EUROPEAN CENTRAL BANK

EUROSYSTEM

September 2017
ECB staff macroeconomic projections for the euro area[1]

The economic expansion in the euro area is projected to continue over the projection horizon at growth rates well above potential. Following a post-crisis peak of 2.2% in 2017, annual real GDP growth is expected to average around 1.8% in 2018 and 2019. The very accommodative monetary policy stance, past progress made in deleveraging across sectors and a continued improvement in the labour market are projected to sustain domestic demand. At the same time, despite the recent appreciation of the euro, the global recovery is expected to support euro area exports.

Headline inflation is expected to decline in the short term, driven mainly by base effects in the energy component, before rising again to reach 1.5% in 2019. Although dampened by the recent appreciation of the euro exchange rate, underlying inflation is envisaged to rise gradually over time, following the expected absorption of economic slack.

1 Real economy

Favourable sentiment indicators suggest that the economic recovery will remain robust. Real GDP rose by 0.6% in the second quarter of 2017, driven by a strong contribution from domestic demand. Labour market conditions have continued to improve in recent months, with the unemployment rate falling faster than expected. As the pace of export growth is expected to normalise somewhat after the strong growth rates seen in early 2017, real GDP growth should moderate slightly in the near term, while remaining well above potential, in line with elevated levels of business and consumer sentiment.

Over the medium term, domestic demand, supported by favourable financing conditions and improving labour markets, will continue to drive the growth

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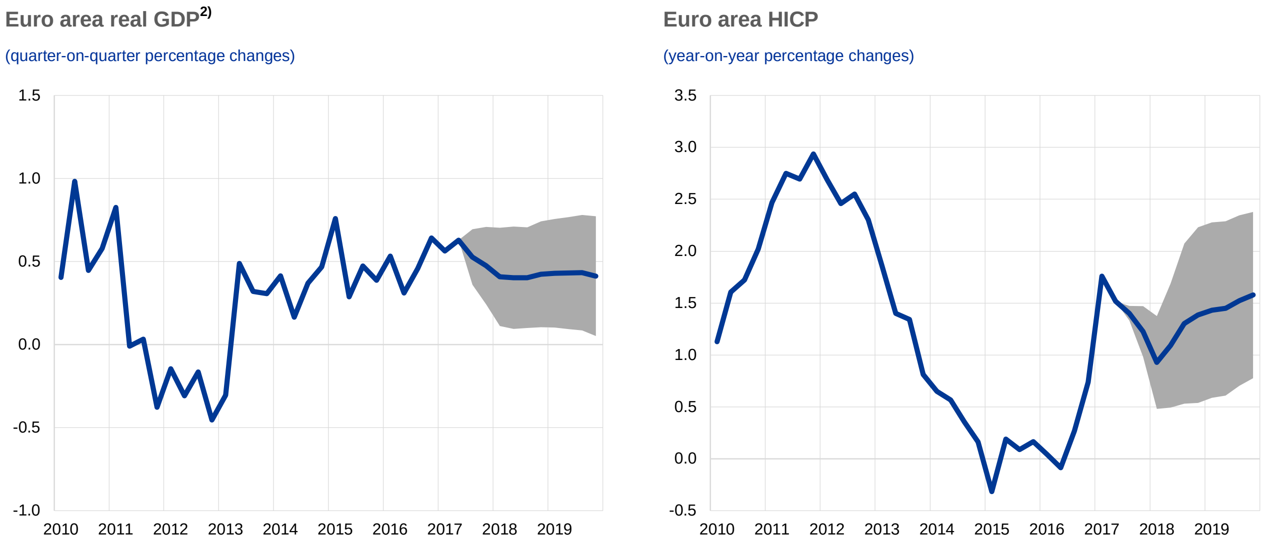
[1] These macroeconomic projections produced by ECB staff are an input to the Governing Council's assessment of economic developments and the risks to price stability. The projections produced by ECB or Eurosystem staff are neither endorsed by the Governing Council nor do they necessarily reflect the views of the Governing Council on the outlook for the euro area. Information on the procedures and techniques used is given in *A guide to the Eurosystem/ECB staff macroeconomic projection exercises*, ECB, July 2016, which is available on the ECB's website. The cut-off date for technical assumptions, such as for oil prices and exchange rates, was 14 August 2017 (see Box 1). The cut-off date for including other information in this exercise was 21 August 2017, with the exception of the quarterly national accounts release for Spain on 24 August, which has been included.
The current macroeconomic projection exercise covers the period 2017-19. Projections over such a long horizon are subject to very high uncertainty, and this should be borne in mind when interpreting them. See the article entitled "An assessment of Eurosystem staff macroeconomic projections" in the May 2013 issue of the ECB's Monthly Bulletin.

See http://www.ecb.europa.eu/pub/projections/html/index.en.html for an accessible version of the data underlying selected tables and charts.

outlook. Beyond the near term a number of favourable factors are expected to continue to support private consumption and investment expenditure over the projection horizon. The ECB's very accommodative monetary policy stance continues to be transmitted to the economy and expectations of future market interest rates (as embedded in the technical assumptions for this projection exercise) remain low over the horizon. Lending to the private sector continues to expand, spurred by low interest rates and favourable bank lending conditions. Private consumption should benefit from the ongoing improvement in labour market conditions. Business investment will continue to recover, reflecting in part a strengthening of profit mark-ups in the context of lower deleveraging needs and rising demand pressures. Residential investment will be supported by favourable income prospects and financing conditions as well as by low yields on alternative investments. External tailwinds should also support growth, with the strengthening of global economic activity and a corresponding improvement in euro area foreign demand.

Chart 1
Macroeconomic projections[1)]

(quarterly data)



1) The ranges shown around the central projections are based on the differences between actual outcomes and previous projections carried out over a number of years. The width of the ranges is twice the average absolute value of these differences. The method used for calculating the ranges, involving a correction for exceptional events, is documented in *New procedure for constructing Eurosystem and ECB staff projection ranges*, ECB, December 2009, available on the ECB's website.
2) Working day-adjusted data.

Private consumption is projected to remain robust over the projection horizon. The latest indicators of consumer confidence, which remains well above its long-term average, point to resilient consumer spending in the near term, also supported by the ongoing improvements in the labour market. In the medium term private consumption is projected to develop broadly in line with real disposable income growth.

Nominal disposable income growth is envisaged to strengthen over the projection horizon, although a pick-up in inflation is likely to contain growth in households' real purchasing power. The contribution from gross wages and salaries to nominal disposable income growth is expected to remain relatively stable over the projection period, as lower employment growth is broadly offset by an increase in the growth rate of compensation per employee. Growth of other personal income is projected to be favourable, reflecting positive profit and property income developments. While real disposable income growth has eased recently, it is expected to strengthen somewhat and remain robust over the projection horizon.

Private consumption growth should also be supported by improving bank lending conditions, reinforced by the ECB's monetary policy measures, and progress achieved in deleveraging. While low interest rates have affected both the interest earnings and interest payments of households, they tend to redistribute resources from net savers to net borrowers. As the latter typically have a higher marginal propensity to consume, this redistribution should support aggregate private consumption. In addition, progress achieved in deleveraging should also support consumption.

The household saving ratio is expected to remain broadly flat over the projection horizon. This broad stability of the saving ratio at the euro area level masks opposing factors. Downward pressures stem from declining unemployment (implying lower precautionary savings), improving credit conditions and low interest rates, while upward pressures result from remaining needs to reduce gross indebtedness and from consumption smoothing in the context of the cyclical expansion.

Box 1
Technical assumptions about interest rates, exchange rates and commodity prices

Compared with the June 2017 projections, the technical assumptions include a significant appreciation of the effective exchange rate of the euro and somewhat lower interest rates. The technical assumptions about interest rates and commodity prices are based on market expectations, with a cut-off date of 14 August 2017. Short-term rates refer to the three-month EURIBOR, with market expectations derived from futures rates. The methodology gives an average level for these short-term interest rates of -0.3% for 2017, -0.3% for 2018 and -0.1% for 2019. The market expectations for euro area ten-year nominal government bond yields imply an average level of 1.1% in 2017, 1.3% in 2018 and 1.6% in 2019.[2] Compared with the June 2017 projections, market expectations for short and long-term interest rates have been revised down by 10-20 basis points.

As regards commodity prices, on the basis of the path implied by futures markets by taking the average of the two-week period ending on the cut-off date of 14 August, the price of a barrel of Brent crude oil is assumed to increase from USD 44.0 in 2016 to USD 51.8 in 2017, USD 52.6 in 2018 and USD 53.1 in 2019. This path implies that, in comparison with the June 2017 projections, oil prices in US dollars are higher by 0.5% in 2017, by 2.3% in 2018 and by 3.0% in 2019. The

2 The assumption for euro area ten-year nominal government bond yields is based on the weighted average of countries' ten-year benchmark bond yields, weighted by annual GDP figures and extended by the forward path derived from the ECB's euro area all-bonds ten-year par yield, with the initial discrepancy between the two series kept constant over the projection horizon. The spreads between country-specific government bond yields and the corresponding euro area average are assumed to be constant over the projection horizon.

prices of non-energy commodities in US dollars are assumed to rise substantially in 2017 and somewhat more moderately beyond.[3]

Bilateral exchange rates are assumed to remain unchanged over the projection horizon at the average levels prevailing in the two-week period ending on the cut-off date of 14 August. This implies an average exchange rate of USD 1.13 per euro in 2017 and of USD 1.18 per euro over 2018-19, compared with USD 1.09 in the June 2017 projections. The effective exchange rate of the euro (against 38 trading partners) is 2.1% higher in 2017 and about 4.4% higher over 2018-19 than assumed in the June 2017 exercise.

Technical assumptions

	September 2017				June 2017			
	2016	2017	2018	2019	2016	2017	2018	2019
Three-month EURIBOR (percentage per annum)	-0.3	-0.3	-0.3	-0.1	-0.3	-0.3	-0.2	0.0
Ten-year government bond yields (percentage per annum)	0.8	1.1	1.3	1.6	0.8	1.2	1.5	1.8
Oil price (in USD/barrel)	44.0	51.8	52.6	53.1	44.0	51.6	51.4	51.5
Non-energy commodity prices, in USD (annual percentage change)	-3.9	9.0	5.4	4.2	-3.9	6.4	2.0	4.5
USD/EUR exchange rate	1.11	1.13	1.18	1.18	1.11	1.08	1.09	1.09
Euro nominal effective exchange rate (EER38) (annual percentage change)	3.8	2.3	2.6	0.0	3.7	-0.4	0.3	0.0

The recovery in residential investment is expected to continue. Housing investment has picked up strongly in many euro area countries in recent quarters. This has been supported by favourable financing conditions, portfolio reallocation towards housing in the context of low yields on alternative long-term investment opportunities, and the ongoing labour market improvement. In addition, adjustment processes in the housing markets of most euro area countries appear to have come to an end. The fundamental conditions for a further recovery of residential investment remain in place over the projection horizon. Nonetheless, some loss of momentum is expected, reflecting the mature phase of the housing cycle and the fading impact of incentives in some countries, remaining deleveraging needs in other countries and adverse demographic trends.

Business investment is projected to continue its recovery over the horizon. It is expected to be supported by a number of factors: business confidence remains elevated on the back of very favourable production expectations and order books; capacity utilisation has continued to increase above average pre-crisis levels; financing conditions are expected to remain very supportive over the projection horizon; there is a need to modernise the capital stock after several years of subdued investment; and profit mark-ups are expected to increase in the context of an already cash-rich non-financial corporation sector. Moreover, leverage ratios in the non-financial corporation sector have declined in the context of increasing asset

3 Oil and food commodity price assumptions are based on futures prices up to the end of the projection horizon. The prices of other non-energy hard commodities are assumed to follow futures until the third quarter of 2018 and thereafter to evolve in line with global economic activity.

prices and moderate debt financing growth across euro area countries. At the same time, some factors are expected to continue to weigh on the outlook for business investment, including expectations of weaker potential output growth and limitations on the intermediation capacity of banks in some countries.

Box 2
The international environment

The global economy is maintaining a solid pace of expansion. After a temporary dip in momentum at the start of the year, hard data and surveys point to a rebound in global real GDP growth in the second quarter. Business and consumer confidence indicators suggest that sentiment remains upbeat. Despite a pick-up in long-term bond yields in recent weeks, financial conditions in advanced economies remain supportive, underpinned by accommodative monetary policies. Financial markets in emerging market economies remain resilient and capital flows towards these economies are robust. Looking further ahead, global economic activity is expected to accelerate moderately. The outlook for advanced economies entails a continued cyclical recovery as their output gaps gradually close. Improving activity is underpinned by monetary and fiscal policies, although expectations of a fiscal stimulus in the United States have been revised downwards following a shift in the political debate. Among emerging market economies, growth will remain resilient in commodity importers such as India and China, while activity in commodity exporters is expected to bottom out after deep recessions in these economies. Global activity (excluding the euro area) is projected to expand by 3.7% in 2017 and 3.8% by 2018-19. The pick-up in activity since 2016 largely reflects the progressive easing of the deep recessions in commodity–exporting economies. Compared with the June 2017 projections, global real GDP growth is largely unchanged, with downward revisions for the United States (following revisions in assumptions about future fiscal stimulus) offset by expectations of greater resilience in emerging market economies.

The international environment

(annual percentage changes)

	September 2017				June 2017			
	2016	2017	2018	2019	2016	2017	2018	2019
World (excluding euro area) real GDP	3.2	3.7	3.8	3.8	3.2	3.5	3.8	3.8
Global (excluding euro area) trade [1]	1.1	5.3	3.8	3.8	0.9	4.4	3.8	3.9
Euro area foreign demand [2]	1.6	4.7	3.4	3.5	1.3	3.7	3.4	3.5

1) Calculated as a weighted average of imports.
2) Calculated as a weighted average of imports of euro area trading partners.

Global trade growth surprised on the upside in early 2017. Looking ahead, world trade is projected to expand in line with global activity over the medium term. Euro area foreign demand is expected to expand by 4.7% in 2017, 3.4% in 2018 and 3.5% in 2019. Compared with the June 2017 projections, it has been revised upwards by 1.1 percentage points in 2017, mainly reflecting stronger first quarter data.

Extra-euro area exports are projected to be dampened by competitiveness losses stemming from the recent appreciation of the euro. Supported by buoyant foreign demand as well as by the depreciation of the euro in the second half of 2016 and early 2017, extra-euro area exports grew strongly in the first quarter of 2017. Looking ahead, extra-euro area exports are expected to grow at a robust pace throughout the projection horizon, reflecting solid foreign demand from both advanced and emerging economies. Nevertheless, extra-euro area exports are expected to be negatively affected by the stronger exchange rate of the euro over the projection horizon, resulting in a downward re-assessment of the evolution of export market shares, which are now projected to decline by 1.1 percentage points over the horizon. In contrast to exports, extra-euro area imports are expected to benefit from the slightly more positive domestic demand developments and the stronger euro exchange rate, thus somewhat reducing the overall contribution of net trade to economic growth.

In an environment of moderate potential growth, the remaining economic slack is expected to be absorbed over the horizon. In contrast to the relatively buoyant actual real GDP growth, potential output is estimated to expand by slightly above 1% over the projection horizon. The subdued rate of increase of potential output primarily reflects a fairly low contribution from the capital stock following a protracted period of historically low investment. Labour is projected to continue to make a positive contribution to potential growth, primarily related to increasing labour force participation on account of past structural reforms. The contribution from labour will nevertheless remain somewhat below its pre-crisis average in the context of a fading contribution from the working age population. The contribution from total factor productivity is also expected to be slightly below its pre-crisis level.

The ongoing improvement in labour market conditions is projected to continue over the horizon. Employment in terms of persons increased by 0.4% in the first quarter of 2017 and is estimated to have grown at a similar pace in the second quarter of 2017. The recent strength in employment growth has been broad-based across countries, but can be partly attributed to favourable temporary factors (such as fiscal stimulus measures in some euro area countries). As the impact of these factors is expected to gradually fade, employment growth is projected to lose some momentum, also reflecting increasing skilled labour supply shortages.

Reflecting its cyclical pattern, labour productivity growth is expected to strengthen in the medium term. The increasing utilisation of both capital and labour in the context of diminishing slack, an increase in the number of hours worked per person and some gains in total factor productivity suggest a sustained strengthening of productivity growth.

The unemployment rate is expected to continue to decline. The unemployment rate declined to 9.2% in the second quarter of 2017, which is the lowest level observed since March 2009. Looking ahead, the number of unemployed is projected to continue to decline substantially. The unemployment rate is expected to decline to 8.1% in 2019, but to remain above its pre-crisis level (of 7.5% in 2007).

Compared with the June 2017 projections, real GDP growth has been revised up for 2017 and is broadly unchanged thereafter. The upward revision for 2017 relates mainly to recent upward surprises in GDP data. More generally, a stronger domestic demand outlook, in line with favourable business and consumer sentiment as well as lower interest rates, is broadly offset by the negative impact on exports stemming from a loss of price competitiveness due to the recent appreciation of the euro.

2 Prices and costs

HICP inflation is expected to show a V-shaped pattern over the projection horizon as base effects related to energy inflation drag down inflation in the near term, before giving way to a gradual recovery in underlying inflation. Headline HICP inflation is foreseen to average 1.5% in 2017, to decrease to 1.2% in 2018 and to strengthen to 1.5% in 2019. Base effects imply a significant drop in the contribution from HICP energy inflation to headline inflation between 2017 and 2018. The assumed increase, albeit modest, in oil prices over the remainder of the projection horizon, as reflected in the oil price futures curve, implies some rebound in HICP energy inflation in 2019. The recent recovery in HICP food inflation is expected to be broadly maintained over the projection horizon, reflecting among other things somewhat stronger assumed growth in food commodity prices. The continuing economic recovery is expected to gradually push up HICP inflation excluding energy and food over the projection horizon. A key factor behind this increase will be the expected rise in labour costs as labour market slack abates.

Improvements in labour market conditions are seen as the predominant source of rising domestic cost pressures in the coming years. Compensation per employee growth is projected to rise from 1.5% in 2017 to 2.3% in 2019. Given the expected cyclical pick-up in productivity growth, unit labour cost growth is expected to strengthen somewhat less, rising from 0.8% in 2017 to 1.4% in 2019. Reduced slack in the euro area labour market and increasing labour supply shortages in some parts of the euro area are seen as important factors behind this pick-up in wage growth. Beyond this, the recent significant pick-up in headline inflation can also be expected to translate over time into higher nominal wage increases in euro area countries where wage formation processes include backward-looking indexation or expectation elements. In addition, a number of the factors currently dampening wage growth are expected to gradually abate. These include the need for wage moderation to regain price competitiveness in some countries and the pent-up wage restraint that was associated with the binding downward rigidities in nominal wages during the crisis. In addition, measures to reduce social security contributions are expected to expire.

Profit margins are envisaged to widen over the projection horizon. Increases in oil prices and their impact on production input costs and on the terms of trade more generally weighed on profit margins in early 2017. As these dampening effects fade, profit margins are expected to benefit from the continued economic recovery, while being constrained somewhat over the course of the projection horizon by increasing unit labour cost growth.

External price pressures have increased strongly in recent quarters and are expected to maintain some upward impetus also over the projection horizon. The annual growth rate of import prices is expected to turn positive in 2017, following four years of decline. The turnaround in 2017 is mainly due to the rebound in oil and non-energy commodity prices since 2016. The expected subsequent easing of growth rates reflects both the moderation in commodity price developments and the downward impact of the recent appreciation of the euro. Underlying global inflationary pressures more generally are expected to strengthen gradually over the projection horizon as global production costs rise in line with diminishing global slack. However, given the remaining high level of global spare capacity and global competitiveness pressures, this is not expected to put substantial upward pressure on euro area import prices.

Compared with the June 2017 projections, the outlook for HICP inflation has been revised down slightly. The appreciation of the euro exchange rate since the previous projection exercise puts downward pressure on HICP inflation. In the case of underlying inflation, this downward pressure is partially offset by an improved outlook for euro area domestic demand (see Box 3).

Box 3
Assessing the impact of the recent appreciation of the euro on the inflation outlook for the euro area

The nominal effective exchange rate (NEER) of the euro has appreciated over the past few months and the ten-day average stood on the cut-off date for the current projection exercise (14 August 2017) 4.4% above the level assumed in the June 2017 projections. This box discusses factors that should be taken into account when assessing the impact of the recent appreciation on the outlook for euro area inflation.

While subject to significant heterogeneity, standard model elasticities generally suggest that an exchange rate shock of the magnitude observed in recent months would have a non-negligible impact on the outlook for euro area inflation.[4] These model elasticities are, however, only valid for exogenous exchange rate shocks. The recent appreciation, by contrast, is likely to have been triggered in large part by the further improved outlook for economic growth in the euro area, which in turn reflects improved prospects for domestic demand, and this should be taken into account when assessing the impact of the recent appreciation on the outlook for inflation.

In the September 2017 projections, the overall impact of the appreciation on inflation is considered to be notably more moderate than implied by standard model elasticities, which generally refer to an exogenous exchange rate shock. Recent empirical studies have acknowledged the endogeneity of exchange rate movements and illustrated the shock-dependence of the impact of exchange rate movements on inflation.[5] That is, the response of prices to a change

[4] See, for example, the article entitled “Exchange rate pass-through into euro area inflation”, *Economic Bulletin*, Issue 7, ECB, 2016.

[5] See, for example, Shambaugh, J., “A new look at pass-through”, *Journal of International Money and Finance*, Vol. 27, Issue 4, pp. 560-591, June 2008; Forbes, K., Hjortsoe, I. and Nenova, T., “The shocks matter: improving our estimates of exchange rate pass-through”, *Discussion Paper*, No 43, Bank of England, External MPC Unit, November 2015; and Ciccarelli, M. and Osbat, C., “Low inflation in the euro area: Causes and consequences”, *Occasional Paper Series*, No 181, ECB, January 2017.

in the exchange rate may differ depending on the underlying nature of the shock(s) triggering the exchange rate movement in the first place, as it may reflect different transmission channels. In the event that an appreciation is fully triggered by a favourable demand shock, empirical estimates even suggest upward price pressures, via a strengthened domestic demand outlook. As expectations of more favourable economic growth – reflecting improved prospects for domestic demand – are a key driver of the recent appreciation of the euro, the dampening effects of the appreciation on inflation should be notably lower than would be implied by a purely exogenous exchange rate shock, the impact of which is captured by standard model elasticities.

3 Fiscal outlook

The fiscal stance is on average projected to be broadly neutral over the projection horizon. The fiscal policy stance is measured as the change in the cyclically adjusted primary balance net of government support to the financial sector. The stance in 2017 is affected by a rebound in government investment after the weak outturn observed in 2016 and a one-off payment in Germany to nuclear power producers (about 0.2% of domestic GDP)[6]. The broadly neutral stance reflects offsetting effects on both the expenditure and the revenue side.

Over the projection horizon, both the government deficit and debt ratios are projected to be on a downward path. The fiscal projection entails a gradual decline in the government deficit throughout the period, owing mainly to an improvement in the cyclical component and a decline in interest payments. The cyclically adjusted primary balance remains broadly unchanged. The government debt-to-GDP ratio is expected to remain on a declining path over the projection horizon, supported by the improvement in the primary balance and a favourable interest rate-growth rate differential.[7]

Compared with the June 2017 projections, the outlook for the budget deficit is broadly unchanged while the debt ratio is somewhat lower, mainly reflecting a more favourable interest rate-growth rate differential in 2017.

6 This followed a constitutional court ruling which declared the reactor fuel tax introduced for the period 2011-16 to be unconstitutional.

7 The differential is calculated as the difference between the nominal effective interest rate on debt and the nominal GDP growth rate.

Table 1

Macroeconomic projections for the euro area[1)]

(annual percentage changes)

	September 2017				June 2017			
	2016	2017	2018	2019	2016	2017	2018	2019
Real GDP	1.8	2.2	1.8	1.7	1.7	1.9	1.8	1.7
		[2.1 - 2.3] 2)	[1.0 - 2.6] 2)	[0.6 - 2.8] 2)		[1.6 - 2.2] 2)	[0.8 - 2.8] 2)	[0.6 - 2.8] 2)
Private consumption	2.0	1.7	1.8	1.5	1.9	1.5	1.6	1.4
Government consumption	1.8	1.2	1.2	1.1	1.8	1.2	1.2	1.1
Gross fixed capital formation	4.1	4.0	3.9	3.1	3.6	3.7	3.4	3.0
Exports 3)	3.2	4.7	3.7	3.8	2.8	4.8	4.3	4.1
Imports 3)	4.5	5.2	4.6	4.2	4.0	5.2	4.6	4.3
Employment	1.4	1.5	1.0	0.8	1.4	1.4	1.0	0.9
Unemployment rate (percentage of labour force)	10.0	9.1	8.6	8.1	10.0	9.4	8.8	8.3
HICP	0.2	1.5	1.2	1.5	0.2	1.5	1.3	1.6
		[1.4 - 1.6] 2)	[0.6 - 1.8] 2)	[0.7 - 2.3] 2)		[1.4 - 1.6] 2)	[0.6 - 2.0] 2)	[0.7 - 2.5] 2)
HICP excluding energy	0.9	1.2	1.3	1.5	0.9	1.2	1.4	1.6
HICP excluding energy and food	0.9	1.1	1.3	1.5	0.9	1.1	1.4	1.7
HICP excluding energy, food and changes in indirect taxes 4)	0.8	1.1	1.3	1.5	0.8	1.1	1.4	1.7
Unit labour costs	0.8	0.8	1.2	1.4	0.9	1.1	1.3	1.5
Compensation per employee	1.2	1.5	2.0	2.3	1.3	1.7	2.1	2.4
Labour productivity	0.4	0.7	0.8	0.9	0.3	0.5	0.8	0.9
General government budget balance (percentage of GDP)	-1.5	-1.3	-1.0	-0.9	-1.5	-1.3	-1.2	-1.0
Structural budget balance (percentage of GDP) 5)	-1.5	-1.4	-1.3	-1.2	-1.6	-1.5	-1.4	-1.3
General government gross debt (percentage of GDP)	89.1	87.5	86.0	84.2	89.2	87.9	86.4	84.7
Current account balance (percentage of GDP)	3.5	2.9	2.5	2.5	3.4	2.8	2.8	2.9

1) Real GDP and components refer to working day-adjusted data.
2) The ranges shown around the projections are based on the differences between actual outcomes and previous projections carried out over a number of years. The width of the ranges is twice the average absolute value of these differences. The method used for calculating the ranges, involving a correction for exceptional events, is documented in *New procedure for constructing Eurosystem and ECB staff projection ranges*, ECB, December 2009, available on the ECB's website.
3) Including intra-euro area trade.
4) The sub-index is based on estimates of actual impacts of indirect taxes. This may differ from Eurostat data, which assume a full and immediate pass-through of tax impacts to the HICP.
5) Calculated as the government balance net of transitory effects of the economic cycle and temporary measures taken by governments (for the ESCB approach, see *Working Paper Series*, No 77, ECB, September 2001, and *Working Paper Series*, No 579, ECB, January 2007). The projection of the structural balance is not derived from an aggregate measure of the output gap. Under the ESCB methodology, cyclical components are calculated separately for different revenue and spending items. For more details, see the box entitled "Cyclical adjustment of the government budget balance" in the March 2012 issue of the ECB's Monthly Bulletin and the box entitled "The structural balance as an indicator of the underlying fiscal position" in the September 2014 issue of the ECB's Monthly Bulletin.

Box 4
Sensitivity analyses

Projections rely heavily on technical assumptions regarding the evolution of certain key variables. Given that some of these variables can have a large impact on the projections for the euro area, examining the sensitivity of the latter with respect to alternative paths of these underlying assumptions can help in the analysis of risks around the projections. This box discusses the uncertainty around some key underlying assumptions and the sensitivity of the projections with respect to these variables.

1) An alternative oil price path

Alternative oil price models point to a risk of oil prices being higher over the projection horizon than suggested by oil price futures. The technical assumptions for oil price developments underlying the baseline projections, based on futures markets, predict a slight upward path for the profile for oil prices, with the price per barrel of Brent crude oil rising to about USD 53 by the end of 2019. This path entailed in oil price futures is consistent with moderate growth in world oil demand, a scenario associated with the global economic recovery gaining some traction. As regards supply factors, the extension of the agreement between OPEC and major non-OPEC producers has not led to a significant increase in the oil price futures curve, probably due to the still high – although declining – level of oil stocks and concerns that some of the largest oil producers may deviate from the agreement. Moreover, the robust expansion in the production of shale oil in the United States has partly offset cutbacks by conventional producers. A combination of alternative models used by Eurosystem staff[8] to predict oil prices over the projection horizon currently suggests a slightly higher oil price path than assumed in the technical assumptions. Such a path may be consistent with unexpected further supply disruptions in the short and medium term. This in turn may result in a faster than expected tightening of the supply/demand balance and therefore in higher oil prices. The materialisation of an alternative oil price path, in which oil prices are 3.8% higher than in the baseline by 2019, would marginally dampen real GDP growth while entailing a slightly faster increase in HICP inflation (up by 0.1 percentage point in 2019).

2) An alternative exchange rate path

This sensitivity analysis investigates, as an illustration, the mechanical impact of a higher path of the exchange rate of the euro compared with the baseline. For illustrative purposes, an alternative path of the exchange rate of the euro is based on the 75th percentile of the distribution provided by the option-implied risk-neutral densities for the USD/EUR exchange rate on 14 August 2017. This path implies a gradual appreciation of the euro vis-à-vis the US dollar to an exchange rate of USD 1.31 per euro in 2019, which is around 11% above the baseline assumption for that year. The corresponding assumptions for the nominal effective exchange rate of the euro reflect historical regularities, whereby changes in the USD/EUR exchange rate correspond to changes in the effective exchange rate with an elasticity of around 52%. This assumption results in a gradual upward divergence of the effective exchange rate of the euro from the baseline, bringing it to a level around 6% above the baseline in 2019. In this scenario, the average of the results from a number of staff macroeconomic models points to real GDP growth being 0.3 percentage point lower in both 2018 and 2019, while HICP inflation would be 0.4 and 0.5 percentage point lower in 2018 and 2019

8 See the four-model combination presented in the article entitled “Forecasting the price of oil”, *Economic Bulletin*, Issue 4, ECB, 2015.

respectively. It should be noted that these estimated impacts on growth and inflation only apply in the event of a purely exogenous exchange rate shock (see the discussion in Box 3).

Box 5
Forecasts by other institutions

A number of forecasts for the euro area are available from both international organisations and private sector institutions. However, these forecasts are not strictly comparable with one another or with the ECB staff macroeconomic projections, as they were finalised at different points in time. Additionally, they use different (partly unspecified) methods to derive assumptions for fiscal, financial and external variables, including oil and other commodity prices. Finally, there are differences in working day adjustment methods across different forecasts (see the table).

As indicated in the table, other institutions' currently available projections for real GDP growth and HICP inflation are overall within the ranges surrounding the ECB staff projections (shown in brackets in the table).

Comparison of forecasts for euro area real GDP growth and HICP inflation

(annual percentage changes)

		GDP growth			HICP inflation		
	Date of release	2017	2018	2019	2017	2018	2019
ECB staff projections	September 2017	2.2	1.8	1.7	1.5	1.2	1.5
		[2.1-2.3]	[1.0-2.6]	[0.6-2.8]	[1.4-1.6]	[0.6-1.8]	[0.7-2.3]
European Commission	May 2017	1.7	1.8	-	1.6	1.3	-
OECD	June 2017	1.8	1.8	-	1.7	1.4	-
Euro Zone Barometer	August 2017	2.0	1.8	1.5	1.6	1.4	1.7
Consensus Economics Forecasts	August 2017	2.0	1.8	1.4	1.5	1.3	1.7
Survey of Professional Forecasters	July 2017	1.9	1.8	1.6	1.5	1.4	1.6
IMF	July 2017	1.9	1.7	1.6	1.6	1.5	1.7

Sources: European Commission's European Economic Forecast, Spring 2017; IMF Article IV country report, 25 July 2017; OECD Economic Outlook, June 2017; Consensus Economics Forecasts, August 2017; MJEconomics for the Euro Zone Barometer, August 2017; and the ECB's Survey of Professional Forecasters, July 2017.
Notes: The Eurosystem and ECB staff macroeconomic projections and the OECD forecasts both report working day-adjusted annual growth rates, whereas the European Commission and the IMF report annual growth rates that are not adjusted for the number of working days per annum. Other forecasts do not specify whether they report working day-adjusted or non-working day-adjusted data.

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