EUROPEAN CENTRAL BANK
EUROSYSTEM

September 2016 ECB staff macroeconomic projections for the euro area[1]

The economic recovery in the euro area is expected to continue, albeit with slightly lower growth rates than envisaged in the June 2016 projections. A substantial downward revision to foreign demand, mostly related to much weaker import demand in the United Kingdom in the wake of the referendum on EU membership, is projected to dampen euro area export growth. However, the "Brexit" vote has had little impact on sentiment and uncertainty indicators in the euro area so far, leaving the prospects for the recovery largely intact. Over the projection horizon, the accommodative monetary policy stance, still relatively low oil prices, improving labour market conditions and progress achieved in deleveraging across sectors should support growth in domestic demand in a context of a gradual global recovery. In annual terms, real GDP is expected to grow by 1.7% in 2016 and by 1.6% in 2017 and 2018.

HICP inflation is expected to average 0.2% in 2016, strongly dampened by a negative contribution from HICP energy inflation related to the past sharp fall in oil prices. As this effect unwinds in early 2017, HICP inflation is expected to increase substantially to 1.2% in that year. The ongoing economic recovery and decline in economic slack are expected to gradually push HICP inflation excluding energy and food higher over the projection horizon, which should support a further increase in headline inflation to 1.6% in 2018.

1 Real economy

The recovery in euro area activity is expected to continue. Euro area GDP in 2015 was revised notably upwards due to a large upward revision in Irish GDP, which in turn primarily reflected the restructuring of large multinational enterprises leading to a strong increase in the level of capital assets in Ireland. The revision implies a level shift in the GDP figures but does not reflect a stronger underlying growth momentum either in the euro area or the Irish economy. According to

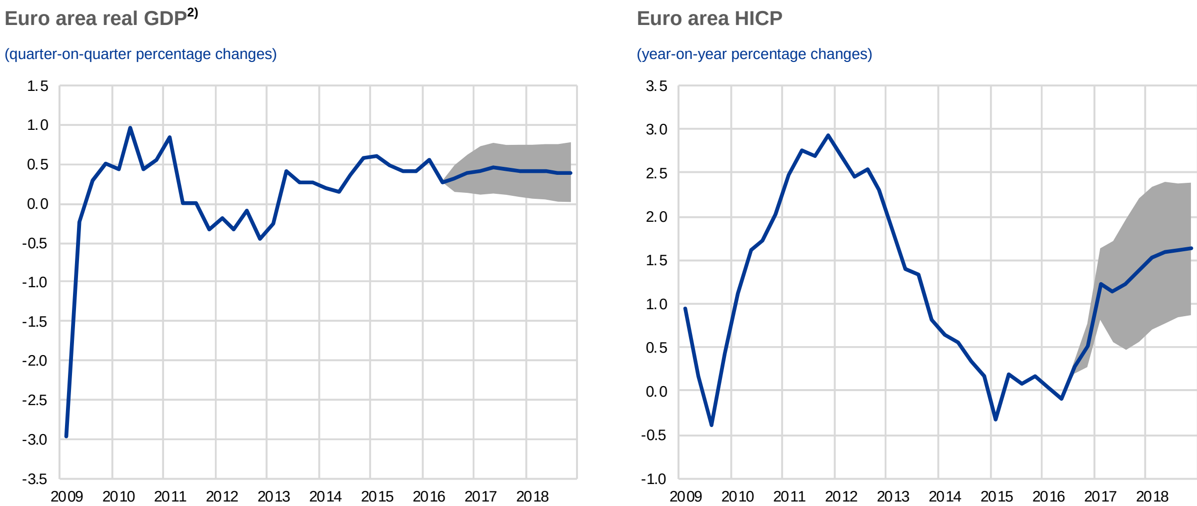
[1] ECB staff macroeconomic projections are an input to the Governing Council's assessment of economic developments and the risks to price stability. Information on the procedures and techniques used is given in *A guide to the Eurosystem/ECB staff macroeconomic projection exercises*, ECB, July 2016, which is available on the ECB's website. The cut-off date for technical assumptions such as oil prices and exchange rates was 11 August 2016 (see Box 2). The cut-off date for including other information in this exercise was 18 August 2016, with the exception of information for Germany and Spain, for which the GDP releases of 24 and 25 August, respectively, have been included.
The current macroeconomic projection exercise covers the period 2016-18. Projections for a period 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.

Eurostat's latest estimate, real GDP growth in the second quarter of 2016 normalised to 0.3%, down from 0.5% in the first quarter, as the favourable effect of some temporary factors faded. Despite the outcome of the UK referendum, euro area business and consumer sentiment remained rather resilient and indicators of financial market volatility and overall macroeconomic uncertainty stayed low (see Box 1). These indicators point to sustained economic growth in the near term.

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.

In annual terms, real GDP is expected to grow by 1.7% in 2016 and by 1.6% in 2017 and 2018. Resilient domestic demand is expected to remain the mainstay for real GDP growth, supported notably by the ECB's accommodative monetary policy stance and supportive fiscal policy in 2016. Export growth is projected to gain some momentum on account of an expected gradual global recovery, but will fall short of import growth, with a negative net trade contribution fading gradually over the projection horizon.

Box 1

Impact on the euro area economic outlook of the outcome of the UK referendum on EU membership

The impact of the UK decision to leave the European Union is expected to adversely affect the euro area economy, mainly via trade linkages, as the outlook for the UK economy has been significantly revised downwards. The current UK baseline is built around a protracted increase in uncertainty that weighs on economic activity. UK GDP growth is expected to slow notably in the second half of 2016 and in 2017. The slowdown in GDP growth in the United

Kingdom is expected to be driven by a marked decline in investment and slower private consumption growth. It has been assumed that uncertainty related to the outcome of trade negotiations will weigh additionally on trade variables, as companies may be hesitant to enter into new longer-term trade arrangements as long as the future relations between the United Kingdom and the European Union are not clear. Therefore, and also reflecting the weaker exchange rate of the pound sterling, UK imports were revised substantially downwards over the projection horizon in comparison with the June 2016 projections. UK export growth has also been revised downwards, but by less, as it is expected to be partly supported by the depreciation of the pound in effective terms. Economic activity in the United Kingdom is foreseen to recover somewhat in 2018, thanks to the expansionary monetary policy.

Euro area activity is expected to be negatively affected mostly through lower exports. Also taking into account its global spillovers, Brexit will cause a considerable downward effect on euro area foreign demand over the projection horizon, cumulatively of about 1.3 percentage points. The adverse effect on real GDP growth from lower foreign demand varies across euro area countries, reflecting differences in trade linkages with the United Kingdom. On top of these trade effects, there are country-specific, Brexit-related exchange rate effects stemming from the strong depreciation of the pound sterling against the euro following the UK referendum. However, for all euro area countries – with the exception of Ireland – the appreciation of the euro against the pound was more than offset by the depreciation of the euro vis-à-vis other major currencies in effective terms. In addition, since the referendum there have been significant downward revisions in long-term interest rates, which may reflect changes in expectations of future euro area and global monetary policy. These two factors dampen the adverse impact of Brexit on the euro area growth outlook.

The euro area growth projection also includes additional country-specific downward impacts. These refer, for instance, to adverse confidence effects in some countries with close links to the United Kingdom, as well as weakened tourism and adverse property market developments in certain countries. Moreover, as the downward revision in the UK growth outlook stems mainly from much lower investment developments, it will disproportionately affect those trading partners that supply the United Kingdom with capital goods.

There are significant Brexit-related downside risks to the euro area projections. The negotiations between the United Kingdom and the European Union may prove to be more difficult than expected, which could weigh further on the trade outlook. Lasting uncertainty may yet lead to deteriorating confidence and lower economic activity over the projection horizon. Lower UK demand for foreign housing could also negatively affect residential investment developments in certain euro area economies. Meanwhile, upside risks can be identified in some euro area countries related to the re-localisation of financial services or foreign direct investment (FDI) flows for the United Kingdom that are instead invested in the country of origin or in other euro area countries.

Private consumption expenditure is projected to grow strongly this year and to stay resilient thereafter. Consumer confidence remains well above historical average levels, suggesting continued private consumption growth in the second half of 2016. The outlook for nominal disposable income growth remains positive, as continued employment growth is accompanied by a slight strengthening in the growth rate of compensation per employee. Other personal income should contribute positively to growth in nominal disposable income, broadly in line with profit developments. The pace of growth in real disposable income is expected to accelerate in 2016, before losing momentum in 2017 and beyond, mostly reflecting the pattern of energy price inflation. Improving bank lending conditions, underpinned by the ECB's monetary policy measures, should support private consumption growth. While lower interest rates have affected the interest receipts and the interest payments of private households by roughly the same amount – leaving average euro area household net interest rate income largely unchanged – they redistribute resources from net savers to net borrowers. As the latter typically have a higher marginal propensity to consume, this redistribution of interest receipts/payments should further support aggregate consumption. In addition, the progress achieved in deleveraging should also support private consumption growth. Overall, annual growth in private consumption is projected to average 1.7% in 2016, 1.6% in 2017 and 1.5% in 2018.

The saving ratio is expected to decline until mid-2017 and to remain flat thereafter. The saving ratio is estimated to have increased somewhat during the second half of 2015 and further in the first half of 2016, reflecting a partial and gradual pass-through of oil price-related real income gains into consumer spending. This upward impact on the saving ratio is expected to be temporary and its unwinding implies a decline in the ratio between the end of 2016 and mid-2017. The saving ratio is then projected to stagnate over the remainder of the projection horizon, reflecting several opposing factors. While falling unemployment, improving credit conditions and low interest rates suggest a decrease in the saving ratio in some countries, debt deleveraging needs are likely to increase the ratio in some vulnerable countries.

Box 2
Technical assumptions about interest rates, exchange rates and commodity prices

Compared with the June projections, the changes in the technical assumptions include slightly lower US dollar-denominated oil prices, a small depreciation of the effective exchange rate of the euro and significantly lower long-term market interest rates.

Technical assumptions

	September 2016				June 2016			
	2015	2016	2017	2018	2015	2016	2017	2018
Three-month EURIBOR (percentage per annum)	0.0	-0.3	-0.4	-0.4	0.0	-0.3	-0.3	-0.3
Ten-year government bond yields (percentage per annum)	1.2	0.7	0.6	0.8	1.2	0.9	1.1	1.4
Oil price (in USD/barrel)	52.4	42.8	47.4	50.6	52.4	43.4	49.1	51.3
Non-energy commodity prices, in USD (annual percentage change)	-19.9	-3.0	5.3	4.2	-19.9	-3.3	4.3	4.6
USD/EUR exchange rate	1.11	1.11	1.11	1.11	1.11	1.13	1.14	1.14
Euro nominal effective exchange rate (EER38) (annual percentage change)	-7.1	3.6	-0.1	0.0	-7.1	4.2	0.2	0.0

The technical assumptions about interest rates and commodity prices are based on market expectations, with a cut-off date of 11 August 2016. 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 2016 and -0.4% for 2017 and 2018. The market expectations for euro area ten-year nominal government bond yields imply an average level of 0.7% in 2016, 0.6% in 2017 and 0.8% in 2018.[2] Reflecting the path of forward market interest rates and the gradual pass-through of changes in market rates to lending rates, composite bank lending rates on loans to the euro area non-financial private sector are expected to decline somewhat in 2016, ease modestly further in 2017 and rise marginally in 2018. 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 11 August, the price of a barrel of Brent crude oil is assumed to fall from USD 52.4 in 2015 to USD 42.8 in 2016, before rising to USD 47.4 in 2017 and USD 50.6 in 2018, which is around USD 1 lower on average over the projection horizon than in the June projections. The prices of non-energy commodities in US dollars are assumed to fall somewhat in 2016 and to rise in 2017 and 2018.[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 11 August. This implies an average exchange rate of USD 1.11 per euro over the projection horizon, compared with USD 1.14 in the June projections. Despite the strong depreciation of the pound sterling against the euro following the UK referendum, the effective exchange rate of the euro (against 38 trading partners) is 0.5% weaker in 2016 and 0.9% lower in 2017 and 2018 than assumed in the June exercise.

Residential investment in the euro area is expected to recover modestly. The projected acceleration of nominal disposable income growth and very low mortgage rates are expected to support a sustained recovery of residential investment. This is also evidenced by a rising number of building permits and increasing demand for loans for house purchase in a context of improved bank lending conditions. In addition, adjustment processes in the housing markets in some countries appear to have come to an end and house prices have started to rise. Nonetheless, high unemployment and high levels of household debt in some countries, as well as adverse demographic developments, dampen the increase in residential investment.

Business investment is expected to continue its recovery. A number of factors are expected to support a recovery in investment: confidence continues to improve on the back of favourable production expectations and a turnaround in selling price expectations; capacity utilisation has increased beyond its long-term average; financing and bank lending conditions have improved substantially, underpinned by

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.

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 2017 and thereafter to evolve in line with global economic activity.

the ECB's non-standard policy measures; domestic demand is expected to remain resilient and external demand is expected to strengthen; a need has arisen to modernise the capital stock after several years of subdued investment; and profit mark-ups are expected to strengthen in the context of an already cash-rich non-financial corporations sector. Moreover, the observed strong recovery in stock prices over recent years and moderate debt financing growth have brought the leverage ratio (debt to total assets) in the non-financial corporations sector close to historical lows. However, the recovery of business investment will still be held back by rigidities in product and labour markets and expectations of weaker potential output growth than in the past.

Extra-euro area exports are significantly adversely affected by a downward revision of euro area foreign demand, largely related to the weaker UK outlook. Foreign demand is expected to gather only modest momentum from mid-2016 onwards, in line with a recovery in global activity, mainly driven by emerging market economies. Nonetheless, the projected growth rates in foreign demand will remain well below their pre-crisis growth rates. The resulting adverse impact on extra-euro area exports is only partly mitigated by the favourable effect of the weaker effective exchange rate of the euro. Altogether, extra-euro area exports are expected to gather only modest momentum from the second half of 2016 onwards. Export market shares are expected to increase marginally in the short term as a result of the weaker exchange rate of the euro and to stagnate thereafter. Extra-euro area import growth is expected to remain relatively contained over the projection horizon. Imports are set to grow in line with their historical elasticity to total demand, albeit still somewhat faster than exports. Accordingly, the current account surplus is expected to decline to 3.3% in 2018.

Box 3
The international environment

Global economic activity is expected to strengthen gradually. Brexit marks the materialisation of a downside risk weighing on an already subdued global outlook. While global financial market volatility following the UK referendum was short-lived, contained, in part, by expectations of further policy accommodation, the outlook in the United Kingdom has deteriorated, weighing on global demand. Moreover, despite tentative signs that activity in large commodity-exporting emerging market economies is bottoming out, global indicators had pointed to modest global growth even before the UK referendum. Looking ahead, the global recovery is expected to remain very gradual. Accommodative policies should support growth prospects in advanced economies, while the progressive easing of the deep recessions in large emerging market economies, particularly Russia and Brazil, should bolster global growth, outweighing the structural slowdown in China.

Global trade remains weak. Cyclical headwinds in emerging market economies, particularly in commodity exporters, where investment has slumped, have weighed on global trade in recent quarters. As these shocks unwind, global imports should recover modestly in the coming quarters. Over the medium term, the projection assumes an elasticity of global trade to global growth of around 1, significantly below pre-crisis levels. Euro area foreign demand is expected to increase from 1.6% in 2016 to 2.6% in 2017 and 3.5% in 2018.

The international environment

(annual percentage changes)

	September 2016				June 2016			
	2015	2016	2017	2018	2015	2016	2017	2018
World (excluding euro area) real GDP	3.2	3.0	3.5	3.7	3.1	3.1	3.7	3.8
Global (excluding euro area) trade[1)]	0.7	0.9	2.8	3.7	0.7	1.8	3.5	4.0
Euro area foreign demand[2)]	0.6	1.6	2.6	3.5	0.6	2.0	3.5	4.0

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

Compared with the June 2016 projections, global activity and euro area foreign demand have been revised downwards. The downward revisions in euro area foreign demand of 0.4 percentage point, 0.9 percentage point and 0.5 percentage point in 2016, 2017 and 2018 respectively primarily reflect expectations of weaker import growth from the United Kingdom and its global spillovers.

The negative output gap in the euro area is expected to narrow steadily over the projection horizon, reflecting only moderate potential output growth. Potential output growth is estimated to edge up over the projection horizon, but to remain far below its pre-crisis rate of around 1.7%. The subdued momentum of potential output reflects primarily a rather low contribution from capital following a protracted period of very subdued investment. The contribution from labour is projected to improve over the projection horizon, reflecting an increasing working age population in the context of the inflow of refugees and an increasing labour force participation, partly on account of past structural reforms. The contribution from labour will nevertheless remain somewhat lower than its pre-crisis average due to the ageing population. In contrast, the expected contribution from total factor productivity broadly matches its pre-crisis level.

Euro area labour market conditions should continue to improve over the projection horizon. Employment is projected to continue to rise over the projection horizon, although somewhat less than in recent quarters. In the short term, this mainly reflects a normalisation as some temporary supportive factors fade, whereas over the remainder of the horizon it mainly reflects that skilled labour supply shortages are assumed to become more binding in parts of the euro area. The unemployment rate is expected to decline, albeit at a slower pace than in 2015, as stronger labour force growth, reflecting the inflow of refugees and the encouraged worker effect, is expected to partly offset the impact of rising employment on the rate of unemployment. These developments in employment imply a pick-up in labour productivity growth from 0.4% in 2016 to 0.9% in 2018, reflecting the usual pro-cyclical pattern.

Compared with the June 2016 projections, the prospects for real GDP growth have been revised downwards slightly over the projection horizon. This mostly reflects the adverse impact of the downward revision of foreign demand on euro area exports, which is only partly compensated by the favourable impact of lower long-term interest rates, the weaker effective exchange rate of the euro and some additional fiscal support.

2 Prices and costs

HICP inflation is projected to average 0.2% in 2016 and to rise noticeably to 1.2% and 1.6% in 2017 and 2018 respectively. The fading of the strong downward effect from the past oil price fall is expected to lead to a significant increase in headline inflation at the beginning of 2017, rising to 1.2% in the first quarter. On the basis of the oil price futures curve, the contribution of HICP energy inflation to headline inflation is expected to swing from -0.6 percentage point in 2016 to around +0.1 to 0.2 percentage point in 2017 and 2018, thereby contributing 0.7 percentage point to the pick-up in headline inflation between 2016 and 2017.

HICP inflation excluding energy and food is expected to rise as economic slack slowly fades. Improvements in labour market conditions, as reflected in a notable decline in the unemployment rate, are expected to bolster a gradual pick-up in wage growth over the projection horizon. With the ongoing economic recovery, continued support to underlying inflation is also expected to materialise via improvements in corporations' price-setting power and the related increase in profit margins. The fading of the dampening indirect effects from energy and non-energy commodity price developments should also contribute to the expected increase in HICP inflation excluding energy and food. Upward effects can also be expected from rising global price pressures more generally, but the gradual fading of upward pressures from the past depreciation of the euro is expected to weigh on the pick-up for HICP inflation excluding energy and food over the projection horizon. Overall, HICP inflation excluding energy and food is foreseen to average 0.9% in 2016 and to strengthen to 1.3% and 1.5% in 2017 and 2018 respectively.

External price pressures will contribute to a pick-up in inflation, with import price inflation expected to turn positive in 2017 following a prolonged period of four years of negative annual rates of change. The import deflator is envisaged to continue to fall in 2016 but to rebound in 2017 and 2018. One key element of the turnaround in import price pressures is the assumed increase in commodity and, in particular, oil prices indicated by futures curves, following their sharp falls in previous years. Strong upward base effects also play a significant role in the turnaround in the annual inflation rate of the import deflator from 2016 to 2017. Beyond these factors, gradually rising global inflationary pressures more generally, as reflected for instance in the projected increases in global consumer price inflation, should add to rising external price pressures in the euro area.

Declining labour market slack and rising headline inflation are expected to support a pick-up in wage growth in 2017 and 2018. Despite a continuous reduction in labour market slack in recent years, wage growth has remained broadly stable so far. Apart from the slack and low inflation, factors that are likely to have continued to weigh on wage growth in the current economic recovery include ongoing adjustment processes across countries to regain or maintain price competitiveness, reinforced by labour market reforms implemented during the crisis. In addition, new jobs appear to have been created, in particular in sectors with low labour productivity and, hence, low wage levels, weighing on aggregate wage growth, via compositional effects. Over the projection horizon, the importance of such dampening effects for wages is expected to recede somewhat and labour market slack is envisaged to decrease further, which should allow growth in compensation per employee to strengthen from 1.2% in 2016 to 1.8% in 2017 and 2.2% in 2018.

The profit margin indicator is expected to benefit from the ongoing economic recovery over the projection horizon. Profit margins were boosted in 2015 by weak labour cost developments and by the sharp fall in oil prices, which does not seem to have been fully passed on to consumer prices. As this latter effect is expected to fade in 2016, the growth rate of the profit margin indicator is expected to decrease. However, the envisaged cyclical improvements in economic activity over the projection horizon are expected to continue to benefit businesses' pricing power and, hence, profit margins, despite a dampening impact from rising labour costs.

Compared with the June 2016 projections, the outlook for HICP inflation is broadly unchanged over the projection horizon.

3 Fiscal outlook

The fiscal stance is projected to be expansionary in 2016 and to turn neutral in 2017 and 2018. The fiscal stance is measured as the change in the cyclically adjusted primary balance net of government support to the financial sector. In 2016, the expansionary fiscal stance is mostly driven by discretionary fiscal measures, while non-discretionary factors play a smaller role and are related, among other things, to a small decline in non-tax revenues.

Over the projection horizon, the general government budget deficit and debt ratios are projected to be on a downward path. In 2016, lower interest payments and the improvement in the cyclical component more than offset the deterioration of the cyclically adjusted primary balance. From 2017 to 2018, further declining interest payments and improvements in both the cyclical component and the primary balance entail a further reduction in the budget deficit. The gradual reduction in government debt over the projection horizon is mainly supported by the favourable growth-interest rate differential in the light of the projected economic recovery and assumed low interest rates. Small primary surpluses should also have a favourable impact on the projected debt path.

Compared with the projections published in June, the fiscal outlook is broadly unchanged as concerns the deficit ratio and more favourable with regard to the debt ratio. The debt-to-GDP ratio is also projected to be lower over the projection horizon, reflecting notably the upward revision to Irish nominal GDP for 2015, which reduced the euro area debt-to-GDP ratio by about 0.4% of GDP.

Table 1
Macroeconomic projections for the euro area[1)]

(annual percentage changes)

	September 2016				June 2016			
	2015	2016	2017	2018	2015	2016	2017	2018
Real GDP [1)]	1.9	1.7	1.6	1.6	1.6	1.6	1.7	1.7
		[1.5 - 1.9] [2)]	[0.7 - 2.5] [2)]	[0.4 - 2.8] [2)]		[1.3 - 1.9] [2)]	[0.7 - 2.7] [2)]	[0.5 - 2.9] [2)]
Private consumption	1.7	1.7	1.6	1.5	1.7	1.9	1.7	1.5
Government consumption	1.4	1.7	0.9	1.0	1.3	1.5	0.8	0.9
Gross fixed capital formation	2.9	3.1	3.3	3.3	2.7	3.2	3.4	3.3
Exports [3)]	6.1	2.6	3.7	4.1	5.2	3.2	4.2	4.4
Imports [3)]	6.1	3.3	4.4	4.7	6.0	4.7	4.7	4.8
Employment	1.1	1.3	0.8	0.7	1.0	1.1	0.9	0.9
Unemployment rate (percentage of labour force)	10.9	10.1	9.9	9.6	10.9	10.2	9.9	9.5
HICP	0.0	0.2	1.2	1.6	0.0	0.2	1.3	1.6
		[0.1 - 0.3] [2)]	[0.6 - 1.8] [2)]	[0.8 - 2.4] [2)]		[0.1 - 0.3] [2)]	[0.6 - 2.0] [2)]	[0.7 - 2.5] [2)]
HICP excluding energy	0.9	0.9	1.2	1.5	0.9	0.9	1.2	1.6
HICP excluding energy and food	0.8	0.9	1.3	1.5	0.8	1.0	1.2	1.5
HICP excluding energy, food and changes in indirect taxes [4)]	0.8	0.9	1.2	1.5	0.8	0.9	1.2	1.5
Unit labour costs	0.4	0.8	1.0	1.3	0.8	0.8	1.0	1.3
Compensation per employee	1.3	1.2	1.8	2.2	1.3	1.3	1.8	2.2
Labour productivity	0.9	0.4	0.7	0.9	0.6	0.5	0.8	0.9
General government budget balance (percentage of GDP)	-2.1	-1.9	-1.7	-1.5	-2.1	-1.9	-1.7	-1.4
Structural budget balance (percentage of GDP) [5)]	-1.6	-1.9	-1.8	-1.6	-1.6	-1.9	-1.8	-1.6
General government gross debt (percentage of GDP)	90.3	89.5	88.4	87.0	90.7	90.0	89.0	87.4
Current account balance (percentage of GDP)	3.2	3.5	3.4	3.3	3.2	2.9	2.8	2.8

1) 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 rising somewhat faster over the projection horizon than suggested by futures. The technical assumptions for oil price developments underlying the baseline projections, based on futures markets, predict an increasing path for oil prices, with the price per barrel of Brent crude oil reaching USD 51.6 by the end of 2018. This path is consistent with a moderate recovery of world oil demand, a scenario associated with the global economic recovery gaining traction, and with a small decline in oil supply. A combination of alternative models used by ECB staff[4] to predict oil prices over the projection horizon currently suggests a higher oil price in 2017 and 2018 than assumed in the technical assumptions. This could emerge owing to a stronger recovery in world oil demand thanks to a stronger than expected pick-up in global activity, and/or a stronger reduction in oil supply owing to lower investment in the oil sector and thus to a reduction in oil production capacity in some oil-producing countries. The materialisation of an alternative path, in which oil prices were 11% higher than in the baseline by 2018, would marginally dampen real GDP growth, while entailing a somewhat faster increase in HICP inflation (up by 0.1 percentage point in 2017 and 0.3 percentage point in 2018).

2) An alternative exchange rate path

This sensitivity analysis investigates, as an illustration, the impact of a lower path of the exchange rate of the euro compared with the baseline. Depreciation risks to the euro exchange rate mainly stem from a divergence in the monetary policy stance on both sides of the Atlantic. In particular, further monetary policy accommodation in the euro area, as well as an earlier than expected rise in the US federal funds rate, could put further downward pressure on the euro. The alternative path of the exchange rate of the euro is based on the 25th percentile of the distribution provided by the option-implied risk-neutral densities for the USD/EUR exchange rate on 11 August 2016. This path implies a gradual depreciation of the euro vis-à-vis the US dollar to an exchange rate of 1.04 USD/EUR in 2018, which is 6.3% below 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 reflect changes in the effective exchange rate with an elasticity of around 50%. This assumption results in a gradual downward divergence of the effective exchange rate of the euro from the baseline, bringing it to a level 3.3%

---

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

below the baseline in 2018. In this scenario, the average of the results from a number of staff macroeconomic models points to higher real GDP growth (up by 0.1-0.2 percentage point) and higher HICP inflation (up by 0.1-0.2 percentage point) in 2017 and 2018.

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 well 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)

	Date of release	GDP growth			HICP inflation		
		2016	2017	2018	2016	2017	2018
ECB staff projections	September 2016	1.7	1.6	1.6	0.2	1.2	1.6
		[1.5-1.9]	[0.7-2.5]	[0.4-2.8]	[0.1-0.3]	[0.6-1.8]	[0.8-2.4]
European Commission	May 2016	1.6	1.8	-	0.2	1.4	-
OECD	June 2016	1.6	1.7	-	0.2	1.2	-
Euro Zone Barometer	August 2016	1.5	1.3	1.6	0.3	1.3	1.6
Consensus Economics Forecasts	August 2016	1.5	1.2	1.6	0.2	1.3	1.6
Survey of Professional Forecasters	July 2016	1.5	1.4	1.6	0.3	1.2	1.5
IMF	July (GDP)/April (HICP) 2016	1.6	1.4	1.6	0.4	1.1	1.3

Sources: European Commission's European Economic Forecast, Spring 2016, May 2016 (in July 2016, the European Commission published two scenarios to reflect the impact of the outcome of the UK referendum on the euro area economic outlook; these showed euro area GDP growth at 1.6% in 2016 and 1.5% in 2017 in the mild scenario, and at 1.5% in 2016 and 1.3% in 2017 in the severe scenario); IMF World Economic Outlook, Update July 2016 (GDP), IMF World Economic Outlook, April 2016 (HICP); OECD Economic Outlook, June 2016; Consensus Economics Forecasts, August 2016; MJEconomics for the Euro Zone Barometer, August 2016; and the ECB's Survey of Professional Forecasters, July 2016.
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.

Postal address: 60640 Frankfurt am Main, Germany
Telephone: +49 69 1344 0
Website: www.ecb.europa.eu