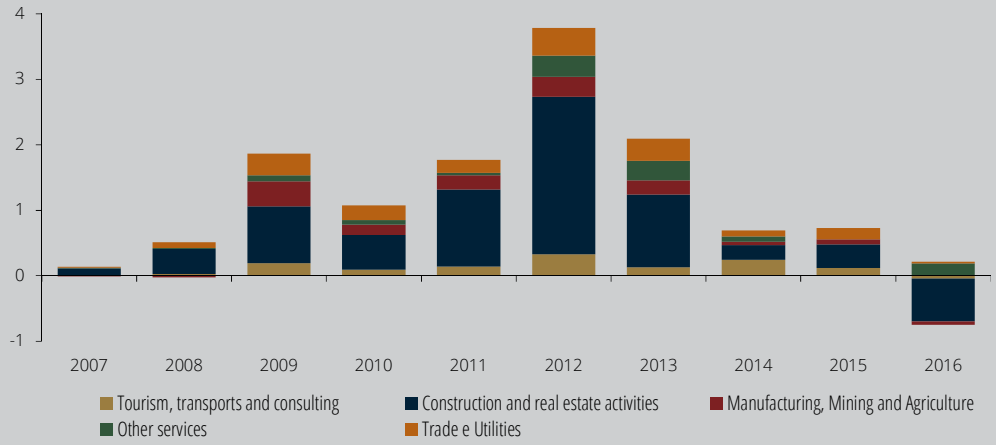


Chart 3.16 • Non-performing loans evolution by industry sector

| Percentage points annual contributions

Source: Banco de Portugal.

Notes: Credit risk is measured by the Z-score estimated according to Antunes, Gonçalves and Prego, 'Firm default probabilities revisited', Banco de Portugal *Economic Studies*, Vol. 2, No 2, April 2016. The year-on-year rate of change is the annual rate of change of outstanding amounts in each month. Annual rates of change are based on the relation between end-of-month outstanding amounts and monthly transactions.

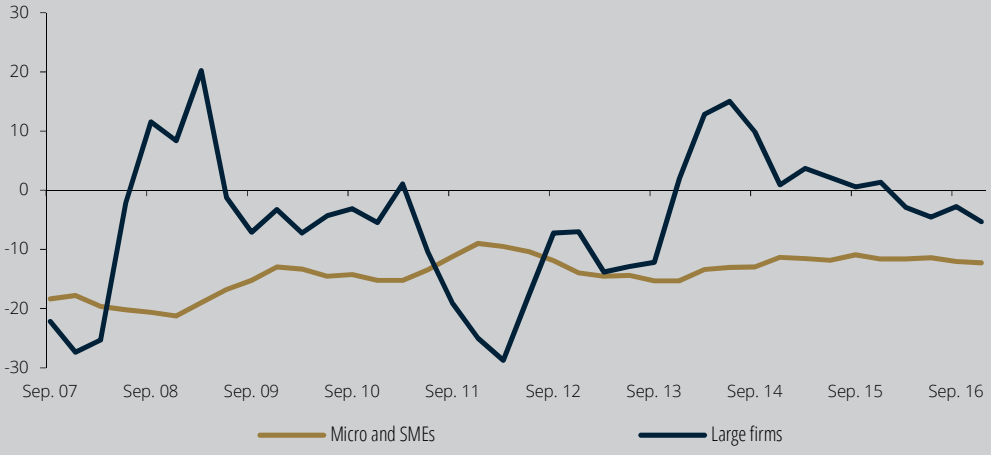


Chart 3.17 • Credit to firms with a past default event

| Percentage points

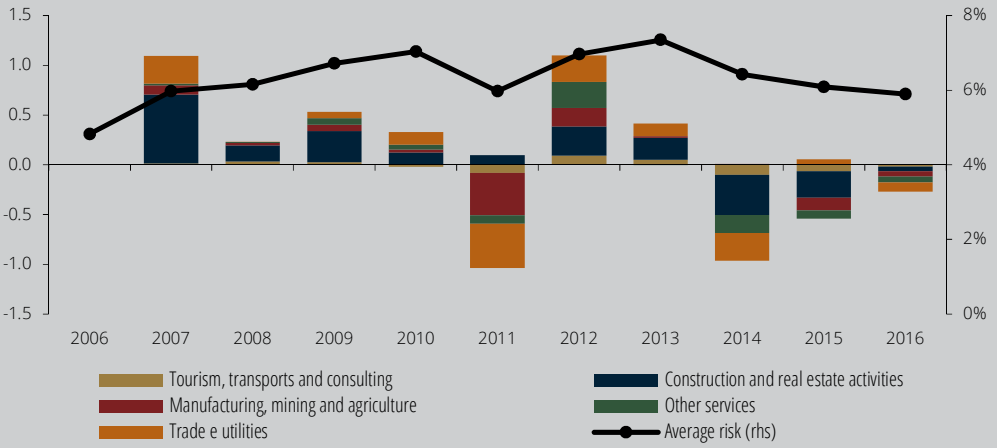
Source: Banco de Portugal.

Note: This analysis includes the evolution of banking loans to firms that registered a credit default event during the period of 2006 to 2016.

a broadly-based increase was observed in the corporate profitability ratio. This improvement was experienced by all economic sectors, with profitability levels in 2015 standing at levels above those of 2007 in wholesale trade and transportation, and services and accommodation. Developments in the ratio of indebtedness to profitability continued to differ across economic sectors. Despite improvements compared with the past, construction and real estate continue to show high levels of indebtedness and low levels of profitability. By contrast, manufacturing, mining and quarrying and agriculture posted the lowest level of indebtedness and the highest level of profitability. In addition, the level of indebtedness in services and accommodation grew considerably, without a significant change occurring in the sector's profitability.

Chart 3.18 • Average risk for firms with only performing loans and industry contributions

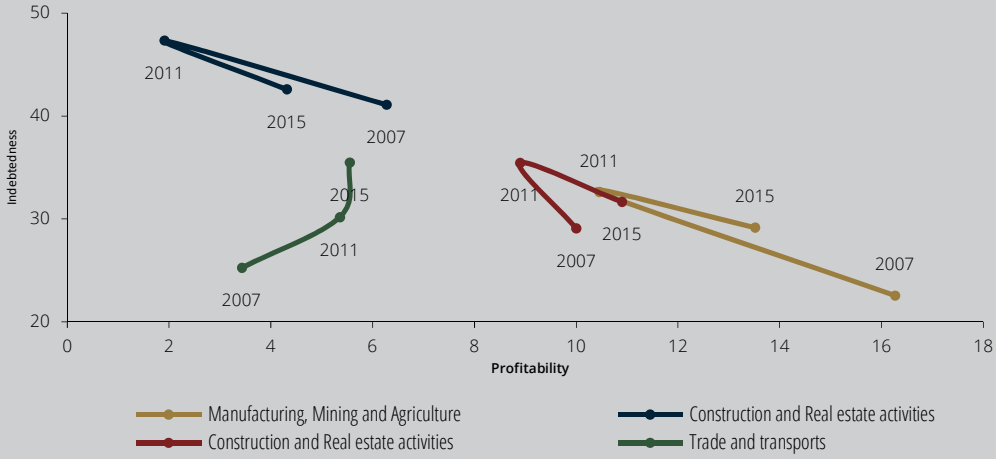
| Annual rate of change and contributions, percentage and percentage points



Source: Banco de Portugal.

Chart 3.19 • Firm's indebtedness and profitability

| In percentage



Source: Banco de Portugal.

Note: Firm's indebtedeness ratio calculated as the sum of total debt over total assets. Firm's profitability ratio calculated as EBITDTA (which stands for earnings before depreciations and amortizations, interest expenses, and income tax) divided by the sum of equity and total debt.

Box 3.2.1 | Market dynamics and the deleveraging of Portuguese firms

The economic and financial crisis of 2008 highlighted the negative effects of the excessive indebtedness of Portuguese firms on financial stability and economic growth. The Economic and Financial Assistance Programme identified the private sector deleveraging, including the financial system, as an important factor for the adjustment of the Portuguese economy. In this context, the indebtedness of Portuguese non-financial corporations as a proportion of total assets, is estimated to have declined by approximately 4 p.p. to 49 per cent in the period between 2012 and 2015, accounting for 118 per cent of GDP by the end of this period.[12]

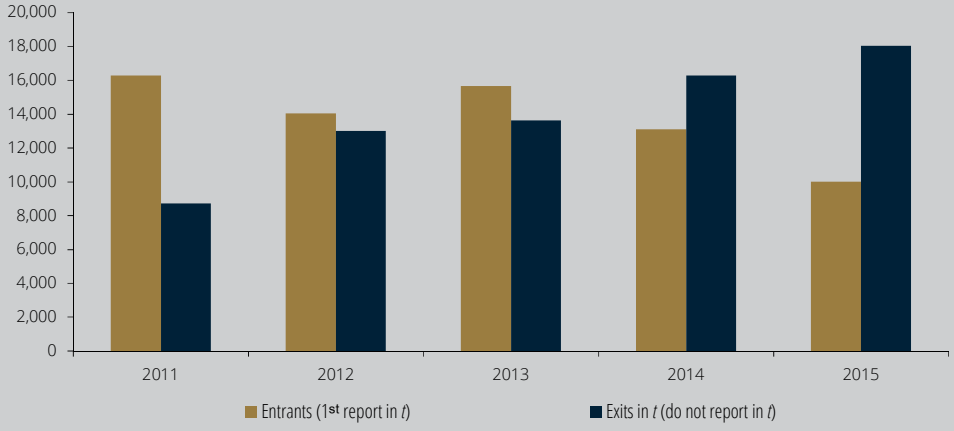
Simultaneously to the deleveraging process observed in the past few years in the private sector, the number of firms ceasing their activity increased.[13] Therefore, it is important to understand to what extent market dynamics contributed to explain the deleveraging process of Portuguese firms.

The firm balance sheet information reported in the survey Simplified Corporate Information (*Informação Empresarial Simplificada* – IES) was considered in the analysis.[14] This dataset allows the identification of firms exiting and entering the market in the period between 2010 and 2015. A firm exit in year *t* is defined by its absence from the IES in that year, provided that this absence does not constitute a reporting gap.[15] The entry of firms in the market is identified by the first year reporting to the IES. Chart 1 shows the number of new firms and firms that have ceased their activity in the period between 2010 and 2015.

In the analysis, debt includes the funding obtained (loans and debt securities) by the firm and reported in the IES. According to this information, the total debt of non-financial corporations declined by around 3.4 percent in 2014 and 6.0 percent in 2015 (Chart 2).

Chart 3 depicts the contributions to the change in the debt of non-financial corporations, considering the set of new firms, the set of firms that have ceased their activity, and the set of firms that remained active in the period between 2011 and 2015. The contribution of the set of new firms to the aggregate change in debt is small, in contrast to the substantial contribution of firms that have

Chart 1 • Entry and exit of firms



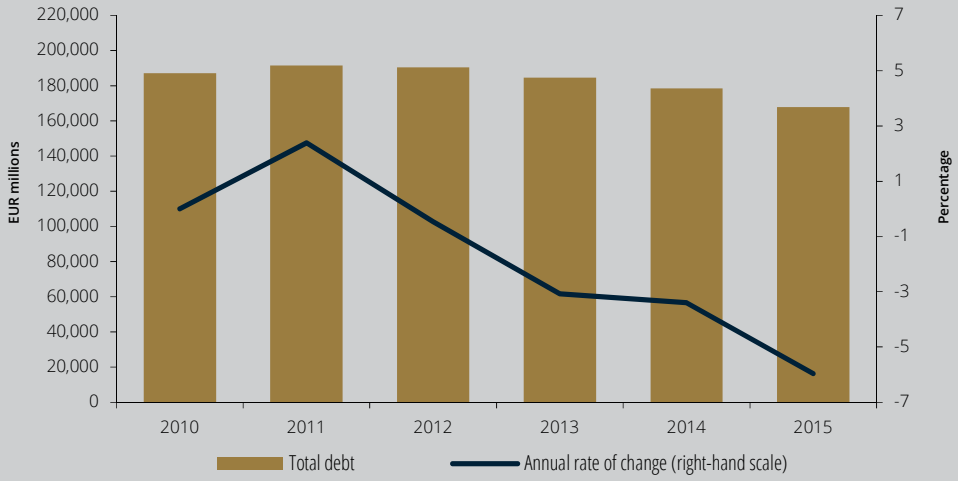
Source: Banco de Portugal.

Note: The sample includes private non-financial corporations of all economic activity sectors except insurance and financial activities.

ceased their activity. The negative contribution of firms exiting the market to changes in debt was particularly evident in 2015.[16] In turn, the debt of firms that remained active increased considerably in 2011 and less significantly in 2012, and decreased in the following years.

Nevertheless, the exit of firms from the market does not necessarily mean that their debt amounts are removed from the debt outstanding amounts recorded in the balance sheets of financial institutions, which are the main source of information when analysing the growth of credit granted by the financial system. In fact, the existence of assets and personal guarantees allows the repayment of part of the debt even after the firm ceases its activity. This box does not analyse this difference between information reported to the IES and information in the balance sheets of financial institutions.

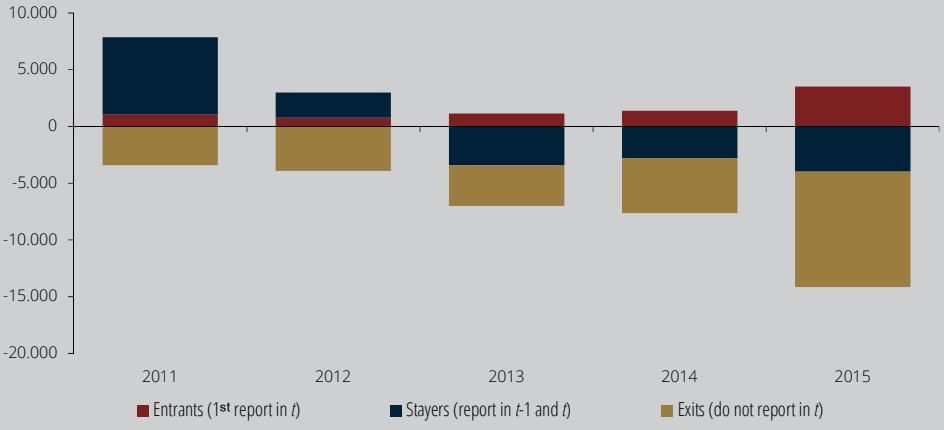
Chart 2 • Total debt of private non-financial corporations | Annual rate of change



Source: Banco de Portugal.

Note: Total debt includes loans and debt securities. The sample includes private non-financial corporations of all economic activity sectors except insurance and financial activities.

Chart 3 • Contributions to debt change by firms' dynamics | EUR millions



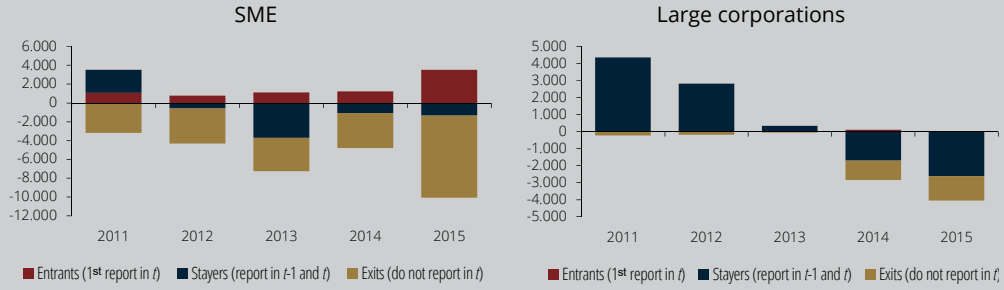
Source: Banco de Portugal.

Note: Total debt includes loans and debt securities. The sample includes private non-financial corporations of all economic activity sectors except insurance and financial activities.

Chart 4 shows the contributions to changes in debt by firm size. The debt reduction resulting from the exit of firms is concentrated in smaller-sized firms. Large firms that remained in the market in 2014 and 2015 also registered a reduction in debt.

The decomposition of the contributions to changes in debt by sector of economic activity shows that the exit of firms in the construction sector had a substantial impact on debt reduction, especially in the last year (Chart 5). Firms in the trade sector that remained in the market in 2012 and 2013 significantly reduced their debt. The debt reduction resulting from the exit of firms in this sector of economic activity is particularly relevant in 2015. In the manufacturing sector, it is particularly relevant the debt reduction of firms that remained in the market in 2014 and firms that ceased their activity in 2015.

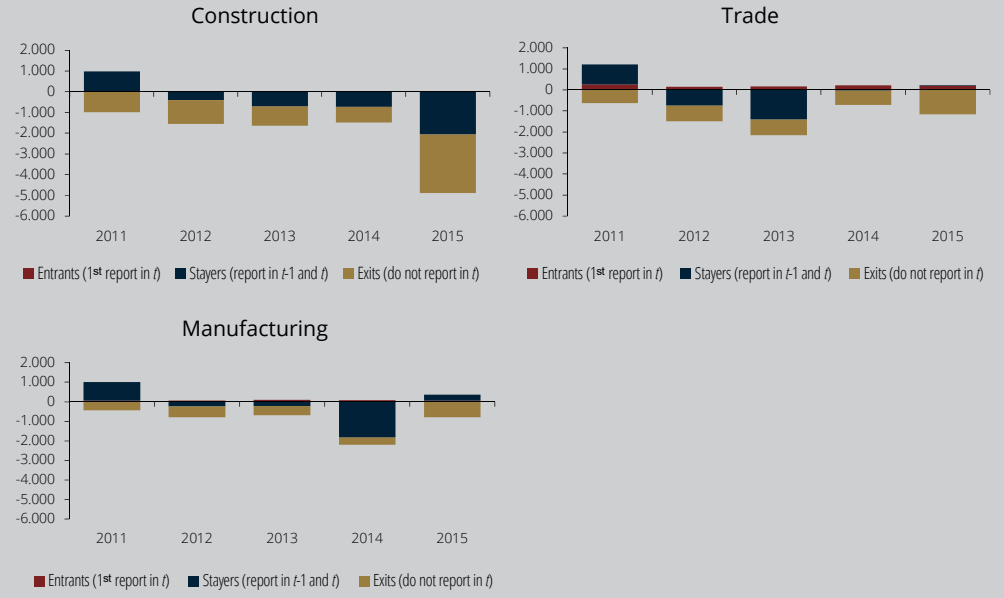
Chart 4 • Contributions to debt change by firms' dynamics | By firm size, EUR millions



Source: Banco de Portugal.

Note: Total debt includes loans and debt securities. The sample includes private non-financial corporations of all economic activity sectors except insurance and financial activities.

Chart 5 • Contributions to debt change by firms' dynamics | By sector of economic activity, EUR millions



Source: Banco de Portugal.

Note: Total debt includes loans and debt securities. The sample includes private non-financial corporations of all economic activity sectors except insurance and financial activities.

In this context of corporate deleveraging, it is important to know to what extent the market dynamics contributed to corporate indebtedness and profitability. The empirical analysis presented below decomposes changes in indebtedness and profitability of Portuguese firms in the period between 2010 and 2015, according to market dynamics and firm age. In the analysis, firms are classified according to their age: *young* firms are those that have been in the market for two years or less, *vintage* firms are those with more than two years and less than five, and established firms are those aged more than five years. Then, the following equation was estimated:

$$y_{it} = \beta_0 + \alpha_i + \delta_t + \gamma_s + \beta_1 Exit_{it} + \beta_2 Entrant_{it} + \beta_3 Young_{it} + \beta_4 Vintage_{it} + u_{it}$$

where y_{it} assumes two indicators: indebtedness (ratio of total debt to assets) and profitability (ratio of EBIT[17] to assets) of firm i in year t. The variables *Exit* and *Entry* are binary and equal to one for firms exiting and entering the market respectively.The variables *Exit* and *Entrant* are binary variables equal to one for firms exiting and entering the market, respectively. The variables *Young* and *Vintage* are also binary variables equal to one for firms less than two years old and firms with two to five years, respectively. Finally, the terms α_i ,δ_t and γ_s denote a set of firm, time, and sector of economic activity fixed effects, respectively. Firm and sector fixed effects account for their specific (observed and unobserved) characteristics, provided they remain constant over time. In turn, time effects attempt to capture the cyclical position of the economy. In this case, the comparison group are the established firms that remained in activity. In order to avoid extreme values, observations above the 99th percentile and below the 1st percentile were not considered. The analysis was performed using the fixed-effects estimator for panel data.

The results of the estimation are reported in Table 1. According to the estimates, firms exiting the market are the most indebted and the least profitable. In turn, firms that have recently entered the market are less indebted and less profitable than older incumbent firms. In particular, firms exiting the market are approximately 33.9 p.p. more indebted and 4.93 p.p. less profitable than older incumbent firms, on average. This selection dynamics suggests that the improvement in the aggregate financial position of Portuguese firms is partly due to the fact that the most indebted and less profitable firms have exited the market.

Table 1 • Fixed effects estimates

	Indebtedness	Profitability
Entrant	-0.0332***	-0.0413***
	(0.0031)	(0.0018)
Exit	0.3386***	-0.0493***
	(0.0047)	(0.0024)
Young	-0.0603***	-0.0543***
	(0.0037)	(0.0026)
Vintage	-0.0223***	-0.0067***
	(0.0025)	(0.0016)
Observations	2,001,156	1,063,059

Note: *, **, *** denote statistical significance at 1, 5, and 10 percent, respectively. Both specifications include firm, sector of economic activity, and time fixed effects. Robust standard errors clustered at firm level in parentheses.

4. Fiscal policy and situation

The general government deficit declined significantly, against a background of a stabilisation in the structural balance and a reduction in the primary structural balance

In 2016, the general government deficit stood at 2.0 per cent of GDP, which is a historically low level (Table 4.1). This figure stands below the official target included in the State Budget for 2016 (2.2 per cent of GDP), the revised estimate included in the State Budget for 2017 (2.4 per cent of GDP), and the limit laid down by the European Union Council in August 2016 (2.5 per cent of GDP).

The deficit improved by 2.3 p.p. *vis-à-vis* the previous year, chiefly as a result of the change in the impact of temporary measures (Chart 4.1). In 2015 the general government balance was negatively affected by the resolution of BANIF (-1.4 per cent of GDP). In 2016 the effect of temporary measures corresponds to revenue obtained from full payments made within the scope of a special programme for the settlement of overdue tax and social contributions (*Programa Especial de Redução do Endividamento ao Estado* – PERES) and the refund by the European Financial Stability Facility (EFSF) of amounts previously paid by Portugal under the Economic and Financial Assistance Programme.[18] Overall, these effects contributed to increase the fiscal balance in 2016 by 0.4 per cent of GDP. Therefore, the decline in the fiscal deficit adjusted for temporary measures stood at 0.5 p.p. of GDP, 0.3 p.p. of which refer to a drop in interest expenditure.

Table 4.1 • Main fiscal indicators | In percentage of GDP

	2010	2011	2012	2013	2014	2015	2016	Change 2016-2015 [a]
Overall balance (1)	**-11.2**	**-7.4**	**-5.7**	**-4.8**	**-7.2**	**-4.4**	**-2.0**	**2.3**
Temporary measures and special factors [a] (2)	-2.8	-0.2	0.0	0.3	-3.6	-1.4	0.4	1.8
Overall balance excluding temporary measures and special factors (3 = 1-2)	**-8.4**	**-7.2**	**-5.6**	**-5.2**	**-3.6**	**-3.0**	**-2.4**	**0.5**
Cyclical component (4)	1.5	0.6	-1.7	-2.3	-1.4	-0.6	-0.1	0.5
Structural balance[b] (5 = 3 - 4)	**-9.9**	**-7.9**	**-3.9**	**-2.9**	**-2.2**	**-2.4**	**-2.3**	**0.0**
Interest expenditure (6)	2.9	4.3	4.9	4.9	4.9	4.6	4.2	-0.3
Structural primary balance (7=5+6)	**-7.0**	**-3.5**	**1.0**	**2.0**	**2.7**	**2.2**	**1.9**	**-0.3**
Structural revenue (percentage of trend GDP) [b]	**39.9**	**42.0**	**43.1**	**44.9**	**44.9**	**44.1**	**42.5**	**-1.6**
Structural primary expenditure (percentage of trend GDP) [b]	**47.1**	**45.6**	**42.2**	**43.0**	**42.3**	**42.0**	**40.6**	**-1.3**
Public debt	**96.2**	**111.4**	**126.2**	**129.0**	**130.6**	**129.0**	**130.4**	**1.4**
Change in public debt (in p.p.)	12.6	15.2	14.8	2.8	1.6	-1.6	1.4	–
(-) Primary balance	8.2	3.1	0.8	0.0	2.3	-0.2	-2.2	–
Differential between the effects of interest and of GDP growth	0.8	6.4	10.0	3.5	2.8	-0.1	0.5	–
Deficit-debt adjustments	3.5	5.8	4.0	-0.6	-3.5	-1.3	3.1	–

Sources: INE and Banco de Portugal.

Notes: (a) Special factors are operations with an one-off effect on the general government deficit which cannot be treated as temporary measures according to the definition adopted in the Eurosystem. (b) Structural figures are adjusted for the impacts of the cycle, temporary measures and special factors. The cyclical component and temporary measures are computed by Banco de Portugal according to the methodologies adopted in the Eurosystem.

According to the cyclical adjustment methodology adopted in the Eurosystem, economic activity gave a positive contribution to fiscal developments, accounting for 0.5 p.p. of the deficit improvement. Therefore, the structural balance is estimated to have stabilised in 2016.[19] As regards the structural primary balance, which excludes the impact of interest expenditure, it is estimated to have declined for the second year in a row (by 0.3 p.p. of trend GDP).

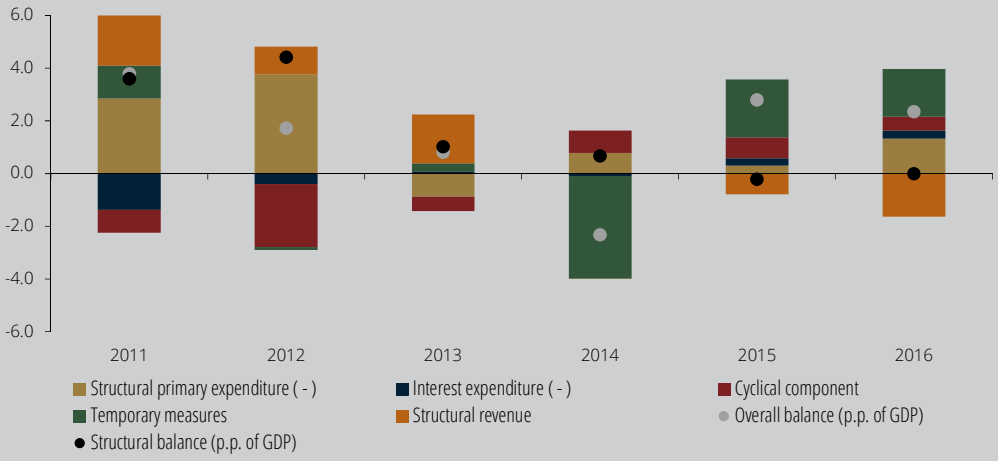
The decline in the structural primary balance in 2016 reflects a drop in structural revenue by 1.6 p.p. of trend GDP, which more than offset the 1.3 p.p. contraction recorded by structural primary expenditure (Chart 4.2). In particular, in structural terms, both the tax and contributory burden and the non-tax revenue declined as a ratio to trend GDP (by -0.9 p.p. and -0.7 p.p. respectively).

The drop in structural revenue largely stemmed from tax revenue developments

In actual terms, tax and contributory revenue rose by 2.2 per cent in 2016, reflecting an increase in revenue from taxes on production and imports and social contributions. Economic activity is estimated to have given a positive contribution to these developments. They also reflect revenue collected within the scope of

Chart 4.1 • Breakdown of the change in the general government balance

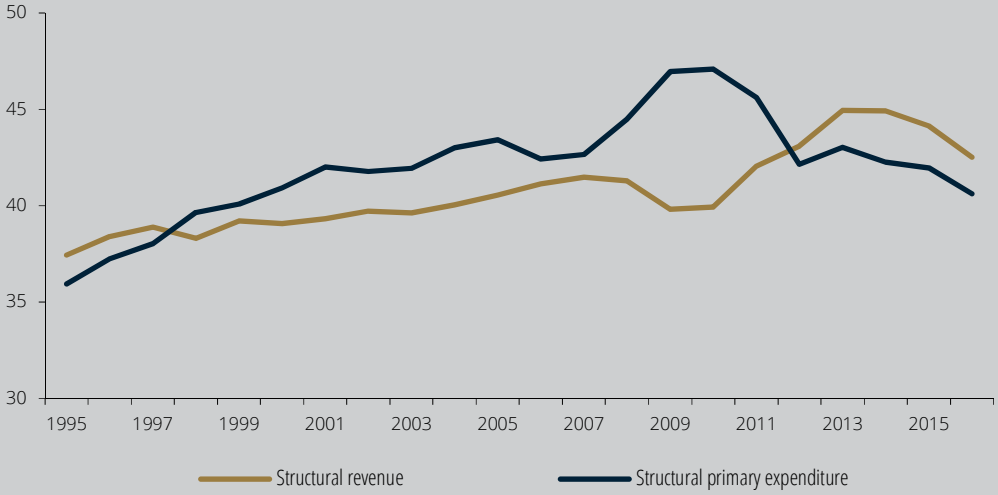
| In percentage points of trend GDP



Sources: INE and Banco de Portugal.

Chart 4.2 • Structural revenue and primary expenditure developments

| In percentage of trend GDP



Sources: INE and Banco de Portugal.

PERES, part of which, as previously mentioned, has a temporary nature. The structural tax and contributory burden, which is adjusted for the impact of the cycle and temporary measures, stabilised in 2016, implying a decline by 0.9 p.p. of trend GDP (Chart 4.3). These developments are chiefly explained by a drop in revenue from the taxes on income and wealth (-0.8 p.p.), reflecting the impact of policy measures implemented not only in 2016, but also in previous years (Box 4.1: 'Structural developments of tax revenue in 2016').

In 2016 non-tax revenue declined by 6.3 per cent, resulting from a drop in other current revenue (including sales of goods and services) and capital revenue. The 3.7 per cent decline in other current revenue reflects decreases in most of its items, particularly as regards interest and dividends. Capital revenue, in turn, declined by 27.9 per cent in actual terms. This occurred in spite of the refund of the margins previously paid to the EFSF, which, as previously mentioned, has a temporary impact. Therefore, the change in capital revenue adjusted for temporary measures would be more negative in 2016, at -51.0 per cent, as a result of the significant fall in capital transfers from the European Union matched by expenditure in the same year.

The decrease in general government expenditure chiefly reflected a decline in investment

The structural decline in primary expenditure was chiefly driven by a decrease in capital expenditure. Adjusting for the effect of temporary measures with an impact on 2015, the decline in capital expenditure was 0.9 p.p. of trend GDP.[20] These developments were largely due to the decline in public investment (Chart 4.4). In 2016, in particular, public investment declined by 30.9 per cent in nominal terms, which partly mirrored a base effect resulting from the recording of real estate acquisitions by Oitante in 2015, within the scope of the resolution of BANIF, and the recording of military material deliveries in 2016.[21] The change in public investment adjusted for these factors stands at -24.8 per cent. This decline may have partly reflected a decrease in funds received from the European Union and it was particularly relevant in the Autonomous Services and Funds subsector. Turning to other capital expenditure adjusted for the impact of temporary measures, there was also a decline as a ratio to trend GDP (0.3 p.p.), reflecting several of base effects that contributed to a one-off growth of this expenditure item in 2015.[22]

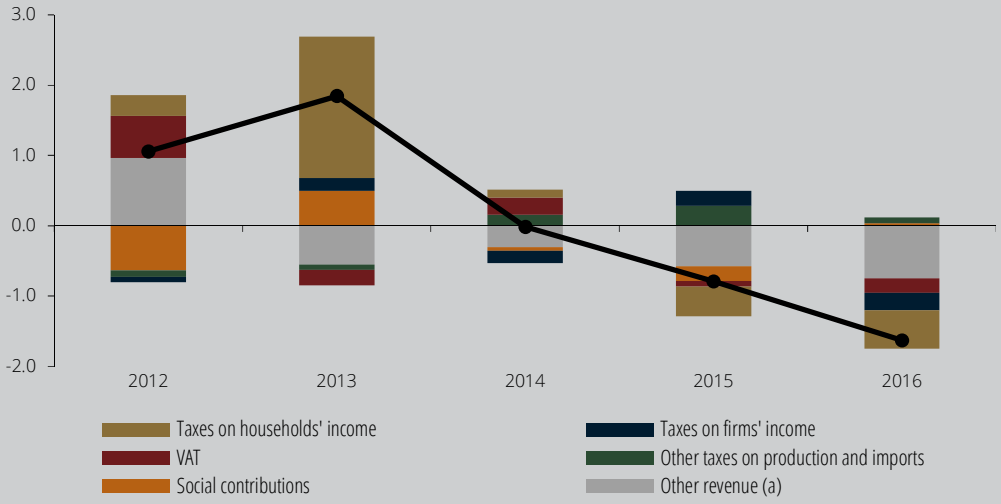


Chart 4.3 • Breakdown of the change in structural revenue
| In percentage points of trend GDP

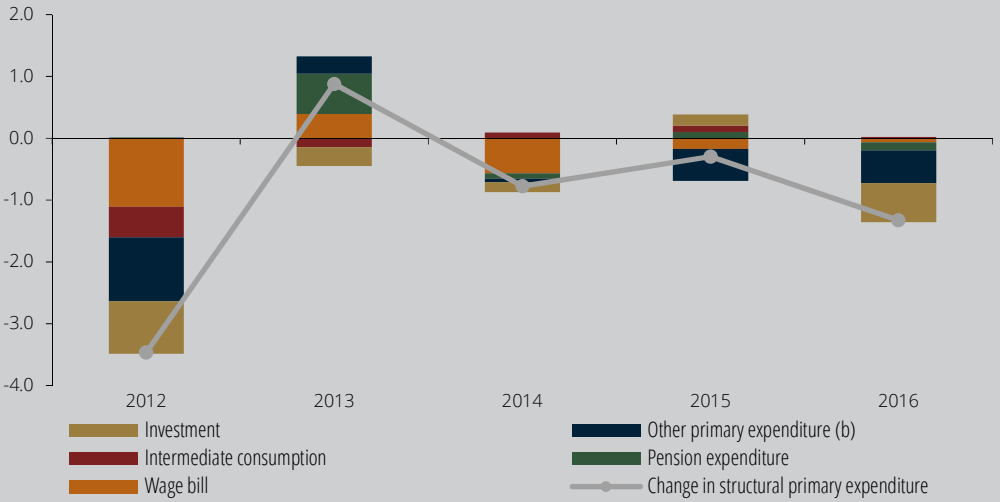
Sources: INE and Banco de Portugal.

Note: (a) Other revenue encompasses 'other current' revenue, including sales, and 'capital revenue'.

In 2016, expenditure on social benefits in cash increased by 1.3 per cent, both in actual and structural terms, and declined by 0.2 p.p. as a ratio to trend GDP. Expenditure on unemployment benefits decreased by 14.3 per cent in actual terms (14.1 per cent in structural terms). This was due to a significant decline in the number of subsidised unemployed, which was more marked than as regards the overall number of unemployed individuals in the economy, and to a slight increase in the average benefit. In 2016, pension expenditure increased by 1.5 per cent. Whereas pension expenditure paid by CGA (public employees' pension system) virtually stabilised due to a lower growth of new retirements, in the general pension system expenditure grew by 2.4 per cent. This is partly explained by the increase in the number of old-age pensioners and the update of the lowest pensions, for the first time since 2010. Social benefits in kind, in turn, declined by 0.7 per cent, as a consequence of lower expenditure in the health sector.

Chart 4.4 • Breakdown of the change in structural primary expenditure

| In percentage points of trend GDP

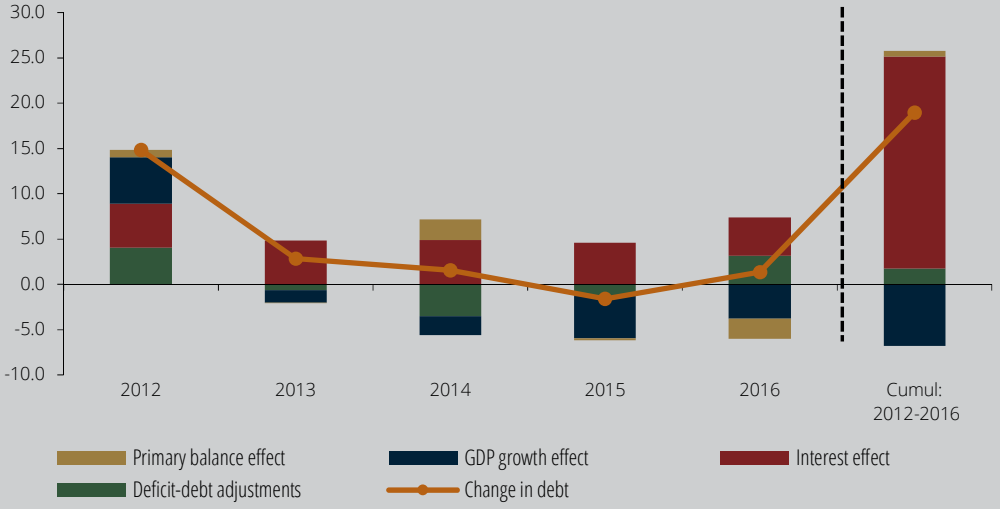


Sources: INE and Banco de Portugal.

Notes: (a) Other primary expenditure includes social payments excluding pensions, general government social contributions, subsidies and other current and capital expenditure.

Chart 4.5 • Breakdown of the change in public debt-to-GDP ratio

| In percentage points of GDP



Sources: INE and Banco de Portugal.

In 2016 compensation of employees and intermediate consumption remained unchanged as a ratio to trend GDP. Compensation of employees increased by 2.8 per cent, after two years of decline. This is explained by the growth in wages and salaries, as a result of the full reinstatement of the wage cuts in force since 2011 and, to a lesser extent, of developments in the number of general government employees.[23] Indeed, in 2016, against a backdrop of a decrease in the number of weekly hours worked in general government, from 40 to 35, the number of employees recorded, for the first time since 2011, a positive quarterly average change. In the case of intermediate consumption, the 2.9 per cent increase was strongly influenced by the rise in expenditure related to public-private partnerships in the road sector, which was again significant. Excluding these outlays, this expenditure item decelerated.

The public debt ratio increased, reflecting a significant accumulation of deposits

At the end of 2016, the general government debt stood at 130.4 per cent of GDP, 1.4 p.p. above the figure recorded at the end of the previous year. In a context where the primary balance contributed to reduce the debt ratio (by -2.2 p.p. of GDP), the change was chiefly explained by deficit-debt adjustments (3.1 p.p. of GDP). The fact that the implicit interest rate on debt exceeded the nominal GDP growth rate has also contributed to increase the ratio (by 0.5 p.p. of GDP) (Chart 4.5).

As regards deficit-debt adjustments, the figure recorded in 2016 is mostly explained by the increase in deposits held by the general government by an amount equivalent to 2.4 p.p. of GDP. This deposit accumulation was likely related to the need to finance the capital injection by the State in Caixa Geral de Depósitos, which occurred at the beginning of 2017. Therefore, in 2016 the debt ratio net of general government deposits declined from 118.9 to 118.1 per cent of GDP.

Similarly to developments in 2015, part of the loan granted by the IMF under the Economic and Financial Assistance Programme was repaid in advance in 2016 (2.4 per cent of GDP). This repayment contributed to reduce the share of debt held by non-residents, from 66.5 per cent at the end of 2015 to 58.2 per cent at the end of 2016 (Chart 4.6). This effect was reinforced by the increased importance of Banco de Portugal as a holder of Portuguese public debt, reflecting the widening of the Eurosystem's asset purchase programme to include sovereign bonds.[24] More specifically, between 2014 and 2016 the percentage of public debt held by the Central Bank increased from 0.7 to 8.8 per cent, implying an increase in the Central Bank's exposure to sovereign risk. This occurred against the decline in the share of non-residents and, to a lesser extent, of other MFIs as debt holders.

In the course of 2016, the Portuguese State participated regularly in sovereign debt markets. Against a backdrop of a widening in the differential between the cost of financing 10-year Portuguese and German debt, the allotment rates of long-term securities were higher than those recorded in 2015 (Chart 4.7). In 2016, in particular, the average rate on 10-year Treasury Bond auctions stood at 3.1 per cent, up from 2.3 in the previous year. As regards short-term issues, the average interest rate on Treasury Bill auctions declined slightly from 0.04 to 0.02 per cent.

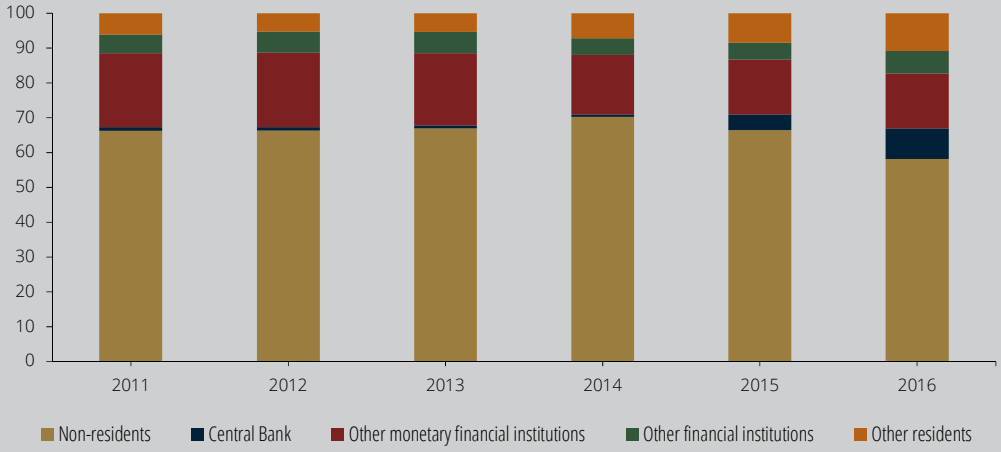
General government debt servicing expenditure declined from 4.6 to 4.2 per cent of GDP in the year under review, which is underpinned by a reduction in the implicit interest rate from 3.6 per cent in 2015 to 3.3 per cent in 2016.[25] These developments stem, on the one hand, from a decline in the interest burden associated with loans under the Economic and Financial Assistance Programme and, on the other hand, from the repayment of Treasury Bonds with higher rates than those of the new issues.

The euro area structural primary balance declined for the second year in a row

According to the European Commission Winter forecasts, published in February 2017, the structural primary balance in the euro area declined

Chart 4.6 • Breakdown of public debt by holder

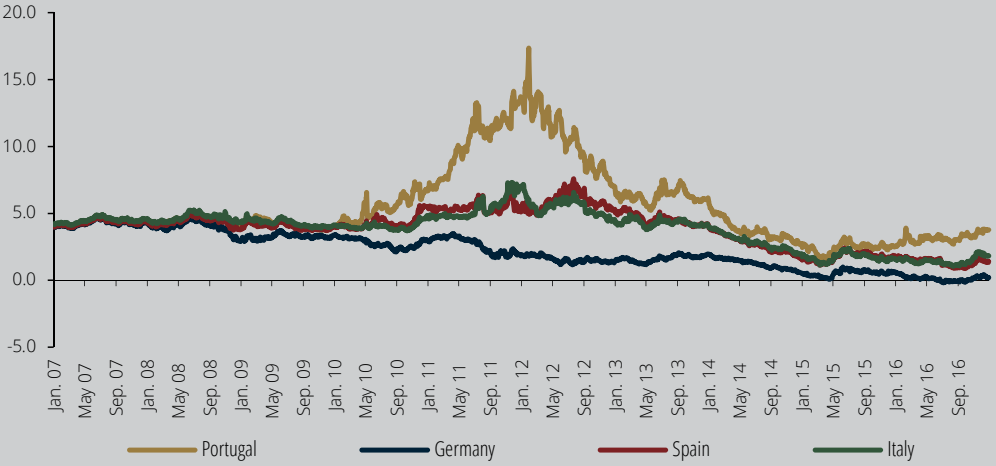
| Percentage



Source: Banco de Portugal.

Chart 4.7 • 10 year government bond yields

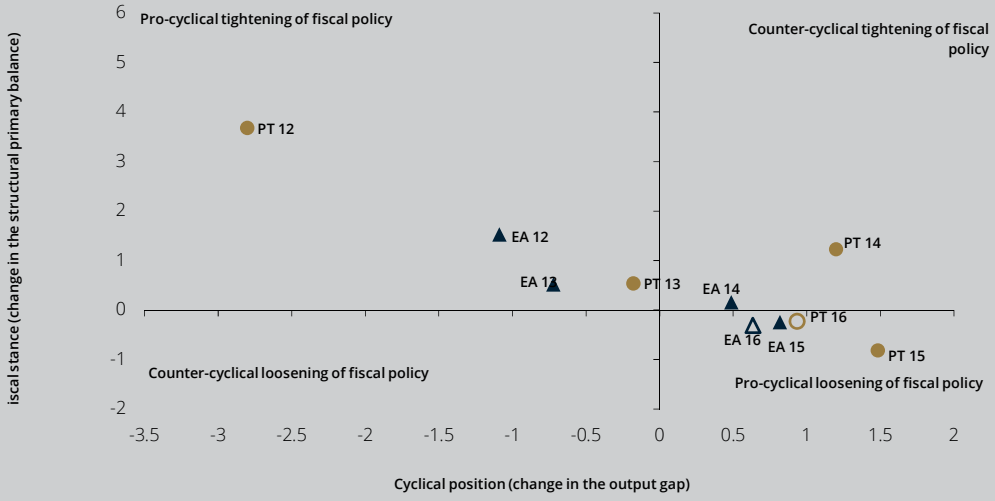
| Percentage



Source: Thomson Reuters.

Chart 4.8 • Fiscal policy and cyclical position in the euro area in 2016

| In percentage points of potential GDP



Source: European Commission (Winter 2017 Forecasts).

Note: The cyclical position of the economy is assessed by the change in the output gap, which broadly corresponds to the difference between actual GDP and potential GDP growth rates.

slightly in 2016 (Chart 4.8). This reflects declines in the structural primary balance in most Member States and particularly in Spain, Cyprus, Austria and Italy. In turn, Greece, Malta, the Netherlands, Latvia and Estonia followed fiscal consolidation strategies in 2016. Regarding economic activity, the Commission estimates that GDP growth in the euro area exceeded the change in potential GDP, although the difference between these aggregates remained negative. This implies that fiscal policy was pro-cyclical in 2016, for the second year in a row.

Within the European fiscal surveillance framework, the excessive deficit procedures for Ireland, Slovenia and Cyprus were abrogated in 2016. As regards the euro area countries subject to the corrective arm of the Stability and Growth Pact, 2016 was the deadline for the correction of the excessive deficit in Portugal and Greece. In both cases, the nominal deficit stood below 3 per cent of GDP (Table 4.2). Spain and France, whose correction deadlines are 2018 and 2017 respectively, recorded nominal deficits above the reference value.

In 2016 public indebtedness remained at a very high level in most euro area countries (Chart 4.9). In particular, the public debt ratio stood below the 60 per cent of the GDP reference value in only 6 of the 19 Member States. Compared with the previous year, there were important declines in Slovenia, Ireland, Germany and the Netherlands. Nevertheless, in 2016 only Malta recorded a public debt ratio below that of 2007, before the outset of the financial crisis.

Table 4.2 • Euro area countries in excessive deficit procedure | As a percentage of GDP

Country	European Council decision date	Current deadline for correction	Last change in the correction year	Fiscal balance in 2016
Portugal	02-12-2009	2016	08-08-2016	-2.0
Spain	27-04-2009	2018	08-08-2016	-4.5
Greece	27-04-2009	2016	04-12-2012	0.7
France	27-04-2009	2017	10-03-2015	-3.4

Sources: Eurostat (Excessive Deficit Procedure – April notification) and European Commission.

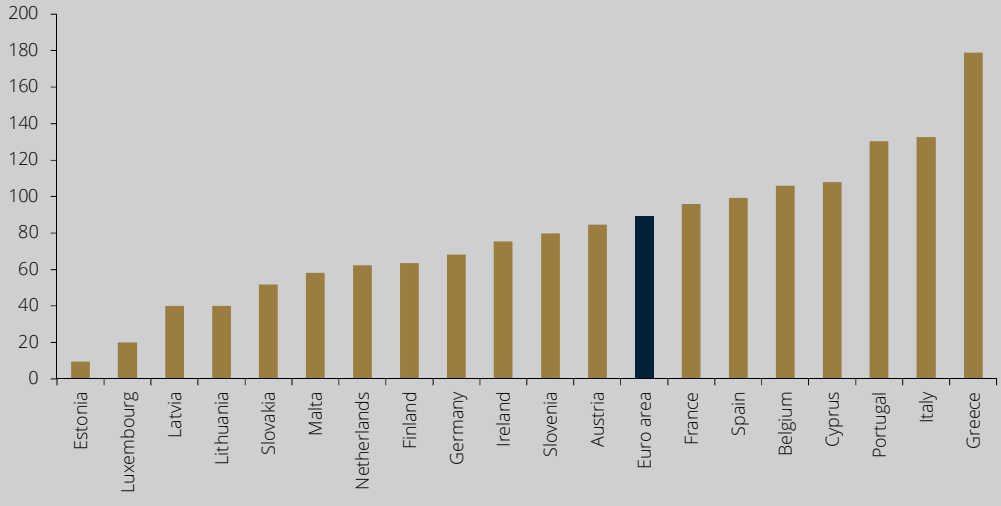


Chart 4.9 • Public debt-to-GDP ratio in the Euro Area in 2016 | As a percentage of GDP

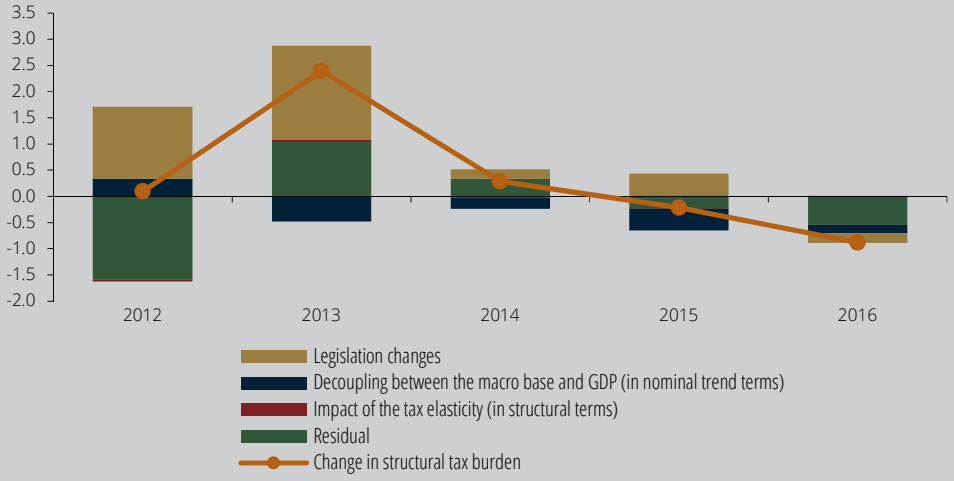
Source: Eurostat.

Box 4.1 | Structural developments in tax revenue in 2016[26]

In 2016 the ratio of structural revenue from taxes and social contributions to trend GDP declined by 0.9 p.p. *vis-à-vis* the previous year. This stemmed from a decline in taxes on income and wealth and, to a smaller extent, in taxes on production and imports (Chart 1). In the year under review, structural revenue from social contributions as a ratio to trend GDP remained unchanged. Note that the decline in structural tax revenue occurred notwithstanding the positive contribution of the permanent component of receipts obtained within the scope of PERES (0.05 p.p. of GDP).

In 2016 structural revenue from taxes on income and wealth declined by 0.8 p.p. of trend GDP, driven by the effect of legislative changes. In particular, revenue from taxes on households declined by 0.6 p.p. in structural terms, largely reflecting the elimination of the Personal Income Tax surcharge introduced in 2013 and the effect of the reform of this tax in 2015 (which impacted 2016 outturn via an increase in net refunds). The impact of the Personal Income Tax reform exceeded the initial estimates, which negatively affects the residual component. This component also reflects the decline in receipts from final withholding taxes on capital revenue resulting from the decrease in interest rates on financial investments. As regards the structural revenue from taxes on corporate income, there was a decline by 0.2 p.p. of trend GDP, reflecting measures approved in previous years. Indeed, the collection of the Corporate Income Tax was negatively affected by the decline in the statutory tax rate from 23 to 21 per cent (within the scope of the reform initiated in 2014), as well as by the change, in 2015, in the regime applicable to investment funds, which brought forward to that year revenue that would have been collected in 2016. These effects more than offset the overall positive impact of the change in the asset assessment regime included in the State Budget for 2016 and the permanent part of the Corporate Income Tax revenue collected under PERES (Chart 2).

Chart 1 • Breakdown of the overall change in structural fiscal burden | In percentage points of trend GDP

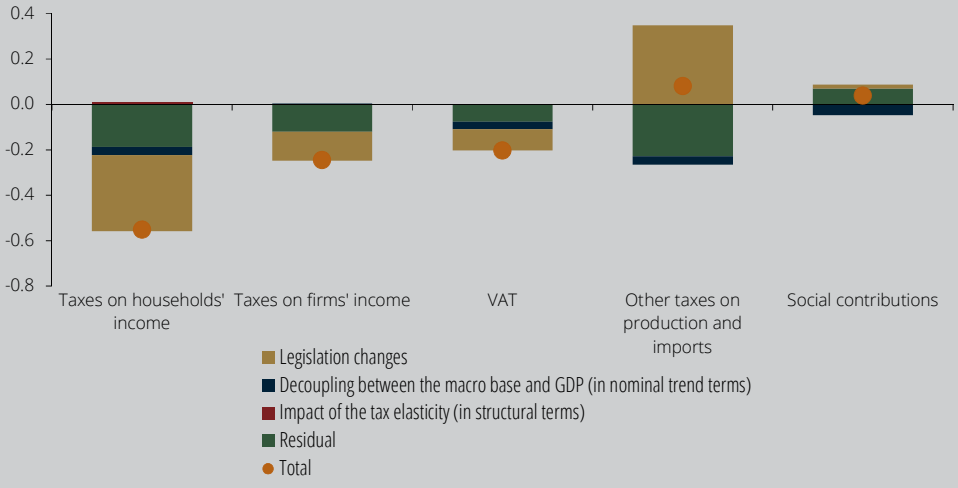


Sources: INE and Banco de Portugal.

In structural terms, the ratio of revenue from taxes on production and imports to trend GDP declined by 0.1 p.p. in 2016. This was chiefly due to the fall in VAT structural revenue (-0.2 p.p.), which more than offset the increase in the collection of other indirect taxes (0.1 p.p.). In the case of VAT revenue, special reference should be made to the negative effect associated with the cut in the rate applicable to some restaurant services. The residual component of this tax is negative, reflecting the unusually high growth of refunds in the first months of 2016. However, this may have been partly offset by the possible overestimation of the effect of the above mentioned VAT rate cut. As regards the other indirect taxes, the structural increase in the ratio of revenue to trend GDP was largely due to several legislative changes included in the State Budget for 2016 (yielding an overall impact of 0.3 p.p. of trend GDP). Due to the magnitude of their estimated impacts, reference should be made to the contributions of the rises in taxes on oil products and on tobacco (0.2 p.p. and 0.1 p.p. of trend GDP respectively). A negative residual (-0.2 p.p.) possibly indicates the overestimation of these effects.[27]

Finally, the ratio of structural revenue from social contributions to trend GDP remained virtually unchanged in 2016, reflecting two symmetrical effects. On the one hand, the fact that the private sector trend wage bill grew less than nominal GDP should have given a negative contribution to structural revenue from social contributions. On the other hand, similarly to previous years, the residual component net of the effect of social contributions related to the civil servants regime was positive.[28] This result may suggest gains from increased efficiency in the collection of contributions.

Chart 2 • Breakdown of the change in structural taxes and social contributions in 2016
| In percentage points of trend GDP



Sources: INE and Banco de Portugal.

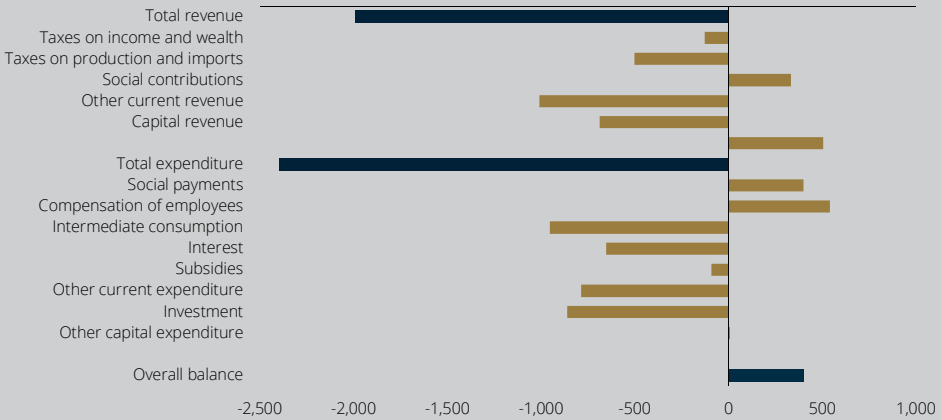
Box 4.2 | Analysis of deviations in budget execution in 2016

In 2016 the general government deficit stood below the first official estimate for the year, presented in the State Budget for 2016, and the revised estimate included in the State Budget for 2017. However, in the course of the year, different fiscal projections released by international institutions suggested that the official target would be missed. Against this background, an analysis of the fiscal deviations gains particular relevance, allowing not only for a better understanding of the 2016 outcome, but also for the identification of some risks in budget execution in the current year.

The State Budget for 2016 was published in early February and entered into force only in April. The estimate for the deficit in the National Accounts included in this document was thus based on information for 2015 with a lower than usual degree of uncertainty and appears to have benefitted from some information on revenue developments at the beginning of the year. The differential between budget outturn and this estimate turned out to be very small (0.2 per cent of GDP), but is underpinned by a significant negative deviation in total expenditure that is almost fully offset by a similar and also negative differential on the revenue side (Chart 1).

Indeed, total general government revenue outturn fell significantly short of the amount envisaged when the State Budget for 2016 was prepared, reflecting, in particular, an overestimation of the collection of non-tax current revenue (including sales) and capital revenue. Growth of tax collection was also lower than expected, particularly as regards taxes on production and imports. In the latter case the deviation may reflect some overestimation of the impact of indirect taxation hikes included in the State Budget for 2016. Note that the decrease in tax revenue occurred in spite of the fact that developments in economic activity and, in particular, in private consumption were close to the projection included the State Budget for 2016. In addition, the deviation might have been more expressive if the PERES had not been implemented.

Chart 1 • Budget execution in 2016 in national accounts: deviations *vis-à-vis* the State Budget for 2016 | In million euro



Sources: INE and Ministry of Finance.

Total expenditure outturn stood also substantially below budgeted. A determining factor contributing to this result was the fact that the State Budget for 2016 stipulated a very significant amount of expenditure in the form of provisions, reserves and spending appropriations. This raises significantly the scope for discretion in the implementation of the budget and, given the limited nature of information available, hinders the monitoring of budget execution in the course of the year. For further details on the utilisation of budget control instruments in 2016, see Box 3 of the report 'Analysis of the General Government Account 2016', published by the Portuguese Fiscal Council.

Both intermediate consumption expenditure and other current expenditure posted in 2016 much lower figures than those considered in the State Budget for 2016. Due to its magnitude, reference should also be made to the negative deviation in public investment, which was likely be affected by the limited execution of revenue from structural funds received from the European Union. Finally, similarly to previous years, expenditure on debt servicing stood below forecasts. In fact, although the budget pointed to the near stabilisation of this expenditure item in 2016, it actually declined *vis-à-vis* the previous year.

5. Supply

Moderate growth of economic activity in 2016

As in the past few years, in 2016 Portuguese GDP *per capita* continued the convergence towards the average EU level and currently stands at around 71 per cent, still lower than observed at the onset of the international economic and financial crisis (Chart 5.1).

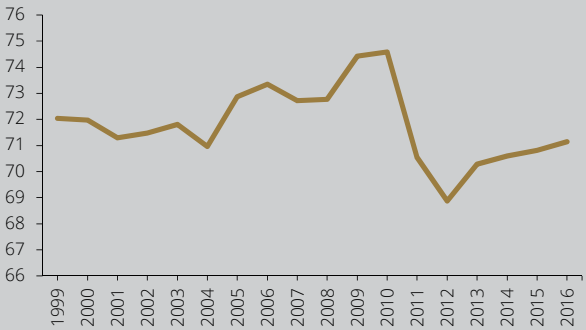
In 2016 gross value added (GVA) at basic prices increased by 0.8 per cent year-on-year, following 1.2 per cent growth in 2015. This increase consolidated the moderate recovery path started at the end of 2013, with overall developments consistent with the coincident indicator for activity and the economic sentiment indicator (Chart 5.2). This notwithstanding, there was a deceleration *vis-à-vis* the previous year and, in this context, the GVA level was still around 3 per cent lower than the value recorded in 2008.

GVA in the services sector rose by 1.1 per cent year-on-year in 2016, as in the previous year. Growth in this sector continued on the recovery path observed since early 2014. This increase mainly reflected 3.4 per cent activity growth in the subsectors trade and repair of motor vehicles and accommodation and food services (Chart 5.3). The dynamics observed in these sectors was associated with very favourable developments in tourism exports (9.7 per cent in real terms, following an 8.9 per cent increase in 2015) and the dynamics of domestic demand. The services confidence indicator maintained a positive stance in 2016 (Chart 5.4).

There was a 0.7 per cent year-on-year increase in industrial activity, in contrast to a 2.0 per cent rise in 2015. However, this was not accompanied by an increase in industrial confidence over the year.

In 2016 activity in the construction sector declined by 1.8 per cent, after a virtual stabilisation in 2015. In annual average terms, activity in this sector remained on a downward trend. This trend reflected this sector's structural adjustment to a lower level of activity, following high investment in construction in previous decades.

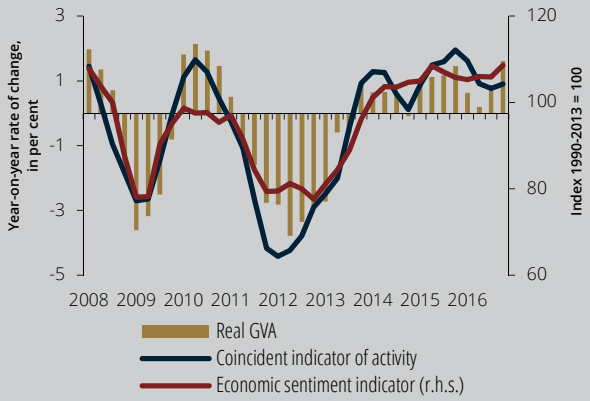
Chart 5.1 • GDP *per capita* at current prices, PPP adjusted, Portugal as a percentage of the European Union (EU15)



Source: European Comission (Ameco).

Note: EU15 refers to the initial 15 members of the European Union.

Chart 5.2 • GVA, Coincident indicator of activity and economic sentiment indicator



Sources: European Comission, INE and Banco de Portugal.

GVA in construction at the end of 2016 accounted for little over half of the value recorded in 2008.

Downward trend of the total population and labour force

In 2016 the resident population and the labour force continued to decline, by 0.3 per cent (Table 5.1). These developments continued to follow the downward trend observed since 2011, although slightly less markedly. Since 2008 the resident population and the labour force have decreased by approximately 250 and 350 thousand individuals respectively. Resident population in the 25-34 age group declined by 2.5 per cent in 2016, while the labour force fell by 2.7 per cent. These falls are quite relevant, but less sharp than those seen in the past few years. In cumulative terms, since 2008 the population and the labour force in this age group have declined by 377 and 345 thousand individuals respectively (Chart 5.5).

The demographic trends in the Portuguese economy cannot be easily reversed, and emigration phenomena tend to compound them. This is a significant drag on Portuguese economic growth, given that the labour factor is an input for production, and the population dynamics itself stimulates activity in various sectors. In addition, a more aged society puts pressure on the sustainability of social security schemes.

Improvement in labour market conditions

Labour market developments in 2016 continued to be characterised by a rise in employment and a decline in the unemployment rate, maintaining the improvement seen from the second quarter of 2013 onwards, in a context of more marked wage dynamics.

Table 5.1 • Labour market indicators | Year-on-year rate of change, in per cent, unless otherwise stated

	Thousands of individuals in 2016	Years			Semesters		
		2014	2015	2016	S2 2015	S1 2016	S2 2016
Population	10 306	-0,6	-0,5	-0,3	-0,5	-0,3	-0,3
Population 25-34 years	1180	-3,6	-2,8	-2,5	-2,7	-2,7	-2,3
Labour force	5178	-1,1	-0,6	-0,3	-0,5	-0,7	0,1
Labour force 25-34 years	1055	-3,8	-3,1	-2,7	-3,1	-2,9	-2,4
Participation rate 15-64 years (in % of the population)		73,2	73,4	73,7	73,5	73,4	74,0
Total employment	4605	1,6	1,1	1,2	0,9	0,6	1,8
Employees	3787	4,4	2,8	2,1	1,9	1,7	2,4
Self-employment	789	-8,2	-5,7	-3,2	-3,6	-5,0	-1,3
Total unemployment	573	-15,1	-11,0	-11,4	-9,7	-10,0	-12,8
Unemployment rate (in % of the labour force)		13,9	12,4	11,1	12,1	11,6	10,5
Unemployment rate 25-34 years (in % of the labour force)		15,5	13,1	12,5	12,5	13,4	11,6
Long-term unemployment (in % of total unemployment)		65,5	63,5	62,1	62,7	61,5	62,7
Discouraged inactives (in % of the labour force)		5,2	5,0	4,6	5,2	4,5	4,7

Source: INE.

Notes: Long-term unemployment includes the unemployed individuals that have been actively seeking employment for 12 months or more. The discouraged inactives include the inactive individuals who were available for work but had not looked for a job during the period.

According to data released by the Ministry of Labour, Solidarity, and Social Security, average wages declared to Social Security in 2016 grew by 1.6 per cent compared to the same period a year earlier, which reflects a 1.0 p.p. acceleration from the previous year. This greater wage dynamics should partly reflect the increase in the national minimum wage. The wage dynamics plays a particularly important role in a context where collective bargaining instruments, particularly of a sectoral nature, are still a few, although there has been a slight increase from the minimum level recorded in 2012. In Portugal the wages of around 90 per cent of employees are defined within the scope of these instruments. This greater wage dynamics seems to have also influenced the trend of the inflation rate in 2016 (Section 7: 'Prices').

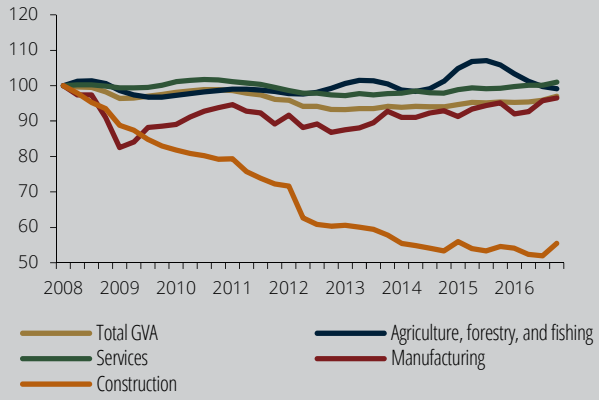
The unemployment rate declined, but remained at very high levels

According to Statistics Portugal's Labour Force Survey, in 2016 the total number of unemployed declined by 11.4 per cent year-on-year, after a 11.0 per cent fall in 2015 (Table 5.1). The unemployment rate was 11.1 per cent (12.4 per cent in 2015), maintaining the downward trend started in 2013 and standing close to the level observed in 2010. In 2016 the decline in the total number of unemployed year-on-year was particularly marked in the 35-44 age group. The share of unemployed receiving unemployment benefits amounted to 25.5 per cent in 2016, against 28.5 per cent in 2015 (Chart 5.6).

In addition, the number of discouraged workers, i.e. individuals not actively seeking a job but who are available for work, accounted for around 4.6 per cent of the labour force in 2016, slightly below the value recorded in 2015 (5.0 per cent). The measure of the unemployment rate that also includes discouraged workers continued to evolve in parallel with that of the official unemployment rate, after having grown more rapidly than the latter up to 2013 (Chart 5.7). Nevertheless, this group is formed by around 238 thousand discouraged workers.

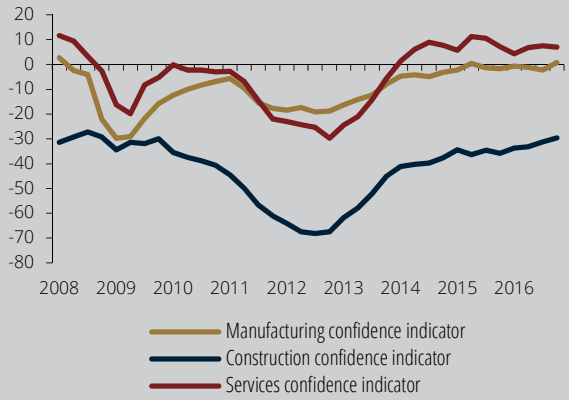
One of the most negative aspects of Portuguese labour market developments in the past few years was the very high level of long-term unemployment, which tends to cause a sharp depreciation of human capital, having an adverse impact on the economy's potential growth. In 2016 the number of unemployed seeking a job for more than 12 months fell by 13.4 per cent (13.7 per

Chart 5.3 • GVA by main sectors of activity
| Index 2008 Q1 =100



Source: INE.

Chart 5.4 • Confidence indicators
| Balances (quarterly mean)



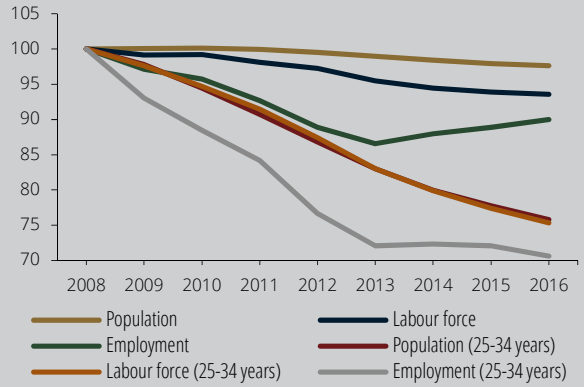
Source: European Comission.

Note: Seasonally adjusted figures.

cent fall in 2015). Nevertheless, the weight of these individuals in total unemployment has remained at a very high level (62.1 per cent, corresponding to a total of approximately 356 thousand individuals). In turn, very long-term unemployment, covering those seeking a job for more than 24 months, accounted for almost half of the group of unemployed (47.5 per cent in 2016 on average).[29] In the same vein, in 2016 the number of unemployed seeking a job for less than 12 months fell by 7.8 per cent (5.7 per cent decline in 2015). The share of these short-term unemployed in the labour force already stands at levels close to those observed prior to the international financial crisis (Chart 5.8).

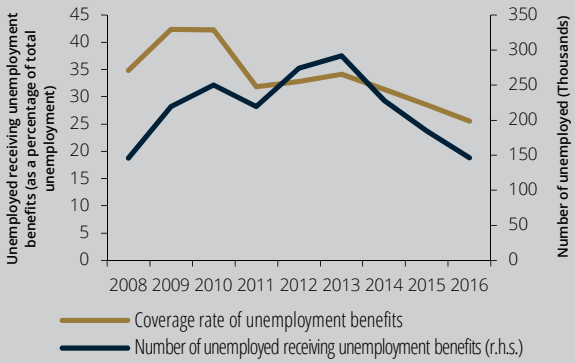
Employment recorded a positive trend, although remaining at historically low levels

Chart 5.5 • Population, labour force, and employment – Total and age group (25-34 years) | Index 2008 =100



Source: INE (Labour Force Survey).

Chart 5.6 • Number of unemployed receiving unemployment benefits and coverage rate



Source: INE (Labour Force Survey).

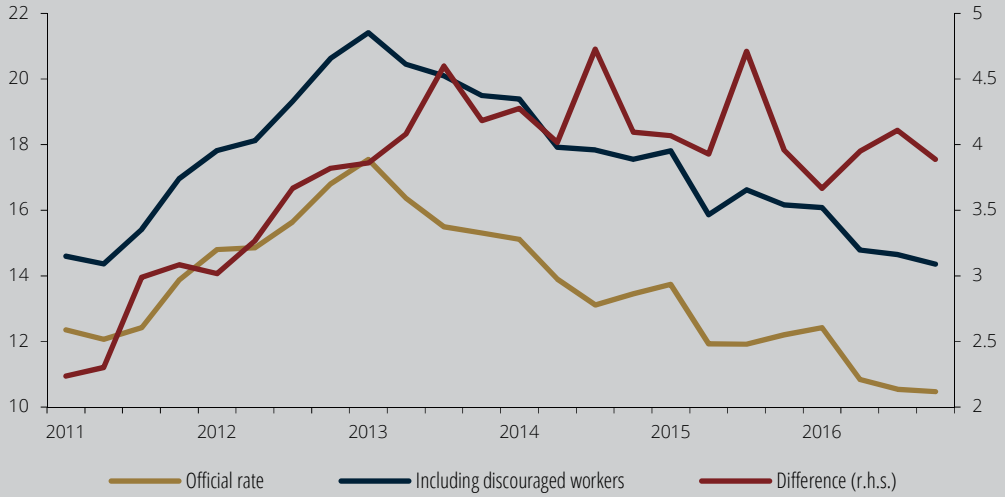


Chart 5.7 • Official unemployment rate and unemployment rate including discouraged workers | Percentage

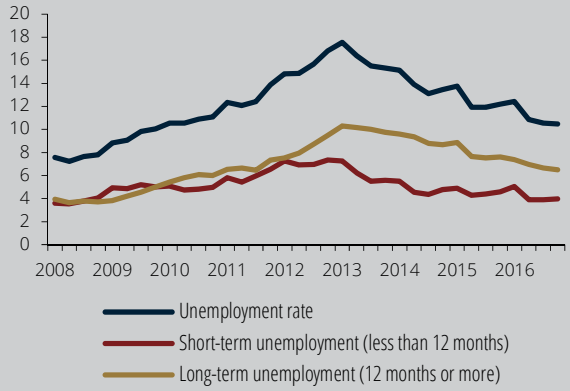
Source: INE (Labour Force Survey).

According to the Labour Force Survey, total employment increased by 1.2 per cent in 2016, after a 1.1 per cent increase in 2015. This reflects a higher number of employees (2.1 per cent more), given that self-employment fell markedly (3.2 per cent). In sectoral terms, the main contribution to the year-on-year rate of change in employment was recorded in tradable services, which include tourism-related activities.[30] In spite of the upward trend, employment remained at historically low levels, in the wake of an unprecedented fall observed between the end of 2008 and early 2013, which according to quarterly national accounts corresponded to around 650 thousand individuals. Approximately 290 thousand jobs seem to have been recovered by the end of 2016. With respect to general government employment, according to information from the Directorate-General for Administration and Public Employment, the number of employees appears to have increased in 2016, as in 2015, which confirms the interruption of the downward trend observed in previous years.

Reduction in apparent labour productivity

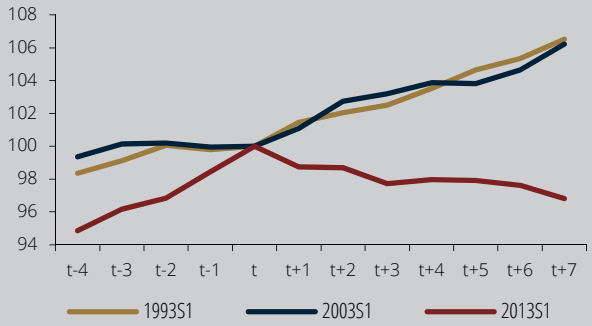
The current recovery phase of the Portuguese economy brings together moderate activity growth and relatively stronger employment growth. In this context, apparent labour productivity based on the quarterly national accounts of Statistics Portugal declined in 2016, in the context of lower and atypical dynamics compared to prior phases of economic recovery.[31] However, from 2011 to 2013 apparent labour productivity growth was strong, also in contrast to prior recessive phases of the cycle (Chart 5.9). The explanations for the reduction in productivity are complex and may relate to changes in the productive structure, in a context where the levels of capital per worker remained low, after several years of low investment levels (Box 5.1: 'Capital per worker and productivity').

Chart 5.8 • Unemployment rate by duration of unemployment | Months



Source: INE (Labour Force Survey).

Chart 5.9 • Apparent labour productivity in the last three crisis and recoveries | Biannual figures; Minimum level of activity = semester t=100



Sources: INE and Banco de Portugal.

Note: Labour productivity was computed dividing GVA (volume chain-linked data, millions of euro) by total (full-time equivalent) employment, except for the crisis in 1992, in which GDP was considered instead.

Box 5.1 | Capital per worker and productivity

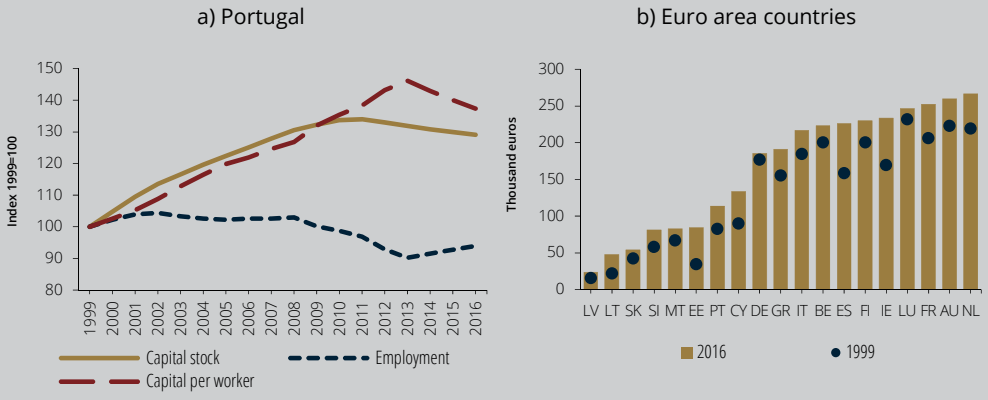
The low growth of apparent labour productivity in the Portuguese economy in the past few decades causes concern as it limits the ability to sustain higher levels of consumption without causing external imbalances. A significant catching-up of output per worker to the euro area average is a particularly important challenge, in a context where there are still weaknesses in the Portuguese economy.

Developments in the level of output per worker relate to various structural issues whose interaction is complex. In its simpler version, the economic growth theory points to the accumulation of inputs and the evolution of the technological framework as determinants of output growth. In this context, the level of output per worker depends on technology and increases with the level of the available capital stock for each worker, with lower variations expected for higher capital intensities. Economic literature has addressed this issue, identifying more elaborate formulations that include, for example, the quality of inputs and more flexible assumptions on their substitutability. In addition, from an empirical viewpoint, the literature has shown weaknesses in the statistical information needed for this analysis, for example as regards capital stock measurement.[32] The existing estimates for the capital stock level in economies typically result from the accumulation of annual investment flows, less an annual depreciation rate resulting from assumptions on the lifetime of the different capital goods.

This box presents some statistical information to place the Portuguese economy in the context of the euro area in the 1995-2016 period in terms of the capital-labour ratio and how it relates to productivity, measured as the level of output per worker.

Panel (a) of Chart 1 shows the cumulative trend of the capital-labour ratio since 1999 in Portugal, jointly with the cumulative trend of each component. The demographic contraction trends experienced by the Portuguese economy, and especially the sharp cyclical developments stemming from the macroeconomic imbalances' adjustment process, led to a strong reduction in

Chart 1 • Net capital stock per worker (2010 prices)



Source: Ameco – European Commission.

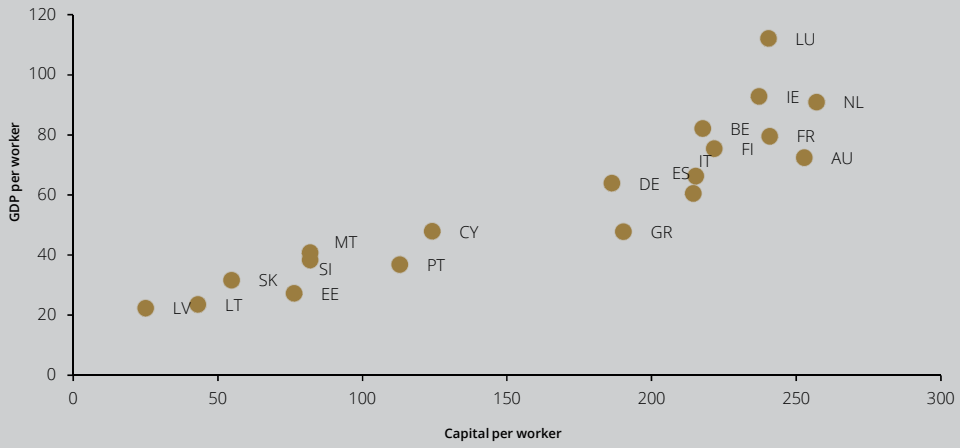
employment after 2008, only partly reversed from 2013 onwards. In turn, European Commission estimates show a contraction of the capital stock after 2011, as a result of insufficient investment levels to offset the depreciation of installed capital. In this context, the capital-labour ratio in the Portuguese economy started to decline after 2013, maintaining a downward path in 2016.

Panel (b) of Chart 1 shows the capital-labour ratios in euro area countries in 1999 and 2016, with the Portuguese economy positioned in the lower segment of the distribution. Although there may be reservations as to the accuracy of capital stock estimates, especially in the countries that have most recently joined the European Union and the euro area, the Portuguese economy's position is unfavourable.

The relationship among euro area economies in terms of capital intensity and labour productivity levels for the average of the period 2007-2016 is shown in Chart 2. As was to be expected, the chart suggests a positive relationship between the two variables, and Portugal's position is far behind the more advanced euro area countries. Hence, although it is important to stress that sectoral distribution and quality of investment are important determinants of growth, the reality seems to show a need for greater aggregate investment levels to increase the productivity of Portuguese workers.

The analysis of the quality of the capital stock existing in the economies is difficult, and the statistical problems mentioned above remain. An imperfect assessment of the capital stock quality can be made from its structure. Chart 3 is based on data from the Penn World Tables 9.0[33] to show the composition of the capital stock by type of capital goods for euro area countries in the 2012-2014 period, according to four categories: (residential and non-residential) structures; machinery (including computers, communication equipment and other machines); transport and other equipment (including software, other intellectual property goods and cultivated assets). In this very elementary analysis, Portugal appears as the country with the greatest proportion of

Chart 2 • Capital and GDP per worker in the euro area (average 2007-2016)
| Thousand euros

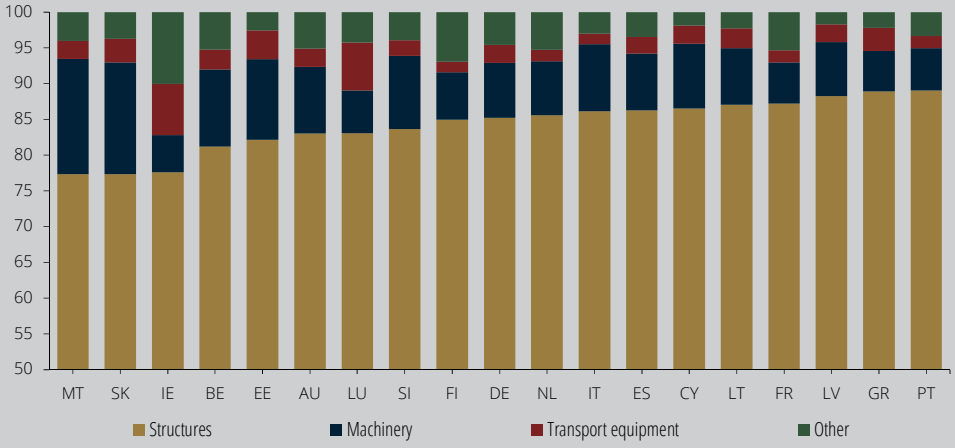


Source: Ameco – European Commission.

structures in the capital stock, which necessarily implies a lower share of equipment in machines and intangible goods. These latter categories tend to be associated with higher profitability rates, and thus there seems to be room for improving the composition of the national capital stock.

Portuguese economic growth will benefit from higher levels of investment in the firms, sectors and types of goods with higher profitability. This investment effort should be primarily based on higher public and private saving rates, to avoid jeopardising the current balance in the external accounts, which is a key element of the Portuguese economy's adjustment process of the past few years. However, creating favourable conditions for attracting foreign direct investment, especially targeted at creating new productive capacity, is also a way to increase the levels of capital per worker without compromising macroeconomic stability. The structural conditions needed to attract foreign direct investment are largely also needed for a correct allocation of investment towards more productive purposes. Efficient market functioning, a level playing field, the reduction of the so-called framework costs, and the stability of the regulatory and tax environments are all part of this set of conditions.

Chart 3 • Structure of capital stock per type of investment (average 2012-2014) | Percentage



Source: Penn World Tables.

6. Demand

Moderate GDP growth based on the dynamics of domestic demand and especially of exports

In 2016 the Portuguese economic activity grew by 1.4 per cent in volume, following a 1.6 per cent growth in 2015 (Table 6.1). In 2016 as a whole GDP growth in Portugal was once again lower than in the euro area, the differential standing at -0.3 p.p. (Chart 6.1). GDP growth in 2016 showed a markedly intra-annual profile, accelerating to 1.9 per cent in the second half of the year, above the value observed on average in the euro area in the same period (1.7 per cent).

Developments in Portuguese economic activity in the most recent period continued to be characterised by moderate growth, particularly taking into account the seriousness and duration of the prior recession. In this context, the GDP level at the end of 2016 was around 4 per cent lower than at the start of 2008. The recovery of economic activity takes place in the context of high indebtedness levels of public and private economic agents and the need to adjust their balance sheets.

The important demographic changes that occurred in Portugal in the past few years render the analysis of *per capita* GDP developments particularly relevant. In 2016 this variable grew by 1.7 per cent (2.1 per cent in 2015), which exacerbated the gap *vis-à-vis* GDP developments (Chart 6.2). As in 2014 and 2015, GDP growth was once again higher than that of GVA, which in 2016 grew by 0.8 per cent (Chart 6.3). The discrepancy between GDP growth and GVA growth related to the evolution of taxes less subsidies, which grew by 4.8 per cent in volume in 2016, compared to 5.1 per cent in 2015.

Table 6.1 • GDP and main components | Year-on-year change in percentage, unless otherwise stated

	% of GDP in 2016	2015	2016	2015		2016			
	2016			H1	H2	Q1	Q2	Q3	Q4
GDP	100.0	1.6	1.4	1.0	1.9	1.0	0.9	1.7	2.0
Domestic demand	98.8	2.5	1.5	1.1	1.8	1.5	0.8	1.0	2.5
Private consumption	65.8	2.6	2.3	2.1	2.5	2.5	1.6	1.9	3.0
Public consumption	18.0	0.7	0.5	0.8	0.3	1.2	0.5	0.2	0.3
Investment	14.9	4.7	-0.8	-2.1	0.6	-2.1	-2.1	-1.8	3.0
GFCF	14.8	4.5	-0.1	-2.4	2.2	-2.5	-2.2	-0.1	4.5
Change in inventories [(a)]		0.0	-0.1	0.0	-0.2	0.1	0.0	-0.3	-0.2
Exports	40.3	6.1	4.4	2.8	6.0	3.7	1.9	5.6	6.4
Imports	39.1	8.2	4.4	3.1	5.6	4.8	1.5	3.9	7.3
Contribution of domestic demand net of imports [(a)]		1.1	0.5	0.4	0.6	0.4	0.4	0.4	0.9
Contribution of exports net of imports [(a)]		0.5	0.9	0.6	1.2	0.7	0.6	1.3	1.1
Memo item:									
GDP – change over the previous period				0.5	1.3	0.2	0.2	0.9	0.7
Domestic demand (exc. change in inventories)	98.7	2.5	1.6	1.1	2.0	1.4	0.8	1.3	2.7

Sources: INE and Banco de Portugal calculations.

Note: (a) Contributions to the real growth of GDP in percentage points. The demand aggregates net of imports are obtained by subtracting an estimate of the imports needed to meet each component. The calculation of import content was based on data for 2005. For more information, see the Box entitled 'The role of domestic demand and exports in economic activity developments in Portugal', in the June 2014 issue of the *Economic Bulletin*.

The less buoyant economic activity in 2016 reflects less robust domestic demand growth, largely due to a fall in investment, in parallel with a deceleration in exports of goods and services, in line with lower domestic demand growth. In this context, the reduction of trade flows with Angola had an impact on the Portuguese economy, with a particularly negative influence on exports of goods.[34] In turn, private consumption grew slightly less than in the previous year, which was accounted for by the less buoyant consumption of non-food current goods and durable goods. Public consumption, determined by the dynamics of compensation of employees and expenses on goods and services in general government, grew by 0.5 per cent in 2016, i.e. slightly less than in 2015. The deceleration in some demand components with a greater import content translated into lower import growth in 2016 as a whole.

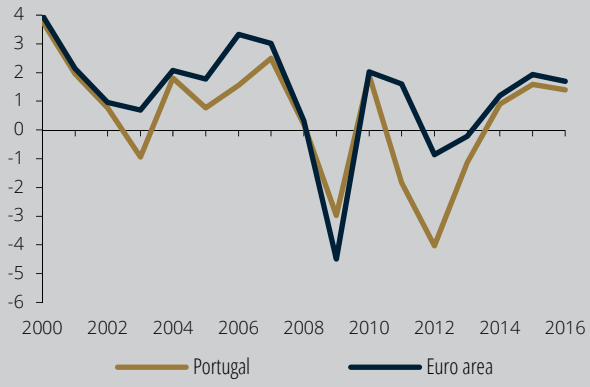
Considering demand components less imports (deducting from each component an estimate of the imports needed to meet said demand), the contribution from domestic demand to GDP growth is estimated to have amounted to 0.5 p.p. in 2016 and the contribution from exports to have stood at 0.9 p.p.

Intra-annual acceleration path of economic activity, reflecting a recovery of both domestic demand and exports of goods and services in the second half of the year

In spite of the lower dynamics over the year as a whole, developments in economic activity in 2016 were characterised by a clearly upward intra-annual profile. Hence, following 1.0 per cent growth in the first half of 2016, GDP increased by 1.9 per cent in the second half. The recovery of both domestic demand and exports of goods and services contributed to this evolution.

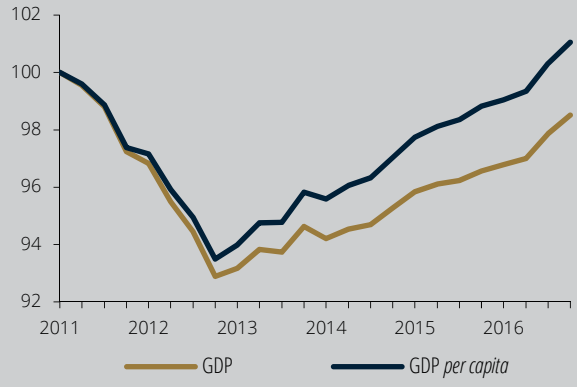
The more buoyant domestic demand in the second half of 2016 was particularly evident in the last quarter, when both private consumption and investment accelerated. In a context of rapid expansion of the consumption of durable goods over the whole year, the consumption of current goods accelerated in the second half of the year. In turn, investment grew slightly in the second half, after a fall in the first half of the year. This development had a major contribution from the significant recovery in investment in machinery and equipment.

Chart 6.1 • GDP growth in Portugal and in the euro area | Year-on-year change in percentage



Sources: Eurostat, INE and Banco de Portugal calculations.

Chart 6.2 • GDP and GDP *per capita* in Portugal | 2011Q1=100



Sources: INE and Banco de Portugal calculations.

Private consumption followed an intra-annual recovery path over the year, with emphasis on consumption of current goods which accelerated considerably in the last quarter

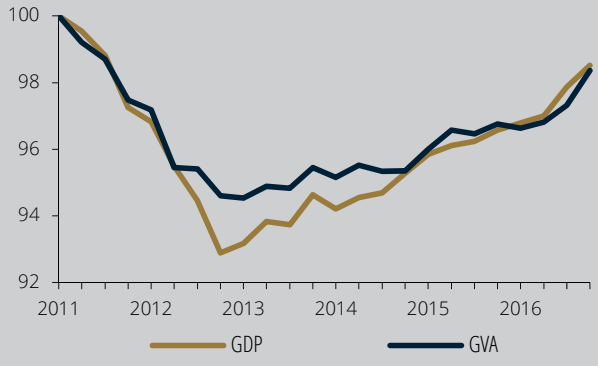
In 2016 private consumption grew by 2.3 per cent, i.e. 0.3 p.p. less than in 2015. Despite the lower dynamics, private consumption continued to grow more than GDP. The behaviour of consumption over the whole year was chiefly accounted for by a deceleration in consumption of current goods and services, in particular the non-food component, in a context where consumption of durable goods grew once again considerably, though less than in 2015 (Chart 6.4). In 2016 the consumption of current goods and services grew by 1.6 per cent, after 1.8 per cent in 2015, while the consumption of durable goods grew by 9.5 per cent (11.9 per cent in 2015). In particular, passenger car sales grew by 16.1 per cent (Chart 6.5).

Intra-annual developments in private consumption showed an upward profile, as a result of particularly pronounced growth in the last quarter of the year, based on an acceleration in the consumption of current goods and services and the maintenance of the high growth of durable goods, particularly sharp in the last quarter of the year.

The more favourable developments in private consumption in the second half of the year occurred in an environment of sharp improvement in consumer confidence, which remained at historically high levels, and a higher household disposable income. The improvement in the consumer confidence indicator at the end of 2016 was particularly noticeable in the assessment of unemployment expectations, which lowered considerably.

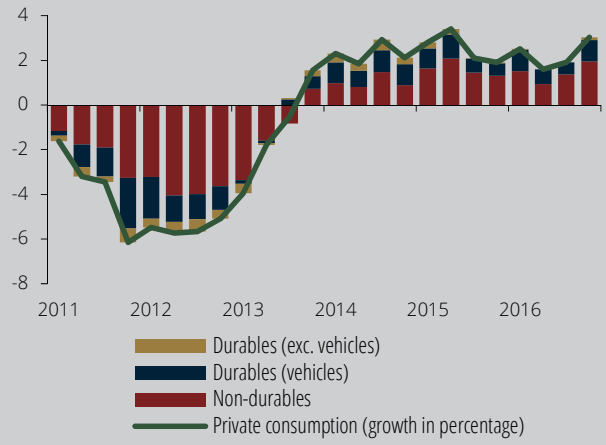
In 2016 the savings rate stood at 4.4 per cent of disposable income, i.e. 0.1 p.p. below the rate recorded in 2015 (Chart 6.6), reflecting slightly higher nominal growth of private consumption than that of disposable income (3.4 and 3.2 per cent respectively). The increase in household disposable income benefited from an improvement

Chart 6.3 • Recent behavior of GDP and GVA in Portugal | 2011Q1=100



Sources: INE and Banco de Portugal calculations.

Chart 6.4 • Main contributions for the growth of private consumption in volume | Year-on-year change in percentage, and contributions in percentage points; quarterly values



Sources: INE and Banco de Portugal calculations.

in the labour market situation, especially in terms of employment, in parallel with a rise in the national minimum wage and the impact of measures included in the State Budget for 2016 relating to the reversal of wage cuts and the personal income tax surcharge (Section 4: 'Fiscal policy and situation').[35] Reference should also be made to the potential effect of the reduction of the debt service in the most recent period, stemming from the stabilisation at low levels of the interest rates prevailing in the household sector, jointly with a decline in indebtedness.[36] Against this background, households' financing conditions improved, notably as regards consumer credit (Section 3.2: 'Monetary and financial conditions in Portugal'). The weight of total consumer credit in private consumption has been following an upward path, standing at values higher than seen prior to the sovereign debt crisis (Chart 6.7). It is an expectable development that nevertheless needs to be monitored with caution.[37]

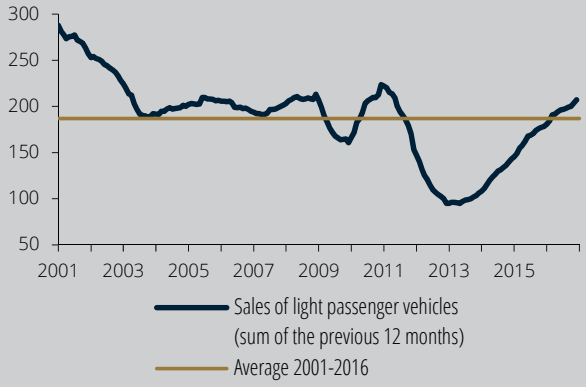
Fall in investment largely reflecting a decline in GFCF in construction

In 2016 the volume of investment fell by 0.8 per cent following a 4.7 per cent increase in 2015. This development involves a contraction of gross fixed capital formation of 0.1 per cent, following 4.5 per cent growth in the previous year.

After a sharp fall observed during the economic and financial crisis, the necessary recovery of GFCF in Portugal has been sluggish. This is also observed in other economies, namely the euro area economy, where the investment level is still lower than seen in 2008 (Chart 6.8). Although there is no consensus on the motives for these developments, they are particularly negative for Portugal, not only because the fall in investment during the crisis period was relatively sharper, but also because capital per employee in the Portuguese economy remains at low levels compared with the euro area average (Box 5.1: 'Capital per worker and productivity').

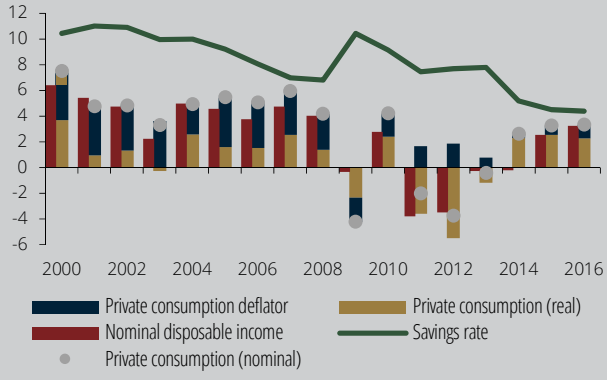
In this context, the higher uncertainty, both domestic and external, in late 2015 and early 2016, in parallel with the maintenance of a high level of corporate indebtedness, appears to have contributed to restrain investment decisions,

Chart 6.5 • Sales of light passenger vehicles | Thousands of vehicles; annual values



Sources: INE and Banco de Portugal calculations.

Chart 6.6 • Savings rate and households' disposable income | Percentage change and savings rate as a percentage of households' disposable income



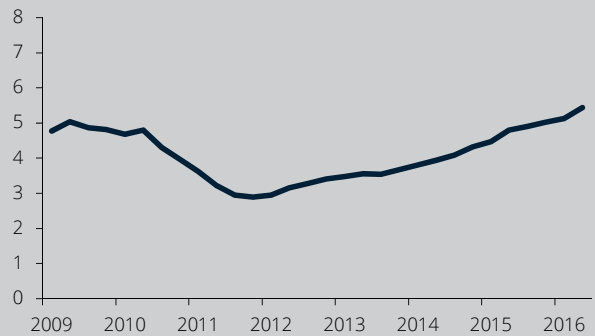
Sources: INE and Banco de Portugal calculations.

namely in the first half of the year (Section 2: 'International environment' and Section 3: 'Monetary and financial conditions'). However, investment recovered in the second half of 2016, particularly in the last quarter, with gross capital formation growing by 4.5 per cent year on year. According to the Investment Survey released by Statistics Portugal, in January 2017, 39.4 per cent of firms claimed to have had their investment restrained in 2016. This was a historically low value that reflected a considerable fall *vis-à-vis* the share computed in July 2016 (50.2 per cent). In addition, although the deterioration of sales prospects continued to be the main constraint on investment, their weight decreased substantially backed by factors such as self-financing capacity or the difficulty to obtain credit (Chart 6.9).

By institutional sector, the reduction in gross fixed capital formation in 2016 as a whole largely reflected a considerable decline in public investment, which fell by 29.2 per cent in volume, after having increased by 16.4 per cent in the previous year. Residential investment also declined in 2016 (-1.9 per cent), with an impact on activity in the construction sector (Section 5: 'Supply'). The fall in residential investment in the past few years, only interrupted in 2015, is part of a stabilisation trend of the Portuguese housing stock, following a considerable increase in the 1990s. This seems to have been reinforced in the most recent period by a need to reduce household indebtedness levels. By contrast, corporate GFCF grew by 6.6 per cent in volume in 2016, following a rate of change of 2.3 per cent in the previous year and showing a markedly upward intra-annual profile.

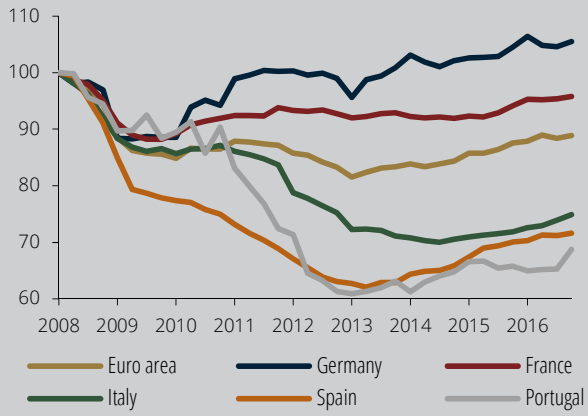
The fall in GFCF in 2016 was largely accounted for by the construction component. In the wake of the declines observed since 2002, followed by a significant recovery in 2015, this investment component, whose weight in total GFCF was around 50 per cent, declined once again sharply. This may partly reflect the effect of the conclusion of a number of major public works at the end of 2015. GFCF in construction recovered slightly at the end of the year (Chart 6.10), in line with the growth of cement sales to the domestic market. In addition, the number and amount of tenders for public works grew significantly in the second half of 2016 (Chart 6.11). After major falls at the end of 2015 and in the first half of 2016, GFCF in machinery and

Chart 6.7 • Share of private consumption in new loans granted by banks to consumption | New operations in percentage



Sources: INE and Banco de Portugal calculations.

Chart 6.8 • Developments in GFCF in selected euro area countries | 2008Q1=100



Sources: INE and Banco de Portugal calculations.

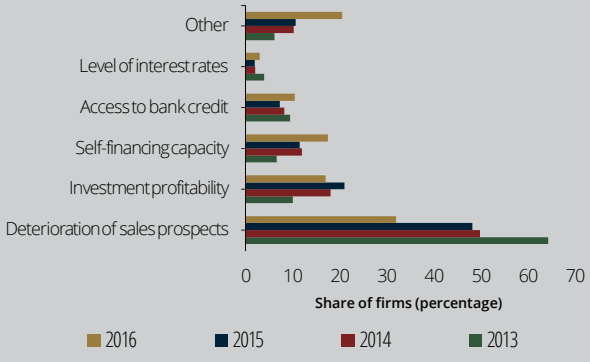
equipment recovered strongly in the third and fourth quarters. This investment component grew by 2.2 per cent in the year as a whole (6.0 per cent in 2015). In turn, GFCF in transport equipment, although decelerating from 2015, continued to grow considerably in 2016 (8.6 per cent).

Deceleration in exports of goods and services reflecting a fall in energy exports and the lower growth of exports of services not related to tourism

In 2016 exports of goods and services grew by 4.4 per cent, compared to an increase of 6.1 per cent in 2015. This reflects the behaviour of the goods component, which grew by 4.3 per cent, after 6.3 per cent in 2015, and of the services component, which decelerated by 1.1 p.p. to 4.6 per cent (Chart 6.12). In particular, energy exports fell, after growing considerably in 2015. Excluding this component, exports of goods grew by 5.1 per cent, i.e. accelerating by 1.8 p.p. from the value recorded in 2015. The positive performance of exports is structural, relying on a corporate restructuring that started before the international financial crisis, and is not accompanied by systematic declines in unit prices (Box 6.1: 'Developments in unit values of Portuguese exports of goods'). As regards services, exports of services not related to tourism decelerated considerably. In turn, exports of tourism services continued to be highly buoyant, in line with developments in their nominal revenue and the considerable growth of the number of overnight stays of non-residents in national hotels. In 2016 exports of tourism services grew by 9.7 per cent in volume (8.9 per cent in 2015).

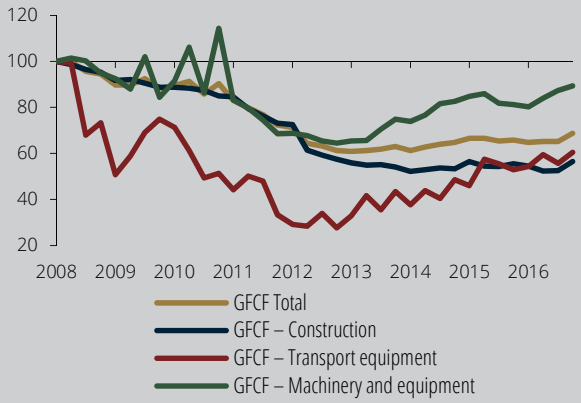
The lower growth of the international economy contributed to the less favourable performance of exports in 2016 as a whole compared to the previous year. In this context, exports to some emerging economies, especially Angola, continued to make a negative and significant contribution to the change in total exports. However, exports of goods and services showed a clear upward intra-annual profile, widespread across all the main components.

Chart 6.9 • Main limitation to investment | As percentage of total firms that reported limitations to investment



Source: INE.

Chart 6.10 • Developments in GFCF in Portugal by type of investment | 2008Q1=100



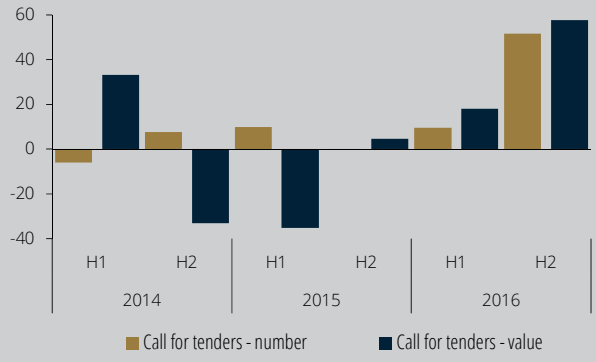
Source: INE.

The deflator of goods exports fell in 2016 (-3.4 per cent) though less markedly when excluding the fuels component (-2.4 per cent). Based on international trade data, exports of goods grew by 1.0 per cent in nominal terms in 2016 (3.7 per cent in 2015). This was largely due to a fall in car exports, particularly to Germany, and a decline in exports of fuels and base metals. The reduction in car exports reflected the temporary closure of an important production unit in early 2016. By destination country, there was a sharp fall in exports of goods to non-EU markets, specifically Angola and China, and to the Netherlands. Angola's contribution to the growth of nominal exports of goods in 2016 was -1.2 p.p., which corresponds to a drop of 28.4 per cent in the year as a whole. This adverse development faded away over the course of 2016 (Chart 6.13), contributing to the intra-annual acceleration profile of exports.[38]

The growth of the volume of exports of goods and services in 2016 was higher than that of the external demand indicator normally used by Banco de Portugal, calculated on the basis of the information used within the Eurosystem, leading to a further gain in the export share. However, this external demand indicator does not consider the relative importance of external trade with Angola. When taking into account the actual weight of Angola and the trend of its imports, external demand for Portuguese goods and services grew less in the most recent period, which implied a slightly higher gain in the share of exports than that obtained with the indicator normally used (Chart 6.14).

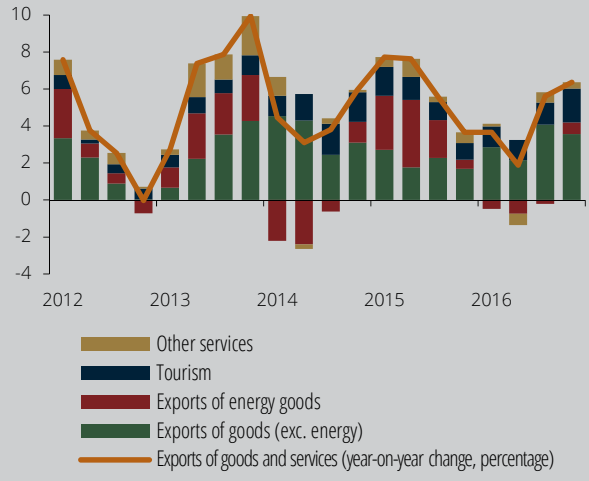
Considering the main intra-EU trading partners, exports of Portuguese goods and services to these destinations have been experiencing overall higher nominal growth than that of total

Chart 6.11 • Number and amount of tenders for public work | Year-on-year change in percentage; half-yearly values



Source: AECOPS.

Chart 6.12 • Main contributions for the growth of goods and services exports in volume | Year-on-year change in percentage, and contributions in percentage points; quarterly values



Sources: INE and Banco de Portugal calculations.

imports of goods and services from those countries, understood as part of external demand for Portuguese goods and services (Chart 6.15). For example, in 2016 nominal exports of goods and services from Portugal to Spain grew by 5.8 per cent, while total Spanish imports grew by 1.6 per cent. Although expressed in nominal terms, this behaviour suggests that Portuguese exports performed well in the Spanish market.

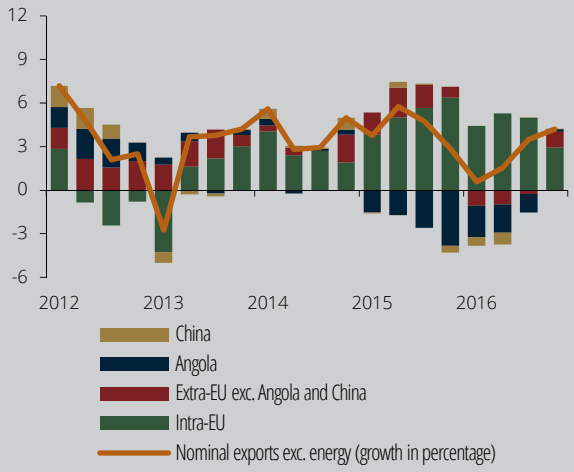
> The deceleration in imports of goods and services continued, linked to a fall in exports of energy and services not related to tourism

Imports of goods and services grew by 4.4 per cent in 2016 (8.2 per cent in 2015). This chiefly reflected a fall in energy imports (-4.0 per cent, after 15.0 per cent growth in 2015) and a less buoyant imports of services, which grew by 2.6 per cent in 2016, after a 6.7 per cent change in 2015 (Chart 6.16). Imports of goods excluding energy grew by 6.5 per cent, decelerating slightly from the value observed in 2015 (7.1 per cent).

The deceleration in imports of goods in 2016 is consistent with the less buoyant behaviour of a number of demand components with a high import content, with a particular emphasis on a fall in exports of fuels and a significant deceleration in GFCF in machinery and equipment.

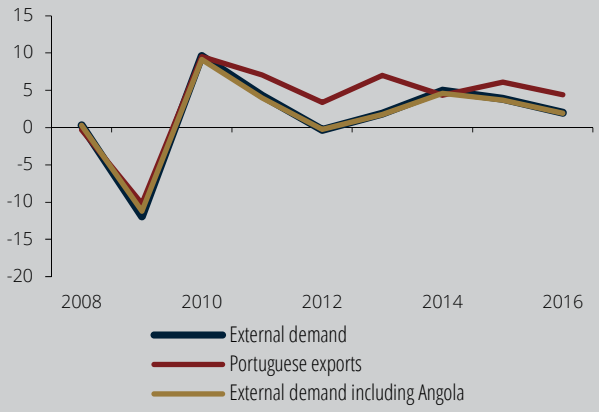
Following the path observed since early 2013, the deflator of goods imports fell further in 2016 (-3.9 per cent). This reduction is less significant when excluding fuel exports, standing at -2.4 per cent. Based on international trade data, imports of goods recorded a 1.3 per cent

Chart 6.13 • Contributions from main trading markets for the nominal growth of goods exports excluding fuel | Year-on-year change in percentage, and contributions in percentage points; quarterly values



Source: INE (International Trade) and Banco de Portugal calculations.

Chart 6.14 • Exports of goods and services and external demand | Year-on-year change in percentage



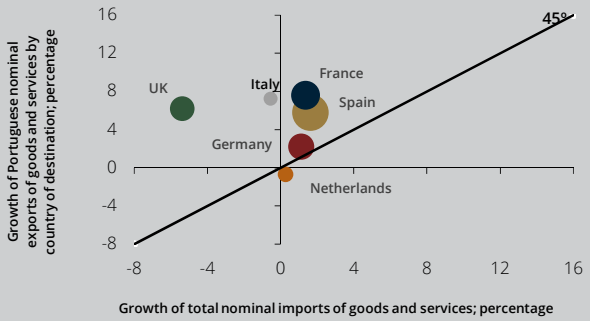
Sources: INE, IMF, ECB and Banco de Portugal calculations.

Note: The indicator of external demand adjusted by the importance of foreign trade with Angola corresponds to the weighted average (weights based on exports) between the indicator of external demand computed by the ECB and Angola's total volume of imports of goods and services. These calculations use the IMF's projections (Word Economic Outlook) for the growth in volume of Angola's imports in 2016.

nominal growth in 2016. By product, in addition to a strong reduction in fuel purchases, also imports of base metals dropped. Similarly to exports, the lower dynamics of imports of goods was particularly evident in non-EU markets. In 2016 imports of goods from these countries recorded a nominal reduction of 3.9 per cent, with imports originating in Angola dropping by 29.1 per cent.

In 2016 imports of goods and services grew more than the import-weighted overall demand, which led to an increase in import penetration, as in the three previous years.

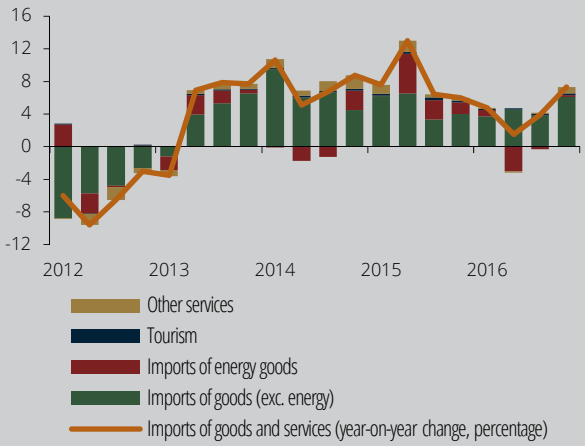
Chart 6.15 • Exports of goods and services for the main EU trading partners in 2016 and total imports from these countries | Year-on-year change in percentage; nominal values



Sources: Eurostat, INE and Banco de Portugal calculations.

Note: The circles represent the locus of combinations between the growth of nominal imports of goods and services in each of the 6 countries considered (X-axis) and the growth of nominal exports of goods and services from Portugal to each of those countries (Y-axis). The size of the circles reflect the importance of each country in the Portuguese exporting structure.

Chart 6.16 • Main contributions for the growth of goods and services imports in volume | Year-on-year change in percentage, and contributions in percentage points; quarterly values



Sources: INE and Banco de Portugal calculations.

Box 6.1 | Developments in unit values of Portuguese goods exports

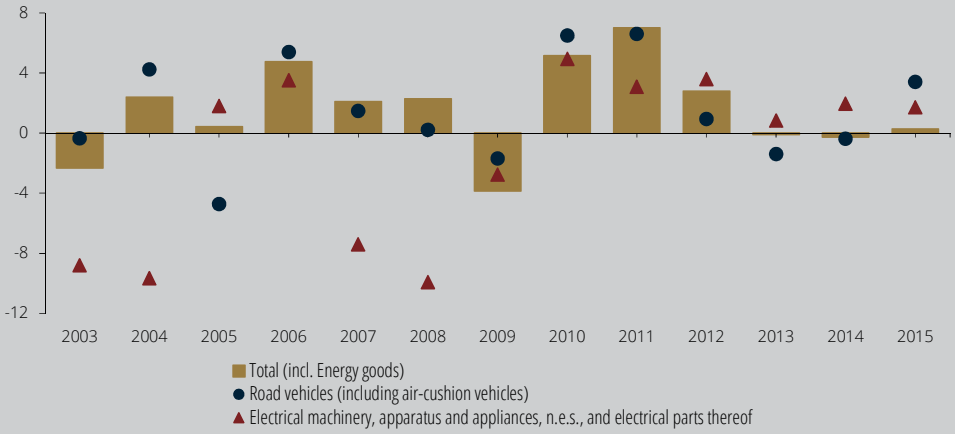
This box complements the analysis of developments in Portuguese goods exports, focusing on changes in their unit values from a predominantly microeconomic viewpoint.

The analysis presented here is based on unit values, which approximate the behaviour of exported goods prices. Nevertheless, prices of internationally traded goods depend on a complex set of factors, including the quality of products and the ability to exercise market power. All calculations are based on both Comext data and detailed reporting on international trade transactions conducted by firms, within the scope of Intrastat and Extrastat surveys. In addition, considering the volatility associated with energy prices, their unit values were excluded from the analysis based on corporate information.

Chart 1 presents the annual rate of change in the unit values of exported goods for the 2003-15 period. This growth rate has always been positive, except for 2003, 2009 and 2013-14. The most exported goods over the whole period and, thus, contributing the most to the total rate of change – namely 'vehicles' and 'machinery, equipment and electrical components' –, account on average for 17 per cent of the total value of goods exports. The growth rates of these two categories of the Standard International Trade Classification (SITC) show that their unit values have increased after 2010, especially in the machinery and equipment component.

Analysing the growth of exports' unit values is more meaningful if compared to developments in a reference region. Hence, taking into account the existing institutional and economic environment, the natural benchmark is the average rate of change in the unit values of goods exported by the European Union (EU).[39] The difference between the growth rates recorded in Portugal and in the EU was centred around zero for the 2003-15 period, which seems to exclude a scenario where Portuguese exporters sought to systematically compete on price (Chart 2).

Chart 1 • Unit-values growth rates of Portuguese goods exports (including energy goods) | Percentage

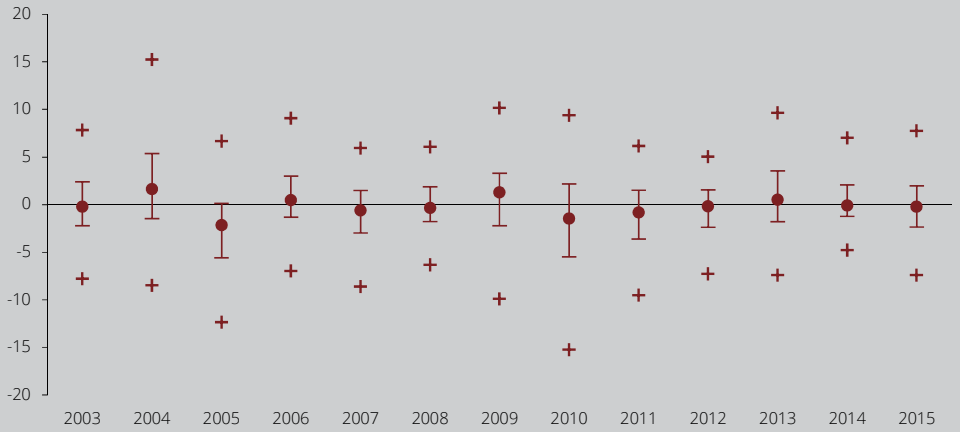


Souce: Banco de Portugal calculations based on Comext dataset.

Among the products whose unit value growth rates surpassed those of the EU are, consistently, 'articles of apparel and clothing accessories', 'crude animal and vegetable materials, n.e.s.' and 'organic chemicals' (Chart 3). Finally, 'footwear' is the only category whose unit value growth rate was always positive in the period under analysis, and in most years higher than the EU average rate (Chart 4).

Corporate information offers an analysis of the relationship between the differences of unit values and firm characteristics, namely in terms of sector of activity and age. The share of goods exporters by sector whose unit value growth rates are higher than the EU weighted average rate

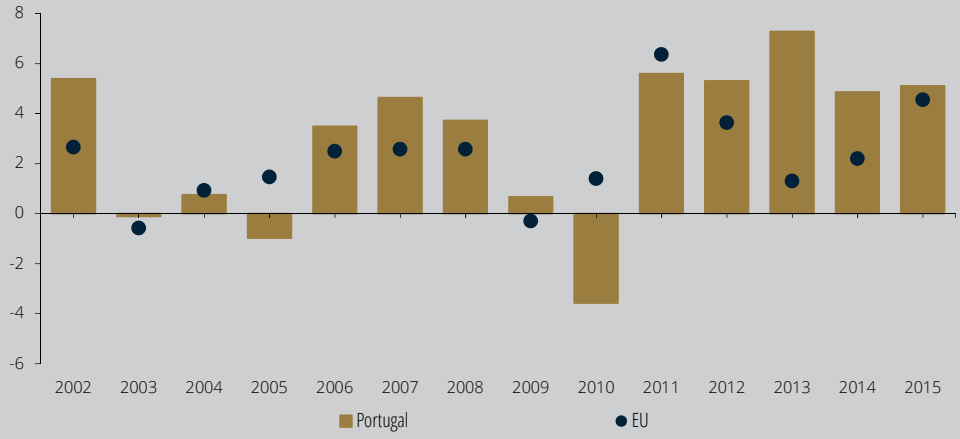
Chart 2 • Differences in unit-values growth rates (Portugal vs EU) | Percentage points



Source: Banco de Portugal calculations based on Comext dataset.

Note: The interval delimited by '+' signs represents the sample range after eliminating outliers – following Tukey (1977)'s method. The interval defined by the vertical line corresponds to the interquartile range and the circle to each distribution's median.

Chart 3 • Unit-values growth rate of articles of apparel and clothing accessories | Percentage

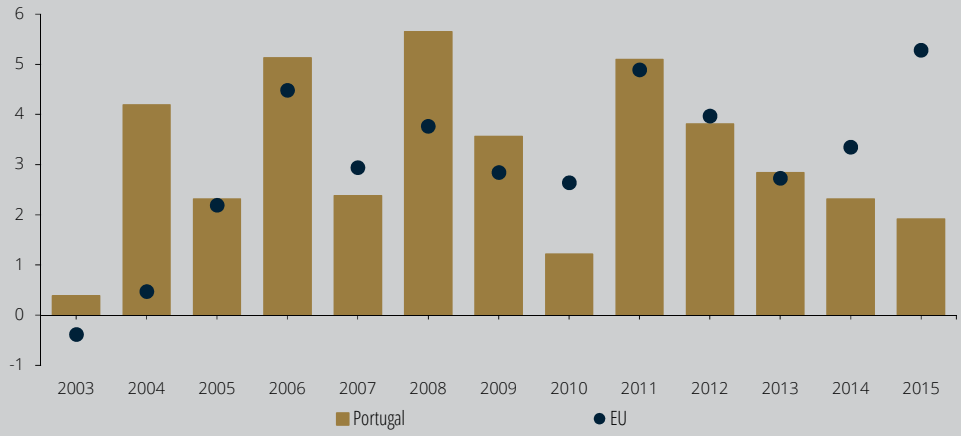


Source: Banco de Portugal calculations based on Comext dataset.

is shown in Chart 5. In the period under review, on average, this share stood at 50 per cent both for manufacturing and services firms. In 2011 and 2012 there was a decline in the proportion of goods exports by service firms whose unit value rate was higher than the EU's. However, in the 2013-15 period as a whole, this percentage surpassed the previous, which may indicate an increase in these firms' competitiveness. Service firms that export goods may be international trade wholesalers or may represent the commercial arm of corporate manufacturing groups.

As regards exporters' age, there is volatility regarding prevalent changes in unit values above the EU average. However, the share of exports associated with firms aged less than five years and

Chart 4 • Footwear unit-values growth rate | Percentage



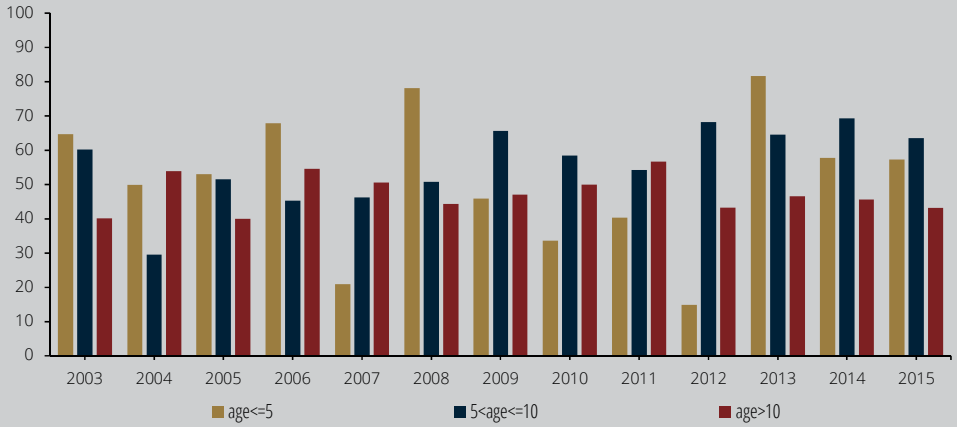
Source: Banco de Portugal calculations based on Comext dataset.

Chart 5 • Exports' share with positive difference in unit-values growth rate (Portugal vs EU) by sector of activity | Percentage

Sources: Banco de Portugal calculations based on Intrastat, Extrastat surveys and Comext dataset.

between five and ten years whose growth rate in exported goods' unit values was above that seen in the EU on average is considerable, often surpassing that of firms aged more than ten years, as was the case in the 2013-15 period (Chart 6).

Chart 6 • Exports' share with positive difference in unit-values growth rate (Portugal vs EU) by age cohort | Percentage



Sources: Banco de Portugal calculations based on Intrastat, Extrastat surveys and Comext dataset.

7. Prices

Slight increase in the inflation rate, based on services and unprocessed food prices

In 2016 the inflation rate in Portugal as measured by the rate of change in the Harmonised Index of Consumer Prices (HICP) was 0.6 per cent, compared to 0.5 per cent in 2015 (Table 7.1 and Chart 7.1). In the year as a whole, services and unprocessed food prices were more buoyant. By contrast, prices of industrial goods, in particular energy, recorded a negative change.

An analysis of contributions from the different categories of goods to the inflation rate in 2016 (Chart 7.2) shows a positive contribution from the change in services prices (0.7 p.p.) and to a lesser extent in unprocessed food prices (0.2 p.p.). In turn, energy and non-energy industrial goods continued to make a negative contribution in 2016 (-0.1 and -0.2 p.p. respectively), while processed food made a virtually nil contribution.

In 2016 services prices grew by 1.5 per cent, accounting for a 0.1 p.p. rise from 2015. This was essentially due to accommodation services, which are part of the very dynamic Portuguese tourism sector. Reference should also be made, although to a lesser extent, to the contribution of telephone and telefax services, financial services, and also restaurants and cafés. The rate of change in unprocessed food prices declined by 0.3 p.p. to 1.6 per cent in 2016, while the rate of change in processed food prices was only 0.3 per cent, i.e. 0.9 p.p. below the 2015 value.

Non-energy industrial goods maintained a negative rate of change (-0.3 per cent), although less sharp than in the previous year (-0.7 per cent). In turn, energy prices remained on the downward trend started in November 2013, declining by 1.8 per cent in 2016, after a 3.7 per cent fall in the previous year, in a context of recovery in oil prices throughout 2016.

Energy prices contributed to the rise in inflation, in a context of recovery in oil prices and an increase in the tax on oil products

The pattern of pre-tax fuel prices largely reflected a decline in oil prices, and that of final prices was mainly influenced by a rise in the tax on oil prices in February 2016 (Charts 7.3 and 7.4).

Table 7.1 • HICP – Main components | As a percentage

	Weights	Year-on-year rate of change			Annual rate of change			
	2016	2014	2015	2016	16 Q1	16 Q2	16 Q3	16 Q4
Total	100.0	-0.2	0.5	0.6	0.4	0.5	0.7	0.8
Total excluding energy	91.9	0.0	0.8	0.9	0.8	0.9	1.0	0.7
Total excluding unprocessed food and energy	81.5	0.2	0.7	0.8	0.8	0.9	0.8	0.6
Goods	57.2	-1.1	-0.1	0.0	-0.2	-0.3	0.1	0.3
Food	24.0	-0.7	1.5	0.8	0.4	0.6	1.5	0.8
Unprocessed food	10.4	-2.1	1.9	1.6	0.1	1.4	3.3	1.5
Processed food	13.5	0.4	1.2	0.3	0.5	0.1	0.2	0.2
Industrial	33.3	-1.4	-1.3	-0.7	-0.7	-1.1	-0.8	-0.1
Non-energy	25.2	-1.4	-0.7	-0.3	0.2	-0.2	-0.2	-0.8
Energy	8.1	-1.5	-3.7	-1.8	-3.0	-3.6	-2.6	2.0
Services	42.8	1.1	1.4	1.5	1.4	1.7	1.5	1.6
Memo items:								
Contribution of administered prices (in p.p.)	–	0.3	0.1	0.1	0.1	0.1	0.2	0.2
Contribution of taxes (in p.p.)	–	0.1	0.2	-0.1	0.2	0.3	-0.4	-0.4
Consumer Price Index (CPI)	–	-0.3	0.5	0.6	0.5	0.5	0.7	0.8
HICP – Euro area	–	0.4	0.0	0.2	0.0	-0.1	0.3	0.7

Sources: Eurostat and Statistics Portugal.

This contrasts with developments in 2015, when profit margins and refining costs made a positive contribution.

Positive inflation differential between Portugal and the euro area continued

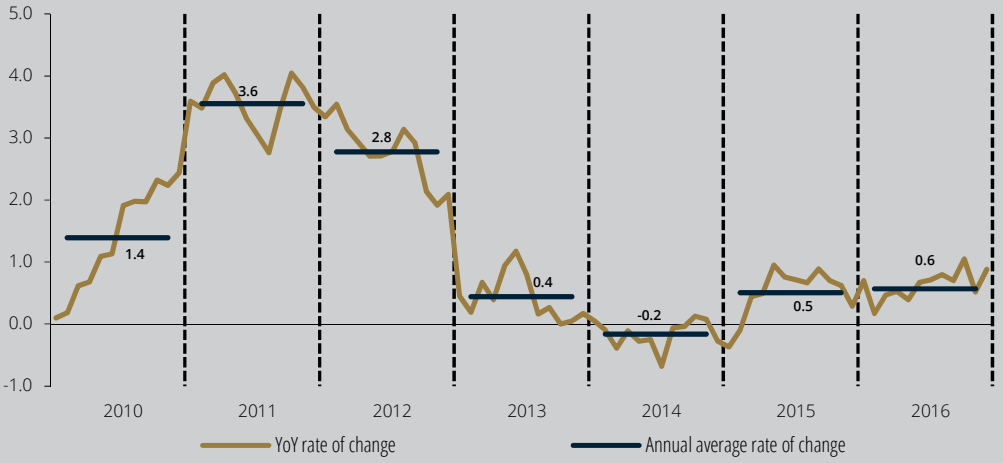
In 2016 the inflation rate in Portugal was higher than the euro area's, which stood at 0.2 per cent, maintaining the differential recorded in 2015 (Chart 7.5). Although the inflation rate in the euro area increased markedly in the second half of the year, only in November did it surpass inflation in Portugal. Energy industrial goods accounted for most of the inflation differential between Portugal and the euro area in 2016 (Chart 7.6). In this component, the differential moved from 3.1 p.p. in 2015 to 3.3 p.p. in 2016. The services differential rose to 0.4 p.p. in 2016, after 0.2 p.p. in 2015. Conversely, non-energy industrial goods prices grew at a slower pace than in the euro area, as seen since early 2012.

Unit labour costs made the main contribution to the inflation rate

Chart 7.7 breaks down the year-on-year inflation rate into the contribution of the main HICP determinants based on Banco de Portugal's

Chart 7.1 • Harmonized index of consumer prices

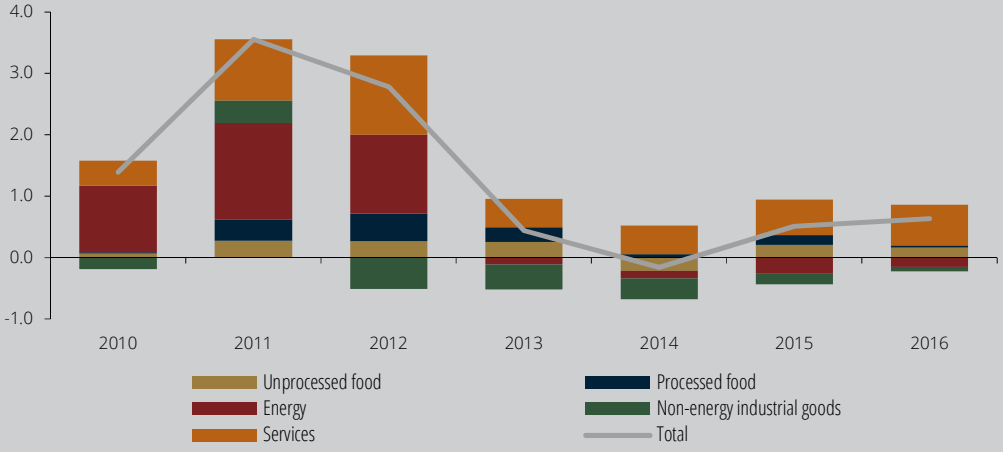
| In per cent



Source: Statistics Portugal.

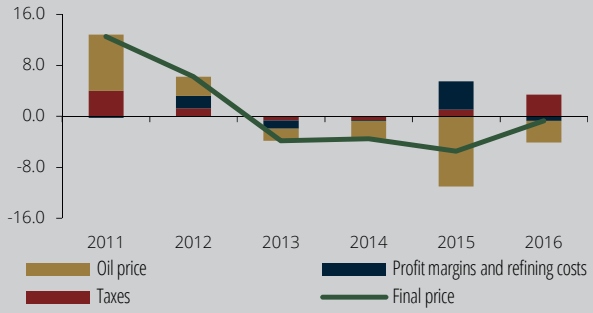
Chart 7.2 • Contributions to the annual growth rate of the HICP

| In percentage points



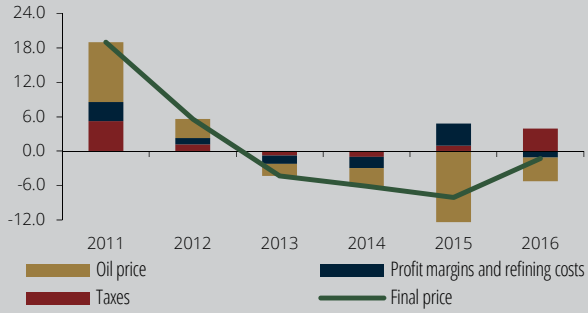
Source: Statistics Portugal.

Chart 7.3 • Contributions to the year-on-year rate of change of petrol prices | In percentage points



Sources: ECB and Directorate General for Energy and Geology.

Chart 7.4 • Contributions to the year-on-year rate of change of diesel prices | In percentage points



Sources: ECB and Directorate General for Energy and Geology.

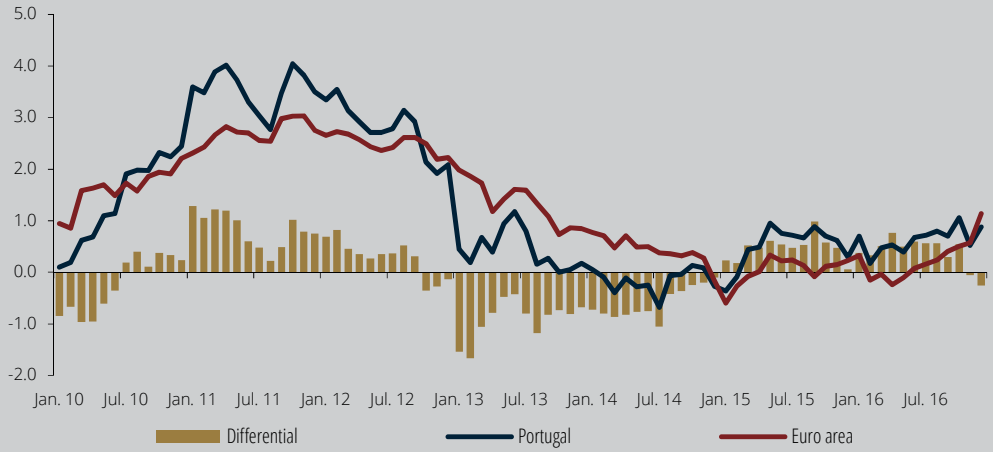


Chart 7.5 • HICP inflation in Portugal and in the euro area | Year-on-year rate of change in percentage and percentage points

Sources: Eurostat and Statistics Portugal.

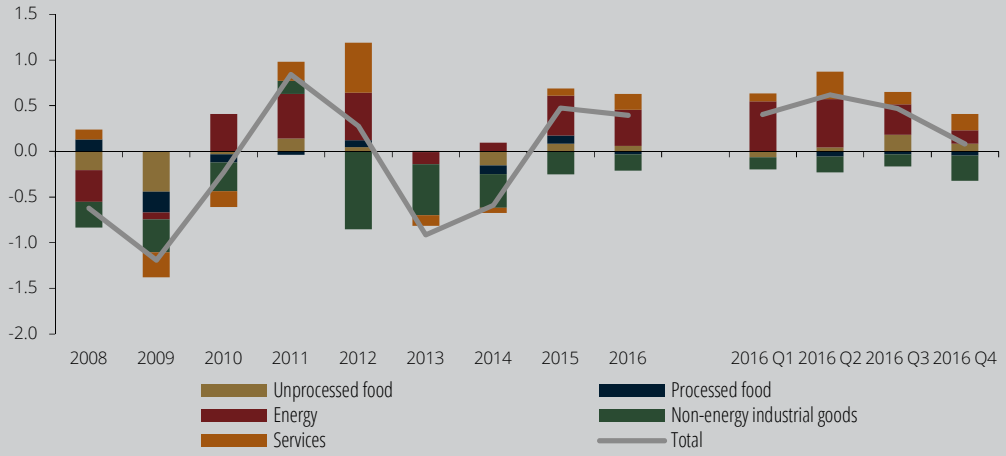


Chart 7.6 • Inflation differential between Portugal and the euro area | Contributions, in percentage points

Sources: Eurostat and Statistics Portugal.

inflation analysis and forecasting model, the so-called MIMO (Monthly Inflation Model).[40]

The analysis suggests that the rise in the inflation rate over the course of 2016 essentially reflected an increase in unit labour costs, whose contribution went up over the year, consistently with an increase in compensations per employee (Section 5: Supply). By contrast, non-energy goods import prices contributed to mitigate the rise in the inflation rate throughout 2016. Fuels, excluding taxation, also made a negative but progressively lower contribution in the recent period, mainly reflecting the time-path of oil prices. The Value Added Tax (VAT) applied to restaurants declined in the second half of 2016, generating a negative contribution from indirect taxation to inflation dynamics. In the third quarter of 2016, the item *Others* – which covers other unidentified factors contributing to inflation – assumed a considerable role, which may be associated with restaurants and cafés not fully reflecting the decline in VAT on the prices charged. This is reinforced by the dynamics of the HICP and the Harmonised Index of Consumer Prices at Constant Tax Rates (HICP-CT) in this item. While the former index recorded a year-on-year rate of change of 1.1 per cent in the third quarter, the latter grew by 8.8 per cent (1.4 per cent and 9.2 per cent in the fourth quarter respectively).

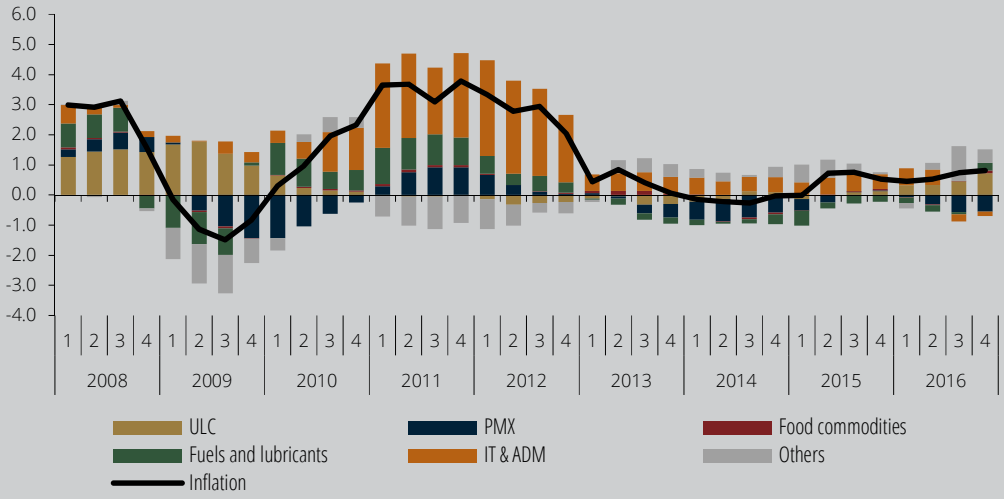
Inflation expectations released by Consensus Economics remained stable at around 0.6 per cent in 2016, in line with actual average inflation (Chart 7.8). This contrasts with the successive upward revisions of inflation expectations observed over the course of 2015. Inflation expectations for 2017 also remained relatively stable throughout 2016, at around 1.2 per cent, i.e. there is an implicit expectation of price inflation between 2016 and 2017 (Chart 7.9).

GDP deflator growth higher than HICP growth, in a context of gradual decline in terms of trade over the year

Throughout 2016 the GDP deflator continued to record a year-on-year rate of change above that of the HICP and of the domestic demand deflator. This pattern started in the second half of 2012. Since Portugal is a net importer of energy goods, the recovery of oil prices throughout 2016 gradually reduced the positive effect of terms of trade, making it negative in the fourth quarter (Chart 7.10).

Chart 7.7 • Inflation rate disaggregation using MIMO

| Contributions, in percentage points



Sources: Eurostat and Banco de Portugal.

Notes: ULC – Unit Labour Costs; PMX – Import prices excluding energy goods; IT – Indirect taxes; ADM – Administered prices.
Obs: The effect of taxes in fuels and lubricants is included in IT & ADM.

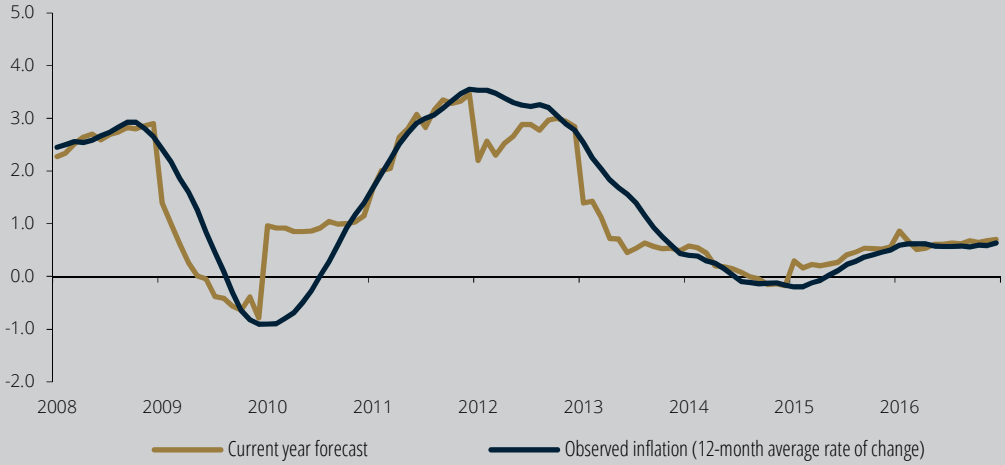


Chart 7.8 • Inflation expectations and observed inflation
| In per cent

Sources: Consensus Economics and Statistics Portugal.

Chart 7.9 • Inflation expectations for current and next year
| In per cent

Source: Consensus Economics.

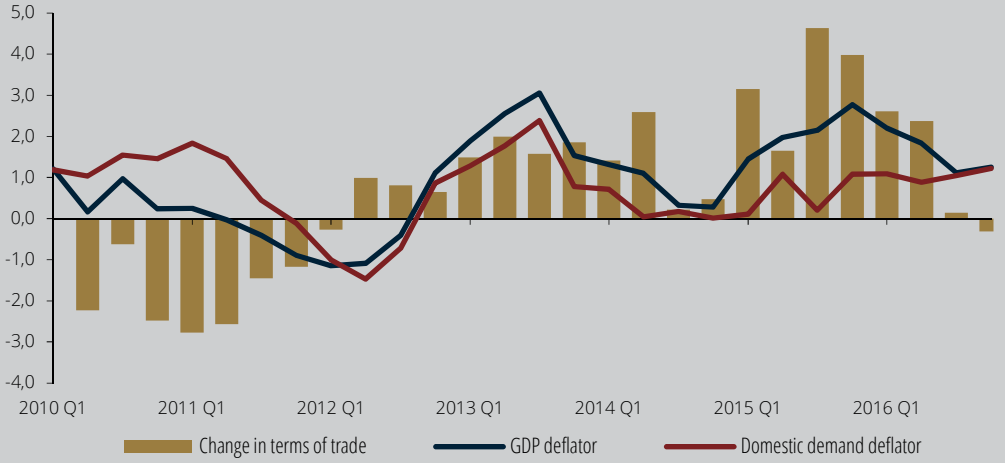


Chart 7.10 • GDP deflator, domestic demand deflator and terms of trade
| In per cent

Source: Statistics Portugal.

8. Balance of payments

In 2016 the net lending of the economy increased to 1.5 per cent of GDP, up from 0.3 per cent in 2015. This improvement reflected a sharper reduction in investment than in savings, in a context of relative stabilisation of net capital transfers. In sectoral terms (Chart 8.1), households had a slight decline in net lending, due to the reduction in capital transfers received. Current savings in this sector, as a percentage of GDP, remained at a lower level than investment, and both aggregates declined slightly in 2016. Non-financial corporations, in turn, moved from net borrowing in 2015 to net lending in 2016, as a result of the increase in current savings, which more than offset the slight increase in investment.

Increase in the current and capital account surplus, based on net exports of goods and services

In 2016 the current and capital account surplus increased to 1.7 per cent of GDP, up from 1.2 per cent in 2015 (Table 8.1). This increase in the balance was the result of a reduction in the deficit of the goods and primary income accounts (both by 0.3 p.p. of GDP) and an increase in the surplus of the services account (by 0.2 p.p. of GDP), associated with the performance of the tourism sector (Chart 8.2). In addition, the capital account surplus declined to 0.9 p.p. of GDP, down from 1.2 p.p. in 2015, strengthening the trend observed in recent years, which are related to the decline in European fund transfers for investment purposes.

The buoyancy of the tourism sector continued to contribute decisively to the behaviour of the goods and services account

The goods account deficit declined by 0.3 p.p. for the second year in a row. This decline was a result of the more pronounced growth of goods' exports (0.8 per cent) than imports (0.3 per cent).

The services account surplus increased again, to stand at 7.1 per cent of GDP in 2016. Exports of services grew by 4.4 per cent, decelerating from the previous year, when the rate of change had stood at 7.5 per cent. Growth in 2016 was chiefly due to the contribution of travel and tourism. This component continued to post very significant buoyancy, reflecting a 10.7 per cent change in 2016, up from 10.2 per cent in the previous year. The main contribution to the deceleration in exports of other services was made by the behaviour of services provided by corporations, which had a rate of change of -3.3 per cent, compared with 15.4 per cent growth in 2015.

Table 8.1 • Current and capital accounts | As a percentage of GDP

	2013	2014	2015	2016
Current and capital accounts	3.2	1.5	1.2	1.7
Current account	1.6	0.1	0.1	0.8
Goods and services account	1.9	1.1	1.8	2.2
Goods	-4.7	-5.5	-5.2	-4.9
Services	6.6	6.6	6.9	7.1
of which:				
Travel and tourism	3.6	4.1	4.4	4.8
Primary income account	-1.2	-2.0	-2.5	-2.2
Secondary income account	0.9	0.9	0.8	0.8
of which:				
Emigrants / immigrants remittances	1.4	1.5	1.6	1.5
Capital account	1.6	1.4	1.2	0.9
Financial Account	3.3	1.6	1.2	1.7
Errors and omissions	0.1	0.1	0.0	0.0

Sources: INE and Banco de Portugal.

Imports of services had similar developments, with a change of 3.1 per cent, down from 5.8 per cent in 2015. The main contributions to growth in 2016 were travel and tourism, intellectual property rights not included elsewhere and other services.

The trade account balance in 2016 benefitted from a positive volume effect, contrary to developments in the two previous years (Chart 8.3). The largest contribution, however, was made by the terms of trade effect, albeit less expressive than in the previous year. This was associated with the development of energy prices (Section 2: 'International environment' and Section 7: 'Prices').

Income paid abroad declined and the subsidies received from the European Union increased

The primary income account deficit decreased by 0.3 p.p. of GDP as a result of the 0.4 p.p. decline in income paid abroad and the maintenance of income received from non-resident entities. The decline in income paid abroad was mainly associated with the decrease in the stock of external liabilities by resident sectors, in particular the general government and other monetary financial institutions (other MFI). The stabilisation of primary income received from abroad was the

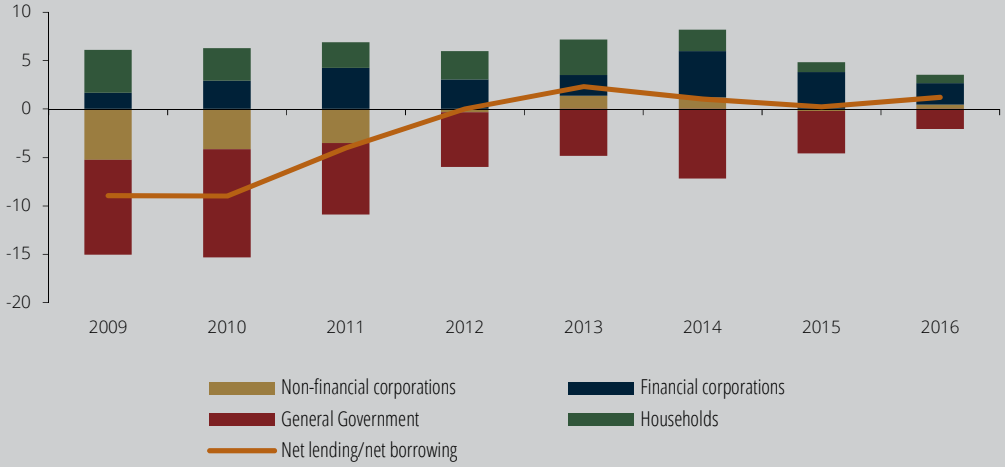


Chart 8.1 • Net lending/net borrowing of the economy

| As a percentage of GDP

Source: INE.

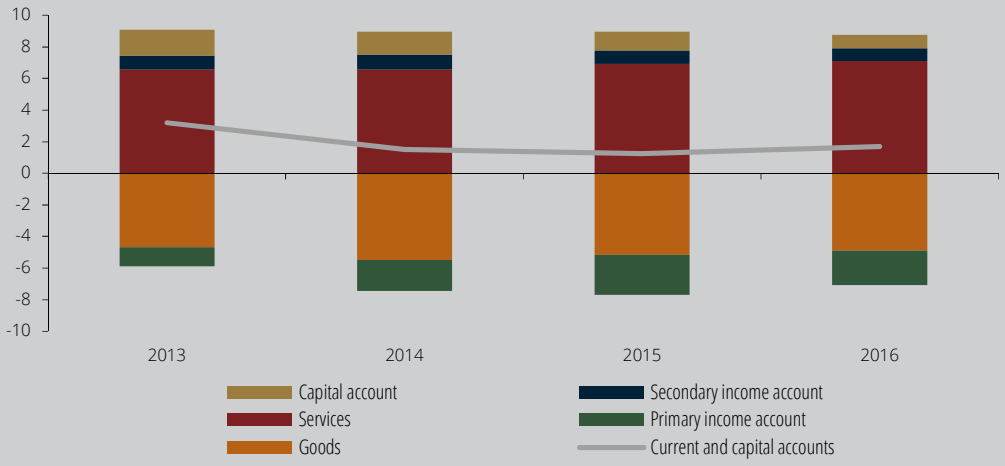


Chart 8.2 • Decomposition of current and capital account balance

| As a percentage of GDP

Sources: INE and Banco de Portugal.

result of mixed developments. On the one hand, there was a decline in interest received associated with long-term debt securities held in portfolio by Banco de Portugal, insurance corporations and pension funds and, to a lesser extent, households. The reduction by insurance corporations and pension funds and households was associated with a decline in the holdings of long-term debt securities issued by non-residents, whereas in the case of Banco de Portugal it was due to a decline in yields on securities. On the other hand, there was an increase in the subsidies from the European Union.

The secondary income account components stabilised as a percentage of GDP. Emigrants' remittances decelerated, which was reflected in a 0.8 per cent increase, down from 8.3 per cent in 2015. Behaviour differed across home countries. Remittances from Switzerland, Angola and Germany declined, but there was an increase in transfers from France, the United States, the United Kingdom and, to a lesser extent, Spain and Luxembourg.

Net lending of the Portuguese economy was reflected in a fall in the negative balance of the international investment position and net external debt

The current and capital account surplus recorded in 2016 implied a financial account surplus, i.e., the purchase of external financial assets by residents was higher than the purchase of national assets by non-residents (Chart 8.4).

These net outflows corresponded to 1.7 per cent of GDP and contributed to the improvement in the International Investment Position (IIP) of the Portuguese economy. At the end of 2016, the IIP stood at 105.1 per cent of GDP, which corresponded to an improvement of 6.9 p.p. of GDP (Table 8.3). In addition to the effect of financial account transactions, the total change in the IIP, as a percentage of GDP, may be broken down into changes in prices of the financial instruments, exchange rate changes in instruments denominated in foreign currency, other changes, such as reclassifications, and also the denominator effect, i.e. the GDP nominal change. Therefore, in addition to the financial account effect, the balance of the IIP as a percentage of GDP was positively influenced by the effect of the nominal GDP change, estimated at 3.3 p.p., and price changes, which correspond to 2.7 p.p. of GDP (Chart 8.5). In this latter item, both the gains in financial assets held by residents and the losses in national liabilities to non-residents contributed to a positive effect on the IIP balance. In particular, rises in sovereign debt yields are reflected in a decline in security prices with a positive impact on the IIP. Conversely, exchange-rate changes and other changes made a negative contribution, equivalent to 0.7 p.p. of GDP.

Table 8.2 • Financial Account | As a percentage of GDP

	2013	2014	2015	2016
Financial Account	3,3	1,6	1,2	1,7
Direct investment	-1,7	-1,5	-0,6	-2,2
Net acquisition of assets	3,0	4,2	0,5	1,9
Net incurrence in liabilities	4,7	5,7	1,1	4,1
Portfolio investment	2,6	-0,7	0,2	8,0
Net acquisition of assets	-0,1	4,2	0,6	0,9
Net incurrence in liabilities	-2,7	4,9	0,3	-7,1
Financial derivatives	0,6	1,1	0,2	0,3
Other investment	1,6	1,7	0,6	-6,9
Net acquisition of assets	-6,2	2,3	-5,4	-2,0
Net incurrence in liabilities	-7,8	0,5	-5,9	4,9
Reserve assets	0,3	1,0	0,8	2,5

Sources: INE and Banco de Portugal.

Banco de Portugal and non-financial corporations purchased foreign assets, whereas non-residents disinvested from public debt and other-MFI's securities.

In 2016 Banco de Portugal was the main agent investing in external assets, especially via the purchase of debt securities, either as reserve assets, or, in particular, as portfolio investment, and deposits with non-resident entities. This initiative by Banco de Portugal corresponds to the participation in the implementation of Eurosystem's monetary policy decisions. Notwithstanding these transactions, the IIP of Banco de Portugal remained virtually unchanged, also due to a significant increase in liabilities to non-residents,

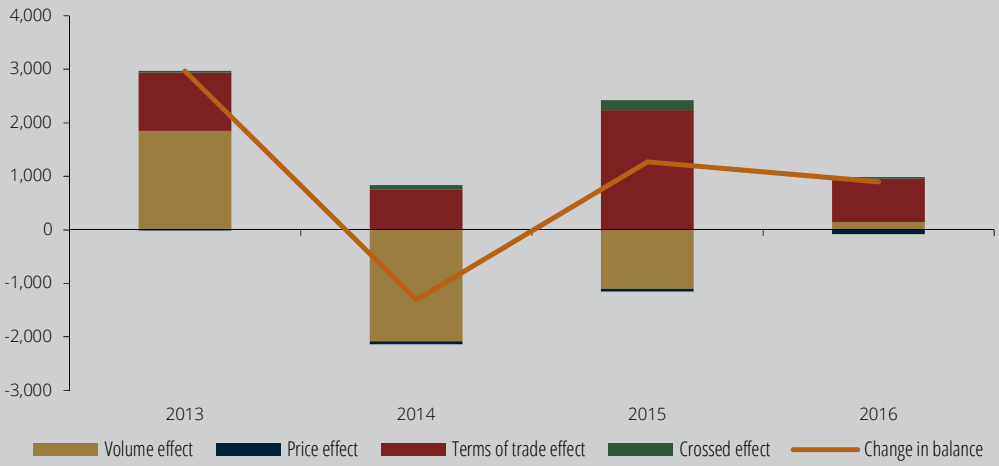


Chart 8.3 • Decomposition of goods and services account

| Million of euros

Sources: INE and Banco de Portugal.

Note: A positive change (negative) implies an increase (decrease) in the overall balance of the goods and services account. The change in the overall balance of goods and services account can be decomposed in four effects: – volume effect – effect of the change in quantities imported and exported; [Xt-1.vxt]-[Mt-1.vmt] – price effect – effect of the average price growth of external trade; [Xt-1.pt]-[Mt-1.pt] – terms of trade effect – effect of the relative change in exports and imports prices; [Xt-1.(pxt–pt)]-[Mt-1.(pmt-pt)] – crossed effect – effect of the interaction between the change in quantities and in prices of exports and imports; [Xt-1.vxt.pxt]-[Mt-1.vmt.pmt] The following notation applies: Xt-1 and Mt-1 are the exports and imports in year t-1 at current prices; vxt and vmt are the change rates in volume of exports and imports in t; pxt and pmt are the change rates of exports and imports prices in t; pt is the average change rate of the prices of external trade in year t ((pxt+pmt)/2).

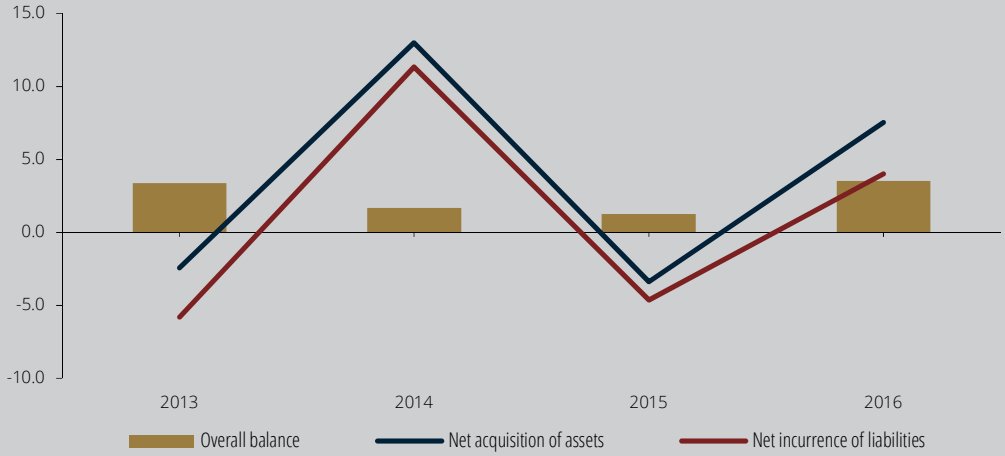


Chart 8.4 • Net change in financial assets and liabilities and overall financial balance

| As a percentage of GDP

Sources: INE and Banco de Portugal.

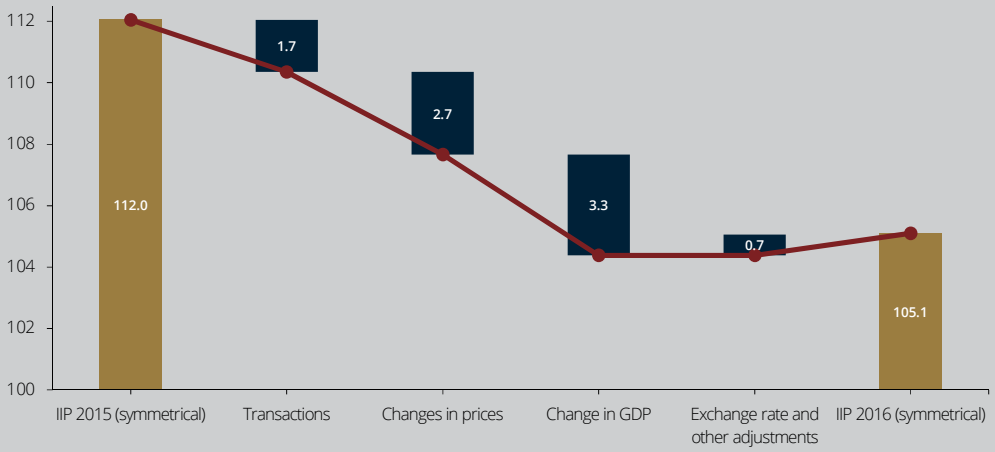
particularly in the form of liabilities to the Eurosystem. Monetary gold valuation also contributed to the increase in financial assets by 0.9 p.p. of GDP (Charts 8.6 and 8.7).

Non-financial corporations were also engaged in investments abroad, albeit to a lesser extent. These investments occurred mainly with corporations with which they had established direct investment links and from which they had obtained funds (Box 8.1 'Direct investment flows into the Portuguese economy'). The balance of these cross transactions was reflected in a higher increase in liabilities than in assets and in the deterioration of the IIP balance of this sector.

Contrary to the increase in external assets by Banco de Portugal and non-financial corporations, non-residents disinvested significantly from national public debt securities (Section 4: 'Fiscal policy and situation') and, to a lesser extent, from securities issued by other MFI.

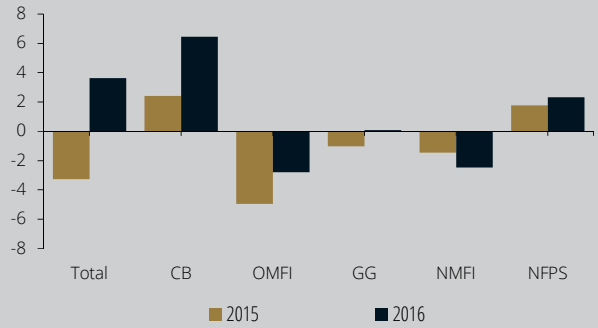
In the case of the general government, and in addition to transactions in debt securities issued, reference should be made to the repayment of loans obtained under the European and Financial

Chart 8.5 • Change in International investment position
| As a percentage of GDP



Sources: INE and Banco de Portugal.

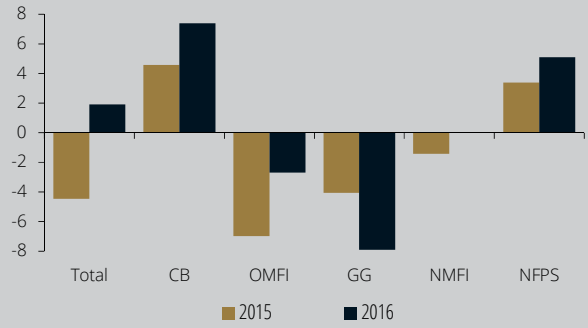
Chart 8.6 • Net acquisiton of assets [1]
| As a percentage of GDP



Sources: INE and Banco de Portugal.

Note: (1) The net acquisiton of assets corresponds to buys less sells of foreign assets by residents. A plus sign represents a net outflow of funds from the portuguese economy.

Chart 8.7 • Net incurrence of liabilities[2]
| As a percentage of GDP



Sources: INE and Banco de Portugal.

Note: (2) The net incurrance of liabilities corresponds to the increase less redemptions of national liabilities with non-resident entities. A plus sign corresponds to a net inflow of funds in the portuguese economy.

Assistance Programme. These transactions were an important contribution to the decline of 12.5 p.p. of GDP in the stock of external liabilities in this sector. This result also had the important contribution of both GDP and the devaluation of Treasury bonds, in a context of an increase in public debt yields.

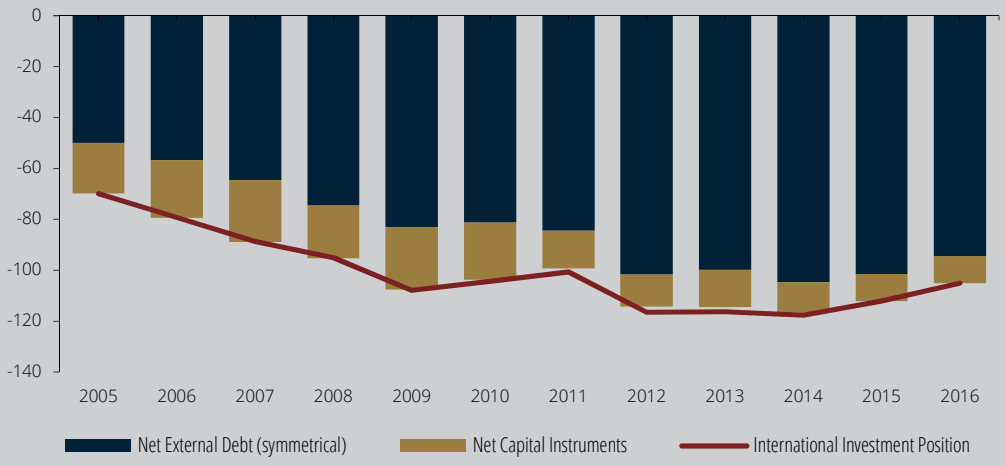
As regards the liabilities of other MFI, in addition to the decline in liabilities in the form of debt securities, there was a decrease in deposits by non-residents. In the same vein, investments abroad in these type of securities by other-MFI also declined. The volume of these transactions was more significant than the decline in liabilities, leading to a deterioration of the negative balance of the IIP in this sector by 1 p.p. of GDP.

Taking into account the significant transactions in debt securities issued by residents, net external debt, which is obtained by excluding capital instruments and financial derivatives from the IIP, declined by 7 p.p. of GDP, down from 101.5 per cent of GDP in 2015 to 94.4 per cent of GDP in 2016 (Chart 8.8).

Table 8.3 • International Investment Position | As a percentage of GDP

	2013	2014	2015	2016
International Investment Position	-116.3	-117.7	-112.0	-105.1
Direct investment	-27.3	-31.1	-30.8	-32.0
Direct investment - Assets	42.1	42.7	42.6	43.5
Direct investment - Liabilities	69.4	73.9	73.4	75.5
Portfolio investment	-10.2	-10.6	-9.2	0.8
Portfolio investment - Assets	64.8	68.8	66.7	65.9
Portfolio investment - Liabilities	75.0	79.3	76.0	65.1
Other investment	-84.5	-84.3	-82.0	-86.6
Other investment - Assets	68.2	69.1	61.9	58.1
Other investment - Liabilities	152.7	153.4	143.9	144.7
Reserve assets and derivatives	5.7	8.3	10.0	12.8

Sources: INE and Banco de Portugal.



Sources: INE and Banco de Portugal.

Chart 8.8 • International investment position, net external debt and position in capital instruments | As a percentage of GDP

Box 8.1 | Direct investment flows into the Portuguese economy[41]

The current situation of the Portuguese economy is characterised by moderate economic growth, relatively weak investment rate and unfavourable developments in labour productivity, against a background of high indebtedness of the different institutional sectors. In this context, the acceleration of economic activity and the increase in productivity require an investment effort that will be easier to implement if there is the possibility to attract external capital.

Foreign direct investment in Portugal reflects the Portuguese economy capacity to attract capital, also resulting in positive externalities, especially in terms of sharing technology and business knowledge. Therefore, it is important to analyse in more detail the nature and composition of these flows.

Balance of payments statistics on foreign direct investment in Portugal include financial transactions on assets and liabilities of resident corporations with their non-resident direct investors, as well as all financial transactions between resident and non-resident corporations, held (directly or indirectly) by the same non-resident entity.[42] Diversified financial flows are thus recorded, comprising reinvested earnings, investment in real estate, debt instruments and other capital instruments.

Reinvested earnings correspond to corporations' results that are retained, and reflect their allocation to foreign holders of the respective capital. Their registration in the balance of payments is therefore made under investment income and in the financial account, corresponding to an increase in investment. Reinvested earnings are recorded in the period in which they are earned.

Investment in real estate corresponds to investment by non-residents in property and residences in the national territory, either for personal use or for rental.

Debt instruments cover funds lent by non-resident entities – in the form of loans or debt securities – whereas capital instruments represent the property rights on the resident entity.

In an open economy as the Portuguese, foreign direct investment is an important source of financial inflows. Compared with other European countries, Portugal is among the main recipients of direct investment as a percentage of GDP (Charts 1 and 2).

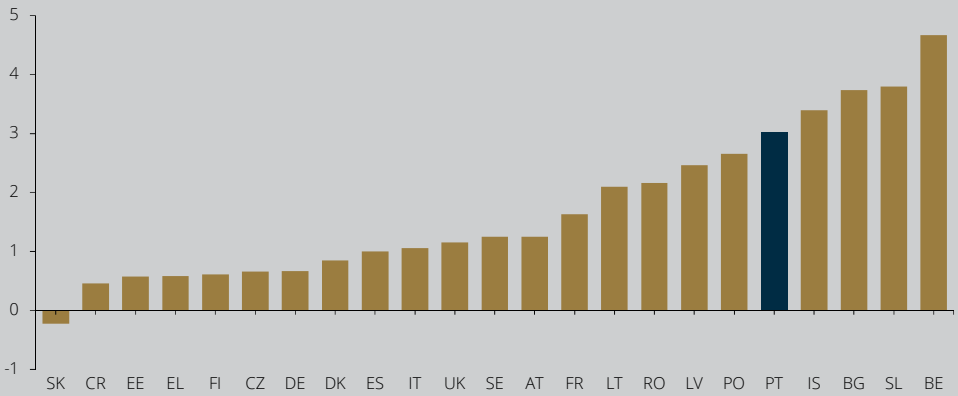
For many years, inflows into the Portuguese economy occurred mainly in the form of portfolio investment and other investment. In the 1996-2016 period, foreign direct investment, on average, accounted for annual net inflows into the economy of 2.4 per cent of GDP. In most recent years, however, and in a context of declining external indebtedness, direct investment flows have been gaining relative importance in the Portuguese economy. In 2013 and 2015 they were in fact the main source of external financing (Chart 3).

Since 2008, this investment represented, on average, 2.1 per cent of GDP. It was higher in 2011 and 2012, when it reached 4.1 per cent of GDP, and in the last two years, when it stood, on average, at 3.2 per cent of GDP.

Financing requirements of the Portuguese economy were partially met with recourse to privatisations, which translated into the purchase of assets by non-residents. Therefore, in 2011 and 2012, the composition of foreign direct investment in Portugal primarily took the form of capital instruments, and was associated with the non-financial corporations sector (Charts 4 and 5).

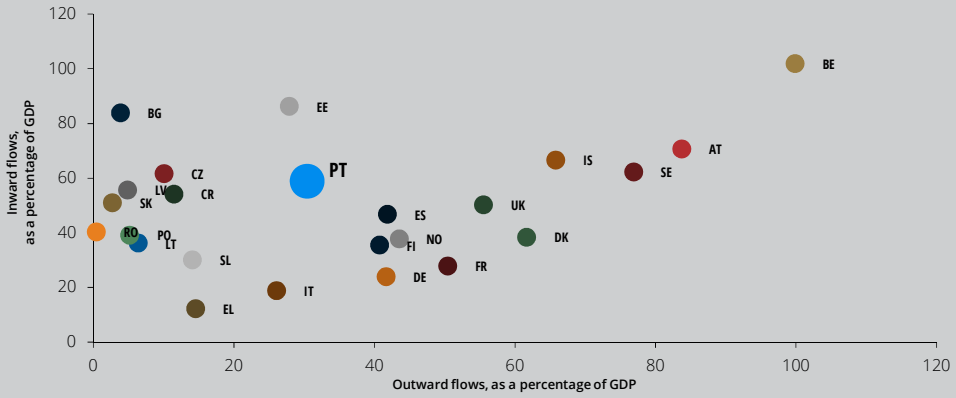
After a decline in inflows in 2013 and 2014, financial transactions intensified again in the last two years. In terms of instrument, however, there was a decline in the amounts of investment in corporations' capital, against an increase in transactions in debt instruments. I.e., resident corporations that received foreign direct investment used that channel to obtain financing from the firms in the

Chart 1 • Foreign Direct Investment – transactions – 2015 | As a percentage of GDP



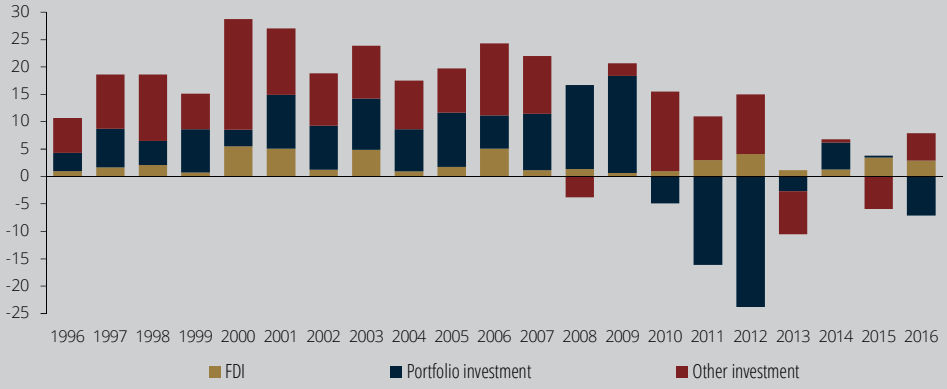
Source: Eurostat.

Chart 2 • Direct investment – stocks – 2015 | As a percentage of GDP



Source: Eurostat.

Chart 3 • Foreign direct investment and other inward funds in portuguese economy – transactions | As a percentage of GDP

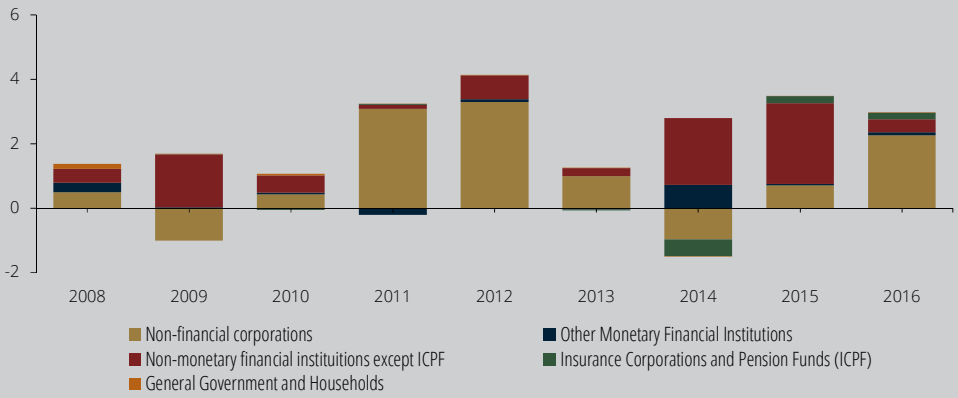


Sources: INE and Banco de Portugal.

group, thus circumventing more restrictive financing conditions in Portugal. This may be related either to loans or to issues of debt securities taken by firms in the group.

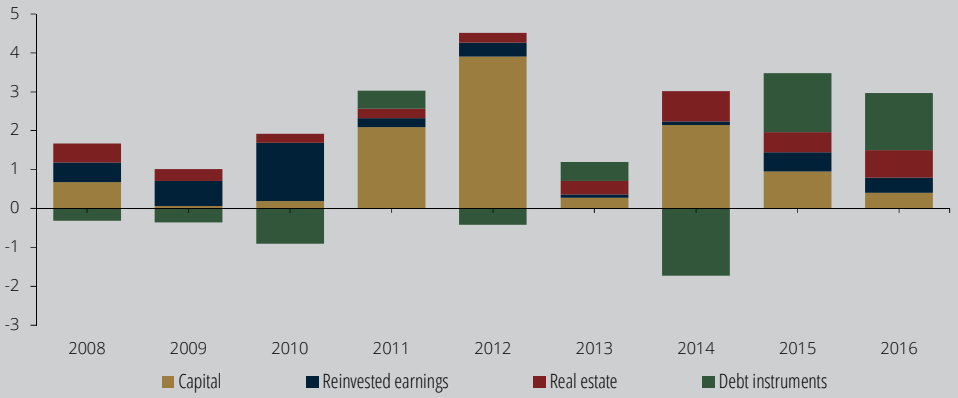
In the last three years, investment in real estate also reinforced its share as component of direct investment.[43] In 2016, flows associated with these transactions exceeded flows of investment in other capital instruments (0.7 per cent versus 0.4 per cent of GDP). These developments reflected demand for land and property by non-residents, in line with the profile of residence permits for investment purposes.

Chart 4 • Foreign direct investment in Portugal, by sector – transactions
| As a percentage of GDP



Sources: INE and Banco de Portugal.

Chart 5 • Foreign direct investment in Portugal, by type of transaction – transactions
| As a percentage of GDP



Sources: INE and Banco de Portugal.

Notes

1. Available at https://www.bportugal.pt/sites/default/files/anexos/pdf-boletim/projecoes_mar_pt_0.pdf

2. For further details, see Félix *et al.* (2007) 'MIMO – A Monthly Inflation Model', winter 2007 issue of the *Economic Bulletin* of Banco de Portugal.

3. Angola is not included in the set of countries used under the Eurosystem's procedure to calculate external demand for the goods and services of each individual country.

4. The APP is composed of four programmes: the Covered Bond Purchase Programme (CBPP), which is currently in its third programme; the Asset-backed Securities Purchase Programme (ABSPP), the Public Sector Purchase Programme (PSPP), and the CSPP. The first two programmes started in 2014 and the third programme in 2015.

5. In its December 2016 meeting, the Governing Council of the ECB announced its decision to extend the APP until the end of 2017. However, purchases were reduced from €80 billion to €60 billion from March onwards.

6. The Eurosystem's architecture only allows monetary financial institutions to have access to the ECB's deposit facility rate.

7. In this respect, see the speech by Yves Merch, 'Ructions in the repo market – monetary easing or regulatory squeezing?', 26 January 2017.

8. This fact tends to be visible in the repo market, particularly on dates close to accounting reporting dates and for rates associated with jurisdictions perceived as safe. On the last business day of December 2016, a number of repo rates reached historical lows.

9. See Antunes, Homero and Prego (2016) 'Firm default probabilities revisited', Banco de Portugal *Economic Studies*, Vol. 2, No. 2, Banco de Portugal.

10. Total credit to non-financial corporations includes loans by resident banks, loans by non-residents, debt securities issuance (held by residents and non-residents), trade credits (granted by residents and non-residents), household loans and Treasury loans (in the case of loans to public undertakings).

11. This definition of indebtedness includes the sum of bank loans, debt securities and trade credits.

12. See Box "Developments in corporate indebtedness in Portugal and the euro area", Economic Bulletin, May 2016, Banco de Portugal. The analysis considers data from the national financial accounts and the measure of indebtedness considered is the ratio of debt (loans and debt securities) to total assets.

13. Félix, S. (2017) "Firm creation and survival in Portugal", Banco de Portugal Economic Studies, Banco de Portugal.

14. The survey IES includes economic, financial, and accounting information of virtually all the Portuguese non-financial corporations and is available for the period between 2005 and 2015. Nevertheless, changes in the accounting standards system in 2010 have led to a loss of data comparability.

15. A reporting gap is observed when the firm reports to the IES in year t-1 and year t+1, but is absent in year t.

16. Some of the absences that are considered exits from the market in 2015 may constitute reporting gaps. This can only be verified when the IES for 2016 becomes available. However, only about 0.2 per cent of the observations are reporting gaps in the period under analysis.

17. EBIT stands for Earnings Before Interest and Taxes.

18. These factors meet the criteria for classification as temporary measures, as defined in the Eurosystem context, which does not necessarily coincide with the classification adopted by other institutions.

19. In August 2016, the EU Council recommended a stabilisation of the structural balance. Compliance with this recommendation shall be assessed on the basis of the cyclical adjustment methodology and the definition of temporary measures adopted by the European Commission.

20. The impact of the resolution of BANIF in 2015 is treated as a temporary measure, according to the definition adopted by the Eurosystem. This operation had a significant impact on capital transfers, chiefly as a result of the capital increase by the State. To a lesser extent, it also affected the public investment aggregate via the recording of real estate acquisitions by Oitante, a special-purpose entity created in the context of the resolution process.

21. Military material delivered in 2016 relates to the sale of F-16 aircrafts to Romania, which negatively affects the general government investment aggregate. In spite of their one-off impact on the balance, these operations are not treated as temporary measures in the context of the definition adopted by the Eurosystem.

22. In 2015 a number of operations contributed to an increase in general government capital expenditure: the conversion into an equity increase of loans granted by Wolfpart to its holding Caixa Imobiliário; the recording of requests for budget increases by Instituto de Financiamento da Agricultura e Pescas (Agricultural and Fisheries Financing Institute); capital increases in public corporations that are not included in the general government.

23. In 2015 the general government wage cuts in force since 2011 started to be reversed, with 20 per cent of the cuts being reinstated. In 2016 the remainder was gradually reinstated in the course of the year, by 25 per cent each quarter.

24. In early 2015, the European Central Bank announced the widening of the asset purchase programmes then in force, to also include the purchase of bonds issued by euro area central governments, as well as by European organisations and institutions.

25. The implicit interest rate is computed as the ratio of interest expenditure to the simple average of the debt stock at the end of the current and the previous year.

26. The analysis in this box is based on the methodology developed in the context of the Eurosystem which allows the breakdown of structural revenue from taxes and social contributions into the following components: i) impact of legislative changes; ii) contribution of the discrepancy between the trend nominal change in the relevant macroeconomic base and GDP; iii) effect of the structural fiscal elasticity in structural terms and iv) residual component. The residual component corresponds to the part of the structural change that is not explained by the previous effects. For further details, see Kremer *et al.* (2006), A disaggregated framework for the analysis of structural developments in public finances, Working paper ECB 579, and Braz, C. (2006), 'The calculation of cyclically adjusted balances at Banco de Portugal: an update', winter 2006 issue of the *Economic Bulletin* of Banco de Portugal.

27. In the case of the tax on oil products, the estimate for the impact of an increase in taxation reflects an ex post reassessment based on the final outturn for the year.

28. Total revenue from social contributions includes actual and imputed social contributions referring to civil servants, which are also recorded on the expenditure side, under compensation of employees.

29. See Box 5.2 of the October 2016 issue of the *Economic Bulletin* for a characterisation of very long-term unemployment in Portugal.

30. According to Eurostat's definition, tradable services include accommodation and food services, trade and repair, transportation and storage, and information and communication activities.

31. Apparent labour productivity was calculated dividing VAT (volume chain-linked series, € millions) by total employment (full-time equivalent), except in the 1992 recession, when it was calculated on the basis of GDP.

32. For a discussion, see for example F. Caselli (2005) 'Accounting for Cross-Country Income Differences', *Handbook of Economic Growth*, volume 1, Chapter 9.

33. Information available at https://fred.stlouisfed.org/release?rid=285.

34. Taking into account the weight of trade with Angola in Portuguese nominal exports, it is possible to estimate the mechanical impact of the fall in exports to Angola on nominal GDP. Hence, in 2016 total exports to Angola (goods and services), excluding an estimate for import contents, appear to have made a contribution of around -0.6 p.p. to 3.0 per cent growth of nominal GDP (in 2015 the contribution was around -0.7 per cent for 3.7 per cent growth of nominal GDP).

35. In 2016, in particular, remuneration received by households grew by 3.6 per cent, after 2.4 per cent in 2015.

36. In 2016 the decline in interest expenses of households contributed 0.4 p.p. to the 3.2 per cent growth of nominal disposable income.

37. See the special issue 'Recent developments in consumer lending: A macroprudential approach', *Financial Stability Report*, Banco de Portugal, November 2016.

38. Following 1.5 per cent year-on-year falls in the first two quarters of 2016, nominal exports of goods grew by 1.9 and 5.1 per cent respectively in the third and fourth quarters of 2016. This was also due to the stabilisation of exports of fuels in the second half of the year, after the break observed in the first half.

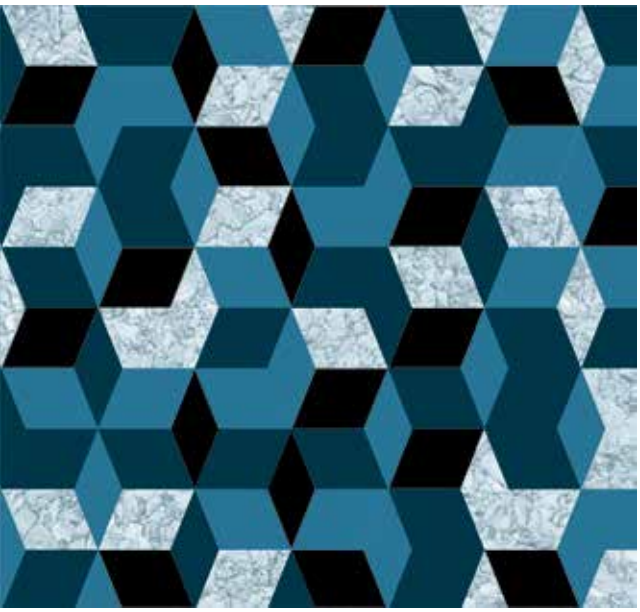
39. Information on the aggregation and calculation of rates of change in European export prices in Banco de Portugal, 2016, 'Portuguese international traders: some facts about age, prices and markets', *Economic Bulletin*, October 2016, special issue.

40. For further details, see Félix *et al.* (2007) 'MIMO – A Monthly Inflation Model ', Winter 2007 issue of the *Economic Bulletin* of Banco de Portugal.

41. This Box was based on information on Foreign Direct Investment in Portugal, according to the directional principle. I.e., all transactions with non-residents regarding resident direct investment firms are considered, irrespective of whether they are an asset or a liability of such corporations.

42. For further details on the statistical treatment of information on direct investment, see Banco de Portugal (2015), 'Statistics of the balance of payments and the international investment position – Methodological notes', *Supplement to the Statistical Bulletin* No. 2/2015.

43. For a more detailed analysis of real-estate investment, see Box 7.1 of the May 2016 issue of the *Economic Bulletin*.



II
Special issue

Distribution mechanisms of monetary policy in the Portuguese economy

Distribution mechanisms of monetary policy in the Portuguese economy

1. Introduction

In the wake of the global economic and financial crisis, the link between the implementation of monetary policy and developments in inequality has re-entered the public debate. This is set against a background where inequality has once again been considered inseparable from economic policy. The perception that the reduction in inequality seen throughout most of the last century had been reversed, together with the fact that advanced economies have failed to return to the activity levels that would have been reached if the trend before the crisis had continued, contributed to the greater importance of issues related to the distribution of economic resources.

It is well known that inequality is not, and should not be, an objective pursued by central banks. In the case of the euro area, the primary objective of the European Central Bank (ECB) is price stability and, secondarily, support to the general economic policies in the European Union. The maintenance of price stability helps prevent the arbitrary redistribution of income. In any case, it is potentially important to understand the link between the implementation of monetary policy and inequality for two sets of reasons. On the one hand, inequality levels prevailing in an economy may affect monetary policy transmission to economic agents, thereby hampering its expected results. On the other hand, monetary policy may affect inequality levels prevailing in the euro area and individual economies and, as such, influence a considerable part of public debate and the Eurosystem's accountability.

The redistribution impact of monetary policy has also been increasingly reviewed in economic literature (see e.g. Auclert, 2016, or Coibion *et al.*, 2016, and respective references). The use of increased computing power to solve economic models with heterogeneous agents, together with the dissemination of microeconomic data on an individual basis, has helped focus academic discussion on distribution issues. There is a new consensus in economic literature that monetary authorities must be aware of the redistribution effects of monetary policy, as well as the unobserved heterogeneity in the economy. This conclusion stands even when the redistribution impact of monetary policy is relatively small over long periods, which are the most suitable when analysing structural developments in inequality: over such time horizons, structural factors become more important, including inter alia the openness of economies, technological progress, institutional changes in the output and labour markets, the tax regime and the social protection network.

The purpose of this article is to look into some of the main monetary policy transmission channels impacting on the distribution of monetary resources among households. Such channels are illustrated on the basis of microeconomic data on the Portuguese economy. However, the analysis will necessarily compare modestly with the title of this article. In fact, the impact of monetary policy on the Portuguese economy goes well beyond the channels analysed in this article. For instance, the reduction in the ECB's intervention rates following the international financial crisis made a key contribution to relieving the debt service of Portuguese households and to reduce liquidity constraints. This channel had a major impact on the Portuguese economy as a whole, but it will not be reviewed here. Studying the distribution effects of monetary policy would involve describing a counterfactual scenario that can only be created using a proper model.

The Special Issue is structured as follows. Section 2 looks into the methodology and the microdata

bases used in the analysis. Section 3 describes some of the main monetary policy redistribution channels, illustrating their potential impact based on microeconomic data on the Portuguese economy. Section 4 includes an exercise that analyses the quantitative impact on the Portuguese economy of the standard and non-standard monetary policy measures implemented over the past few years. Section 5 presents and discusses the main conclusions of this exercise.

2. Methodology and databases

In this article, the household is the unit of analysis. By definition, this is the unit where inequality resulting from its links with the market is of greater interest. Although in Portugal it is still not possible to track wealth trends for a representative sample of the population over time, results are now available from two rounds of the Household Finance and Consumption Survey, a Eurosystem initiative that Banco de Portugal and Statistics Portugal (Portuguese acronym: INE) have implemented domestically. The information gathered from these surveys will make it possible to start tracking the impact under review (see Banco de Portugal and Statistics Portugal, 2016, Costa and Farinha, 2012, and Costa, 2016).

In this article, household inequality is assessed on the basis of two concepts of wealth: wealth in broad sense and net wealth.

Wealth in broad sense assesses, at a given moment in time, the range of decisions that households may make in the course of their lifetime and, therefore, provides a good summary of the resulting well-being. This aggregate may be broken down into two very different components, as illustrated by the following equation:

$$Wealth\ in\ broad\ sense\ = \\ Net\ wealth + Human\ wealth \quad (1)$$

On the one hand, the net wealth (or non-human wealth) of each household when the period under review begins results from the difference between its assets and its liabilities. This net wealth, by construction, is predetermined and generates some return, including capital gains, over time. On the other hand, there is the so-called human wealth, i.e. the sum of current and future income resulting from household decisions as to how to spend time in the labour market.

Over the lifetime of each household, human wealth will depend on exogenous conditions – such as the labour market environment and structural changes – and idiosyncratic features of the household under review. Among household-specific features are the (accumulated or inherent) efficiency with which household members that participate in the labour market are able to turn their time into income, and the starting position in the labour market, which, together with age, partially determines future returns on that market. The transformation of initial conditions into returns in the labour market is anything but deterministic. As is well known, luck plays its part, which means that idiosyncratic shocks help determine, inter alia, which household members will be employed, the quality of the match between employees and workers (according to their skills) and developments in the sector of activity where a household member will work. Labour income results from the combination of these opportunities. This clearly shows that, in contrast to net wealth, human wealth depends on a great deal of unavailable information. At best, information is only available on probability distributions.

At a given moment in time, the sum of the expected value of labour income in the course of a lifetime, discounted back to that moment, determines the household's human wealth. This aggregate includes pension income, given its close link to labour market participation. In practical terms, each household was assumed to have a wide horizon when making its decisions, as would be the case when using an infinite-horizon agent model. Assuming that labour income corresponds to a perpetuity, and taking into account a discount

rate of 4%, this would imply that human wealth may be proxied by multiplying current labour income[1] by 25. This proxy is used in the exercises below, although results are qualitatively robust to the use of different discount rates. Equation (1) can therefore be re-written as follows:

$$Wealth\ in\ broad\ sense\ = \tag{2}$$

$$Net\ wealth + \ Human\ wealth\ \approx Net\ wealth + 25 \times Labour\ income$$

Knowing the distribution of the sum of these two types of wealth among households representing a given population provides a good measure of inequality among that population. The way in which this distribution reacts to structural changes in the economy – including a persistent policy change – provides a measure of the distribution impact of that change.

To simplify the analysis, in this article households are broken down into wealth in broad sense and net wealth quintiles, assuming that the average of each quintile summarises the corresponding population group.[2] The ratios used to gauge inequality are the ratio of the average population to the intermediate quintile (Average/Q3), the ratio of the highest quintile to the intermediate quintile (Q5/Q3) and the ratio of the highest quintile to the lowest quintile (Q5/Q1). The higher the ratios, the more unequal the distribution is. These ratios should be interpreted with caution. For instance, while the Average/Q3 ratio is not very sensitive to small changes in the distribution, the Q5/Q1 ratio reacts very strongly if Q1 figures are very low.[3]

Table 1 shows descriptive statistics on the level and distribution of wealth in broad sense and net wealth in the Portuguese economy, on the basis of the Household Finance and Consumption Survey for 2010 (to see a comparison between the outcome of the Household Finance and Consumption Survey for 2010 and that for 2013, see Costa, 2016). The various distribution quintiles for wealth in broad sense and net wealth comprise different households. Indeed, there is a relatively small overlap between households across distribution quintiles, as illustrated in Table 2. For instance, only 48 per cent of households in the lowest quintile of wealth in broad sense are also included in the lowest net wealth quintile. This different household composition in both measures of wealth distribution plays a key role when interpreting the results obtained in Section 3.[4]

Table 1 illustrates the high inequality levels in net wealth and wealth in broad sense in Portugal. In particular, the average value of net wealth in the first distribution quintile is close to zero. This explains the high inequality in net wealth as measured by the Q5/Q1 ratio. Turning to wealth in broad sense, its dispersion is much lower, given that human wealth's dispersion is relatively low. Overall, the heterogeneity prevailing in the distribution of net wealth and wealth in broad sense suggests that the potential redistribution impact of monetary policy on the Portuguese economy cannot be ignored.

This article includes a number of stylised exercises discussing in what way monetary policy changes can be transmitted to household wealth. Monetary policy has distribution effects via several channels. The unexpected impact on price levels is one of the most studied channels in literature. This 'Fisher channel' has been analysed in literature for a long time, starting with Fisher (1933). Briefly, an unexpected shock leading to an increase in the consumer price index has a redistribution effect by changing the real value of household exposures. An increase in prices redistributes resources from households with positive nominal wealth positions to households with negative nominal positions, which means that it generates a reduction in real wealth for creditors and an increase in real wealth for debtors, if assets held at the time of the policy shock are denominated in cash units.

Table 1 • Distribution of wealth in broad sense and net wealth in Portugal
| Values in euros

	Wealth in broad sense	Net wealth
Q1	291,814	1,282
Q2	386,690	34,010
Q3	495,483	78,982
Q4	698,424	146,449
Q5	1,375.553	529,285
Total	649,441	157,933
Q5/Q3	2.8	6.7
Q5/Q1	4.7	412.8
Average/Q3	1.3	2.0

Note: Calculations based on HFCS 2010. Average values.

Table 2 • Distribution of the population by quintiles of wealth in broad sense and of net wealth
| In percentage

Quintiles of wealth in broad sense	Net wealth quintiles					
	<20	20-40	40-60	60-80	>=80	Total
<20	**48**	31	16	4	0	100
20-40	26	**28**	25	18	4	100
40-60	14	21	**27**	26	11	100
60-80	9	15	20	**29**	27	100
>=80	3	5	11	23	**58**	100
Total	100	100	100	100	100	

Note: Calculations based on HFCS 2010. Average values.

Another redistribution channel attributable to monetary policy results from developments in nominal interest rates. Persistently increasing the average inflation rate, as well as the short-term nominal interest rate, results in a relatively larger increase in taxes for cash-holding households – with approximately zero nominal profitability – compared with households holding assets with positive returns. Given that relatively poorer agents hold a larger share of their wealth in cash, they are negatively affected by the aforementioned policy change compared with richer agents. This effect is described in Erosa and Ventura (2002) and Adão and Correia (2016).

Since the beginning of the euro area, the Portuguese economy has been characterised by a monetary regime where nominal interest rates and the inflation rate are low and not very volatile. Consequently, the redistribution impact of monetary policy via both channels described above has probably been negligible in the recent past and, therefore, is not analysed in this article. By contrast, the following section looks into the channels that may have had a significant impact on the distribution of net wealth and human wealth among Portuguese households in the recent past. These channels result from the implementation of standard monetary policy measures – more specifically, through changes in the ECB's intervention rates – as well as the adoption of non-standard monetary policy measures, namely through the purchase of assets by the Eurosystem.

On the one hand, as regards net wealth, the article analyses the transmission channel via asset prices and interest rates in various markets, i.e. the channel through which monetary policy values (positively or negatively) household

assets and liabilities. This channel is analysed in detail in Sub-sections 3.1 and 3.2, through a partial equilibrium exercise, which adopts a similar approach to that of Doepke and Schneider (2006).

On the other hand, as regards human wealth, Sub-section 3.3 describes the redistribution impact of monetary policy via the labour income channel. This channel arises due to changes in labour income, associated with monetary policy measures, with a varying impact on different segments of the population. This exercise is based on Household Finance and Consumption Survey data, together with microeconomic data from the Labour Survey.

3. Distribution channels of monetary policy in Portugal

How does a monetary policy change affect the distribution of wealth in broad sense and net wealth of households in Portugal? This section aims to answer this question. The answer is provided within a partial equilibrium framework and unvarying composition of investment portfolios, thereby excluding agents' reaction to policy changes. A stylised approach is used on the redistribution impact of monetary policy via valuation changes in the stock of net wealth (Subsection 3.1), income flows generated by this stock of net wealth (Sub-section 3.2) and labour income changes (Sub-section 3.3).

The exercise focuses on stylised monetary policy changes towards greater monetary accommodation, through a reduction in interest rates and the implementation of non-standard monetary policy measures. Although assessing all transmission mechanisms poses a number of challenges, one can argue that such a monetary impulse will tend to reduce (lending and deposit) nominal interest rates and foster employment, activity, asset prices and business profits. These stylised shocks are analysed in the following sub-sections.

According to the adopted identification strategy, the asset portfolio composition remains unchanged at a given moment for a specific household. Developments in net wealth over time are exclusively due to changes in the path followed by prices and returns on assets and liabilities. The question, therefore, is how, due to monetary policy, developments in these prices or returns change over time and how this leads to different developments in wealth for each household, under the assumption of unvarying portfolios. This exercise is along the same lines as that developed by Domanski *et al.* (2016), taking Doepke and Schneider (2006) as a starting point.

3.1. Transmission channel via asset prices: stock valuation

One of the transmission channels of monetary policy to the distribution of wealth in broad sense stems from valuation changes in the stock of assets. At first sight, given the concentration of assets in the top wealth quintile (wealth in broad sense and, in particular, net wealth), it could be expected that an increase in the value of assets would lead to an increase in inequality. However, this is not necessarily the case. Indeed, a specific increase in the value of assets impacts on wealth (in broad sense and net) distribution, not only directly on the assets per se, but also via the leverage of the various population quintiles. This link is illustrated by equation (3) for net wealth, which is defined as the difference between assets (A) and debt (D) of a given distribution quintile (Q_i). The equation shows that the percentage increase in net wealth of a given quintile, resulting from a percentage rise in the value of assets $\frac{\Delta A^{Q_i}}{A^{Q_i}}$, is obtained by multiplying this percentage increase in the value of assets by a factor $\frac{1}{1-\frac{D^{Q_i}}{A^{Q_i}}}$ that positively depends on leverage in that quintile.

$$\frac{\Delta(A^{Q_i}-D^{Q_i})}{A^{Q_i}-D^{Q_i}}=\frac{\Delta A^{Q_i}}{A^{Q_i}}\frac{A^{Q_i}}{A^{Q_i}-D^{Q_i}}=\frac{\Delta A^{Q_i}}{A^{Q_i}}\frac{1}{1-\frac{D^{Q_i}}{A^{Q_i}}} \quad (3)$$

In the case of wealth in broad sense, the impact of changes in assets is illustrated by equation (4). In this case, the wealth aggregate includes human wealth, HW^{Q_i}, and, therefore, the impact of a percentage increase in assets is not only positively related to leverage in each quintile but also negatively related to the ratio of human wealth to total assets in each quintile:

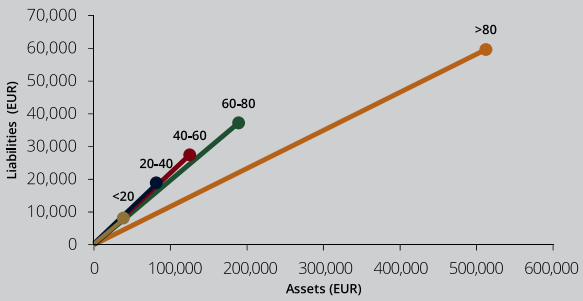
$$\frac{\Delta(A^{Q_i}+HW^{Q_i}-D^{Q_i})}{A^{Q_i}+HW^{Q_i}-D^{Q_i}} = \frac{\Delta A^{Q_i}}{A^{Q_i}} \frac{A^{Q_i}}{A^{Q_i}+HW^{Q_i}-D^{Q_i}} = \frac{\Delta A^{Q_i}}{A^{Q_i}} \frac{1}{1+\frac{HW^{Q_i}}{A^{Q_i}}-\frac{D^{Q_i}}{A^{Q_i}}} \quad (4)$$

As such, to assess the distribution impact via this transmission channel, it is necessary to look into the link between the asset aggregate and the amount of liabilities held by each household typifying the distribution quintiles. This link is shown in Charts 1 and 2, for the distribution of wealth in broad sense and net wealth respectively. The slope of the lines for each quintile corresponds to leverage, measured by the debt-to-assets ratio. The charts show that the highest wealth quintiles (both net and in broad sense) have the lowest leverage.

In the case of net wealth, the Portuguese economy is characterised by a population where growing wealth corresponds to a decreasing indebtedness ratio. This is highly significant and implies that a similar percentage increase in the value of assets across net wealth distribution quintiles always improves the relative position of the lowest quintiles *vis-à-vis* the average quintile and the highest quintiles. This means that higher asset values increase relatively more the net wealth of poorer households, regardless of asset concentration. Similarly, in the case of a decrease in the value of assets, more leveraged households would post a larger decline in net wealth.

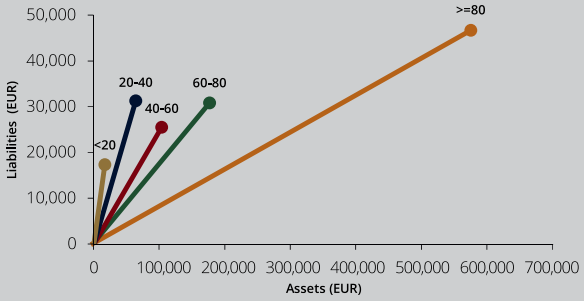
In the case of the distribution of wealth in broad sense across quintiles, the link between leverage and wealth is not so clearly monotonic (excluding the highest quintile). Therefore, in the case of a homogeneous increase in the value of assets, the final impact on inequality will result from the weighing of the relative share of human wealth in assets and leverage, as illustrated by equation (4). Chart 3 shows that the ratio of human wealth to assets (the term $\frac{HW^{Q_i}}{A^{Q_i}}$ in equation (4)) is lower for the highest quintile of wealth in broad sense than for the other quintiles, in contrast to the lower leverage in this quintile. Only an empirical simulation reveals which effect is predominant.

Chart 1 • Relation between assets and liabilities, by quintiles of wealth in broad sense



Note: Based on the Household Finance and Consumption Survey for 2010.

Chart 2 • Relation between assets and liabilities, by net wealth quintiles



Note: Based on the Household Finance and Consumption Survey for 2010.

Chart 4 shows this ratio for net wealth quintiles, but has no role in the analysis.

For that purpose, Table 3 (first column) presents a stylised simulation of the impact of changes in the value of assets for some interquintile ratios, in the case of both the wealth in broad sense and the net wealth distributions. Calculations were made on the basis of the Household Finance and Consumption Survey for 2010. The table confirms that a similar percentage increase in the value of assets across distribution quintiles fosters inequality in the distribution of wealth in broad sense and reduces inequality in net wealth distribution.

Table 3 • Impact of changes in the value of assets on the distributions of wealth in broad sense and net wealth | Percentage changes in initial ratios, excluding ratio values

Ratios based on quintiles of wealth in broad sense

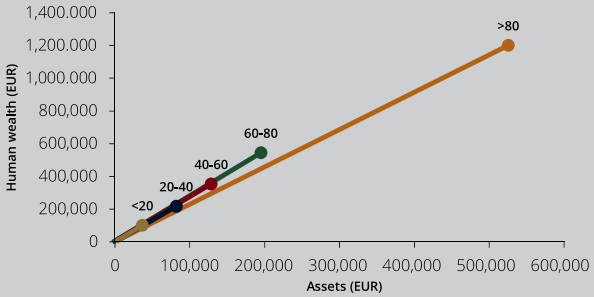
	Initial ratios	10% increase in real estate, tradable assets and businesses	10% increase in real estate	10% increase in tradable assets	10% increase in the values of businesses
		(1)	(2)	(3)	(4)
Q5/Q3	3.6	0.305	-0.277	0.063	0.533
Q5/Q1	11.9	0.343	-0.292	0.060	0.589
Average/Q3	1.4	0.150	-0.157	0.034	0.279

Ratios based on net wealth quintiles

	Initial ratios	10% increase in real estate, tradable assets and businesses	10% increase in real estate	10% increase in tradable assets	10% increase in the values of businesses
		(1)	(2)	(3)	(4)
Q5/Q3	6.7	-1.411	-3.221	0.120	1.877
Q5/Q1	412.4	-48.701	-49.625	-0.015	1.686
Average/Q3	2.0	-0.761	-1.967	0.076	1.255

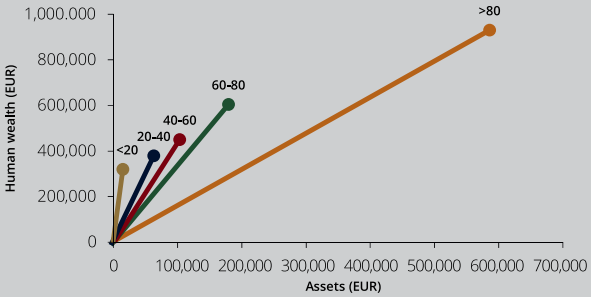
Note: Calculations based on HFCS 2010.

Chart 3 • Relation between human wealth and assets, by quintiles of wealth in broad sense



Note: Calculations based on the Household Finance and Consumption Survey for 2010.

Chart 4 • Relation between human wealth and assets, by net wealth quintiles



Note: Calculations based on the Household Finance and Consumption Survey for 2010.

The table also breaks down the impact of the valuation of the various assets held by households. Assets are typically broken down into real assets and financial assets. Real assets chiefly include real estate and self-employment businesses[5], and hold a large share in net wealth of households in Portugal and most euro area countries. In turn, financial assets mainly comprise deposits and marketable securities, including shares, bonds and mutual fund investment units.

In the case of a percentage increase in a component of total household assets, e.g. housing, represented as H^{Q_i}, equation (3) on net wealth distribution would be re-written as follows (and analogously for equation (4) on wealth in broad sense):

$$\frac{\Delta(A^{Q_i} - D^{Q_i})}{A^{Q_i} - D^{Q_i}} = \frac{\Delta H^{Q_i}}{H^{Q_i}} \frac{H^{Q_i}}{A^{Q_i}} \frac{A^{Q_i}}{A^{Q_i} - D^{Q_i}} = \frac{\Delta H^{Q_i}}{H^{Q_i}} \frac{H^{Q_i}}{A^{Q_i}} \frac{1}{1 - \frac{D^{Q_i}}{A^{Q_i}}} \quad (5)$$

As such, a similar percentage increase in housing prices across quintiles will impact on net wealth distribution according to the share of housing in total assets and leverage for each quintile.

Columns 2, 3 and 4 of Table 3 illustrate the effect on wealth of 10% increases in housing prices, on the value of marketable financial assets and on the value of self-employment businesses. This analysis is particularly useful given the perception that monetary policy – in particular, non-standard monetary policy – had a sizeable impact on the increase in value of these assets.

The exercise demonstrates that an increase in housing prices helps reduce inequality in wealth distribution, given that housing has a relatively homogenous importance across wealth quintiles, but lower in the case of the highest wealth quintile (Charts 5 and 6). In turn, an increase in the value of shares, bonds and mutual funds typically contributes to an increase in inequality, in line with the high inequality in the distribution of these assets, which are greatly concentrated and hold a relatively high share in the last distribution quintile (Charts 7 and 8). The sole exception is the Q5/Q1 ratio in net wealth distribution, stemming from the impact of high leverage on the first net wealth quintile, as explained above (see Chart 2). Similarly, self-employment businesses also contribute, as expected, towards increased inequality in wealth distribution.

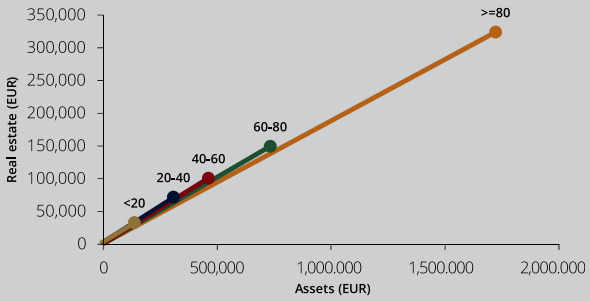
3.2. Transmission channel via return on net assets: income flows

A monetary policy change may lead to transformations in the distribution of household wealth, not only due to changes in asset valuation (Subsection 3.1), but also due to changes in income flows stemming from policy changes. This subsection analyses the issue, once again by simulating stylised shocks applied to microeconomic data available in the Household Finance and Consumption Survey for 2010. More specifically, the stylised exercise consists in assessing the impact on the distribution of net wealth and wealth in broad sense of: (i) a 4 p.p. reduction in the interest rate on time deposits, (ii) a 4 p.p. increase in the return rate on self-employment businesses, and (iii) a 4 p.p. reduction in interest rates on consumer loans and housing loans.

This exercise is based on a number of assumptions. First, it is once again assumed that no decisions have been made on wealth composition. It only varies due to changes in interest/return rates. Second, it takes into account a change in interest rates from 5% to 1% and a change in return on self-employment businesses from 1% to 5%, although results are relatively robust to other rate levels compatible with a similar 4 p.p. change. Third, it is assumed that, among deposits, only time deposits bear interest. Fourth, the reduction in interest rates affects all time deposits and housing loans, taking into account a residual maturity of one year in deposits and the fact that housing loans typically have a floating rate. Fifth, it is assumed that the reduction in interest rates affects 40% of consumer loans, with a residual average maturity of 2.5 years. Finally, the exercise assumes that time deposits mature over this period and that interest is reinvested. Similarly, it is assumed that debt maturing over this period is refinanced, including interest.

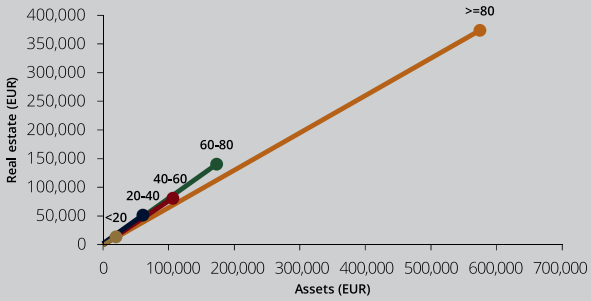
Table 4 shows results for this exercise, simulating shocks that will tend to follow an expansionary monetary policy shock. Its main conclusions are as follows. First, on the asset side, a decrease in return on time deposits leads to an increase in net wealth inequality (column 1), reflecting the combination of greater leverage for poorer households and a relatively similar share of time deposits in total assets among the Q1, Q3 and Q5 net wealth distribution quintiles (Chart 10). In the case of wealth in broad sense, the decrease in return on deposits helps reduce inequality. In wealth in broad sense, both the dispersion in the share of deposits in total assets and the dispersion in leverage across household quintiles – in particular, the Q1, Q3 and Q5 quintiles – is lower than in net wealth (Chart 9). Second, an increase in return on businesses leads to greater inequality, due to their greater share of the highest wealth (net and in broad sense) quintiles (column 2). Third, a decline in loan rates tends to reduce inequality, given that leverage is relatively greater in the lowest wealth quintiles, particularly in the case of net wealth. This conclusion stands both for housing loans and consumer and other loans (columns 3 and 4). The smaller reduction in inequality in the case of wealth in broad sense is due to the lower dispersion in leverage as well as the fact that loans are more unevenly distributed across quintiles in this case.

Chart 5 • Relation between real estate and total assets, by quintiles of wealth in broad sense



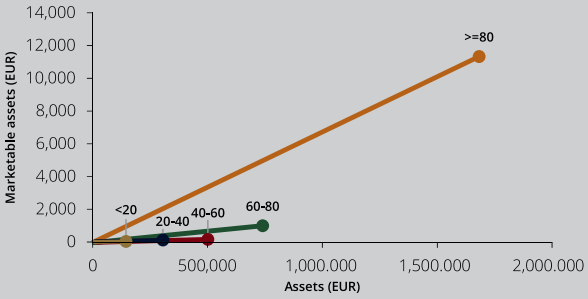
Note: Calculations based on the Household Finance and Consumption Survey for 2010.

Chart 6 • Relation between real estate and total assets, by net wealth quintiles



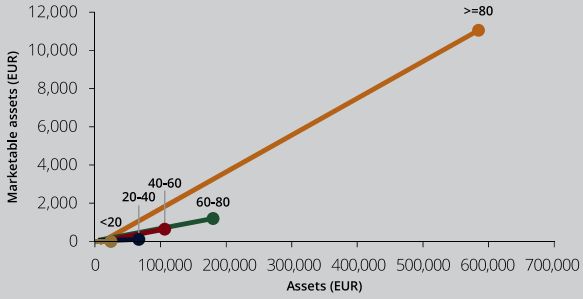
Note: Calculations based on the Household Finance and Consumption Survey for 2010.

Chart 7 • Relation between tradable assets and total assets, by quintiles of wealth in broad sense



Note: Calculations based on the Household Finance and Consumption Survey for 2010.

Chart 8 • Relation between tradable assets and total assets, by net wealth quintiles



Note: Calculations based on the Household Finance and Consumption Survey for 2010.

Table 4 • Impact of changes in income flows on the distributions of wealth in broad sense and net wealth | Percentage changes in initial ratios, excluding ratio values

Ratios based on quintiles of wealth in broad sense

	Initial ratios	4 pp decrease in the interest rate on deposits	4 pp increase in the rate of return of businesses	4 pp decrease in the interest rate on housing loans	4 pp decrease in the interest rate on consumer loans
		(1)	(2)	(3)	(4)
Q5/Q3	3.6	-0.004	0.158	-0.004	-0.002
Q5/Q1	11.9	-0.006	0.175	-0.004	-0.003
Average/Q3	1.4	-0.001	0.083	-0.002	-0.001

Ratios based on net wealth quintiles

	Initial ratios	4 pp decrease in the interest rate on deposits	4 pp increase in the rate of return of businesses	4 pp decrease in the interest rate on housing loans	4 pp decrease in the interest rate on consumer loans
		(1)	(2)	(3)	(4)
Q5/Q3	6.7	0.041	0.558	-0.042	-0.011
Q5/Q1	412.4	0.702	0.502	-2.242	-1.433
Average/Q3	2.0	0.027	0.373	-0.024	-0.005

Note: Calculations based on HFCS 2010.

3.3. Labour income channel: the redistribution impact on human wealth

Monetary policy may also have redistribution effects due to the heterogeneous impact on labour remuneration developments. This heterogeneity stems from the combination of two factors: on the one hand, cyclical labour market transitions are known to differ across demographic groups; on the other hand, the distribution of the various demographic groups is uneven across wealth (net and in broad sense) quintiles. Several authors have documented that expansionary monetary policy disproportionally reduces unemployment for young people and less qualified workers. If these population segments are predominant in the lowest wealth distribution quintiles, an expansionary monetary policy will tend to reduce inequality in the respective wealth distribution.

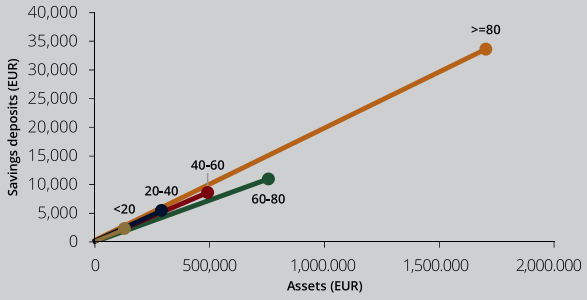
This section analyses the potential importance of this channel in the case of the Portuguese economy, based on microeconomic data from the Labour Survey and the Household Finance and Consumption Survey. The exercise first shows that, comparing the 2011–13 recession with the recovery phase in 2013–16, a considerable heterogeneity emerges in transitions between employment and unemployment according to age and qualification. Afterwards, evidence is presented on how individuals are unevenly distributed across quintiles of wealth in broad sense and net wealth. Given the two time periods under review, in this stage, the exercise used data from the Household Finance and Consumption Survey for 2013, which provides a better picture of the 2011–16 period. Finally, the exercise looks into the redistribution impact of a 1% increase in net employment growth on the Portuguese economy.

Since the first quarter of 2011, there have been two distinct stages in the Portuguese economy.[6] Up to the second quarter of 2013, an unprecedented recession in recent times took hold. Afterwards, a sustained recovery began,

although more gradual compared with previous economic upturn periods. The two periods are used as a reference to illustrate heterogeneity in flows between states in the labour market in the Portuguese economy. More specifically, the analysis focuses on the percentage change in the frequency of transitions between employment and unemployment, and vice-versa, by breaking down the labour force into four demographic groups according to two predetermined characteristics of individuals: age and qualification.

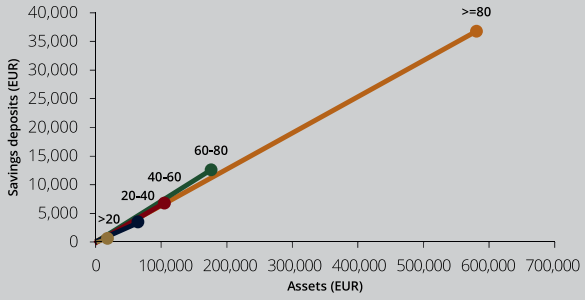
Unsurprisingly, transitions from employment to unemployment are more frequent for younger and less qualified individuals. Moreover, transitions from unemployment to employment are more frequent for younger and more qualified individuals. Comparing the two periods under review, i.e. 2011 Q2-2013 Q2 and 2013 Q3-2016 Q4, the frequency of flows between employment and unemployment declined by approximately 25% and the frequency between unemployment and employment increased by around 18%, both in terms of average quarterly transitions. According to microeconomic data from the Labour Survey, the decrease in flows to unemployment was relatively broad-based across age groups and relatively more concentrated in less qualified groups, while the increase in flows to employment was relatively higher in younger and less qualified groups (Charts 11 and 12).

Chart 9 • Relation between savings deposits and total assets, by quintiles of wealth in broad sense



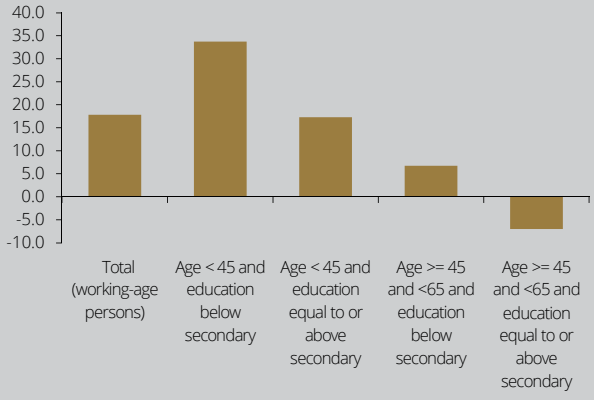
Note: Calculations based on the Household Finance and Consumption Survey for 2010.

Chart 10 • Relation between savings deposits and total assets, by net wealth quintiles



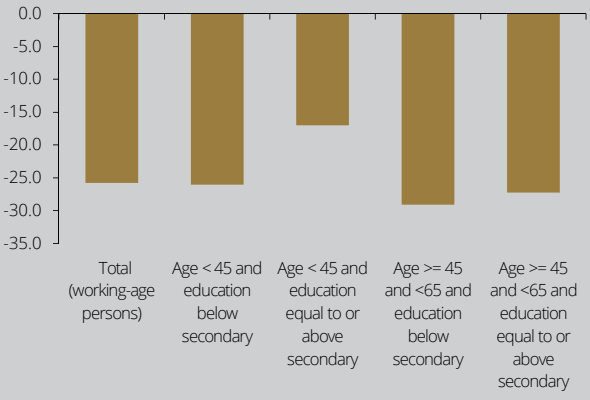
Note: Calculations based on the Household Finance and Consumption Survey for 2010.

Chart 11 • Change in the frequency of transitions from unemployment to employment, between 2011 Q3-2013 Q2 and 2013 Q3-2016 Q4 | In percentage



Source: Labour Survey.

Chart 12 • Change in the frequency of transitions from employment to unemployment, betwee 2011 Q3-2013 Q2 and 2013Q3-2016 Q4



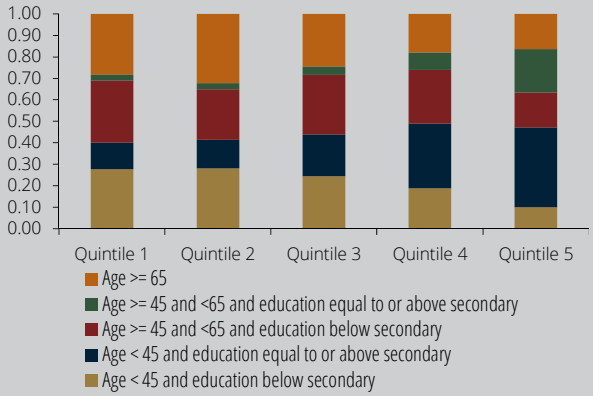
Source: Labour Survey.

Charts 13 and 14 confirm that this heterogeneity affects differently the various quintiles of the distributions of wealth in broad sense and net wealth. In terms of qualifications, the charts show that the less qualified labour force is relatively more concentrated in the lowest quintiles of both distributions. However, in terms of age groups, the two distributions differ. Indeed, in the distribution of wealth in broad sense, the share of individuals under 45 in total labour force is relatively stable across distribution quintiles, while as regards net wealth distribution the share of individuals under 45 is relatively higher in the lowest distribution quintiles. Furthermore, the share of individuals aged 65 or more in total population is relatively higher in the lowest quintiles of the distribution of wealth in broad sense, while as regards net wealth distribution the opposite applies, i.e. older age groups are more concentrated in the highest net wealth quintiles.

The combination of these data suggests that policies contributing to a rise in employment will tend to affect the distributions of wealth in broad sense and net wealth differently. To quantify these effects on the Portuguese economy, a stylised exercise was conducted, by cross-checking data from the Labour Survey and the Household Finance and Consumption Survey for 2013.

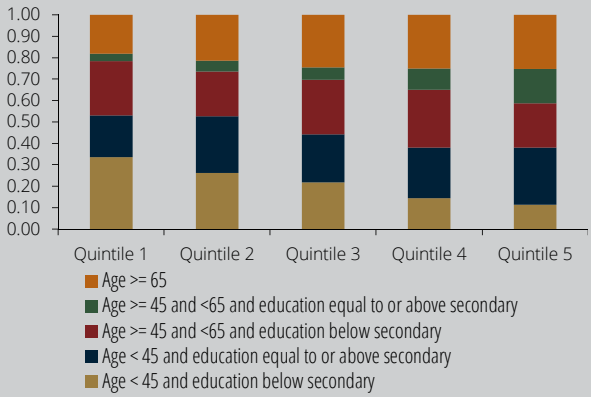
The exercise assessed the distribution impact of a net increase in employment of 1%, taking into account the circumstances characterising the economic recovery seen since 2013. Based on the Labour Survey, a 1 p.p. growth in employment was broken down into the four aforementioned age groups (for the working-age population), similarly to that seen between 2011 Q2–2013 Q2 and 2013 Q3–2016 Q4. Next, the assumption was that this growth occurred regardless of the wealth distribution quintile of the individuals. Under the assumption that, for each demographic group in each wealth quintile, job creation implies an increase in labour income corresponding to remuneration *per capita* of workers in that population segment, it is possible to estimate income changes in each segment stemming from the 1% aggregate shock on net employment. To take into account the possible existence of unemployment benefits, as well as the fact that income arising from a re-entry to the labour market is typically below the average, it was assumed that the increase in income for an individual that finds a job is only 50% of the

Chart 13 • Population structure, by quintiles of wealth in broad sense



Note: Calculations based on the Household Finance and Consumption Survey for 2013.

Chart 14 • Population structure, by net wealth quintiles



Note: Calculations based on the Household Finance and Consumption Survey for 2013.

income per worker calculated for each population segment. This factor affects the magnitude but not the sign of the results.

Finally, it was assumed that the increase in labour income fosters both wealth in broad sense and net wealth. In the case of wealth in broad sense, monetary policy is assumed to have no permanent real effects and, therefore, labour income increases only have an impact during the period under review.[7] In the case of net wealth, it was assumed that the increase in income is fully invested in assets, with no changes to the composition of household portfolios. This choice is not straightforward, but takes into account that additional income expands the range of options open to households at the end of the period.

Given the assumptions made, a 1% increase in net employment helps reduce inequality in net wealth and, to a lesser extent, inequality in wealth in broad sense. In the case of net wealth, the ratio of the top to the bottom quintile (Q5/Q1) falls by 3.8% and the Q5/Q3 ratio by 0.1%.[8] In the case of wealth in broad sense, percentage decreases in these ratios are lower. The smaller redistribution impact on wealth in broad sense results, inter alia, from the fact that: (i) the bottom net wealth distribution quintile is associated with very low wealth, (ii) a relatively larger share of population aged over 65 – assumed, in this exercise, to not be working – is included in the bottom quintiles of the distribution of wealth in broad sense, and (iii) younger groups account for a relatively significant share in the top quintiles of the distribution of wealth in broad sense.

4. Stylised quantification of the distribution impact of monetary policy in Portugal after 2010

The previous sections looked into the impact of stylised changes in prices and other relevant factors on wealth inequality indicators. This section aggregates these channels in their entirety as a response to monetary policy changes. The starting point for this exercise is a stylised change in monetary policy that causes a continuous reduction in the short-term nominal interest rate for a long period of time. This monetary impulse leads to changes in factors affecting wealth distribution. The ultimate goal is to compare the relative importance of the various channels to wealth distribution changes, while keeping in mind the merely stylised nature of this exercise.

Although it can be challenging to pinpoint all mechanisms at play, models can be used in order to rationalise such effects. For instance, in a Neo-Keynesian model, an unexpected reduction in the nominal interest rate leads to a decrease in savings – given that saving has become less appealing – and the resulting immediate increase in consumption. This direct effect produces a temporary rise in economic activity leading to upward pressure on labour demand by firms. The resulting increase in wages and employment is an indirect effect of monetary policy changes, via general equilibrium mechanisms in this type of economy. This indirect mechanism will positively affect human wealth of households and, possibly, net wealth too, as a result of the investment of additional resources in various assets.

A further example is the effect of economic activity on the profits of privately-owned firms. Indeed, if, during the monetary stimulus period, GDP grows more rapidly than without the stimulus, corporate profits will also be greater, thus freeing up additional resources to the households that own these firms. The accumulated additional resources correspond to an increase in non-human wealth at the end of the period under review.

To calculate realistic paths for the main aggregate variables associated with monetary stimulus that may help in the exercise, the PESSOA model was estimated for the Portuguese economy (see Almeida *et al.*, 2013 and Júlio and Maria, 2017). This stylised simulation calculates the effect of additional monetary accommodation on any baseline scenario.

To make this exercise more illustrative of the Portuguese experience in the recent past, monetary

accommodation is analysed from the end of 2010 onwards, immediately after the Household Finance and Consumption Survey for 2010, with this stimulus being extended up to the end of 2015.

During this period, euro area short-term nominal interest rates fell markedly. From 2014 onwards, standard monetary policy was largely exhausted given that ECB key interest rates, particularly the deposit facility interest rate, were close to their lower bound.[9] Following the introduction in 2015 of non-standard monetary policy measures based on the purchase of sovereign debt securities and other assets, interest rates impacting on households and firms kept on decreasing. When the nominal interest rate is close to the lower bound, the concept of the 'shadow' interest rate becomes useful. In an economy where no lower bound is applied to interest rates and non-standard monetary policy measures have not been implemented, this interest rate would have accommodative monetary effects similar to those in an economy with an interest rate set at the lower bound and non-standard monetary policy measures in place. The calculation of such shadow interest rates (see, e.g. Wu and Xia, 2017, as well as the references in that study) shows that they continued to decrease up to late 2016. This exercise gauges the impact of interest rate cuts in a benchmark case, e.g. a less aggressive reaction by the ECB in terms of monetary accommodation.

Chart 15 illustrates possible developments in a number of aggregate variables of importance to the exercise. The nominal interest rate declined throughout the five-year period and was normalised to a 3 p.p. reduction from the initial value.[10] This cannot be interpreted as an estimate of total monetary accommodation in the course of the period, but merely as a quantitative benchmark allowing a comparison of the relative importance of the various channels analysed in this article. This accommodation is exogenous to the Portuguese economy, as it is decided at euro area level. The PESSOA model also takes into account changes in demand for Portuguese goods and services by euro area countries, given that they are also affected by reductions in the nominal interest rates.

A 3 p.p. monetary accommodation leads to a cumulative increase in GDP during the five-year period of approximately 5.2%, compared to a scenario where no additional accommodation is implemented. Employment increases by around 3.9% and disposable income by approximately 8.4%. The chart also illustrates developments in EBITDA as a percentage of assets in private Portuguese firms. These developments result from the impact on this corporate profitability measure of the increase in economic activity and, in particular, the increase in GDP during the period under review.[11] The monetary stimulus leads to an increase in EBITDA, which, cumulatively over the period, results in a 1.9% increase in value for firms, under the assumption of a reinvestment of earnings.[12] These additional resources add, therefore, to initial non-human wealth.

Monetary policy also has an indirect impact on the prices of a number of assets. In particular, macroeconomic developments illustrated in Chart 15 lead to changes in housing prices, which, in turn, result in a 1.2% increase from the initial situation.[13] Table 5 shows the outcome, in terms of the distributions of wealth in broad sense and net wealth, of the path followed by a number of variables compared to a benchmark case where there is no monetary stimulus. The exercise employs the same methods and assumptions regarding the increase in value of stocks and flows as described in Section 3. Given that this is a five-year period, labour income increases are accumulated over the five years taking into account the gradual rise in employment. For the sake of simplicity, only the Q5/Q3 and Q5/Q1 ratios are presented.

Table 5 • Impact of a prolonged monetary stimulus on wealth distribution | Initial and final ratios and changes stemming from several components of wealth in broad sense and of net wealth

Ratios based on quintiles of wealth in broad sense

	Initial ratios	Final ratios	All changes	All changes except employment	1,24% increase in real estate	1,9% increase in the value of businesses	3 pp decrease in the interest rate on deposits	3 pp decrease in the interest rate on housing loans	3 pp decrease in the interest rate on consumer loans	3,9% increase in employment
Q5/Q3	3.636	3.629	-0.20	-0.18	-0.068	0.10	-0.018	-0.18	-0.010	-0.025
Q5/Q1	11.86	11.83	-0.24	-0.19	-0.071	0.11	-0.027	-0.19	-0.014	-0.050

Ratios based on net wealth quintiles

	Initial ratios	Final ratios	All changes	All changes except employment	1,24% increase in real estate	1,9% increase in the value of businesses	3 pp decrease in the interest rate on deposits	3 pp decrease in the interest rate on housing loans	3 pp decrease in the interest rate on consumer loans	3,9% increase in employment
Q5/Q3	6.707	6.490	-3.2	-2.1	-0.83	0.36	0.18	-1.8	-0.056	-1.1
Q5/Q1	412.4	106.4	-74	-61	-20	0.32	3.1	-50	-6.7	-34

Note: Figures result from a simulated change in the nominal interest rate using the PESSOA model and satellite models estimated for the Portuguese economy. Methodological assumptions for the calculation of the impact of the various simulated changes on the distribution are detailed in Section 3. Calculations based on the Household Finance and Consumption Survey for 2010 and 2013 and the Labour Survey.

The results indicate that an increase in monetary accommodation, as illustrated by Chart 15, under the various methodological assumptions adopted, leads to a sizeable reduction in net wealth distribution inequality, chiefly due to cuts in interest rates on housing loans and the increase in resources available stemming from a rise in employment. The effect via housing prices – with housing in Portugal being the main form of non-human wealth of households and being comparatively well distributed – also plays a key role in that reduction, although the effect of monetary accommodation on housing prices is low.

Chart 15 • Macroeconomic developments in a number of variables following monetary stimulus

Note: Figures result from a simulated change in the nominal interest rate using the PESSOA model and satellite models estimated for the Portuguese economy.

In turn, improvements in corporate profitability stemming from increased GDP growth contribute to an increase in inequality, given that households in the top two quintiles benefit the most from this channel. However, households in the bottom quintiles also benefit indirectly from improvements in corporate profitability due to a rise in employment, stemming from firms distribution inequality.

Overall effects on wealth in broad sense are lower than those in net wealth. Turning to the impact of labour income, the underlying reasons are analysed in Section 3 and include the relatively larger share of population aged over 65 in the bottom quintiles of the distribution, together with a higher share of younger and more qualified individuals in the top quintiles. As such, the boost given by monetary policy to employment is broadly shared across population groups.

The outcome of the exercise is broadly in line with empirical and quantitative literature on the impact of monetary policy on net wealth (see Coibion *et al.*, 2016, Deutsche Bundesbank, 2016 or Furceri *et al.,* 2016). This study shows that, in the case of Portugal and with certain caveats, the outcome can also be applied to wealth in broad sense, although in this case the impact is lower.

5. Conclusions

This Special Issue looks into the distribution effects of monetary policy using exercises based on empirical data on the Portuguese economy. First, wealth is characterised using Household Finance and Consumption Survey data, as well as Labour Survey microdata, and the various channels affecting two types of wealth – wealth in broad sense and net wealth – are analysed. It is also demonstrated that households in quintiles of wealth in broad sense are not necessarily those of the corresponding net wealth quintiles. Exercises conducted here assess in a stylised manner the impact of increased monetary accommodation, which will tend to lead to increases in asset prices, business profitability and net job creation, and declines in interest rates on deposits and loans.

Distribution effects via an increase in asset prices depend on leverage and the asset portfolio composition for each population group. In the case of Portugal, it is shown that households in the top wealth quintiles are, on average, less leveraged than those in the bottom quintiles. This implies that increases in value of assets tend to benefit relatively more households in the bottom quintiles, which, in turn, tends to reduce net wealth inequality.

Leverage also decreases with quintiles of wealth in broad sense, but less so than in the case of net wealth. The ratio of human wealth to total assets also decreases in parallel with wealth quintiles. As a result, the distribution effect of increases in the value of assets leads to an increase in inequality in wealth in broad sense.

The data suggest that increases in housing prices will tend to reduce inequality in net wealth and wealth in broad sense. In the case of an increase in self-employment businesses and marketable financial assets, it will lead to greater distribution inequality.

Reductions in interest rates tend, in turn, to affect the accumulation of wealth via changes in income flows from financial investments and loan instalments. In the case of deposit rates, their reduction leads to a decline in net wealth inequality. Turning to loans, they reduce inequality in the distribution of both types of wealth.

Net job creation potentially resulting from monetary policy chiefly benefits younger and less qualified workers. This effect tends to reduce net wealth inequality and, to a lesser extent, inequality of wealth in broad sense, due to differences in population quintile distribution for both types of wealth.

The factors that help reduce wealth distribution inequality are not separable from those that contribute to its increase. For instance, the rise in employment (which helps reduce inequality) is largely due to higher corporate profitability (which

contributes to an increase in inequality). Therefore, it is necessary to analyse the total effect of the various channels on wealth distribution.

The Special Issue also includes a stylised exercise where, using various macroeconomic and statistical models adapted to the Portuguese economy, all channels are simultaneously simulated. Results are similar to those described above, although the relative magnitude of the various channels can now be analysed more realistically. In the case of net wealth, the total effect leads to a reduction in inequality. In the case of wealth in broad sense, the more homogeneous distribution of various wealth components by population groups also leads to a reduction in inequality, although lower.

As a whole, the results describe monetary policy as an instrument influencing not only the general state of the economy, but also cyclical developments in inequality, through several channels. However, a number of important channels in terms of the impact of monetary policy on the economy as a whole are not included in the analysis. More detailed research into the distribution impact of these mechanisms would, therefore, be an interesting topic for future study.

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Notes

1. The 25x multiplier factor applied to labour income estimates the current value of that flow over a long period of time. For instance, a constant income flow updated at a 3.5% nominal rate over 40 years has a current value of approximately 22 times the value of the flow. In practice, this factor does not influence the outcome in the case of reasonable values in the update rate and the remaining period for the flow. As such, a 25x multiplier factor was adopted.

2. The quintiles for a given set of elements characterised by an attribute are the five groups such that each comprises a fifth of the whole, grouped in ascending order of the attribute. Therefore, the first wealth quintile for a population of households corresponds to the 20% least wealthy households, the second quintile corresponds to the 20% of households that come immediately after in terms of wealth, and so on.

3. If households in the intermediate quintile are very differently affected from those in the bottom quintile, the Q5/Q3 and Q5/Q1 ratios may follow different paths.

4. Furthermore, by definition, the first quintile of the distribution of wealth in broad sense largely coincides with the first income distribution quintile. Indeed, approximately 75% of households in the first income distribution quintile are also included in the first quintile of the distribution of wealth in broad sense. By contrast, only one-third of households in the first income distribution quintile is included in the first net wealth distribution quintile. Therefore, the analysis of redistribution effects on the first quintile of wealth in broad sense is a better proxy for the situation of poor households, as typically defined within the European Union (i.e. the lack of monetary income, measured in relative terms against average population income).

5. Self-employment businesses are those where a household member owns and actively participates as a worker/manager.

6. In the first quarter of 2011, the Labour Survey underwent major methodological changes.

7. That is, the increase in labour income is not multiplied by 25 in the estimate for wealth in broad sense developments at the end of the period.

8. In the Household Finance and Consumption Survey for 2013, the first net wealth quintile is negative. Calculations assume that the first quintile posts positive net wealth, such that the Q5/Q1 ratio is close to 412, similarly to the Household Finance and Consumption Survey for 2010 (see Table 1).

9. See the Special Issue entitled 'Life below zero: monetary policy transmission under negative interest rates', December 2016 *Economic Bulletin*, Banco de Portugal.

10. The path followed by the nominal interest rate is due to the magnitude of the reduction in shadow interest rates between the end of 2010 and the end of 2015 as implied in Wu and Xia (2017), although other references would result in similar values.

11. The impact of an increase in GDP on EBITDA of private firms was gauged using a model where the dependent variable is EBITDA as a percentage of assets of Portuguese small and medium-sized firms, selected among the class of autoregressive models of order zero, one and two, estimated in terms of levels, quarterly differences and year-on-year differences, with up to two explanatory variables of a group that includes: (i) logarithmic values of current GDP, GDP at constant prices, HICP and employment; (ii) the interest rate on the stocks of loans to non-financial corporations and the unemployment rate. The specification was selected using the Akaike information criterion. The chosen model implies a 0.37 elasticity of quarterly changes in EBITDA as a percentage of corporate assets *vis-à-vis* the year-on-year GDP growth rate.

12. This assumption implies that income flows from self-employment businesses remain constant compared with the initial value.

13. This impact is estimated on the basis of an econometric model that links housing prices in Portugal with variables such as employment, the real interest rate and household disposable income.