## Economic Bulletin

March 2019



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## I Projections for the Portuguese economy: 2019-2021

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## 1 Introduction

## Maturing expansionary phase of the business cycle

According to the projections published in this *Economic Bulletin*, the Portuguese economy is expected to continue to grow in the period 2019-21, although at a slightly slower pace than in the past few years (Table I.1.1). Following an increase of 2.1% in 2018, the Portuguese gross domestic product (GDP) is expected to grow by 1.7% in 2019 and 2020 and by 1.6% in 2021, moving closer to potential growth.<sup>1</sup> Projected growth outpaces that recently released by the European Central Bank (ECB) for the euro area,<sup>2</sup> which indicates slight progress in the Portuguese economy's convergence towards average income levels in the euro area.

Underlying these projections is a broadly benign economic and financial environment for the Portuguese economy, with external demand growing by 3.4%, on average, and financing conditions remaining favourable for the various economic sectors. The euro area monetary policy stance remains accommodative, against a background of continued low interest rates (Chapter 2).<sup>3</sup> Prevailing downside risks to economic growth in the Portuguese economy are mostly associated with a possible materialisation of key risks to developments in activity and trade worldwide (Chapter 6 and Box 1).

	Weights	ights EB March 2019			EB December 2018				
	2018	2018	2019 <sup>(p)</sup>	2020 <sup>(p)</sup>	2021 <sup>(p)</sup>	2018 <sup>(p)</sup>	2019 <sup>(p)</sup>	2020 <sup>(p)</sup>	2021 <sup>(p)</sup>
Gross domestic product	100.0	2.1	1.7	1.7	1.6	2.1	1.8	1.7	1.6
Private consumption	65.0	2.5	2.7	1.9	1.6	2.3	2.0	1.8	1.6
Public consumption	17.3	0.8	0.3	0.2	0.2	0.7	0.1	0.0	0.2
Gross fixed capital formation	17.1	4.4	6.8	5.8	5.2	3.9	6.6	5.9	4.9
Domestic demand	99.9	2.7	3.0	2.3	2.0	2.4	2.4	2.2	2.0
Exports	43.6	3.7	3.8	3.7	3.6	3.6	3.7	4.0	3.6
Imports	43.5	4.9	6.3	4.7	4.1	4.1	4.7	4.9	4.2
Contribution to GDP growth, net of									
imports (in p.p.) <sup>(a)</sup>									
Domestic demand		1.3	1.3	1.1	1.0	1.2	1.2	1.0	1.0
Exports		0.8	0.4	0.6	0.7	0.9	0.7	0.7	0.6
Employment <sup>(b)</sup>		2.3	1.5	0.9	0.4	2.2	1.2	0.9	0.4
Unemployment rate		7.0	6.1	5.5	5.2	7.0	6.2	5.5	5.3
Current plus capital account (% of GDP)		0.4	0.6	0.6	0.9	1.3	1.3	1.3	1.6
Goods and services account (% of GDP)		1.0	0.2	-0.2	-0.4	1.5	1.1	0.9	0.7
Harmonised index of consumer		1.2	0.8	1.2	1.3	1.4	1.4	1.5	1.6
prices									

#### Table I.1.1 • Projections of Banco de Portugal for 2019-2021 | Annual rate of change, in percentage

Sources: Banco de Portugal and Statistics Portugal. | Notes: (p) - projected, (p.p.) - percentage points. For each aggregate, this table shows the projection corresponding to the most likely value, conditional on the set of assumptions considered. (a) The demand aggregates net of imports are obtained by subtracting an estimate of the imports needed to meet each component. The import content calculations were based on 2015 data. For more information, see the Box 2. Differences between GDP growth rate and the sum of the contributions is due to rounding effects. (b) Total employment, in number of persons, according to the national accounts concept.

Similarly to previous years, the pattern of growth projected for the Portuguese economy continues to be supported by private consumption growth, dynamic gross fixed capital formation (GFCF) and

- 1. These projections comprise data available up to 15 March and the set of assumptions consistent with the ECB's projection exercise (Chapter 2).
- 2. Growth projected for the euro area stands at 1.1% in 2019, 1.6% in 2020 and 1.5% in 2021.
- 3. For an in-depth discussion of the natural euro area interest rate and the key challenges it poses to monetary policy conduct by remaining at historically low levels, see the Special issue entitled "The natural interest rate: from the concept to the challenges to monetary policy".

a sustained increase in exports. The share of exports in GDP is expected to stand at around 47% in 2021, increasing by approximately 3 percentage points (p.p.) of GDP from 2018 (Chapter 3). These developments result in a continued increase in the degree of openness of the Portuguese economy.

Similarly to 2018, the contribution of domestic demand to GDP growth is expected to be higher than that of exports over the projection horizon. Against this background, growth in imports is projected to be higher than in exports, resulting in a negative goods and services account balance from 2020 onwards. Nevertheless, the current and capital account surplus is expected to be maintained over the projection horizon, largely due to the expected increase in European Union (EU) funds during this period (Box 2). Compared with the December 2018 exercise, this surplus was revised downwards.

In line with the euro area, the increase in inflation is expected to remain contained over the projection horizon (Chapter 5), despite the gradual decline in the slack in both the labour market (Chapter 4) and the product market, with most estimates pointing to negative unemployment gaps and positive output gaps.

## Slight downward revision in GDP growth in 2019 and downward revision in inflation in the 2019-21 horizon

The current projection for the annual growth rate of GDP in 2019 was revised downwards by 0.1 p.p. from that published in the December issue of the *Economic Bulletin*. As regards the period 2020-21, projections for GDP growth are virtually unchanged. The 2019 revision partly reflects the incorporation of the Quarterly National Accounts for the fourth quarter of 2018, which pointed to slightly less buoyant activity at the end of the year compared with the previous projection exercise.<sup>4</sup> In addition, the revision of the set of assumptions for the external environment has a slightly negative impact on activity, largely due to the downward revision in the indicator of external demand for Portuguese goods and services. The revision in the assumption for external demand is also the main factor behind the projection error for the GDP growth rate in 2018 prepared by Banco de Portugal a year ago (Box 3). In turn, short-term indicators available for the start of 2019 point to more favourable developments than previously expected.

The projection for inflation was revised downwards by 0.6 p.p. in 2019 and by 0.3 p.p. in 2020 and 2021, in a context where the projection for euro area inflation was also revised downwards for the entire projection horizon. These revisions reflect the incorporation of data released after the publication of the December issue of the *Economic Bulletin* (including the update on the assumptions), changes in a number of regulated prices and a more moderate outlook for economic activity.

# 2 External environment and technical assumptions of the projections

The external environment of the Portuguese economy remained broadly benign in 2018, but global economic activity expanded at a slightly slower pace than expected. This reflected a slowdown

4. A more detailed analysis of economic developments in 2018 will be published in the May issue of the Economic Bulletin, due to be released on 8 May.

in the GDP of advanced economies, associated with a maturing cycle in these economies, but which became more marked due to specific and idiosyncratic factors, particularly car production bottlenecks in Germany, risks associated with the policy measures announced in Italy and the uncertainty brought about by the United Kingdom (UK) leaving the EU. In the euro area, GDP grew by 1.9% in 2018, i.e. below the 2.5% observed in 2017, with the deceleration in activity being relatively broadly based across countries, although particularly marked in Germany and Italy in the second half of the year. In turn, the pace of global trade growth declined in 2018, in a context of decelerating global industrial activity and trade disputes (Chart I.2.1). These developments occurred against a background of high global uncertainty.

Over the projection horizon, global economic expansion is expected to continue at a more moderate pace, in a context of a maturing expansion and a gradual reduction in monetary and fiscal policy stimuli in major advanced economies, in particular the United States, as well as a gradual deceleration in the Chinese economy. By contrast, activity is expected to recover in the emerging economies that were most affected by the recent financial turmoil. According to the assumptions underlying the exercise, world GDP is projected to decelerate from 3.5% in 2018 to 3.3% in 2019, hovering around this rate between 2020 and 2021 (Table I.2.1).<sup>5</sup> A further decline in growth, to 1.1%, is projected for the euro area in 2019, against a background of deteriorating economic sentiment indicators in the past few months in several countries and sectors, which suggests some persistence of the adverse factors affecting economic performance in 2018. Under the assumption that these factors will gradually fade, the maintenance of the fundamental determinants supporting the expansion in the euro area is expected to translate into a recovery in economic growth to around 1.5% in 2020-21. Compared with the December projections, GDP growth in the euro area was revised downwards in 2019 and 2020 (by -0.6 p.p. and -0.1 p.p. respectively), remaining unchanged in 2021.

Global trade is expected to slow down more markedly than activity in 2019, against a background of both high uncertainty over geopolitical developments and trade policies. According to the assumptions underlying the exercise, global trade is expected to grow by 2.8% in 2019 (-1.6 p.p. than in 2018) and to accelerate to 3.6% at the end of the horizon. After decelerating over the course of 2018, external demand for Portuguese goods and services is expected to grow at a relatively steady pace in 2019-21, close to the rate projected for 2018. These developments are associated with a slight recovery in growth in intra-euro area trade and a moderation in growth in extra-euro area imports (Chart I.2.2). Compared with the assumptions underlying the December exercise, growth in external demand was revised downwards in 2019 and 2020 (-0.5 p.p. and -0.2 p.p. respectively).

Oil prices were very volatile throughout 2018, ranging between around USD 50 and almost USD 90 per barrel. An upward trend was prevalent up to October, in a context of sustained global demand and supply-side constraints. From October onwards, prices for this commodity reversed abruptly, as a result of production increases in a number of oil-producing countries and fears of oversupply, as well as the expected impact on demand for crude oil of a downward revision in the global growth outlook. On the basis of the technical assumptions, oil prices are projected to drop by around USD 10 in 2019, to USD 62 per barrel, and to stand at USD 61 per barrel in 2020-21.

Compared with the assumptions underlying the December exercise, the price of Brent oil was

<sup>5.</sup> The assumptions for global activity and trade and projections for euro area GDP and inflation coincide with those in the ECB's projection exercise released on 7 March (see "ECB staff macroeconomic projections for the euro area", March 2019). The external environment of the euro area and technical assumptions for oil prices, interest rates and exchange rates include data available up to 12 February.

revised downwards by slightly more than USD 5 per barrel over the period 2019-21.

#### Table I.2.1 • Projection assumptions

		EB March 2019			Revisions compared to EB December 2018			
	2018	2019	2020	2021	2018	2019	2020	2021
International environment								
World GDP yoy	3.5	3.3	3.4	3.3	-0.1	0.0	0.0	0.0
World trade yoy	4.4	2.8	3.6	3.6	-0.3	-0.9	-0.1	-0.3
External demand yoy	3.4	3.1	3.6	3.4	0.0	-0.5	-0.2	0.0
Oil prices in dollars aav	71.1	61.7	61.3	60.6	-0.7	-5.8	-5.5	-5.3
Oil prices in euros aav	60.2	54.2	53.8	53.2	-0.7	-5.3	-5.0	-4.9
Monetary and financial conditions								
Short-term interest rate (3-month EURIBOR) %	-0.3	-0.3	-0.2	0.0	0.0	0.0	-0.2	-0.3
Implicit interest rate in public debt %	2.9	2.8	2.7	2.6	0.0	0.0	-0.1	-0.1
Effective exchange rate index yoy	2.5	-1.4	0.0	0.0	0.1	-0.7	0.0	0.0
Euro-dollar exchange rate aav	1.18	1.14	1.14	1.14	0.0	0.4	0.4	0.4

Source: Eurosystem (Banco de Portugal calculations). | Notes: yoy – year-on-year rate of change, aav – annual average value. An increase in the exchange rate corresponds to an appreciation of the euro. The revision in the euro-dollar exchange rate is presented in percentage. The technical assumption for bilateral exchange rates assumes that the average levels observed in the two weeks prior to the cut-off date will remain stable over the projection horizon. The technical assumption for oil prices is based on futures markets. Developments in the 3-month Euribor rate are based on expectations implied in futures contracts. The implicit interest rate on public debt is computed as the ratio of interest expenditure for the year to the simple average of the stock of debt at the end of the same year and at the end of the preceding year. The implicit rate includes an assumption for the interest rate associated with new issuances.

## **Chart I.2.1** • Global activity PMI and global uncertainty

#### Chart I.2.2 • World GDP and foreign demand for Portuguese goods and services | Contributions to the annnual rate of change, in percentage points

Portuguese foreign

demand

2017 2018 2019 2020 2021

(p) (p)

Euro area

(p)



Sources: Markit and www.policyuncertainty.com. | Note: 3ma – 3-month moving average.

——March 2019 projections (%) Source: Eurosystem. | Note: (p) – projected.

2017 2018 2019 2020 2021

(p) (p) (p)

World excluding euro area

World GDP

Short-term interest rates remained at historically low levels in 2018. According to market expectations, these rates should increase very gradually from 2020 onwards, with the three-month interest rate standing at around 0% at the end of the projection horizon. The current assumptions incorporate a downward revision in interest rates compared with the assumptions considered in the December exercise, due to a postponement of market expectations regarding an increase in key interest rates. Assumptions for public finances - mentioned throughout the document - only include fiscal policy measures that have already been approved (or are highly likely to be approved) and that are sufficiently specified, in line with Eurosystem rules.

### Expenditure and external accounts 3

Growth in GDP is expected to reflect favourable developments in domestic demand and exports, and the net contribution of domestic demand is likely to be higher than that of exports in 2019-21 (Chart I.3.1). Similarly to the recovery period, the contribution of domestic demand is projected to be associated with growth in private consumption and the dynamics of GFCF, specifically corporate GFCF (Chart I.3.2). Developments projected for domestic demand are compatible with a gradual decline in the high level of indebtedness observed in several economic sectors as a percentage of GDP over the projection horizon.



0.0

2014

Exports

2015

2016

for GDP growth in real terms | In percentage

Chart I.3.1 • Main contributions net of imports Chart I.3.2 • Contributions net of imports for the average annual rate of change of real GDP | In percentage points



Sources: Banco de Portugal and Statistics Portugal. | Notes: (p) Sources: Banco de Portugal and Statistics Portugal. | Notes: (p) – projected. - projected. The demand aggregates net of imports are obtained Export. - Exports of goods and services. The demand aggregates net of data. For more information, see the Box 2.

2017

Domestic demand

2018

2019

(p)

2020

(p)

- GDP (%)

2021

(p)

by subtracting an estimate of the imports needed to meet each imports are obtained by subtracting an estimate of the imports needed to component. The import content calculations were based on 2015 meet each component. The import content calculations were based on 2015 data. For more information, see the Box 2.

### Growth in private consumption in line with disposable income

In the past five years, private consumption has grown at a relatively stable rate of around 2.4%. Over the projection horizon, private consumption is expected to continue to grow moderately, at an average rate of 2.1%, which is slightly higher than average growth in GDP.

The increase in private consumption is associated with favourable developments in real household disposable income, reflecting the increase in employment and nominal wages - including the minimum wage in 2019 - and contained developments in prices. Consumer confidence remains high, albeit below the levels recorded in the recent past, and households maintain positive expectations regarding developments in their financial situation. In addition, assumptions for developments in fiscal variables in 2019 help increase households' disposable income. In particular, in addition to the impact of career revisions in general government, the effects of the tax-cutting measures on households and the increase in social benefits are also relevant.

Over the projection horizon, (durable and non-durable) private consumption is expected to decelerate, in line with real disposable income, which is projected to slow down mainly as a result of a deceleration in employment. The fading impact of the increase in the minimum wage and of fiscal measures, as well as the decrease in inflation in 2019, are projected to influence the deceleration trend. Against this background, the household savings rate is expected to remain at low levels.

Assumptions for public consumption considered in the projection point to slightly positive growth in 2019, below that of 2018. In the case of expenditure in goods and services, these developments are largely due to a reversal of the one-off effect of expenditure related to the 2017 wildfires (with an impact on intermediate consumption in 2018), as well as an expected decline in expenditure associated with public-private partnerships in the road sector. Compensation of employees is also expected to decelerate in 2019, in line with lower growth in public employment. Over the remaining projection horizon, public consumption is expected to remain fairly constant, within a context of very moderate growth in public employment.

### Buoyant developments in investment

GFCF is expected to grow by around 6%. The business component is projected to make the largest contribution to these developments. This performance is anchored in a number of factors that are favourable to investment, inter alia: a continued broadly positive outlook for developments in demand, rates of capacity utilisation close to the pre-crisis average, the need to recover and build up capital stock, favourable financing conditions, and a number of large-scale infrastructure projects which, in some cases, are expected to benefit from EU funds, as the end of the current programming period draws near.

Nevertheless, the momentum is expected to decline in 2019-21, compared with average growth observed in 2016-18. Qualitative survey data suggest that entrepreneurs have been less optimistic regarding developments in their business in the near future (Chart I.3.3). Corporate investment decisions, particularly of exporters, may be negatively affected by uncertainty regarding global trade tensions.

In the period 2019-21, housing investment is projected to continue recovering, given that the main growth factors remain in place – an increase in demand from residents and non-residents and access to financing with low interest rates. However, the housing market is expected to gradually decelerate, also as a result of slower economic growth compared with the past few years. Against this background, the share of GFCF in housing in GDP is expected to remain fairly stable at around 3% until the end of the projection horizon.

Public investment is projected to accelerate slightly in 2019, in line with the State Budget for 2019. Developments are expected to be positive – but gradually become more subdued – over the projection horizon.

### Exports grow in line with external demand

Over the projection horizon, growth in exports is expected to be fairly stable, at around 3.7%, in line with the indicator of external demand for Portuguese goods and services and with slight market share gains (Chart I.3.4).

In the period 2019-21, growth in external demand is expected to remain close to the value estimated for 2018, against a background where economic activity worldwide and, in particular, in the euro area post favourable developments, with growth coming closer to its potential, which is projected to be lower than before the international financial crisis. In addition, specific sectoral effects - related inter alia with car production and the oil industry - are expected to gradually normalise. These had a considerable impact (with opposite signs) on the export market share in 2018. Market share gains projected for 2019-21 are mostly associated with tourism. Similarly to 2018, tourism exports are projected to slow down over the projection horizon, following the extraordinary growth of the recent past and against a background of recovery in a number of competing destinations.<sup>6</sup>

As usual, imports are projected to be in line with overall demand weighted by import content, taking into account the average patterns observed in the past (Box 4).





### foreign demand and market share | Annual rate of change, per cent



Source: European Commission. | Note: The dotted lines correspond to 12-month moving averages.

## The economy maintained its net lending position, with a deterioration in the goods and services account balance

Over the projection horizon, the Portuguese economy is expected to maintain its net lending position, reflected in an average current and capital account surplus of 0.7% of GDP.

In 2018 the current and capital account surplus declined by 1 p.p. of GDP compared with the previous year, to 0.4% of GDP, mainly reflecting a more pronounced increase in imports of goods and services in real terms, compared with exports. For 2019 and the following years, the gradual decline in the goods and services account balance is projected to continue, dropping to negative levels from 2020 onwards. However, these developments are expected to be accompanied by an improvement in the income and capital account balance (Chart I.3.5). Against this background, the current and capital account surplus increases over the projection horizon, reaching 0.9% of GDP in 2021.

A deterioration in the goods and services account balance is largely the result of a negative volume effect, reflecting the buoyancy of imports compared with exports. Developments in the income balance benefit from the ongoing low interest rates and the reduction in interest on public

Sources: Banco de Portugal, Eurosytem and Statistics Portugal. | Note: (p) – projected.

<sup>6.</sup> For an in-depth discussion on tourism exports, see the Special issue entitled "Tourism exports: recent developments and future prospects", in the December 2018 issue of the Economic Bulletin.

debt. Given that the amount of funds received from the EU was slightly below the levels observed in the same stage of the previous programming period, these funds are expected to recover over the projection horizon (Box 2). In 2021 the capital account balance is also projected to be affected by a one-off effect, associated with the reimbursement by the European Financial Stability Facility of amounts paid by Portugal under the Economic and Financial Assistance Programme.



Chart I.3.5 • Main components of the current and capital account | Per cent of GDP

Sources: Banco de Portugal and Statistics Portugal. | Note: (p) – projected.

## 4 Labour market

## Favourable developments in the labour market, with a recovery in output per worker

Over the projection horizon, employment is expected to grow further, although at a gradually slower pace in both the private and public sectors. The deceleration trend reflects the maturing business cycle and increased labour supply constraints. The number of firms with difficulties in recruiting skilled personnel is above historical average levels. Among the factors limiting production, firms have reported recruitment problems as the second most relevant factor in 2018. The share of firms that consider that these difficulties limit investment has also been on the rise.

Employment growth is linked to the decrease in the number of unemployed persons and, to a lesser extent, the increase in the labour force (Chart I.4.1). The unemployment rate is likely to follow a downward path over the projection horizon, moving from 7% in 2018 to 5.2% in 2021. However, the reduction should continue at a more moderate pace than in the past few years. In spite of unfavourable demographic developments – which may be mitigated if net migration remains positive –, the labour force is expected to post slightly positive changes, reflecting the return to the labour market of discouraged workers, the gradual increase in the retirement age and increased female participation in the workforce.

Following a recovery period characterised by a marked rise in employment, which exceeded that in activity, developments in output per worker are expected to be positive over the projection horizon (Chart I.4.2). Productivity growth is associated with a number of factors, such as the gradual recovery and build-up of the productive capital stock available to workers (which is a slow-moving process by nature), and the better allocation of resources in the Portuguese economy.

Chart I.4.1 • Developments in employment | Contributions to the annual rate of change, in percentage points



Sources: Banco de Portugal and Statistics Portugal. | Notes: (p) projected. (a) A positive contribution means that a decrease in the projected. Total employment is measured in number of persons, unemployment rate contributed to an increase in employment. Total according to the national accounts concept. employment is measured in number of persons, according to the national accounts concept. The labour force includes a scale factor in order to harmonise the levels of employment in the Labour Force Survey and in the National Accounts.

#### Chart I.4.2 • Contributions of output per worker and employment to the annual rate of change of GDP | In percentage points



Sources: Banco de Portugal and Statistics Portugal. | Notes: (p) –

## 5 Prices and wages

### Moderate increase in prices

According to the projections, inflation, as measured by the rate of change in the Harmonised Index of Consumer Prices (HICP), is expected to decrease from 1.2% in 2018 to 0.8% in 2019, and to increase gradually over the period 2020-21 (Chart I.5.1). Looking at the latest projections for the euro area, price developments should be below those projected for the euro area.<sup>7</sup>

Over the past few years, the resources available in the labour and product markets have progressively decreased, and are assumed to continue to decrease over the projection horizon, against a background of a maturing business cycle. This has led to a gradual acceleration in nominal wages in the private sector. Over the projection horizon, this trend is anticipated to continue, with wage developments in 2019 being influenced, on the one hand, by the update of the minimum wage and, on the other hand, by expectations of moderate price developments. Wage developments in the public sector include the impact of career revisions in general government (which started in 2018 and whose effects extend to 2020), as well as the assumption of wage updates in line with inflation in 2020-21.

Consumer price developments have been subdued, not only in Portugal, but also in other economies, such as the euro area. This is associated with a number of factors that help mitigate price increases. At international level, assumptions point to moderate inflationary pressures and a decrease in oil prices, in line with the assumptions underlying the projection exercise. Furthermore, the pass-through of wage costs to prices may be more limited, against a background of inflation expectations anchored at moderate levels and an upturn in productivity, which contributes to subdued developments in unit labour costs. Changes in profit margins should also remain contained, given

that some signs of compression have emerged over the past two years, which may extend to the beginning of the projection horizon.

A number of specific temporary factors support a decrease in inflation in 2019. One such factor is the gradual unwinding of very substantial increases in the pricing of tourism-related services in the recent past. Moreover, price developments in 2019 include reductions in some regulated prices, such as school books, electricity and passenger transport services, in line with the subsidisation of travel cards included in the State Budget for 2019 (with a positive impact on the public consumption deflator).

**Chart I.5.1** • Harmonised index of consumer prices | Contributions to the annual rate of change, in percentage points



Sources: Banco de Portugal and Eurostat. | Note: (p) – projected.

## 6 Uncertainty and risks

### Downside risks to activity and balanced risks to inflation

The projections presented in this Bulletin refer to the most likely scenario, based on the assumptions set out in Table I.2.1. This central scenario may be affected by the materialisation of a set of risks and uncertainties, which involve deviations from the assumptions included in the current projections or the possibility of events occurring that have not been considered in the projections.

Over the projection horizon, risks to activity are on the downside, associated with the international environment. These risks are related to the possibility that the recent loss of momentum in the euro area economy – where the major export markets for Portugal are concentrated – reflects more persistent factors, to the rise of protectionist policies, the intensification of geopolitical tensions and a more marked deceleration in the Chinese economy. Furthermore, the Portuguese economy may also be affected by risks associated with increased financial market turmoil and heightened tensions in euro area sovereign debt markets. Should these risks materialise, exports and domestic demand would be negatively affected and developments in the external balance might be unfavourable. Increased uncertainties worldwide, due to e.g. the UK's departure from the EU, threaten business confidence, and may lead to the postponement of investment. The size of the negative impact on economic activity associated with these scenarios naturally hinges on the nature and magnitude of shocks on the economy. Box 1 presents a sensitivity analysis of economic activity developments in Portugal to negative external demand shocks.

As regards inflation, risks are deemed to be balanced. Inflation may be higher if labour market pressures builds up and if its pass-through to prices increases in Portugal and the euro area, and if trade tariffs impacting on import prices increase. These upside risks are, however, counterbalanced by downside risks associated with the possibility of a loss in momentum in economic activity.

## 7 Conclusion

The Portuguese economy is expected to grow further in the period 2019-21, against a background of a broadly favourable economic and financial environment. However, the pace of growth should stand below that seen over the past few years and close to the available estimates for potential growth. Prospects of a reduction in growth are also common to other economies, such as the euro area. A factor contributing to these developments is the deceleration in world trade, and there is a risk that this trend will deepen.

Furthermore, in Portugal specific constraints to medium and long-term growth still persist. Despite the favourable developments seen over the past few years, driven by a more sustainable growth profile, numerous challenges (demographic, technological, institutional challenges, and high indebtedness) surround the potential growth in the Portuguese economy.<sup>8</sup> In this context, it is important to put in place conditions to foster an increase in productivity, through a better allocation of resources, the improvement of the functioning of product and labour markets, and investment in human capital and innovation.

For an in-depth discussion of potential output, see the Special issue entitled "Potential output: challenges and uncertainties", *Economic Bulletin*, December 2017.

### Box 1 • Sensitivity analysis of the projections to adverse external demand shocks

Exports of goods and services have performed very favourably over the past decade, and have taken up a key role in the adjustment process of the Portuguese economy. Over the projection horizon, and according to the international environment assumptions underlying the Eurosystem's projection exercise, the average annual growth in external demand is expected to stand at 3.4% in the period 2019-21, moving at a pace close to that observed in 2018. In this context, exports of goods and services should continue to make a substantial contribution to Portuguese economic growth over the coming years.

This relatively benign scenario for external demand is subject to a broad set of risk and uncertainty factors. Due to its potential impact on trade flows worldwide, one such factor is the possibility that the recent loss of momentum in the euro area economy – where the main export markets for Portugal are concentrated – reflects more persistent factors than currently expected. Another factor is the possibility of a deterioration in geopolitical tensions and the implementation of new protectionist measures, as well as a hypothetical slowdown in the Chinese economy beyond what is currently expected. External demand addressed to Portuguese exporters may also be negatively affected by a reduction in trade relations between the UK and the EU. The materialisation of some such risks would generate a negative shock on external demand for Portuguese goods and services, with an impact on economic activity.

In this context, this box presents two alternative scenarios to illustrate the impact on the Portuguese economy of the materialisation of some of the aforementioned risks, using the macroeconometric model developed by Banco de Portugal. These scenarios look only at the impact from external demand for Portuguese goods and services and, therefore, no other transmission channels of potential external shocks were taken into account.



**Chart C1.1** • External demand for Portuguese goods and services | Annual rate of change in percentage

The first scenario is based on the assumption that the recent deceleration in the euro area will be more persistent. Indeed, projections for the euro area recently released by the ECB are based on the assumption that the adverse factors that have recently affected the world economy and, in particular, the euro area economy, will unwind in the second half of 2019. If these factors fail to unwind over the next few quarters, external demand for the Portuguese economy will be lower. In

Sources: European Central Bank and Banco de Portugal.

this context, it was assumed in this scenario that the rates of changes in the euro area economic activity and in imports over the projection horizon would be similar to those posted in the second half of 2018. This scenario implies external demand growth of approximately 2.5% over the projection horizon, by contrast to the assumption of 3.4% average growth underlying the projections presented in this *Bulletin* (Chart C1.1). In both the first and second scenarios, it is assumed that the less favourable developments in the euro area have no impact on the other assumptions underlying the projections for the Portuguese economy (most notably, interest rates, the exchange rate, oil prices and the competitors' prices).

The second scenario, which is less likely to occur, corresponds to a more adverse external demand shock, due to the materialisation of a wider set of risks. The 2019 external demand shock has a similar size and duration to the 2012 shock, set against the backdrop of the sovereign debt crisis in the euro area (Chart C1.1).<sup>9</sup> In this scenario, the growth rate of external demand in 2019 and 2020 is 3.3 p.p. and 1.9 p.p. respectively below the assumptions incorporated in the projections presented in this Bulletin. In this context, external demand levels would virtually stabilise in 2019 and grow by 1.7% in 2020, while changes in 2021 would not differ substantially from the projection assumptions (Chart C1.2).

An external demand shock directly affects exports of goods and services. Compared with the central scenario, the reduction in aggregate demand has a negative impact on demand for inputs, more specifically, capital and labour, and leads to a decrease in investment and employment. Lower labour market pressure results in wage cuts, which, together with an increase in the unemployment rate, imply a reduction in households' disposable income and private consumption.

The overall impact of lower external demand scenarios on activity growth is negative (Chart C1.3). In the first scenario, the impact corresponds to -0.1 p.p. in the first year and -0.3 p.p. in the second year. In the more adverse scenario, the impact on the GDP growth rate is -0.7 p.p. in 2019 and 2020. In the last year of the projection horizon, the external demand shock would already have a small impact on the GDP growth rate, of approximately -0.2 p.p. in both scenarios.

9. In practice, the shock was quantified on the basis of a stylised exercise, using a dispersion measure as a metric for the shock. For that purpose, the standard deviation measured in the quarterly growth rate of external demand was calculated using data since the beginning of the euro area. The implemented shock corresponded to a negative shock from a standard deviation (1.8%) on external demand in the first quarter of 2019. Due to the nature of identified risks, the implemented shock should not be a temporary shock felt just over one quarter, but must be somewhat persistent. The shock's persistence was estimated at 0.68, using a first-order autoregressive model, for the same sample period. The implemented shock on external demand can be defined as:

#### $\Delta w dr_t = \rho \Delta w dr_{t-1} + e_t$

where  $\Delta w dr_t$  corresponds to the quarter-on-quarter rate of change in external demand, p corresponds to the shock's persistence, i.e. 0.68, and  $e_t$  is the error term, standing therefore at 1.8% at the time of the shock. This methodology results in an annual external demand profile comparable to that observed in 2012.

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## $\mathbf{Box}~\mathbf{2}~\boldsymbol{\cdot}~\mathsf{Impact}$ of EU funds on the current and capital account: Portugal 2020 in perspective

Since joining the European Economic Community, Portugal has received funds to support economic, social and territorial cohesion within the European area. On the basis of available information, estimates indicate that – from 1986 until the end of 2018 – Portugal received a total amount of around €130 billion at 2011 prices, corresponding, on average, to around 2.5% of GDP per year. Portugal also transfers funds to the European budget, which include customs duties, agricultural levies and the financial contribution (based on Value Added Tax and Gross National Income). In the period from 1996 to 2018 (covered by the balance of payments series), these transfers were relatively steady, at around 1% of GDP per year.

In the current programming period, the final beneficiaries had received about 40% of the total planned allocation by the end of 2018. In a country-by-country comparison, the percentage of funds received by Portugal in the current programming period is higher than the European average, ranking sixth highest. Compared to the previous cycles, the percentage of funds received in the current programming period is slightly lower than in the same phase of previous programming periods. In this context, there should be a recovery of European Union (EU) funds over the projection horizon.

This box describes Banco de Portugal's estimates of EU funds underlying the projections for the current and capital account balance presented in this *Economic Bulletin*, from a historical perspective.<sup>10</sup> These amounts necessarily have a major impact on the current and capital account balance, which is also expected to be observed over the projection horizon (Chart C2.1).

A crucial preliminary issue relates to the definition of the subject-matter under analysis. The debate on EU funds typically focuses on the five major multiannual programming periods already implemented in Portugal: the Community Support Framework I (QCA I) for 1989-93; the Community Support Framework II (QCA II) for 1994-99; the Community Support Framework III (QCA III) for 2000-06; the National Strategic Reference Framework (QREN) for 2007-13; and the current Portugal 2020 Partnership Agreement for 2014-20.<sup>11</sup> However, the scope of these frameworks varies over time and does not encompass all financial instruments for economic development and for the structural and cohesion support policies provided by the EU.<sup>12</sup> For reasons of comparability, the analysis below focuses on a specific set of instruments, irrespective of whether they are explicitly covered by the rules of each framework. In particular, the instruments under analysis are the current European Structural and Investment Funds (ESI Funds) and the European Agricultural Guarantee Fund (EAGF).<sup>13</sup> Despite not corresponding to total EU funds received and accounted for in the current and capital account, these instruments represent the vast majority of these funds (Chart C2.2). As they are well known, the analysis uses the Portuguese acronyms for the programming periods, but their use should be understood in a broad sense, referring in general to the financial resources received in each programming period as part of the set of instruments under analysis.

10. Data on EU funds included in the current and capital account reflect transfers to final beneficiaries.

11. Support was also granted in the first three years after accession (1986-88), corresponding to around 1.5% of GDP per year, financed under the European Social Fund (ESF), the European Agricultural Guidance and Guarantee Fund (EAGGF), the European Regional Development Fund (ERDF) and the Specific Budget Line of the Specific Programme for the Development of Portuguese Industry (*Linha Orçamental Específica do Programa Específico de Desenvolvimento da Indústria Portuguesa* – LOE-PEDIP).

- 12. This issue is also addressed in Pires, L. M. (2017). "30 anos de Fundos Estruturais." Relações Internacionais, 53, 19-38.
- 13. ESI Funds include the European Regional Development Fund (ERDF), the European Social Fund (ESF), the Cohesion Fund (CF), the European Agricultural Fund for Rural Development (EAFRD) (the current designation of the guidance section of the European Agricultural Guidance and Guarantee Fund EAGGF) and the European Maritime and Fisheries Fund (EMFF) (the current designation of the Financial Instrument for Fisheries Guidance and Guarantee Fund EAGGF). The European Fisheries Fund (EMFF) (the current) of the European Agricultural Guidance and Guarantee Fund (EAGGF). The set of information used covers all these funds, with the exception of the FIFG and the guarantee section of the EAGGF in the QCA I, for which information could not be collected.



Payments to the EU Balance of the current and capital account

Sources: Banco de Portugal and Statistics Portugal. | Notes: (p) – projected. The series of the balance of payments are available from 1996 onwards

#### Chart C2.2 • The five main programming periods of european transfers | Million of euros, constant prices of 2011 and in per cent of GDP



Sources: Agência para o Desenvolvimento e Coesão, Boletim Informativo QREN, Leaflet "Fundos Estruturais 10 anos em Portugal" by Direção Geral do Desenvolvimento Regional, DGRM, IFAP/GPE and Statistics Portugal (Banco de Portugal calculations). | Notes: The designation of the programming periods should be understood in a broad sense, covering in general the financial resources received through the set of instruments considered (ESIF and EAGF). In the case of Portugal 2020, data refer to the planned EU amount, including an estimate for the transfers regarding EAGF. Private consumption deflator was used in order to have an annual constant-price series (2011 prices). GDP figures for each programming period are used to calculate the series as a share of GDP, including the projections presented in this Bulletin for 2019-20, in the case of the current programming period.

The years of the programming periods are not strict in the sense that funds associated with a given programming period may be received after the final year of the programming period.<sup>14</sup> For example, the QREN formally ended in 2013, but funds continued to be received until 2016 under the projects approved in this period.<sup>15</sup> In addition, the temporal distribution of the funds received in each period is not constant over time.<sup>16</sup> The process of preparing, approving, implementing and evaluating projects applying for EU funding translates into a time pattern of financial flows common to the various programming periods. This pattern is characterised by lower flows at the beginning and at the end of each cycle, with the largest flows of funds typically concentrated around the end of the formal programming period.

Developments projected for EU funds to be received in the period 2019-21 take into account the average time patterns observed in the past for previous cycles, as well as information obtained from monitoring the current programming period.

The financial allocation under the current programming period is around €31 billion, of which approximately €26 billion refer to ESI Funds.<sup>17</sup> By the end of 2018, the final beneficiaries had already

- 14. For the EAGF (and previous designations), there are no overlapping funding allocations for two consecutive programming periods.
- 15. Funds received in 2016 correspond to transfers from managing authorities to final beneficiaries concerning expenditure incurred in 2015, in line with the rule on the execution of this support framework. The time lag that may exist between the expenditure and transfers to the final beneficiaries is typically associated with the need to verify the regularity of the expenditure.
- 16. Annual developments in funds received per programming period follow, as much as possible, the criterion adopted in the compilation of the current and capital account, which refers to transfers to final beneficiaries. In cases where it was not possible to obtain this information (ERDF, CF and ESF in the QCA I, II and III), the analysis uses developments in transfers from the EU to Portugal. For the QCA II and III, it was not possible to collect information from the ESF and the CF on annual developments per programming period. In these cases, an annual estimate was used on the basis of developments in the series incorporated in the current and capital account.
- 17. The total allocation shown includes an estimate of funds received from the EAGF for the period 2019-20.

received about 40% of the total planned allocation, i.e. the rate of received funds is around 40%, standing at approximately 35% in the case of ESI Funds.<sup>18</sup> In a country-by-country comparison, the rate of received funds in Portugal under the current programming period is higher than the European average, ranking sixth highest of all the countries (Chart C2.3).<sup>19</sup> Among the group of countries with a financial allocation equal to or higher than 1% of GDP per year (corresponding to the first 14 countries in Chart C2.3), the rate of received funds in Portugal is the highest. Compared to the rates of received funds in the previous periods, the current programming period is slightly below the previous period in the same stage of the programming period and also below previous periods (Charts C2.4 and C2.5).

It is not only in Portugal that the rate of received funds in the current programming period lags behind the observed in previous periods. Considering the same stage in different programming periods (in particular, four years after it began, which corresponds to 2018 in the current partner-ship agreement), the rate of received funds in the current programming period is the lowest both for Portugal and most European countries (Chart C2.6).<sup>20</sup>

This profile of lower rates may be related to the implementation of new performance tools introduced by the European Commission in 2014.<sup>21</sup> The Commission has been focusing on integrated planning and results, which makes contracting more demanding. In addition, in comparison with the previous programming period, there was exceptional frontloading of the planned amounts of European co-financing for the countries subject to assistance programmes – such as Portugal – from 2011 onwards.<sup>22</sup> Finally, the first two programming cycles were shorter (5 and 6 years respectively), which naturally led to a frontloading in the rates of received funds, compared to more recent programming periods.

In this context, over the projection horizon, EU funds are expected to recover from 1.8% of GDP in 2018 to 2.3%, 2.6% and 2.4% in 2019, 2020 and 2021 respectively (Chart C2.1). As in previous programming periods, estimates point to considerable amounts under the current programming period being received after 2020. In addition, the estimated profile of the flows of financial support is consistent with the use of the total planned allocation within a period of up to three years after the end of the formal programming period, as observed in the previous period.

The next programming period 2021-27 is expected to continue the downward trend in the amounts received by Portugal observed in the previous programming periods (Chart C2.2). However, negotiations remain surrounded by high uncertainty, also due to the UK's withdrawal from the EU.

- 19. Data used for Portugal in international comparisons are made available by the European Commission and refer to transfers to Member States, while current and capital account data reflect transfers to final beneficiaries. Data for the current programming period include all ESI Funds (https://cohesiondata. ec.europa.eu/2014-2020/ESIF-2014-2020-EU-payments-daily-update-/gayr-92qh, accessed on 9 January 2019).
- 20. Data used for Portugal in international comparisons are made available by the European Commission and refer to transfers to Member States, while current and capital account data reflect transfers to final beneficiaries. For the previous programming periods, only information on the ERDF, the CF, the EAFRD (and previous designation) and the ESF is available (https://cohesiondata.ec.europa.eu/Other/Historic-EU-payments-regionalised-and-modelled/tc55-7ysv, accessed on 9 January 2019). Data for the current programming period include all ESI Funds (https://cohesiondata.ec.europa.eu/2014-2020/ESIF-2014-2020-EU-payments-daily-update-/gayr-92qh, accessed on 9 January 2019).
- 21. OECD (2018). OECD Economic Surveys: European Union 2018, OECD Publishing, Paris.
- 22. For further details, see: http://europa.eu/rapid/press-release\_IP-11-942\_en.htm.

<sup>18.</sup> The rate of received funds corresponds to the ratio of the amount received by the final beneficiaries at each point in time to the total amount received in the programming period. The total planned EU amount is used for the current programming period. In this case, the rate of received funds is equivalent to the "rácio pagamentos/programado" (ratio payments/planned), used by Agência para o Desenvolvimento e Coesão (Portuguese Agency for Development and Cohesion) in the bulletins on European Union funds (*Boletim Informativo dos Fundos da União Europeia*) (https://www.portugal2020.pt/Portal2020/monitorizacao).



Chart C2.3 • International comparison of

Source: European Commission. | Notes: Data up to the end of 2018. The rate of received funds corresponds to the ratio of the amount of funds received in each period to the total amount received in the programming period. The planned EU amount is used for the current programming period. Countries are sorted according to the ratio of planned EU amount to GDP in the period 2014-17. The line represents the average in the EU. The database released by the European Commission refers to transfers to the Member States, while data included in the balance of payments refers to transfer to the beneficiaries. For more details on these data see footnote 19.

## **Chart C2.4** • Rate of received funds by programming periods | Per cent



Sources: Agência para o Desenvolvimento e Coesão, Banco de Portugal, Boletim Informativo QREN, Leaflet "Fundos Estruturais 10 anos em Portugal" by Direção Geral do Desenvolvimento Regional, DGRM e IFAP/GPE. | Notes: The dotted line represents projections. The rate of received funds corresponds to the ratio of the amount of funds received by the beneficiaries in each period to the total amount received in the programming period. The planned EU amount is used for the current programming period. The designation of the programming periods should be understood in a broad sense, covering in general the financial resources received through the set of instruments considered (ESIF and EAGF). Period T refers to the first year of the programming period. The circles denote the last year of the programming period. Note that the first two programming periods were shorter (5 e 6 years, respectively).

## **Chart C2.5** • Cumulated rate of received funds by programming periods | Per cent



Sources: Agência para o Desenvolvimento e Coesão, Banco de Portugal, Boletim Informativo QREN, Leaflet "Fundos Estruturais 10 anos em Portugal" by Direção Geral do Desenvolvimento Regional, DGRM e IFAP/GPE. | Notes: The dotted line represents projections. The rate of received funds corresponds to the ratio of the amount of funds received by the beneficiaries in each period to the total amount received in the programming period. The planned EU amount is used for the current programming period. The designation of the programming periods should be understood in a broad sense, covering in general the financial resources received through the set of instruments considered (ESIF and EAGF). Period T refers to the first year of the programming period. Note that the first two programming periods were shorter (5 e 6 years, respectively).

**Chart C2.6** • International comparison of the rate of received funds, cumulated up to the fourth year after the beginning of the programming period (T+4), by programming period | Per cent



Source: European Commission. | Notes: The rate of received funds corresponds to the ratio of the amount of funds received in each period to the total amount received in the programming period. The planned EU amount is used for the current programming period. The blue areas represent the interval between the 25th and 75th percentile. Vertical lines denote the minimum and the maximum. The horizontal white line denotes the median. In the current programming period, the fourth year after its beginning (T+4) corresponds to 2018. In order to keep the same terminology, programming periods are refered to by using the Portuguese designations. The database released by the European Commission refers to transfers to the Member States, while data included in the balance of payments refers to transfer to the beneficiaries. For more details on these data see footnote 20.

### Box 3 • An assessment of projections for 2018

This box provides an analysis of the main factors behind the deviation between the annual growth rates of the Gross Domestic Product (GDP) and the Harmonised Index of Consumer Prices (HICP) observed in 2018 and those projected by Banco de Portugal in the note published in March 2018, which contained for the first time complete information for 2017.<sup>23</sup>

In the projections for the Portuguese economy published by Banco de Portugal on a quarterly basis, a number of macroeconomic models and a range of assumptions are used for the external framework variables resulting from the Eurosystem projection exercise.<sup>24</sup> In this range of assumptions, the external demand for Portuguese firms, the oil prices in international markets, the 3-month Euribor rate and the main competitors' prices of Portugal in external markets are all particularly relevant to the projection exercise. As to the incorporation of budget variables into the projection exercise, the rules followed are those adopted under the Eurosystem projection exercises, i.e. specific measures with sufficient detail included in the State Budget for 2018.

In this context, deviations between actual and projected growth rates, usually known as 'projection errors', result not only from the fact that the assumptions incorporated in the projection exercise may not materialise, but also from factors related to the models themselves and to judgemental elements incorporated in the projection.

In the note published in March 2018, the projection for the annual real GDP growth rate for 2018 was 2.3%, compared with an actual rate of 2.1%, according to the Quarterly National Accounts released on 28 February 2019. Tables C.3.1 and C.3.2 analyse the main factors behind the 0.2 p.p. projection error in the annual GDP growth rate.

Table C3.1 shows the revisions to the main variables of the external environment, defined as the difference between the actual value and the underlying value of the March 2018 exercise and the contribution of these revisions to the GDP growth rate. The estimation of these contributions is made using the elasticities implied in the main macroeconomic model used in the projections.

Table C3.1Revisions of the external environment and its impact on the annual real GDPgrowth rate in 2018 | Revision of the annual growth rate in p.p., except interest rate, compared to theMarch 2018 projection

	Revisions on the external environment	Impact on the annual growth rate of GDP
Interest rate	0.0	0.0
Competitors' prices in euros	0.6	0.1
Oil prices in euros	15.7	-0.1
External demand	-1.3	-0.3
Impact of revisions on the external environment		-0.2

Source: Banco de Portugal.

23. Available at https://www.bportugal.pt/sites/default/files/anexos/pdf-boletim/proj\_mar2018\_e.pdf

24. In the case of the March note, the external environment assumptions are those implicit in the document published in March by the ECB entitled "ECB staff macroeconomic projections for the euro area", available at https://www.ecb.europa.eu/pub/projections/html/ecb.projections201903\_ ecbstaff~14271a62b5.en.html .

## **Table C3.2**• Projection error in the real GDP growth rate and in the HICP rate of change in 2018| Observed – projected in March 2018

	Weights in 2017	Projection error	Gross contributions to the projection error in the annual growth rate of GDP	Net contributions to the projection error in the annual growth rate of GDP
GDP	100.0	-0.2	-0.2	-0.2
Private consumption	64.8	0.4	0.3	0.3
Public consumption	17.5	0.3	0.1	0.1
Investment	16.9	-1.6	-0.3	-0.1
Exports	42.7	-3.5	-1.6	-0.4
Imports	41.9	-2.8	1.4	_
HICP	-	0.0	-	-

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 import content calculations were based on 2013 data. For more information, see the Box "The import content of global demand in Portugal" in the December 2017 issue of the *Economic Bulletin*.

Analysis of the results of Table C.3.1 shows that revision in the external environment assumptions should have contributed, all else being equal, to a -0.2 p.p. error in the rate of GDP growth. In this context, the downward revision of growth in external demand for Portuguese firms (by -1.3 p.p., with a -0.3 p.p. impact on GDP growth) stands out.

Table C.3.2 breaks down the GDP projection error based on the (gross and net) contributions from aggregate demand components. The projection error for inflation is also shown, as measured by the HICP growth rate.

Analysis of Table C.3.2 shows that the overestimation of goods and services export growth – partly arising from the revision of the external demand assumption – was the main factor behind the GDP growth rate projection error. The magnitude of the export error was higher than that of imports, contributing to an overestimation of the positive balance of the goods and services account in 2018.

As far as investment is concerned, the projection error, although of a smaller magnitude than that of exports, should have partly reflected the higher than anticipated growth in oil prices and indirect effects of the revision of external demand. The more unfavourable international scenario than that underlying the assumptions incorporated in the March 2018 projection, was partly offset by a more dynamic behaviour of private consumption and, to a lesser extent, public consumption. The underestimation of private consumption was associated with an employment momentum higher than initially projected, and which was reflected in higher growth of household disposable income.

With regard to HICP developments, the 2018 inflation rate of 1.2% corresponded to the projection published in the March note. In this case, the higher than projected increase in energy prices, coupled with an upward revision of oil prices, was offset by more negative developments in the prices of non energy industrial goods.

#### Box 4 • Update of the import content of global demand for the Portuguese economy

This box updates the import content of the main global demand aggregates, based on data recently published by Statistics Portugal. Among a number of uses, this information is particularly useful to calculate the contributions to GDP growth of each demand component net of imports, as well as to calculate global demand weighted by import content, which is an important indicator for forecasting imports.

## Table C4.1 Import content of demand at purchasers' prices | By unit of demand of each component

		тето
	2015	2013
Private consumption	0.23	0.22
Durable	0.54	0.50
Non-durable	0.20	0.21
Public consumption	0.10	0.09
GFCF	0.36	0.32
Machinery and equipment	0.72	0.71
Transport equipment	0.74	0.75
Construction	0.18	0.16
Other products	0.19	0.15
Domestic demand	0.22	0.21
Exports	0.44	0.45
Goods	0.49	0.51
Services	0.23	0.22
Global demand	0.28	0.27

Sources: Statistics Portugal and Banco de Portugal.

Given that each global demand unit – private consumption, public consumption, investment or exports – can be met with recourse to domestic output or imports, the import content represents the value of imports needed to satisfy each demand component. These imports may be direct (mainly imports for consumption or investment) or indirect (imports of intermediate goods or services needed to domestically produce other goods or services). The calculation of import content by product is based on symmetric matrices of domestic output and imports containing information both from intermediate consumption (by product and homogeneous branch of production) and final uses by product. These matrices, known as input-output symmetric matrices, correspond to a breakdown of national accounts data (input-output tables), but are not available with the same frequency. In November 2018 the symmetric matrices and the content of primary inputs (including the import content) for final demand components by product (with a disaggregation of 82 products) for 2015 were released on Statistics Portugal's website.<sup>25</sup> The information previously available referred to the years 2008 and 2013.<sup>26</sup>

25. See Statistical Portugal's press release: Symmetric Input-Output Matrices, 2015, 30 November 2018.

26. For an analysis of the temporal behaviour of the import content for a longer period based on data for the years available from 1980 to 2008, see Cardoso, F., Esteves, P. and Rua, A. (2013) "The import content of global demand in Portugal ", Banco de Portugal, Autumn *Economic Bulletin*. Box 2 of the issue of the December 2017 *Economic Bulletin*, "The import content of global demand in Portugal", presents some breakdown by product and demand component of the import content in 2013. This box also includes a description of the methodology for calculating the contributions to GDP growth net of import content.



Sources: Statistics Portugal and Banco de Portugal.

Table C4.1 shows the total new import content (i.e. including the direct and indirect import components) for the main global demand aggregates in 2015 compared to those previously released for 2013. The import content presented in this box represents values per unit of demand at purchaser's prices and corresponds to aggregations of import content by product published by Statistics Portugal, taking into account the structure by product of each demand aggregate. The non-import content reflects domestic value added and taxes less subsidies.

As might be expected given the structural nature of this type of information, no substantial changes in the import content of the main demand components were observed between 2013 and 2015. The import content of global demand amounted to 28%, compared to 27% in 2013. The global demand components with the highest import content in 2015 were exports and GFCF (at 44% and 36% respectively) and the component with the lowest import content was public consumption (at 10%). The import content in total private consumption was 23%. Compared to 2013, there was a 4 p.p. increase in the import content of GFCF. This mainly reflected changes in the investment structure – with an increasing weight of components with high import content such as machinery and transport equipment – rather than significant changes in import content by type of product/asset.

The contributions net of import content to the GDP rate of change presented in this Bulletin (Table 1) are based on the 2015 import content, as shown here for the various demand components. Another use for this type of data is illustrated in Chart 1, which shows year-on-year volume rates of change in imports and global demand, as well as in global demand weighted by import content (i.e. aggregation of the various global demand components weighted by the corresponding import content). This latter indicator, which takes into account the different import content of each demand component, has a profile closer to that of imports. It is therefore a more appropriate indicator for forecasting imports than an indicator corresponding to the simple and unweighted aggregation of the demand components.

## II Special issue

The natural interest rate: from the concept to the challenges to monetary policy

## The natural interest rate: from the concept to the challenges to monetary policy

## Introduction

Since early 2019, when net purchases under the expanded asset purchase programme (APP) ended, changes in the European Central Bank's (ECB) key interest rates and forward guidance figure out as paramount in shaping the monetary policy stance in the euro area (Draghi, 2018),<sup>1</sup> in order to ensure that inflation developments are consistent with the price stability objective.

The increased importance of key ECB interest rates as a marginal instrument for shaping the monetary policy stance makes the debate on the concept of the natural interest rate even more relevant. There are several interpretations of this concept in economic literature, although they are closely interrelated. The natural interest rate is commonly defined as the real interest rate<sup>2</sup> prevailing under conditions deemed as desirable on grounds of macroeconomic stabilisation, in the absence of transitory shocks or nominal adjustment frictions. The estimation of the natural interest rate is, therefore, of particular importance to macroeconomic analysis and, most notably, to monetary policy, given that it supports central banks in the accomplishment of their mandates, as it helps them set out a policy stance to close the output gap and stabilise the inflation rate.

The major challenges posed by the use of the natural interest rate as a monetary policy instrument result from the fact that the level of this rate is not directly observable and that it changes over time. Accordingly, over the past few years, several approaches have been proposed on how to estimate its evolution. Despite the particular features of each existing method, the uncertainties surrounding the estimates derived by each approach and the dispersion of the results available, the empirical evidence consistently suggests that the natural interest rate in major advanced economies is at historically low levels, and may stand close to zero or even in negative territory in the euro area. In this context, it becomes crucial, on the one hand, to examine the reasons underpinning the developments in the natural interest rate and, on the other hand, to understand how its path affects the future monetary policy stance.

The following sections outline in greater detail the concept of natural interest rate, the factors related to its path, as well as estimates and the challenges posed by its levels, particularly in the euro area. The first section addresses the concept of natural interest rate and works out its role in the conduct of monetary policy. The second section describes the possible factors underlying developments in the natural interest rate. The third section presents estimates for developments in the natural interest rate over the past decades and looks into its future dynamics. The fourth section considers the possible implications of the low level of the natural interest rate on the future monetary policy stance. The last section presents the final conclusions.

<sup>1.</sup> However, it must be acknowledged that non-standard monetary policy measures taken in the past still affect the ECB's policy stance, thereby ensuring its broadly accommodative nature.

<sup>2.</sup> To put it simply, the real interest rate is the nominal interest rate adjusted by the inflation rate.

## Concept and relevance to the monetary policy stance

Chart 1 presents developments in real interest rates with a three-month and a ten-year maturity for Germany, the euro area, the United Kingdom, the United States and Japan.

Chart 1 • Developments in real interest rates | Per cent



Sources: ECB, Federal Reserve Bank of St. Louis, OECD and Banco de Portugal calculations. | Notes: Quarterly data. Due to limited data availability and for the sake of simplicity, real interest rates presented here are approximated as the difference between average nominal interest rates and average annual inflation rates recorded each quarter. Three-month rates – money market interest rates. Ten-year interest rates – sovereign bond interest rates. Euro area interest rates correspond to an average. Last observation: 2018 Q4.

As Chart 1 illustrates, since the mid-1980s, real interest rates have exhibiting a downward trend in major advanced economies, which has intensified in the wake of the global financial crisis that unfolded in 2007 and 2008. This fall in the level of interest rates has spurred an extensive literature (see, for instance, Rachel and Smith, 2017) and is often associated with a gradual decline in equilibrium real interest rates or natural interest rates at an international level. Therefore, it is relevant to understand what this reference is about and why it is so important for macroeconomic analysis and, in particular, for the monetary policy stance.

Different definitions of natural interest rate coexist in economic literature. The concept of natural interest rate was pioneered by Wicksell (1898).<sup>3</sup> Although the author did not directly state it, he argues that the natural interest rate may be interpreted as: (i) the interest rate that ensures the equilibrium in the savings/investment markets, (ii) the rate associated with the return on capital, and (iii) the interest rate which is neutral in respect to prices, as tends neither to raise or lower them. Therefore, two common features across all interpretations are the idea of consistency with an equilibrium and the assumption that the natural interest rate is not constant, but rather time-varying. Throughout the 20<sup>th</sup> century, many suggestions were made as regards the concept of the natural interest rate, but, bearing in mind the words of Williams (1931),<sup>4</sup> it is worth remarking that this is a theoretic and abstract term, so that each interpretation must be viewed according to the approach used to derive an estimate of this equilibrium interest rate.

4. According to Williams (1931): "The natural rate is an abstraction; like faith, it is seen by its works. One can only say that if the bank policy succeeds in stabilizing prices, the bank rate must have been brought in line with the natural rate, but if it does not, it must not have been."

<sup>3.</sup> According to Wicksell (1898): "There is a certain rate of interest on loans which is neutral in respect to commodity prices, and tends neither to raise or lower them. This is necessarily the same as the rate of interest which would be determined by supply and demand if no use were made of money and all lending were effected in the form of capital goods. It comes to much the same thing to describe it as the current value of the natural rate of interest on capital."

In this context, many authors have operationalised the concept of natural interest rate. A contemporaneous definition, which is repeatedly used in new-Keynesian models, follows from the approach used, for instance, in Woodford (2003), according to which the natural interest rate is the real interest rate that would be observed at any time in an economy in which all prices and wages were perfectly flexible, thereby continuously adjusting to reflect the supply and demand conditions in its markets. Alternatively, Laubach and Williams (2003) and Holston et al. (2017) define the natural interest rate as the short-term real interest rate consistent with an economy at its potential level, in the absence of temporary shocks on aggregate demand and supply. In turn, Summers (2014) postulates that the natural interest rate is the real interest rate associated with an economy at full employment.

As stated above, although there is no single and universally accepted definition of natural interest rate, the proposed characterisations are closely interrelated, meaning that, in general, the natural interest rate tends to be interpreted as the real interest rate that would prevail under circumstances considered as desirable from the standpoint of macroeconomic stabilisation. In particular, it can be described as the short-term real interest rate compatible with output being at its potential or natural level, in the absence of transitory shocks or nominal adjustment frictions. Therefore, the natural interest rate is the real interest rate at which the output gap is equal to zero and (eventually or concomitantly, depending on the type of model) inflation is at the central bank's objective, whenever one has been set.<sup>5</sup>

As may be gleaned from this interpretation, the natural interest rate may be used by central banks in the pursuance of their mandates. In practice, the monetary policy stance may be determined by comparing the (real) interest rate level stemming from monetary policy to the natural interest rate level: if the policy rate is set below (above) the natural interest rate, the monetary policy stance will then be expansionary (contractionary). However, using the natural interest rate as a reference for monetary policy stance poses, at least, two major challenges: (i) it is an unobservable variable, and (ii) its level changes over time in response to equally unobservable shocks, in accordance with dynamics that are not plenty known.

## Determinants of the evolution of the natural interest rate

As described in the previous section, the natural interest rate is an abstraction. Accordingly, over the past few years, a number of methods have been used to estimate the level of the natural interest rate in several economies and to elucidate about the factors associated with its evolution. This section summarises the determinants deemed as the most relevant for the evolution of the natural interest rate and unveils some estimates of its impact on the euro area path.

<sup>5.</sup> In some new-Keynesian models, an output gap at zero is concomitant with the stabilisation of inflation around its objective. Blanchard and Galí (2007) have designed this association as the 'divine coincidence'.

#### Demographic developments

Demographic trends are taken as an important aspect in the production structure of many countries (see, for instance, Carvalho et al., 2016, and Fiorentini et al., 2018). In this context, evidence shows that, particularly in advanced economies, longer average life expectancy, declining birth rates and the consequent changes in the age structure have contributed to a downward trend in the equilibrium real interest rate, given that different cohorts of the population make different saving choices. As a result, and by being aware of the longer average life expectancy, economic agents tend to be more willing to save during their working lives to prepare for longer retirement periods. Given that, all things being equal, underlying higher aggregate savings leads to a lower real interest rate, this effect may have contributed to a reduction in the natural interest rate. Still, the fall in interest rate levels may have been mitigated by the lower share of working age agents that fomented a reduction in total savings.

Estimates derived using overlapping generations models (OLGs), which are typically used to gauge the impact of demographics, signal that demographic developments in the euro area may have contributed to a decrease in the natural interest rate of around one percentage point since 1980 (Bielecki et al., 2018, and Papetti, 2018), which means that the effect of higher savings should more than offset the effect of the decreasing working age population.

#### Increasing income inequality

The increase in income inequality seen over the past few decades in several developed countries has also been mentioned as a factor explaining the behaviour of the natural interest rate. Available evidence suggests that cohorts of the population with higher (lower) disposable income are more (less) willing to save (see, for instance, Dynan et al., 2004). Therefore, a greater concentration of wealth in high-income economic agents leads to an overall increase in aggregate savings, which puts a downward pressure on the level of the natural interest (see, for instance, Francis, 2009, and Summers, 2014).

### Global savings glut

In consonance with the above arguments, the path followed by equilibrium real interest rates may also be influenced by a global saving glut, which, while keeping the value of investment unchanged, leads to a reduction in equilibrium interest rates (see, for instance, Bernanke, 2007, and Caballero et al., 2008). This has been largely promoted by a number of emerging market economies, such as China and other Asian countries, and some Middle Eastern oil-producing countries that have built up their reserves over the past few years. This pattern may have contributed to a global increase in the propensity for saving, thereby inducing a negative effect on the level of the natural interest rate in several economies.

### Productivity and trend potential output growth

Developments in total factor productivity and potential output growth are key determinants of the level of the natural interest rate, as they affect the return on capital, which, in turn, influences investment decisions. When the total factor productivity growth is weaker, the marginal productivity of capital tends to be lower, which leads to a fall in the level of the natural interest rate (see, for instance, Gagnon et al., 2016).

In parallel, over the past few years, estimates for the potential output growth have been decreasing. This trend was more marked after 2008 and, in the short run, this pattern is not expected

to change, which tends to reduce incentives for new productive investments. Furthermore, the moderation in the potential output growth can be viewed as a reduction in the future household income, which, according to the permanent income hypothesis, leads to an increase in current savings. Therefore, a slowdown in the potential output may result in a decrease in the level of the natural interest rate (see, for instance, Fries et al., 2017).

The effects of these factors assume particular importance in semi-structural models, as outlined by Laubach and Williams (2003), whose model is built on two main equations – an aggregate demand curve and a Phillips curve describing the link between output and inflation - to derive estimates on the level of the natural interest rate and other economic variables. Specifically, on the basis of this type of models, the slowdown in potential output and productivity may account for at least one percentage point of the decrease in the euro area natural interest rate since 1980 (Holston et al., 2017).

#### **Financial factors**

In addition to the aforementioned structural determinants, the 2007-08 global crisis may have contributed to enhance the downward trend in the natural interest rate due to its impact on financial market participants' behaviour.

First, increased uncertainty caused by the crisis contributed to a surge in desired savings and a decline in investment, which was also affected by higher risk premia. The combination of these effects led to a reduction in the level of interest rates in several economies (see, for instance, Krustev, 2018).

Second, against a background of lower risk appetite due to an increase of perceived downside risks to the global economy, the preference for high credit quality and highly liquid assets ticked up, thereby pushing their price up and their rate of return down. At the same time, there was an increase in risk premia, i.e. an increase in compensation requested by economic agents to hold assets whose expected return is more penalised during adverse economic stages (see, for instance, Gerali and Neri, 2018).6

Third, the growing international financial integration has also fostered greater demand for sovereign bonds perceived as safe and liquid, which are typically issued by the Treasuries of major advanced economies, thus adding to the downward momentum of their yields (see, for instance, Blanchard et al., 2014).

Fourth, the strengthening of financial regulation at international level has compelled several institutions to change their balance sheet composition, by increasing the share of assets perceived as safe and liquid. This shift in portfolios took place during a time when many central banks implemented non-standard monetary policy measures, such as expanded asset purchase programmes, which, while increasing central bank reserves – safe and liquid assets, but available only to monetary policy counterparties (banks) - withdrew from the market high quality bonds accessible to many types of economic agents. The combination of these effects led to a greater demand for safe assets, which, in turn, was not offset by an increase in their supply,<sup>7</sup> thereby putting additional downward pressure on the level of equilibrium interest rate (see, for instance, Caballero and Farhi, 2014).

<sup>6.</sup> In this regard, the measures of return on capital have been relatively stable over time and, consequently, the spread of these metrics against yields on assets perceived as safe and liquid has increased. This pattern seems to stem from higher profit margins and risk premia (see, for instance, Brand et al., 2018).

<sup>7.</sup> This effect was amplified by a downgrade in the credit rating of a number of euro area sovereign issuers, which reduced the share of available securities deemed as fully safe and liquid.

To sum up, there is strong evidence pointing to the importance of financial factors to the reduction in the level of the natural interest rate. In the euro area, and according to semi-structural models, it is estimated that financial factors have made a contribution of one to two percentage points to the decline in the natural interest rate (Holston et al., 2017, and Brand and Mazelis, 2018). This indication is borne out by the conclusion obtained by using structural models,<sup>8</sup> according to which risk premia changes have played a crucial role in the reduction in the euro area natural interest rate since 2008 (see, for instance, Haavio et al., 2017, and Gerali and Neri, 2018).

#### **Combination of factors**

Having identified the factors potentially associated with the downward path followed by the natural interest rate, it would be helpful to understand their relative importance. However, this is hard to put into practice in an integrated and fully satisfactory manner given the reasons detailed below. First, many of the aforementioned determinants are not independent, which makes it more difficult to make an individual impact assessment. Second, estimates for the natural interest rate are surrounded by a high degree of uncertainty and, consequently, the contribution of the factors considered when modelling each inference should be assessed with some caution. Third, the impact from the various factors may not be linear and change over time.

All in all, demographic developments, lower potential output and productivity growth, as well as cyclical financial factors, such as higher risk premia as a result of the global financial crisis, are pointed as the most relevant factors underlying the downward trend followed by the natural interest rate in major advanced economies and, more specifically, in the euro area.

## Estimates for the level of the natural interest rate in the euro area and the outlook on future developments

As previously documented, the natural interest rate is a latent variable, whose level changes over time and, therefore, must be estimated.

A simple approach to infer on the level of the natural interest rate involves the use of data on financial market interest rates. Indeed, assuming that, in the long run, the output gap tends to stand at zero, real interest rates in the money and bond markets should not, on average, deviate significantly from the level of the natural interest rate, under the assumption that there are no marked fluctuations in the inflation path. As stated above and as illustrated in Chart 1, both short-term and long-term market interest rates have been on a downward trend since the mid-1980s. This suggests that, over the past 30 years, and against a background of relatively stable inflation rates, the natural interest rate has followed a downward path, and, in the wake of the global financial crisis, may stand close to zero or even in negative territory.

To sustain the inference obtained on the basis of market data, several methods have been proposed, featuring sometimes more theoretical and at other times more empirical approaches, which take into account the determinants underlying developments in the equilibrium real interest rates.

<sup>8.</sup> Structural models, such as the dynamic stochastic general equilibrium (DSGE) models, help tracking the impact of structural shocks on the system throughout the business cycle, which, compared to semi-structural models, may be more interesting from a monetary policy standpoint. However, given the volatility surrounding estimates resulting from structural models, it is possible that, by using them, monetary policy-makers are being too responsive.

Chart 2 shows estimates for developments in the euro area natural interest rate in accordance with a set of methodologies commonly mentioned in the literature.9



#### Chart 2 • Behaviour of the natural interest rate in the euro area | Per cent

Sources: Papetti (2018) and Bielecki et al. (2018). | Note: The estimates presented by these authors aim at isolating the impact of demographic changes. Annual data. Last observation: 2016.

Sources: Federal Reserve Bank of New York and Fiorentini et al. (2018). Note: Estimate by Holston et al. (2017): Quarterly data. Last observation: 2016 Q4. Estimate by Fiorentini et al. (2018): Annual data. Last observation: 2016.



Sources: Haavio et al. (2017), and Gerali and Neri (2018) | Note: Quarterly data. Last observation: 2017 Q4.

Looking at the above estimates, it should be acknowledged that, regardless of the type of model, available evidence supports the indications from the level of interest rates associated with financial instruments. Accordingly, as illustrated by Brand et al. (2018), there is sustained evidence indicating that, in the euro area, the natural interest rate has followed a downward path, particularly after 2008. As regards the current level of the natural interest rate, although there is some discrepancy among models, most estimates available consistently point to low figures, possibly close to zero or even negative.

Still as regards Chart 2, two additional comments come in order. First, estimates for the level of the natural interest rate are imprecise, with authors reporting very wide confidence bands and, consequently, any look into the level of the natural interest rate warrants special caution. Second,

9. The estimates shown in Chart 2 were provided by the respective authors.

the dispersion of results obtained by using alternative methodologies should be worked out taking into account the various interpretations and model calculations for the same concept. Indeed, each estimate is inevitably associated with its specification as well as with the factors and channels considered or excluded when modelling it. Accordingly, the various inferences should not be interpreted and compared in an isolated manner, but, instead, be framed by the specification on the basis of the respective estimate. Third, although available estimates are subject to a high level of uncertainty, they are highly consistent, particularly in the most recent period and within the same model class, which makes it possible to monitor, with some confidence, the behaviour of the natural interest rate.

However, monetary policy-makers seek not only to gauge the current level of the natural interest rate but also to understand its future path. Therefore, the aforementioned appraisals should also be taken into account when projecting the level of the natural interest rate (Yellen, 2015).

Given that estimates for the natural interest rate are conditional on the approach used in its modelling, not all specifications can be used in forward-looking analysis. In a number of cases, the estimate for the equilibrium interest rate is deemed to be a terminal value (e.g. semi-structural models) and, as such, the latest estimate available is assumed to be constant in the future. In other situations, by definition, the current and expected levels of the natural interest rate are not necessarily the same (e.g. structural models).

Still, in light of the constraints associated with potential forecasts of the future level of the natural interest rate, most projections available indicate that there is a greater probability that, over the next few years, the natural interest rate will stay close to or slightly below zero, instead of going back up. This effect may be explained by the fact that a large proportion of factors that seem to be contributing to the low level of interest rates in major advanced economies, such as demographic developments,<sup>10</sup> will not reverse their trend in the next few years.

To sum up, on the back of the high uncertainty surrounding the forward-looking analysis, it seems that an increase in equilibrium interest rate levels will warrant a reversal in current demographics trends, an improvement in the economic growth outlook in the long run, possibly stemming from positive shocks on productivity, and changes in financial factors leading to greater risk appetite and the ensuing reduction in risk premia.

## Challenges posed by the level of the natural interest rate to conduct monetary policy

The indication that the natural interest rate in major advanced economies is and may remain at historically low levels poses significant challenges to conduct monetary policy, as detailed in this section, with particular emphasis on the euro area.

A lower natural interest rate environment implies that, keeping the price stability objective in mind, nominal interest rates would also be lower in the long run. This follows directly from the Fisher relation between nominal and real interest rates.

<sup>10.</sup> While, at the start of the 21st century, the ratio of population over 65 to working age population was 1/4, according to EC projections, it may increase to 1/2 by 2050. In this context, estimates on the basis of OLG models indicate that the level of the natural interest rate in the euro area is likely to remain low, reflecting past falls in birth rates, longer average life expectancy and a higher old-age dependency ratio (Fiorentini et al., 2018). Therefore, if the current outlook holds out, it is possible that the level of real interest rates will decrease further until 2030 (see, for instance, Bielecki et al., 2018, and Papetti, 2018).

Against this background, given the evidence for the levels of current and future natural interest rates, it is reasonable to assume that, in the near future, the room for increases in the policy interest rate may be more limited. In the euro area, in particular, the key ECB interest rate hikes should be carefully planned in order to prevent that involuntarily the monetary policy stance becomes too restrictive.

An important challenge resulting from the low level of the natural interest rate is associated with scenarios where greater monetary accommodation is sought. In this case, monetary authorities tend to lower the nominal interest rate with the purpose of bringing down the level of the real interest rate. Therefore, if the natural interest rate is low, it is more likely that the monetary policy interest rate will hit its effective lower bound, as documented, for instance, by Kiley and Roberts (2017), and Bielecki et al. (2018). This lower bound should not stand below the nominal return on cash, which is zero. Therefore, in an environment where several central banks have taken monetary stimulus measures, by reducing their policy interest rates, very few have done so with recourse to values below -0.5%, as seen in Chart 3. Indeed, although it is not possible to ascertain the exact lower bound of interest rates, it should be close to, but slightly below, zero.<sup>11</sup>

In the euro area, in June 2014, the Governing Council of the ECB decided to go below the zero lower bound for nominal interest rates, by setting a negative rate on the deposit facility,<sup>12</sup> which remunerates reserves placed by commercial banks with the central bank. In its March 2016 meeting, the Governing Council implemented the latest cut in the deposit facility rate, which has stood at -0.4% ever since.



#### Chart 3 • Evolution of monetary policy interest rates | Per cent

Source: Refinitiv. | Notes: Euro area – Deposit facility rate; Denmark – Certificates of deposit rate; Switzerland – Interest rate on sight deposits; Sweden – Repo rate; Japan – Central bank deposit rate. Daily data. Last observation: 31 December 2018.

Although the nominal interest rate cannot fall below its effective lower bound, the real interest rate can be reduced with recourse to non-standard monetary policy measures, which have been included

12. Amid excess liquidity, of all key ECB interest rates, the deposit facility rate is regarded as monetary policy interest rate.

<sup>11.</sup> Given that cash offers zero nominal return, it would be expected that agents prefer it to any other asset offering negative nominal return rates. However, in practice, holding cash may incur some costs that imply that the effective lower bound of nominal interest rates may fall slightly below zero. A further problem associated with the introduction of negative nominal interest rates stems from their impact on financial stability, given that: (i) they act as a tax on bank reserves deposited with the central bank as they typically cannot be passed through to return on deposits, and (ii) they may encourage excessive risk-taking and/or an increase in lending rates.

in the monetary authorities' toolkit over the past few years. Indeed, in addition to setting the policy interest rate at, or slightly below, zero, several central banks have eased monetary policy further with recourse to non-standard measures, such as: (i) improving communication by providing information about its future monetary policy intentions (forward guidance), (ii) introducing longer-term refinancing operations (LTROs), and (iii) implementing expanded asset purchase programmes. All such measures<sup>13</sup> have a substantial impact on monetary and financial conditions prevailing in the economy, thereby boosting economic growth and, therefore, creating a favourable landscape for inflation to converge towards the price stability objective.<sup>14</sup>

#### Forward guidance

One way to promote a fall in the level of real interest rates without implementing cuts in the level of policy interest rates, but by raising the level of inflation expectations, is for central banks to announce enhanced forward guidance on monetary policy,<sup>15</sup> where, based on their assessment of the outlook for price stability, a strong commitment is kept that, over a given period of time, monetary policy will remain expansionary. If credible, this announcement may lead to an increase in the level of inflation expectations, which, in turn, should result in a fall in the level of real interest rates and, consequently, may boost economic activity and contribute to an increase in inflation. At the same time, given the guarantee that the policy interest rate will remain low for an extended period of time, commercial banks are expected to also lower their interest rates on loans, which means that consumption and productive investment may be stimulated, thus boosting economic growth and leading inflation to levels in line with the central bank's objective.

Against this background, the Governing Council has made plain its commitment to significant monetary policy stimuli to support the build-up of domestic price pressures, thereby signalling a phased-out monetary policy normalisation and safeguarding a sufficiently wide range of flexibility to respond to future developments. Therefore, after the end of its net purchases under the APP, the Governing Council announced that it intended to reinvest, in full, the principal payments from maturing securities purchased under this programme for an extended period of time past the date when it starts raising the key ECB interest rates, and in any case for as long as necessary to maintain an ample degree of monetary accommodation. With regard to expected developments in key interest rate levels, in its communications, the Governing Council has sought, on the one hand, to influence agents' expectations for the date of the monetary policy interest rate 'lift-off' and, on the other hand, to affect the expected path of interest rates after their first rise (slope of the yield curves).

To sum up, the Governing Council's forward guidance on key interest rates and the period of reinvestment of the stock of assets on the Eurosystem's balance sheet continues to provide substantial accommodation, although policy interest rate levels are limited by the lower bound on nominal interest rates.

<sup>13.</sup> Lowering the policy interest rate below zero is actually seen as a non-standard monetary policy measure.

<sup>14.</sup> For an analysis of the effectiveness of non-standard monetary policy measures in the euro area, see, for instance, Altavilla et al. (2015).

<sup>15.</sup> The ECB started to provide this guidance in July 2013, when the Governing Council stated that it expected that key ECB interest rates would remain low for an extended period of time.

#### Longer-term refinancing operations (LTROs)

Typically, central banks provide liquidity to commercial banks through short-term operations. During periods where they aim to increase monetary accommodation, the maturity of loans granted by the monetary authority can be extended, through LTROs, so that commercial banks can ensure a stable and reliable financing structure, which is particularly important amid increased financial market uncertainty, while improving the monetary policy transmission mechanism by underpinning the supply of bank loans to the real economy.

In particular, in the euro area, the Governing Council launched targeted LTROs<sup>16</sup> to expand the liquidity in the financial system and encourage credit lending. Accordingly, long-term loans were granted to commercial banks, providing them with an incentive to expand lending to the private sector. Furthermore, this measure may also directly lead to an increase in inflation expectations and, consequently, to a decrease in the level of the real interest rate, which, in turn, strengthens monetary policy accommodation, thereby boosting activity and supporting the convergence of inflation towards the objective.

#### Expanded asset purchase programmes

One other measure taken by a number of central banks is the implementation of expanded asset purchase programmes, i.e. quantitative easing programmes.<sup>17</sup> Overall, the monetary policy interest rate controlled by central banks is a short-term rate, and it is expected that, in addition to changes in money market interest rates (typically, with a residual maturity lower than one year), any change in the policy rate will also result in changes in longer-term interest rates, which, in turn, have a stronger impact on economic agents' decisions. The idea behind the quantitative easing programmes is precisely to affect longer-term interest rates, due to the impossibility of cutting the policy interest rate given its proximity to the lower bound.

Indeed, expanded asset purchase programmes (which include, among other instruments, public and private bonds) are aimed at reducing the level of longer-term interest rate by compressing the term premium component which is associated with the excess yield that investors demand for holding bonds with a longer residual maturity, which are consequently subject to greater market value losses in a scenario of increased interest rates. The absorption of part of the duration risk reduces the term premium and, consequently, puts downward and lasting pressure on longer-term maturities along the yield curve, which makes longer-term borrowing more affordable, thereby promoting productive investment and the consumption of durable goods. With fewer long-dated bonds available to the private sector, economic agents replace the instruments purchased by the monetary authority with similar instruments (portfolio rebalancing), which leads to a fall in the yields on those securities. Furthermore, the purchase of long-term securities strengthens the central bank's commitment to maintain the low level of the policy interest rate for an extended period of time, which, in turn, affects the shape of the yield curves, particularly as regards the expectations component, as it reflects the agents' perceptions regarding the future path of interest rate (signalling effect). This signalling effect may be construed as a reinforcement of the aforementioned forward guidance.

<sup>16.</sup> The first TLTRO series was announced in June 2014. Later on, in March 2016, a second series was announced (TLTROs-II), followed by a third series (TLTROs-III) in March 2019.

<sup>17.</sup> Filardo and Nakajima (2018) suggest that although expanded asset purchase programmes increase the amount of reserves, they may result in decreases in the natural interest rate, given that they contribute to a greater shortage in liquid and safe securities accessible to various economic agents (banks and non-banks).

#### Other alternatives

In addition to the above measures, which were taken by several central banks in major advanced economies, a number of alternatives have been suggested (although not yet implemented) so that, in an environment where central banks are operating at or close to the lower bound on interest rates, they may reinforce the monetary policy accommodation necessary to bring inflation closer to the price stability objective established by each central bank.

One of the strategies suggested in literature is to raise the inflation objective, so as to make more room to lower the level of nominal interest (see, for instance, Blanchard et al., 2010). A large proportion of central banks have set their inflation objective at (or slightly below) 2% in the medium to long term. This means that, if the level of the natural interest rate is around zero, the level of the nominal interest rate will be around 2%, assuming that inflation expectations are fully anchored to the price stability objective. Therefore, if the increase in the inflation objective is credible and, consequently, able to raise the level of inflation expectations, it would make more room for a decrease in real interest rates. However, increasing the inflation objective and, consequently, the average level of inflation entails non-negligible costs (it affects the central bank's credibility, influences agents' planning and decisions, raises financial stability issues, inflicts losses on net savers, etc.) that undermine the potential attractiveness of this alternative (Adão, 2019).

One other option proposed is to move from an inflation targeting to a price level targeting, according to which the central bank must change the policy interest rate in a way that prices grow along a constant and pre-announced path (see, for instance, Svensson, 1999). Under these circumstances, if, at any time, the inflation rate falls below the price stability objective, then, in the next period, the central bank should tolerate a higher inflation rate so that prices can follow the targeted path, to maintain constant the average long-term inflation rate.<sup>18</sup> Taking into account that moving away from an inflation targeting towards a price level targeting would change the central bank's reaction function, to which economic agents' response would be hard to predict, it has also been suggested that this change should be only temporary and against a background where the central bank operates close to the lower bound on interest rates (Bernanke, 2017).

Finally, there is a line of research which argues that, when interest rates hit or are close to the lower bound, it may be desirable to adopt non-standard fiscal policy measures (see, for instance, Correia et al., 2013). According to this view, a fall in the level of real interest rates can be achieved not by cutting the level of nominal interest rates but by temporarily raising inflation through an increase in the consumption tax rate. To prevent changes to incentives other than those that would have been affected if the nominal interest rate could be reduced, this temporary adjustment to the consumption tax rate should be offset by a cut in the labour income tax and the capital income tax.

## Conclusion

This Special issue discusses the concept, determinants and estimates for the natural interest rate, as well as its role in the conduct of monetary policy, with particular emphasis on the euro area.

Given that the natural interest rate is an unobservable variable that changes over time, several methods have been proposed over the past few years to gauge this major reference rate for monetary policy conduct. However, due to the fact that the natural interest rate is an abstraction, the conclusions

In line with this strategy, an objective could be set for nominal output, which, in practice, would guarantee that the inflation rate would be higher when output growth is low (Carney, 2012).

drawn by using different methodologies must be interpreted with caution, on the basis of the factors and the channels that were included or omitted from the estimates.

Available evidence suggests that the downward path followed by real interest rates in major advanced economies is linked to a gradual decrease in the level of the natural interest rate at international level. In particular, in the euro area, there is sustained evidence that, although estimates for the natural interest rate are imprecise, this rate has followed a downward trend, most notably after 2008. Therefore, many estimates indicate that, over the past few years, the level of the natural interest rate has stood close to zero or even in negative territory.

According to the literature, the behaviour of the natural interest rate has been determined by structural factors, such as demographic developments, a slowdown in potential output and productivity, but also by financial factors, which have become particularly relevant in the wake of the global crisis. Looking forward, most projections available for the euro area have suggested that it is more likely that the natural interest rate will remain at low levels over the next few years, instead of reversing the trend seen in the past 30 years. In this context, the increase in the natural interest rate is conditional on changes to the ongoing demographic transition and long-term potential growth, as well as a reduction in risk premia.

Finally, the indication that the natural interest rate in the euro area is and may stand at historically low levels poses significant challenges to the conduct of monetary policy. First, the room for increases in key ECB interest rate may be more limited than that estimated in the past. Second, it should be acknowledged that, against this background, it becomes more likely that the monetary policy interest rate will hit the lower bound. This could mean that, to accomplish greater monetary accommodation, it may be necessary to make more use of non-standard monetary policy measures.

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