ECONOMIC BULLETIN

JUN. 2023

BANCO DE PORTUGAL
EUROSYSTEM

ECONOMIC BULLETIN

JUNE 2023

BANCO DE PORTUGAL
EUROSYSTEM

Lisboa, 2023 • www.bportugal.pt

Economic Bulletin | June 2023 • Banco de Portugal Rua do Comércio, 148 | 1100-150 Lisboa • www.bportugal.pt •
Edition Economics and Research Department • Design Communication and Museum Department | Design Unit •
Translation International Relations Department | Translation Unit • ISSN (online) 2182-0368

Contents

I Portuguese economy: 2023-25

1 Projections for the Portuguese economy: 2023-25

The Portuguese economy is projected to grow by 2.7% in 2023, 2.4% in 2024 and 2.3% in 2025 (Table I.1.1). Following the recovery from the pandemic shock, at the beginning of 2023 GDP stood 5.4% above its 2019 level. GDP growth in Portugal remains robust and above that of the euro area over the projection horizon. The inflation rate is projected to decline from 5.2% this year to 3.3% in 2024 and 2.1% in 2025, which is already close to the monetary policy target (Table I.1.1).

Favourable labour market developments, public measures to support household income and larger inflows of European funds supersede the negative effects of persistent high inflation and tightening monetary policy on domestic demand. In addition to less favourable monetary and financial conditions, the international and financial context of the Portuguese economy is characterised by a considerable reduction in external inflationary pressures and less buoyant external demand for Portuguese goods and services (Box 1).

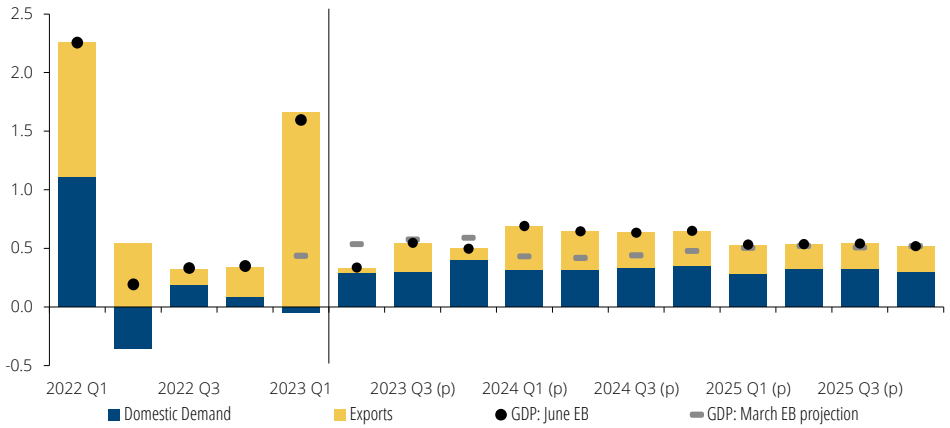
Table I.1.1 • Projections of Banco de Portugal for 2023-25 | Annual rate of change, in percentage (unless otherwise stated)

	Weights 2022	EB June 2023				EB March 2023			
		2022	2023 (p)	2024 (p)	2025 (p)	2022	2023 (p)	2024 (p)	2025 (p)
Gross domestic product	100	6.7	2.7	2.4	2.3	6.7	1.8	2.0	2.0
Private consumption	64	5.8	1.6	1.7	1.7	5.7	0.3	1.0	1.3
Public consumption	18	1.7	1.5	1.4	0.9	2.4	1.8	1.1	0.8
Gross fixed capital formation	20	3.0	3.1	5.3	5.4	2.7	2.3	5.2	4.2
Domestic demand	103	4.5	1.1	2.4	2.3	4.5	0.8	1.8	1.8
Exports	50	16.7	7.8	4.2	4.0	16.7	4.7	3.7	3.9
Imports	53	11.1	4.0	4.2	3.9	11.0	2.4	3.4	3.5
Employment (number of individuals) (a)		2.0	0.6	0.6	0.5	2.0	0.1	0.2	0.2
Unemployment rate (b)		6.0	6.8	6.7	6.7	6.0	7.0	6.9	6.7
Current and capital account (% of GDP)		-0.4	3.8	3.5	3.8	-0.4	1.9	2.3	2.7
Trade balance (% of GDP)		-2.1	1.7	1.6	1.8	-2.1	-0.2	0.1	0.5
Harmonised index of consumer prices		8.1	5.2	3.3	2.1	8.1	5.5	3.2	2.1
Excluding energy		6.7	6.8	3.5	2.3	6.7	6.7	3.2	2.4
Excluding energy and food		5.0	5.7	3.1	2.3	5.0	5.1	3.1	2.3
Budget Balance (% of GDP)		-0.4	-0.1	0.2	0.2	–	–	–	–
Public Debt (% GDP)		113.9	103.4	97.1	92.5	–	–	–	–

Sources: Banco de Portugal and Statistics Portugal. | Notes: (p) – projected, % – percentage. Cut-off date for macroeconomic projections: 26 May. The current projections are part of the Eurosystem's June 2023 projection exercise, released on June 15. For each aggregate, this table shows the projection corresponding to the most likely value, conditional on the set of assumptions. (a) According to the national accounts concept. (b) In percentage of the labour force.

The projections for growth in economic activity have been revised upwards. In the first quarter of 2023, the economy grew faster than expected, by 1.6% quarter on quarter, largely supported by buoyant exports (Chart I.1.1). Available indicators point to activity continuing to expand, with quarter on quarter changes of 0.3% in the second quarter and 0.5% in the following two quarters. For 2024-25 there is a smaller upward revision across all expenditure components. In the case of domestic demand, this revision is favoured by prospects for higher real disposable income growth, with continued labour market momentum, while in exports it reflects additional market share gains in services following recent developments.

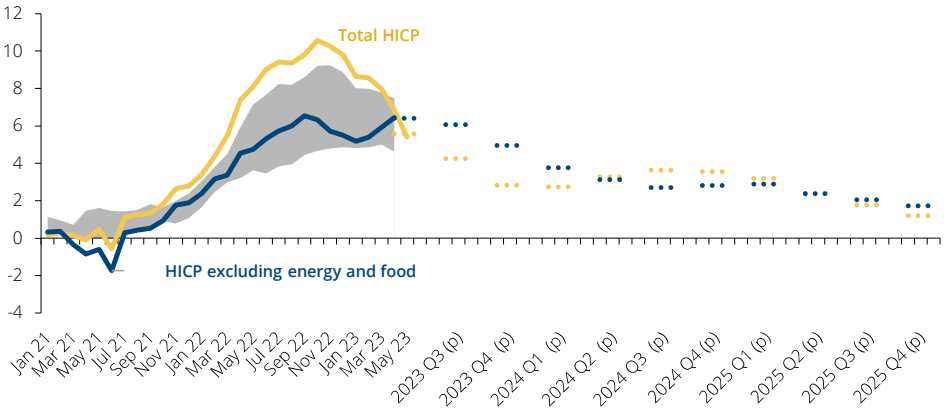
Chart I.1.1 • Quarterly GDP and contribution of domestic demand and exports | Quarter-on--quarter rate of change, in percentage, and contributions net of import contents, in percentage points



Sources: Banco de Portugal and Statistics Portugal. | Notes: (p) – projected. The vertical line indicates the start of the projection horizon of the June 2023 EB.

Inflation has been on a downward path since the end of 2022. In 2023, the slowdown in prices is expected to result from the more volatile components of the HICP, mainly reflecting the anticipated reduction in the price of energy and food commodities on international markets (Chart I.1.2). The reduction in inflation excluding these goods will occur later, conditioned by lagged indirect effects stemming from volatile components of inflation and pressures associated with rising wages and profit margins (Box 2). Monetary policy tightening in an environment of anchored inflation expectations should imply the convergence of inflation at the end of the horizon to values in line with the price stability objective and close to those projected for the euro area. The inflation projection for 2023 is revised by 0.3 percentage points (p.p.) compared with the March issue of the *Economic Bulletin*, with lower external inflationary pressures and the impact of the temporary reduction in VAT for some food items being partly offset by higher domestic pressures on the services component.

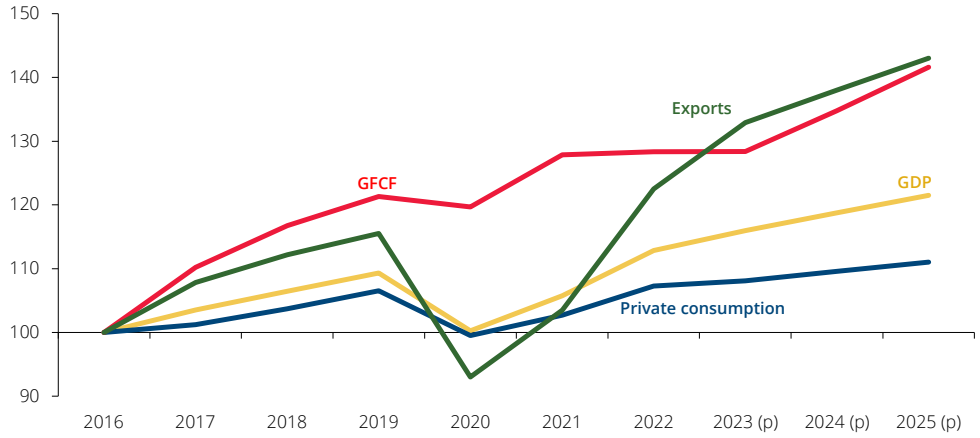
Chart I.1.2 • HICP: Observed and projected developments | Year-on-year percentage rate of change



Sources: Statistics Portugal and Banco de Portugal. | Notes: (p) - projected. The grey area delimits the range defined by a wide set of core inflation measures for Portugal, namely the 30% and 10% trimmed average, the weighted and simple median, common inflation and the HICP excluding food, energy and volatile items related to tourism. The horizontal lines refer to the projection for the average quarterly rate of change. The figure for the May overall HICP is the flash estimate and as such may be subject to revision.

In 2025, economic activity and employment are expected to stand at around 11% and 3.9% respectively, above the figures observed in 2019. These developments reflect a rapid recovery from the pandemic crisis and the resilience of the economy to the repercussions of the armed conflict in Europe, high inflation and tightening monetary policy. Growth in 2023-25 continues to be characterised by an upward trend in the share of exports and GFCF in GDP, similar to that observed before the pandemic (Chart I.1.3).

Chart I.1.3 • GDP and expenditure components net of imported content | Index 2016=100



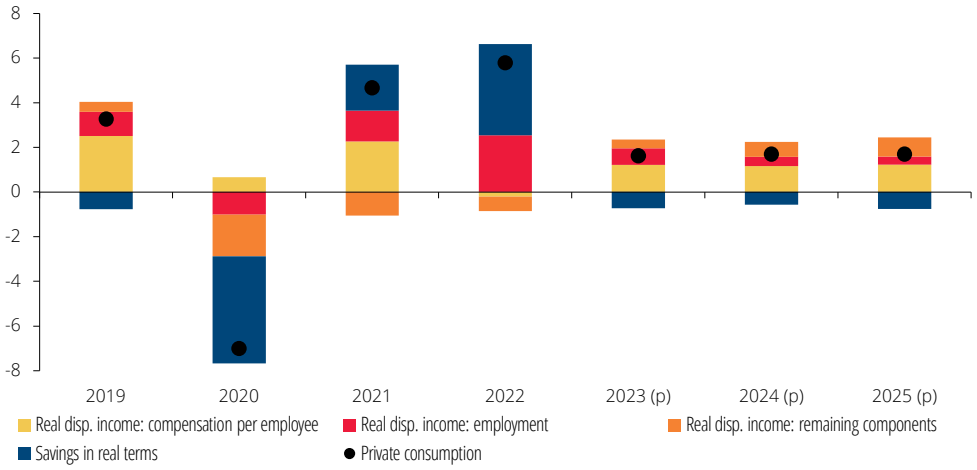
Sources: Banco de Portugal and Statistics Portugal. | Note: (p) – projected.

Private consumption will grow by 1.7% in annual average terms (Chart I.1.4). This growth reflects the exhaustion of the post-pandemic recovery dynamics, high inflation and deteriorating financing conditions. Real disposable income will grow by 2.2% in annual average terms, against a background of increased employment, real wage growth and household support measures (Box 3 and Box 4). The savings rate will increase from 6.6% in 2023 to 7.5% in 2025, close to that observed before the pandemic. Public consumption is expected to grow by 1.5% in 2023, decelerating to 0.9% by 2025.

GFCF grows 3.1% in 2023, restrained by the tightening of monetary policy, with the consequent increase in financing costs. Housing investment will be the most affected by the more unfavourable financial conditions. These also have a negative impact on corporate GFCF, reinforced by relatively high uncertainty. Public investment is expected to receive a strong boost in 2023 (25%) and decelerate to 7% in subsequent years. In 2024-25, with the gradual moderation of interest rates and the investment of European funds received, total GFCF will accelerate to around 5.3%.

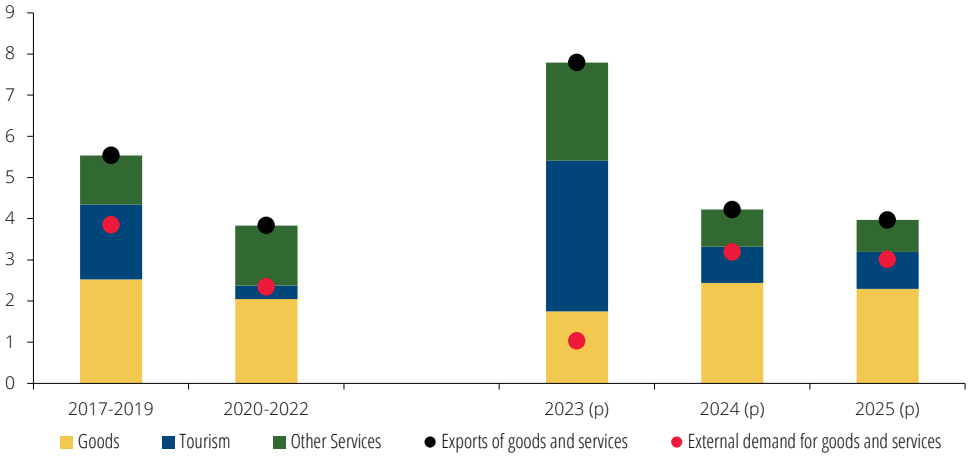
After rising by 16.7% in 2022, exports are expected to slow down to 7.8% in 2023 and 4.1% in 2024–25 (Chart I.1.5). In the first quarter of 2023, exports increased by 6.8% quarter on quarter (19.3% in the case of tourism). In 2024-25, tourism exports will grow at a slower pace but still faster than external demand for goods and services. Goods exports decelerate to 2.8% in 2023 (5.1% in 2022), reflecting the slowdown in external demand, despite the positive effects of dissipating supply chain constraints. The later acceleration in external demand will translate into an average growth in goods exports of 4% in 2024-25. These projections translate into significant market share gains in 2023 but lower than those of previous years in 2024-25.

Chart I.1.4 • Decomposition of private consumption growth | Rate of change in percentage and contributions in percentage points



Sources: Statistics Portugal and Banco de Portugal. | Notes: (p) – projected. A reduction in savings implies a positive contribution to the change in private consumption. The contribution from compensation per employee includes the cross effect between employment and compensation per employee. Disposable income and savings were deflated with the private consumption deflator, according to the national accounts methodology. The evolution of the private consumption deflator may diverge from that of the consumer price index for conceptual reasons.

Chart I.1.5 • External demand, exports and contribution of components | Rate of change in percentage and contributions in percentage points



Sources: Banco de Portugal, Eurosystem and Statistics Portugal. | Notes: (p) – projected. The indicator of external demand for the Portuguese economy consists of an average of imports of trading partners, weighted by their share in Portuguese exports.

Imports are expected to maintain average annual growth of 4.1%, in line with projected developments in global demand weighted by import content.

In 2023-25, the Portuguese economy will return to a net lending position, of about 3.7% of GDP. The improvement vis-à-vis the current and capital account deficit of 0.4% of GDP in 2022 mainly reflects the increase in the goods and services account balance in 2023, linked to favourable volume and terms of trade effects. The balance of the remaining components of the current and capital account is expected to increase in 2023 to 2.1% of GDP (1.6% in 2022) and to remain stable in 2024-25, mainly as a result of the profile of EU transfers.

External surpluses and near even budget balances mean that external and public indebtedness ratios remain on a downward path against a background of cumulative nominal growth of around 23% over the projection horizon (for more details on the fiscal projections, see Part I.2 of this Bulletin).

In the labour market, the pressure of demand over supply continues. Employment is projected to grow moderately, averaging 0.6% annually. Positive net migration flows and an increase in the activity rate are expected to offset the negative impact of the natural balance on labour supply. Against this background, the unemployment rate is expected to remain below the trend at 6.8% in 2023-25. The small labour market slack and high inflation will contribute to an acceleration in compensation per employee in 2023 (from 6.1% to 7.2%), with a gradual slowdown to 3.8% in 2025. The projections include a 7.8% minimum wage increase in 2023, followed by 6.6% in 2024 and 5.6% in 2025. In real terms, compensation per employee is projected to grow on average by 1.6%, slightly below productivity growth. This implies a reduction in the weight of labour costs in GVA over the projection horizon, converging in 2025 to close to pre-pandemic levels.

Balanced risks to activity and slightly upside risks to inflation have been identified. Downside risks to the projection for activity are of external origin and relate to a potential worsening of the geopolitical environment. A more persistent inflation environment may imply a further tightening of monetary policy and there is also a risk of heightened financial tensions at global level, affecting real activity. Rising financing costs could affect domestic demand more than expected. However, savings accumulated during the pandemic mitigate this risk. Upside risks to activity are the resilience of consumption and the strength of exports, which surprised on the upside in the most recent period, and it cannot be ruled out that this may be repeated. Inflation could be affected by new shocks to international commodity prices and be more persistent owing to a strengthening of indirect and second round effects on wages and profit margins.

The stabilising role of economic policies remains crucial. The global economy has been affected by two large shocks, the COVID-19 pandemic and the invasion of Ukraine, which led to an inflationary process. It is not yet clear what structural balances will emerge after such disruptive shocks. Coordination across countries and between monetary and fiscal policy has been instrumental in limiting the impact of these shocks and remains important in the current context of normalisation of monetary policy. To boost recent growth, characterised by buoyant exports, and to transform it into new long term competitiveness factors, it is essential to maintain predictability in policies, promote investment and sustain demand for higher skilled workers, which reflects in trend productivity growth.

Box 1 • External environment, financing conditions and policies

Global activity is expected to remain constrained by high inflation and tighter monetary and financial conditions. In the assumptions of the June Eurosystem projection exercise, global growth decreases from 3.3% in 2022 to 2.9% in 2023 – due to developments in advanced economies, remaining at around 3% in 2024 25 (Table B1.1).

Table B1.1 • Eurosystem staff projection assumptions

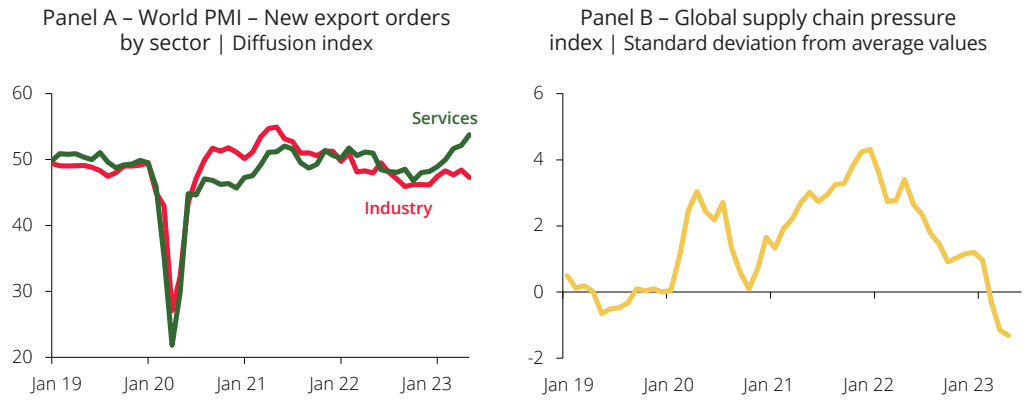
		EB june 2023				Revisions from EB march 2023			
		2022	2023	2024	2025	2022	2023	2024	2025
International environment									
World GDP	tva	3.3	2.9	2.9	3.1	0.0	0.1	-0.1	0.0
Euro area GDP	tva	3.5	0.9	1.5	1.6	-0.1	-0.1	-0.1	0.0
World trade	tva	6.0	1.5	3.4	3.3	-0.3	-1.1	0.1	-0.1
External demand	tva	7.8	1.4	3.2	3.0	0.0	-1.2	0.3	0.0
International prices									
Oil prices	vma	98.6	72.0	66.9	64.8	0.0	-4.6	-5.4	-3.8
Gas prices (MWh)	vma	123.1	42.4	51.9	46.5	0.0	-16.0	-9.6	-4.4
Non-oil commodity prices	tva	19.4	-13.9	-2.1	1.3	0.0	-5.5	-2.4	0.1
Competitors' import prices	tva	15.9	0.4	2.6	2.3	-0.1	-1.8	0.5	0.4
Monetary and financial conditions									
Short-term interest rate (3-month EURIBOR)	%	0.3	3.4	3.4	2.9	0.0	0.1	0.1	0.0
Implicit interest rate in public debt	%	1.7	2.3	2.5	2.7	-0.2	0.0	0.1	0.3
Effective exchange rate index	tva	-3.5	3.8	0.2	0.0	0.0	0.9	0.2	0.0
Euro-dollar exchange rate	vma	1.05	1.08	1.09	1.09	0.0	0.6	0.8	0.8

Sources: Banco de Portugal and Eurosystem (Banco de Portugal calculations). | Notes: yoy – year-on-year rate of change, % – in percentage, aav – annual average value, MWh – megawatt-hour. Technical and external environment assumptions, as well as projections for euro area GDP and inflation, coincide with those in the ECB projection exercise released on June 15 (see "Eurosystem staff macroeconomic projections for the euro area", june 2023), which include information up to May 24. International prices are in euros. The technical assumptions for the price of oil, gas and non-energy commodities is based on futures markets. The import price of competitors corresponds to a weighted average of the export deflators of the countries from which Portugal imports, weighted by their share on total Portuguese imports (for more information, see "Trade consistency in the context of the Eurosystem projection exercises: an overview", ECB Occasional Paper 108, March 2010). The evolution of the 3-month EURIBOR is 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. An increase in the exchange rate corresponds to an appreciation of the euro. The effective exchange rate of the euro is computed against 41 trading partner countries. The technical assumption for bilateral exchange rates assumes that the average levels observed in the 10 business days prior to the cut-off date are maintained over the projection horizon.

External demand for Portuguese goods and services slows down from 7.8% in 2022 to 1.4% in 2023, in line with developments in imports from trading partners. These developments occur amid a shift in global demand, with an increase in the weight of services, including non tradable services, at the expense of consumption of goods and investment (Chart B1.1). For 2024 25, growth is expected to be in line with the usual relationship between trade and activity (Table B1.1).

Global inflation is expected to decrease gradually. In the short term, lower inflation stems from energy prices. In the case of the less volatile components, inflationary pressures associated with labour market dynamics and wage increases, particularly in advanced economies, point to a more gradual slowdown. Inflation in the euro area is expected to decrease from 8.4% in 2022 to 5.4%, 3% and 2.2% in 2023, 2024 and 2025 respectively (excluding food and energy, it will rise from 3.9% in 2022 to 5.1% in 2023 and decline to 3.0% in 2024 and 2.3% in 2025).

Chart B1.1 • PMI indicators for world trade and pressures on the global supply chain



Sources: S&P Global and Federal Reserve Bank of New York (Banco de Portugal calculations).| Notes: The PMI diffusion index is based on monthly surveys to businesses in the industry and service sectors, in which a value below 50 indicates a reduction in export orders. The global supply chain pressure index integrates information on transportation costs and industry indicators to assess the conditions of the global production chain.

External inflationary pressures are expected to be markedly lower in 2023. International energy prices (oil and gas) will fall by around 45% and stabilise in the following years. The price of oil is projected to decrease gradually in line with subdued global demand. The prices of non energy commodities will fall by around 14% in 2023, with a further slight decrease in 2024, reflecting developments in food commodities. Import prices of Portugal's competitors in external markets are expected to slacken in 2023, from around 16% to 0.4%, and to accelerate to around 2.5% in 2024–25.

Monetary and financial conditions will become less favourable, reflecting higher interest rates and an appreciation of the euro (Table B1.1). The assumptions for the three month EURIBOR point to an increase to 3.4% in 2023 24 and a reduction to 2.9% in 2025. The interest rate implied in the Portuguese government debt is projected to increase from 2.3% in 2023 to 2.7% in 2025. The nominal effective exchange rate of the euro will appreciate by 3.8% in 2023.

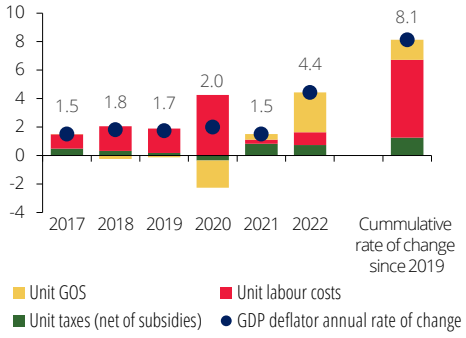
Box 2 • Profit margins and inflation

The sharp rise in energy and other international commodity prices has led to input cost pressures for firms. The way firms pass through this cost increase to selling prices is an important factor in determining the scale and duration of inflationary pressures. Firms can absorb part of the terms-of-trade shock into their profit margins, but they can also keep them unchanged or increase them, if accommodated by demand. The feasibility of these options depends on the degree of competition prevailing in the market where each firm operates. In more competitive markets – with sales dispersed across many firms and easy entry by new firms – it is more difficult to increase profit margins, even in episodes of accommodating demand.

A common way of assessing the impact of profit margins on prices uses the decomposition of the GDP deflator from an income approach. The change in the GDP deflator can be decomposed into the contribution of taxes net of subsidies on products per unit of output, profits per unit of output and productivity-adjusted wage costs, which are sources of domestically generated inflationary pressures. Profits are proxied by the gross operating surplus (GOS), corresponding to gross value added (GVA) less paid labour compensation, including an estimate of the labour compensation of the self-employed.

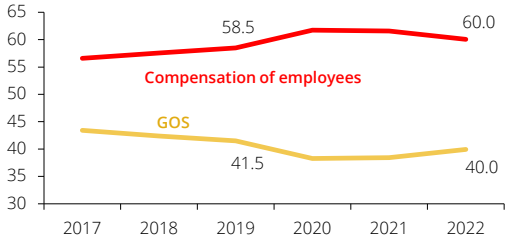
In Portugal, the GDP deflator increased by 4.4% in 2022, with contributions of 2.8 p.p. of GOS per unit of output and 0.9 p.p. from unit labour costs (Chart B2.1). The increase in the contribution from unit profits in 2022 indicates that firms have passed through the production cost shock to consumers and recovered part of the profit losses of 2020. The impact of rising nominal average wages has been cushioned by productivity increases, implying a contained contribution to domestic inflationary pressures in 2022. In cumulative terms compared to 2019, the impact of unit profits on the change in the GDP deflator was lower than that of labour compensation, which is related to their very different behaviour in 2020.

Chart B2.1 • Breakdown of the change in the GDP deflator | In percentage and percentage points



Source: Statistics Portugal (Banco de Portugal calculations). | Notes: The gross operation surplus is the difference between the value added of the economy and the compensation of labour (including an estimate for the labour compensation of self-employed workers).

Chart B2.2 • Share of capital and labour on nominal GVA | In percentage

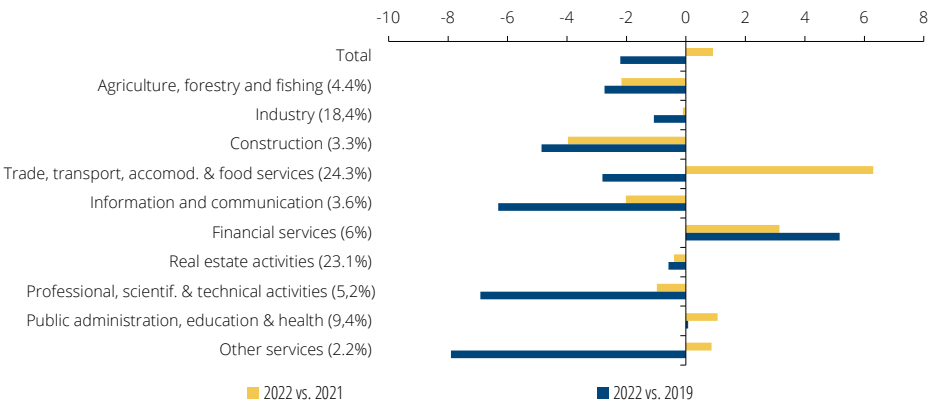


Source: Statistics Portugal (Banco de Portugal calculations). | Notes: The share of capital and labour correspond respectively to the ratio of GOS and compensation of employees (including an estimate for the labour compensation of self-employed workers) on nominal GVA.

Despite the increase in 2022, the share of capital in GVA still stood below pre-pandemic figures (Chart B2.2). The labour compensation share increased during the pandemic, benefiting from the simplified layoff scheme and other public policies aimed at protecting employment and income, as well as from the effort made by firms to maintain employment despite the abrupt halt in activity. This effort translated into a decrease in the share of capital in GVA, but proved to be a successful strategy given the temporary nature of the crisis.

An analysis by sector of activity using national accounts data suggests that the increase in the GOS/GVA ratio for the whole economy in 2022 was largely due to a strong recovery in trade, transport, accommodation and food service activities (Chart B2.3). This sector likely benefited from the strong increase in demand associated with the reopening of the economy and tourism momentum in 2022, although the GOS/GVA ratio remained below the 2019 figure. In most industries, the GOS/GVA ratio in 2022 remained at lower levels than in 2019.

Chart B2.3 • Ratio GOS/GVA – detail by industry | Change in percentage points



Source: Statistics Portugal (Banco de Portugal calculations). | Note: The GOS is proxied by the difference between GVA and compensation paid for each industry, referring only to compensation of employees. In aggregate terms, this measure of GOS differs in level from that considered in the previous charts, but its evolution is similar. The percentage in parentheses next to the designation of the sectors corresponds to the weight of the respective GOS in the total GOS of the economy.

It is important to take into account that the GOS/GVA ratio is an imperfect measure of the relevant economic concept of profit margin (markup), which is not directly observable. The markup is the ratio between the price a firm charges and its marginal production cost, capturing the pricing power of firms. The GOS/GVA ratio can vary even when firms keep their markups constant.[1] These two concepts (GOS/GVA ratio and markup) can be related:

$$Markup = \frac{P}{MC} \cong \frac{P}{AC} \cong \frac{PY}{p^x x + wL} \cong \frac{Sales}{Variable\ Costs}$$

$$\frac{GOS}{Nominal\ GVA} = \frac{PY - p^x x - wL}{PY - p^x x}$$

Therefore:

$$\frac{GOS}{Nominal\ GVA} = 1 - \frac{1}{(markup-1) * \frac{p^x x + wL}{wL} + 1}$$

where P is the selling price, MC is the marginal cost, AC is average cost (which can proxy marginal cost under certain conditions relating to firms' production function), Y is output, wL stands for labour costs (w = nominal wage; L = employment) and $p^x X$ for intermediate input costs (p^x= cost of intermediate input, X= quantity of intermediate input).

With a constant markup, profits increase proportionally to sales revenue. However, the capital share is calculated not in relation to total sales but to GVA, obtained from the difference between sales (production) and intermediate consumption. Thus, when the relative cost of intermediate goods increases, GVA may increase less than sales and the GOS/GVA ratio may rise, even if firms

1. Regarding the assumptions on the firm's production function underlying the derivation, see Colonna, F, Torrini, R. and E. Viviano (2023), "Profit share and firm markup: How to interpret them?", Banca d'Italia, *Occasional Paper* No 770. Changes in the GOS/GVA ratio can only be unambiguously interpreted as changes in firms' markups if they produce without using intermediate goods.

keep their pricing strategies unchanged. This issue is relevant because the prices of imported energy commodities and other intermediate goods have risen more sharply than labour costs in 2022.

One way of overcoming this problem is by calculating the capital share as a ratio of the production value rather than the value added, but such information from national accounts is only available with a two-year lag. An alternative is to use firms' income statement data to compute ratios as a share of sales, allowing for a better proxy of firms' pricing behaviour. This option also has the advantage of focusing the analysis on non-financial corporations' profit margins while the macroeconomic approach refers to the whole economy.

Using the quarterly statistics of non-financial corporations, the following aggregate ratios were calculated: GOS/GVA, GOS/Sales and also EBITDA/Sales (Chart B2.4). The last two ratios are a better proxy of markup developments by relating profitability indicators to the value of sales whose prices are determined by firms. The behaviour of the GOS/GVA ratio of firms is similar to that of the capital share based on national accounts data – in particular, indicating a sharp fall in 2020 and a subsequent upturn – but shows figures in 2022 already higher than in 2019. The GOS or EBITDA to sales ratios increased moderately in 2022, pointing to a slight markup widening. By sector of activity, these ratios developed differently. In industry and construction, the ratios as a percentage of sales fell in 2022, pointing to an important impact of the increase in intermediate costs in these sectors. As regards services, the various ratios suggest increases in markups.

Evidence based on national accounts data points to an increase in the share of capital in 2022, reflecting a partial recovery of the fall during the pandemic.[2] However, this outcome does not imply a change in the pricing strategy of most firms. Microeconomic evidence suggests that firms' markups developed differently across sectors, with an increase in services and a decrease in industry and construction.[3] The projection presented in this Bulletin assumes that upward pressures on prices associated with gross operating surplus remain high in 2023 but are progressively limited by the moderation of intermediate goods costs and by the impact of tighter monetary policy on demand.

2. The results presented may change in the context of future revisions of national accounts data.
3. Profitability ratios based on quarterly statistics of non-financial corporations may be revised in the context of the publication of annual indicators based on data from the *Informação Empresarial Simplificada* (Simplified Corporate Information).

Chart B2.4 • Corporate profitability ratios | In percentage

Source: Banco de Portugal – Quarterly statistics of non-financial corporations from the Central Balance Sheet Database (based on the quarterly survey to non-financial corporations). | Notes: Profitability ratios for non financial corporations exclude the agriculture and fishing sector. EBITDA corresponds to earnings before interest, taxes, depreciation and amortization.

Box 3 • The redistributive impact of measures to support households in response to rising prices and pension developments

In response to the rise in prices, several measures have been implemented to support household income. The simulation of their impact on the disposable income of households at different points in the income distribution contributes to understand to what extent such support has targeted those with fewer financial resources.

The rent subsidy (maximum of €2,400 per year), the extraordinary transfer to vulnerable households in 2023, amounting to €360, and the extraordinary complement to the child benefit of €180 per child stand out from the support measures announced since the beginning of 2023. Although the VAT reduction on a number of food items has no direct impact on disposable income, it is possible to simulate what the maximum effect of this measure would be on different households assuming a pass-through of the VAT reduction to consumer prices, no changes in the consumption structure and no effect of demand increases on prices. Note that the set of goods considered in the analysis is broader than the basket subjected to the zero VAT rate.[4]

The direct impact of these measures on household income is assessed using the EUROMOD microsimulation model.[5] The effects of the measures on other macroeconomic variables, influencing their total effect on disposable income, are not considered. The income distribution stems from the 2020 EU-SILC (reporting 2019 income variables) updated for 2022 and 2023.

The effect of these measures on household disposable income is progressive and similar to the one estimated for the measures implemented in 2022 (Chart B3.1).[6] The most significant overall impact is observed in the first income decile, reaching around 8%, contrasting with an average of 1.1% for the whole population. The support to vulnerable households and the rent subsidy contribute largely to this progressive profile. The reinforcement of the child benefit and the VAT reduction are less targeted than the two preceding measures, but they also gradually lose importance along the income distribution, having effects of similar magnitude of respectively 0.2% and 0.3% on average for the whole population.

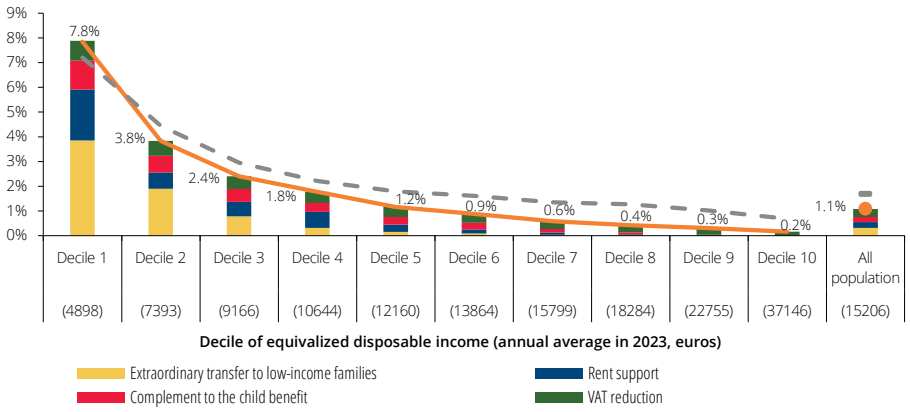
The measures in force in 2023 differ in terms of their degree of concentration at different income levels (Chart B3.2). The measure most targeted at the population with fewer resources is the extraordinary support to low-income households, channelling around 71% of its budgetary cost to the first quintile of the distribution. The budgetary cost of the rent support and the extraordinary complement to the child benefit is further channelled to this group of the population by around 40% and 35% respectively. In the case of the VAT reduction, households in the top income quintile receive 20% more of public resources than those in the lowest income quintile, not contributing to a policy focused on vulnerable households.

In addition, pension growth until 2024 is significant, reaching the level that would be expected in accordance with the legislation in force in that year. In the case of the lowest pensions, their amount is even slightly higher than what would result from the legal formula, due to their

4. The set of goods considered in this analysis includes rice, bread, pasta, beef, pork, poultry, fish (except seafood), milk, yoghurt, cheese, eggs, butter, margarine and other vegetable oils, olive oil, citrus fruit, bananas, apples, pears and other drupes, vegetables (except processed ones), potatoes and other tubers.
5. For further details about EUROMOD, please visit https://euromod-web.jrc.ec.europa.eu/. The EUROMOD extension to indirect taxes is used for the VAT reduction analysis together with data from the 2020 Survey on Income and Living Conditions (EU-SILC) and the 2010 Household Budget Survey (HBS). For further details on this extension see Akoğuz, Capéau, Decoster et al. (2020), "A new indirect tax tool for EUROMOD: final report (2020)". This extension, like EUROMOD, is maintained and developed by the European Commission's Joint Research Centre in Seville.
6. See box entitled "The redistributive impact of recent measures to support household income", *Economic Bulletin*, December 2022. The extraordinary support to vulnerable households was reinforced by the end of 2022 and was included in the present analysis in addition to the measures analysed in the December issue of the *Economic Bulletin*. Furthermore, for the purpose of comparing that exercise with 2023, the supplement for pensioners was removed from the 2022 measures and is examined separately.

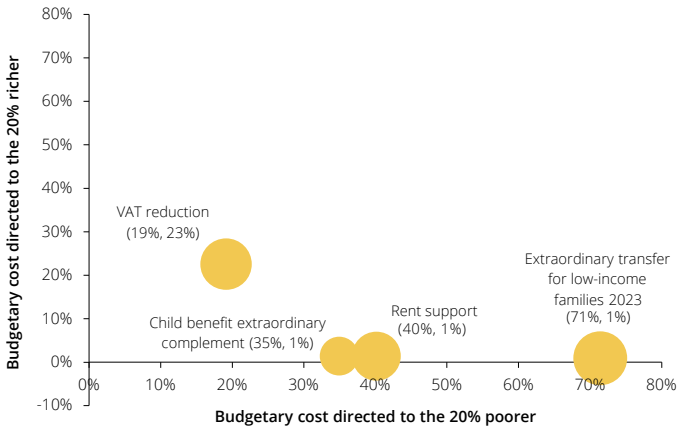
extraordinary revaluation in 2022 (Table B3.1). The number of households with pensioners, as well as the share of pensions in disposable income, is higher in the first deciles of the income distribution. According to EU-SILC data, almost 30% of the households with pensioners are concentrated in the first two deciles of the income distribution, twice as many as in the last two deciles, with pension income representing around 50% of the disposable income in the first two deciles and 26% and 27% in the ninth and tenth respectively. Consequently, and considering that the updates were differentiated according to the amount of the pension with a progressive profile, the impact of the revaluation of pensions on the disposable income is expected to be less relevant as income increases.

Chart B3.1 • Impact of income support measures by income decile | Percentage of equivalized disposable income



Source: Banco de Portugal calculations based on EUROMOD simulations and its extension to indirect taxes and on EU-SILC and HBS data (in the case of the VAT reduction simulation). | Notes: Households are distributed by deciles according to their equivalized disposable income in the baseline scenario (without measures). The calculation of the equivalized disposable income uses the OECD modified scale where the first adult has a weight of 1, additional members aged 14 or more a weight of 0.5 and children aged up to 14 a weight of 0.3.

Chart B3.2 • Allocation of the budgetary cost of the measures among the 1st and 5th quintiles of disposable income



Source: Banco de Portugal calculations based on EUROMOD simulations and its extension to indirect taxes and on EU-SILC and HBS data (in the case of the VAT reduction simulation). | Notes: The area of each circle is proportional to the budgetary cost of each measure (impact on the expenditure, net of the impact on the revenues) and the percentages presented show the cost directed to the lower and higher income quintiles, respectively. Households are distributed by deciles according to their equivalized disposable income in the baseline scenario (without measures). The calculation of the equivalized disposable income uses the OECD modified scale where the first adult has a weight of 1, additional members aged 14 or more a weight of 0.5 and children aged up to 14 a weight of 0.3.

Table B3.1 • Pensions update 2022-24 | Percentage

	Monthly pension in 2021 (euros)		
	443	1,773	3,989
YoY rate in 2022			
verified	5.9	4.1	3.8
rule application	1.0	0.5	0.2
YoY rate in 2023			
verified	2.9	2.6	2.0
rule application	8.4	8.1	7.5
YoY rate in 2024			
announced*	8.5	8.1	7.5
rule application*	6.7	6.3	5.7
rate of change 24-21			
verified and announced*	18.3	15.5	13.9
rule application*	16.9	15.5	13.9

Source: Banco de Portugal calculations. | Notes: Pensions reference values are monthly (paid in 14 times in a year) and correspond to the average value of each of the update bracket defined by the pensions legislation. (*) For 2023, the calculation of the verified pensions growth includes the extraordinary complement for pensioners as part of the pension received in 2022; For 2024, the update of pensions is in line with the projections of this bulletin.

Box 4 • Income after debt service and expenditure on food and energy: evidence for different types of households

Rising inflation and interest rate hikes led to an increase in household spending. After more than a decade of money market interest rates close to zero, interest rates rose, which was an exceptional event on the European credit market. However, this rise has been followed by an increase in income, as a result of buoyant labour market conditions and the implementation of income support measures, especially for the most vulnerable.

To examine the combined impact of these dynamics on different household segments, this box assesses disposable income developments, minus two components: (i) debt service payments and (ii) expenditure associated with maintaining the same volume of consumption of food and energy goods as in 2021. Developments in 2022 and 2023 make it possible to measure the effort required from different households over this period.

Households are grouped according to disposable income per equivalent adult (i.e. household composition adjusted),[7] age group, education and work status of the reference person. These characteristics are assessed in 2021 and maintained in 2022 and 2023.

The growth in disposable income in 2022 and that projected for 2023 is reflected in each household, based on information on the composition of income from three different databases: the Household Finance and Consumption Survey (HFCS), the Survey on Income and Living Conditions and the Labour Force Survey. As regards debt service, the Central Credit Register's aggregate data available until March 2023 are simulated until the end of 2023, based on market expectations for interest rate

7. Income per equivalent adult is calculated based on the modified OECD equivalence scale, which assigns a weight of 1.0 to the first adult in the household, 0.5 to the other adults and 0.3 to each child (individuals aged under 14).

changes and the HFCS data are again used to estimate its breakdown by households.[8] The food and energy expenditure considered is that required to maintain the volume consumed in 2021, i.e. before the sharp rise in the price of these goods. Even though these are essential goods, this assumption may overestimate the impact of inflation, since it does not take into account substitution effects, which are always present in markets subject to price shocks. The breakdown of these volumes by households is based on Household Budget Survey data.

This methodology closely follows that of the Box "Effect of inflation and rising interest rates on the financial situation of households" in the December 2022 issue of the *Economic Bulletin*, updating estimates with the latest data.

In cumulative terms, between 2021 and 2023, and for households as a whole, nominal income minus debt service payments and food and energy expenditure – hereinafter referred to as disposable income after essential expenditure – grew by 14.6% (Table B4.1).

Households in the bottom income quintiles, where the share of food and energy expenditure represents around 40% of income, are the most exposed to price increases in these goods. The debt service increases in all groups of households, despite its marginal impact, as more than half of households have no debt and less than a third have variable rate debt, which in most cases reflects the absence of housing loans. In households where the reference person is aged 65 or over, or is inactive, there is a positive contribution from the increase in interest rates as the increase in interest received is sharper than the increase in loan instalments. In the top income quintile the debt service increase is offset by the increase in interest received, because despite the high percentage of indebted households, the debt-to-income ratio is rather small.

All groups of households have income increases above what is strictly necessary to offset the increase in food and energy expenditure and debt service payments. The largest increases in disposable income after essential expenditure take place in households in the first two quintiles of income per equivalent adult in 2021 and in those in which the reference person was unemployed (23.4%, 18.6% and 18.8% respectively). Favourable developments in these households' income largely reflected the increase in social transfers and the growth in employment, which benefits more those groups with a higher percentage of unemployed.

Among the group of households with variable rate debt (around 30%), which are the most rapidly affected by the change in monetary policy, disposable income after essential expenditure increases by 12.9% between 2021 and 2023 (Table B4.2). The households that are exposed the most to the increase in debt service, either because of a sharp change in this expenditure or because of its share in income, are those in the first income quintile, those in which the reference person was unemployed in 2021 and, by age, the youngest age classes. This effect is, however, offset by the growth in disposable income in these groups, which benefited from the labour market momentum.

8. Loans are broken down into housing and consumption and other purposes and in each of these segments into loans with variable or fixed rates. In simulating the debt service for the period not yet shown in the CCR (between April and December 2023) the total outstanding amounts remain equal. In simulating variable rate loans, the type of reference rate for each loan and the date on which they are updated are considered. The values used for Euribor rates between May and December 2023 are estimated with expectations on 23 May 2023 implicit in market instruments (which, on average, over that period translates into an increase of 0.9 percentage points in interest rates used as reference rates). In fixed rate loans, to incorporate the fact that some loans reaching maturity are replaced by others with higher rates, an average interest rate increase of 0.3 percentage points is assumed. This assumption is in line with developments in the past few months with observed data of the average interest rate on loans to consumption and other purposes.

Table B4.1 • Disposable income deducted from debt service and expenses necessary to maintain the 2021 level of food and energy goods consumption: All households

	Rate of change between 2021 and 2023 (%)					By memory, data in the base period (2021)					
							Weight in disposable income excluding interest (%)				
	Income minus debt service and expenditure on food and energy goods	Disposable income excluding interest	Food and energy expenditures	Interest received	Debt service	Disposable income excluding interest (euros)	Food and energy expenditures	Interest received	Debt service	Number of households (thousand)	% of households with variable interest rate loans in each group
Total	14.6	15.2	18.4	91.9	14.7	37,239	30.7	0.7	9.6	4,044	29.9
Quintile of disposable income per equivalent adult											
Q1	23.4	20.4	18.7	91.9	13.4	20,273	40.4	0.4	8.1	811	12.2
Q2	18.6	17.3	18.5	91.9	11.6	25,613	37.9	0.5	12.8	807	25.2
Q3	15.0	16.1	18.4	91.9	16.4	29,653	38.0	0.4	9.9	810	28.2
Q4	13.0	14.7	18.4	91.9	17.1	39,048	33.9	0.7	11.4	813	42.2
Q5	12.4	12.9	18.3	91.9	14.1	71,880	20.6	1.1	7.8	803	42.0
Age of the reference person											
<35	16.5	16.1	17.8	91.9	13.1	29,878	34.0	0.4	15.3	254	28.0
35-44	14.8	16.1	18.1	91.9	20.4	44,412	27.5	0.4	12.8	708	60.7
45-54	16.8	16.7	18.3	91.9	15.9	45,083	30.0	0.6	13.1	869	52.1
55-64	15.5	15.3	18.5	91.9	8.5	46,467	27.4	0.6	8.0	787	22.7
>=65	11.0	12.5	18.8	91.9	7.0	25,105	37.1	1.5	3.4	1,425	5.5
Education of the reference person											
Lower than secondary	16.0	16.1	18.6	91.9	11.8	30,739	33.0	0.5	8.2	2,402	20.0
Secondary	14.5	15.4	18.3	91.9	15.5	38,054	32.6	0.6	11.7	755	40.3
Tertiary	12.8	13.7	18.0	91.9	17.7	54,144	26.0	1.2	10.4	887	47.9
Work status of the reference person											
Worker	15.5	15.9	18.2	91.9	15.6	44,440	28.3	0.6	11.7	2,408	44.7
Unemployed	18.8	18.2	18.8	91.9	13.7	37,079	27.5	0.1	9.6	144	23.3
Retired	11.1	12.8	18.8	91.9	6.9	26,124	38.5	1.4	3.8	1331	6.8
Other	14.6	14.9	18.7	91.9	7.9	21,564	34.1	1.1	3.1	161	5.8

Source: Banco de Portugal and Statistics Portugal (calculations by Banco de Portugal). | Notes: Data refer to average values per household. The characteristics of the households refer to the base period of the exercise. Income quintiles refer to all households.

Table B4.2 • Disposable income deducted from debt service and expenses necessary to maintain the 2021 level of food and energy goods consumption: Households with some variable rate debt

	Rate of change between 2021 and 2023 (%)					By memory, data in the base period (2021)				
							Weight in disposable income excluding interest (%)			
	Income minus debt service and expenditure on food and energy goods	Disposable income excluding interest	Food and energy expenditures	Interest received	Debt service	Disposable income excluding interest (euros)	Food and energy expenditures	Interest received	Debt service	Number of households (thousand)
Total	12.9	14.8	18.4	91.9	18.8	50,320	26.5	0.4	13.1	1,211
Quintile of disposable income per equivalent adult										
Q1	19.8	19.5	18.7	91.9	20.5	32,153	32.7	0.2	17.0	99
Q2	18.2	17.3	18.5	91.9	13.5	36,951	32.6	0.2	17.7	203
Q3	12.5	15.8	18.4	91.9	25.0	39,464	30.8	0.2	13.0	229
Q4	11.1	14.9	18.4	91.9	24.5	43,718	32.4	0.5	13.3	343
Q5	12.1	13.1	18.3	91.9	14.7	77,769	19.2	0.6	11.2	337
Age of the reference person										
<35	11.8	14.7	18.0	91.9	23.2	43,650	29.5	0.5	12.5	71
35-44	12.3	15.3	18.2	91.9	25.9	45,151	26.4	0.4	12.7	429
45-54	14.1	15.5	18.4	91.9	17.5	49,819	29.0	0.5	15.1	453
55-64	13.1	13.8	18.6	91.9	11.5	66,508	21.8	0.4	10.7	179
>=65	9.7	11.3	18.9	91.9	6.4	50,633	25.0	0.5	11.0	78
Education of the reference person										
Lower than secondary	15.1	16.1	18.7	91.9	16.6	46,812	26.9	0.2	13.0	481
Secondary	12.4	14.9	18.4	91.9	20.8	45,428	29.1	0.3	12.0	304
Tertiary	11.2	13.5	18.1	91.9	19.8	57,800	24.7	0.7	13.8	425
Work status of the reference person										
Worker	13.1	15.0	18.3	91.9	19.7	50,923	26.3	0.4	13.2	1,077
Unemployed	11.5	15.0	19.0	91.9	22.6	37,753	28.0	0.2	14.9	34
Retired	10.9	12.2	19.0	91.9	6.3	51,364	27.7	0.5	11.3	90
Other	11.6	12.9	18.9	91.9	9.9	33,175	28.1	0.7	11.9	9

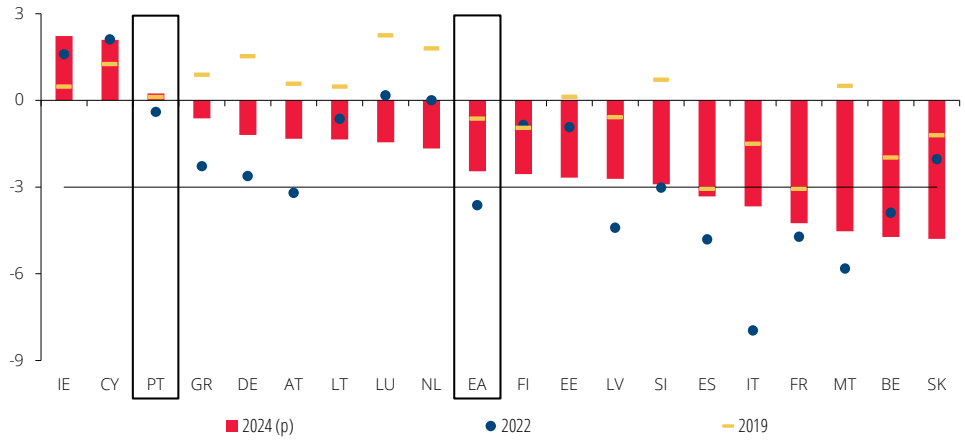
Source: Banco de Portugal and Statistics Portugal (calculations by Banco de Portugal). | Notes: Data refer to average values per household. The characteristics of the households refer to the base period of the exercise. Income quintiles refer to all households.

In conclusion, the results suggest that between 2021 and 2023 all household groups analysed show growth in disposable income after essential expenditure close to or above the projected value of the cumulative HICP rate of change, excluding food and energy, over this period (11%). This means that, on average, households in these groups will be able to service their debt and maintain the same volume of food and energy consumption as in 2021, without jeopardising any other type of expenditure. Note that the analysis is based on average figures for each group of households and therefore does not reflect the heterogeneity in each of them.

2 Public finance analysis and projections

The budget balance is expected to be close to equilibrium until 2025, assuming the fiscal policy measures already adopted and announced.[9] After a balance of -0.4% of GDP in 2022, an improvement to -0.1% is projected for 2023, followed by surpluses of 0.2% in the following years (Chart I.2.1). The latest estimate by the government, included in the update of the Stability Programme, foresees the deficit to remain at the 2022 level in 2023, with a modest improvement in the subsequent years to -0.2% and -0.1% in 2024 and 2025. The primary balance is expected to be around 2.5% within the projection horizon, still below the pre-pandemic level of 3.1%. According to the projections by the European Commission, only Portugal, Cyprus, and Ireland are expected to have budget balances close to equilibrium in 2024.

Chart I.2.1 • General government balance outturn and projections in Portugal and the euro area | Percentage of GDP



Sources: Statistics Portugal and Banco de Portugal (Portugal) and European Commission (remaining countries and euro area aggregate). | Notes: Countries are ordered by the 2024 budget balance. The values projected by the European Commission for Portugal are -0.1% of GDP in 2023 and 2024.

The structural primary balance improves over the projection horizon but falls short of the pre-pandemic level. The contribution of the cyclical component to the change in the balance is negligible as, on average, activity grows in line with potential (Chart I.2.2). The interest expenditure ratio gradually increases until 2025, in a context of rising interest rates. Thus, the structural primary balance is projected to improve, indicating a restrictive fiscal policy stance, though not enough to offset the deterioration observed in 2020. The improvement stems from a greater reduction in primary expenditure than the decrease in revenue from taxes and social contributions. The structural primary expenditure ratio in 2025 is significantly higher than before the pandemic (by 2.2 p.p.), while revenue from taxes and social contributions is 0.5 p.p. above.

9. The fiscal projections for Portugal presented in this Bulletin are prepared according to the rules of the Eurosystem projection exercises, incorporating only those measures that have been approved by parliament or that have already been defined in detail by the government and are likely to pass the legislative process.

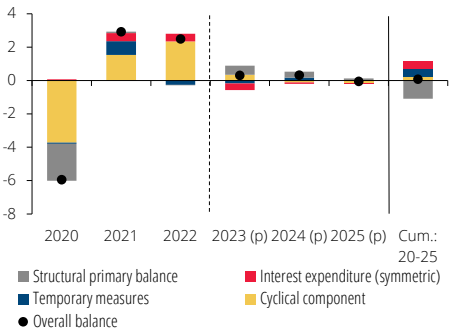
It is also worth noting that since the Recovery and Resilience Plan (RRP) is primarily financed in the short term through grants, it has a roughly neutral impact on the budget balance, meaning that the effective stimulus generated by fiscal policy is greater than the change in the structural primary balance.

Although the budget balance for 2025 is close to that of 2019, they differ in composition. In 2025, the balance benefits from a more positive cyclical component, a lower interest expenditure ratio and the absence of temporary measures that deteriorated the balance in 2019. Therefore, structurally, the primary balance in 2025 is 1.1 p.p. of potential GDP lower than in 2019. To ensure the necessary adjustment of public accounts, it is important to bring the structural balance closer to equilibrium as soon as possible.

The pandemic-related measures and those addressing price increases, ideally temporary and focused on the most vulnerable, are phased out over the projection horizon, justifying the restrictive stance of fiscal policy. In 2022, Covid-related measures amounted to 1.8% of GDP, resulting from healthcare expenses, support to firms, and capital injections to airline companies (Chart I.2.3). The direct impact on the deficit from compensation measures for price increases was 1.2% of GDP in 2022, and it is expected to remain at that level in 2023. As regards pensions, the impact of the measures is shown in relation to the regular update rule. From the second half of 2023 onwards, pensions are already in line with what would result from this update, and the aggregate effect over the two years is positive. As for other measures not related to the pandemic or price increases, their average annual impact amounts to 0.8%, with notable mentions of those approved in the 2023 State Budget concerning personal and corporate income taxes, as well as measures related to public sector wages, which are mostly permanent.

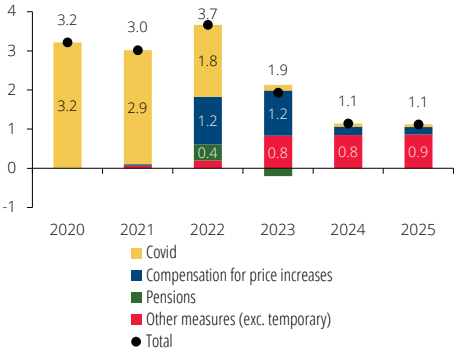
The current projection does not consider the tax relief measure for personal income tax presented in the Stability Programme, as it is not fully specified.

Chart I.2.2 • Breakdown of the change in the general government balance in Portugal | Percentage points of GDP and potential GDP



Sources: Statistics Portugal and Banco de Portugal. | Note: Correction for cyclical effects and temporary measures is calculated by Banco de Portugal in accordance with the methodology and definitions used in the ESCB. For more details, see Braz et al. (2019), "The new ESCB methodology for calculating cyclically adjusted budget balances: an application to the Portuguese case", *Review of Economic Studies*, Volume V, no. 2, April, Banco de Portugal.

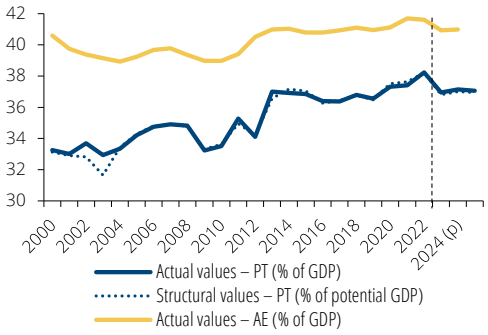
Chart I.2.3 • Direct impact of policy measures on the budget deficit in Portugal | Percentage of GDP



Source: Banco de Portugal.

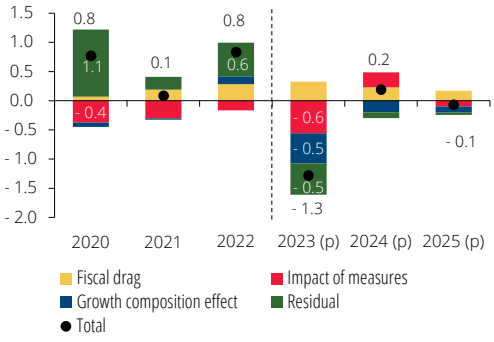
Over the forecast horizon, revenue from taxes and social contributions as a percentage of GDP is expected to be close to that of 2019. This is also expected for the structural ratios (Chart I.2.4). The estimated reduction for 2023 compared to 2022 is common to the main components of tax and social contributions revenue and amounts to -1.3 p.p. (Chart I.2.5). The implemented tax changes account for 0.5 p.p. of this reduction, namely the personal income tax relief measures included in the State Budget (0.3 p.p.) and the extraordinary VAT exemption measure applied to the essential food basket (0.2 p.p.). The contribution of the tax on oil products is negligible since the average rate in 2022 is close to that of 2023. Lower growth in the wage bill and private consumption than in activity accounts for 0.5 p.p. of the decline in revenue from taxes and social contributions. The remainder comes primarily from corporate income tax. Lastly, these effects are somewhat mitigated by the impact of personal income tax progressivity, which results in higher revenue growth in an inflationary environment (Box 5).

Chart I.2.4 • Actual and projected revenue from taxes and social contributions in Portugal and the euro area | Percentage of GDP and potencial GDP



Sources: Statistics Portugal and Banco de Portugal (Portugal) and European Commission (euro area). | Note: The European Commission projection horizon ends in 2024.

Chart I.2.5 • Breakdown of the change in revenue from taxes and social contributions in Portugal | Percentage points of GDP

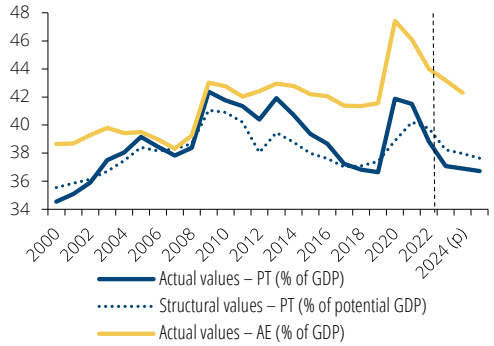


Sources: Statistics Portugal and Banco de Portugal. | Note: For more details on the methodology, see Braz et al. (2019).

Primary current expenditure grows at an average rate of 5% per year over the projection horizon, reducing its ratio to GDP. The growth is higher than the forecast for the euro area, but the evolution in ratio is similar (Chart I.2.6). The 1.5 p.p. decrease in 2023 results from the reduction in pandemic support measures and compensation for price increases, which is more significant in subsidies and social benefits categories, as well as strong potential growth in nominal terms. These effects more than offset the still substantial increase in social benefits, as well as wages, which grow by around 5% and 8% respectively (Chart I.2.7).

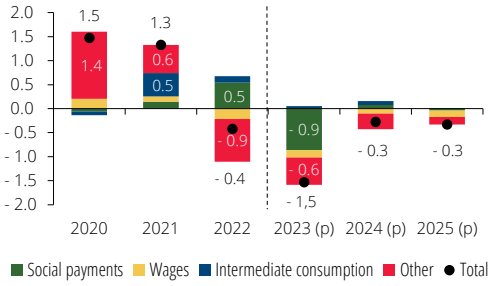
The projection for 2024 and 2025 is a no-policy-change exercise, still affected by the end of the transitional measures compensating for price increases. Social benefits are projected to grow by around 7% and 5% each year, given the base effect associated with the smaller increase in pensions in the first half of 2023 and the lagged impact of inflation through indexation mechanisms. Wages are expected to grow by around 5% and 3%, reflecting an update in line with inflation, the impact of the national minimum wage, and the stabilisation of public employment. Intermediate consumption is projected to grow in line with potential GDP, with the reduction in pandemic related expenses in 2023 being offset by expenditure with RRP projects.

Chart I.2.6 • Actual and projected primary current expenditure in Portugal and the euro area | Percentage of GDP and potential GDP



Sources: Statistics Portugal and Banco de Portugal (Portugal) and European Commission (euro area). | Note: The European Commission projection horizon ends in 2024.

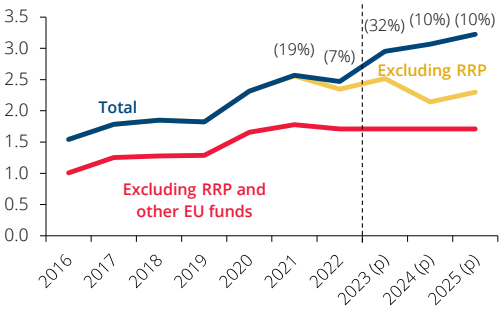
Chart I.2.7 • Breakdown of the change in structural primary current expenditure in Portugal | Percentage points of potential GDP



Sources: Statistics Portugal and Banco de Portugal. | Note: For more details on the methodology, see Braz et al. (2019).

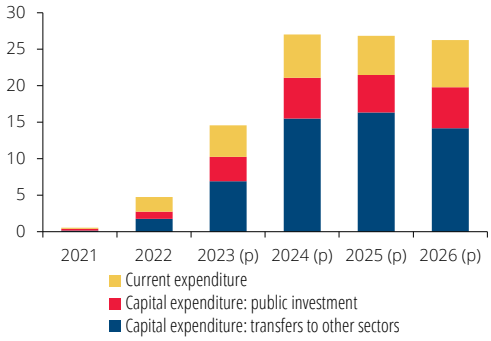
Public investment accelerates in 2023, maintaining a significant growth over the following years. The profile is similar to that of the Stability Programme and is determined by financing from European funds (Chart I.2.8). A more gradual evolution was considered for the RRP, with the implementation rate at around 15% in 2023 and 25% in subsequent years (Chart I.2.9). Difficulties in effectively implementing expenditure in the initial phase are common among other euro area countries. As for the regular EU support frameworks, the projection period is marked by the end of the funds received under the Portugal 2020 programme and the start of Portugal 2030 in 2023. The share of public investment not financed by European funds has remained stable in the most recent period at around 70%, despite available European funds.

Chart I.2.8 • Public investment in Portugal | Percentage of GDP



Sources: Statistics Portugal and Banco de Portugal. | Note: Values in parentheses correspond to nominal rates of change.

Chart I.2.9 • Public expenditure in the context of the RRP in Portugal | Percentage of total in 2021-2026



Sources: Statistics Portugal, Ministry of Finance and Banco de Portugal.

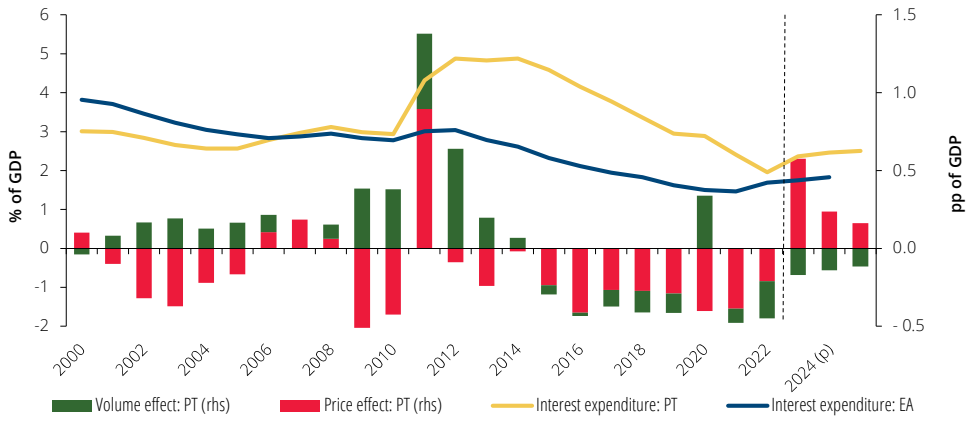
From 2023 onwards, interest on debt as a percentage of GDP resumes an upward trajectory, after having decreased since 2015 (Chart I.2.10). Interest rates on new Portuguese public debt started to increase in early 2022 (Chart I.2.11). In the case of 10-year treasury bonds, the first issuance

in 2022 had an average interest rate of 1%, and in the March 2023 issuances the rates exceeded 3.5%. A rate above 4% is assumed at the end of the projection horizon. The implicit interest rate on debt reached a low of 1.7% in 2022 and is estimated to increase gradually to 2.7% by 2025. The interest rate effect on expenditure is partly offset by the continuation of the debt variation being lower than that of nominal GDP, resulting in the interest expenditure ratio increasing by 0.4 p.p. in 2023, 0.1 p.p. in 2024, and stabilising in 2025.

Developments in the interest expenditure ratio appear to be more favourable than anticipated. The transmission of market interest rates to interest on public debt depends on the structure, maturity, and indexation of the debt. At the end of 2022, Portuguese public debt was essentially composed of fixed rate treasury bonds, which accounted for 57% of the total from a non-consolidated perspective (Chart I.2.12). Recently, the average remaining maturity of public debt has been slightly below 7 years.

Despite the increase in market interest rates, debt service costs as a percentage of GDP declined by 0.4 p.p. in 2022 and are virtually at the level of 2021 at the end of the projection horizon. Part of this result is explained by nominal growth. The remainder is also driven by the amortisation of treasury bonds with coupon rates close to or higher than new issuances. The negative interest of treasury bills and the refinancing of tranches of the European Financial Stabilisation Mechanism (EFSM) loan at more favourable rates also contributed to the 2022 developments. The change in the debt structure, with a higher share of savings certificates, pushes in the opposite direction and mostly accounts for the higher increase in interest in 2023 and for its maintenance in the following years.

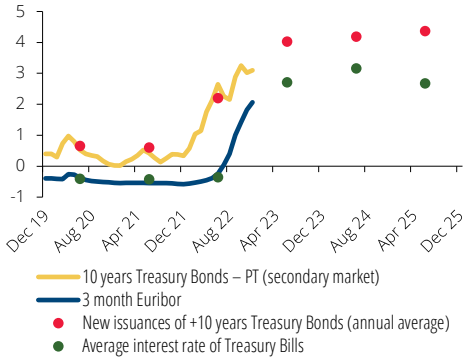
Chart I.2.10 • Interest expenditure in Portugal and the euro area: level and breakdown of the change | Percentage and percentage points of GDP



Sources: Statistics Portugal and Banco de Portugal.

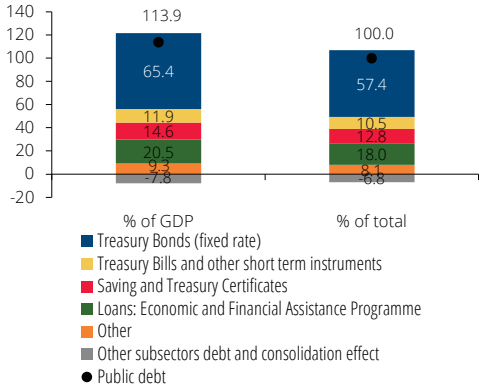
The public debt ratio will continue to decline over the projection horizon, benefiting from primary surpluses and especially nominal growth. After peaking at 134.9% in 2020, the debt ratio started to decline, reaching 113.9% at the end of 2022 (Chart I.2.13). By 2025, a further decrease of more than 20 p.p. is expected. The difference between the implicit interest rate and nominal growth, which, like the primary surplus, allows for debt reduction, narrows over the projection horizon but remains negative in 2025. According to the European Commission's projections, Portugal improves its relative position, with a debt ratio at the end of 2024 still high but lower than that of Greece, Italy, France, Spain, and Belgium (Chart I.2.14).

Chart I.2.11 • Interest rates | In percentage



Sources: Refinitiv, European Central Bank and Banco de Portugal.

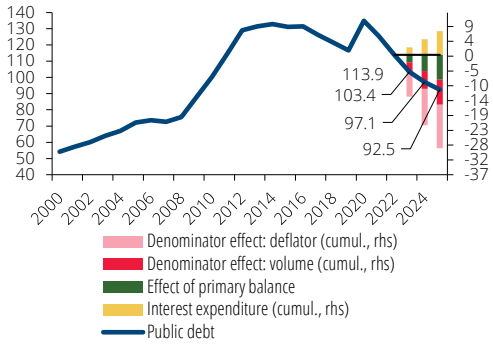
Chart I.2.12 • Structure of the Portuguese public debt in 2022 | Percentage of GDP and of total public debt



Sources: Statistics Portugal and Banco de Portugal.

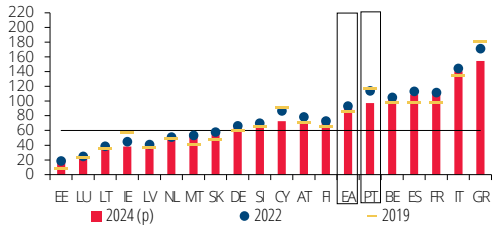
A fiscal target of a primary surplus identical to that of 2019 supports the debt ratio reduction trajectory beyond the projection horizon. Until 2025, the implicit interest rate remains lower than nominal growth, but the prospects indicate that this differential will narrow. Assuming, in the years 2026-30, that nominal GDP grows by one percentage point above the implicit interest rate and a primary surplus identical to that of 2019 (around 3%), the debt ratio would stand at 73% of GDP by the end of 2030 (Chart I.2.15). Thus, it is shown that the materialisation of the projection included in this Bulletin and the subsequent adoption of sound fiscal policy generate a very positive outcome for the evolution of the debt ratio.

Chart I.2.13 • Public debt ratio in Portugal: level and determinants in the projection | Percentage and percentage points of GDP



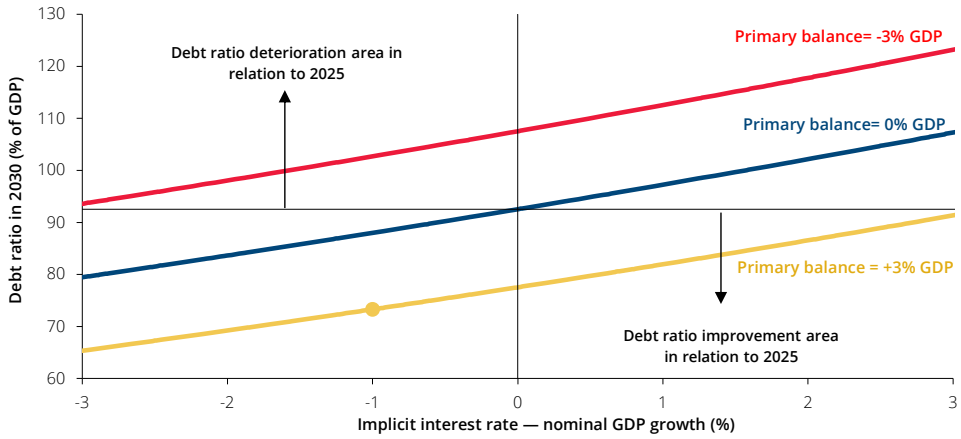
Sources: Statistics Portugal and Banco de Portugal. | Notes: The projection considers the technical assumption of zero deficit-debt adjustments. The difference between interest expenditure and the total denominator effect corresponds to the "snowball effect".

Chart I.2.14 • Public debt ratio in Portugal and the euro area: level and determinants in the projection | Percentage and percentage points of GDP



Sources: Statistics Portugal and Banco de Portugal (Portugal) and European Commission (remaining countries and euro area aggregate). | Notes: Countries are ordered by the 2024 debt ratio. The values projected by the European Commission for Portugal are 106.2% of GDP in 2023 and 103.1% in 2024.

Chart I.2.15 • Public debt in 2030 in Portugal as a function of the primary balance and the differential between the interest rate and GDP growth | Percentage and percentage of GDP



Source: Banco de Portugal. | Note: The horizontal line corresponds to the projected public debt ratio for 2025, 92.5%.

High public and private indebtedness is a vulnerability of the Portuguese economy. On the public side, it is important to maintain a prudent fiscal policy and a downward trajectory of the debt ratio, particularly in the current context of monetary policy normalisation and rising interest expenditure. Limiting the growth of primary current expenditure to that of potential GDP is crucial to have room to respond to future shocks. It is also necessary to accelerate the implementation of the RRP and pursue the respective reforms to foster economic growth.

Box 5 • Direct effect of rising inflation on revenue from taxes and social contributions

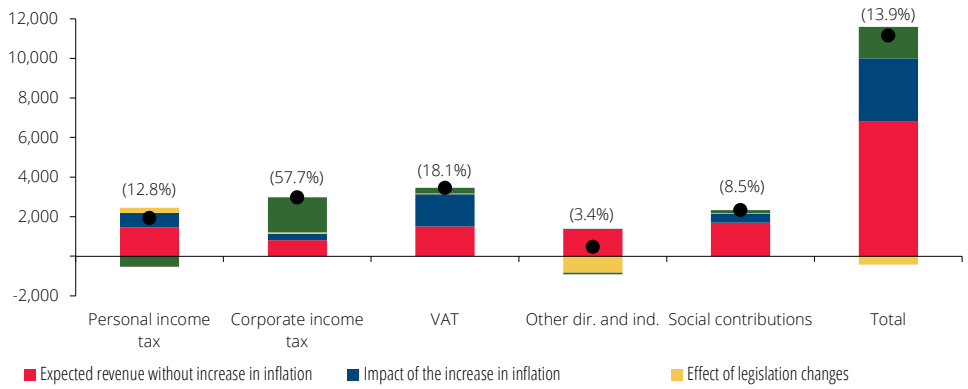
Inflation increases tax bases. The direct effect on tax revenue depends on whether the tax is levied on the nominal value of economic transactions or on quantities, whether the tax parameters are updated or not based on inflation, and the potential existence of time lags. Indirectly, inflation also affects tax revenue by influencing the decisions of economic agents and the implementation of economic policies.

For the main taxes, the revenue for 2022 is estimated based on the elasticities and macroeconomic bases used in the projection and cyclical adjustment of the budget balance. This estimate corresponds to what would be expected without the increase in inflation, i.e. assuming prices and wages vary as they did in 2021. The impact on revenues from rising inflation between 2021 and 2022 is then estimated separately. Legislative changes are also considered. The residual component captures the difference between the observed revenue and the total estimate. The effects of increased inflation on the quantities consumed are included in the expected revenue and are not shown separately.

It is observed that, out of the increase in tax and social contributions revenue in 2022 (€11,156 million), approximately 30% (€3,212 million) resulted from the inflation increase (Chart B5.1). The breakdown by major taxes shows that the largest impact is on VAT revenue. In the case of personal income tax and social contributions, the effect is smaller because the difference in wage growth between 2021 and 2022 is lower than in consumer prices. In the case of personal income tax, this effect mitigates the impact of tax progressivity. For the remaining direct and indirect taxes, except for stamp duty, it is considered that there is no impact from the inflation increase.

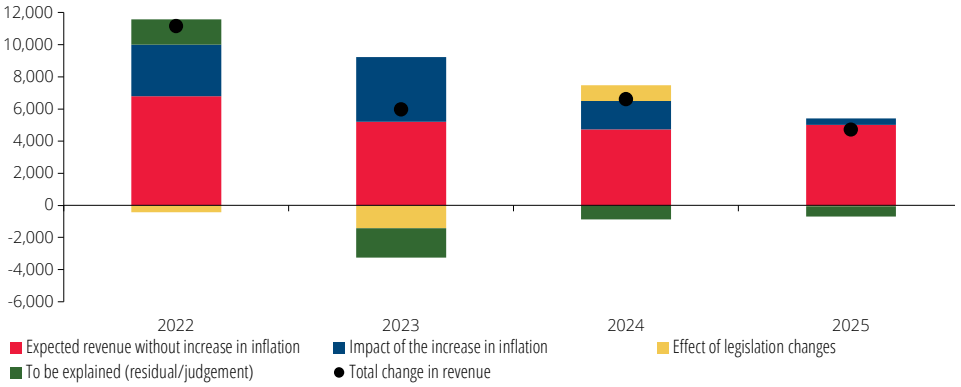
In the breakdown of the change in revenue for the remainder of the horizon, price and wage changes in 2021 continue to be used as a benchmark. In 2023, the impact of the inflation increase is greater than in 2022 as a result of wage developments and the GDP deflator, but it falls rapidly by 2025 (Chart B5.2). The expected revenue without inflation increase practically stabilises over the horizon. In 2023, the negative effect of legislative changes is significant, but it will be partially reversed the following year, given the transitory nature of cuts in VAT and tax on oil products. Lastly, it should be noted that the negative residual in 2023-25 represents judgement introduced to make the projection more prudent.

Chart B5.1 • Breakdown of the change in tax and social contributions revenue in 2022 | Million euros



Source: Banco de Portugal. | Note: Values in parentheses represent growth rates in 2022.

Chart B5.2 • Breakdown of the change in tax and social contributions revenue in 2022-2025
| Million euros



Source: Banco de Portugal.

II Special issue

Demographic scenarios for Portugal in the 21st century

Demographic scenarios for Portugal in the 21st century[1,2]

Developments in Portuguese society over recent decades have been characterised by a lower number of births, longer life expectancy and migratory flows that occur globally.

How will these trends develop over the 21st century? What will the population be by 2100? What percentage will be children and the elderly? How will demographic dynamics affect the trend for educational improvement in the population? This Special issue discusses these questions by using alternative scenarios.

The shrinking and ageing of the population in the long term, associated with the most likely scenarios, affect developments in the working-age population. The combination of a smaller but more educated population is a key issue when analysing the potential long-term economic output. Moreover, the composition of household expenditure tends to vary with age structure; for example, the proportion of expenditure on education or healthcare varies with age. Finally, public spending on pensions and healthcare is also influenced by the percentage of elderly people.

There are less obvious effects. The real rate of return on savings will tend to decline should individuals seek complementary savings instruments to support a longer life. Similarly, housing stock and prices will be affected by demographic determinants.

Resident population in Portugal over the past decades

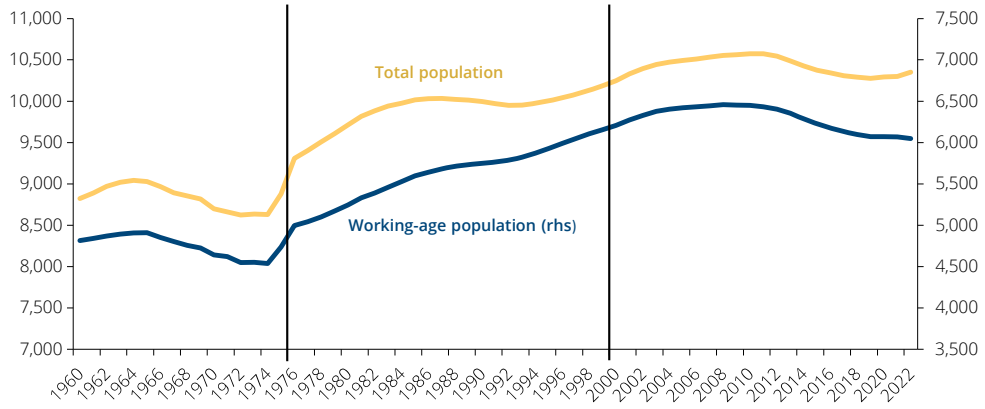
The last quarter of the 20th century was marked by an increase in the Portuguese population of 10% in cumulative terms, despite a slowdown in the resident population from the mid-1980s. The beginning of the 21st century was marked by slower growth, with a 3% increase in population in the first decade followed by a decrease of 3% in the following decade (Chart 1). Since 2020, the population has increased slightly and by early 2022 it was at the same level as 2002, albeit with an older structure.

The working-age population grew more sharply than the overall population until early 2000. However, from the first decade of 2000 onwards, the working-age population grew less dynamically, given an increase in the older population and a decrease in the younger working-age population (Chart 1).

When breaking down developments in the overall resident population into natural change and net migration, two key findings stand out. On the one hand, a positive contribution of the natural population change, which had decreased over decades and became negative from 2009. In 2020 and 2021 the natural balance decreased even further caused by the fall in the number of births and the increase in mortality because of the COVID-19 pandemic (Chart 2). On the other hand, the volatile contribution of migration flows was driven by political and economic reasons. These included the colonial war in the 1960s and the return of settlers from former colonies in 1974 and 1975, the economic crisis in early 1980s, European integration in late 1980s-90s and the financial and sovereign debt crises from 2008 onwards. From 2017 there was a positive contribution of the migratory balance, reaching its peak in 2021, the highest since 1974 and 1975, exceptional years for immigration.

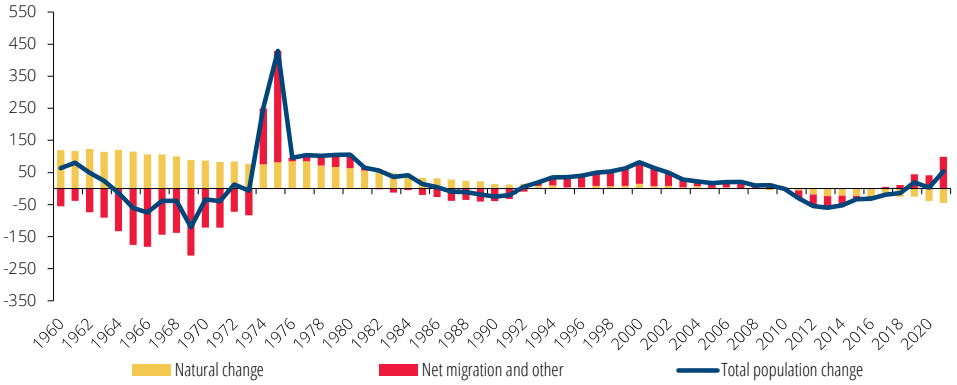
1. Preprared by António Antunes, Fátima Cardoso, Vanda Cunha and Cláudia Duarte.
2. The data cut-off date for this Special issue is 26 May. The estimates for the 2022 resident population in Portugal released by Statistics Portugal (INE) on 15 June do not differ significantly from those included in this Special issue.

Chart 1 • Resident population in Portugal | Thousands



Source: Eurostat. | Notes: Population on 1st January of each year. The working-age population corresponds to individuals aged between 20 and 64 years.

Chart 2 • Annual change in resident population in Portugal | Thousands



Source: Eurostat. | Notes: Natural change corresponds to the difference between the number of live births and the number of deaths (of residents) in each year. Net migration is defined by the difference in each year between the flows of permanent immigrants (those, who having lived abroad for a continuous period of at least one year, intent to stay for at least one year) and permanent emigrants (those, who having been resident for a continuous period of at least one year, intent to live abroad for a continuous period of at least one year). "Other" may include reclassifications and statistical discerpancies between the total population change in the beggining of years t and t+1 and the natural change and net migration in year t.

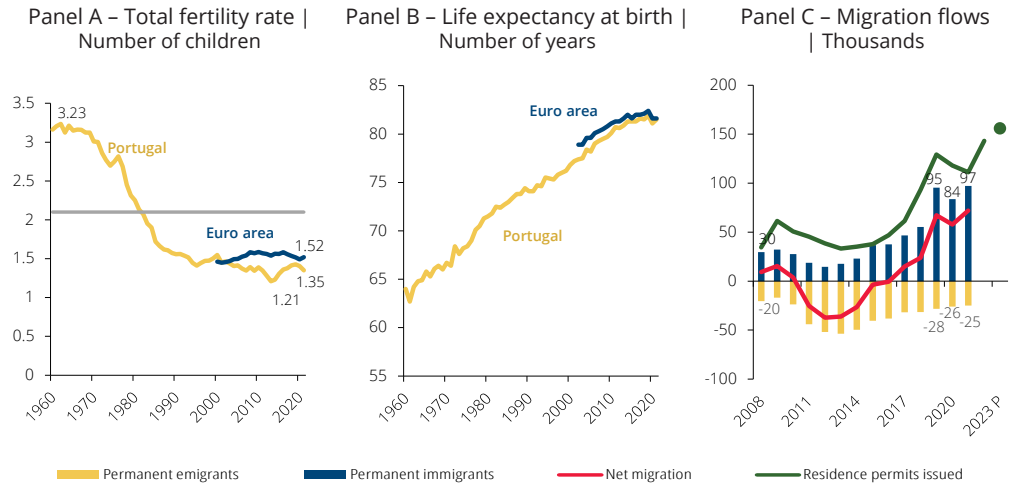
These population dynamics are driven by significant changes in fertility, life expectancy and the characteristics of migration flows in Portugal.

The total fertility rate fell during the 1970s and 1980s and from 1983 onwards it has always been below the population replacement level, estimated at 2.1 children (Banco de Portugal, 2019). In the following decades this rate remained low, even compared to the euro area average, where it has remained since the beginning of the century at around 1.5 (Chart 3, Panel A). This has translated into a decrease in the younger population, with implications for the young working-age population, especially since the early 2000s.

In contrast, the longevity of the population has been increasing and converging with the euro area average due to a gradual decrease in the mortality rate in all age groups. Thus, the average life expectancy at birth was 81.5 years in 2021, 15 years more than in the 1960s (Chart 3, Panel B).

The increase in net migration since 2017 has been the result of increased immigration flows, especially from Brazil, whereas emigration flows have remained relatively stable as well as lower than during the sovereign debt crisis (Chart 3, Panel C). In the Population censuses the share of foreign-born persons residing in Portugal rose from 2.2% in 2001 to 5.2% in 2021. The latest indicators for 2022 and early 2023 provided by the Portuguese Immigration and Borders Service point to an increasing inflow of foreign migrants, especially from outside the European Union. Moreover, immigrants have a younger age structure. These developments, if maintained, may shift the population dynamics in the coming years, an issue that is addressed in one of the scenarios presented below.

Chart 3 • Demographic drivers



Sources: Eurostat, Statistics Portugal and Portuguese Immigration and Borders Service (SEF). | Notes: (A) Total fertility rate corresponds to the average number of live births per woman of childbearing age (from 15 to 49 years old), assuming that each woman throughout her entire life would be subject to the fertility rates by age observed in the respective year, and which would survive that entire period. (B) Life expectancy at birth is the expected length of life (in number of years) of an individual facing since birth the age-related mortality rates observed in the respective year. (C) Net migration is defined by the difference in each year between the flows of permanent immigrants and permanent emigrants. Residence permits issued show a slight change in concepts from 2011 onwards; for 2023 they were projected by applying the year-on-year rate of change of the first quarter of 2023 to the value for 2022.

These factors when combined result in a marked ageing of the Portuguese population, one of the most marked in the euro area. Between the beginning of 1999 and 2022, the median age increased by almost 10 years in Portugal, from 37.2 to 46.8, and by almost 6.5 years in the euro area, from 38.5 to 44.9. Looking back to 1960, the median age in Portugal was 28.

Demographic projections until 2100

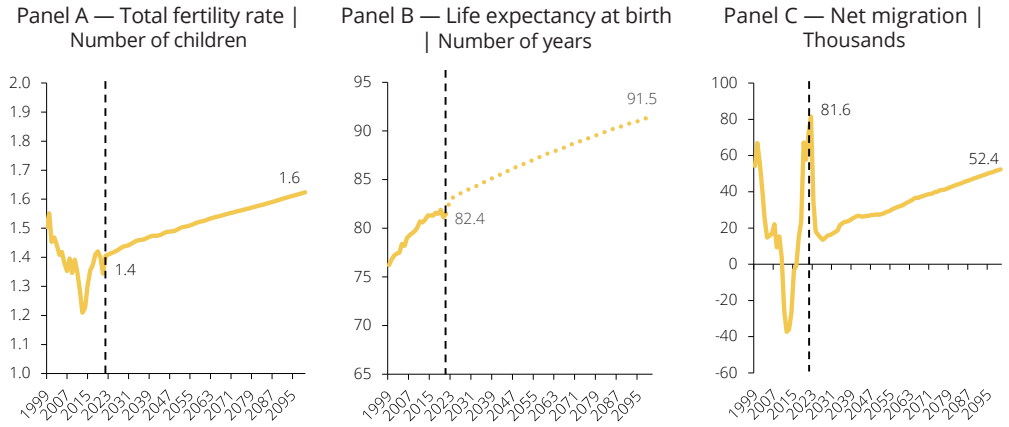
Eurostat's baseline scenario

Demographic projections for Portugal for 2022-2100 take as baseline scenario the projections released by Eurostat for the population of European Union countries (EUROPOP23).[3] These projections are based on assumptions for the future evolution of the main population determinants: fertility, mortality and migration flows (Chart 4).

3. Projections available at https://ec.europa.eu/eurostat/databrowser/view/proj_23np/default/table?lang=en

The assumptions use historical data and entail a partial convergence among European Union countries' fertility, mortality and migration patterns (Eurostat, 2023a and 2023b).

Chart 4 • Observed and projected evolution of population drivers



Source: Eurostat. | Notes: In the projection period (2022-2100) the total average life expectancy, not published by Eurostat, is estimated by weighting the life expectancy at birth of men and women by the respective shares in total projected population. For more details on the variables definitions, see the notes in Chart 3. The dashed vertical line marks the first year of the projection period.

Eurostat's baseline scenario projections assume a slightly rising profile for the total fertility rate which, by the end of the projection horizon, stands at 1.6 children per woman, a figure close to that observed in early 1990s, but below the generational replacement level.

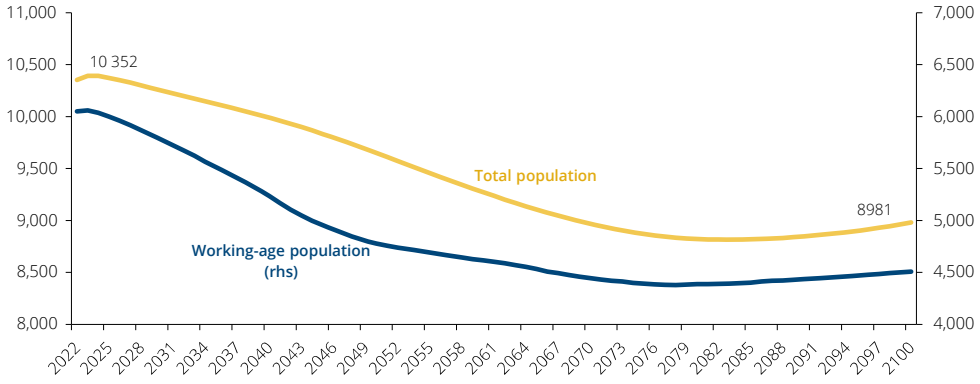
In turn, average life expectancy at birth maintains its pre-pandemic upward profile. Between 2022 and 2100 it is expected to increase by 10.2 years for men and 8.2 years for women. Average life expectancy at age 65 is projected to increase by seven years over the projection period.

Net migration projections assume that the net flow will be positive between 2022 and 2100, with an annual average figure close to 35 thousand individuals, lower than in the last year. At the end of the horizon (last decade) average annual figures are projected at around 50 thousand net inflows. These assumptions are based on a significant reduction in net migration inflows in 2023, which seems unlikely in view of the data already known for 2022 and early 2023.

Based on these assumptions, the most prominent features of the projections for Portugal for the period 2022-2100 are population shrinking and ageing (Charts 5 and 6).

The resident population of Portugal shows a decrease of 1.37 million individuals between 2022 and 2100 (13%). Following a slight growth between 2020 and 2023, reflecting positive net migration flows, a continuous fall is projected until the early 2080s, with a slight subsequent rebound until the end of the horizon. The working-age population shows a similar profile, but with a sharper fall over the period up to 2050, mainly reflecting the sharp decline in the birth rate from 1980 onwards.

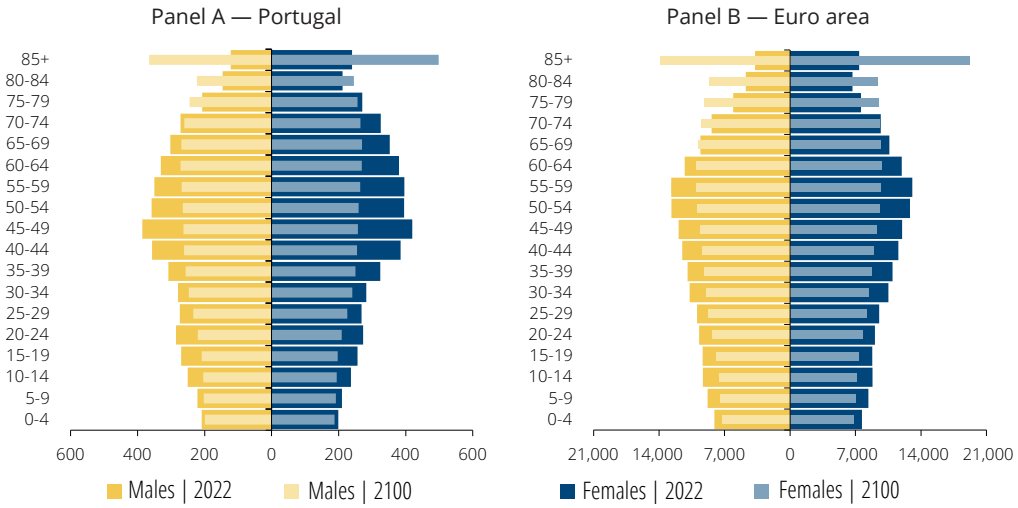
Chart 5 • Projected resident population 2022-2100 | Thousands



Source: Eurostat (baseline cenario EUROPOP2023). | Notes: Population on 1st January of each year. The working-age population corresponds to individuals aged between 20 and 64 years.

Developments in the age pyramid between the beginning and the end of the projection illustrates the ageing of the resident population of Portugal (Chart 6, Panel A). Considering major age groups, only the group aged 65 years or over increases, only partially offsetting the decline in lower age groups. As a percentage and compared to 2022, the age groups between 25 and 64 show the greatest declines. Among those aged 65 and over, the population increase is most significant in age groups above 75, and especially above 85. The narrowing of the age pyramid in all groups aged up to 74 years is quite remarkable, broadening only at the top. In the euro area, the population decrease until 2100 is less sharp (about 4.5%) (Chart 6, Panel B).

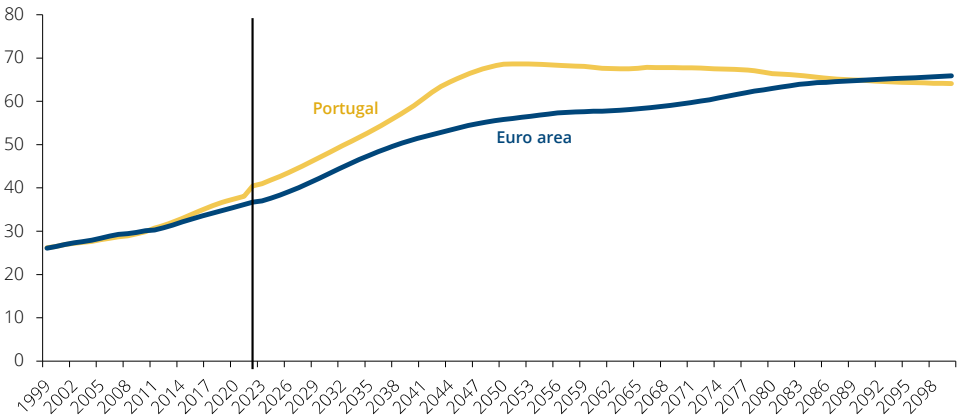
Chart 6 • Age pyramids of total population in 2022 and 2100 | Thousand individuals by age groups



Source: Eurostat.

This trend in age structure increases the old-age dependency ratio. The ratio of the number of individuals aged 65 or above to those of working-age (20 to 64 years) is expected to continue rising until early 2050s and decrease slightly thereafter (Chart 7), standing at 64.2% in 2100 (40.5% in 2022), slightly lower than in the euro area.

Chart 7 • Old-age dependency ratio in 2100 | Per cent



Source: Eurostat. | Note: The old-age dependency ratio is the share of elderly persons (aged 65 and over) in the working-age population (aged between 20 to 64 years). Projected values from 2022 onwards.

Alternative scenarios

This section presents three alternative scenarios prepared by the Banco de Portugal to illustrate the sensitivity of the projections to the assumptions. Table 1 presents the alternative scenarios and changes to the assumptions compared to the baseline scenario.

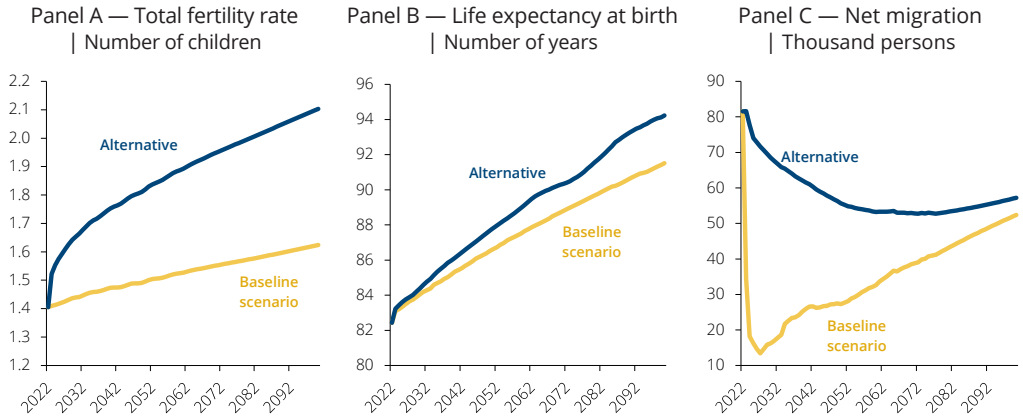
Scenario A illustrates the higher fertility rate case. This scenario is drawn from the French case, which stands out for its higher fertility rates. The French total fertility rate increased by about 0.4 children between 1993 and 2010, standing at two children by the end of that period. It is widely agreed that this development is not alien to the broad, consistent and stable set of family support policies, notwithstanding the debate in literature on their quantitative impact (Thevenon, 2016). Scenario A assumes an increase of around 0.4 children in the first 20 years of the projection horizon, slowing down to around one third of that rate in the following six decades. Compared to the baseline scenario, the total fertility rate assumed for Portugal is around 30% higher in 2100, reaching 2.1 children (Chart 8, panel A).

Table 1 • List of alternative scenarios and of changes vis-à-vis the baseline scenario

	Comparison with the baseline scenario		
Scenario	Fertility rate	Mortality rate	Net migration
A	Higher	Same	Same
B	Same	Lower	Same
C	Same	Same	Higher persistency

Source: Banco de Portugal. | Note: The baseline scenario corresponds to the recent baseline scenario released by the Eurostat (EUROPOP2023).

Chart 8 • Drivers of population dynamics: comparison between alternative and baseline scenarios



Sources: Banco de Portugal and Eurostat (calculations by Banco de Portugal). | Notes: The baseline scenario corresponds to the recent baseline scenario released by the Eurostat (EUROPOP2023). For more details about the variable definitions, see the notes to Chart 3.

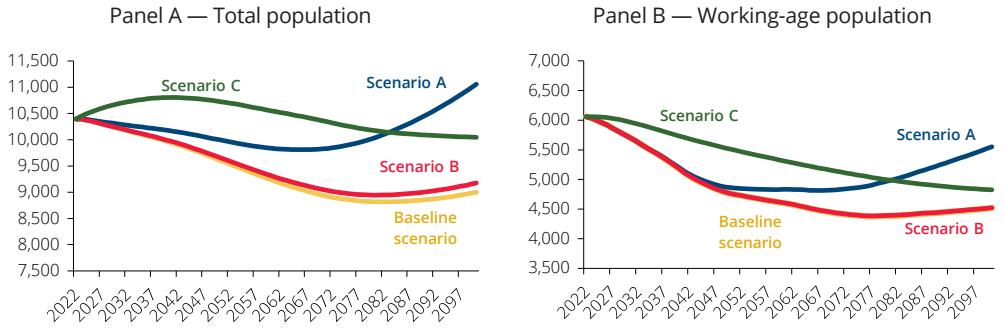
Scenario B considers higher life expectancy, assuming an average annual growth of about half of that observed from 1960 to 2022. This is a stronger growth rate than in the baseline scenario, but still consistent with multidisciplinary literature on human longevity. This assumption is implemented through a uniform decrease in the crude mortality rate per age group over the projection horizon. Compared to the baseline scenario, life expectancy at birth is 2.7 years higher in 2100, rising from 91.5 to 94.2 years (Chart 8, panel B).

Scenario C revises net migration flows from the beginning of the projection horizon by using data up to the first quarter of 2023 (Chart 3, panel C). In this scenario, the estimates for net migration up to 2025 are consistent with the demographic framework underlying the macroeconomic projections released in this Bulletin. Starting from these figures, a very gradual convergence towards the baseline scenario is assumed, where the difference between the 2025 figure and the Eurostat projection decreases by 2% per year (Chart 8, panel C). This scenario entails an annual net inflow of 58,000 individuals over the projection horizon and a resident population close to 10 million in 2100.

These scenarios affect population trends differently (Chart 9). The higher fertility scenario (A) translates into a 6.4% increase of the overall population in 2100, with a population growth trend from 2070 onwards. At the end of the projection horizon, the overall population stands at around 11 million. Moreover, higher fertility is associated with a decline in population ageing, reflecting an increase in the share of younger age groups (Chart 10). However, the transmission of these effects to the working-age population occurs in the very long term, even assuming higher fertility growth early in the projection horizon. Despite being 23% above the baseline scenario, the working-age population in 2100 is around 8% lower than at the beginning of the projection horizon. This fact suggests that the implementation of a family support package, which succeeds in the medium term in terms of higher fertility, will have very long-term effects on the evolution of the overall population and in particular, the working-age population.

The scenario of higher life expectancy (B) does not change the main features of the baseline scenario. The fall in the overall population in 2100 is slightly lower, with more individuals in the higher age groups. This yields a virtually identical evolution of the working-age population as in the baseline scenario.

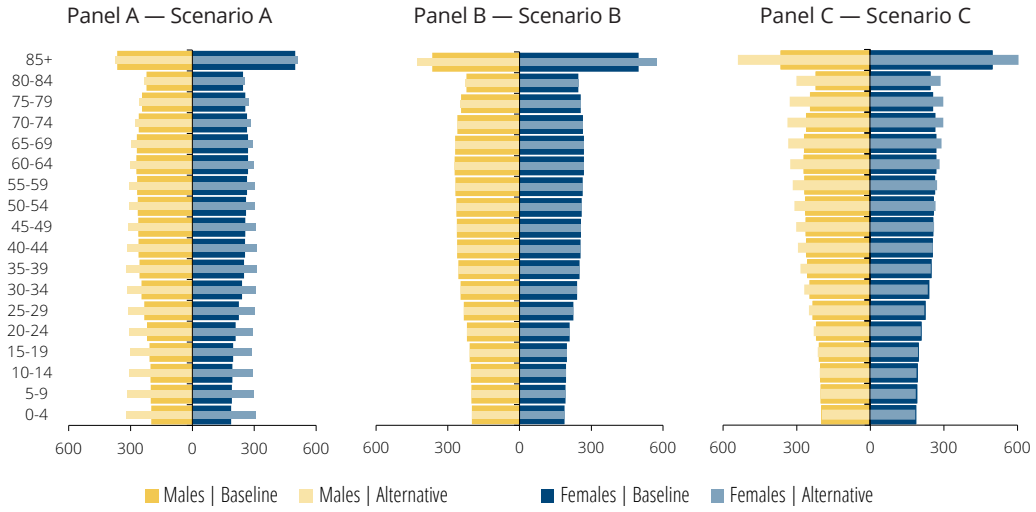
Chart 9 • Developments of the resident population in alternative scenarios | Thousands



Sources: Banco de Portugal and Eurostat (calculations by Banco de Portugal). | Notes: The baseline scenario corresponds to the recent baseline scenario released by the Eurostat (EUROPOP2023). Scenario A corresponds to the scenario with higher fertility rate. Scenario B corresponds to the scenario with higher life expectancy. Scenario C corresponds to the scenario with higher persistency of net migration in figures close to the ones observed in the latest years. The working-age population corresponds to the individuals aged between 20 and 64 years.

In the scenario of a more persistent migratory inflow, ageing remains. Notwithstanding, there is a distinctive feature. Slight population increases observed recently continue over several decades. However, the evolution of the natural population change once again controls the population dynamics, leading to a slight decrease in population at the end of the horizon, which is around 10 million.[4]

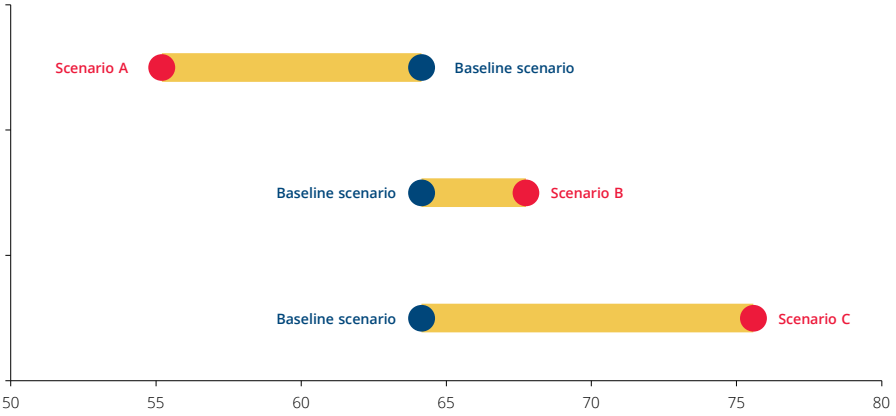
Chart 10 • Comparison of age pyramids in 2100 | Thousand individuals by age groups



Sources: Banco de Portugal and Eurostat (calculations by Banco de Portugal). | Notes: The baseline scenario corresponds to the recent baseline scenario released by the Eurostat (EUROPOP2023). Scenario A corresponds to the scenario with higher fertility rate. Scenario B corresponds to the scenario with higher life expectancy. Scenario C corresponds to the scenario with higher persistency of net migration in figures close to the ones observed in the latest years.

4. Eurostat does not disclose the age profile underlying its migration flows projections. The model used considers an average age profile, observed over the past decade. Against this background, the model cannot accurately reproduce the population dynamics underlying the net migration projections in the Eurostat baseline scenario.

Chart 11 • Old-age dependency ratio in 2100 | Per cent



Sources: Banco de Portugal and Eurostat (calculations by Banco de Portugal). | Notes: The old-age dependency ratio is the share of elderly persons (aged 65 and over) in the working-age population, i.e. the population aged between 15 and 64 years. The blue circles denote the old-age dependency ratio in the baseline scenario, while the red circles represent that ratio in each of the alternative scenarios. The baseline scenario corresponds to the recent baseline scenario released by the Eurostat (EUROPOP2023). Scenario A corresponds to the scenario with higher fertility rate. Scenario B corresponds to the scenario with higher life expectancy. Scenario C corresponds to the scenario with higher persistency of net migration in figures close to the ones observed in the latest years.

Compared to the baseline scenario, the old-age dependency ratio falls only in the scenario of higher fertility (Chart 11). Nevertheless, the impact on the working-age population is progressive and has a considerable time lag. In the scenarios of greater longevity and more persistent immigration, the old-age dependency ratio will tend to increase vis-à-vis the current situation, as the total fertility rate remains unchanged from the baseline scenario.

The percentage increase in fertility will have to be around four times greater than the one in life expectancy for the effects on the old-age dependency ratio to cancel out. This suggests that population ageing and the old-age dependency ratio decrease in scenarios where population change is dominated by the increase in fertility.

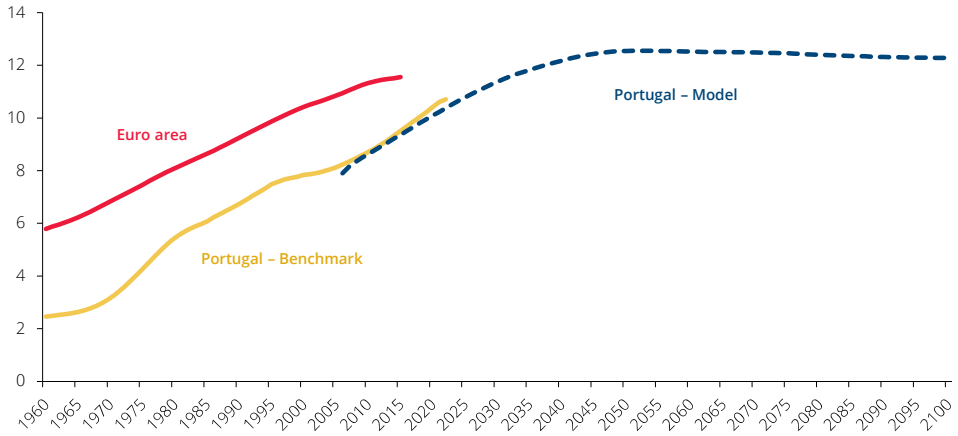
Educational dynamics of the population

In tandem with the demographic transition, an educational transition is also underway, reflected in a more educated younger generation. What are the consequences for the Portuguese population's educational trends because of demographic developments? This is a key question in determining the potential output of the Portuguese economy in the future.

To answer this question, an educational component has been added to the demographic model that makes it possible to work on schooling in detail (Box 1). Based on the population trend in the baseline scenario and on the educational structure recently observed, we estimated the average number of years of schooling of the population aged 15 to 64 (Chart 12). The age bracket is chosen because it makes international comparisons easier, and the harmonised database released in Barro and Lee (2013) is used as a benchmark. It is assumed that there are no legal changes nor changes in the performance and preferences of stakeholders in the education system over the projection horizon, compared to the estimation sample (2006-21). In the curve corresponding to the model, the average number of years of schooling corresponds to complete education cycles (Box 1), therefore it should be slightly below the simple average number of years of schooling calculated for the reference series.

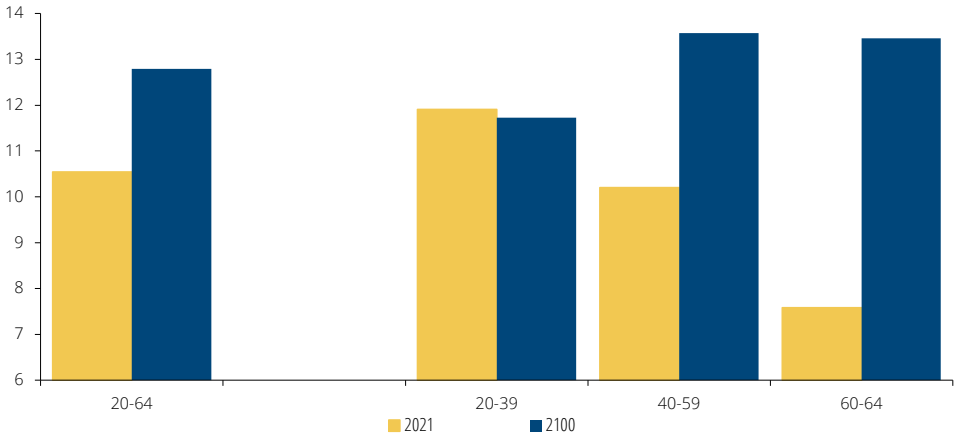
The evolution estimated in the model suggests the maturation of the educational transition process, illustrated by the increase in the average number of years of schooling until 2050 and its relative stabilisation until the end of the projection horizon. The percentage of the population aged 15 to 64 with a higher education degree (including PhD) stands at 30% in 2022. In the breakdown of EU countries, Portugal is in the third decile. Based on the model's assumptions, this percentage will surpass 40% in 2100, converging to maximum figures as currently observed in the European Union, namely countries that are mature in terms of educational transition, such as Sweden.

Chart 12 • Average years of schooling: population aged 15-64 years | Years



Sources: Banco de Portugal, Barro and Lee (2013) and Statistics Portugal (Banco de Portugal calculations). | Notes: The series refer to the average years of schooling of resident population aged 15 to 64 years. The benchmark series for Portugal and the series for the average of the euro area are based on the five-year database released by Barro e Lee (September 2021 version). In the case of the euro area average, annual figures are obtained by simple linear interpolation. In the case of Portugal, the five-year series are complemented with data from Census for 2021, being used information from the Labour Force Survey to build an annual indicator used in the temporal interpolation procedure. The series "Portugal – Model" is estimated within the framework of the model presented in Box 1 and calculated with the years of schooling corresponding to the highest degree completed (see Table B1.1 in Box 1), leading to slightly lower figures than in both reference series, which use the total years of schooling.

Chart 13 • Average years of schooling, by age group | Years



Source: Banco de Portugal. | Notes: The series refer to the average years of schooling of resident population aged 20 to 64 years, which corresponds to the age groups covered by the working-age population. The breakdown of the average years of schooling by age group is estimated within the framework of demographic model presented in Box 1.

Considering the working-age population, estimates show a 20% increase in the average number of years of schooling over the projection horizon, standing at 12.8 years in 2100 (Chart 13). Given the legal framework of compulsory schooling, the increase in the average number of years of schooling is concentrated in age brackets above 40.

Final considerations

The demographic changes witnessed at the outset of this century are the result of structural socio-economic events, resulting in lower fertility and higher life expectancy. Net migration is, to the contrary, influenced by the economic cycle and has a more immediate impact on the working-age resident population.

This time dichotomy between slower trends in fertility and mortality and more cyclical dynamics in net migration is highlighted when analysing future prospects. The most relevant scenarios for the demographic outlook are associated with fertility and net migration issues. In a scenario of recovering fertility it is possible to reverse the downward trend of population growth and mitigate its ageing. In the long term, this type of scenario would make it possible to reverse or mitigate the impacts on age-related public spending (for example, on pensions). In any case, the need for fiscal consolidation to curb the demographic effect is evident, and the adoption of measures to ensure economic stability and intergenerational fairness is recommended as of now.

In a scenario of greater persistence of positive net migration, it is possible to mitigate structural demographic trends and maintain, in the long term, the resident population at current levels. This is an important dimension of adjustment for the labour market, to be conducted by public authorities in the context of the single market in the European Union.

Crossing demographic dynamics, the process of increasing schooling for the Portuguese population is expected to continue in the coming decades, and the educational transition is to be completed by 2050. This trend reflects the current legal framework of compulsory schooling and the gradual replacement of less qualified generations by more qualified ones. However, an increase in human capital quality, productivity and income also requires demanding education and vocational training policies matching the supply of skills to labour market needs.

Box 1 • Methodological notes on the model

The two major determinants in demographic projections are the age of individuals and their gender: the elderly and men generally have lower life expectancies, and the number of women of childbearing age determines the birth potential. The model used in this Special issue describes these determinants, based on assumptions about mortality, fertility and net migration flows. The model is expanded to a further determinant, the educational level by age.

The model used to simulate demographic scenarios is based on the classification of individuals by age group and gender. At the end of the year, individuals are classified by gender and into age groups within a five-year range: up to four years old, from five to nine years old, and so on up to the group of those aged 85 or over. The population dynamics is then fuelled by three factors: deaths, births and immigration net of emigration. The first of these factors subtracts from the existing population; the last two add to the population.

The functioning of the model relies on the assumption of population homogeneity within each of these groups in terms of death rates, births, net migration and age distribution within the age group. For example, in the age group of women between 25 and 29, it is assumed that fertility and mortality rates are the same and that one fifth of the women in this group are 25 years old.

If $S_{a,s,t}$ is the number of individuals at the end of year t in age group a, defined as indicated above and numbered from 1 to 18, and sex s, where female is denoted by $s = 1$; $n_{a^f,t}$ the fertility rate for women in the age group a^f in year t, as measured by the ratio of the number of live births to the number of women in that group, considering only groups corresponding to childbearing age, i.e. $a^f \in F$ com $F = \{4, \dots, 10\}$; $m_{a,s,t}$ the mortality rate by age and sex, corresponding to the ratio of the number of deaths in the population of the respective demographic group (a and s); and $i_{a,s,t}$ immigration net of emigration of individuals of the respective populational group, then the population at the end of year t of the age group a and sex s shall be given by

$$S_{a,s,t} = \frac{1}{5}(1 - m_{a-1,s,t})S_{a-1,s,t-1} + \frac{4}{5}(1 - m_{a,s,t})S_{a,s,t-1} + \mathbf{1}_{a=1}\sum_{a^f \in F} n_{a^f,t}p_{s,t}S_{a^f,1,t-1} + i_{a,s,t}$$

The interpretation of this equation is simple. The first term on the right-hand side represents individuals who in the previous year were one year younger than the lower age limit of the age group a, and therefore were in age group $a - 1$, having survived. The second term represents individuals of sex s who were in age group a and survived to the end of the year. The third term represents individuals born during the year and requires further explanation. It exists only for the first age group, as explained by the indicator function $\mathbf{1}_{a=1}$, and includes the sum of age groups F of women of childbearing age, children born during the year, being $p_{s,t}$ the proportion of children born of sex s. Finally, the last term represents the net inflow of immigrants during the year. This equation is slightly different for the last age group considered (where $a = 18$), since the second term does not include the factor $\frac{4}{5}$ because there are no transitions to the next age group.

Applying the model to data

The model is adjusted to the demographic data released by Eurostat, combining series from 1960 to 2022 with the baseline scenario projections up to 2100 (EUROPOP2023). The population series in each year area refer to 1 January and it is necessary to introduce a one-year lag to make them compatible with the dynamic equation presented above. Since the structure of the model will not be identical to the models used by Eurostat and the data do not have all the information required for their adjustment, simplifying assumptions are necessary. For the period 1960 to 2100, information is available for the number of individuals by age group and sex ($S_{a,s,t}$), fertility

rates by age group of women of childbearing age ($n_{af,t}$) and mortality rates ($m_{a,s,t}$). The share of female live births was considered equal to that implied by Eurostat data. Based on these variables, net migration per population group are estimated for that period ($i_{a,s,t}$).

Education in the model

Demographic projections may be extended to other dimensions, such as education. The strategy adopted is based on superimposing a classification by level of education completed on the demographic module described above. The starting point is to classify the population by level of education completed or by the number of years of schooling completed, with no distinction being made between gender-differentiated educational trends. Table B1.1 presents the seven education groups considered, whose choice was guided by some characteristics of the Portuguese education system, to which correspond certain notional values for the number of completed years of schooling.

The approach used consists in estimating the parameters of matrixes with a Markovian structure describing the fraction $\Pi_{e'|a,e}$ of individuals in the age group a and educational level e who, in the following year, will be at educational level e', represented by $\Pi_a = \left[\Pi_{e'|a,e}\right]_{i=e,j=e''}$, where i and j index rows and columns respectively. If the row-vector h_a contains the number of individuals of the age group a across educational groups, the matrix product $h_a\Pi_a$ will contain the fraction of individuals in each educational group in the following year. Naturally, these matrices have several restrictions, imposed, among other reasons, by (i) no regression being possible in the degrees of education already achieved by an individual, (ii) not being able to complete educational levels if the individual is not old enough, and (iii) not being able to complete in one year more than one educational level.

These restrictions mean that the matrix Π_a can only have non-zero elements on the main diagonal and on the second upper diagonal, in this case up to the level of education that can be completed by an individual in the age group a

Table B1.1 • Description of education levels

Education level	No schooling	Four years of schooling	Six years of schooling	Nine years of schooling	Mandatory schooling (12 years)	Tertiary education (up to master)	Doctoral
Educacion group (e)	1	2	3	4	5	6	7
Number of years of schooling completed	0	4	6	9	12	15.5	21

Source: Banco de Portugal.

Transition matrices may vary from year to year, but in this analysis they are considered invariant in time. In order to reduce the number of model parameters, restrictions were imposed in addition to those detailed above. Thus, it was considered that for individuals aged 45 or over the transition matrix is the identity matrix, i.e., the educational qualifications of these individuals do not change. A restriction is also imposed on age groups after the age of majority (20-24 and over) the transitions of education levels only occur for individuals with at least complete basic education.

The parameter estimation may use external sources, minimising metrics defined as distances between observed data values and values obtained with the model. This procedure is sometimes

called the "method of simulated moments". This study considered the population structure by age and educational level and the average schooling of the population aged 15 to 64 years, during the period 2006-21. Data analysis suggests that this period does not seem to show significant impacts from changes in the Portuguese education system and the estimated parameters will reflect its structural trends.

In the case of the structure by age and education, data from the Labour Force Survey were used, which, albeit with high sample variability, should capture the main characteristics of the population over the years, in terms of academic qualifications. In the case of the average years of education of the population aged 15 to 64 years, the series is based on five-year values from the Barro and Lee database (2013, September 2021 version). These five-year series are complemented with data from the 2021 Census, and information from the Labour Force Survey is used to build the annual indicator for temporal interpolation.

III Policy insights

Public-private wage differential in Portugal

Public-private wage differential in Portugal[1]

To fully understand the wage premium in the public sector, it is necessary to take into account the characteristics of the human resources in each sector.

The debate on careers and working conditions in the public sector has been marked by the identification of bonuses and other forms of benefits compared to the private sector. Irrespective of the sector, the wage dimension is essential to remunerate productive characteristics and to promote productivity. However, a proper assessment of the wage premium cannot be based on a simple comparison of wages between sectors but has to take into account differences in the workers' productive skills. Given that both sectors compete for the same human resources in the labour market, identifying differences in the way they value these productive features is essential to gauge the efficiency of remuneration policies and, consequently, assess the allocation of resources between the public and private sectors.

The public sector is composed of different careers with their own rules and human resources management. In particular, there is variability in the rules for career progression, with systems coexisting where time is the decisive variable for progression and where progress depends on performance evaluations. There are also careers where progression is made only in a one-dimensional, step-by-step manner, and others involving in-house applications for jobs with rigid quotas to access higher levels.

Human resources management in the public sector has undergone profound changes over the last two decades. From 2007/2008 onwards, the performance evaluation and progression systems were revised by introducing a single wage scale. In addition, the need to reduce public spending during the Economic and Financial Assistance Programme (EFAP) led to measures that included cutting wages temporarily and freezing career progressions with longer-lasting impacts.

This Policy Insights first presents an aggregate approach, not differentiating career types. A second part focuses on the wage trajectory of specific careers initiated after the legislative changes of 2007/2008.

The aggregate approach uses microdata from the EU statistics on income and living conditions (EU-SILC) provided by Eurostat, and focuses on the 2008-09 and 2018-19 periods, also comparing with the euro area. The public sector is approximated through the economic activities "Public Administration and Defence; Compulsory Social Security" and "Education" representing around 75% of civil servants. The database does not make it possible to identify which education and health workers are in the public or private sector. In education, public sector employees account for around 80% of the total, according to data from the Directorate General for Administration and Public Employment. Regarding the health sector, civil servants represent only around 40% of the total, justifying its exclusion from the analysis.

1. Prepared by Cláudia Braz, Manuel Pereira and Sharmin Sazedj.

The percentage of workers with tertiary education is much higher in the public sector than in the private sector.

Wages in the public sector tend to be higher than in the private sector as many areas of public service require higher qualifications and in some public functions, such as those in sovereign governmental bodies, job stability is prioritized. In the more recent period, half of the civil servants are graduates (with tertiary education), compared to only 20% in the private sector, although educational attainment has improved in both sectors (Table 1). The public sector also differs from the private sector in terms of a high proportion of women (over 60%), a higher average number of years of experience (4 years more) and a lower average number of hours worked.

Table 1 • Characterization of public and private sectors: descriptive statistics

	2008-09		2018-19	
	Public	Private	Public	Private
Monthly wage (euros)	1,686	1,099	1,778	1,253
Female (%)	63.5	39.9	62.0	41.4
Experience years (average)	26.0	22.1	29.1	24.7
Up to basic education (%)	39.8	70.3	24.0	48.1
Secondary education (%)	19.6	20.2	25.8	32.6
Higher education (%)	40.6	9.5	50.2	19.3

Source: EU-SILC (Banco de Portugal calculations). | Note: The salary corresponds to the gross yearly remuneration divided by the number of months worked. Professional experience is approximated by age minus years of schooling.

The average wage premium in the public sector stands at around 11% in the more recent period, having decreased by around 3 p.p. since 2008-09.

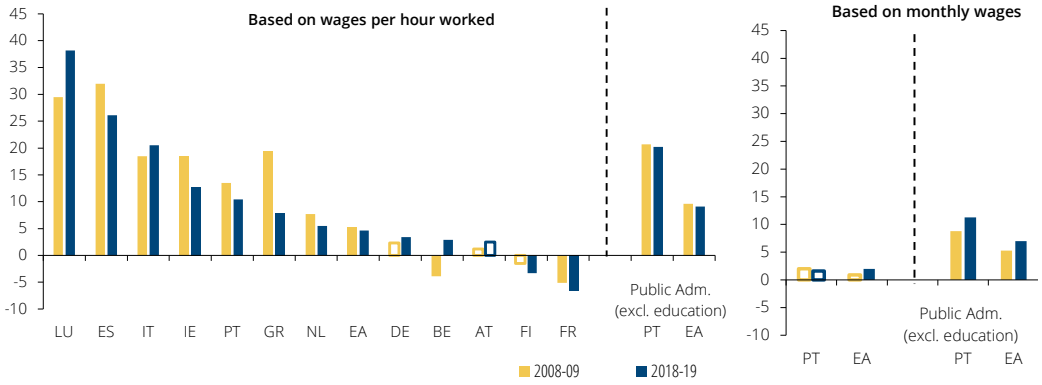
The public sector wage premium is assessed using hourly wages and controlling for the differences resulting from this diverse composition between both sectors in terms of gender, experience and education. Additionally, the methodology takes into account that experience does not have a linear effect on progression, meaning that an additional year of experience does not always yield the same salary return (Box 1).

The public sector wage premium stands at around 11% in the more recent period, having decreased by 3 p.p. since 2008-09 (Chart 1). An analysis by gender reveals that the premium is similar for both men and women. For the euro area average the premium is lower, although the composition and size of the public sector differ across countries. The premium in Portugal has been approaching the euro area average, although it is still around 6 p.p. higher. Among the countries analysed, there is variability in the size and even sign of the wage premium between sectors. The premium is negative only in France and Finland (favouring the private sector). In the remaining countries the premium is positive, or nil in the case of Austria, and in some cases it is larger than the estimate for Portugal.

When considering only public administration (i.e. excluding education), premiums are higher both in Portugal and the euro area. In Portugal, the premium is 20% in the more recent period, 11 p.p. above the euro area average.

Note that the wage differential narrows in both Portugal and the euro area when considering the monthly wage per employee instead of the hourly wage, due to the average number of hours worked being lower in the public sector. In Portugal, considering the broader definition of the public sector, it becomes nil.

Chart 1 • Wage differential between the public and private sector | As a percentage of private sector wages

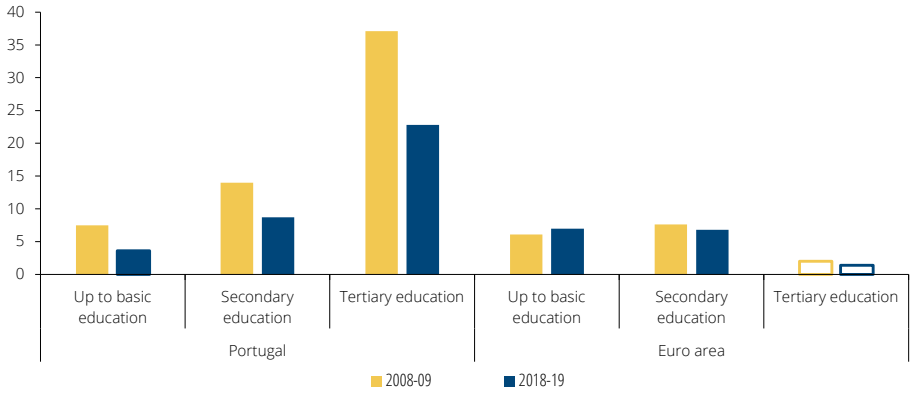


Source: EU-SILC (Banco de Portugal calculations). | Note: Unfilled bars correspond to statistically insignificant estimates at a 5% level.

The wage premium is higher for graduates, although it is lower than in the past.

The decomposition of the public sector wage premium by education level reveals that it is higher for those with tertiary education (23% in the more recent period), although a 9% premium also holds for those who have completed secondary education (Chart 2). Part of the premium for graduates stems from a higher proportion of graduates in lower-skilled occupations in the private sector relative to the public sector. In all cases, there has been a reduction in the wage differential since 2008-09, particularly significant for graduates (-14 p.p.). By contrast, in the euro area the premium is higher for lower educational levels and even non-existent for graduates.

Chart 2 • Wage differential between the public and private sector by level of education | As a percentage of private sector wages per hour worked



Source: EU-SILC (Banco de Portugal calculations). | Note: Unfilled bars correspond to statistically insignificant estimates at a 5% level.

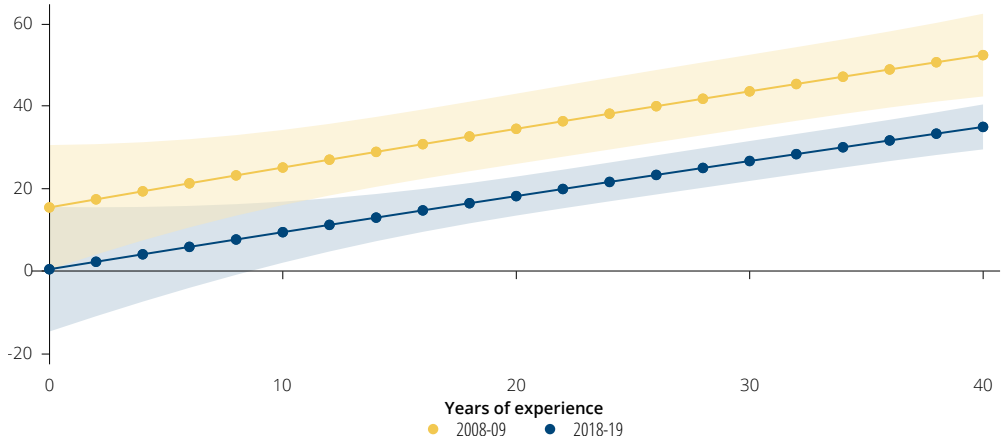
The public sector remains advantageous in terms of wages, especially for experienced graduates, but is no longer attractive in the early stages of a career.

The methodology used also makes it possible to verify whether professional experience, which is used to approximate seniority at work, has a differentiated effect in the public and private sectors. The return from professional experience, albeit positive in both sectors, is higher in the public sector, resulting in a growing wage premium throughout the career. This result is influenced by older careers in the public sector, i.e. initiated before the significant changes they underwent.

A graduate worker in the public sector has, compared to the private sector, a wage gain around 35 p.p. higher at the end of the career, relative to the starting point (Chart 3). Between 2008-09 and 2018-19, this increasing profile of the differential remained unchanged but with a roughly even reduction throughout the career. In 2008-09, all levels of experience had a premium in the public sector, which is no longer the case for graduates at the beginning of their career in the more recent period. As a result, the public sector has lost the ability to attract young graduates compared to the private sector.

For workers without tertiary education the wage differential only becomes positive after 28 years of experience, for those with 9 years of schooling or less, and after 20 years of experience, for those who completed high school (Chart 4).

Chart 3 • Wage differential between the public and private sector for workers with higher education | As a percentage of private sector wages per hour worked



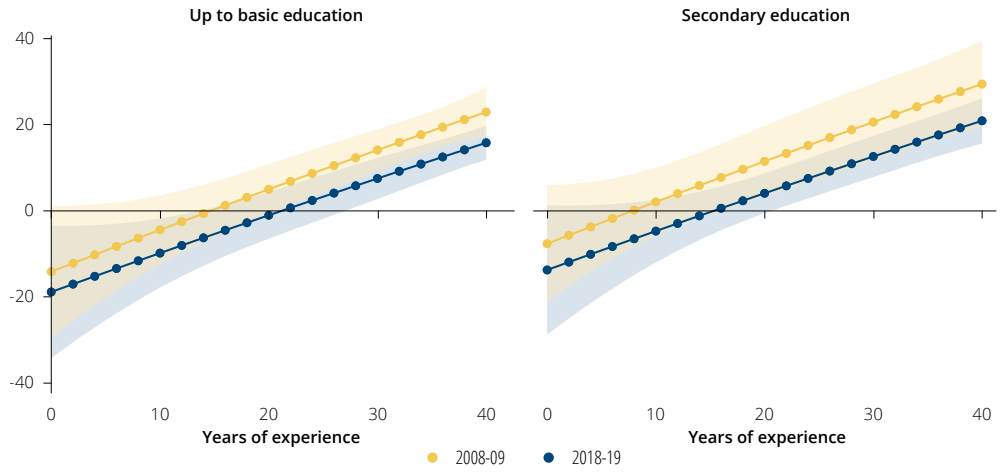
Source: EU-SILC (Banco de Portugal calculations). | Note: Shaded areas represent the 95% confidence interval.

The public sector wage premium decreases as wages increase.

A recurring theme in the public policy debate on the wage premium revolves on its relative size across different wage floors. The previous results show that the public sector continues to provide a significant wage advantage to graduates, except for those in the early stages of their careers. It is important to examine whether this is the case throughout the entire wage distribution and in

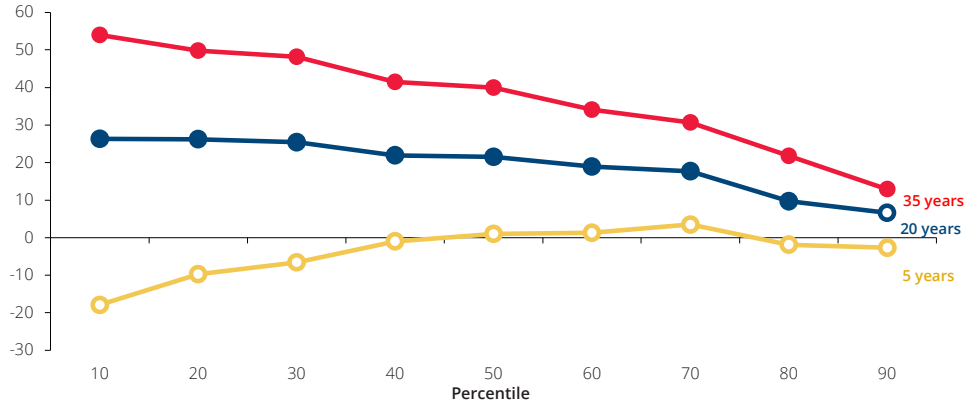
particular, whether the public sector remains competitive in higher wage ranges. To answer this question, graduates with 5, 20 and 35 years of experience in a given percentile of the public sector wage distribution, are compared with individuals in the same percentile of the private sector wage distribution. For graduates with work experience, the wage differential is decreasing but remains positive for the entire distribution if the graduate has 35 years of experience, and up to the 80th percentile if the graduate has 20 years of experience (Chart 5). These results suggest that wage practices in the public sector mitigate wage inequality vis-à-vis the private sector. There is no premium for graduates at the beginning of their careers (with 5 years of experience) across the wage distribution.

Chart 4 • Wage differential between the public and private sector for workers without higher education | As a percentage of private sector wages per hour worked



Source: EU-SILC (Banco de Portugal calculations). | Note: Shaded areas represent the 95% confidence interval.

Chart 5 • Wage differential between the public and private sector along the percentiles of the income distribution for a graduate with 5, 20 and 35 years of experience | As a percentage of private sector wages per hour worked



Source: EU-SILC (Banco de Portugal calculations). | Note: Unfilled points correspond to statistically insignificant estimates at a 5% level. Each point represents the relative differential between the respective percentile of the public sector wage distribution and the same percentile in the private sector. For example, the first point on the blue line reads as follows: the wage gap between the 10th percentiles of the wage distributions of graduates with 20 years of experience is 26%.

The legislative changes that have taken place since 2007 warrant an analysis by type of career and moment of entry.

The results presented confirm previous studies identifying pay differentials between the public and private sectors, but do not allow to analyse more homogeneous careers in the two sectors. A generic comparison is limited by the existence of functions exclusive to each sector. For example, functions in sovereign bodies (such as justice and defence) are exclusive to the public sector. Thus, in order to increase comparability across sectors, the analysis below focuses on the general career of senior technicians. In particular, the hypothetical evolution of the wages of individuals entering this career is compared with the wage trajectory of graduates starting their careers in the private sector. Such an analysis also makes it possible to highlight the current situation by focusing exclusively on existing careers. The period analysed spans the first 12 years after 2009.

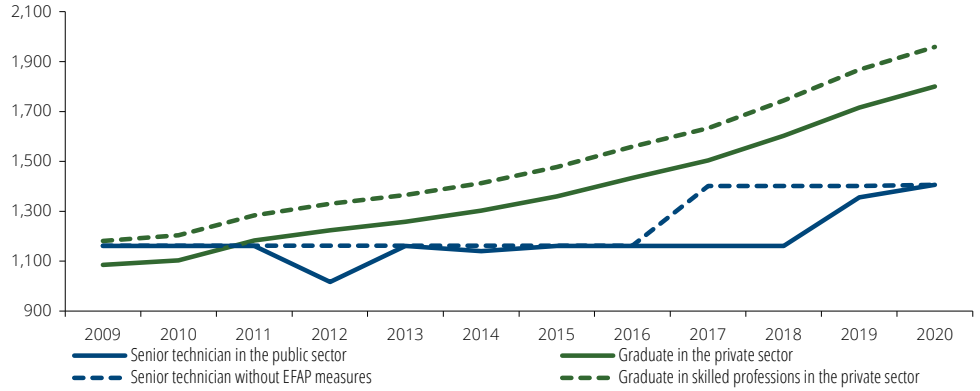
The hypothetical wage trajectory of a senior technician, entering the public sector in the recent period, compares unfavourably with a graduate in the private sector.

For civil servants' hypothetical career, an average performance is assumed, allowing for the accumulation of the ten points required for advancement every seven years. The progression is presented with and without the temporary measures implemented during the EFAP. There is a positive wage differential at the beginning of the career (in 2009) fading away after two years, even in the absence of the EFAP measures, as they did not affect much the progression of senior technicians (Chart 6). If the comparison focuses solely on graduates in highly-skilled occupations in the private sector, there is not even an entry-level premium. This analysis should be complemented with changes in the number of workers in each sector and with productivity data, which goes beyond the scope of this Policy Insights.

Wage prospects are very different within the public sector, as evidenced by the career trajectories of senior technicians and teachers.

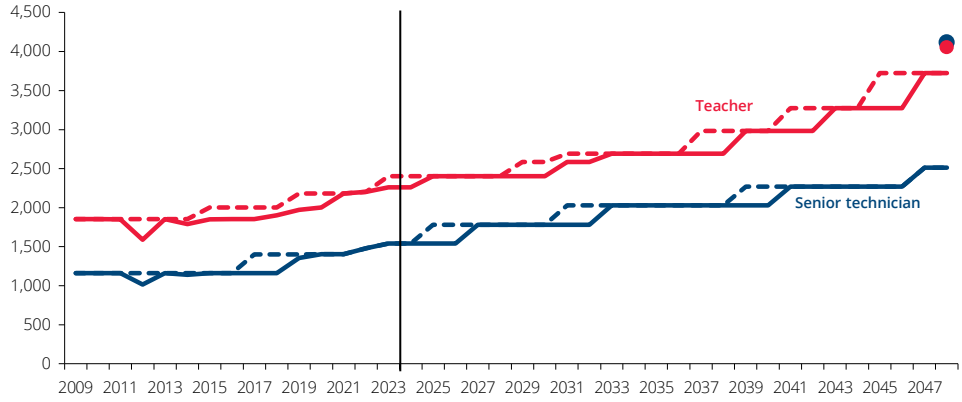
In order to analyse differences within the public sector itself, in addition to the senior technician career, this analysis included teaching careers excluding tertiary education and simulated hypothetical wage trajectories over 40 years, keeping the previous assumptions and assuming progression once in each four years for teachers. Wages at the end of the career approximately double compared to the start for both occupations (Chart 7). In addition, teachers' salaries exceed those of senior technicians throughout their careers (46% on average). Lastly, at the end of their career, senior technicians with an average performance are far from the top of the career (€1,600 or 61%). Teachers' career-end wages stand at 92% of the top of the career.

Chart 6 • Comparison between careers: hypothetical in the public sector and observed in the private sector | Monthly wages in euros



Source: Quadros de pessoal and Banco de Portugal calculations. | Note: Only base wages have been considered. Private sector careers are based on the evolution of the average salary for individuals who started their professional careers between 2008 and 2010, calculated on the basis of Quadros de Pessoal. The analysis includes graduates (excluding doctors and teachers), respectively, in all professions and in the most qualified ones (specialists, technicians and intermediate-level professions). The salary trajectory in the public sector is simulated according to the rules of progression in effect during this period. It assumes entry in 2009 at the lowest level and an average performance such that there is an accumulation of 3 points in 5% of years, 2 points in 20% of years, and 1 point in the remaining years. The dashed blue line represents the trajectory without the Economic and Financial Assistance Programme measures.

Chart 7 • Hypothetical careers in the public sector: senior technician and teacher | Monthly wages in euros



Source: Banco de Portugal calculations. | Note: The dots represent the career top. The dashed lines represent the trajectory without the Economic and Financial Assistance Programme measures. Entry in 2009 at the lowest level is assumed. Only base wages have been considered. After 2023 the monthly salaries are from the 2023 wage scale. In the case of specialists, an average performance is assumed such that there is an accumulation of 3 points in 5% of years, 2 points in 20% of years, and 1 point in the remaining years. As for teachers, progression in the standard module of 4 years has been considered, as well as a waiting period of 2 years in the transition to the 5th and 7th steps, access to which is dependent on the existence of a vacancy.

Closing the gap between public and private sector wages should contribute to a more efficient labour market.

To sum up, between 2008 and 2019, there was a convergence between public and private sector wages. This brought the wage premium closer to the euro area average. The remaining public

sector wage premium seems to stem from older careers, in particular those of workers with higher education. This premium is no longer observed in new careers. The private sector's increased demand for high skills may help explain the reduction in the wage differential. These results can contribute to a more well-balanced and efficient labour market provided that the public sector's ability to attract and retain highly-skilled employees is not compromised.

Box 1 • Methodological note

The results presented in this Policy Insights are based on an econometric model where the public sector wage premium is estimated through a wage regression. This regression includes the characteristics of workers, which are interacted with a dummy variable indicating whether the individual works in the public sector. Thus, it is possible that individual characteristics, namely human capital, are remunerated differently in the two sectors.

The empirical specification is estimated by the least squares method, separately for 2008-09 and 2018-19 and by country, and can be described as:

$$\ln y_i = \boldsymbol{\beta_1 x_i} + \boldsymbol{\beta_2 x_i}\, p_i + \beta_3 A_t + e_{i,}$$

where the dependent variable $\ln \boldsymbol{y_i}$ is the natural logarithm of an individual's hourly wage $\boldsymbol{i}$, $\boldsymbol{x_i}$ is the vector of the variables that interact with the public sector dummy variable, represented by $\boldsymbol{p_i}$, and the variable $\boldsymbol{A_t}$ is a fixed year effect. The interacted explanatory variables, included in the vector, $\boldsymbol{x_i}$, are gender, professional experience in years, and a quadratic term of it, as well as binary variables identifying whether an individual has completed secondary or tertiary education and a constant term (capturing the effect associated with the completion of 9 years of schooling or less). Euro area results are based on a joint regression for countries, with the same specification, but with all variables interacted with country-specific fixed effects.

The results in Charts 1 to 4 correspond to the marginal effect of the public sector dummy variable, with the remaining regressors assessed at average or, where applicable, at the specific values in the charts.

The results shown in Chart 5 are reached by estimating the same specification through a quantile regression at the specified percentiles of the dependent variable. The chart shows the estimation of the marginal effect of the public sector dummy variable, assessed at the specific values of the indicated regressors.

IV Series

Quarterly series for the Portuguese economy: 1977-2022

Annual series on household wealth: 1980-2022

Quarterly series for the Portuguese economy: 1977-2022

Every year the Banco de Portugal discloses an update of the quarterly long series for the Portuguese economy. These series are distributed into three blocks: expenditure, household disposable income and labour market.

The update released in this Bulletin maintains the same breakdown as previously and includes quarterly figures for 2022 for the first time. The data is consistent with the latest version of the Quarterly National Sector Accounts published by Statistics Portugal on 24 March 2023 and mainly follows the methodological procedures described in detail in Cardoso and Sequeira (2015).[1]

The quarterly series published for GDP and main expenditure components match the data released by Statistics Portugal for the period from 1995 onwards. The household disposable income series for the period from the first quarter of 1999 onwards also match those published by Statistics Portugal (Quarterly National Sector Accounts), adjusted for seasonal and calendar effects.

In the labour market block, series are grouped according to two different measures: full-time equivalent (FTE, National Accounts concept) and thousands of individuals (Labour Force Survey concept). The FTE employment series correspond, in annual terms, to those released by Statistics Portugal since 1995. The series measured in thousands of individuals and the unemployment rate series only differ from those currently published by Statistics Portugal due to seasonal adjustments.

In annual terms, for the period prior to 1995, the series follow the developments in the Long time series for the Portuguese economy (SLEP, in Portuguese, 2020), published by Statistics Portugal and the Banco de Portugal in December 2021.

In general, seasonal adjustments were made using the X13-ARIMA procedure (via the *JDemetra+ software*).

These quarterly and annual series for the 1977-2022 period are available in electronic format on the Banco de Portugal's webpage for this *Economic Bulletin* and on BPstat | Statistics Online under the domains National accounts and Population and labour market.

1.1. Cardoso, F. and Sequeira, A. (2015), "Quarterly series for the Portuguese economy: 1977-2014", *Occasional Paper* No 1, Banco de Portugal.

Annual series on household wealth: 1980-2022

The annual series on household wealth for the period 1980-2022 correspond to an update of the estimates published in the *Economic Bulletin* of May 2022. These wealth estimates, published annually,[2] include the financial component (assets and liabilities) and housing (the main component of non-financial wealth). The concepts and methodology are identical to those described in Cardoso, F., Farinha. L. and Lameira, R. (2008).[3]

The financial series (assets and liabilities) presented here are consistent with the latest version of the national financial accounts published by the Banco de Portugal, which are available for the 1994-2022 period. The financial series for the period before 1994 were estimated using the implicit rates of change in the previous wealth series and obtained in accordance with the methodology described in detail in Cardoso, F. and Cunha, V. (2005).

For the period from 2000 to 2020, the housing wealth series is based on estimates of households' housing capital stock provided by Statistics Portugal.[4] This series was extended to the 1980-1999 and 2021-2022 periods. For the period before 2000, the series was obtained by retrospectively matching the rates of change in the total housing capital stock, which is part of the Long time series for the Portuguese economy (SLEP 2020) published by Statistics Portugal and the Banco de Portugal in December 2021. For 2021 and 2022, the series has been estimated respecting the growth rate of an indicator for the housing capital stock based on a methodology similar to that used in calculating the capital stock series of SLEP 2020. The calculation of the capital stock series is based on the perpetual inventory method, consisting of successively accumulating fixed capital investment (in this case, housing investment), assuming hypotheses for its service life and its survival and depreciation method.[5] Data in current prices for 2021 and 2022 were obtained using as stock deflator an estimate based on the House Price Index published by Statistics Portugal.

The housing capital stock estimates made available by Statistics Portugal do not include the value of land underlying dwellings, which is included in the wealth series published here. The value of the land was estimated based on the ratio set for tax purposes (namely, regarding housing evaluations for municipal property tax), corresponding to 25% of overall housing value.

2. The series are only available in electronic format on Banco de Portugal's webpage for this *Economic Bulletin*.
3. Cardoso, F., Farinha, L. and Lameira, R. (2008), "Household wealth in Portugal: revised series", *Occasional Paper* No 1, Banco de Portugal. This publication corresponds to the revised series previously published in Cardoso, F. and Cunha, V. (2005), "Household wealth in Portugal: 1980-2004", *Working Paper* No 4, Banco de Portugal, where the calculation methodology is described in more detail.
4. Statistics Portugal published the capital stock accounts in November 2017 for the first time, available on the National Accounts area of its website. For further details, see: Statistics Portugal (2017), "Capital stock (Base 2011) 2000-2015", Press release of 24 November.
5. For more details on the methodology for calculating the capital stock series of SLEP 2020 see Séries Longas para a Economia Portuguesa (2021), Statistics Portugal and Banco de Portugal.