ECONOMIC BULLETIN

DEC. 2021

BANCO DE PORTUGAL
EUROSYSTEM

ECONOMIC BULLETIN

DECEMBER 2021

BANCO DE PORTUGAL
EUROSYSTEM

Lisboa, 2022 • www.bportugal.pt

Economic Bulletin | December 2021 • Banco de Portugal Av. Almirante Reis, 71 | 1150-012 Lisboa • www.bportugal.pt
Edition Economics and Research Department • **Design** Communication and Museum Department | Design Unit •
Translation International Relations Department | Translation Unit • **ISSN (online)** 2182-035x

Contents

I Projections for the Portuguese economy: 2021-24

1 Introduction

The Banco de Portugal projects that the Portuguese economy will grow by 4.8% in 2021 and 5.8% in 2022, followed by a more moderate pace of expansion in 2023 and 2024, 3.1% and 2.0% respectively (Table I.1.1). The economic recovery will lead to a rise in employment and a decrease in the unemployment rate to levels lower than those recorded prior to the pandemic. Inflation will increase in 2021 and 2022, to 0.9% and 1.8% respectively, standing at 1.1% and 1.3% over the next two years, with a profile largely influenced by developments in energy prices. Inflation excluding energy goods is projected to gradually increase over the projection horizon, standing at 1.5% in 2024.

Table I.1.1 • Projections of Banco de Portugal for 2021-24 | Year-on-year percentage change, unless otherwise stated

	Weights 2020	December 2021 EB					October 2021 EB		June 2021 EB			
		2020	2021 (p)	2022 (p)	2023 (p)	2024 (p)	2020	2021 (p)	2020	2021 (p)	2022 (p)	2023 (p)
Gross domestic product (GDP)	100	-8.4	4.8	5.8	3.1	2.0	-8.4	4.8	-7.6	4.8	5.6	2.4
Private consumption	64.2	-7.1	5.0	4.8	2.2	1.8	-7.1	4.3	-5.9	3.3	4.9	2.3
Public consumption	19.1	0.4	4.8	1.4	-1.3	-0.1	0.4	5.2	0.4	4.9	0.4	-0.2
Gross fixed capital formation	19.1	-2.7	4.9	7.2	6.6	3.9	-2.7	5.6	-1.9	7.6	8.2	5.8
Domestic demand	102.1	-5.6	5.1	4.6	2.4	1.9	-5.6	4.9	-4.6	4.5	4.7	2.6
Exports	37.0	-18.6	9.6	12.7	7.8	3.9	-18.6	9.6	-18.6	14.5	13.1	4.8
Imports	39.1	-12.1	10.3	9.3	6.2	3.6	-12.1	9.7	-12.0	13.2	10.6	5.1
Contribution to GDP growth, net of imports (in p.p.)[a]												
Domestic demand		-3.0	3.1	2.6	1.2	1.1	-3.0	3.0	-2.3	2.4	2.5	1.3
Exports of goods		-0.8	1.1	0.2	0.6	0.4	-0.9	1.3	-0.7	1.9	0.3	0.3
Exports of services		-4.6	0.6	3.0	1.2	0.6	-4.5	0.5	-4.5	0.5	2.8	0.8
Employment (number of persons)[b]		-1.9	2.5	1.6	0.5	0.3	-1.9	2.6	-1.7	1.3	1.3	0.4
Employment (hours worked)[b]		-9.3	8.3	4.0	0.6	0.3	-9.3	8.4	-9.2	5.9	4.1	0.5
Unemployment rate [c]		7.0	6.6	6.0	5.7	5.6	7.0	6.8	7.0	7.2	7.1	6.8
Current plus capital account (% of GDP)		0.0	0.2	1.8	2.6	1.8	0.0	1.0	0.1	0.9	2.1	1.8
Trade balance (% of GDP)		-1.8	-3.0	-2.1	-1.2	-1.0	-1.8	-2.3	-1.8	-2.1	-1.4	-1.3
Harmonised index of consumer prices		-0.1	0.9	1.8	1.1	1.3	-0.1	0.9	-0.1	0.7	0.9	1.0
Energy goods		-5.2	7.8	6.3	-1.3	-0.8	-5.2	6.9	-5.2	5.6	1.0	-1.3
Excluding energy goods		0.3	0.4	1.3	1.4	1.5	0.3	0.4	0.3	0.3	0.9	1.2

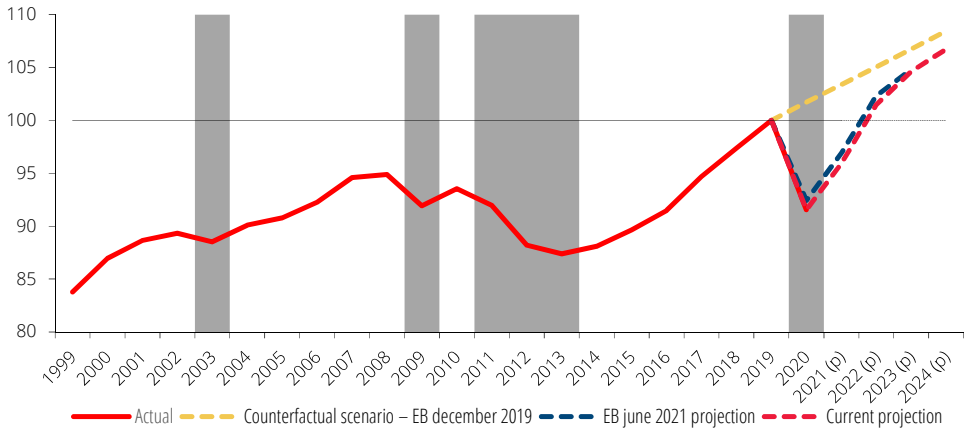
Sources: Banco de Portugal and Statistics Portugal. | Notes: (p) – projected, p.p. – percentage points. For each aggregate, this table shows the projection corresponding to the most likely value, conditional on the set of assumptions considered. (a) The demand aggregates net of imports are obtained by subtracting an estimate of the imports used in each component. For more information on the methodology underlying this calculation, see Cardoso and Rua (2021) "Unveiling the real contribution of final demand to GDP growth", Banco de Portugal, *Economic Studies* – Vol. 7, No. 3. (b) According to the national accounts concept. (c) In percentage of labour force.

In the short term, activity will be constrained by a renewed wave of the pandemic in Europe and by global supply chain disruptions. The reintroduction of restrictive measures to contain the pandemic, including on international mobility, together with increased uncertainty, will have an impact on the recovery´s pace, particularly in tourism-related services. In addition, global supply chain bottlenecks, which have pushed up costs and led to shortages of commodities and other goods, are assumed to dissipate from the second half of 2022 onwards.

The projected path of economic growth is supported by the maintenance of favourable financial conditions and increased inflows of funds from the European Union. No significant adverse effects on aggregate economic activity are expected from the end of some temporary support, which were partly replaced by measures more targeted at the most affected sectors and firms.

Gross domestic product (GDP) will return to its pre-pandemic level in the first half of 2022, but at the end of the horizon it remains below the trend projected before the pandemic occurred (Chart I.1.1). The estimated activity gap in 2024 is around 2% compared to the projection in the December 2019 issue of the *Economic Bulletin*, reflecting a smaller impact on economic activity over the medium term than in past economic recessions. A more effective implementation than estimated of the Recovery and Resilience Plan could mitigate this gap.[1]

Chart I.1.1 • Actual and projected GDP – comparison with counterfactual scenario and the EB june projection | Index 2019 = 100



Sources: Banco de Portugal and Statistics Portugal. | Notes: The counterfactual scenario corresponds to the December 2019 EB from 2019 to 2022. The figures for 2023-24 were obtained assuming the growth trend of previous years. Shaded areas mark years of falling GDP.

Average GDP growth in Portugal over the period 2022-24 will be 3.6%, compared to an Eurosystem projection of 2.9% for the euro area. Between 2019 and 2021, the fall in GDP was larger in Portugal, due to the services sectors most affected by the pandemic weighing more on the domestic economy. In cumulative terms since 2019, growth at the end of the projection horizon is expected to be similar in Portugal to that of the euro area.

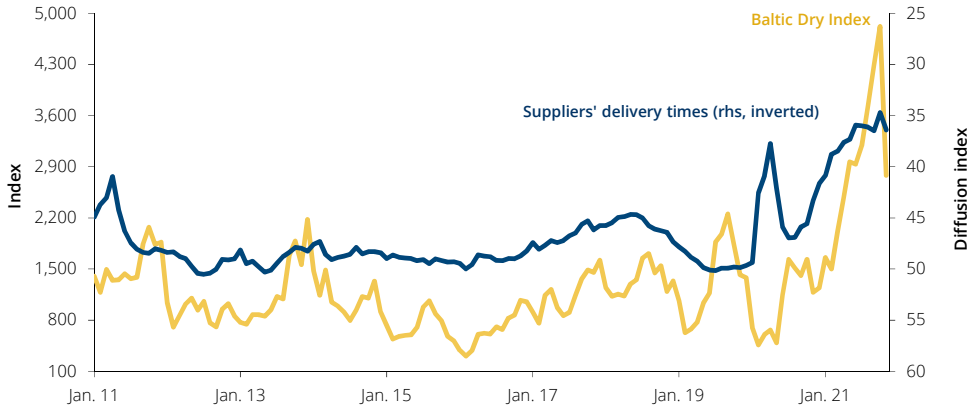
The current projections revise economic growth in 2022-23 upwards from that projected in the June issue of the *Economic Bulletin*, while the estimate for 2021 published in the October issue of the *Economic Bulletin* remains unchanged. Given the downward revision of 2020 GDP at the time of the release of the Annual National Accounts by Statistics Portugal, GDP in 2023 will stand very close to that projected in June (Chart I.1.1). The projection for inflation was revised upwards over the projection horizon compared to the June issue of the *Economic Bulletin* – notably in 2022, with a 0.9 p.p. revision – reflecting the increase in import prices, including oil, and the reduction in labour market slack, both more markedly than anticipated in June.

1. See Box: "Impact of the Recovery and Resilience Plan for the period 2021-26", *Economic Bulletin*, March 2021.

2 External environment, financing conditions and policies

The worsening of the pandemic and the problems in global supply chains constrain activity and global trade growth in the short term. The recent recovery in advanced economies benefited from advances in the vaccination process and increased confidence. In the euro area, GDP grew by 2.2% quarter on quarter in the third quarter (-0.2% and 2.2% in the first and second quarters). By sector of activity, services that are more reliant on personal contact rebounded strongly. The recent worsening of the pandemic is expected to lead to a deceleration in activity in the coming months. The recovery has also been affected by bottlenecks in goods transport, shortages in the supply of intermediate goods and rising commodity prices and transport costs, which have proved more persistent than anticipated (Chart I.2.1 and Box 1). According to the European Commission's Opinion Surveys, there is an increasing and historically high share of euro area industrial and construction firms reporting shortages of materials or equipment as a constraint on activity.

Chart I.2.1 • Maritime transport costs and suppliers' delivery times



Sources: IHS Markit and Baltic Exchange. | Notes: The Baltic Dry Index provides a benchmark for the price of moving the major raw materials by sea (dry bulk). Suppliers' delivery times - global manufacturing PMI; readings below 50 indicate that delivery times deteriorated.

Global activity and external demand for Portuguese goods and services are anticipated to grow strongly. In 2021, according to the assumptions of the Eurosystem's projection exercise, global activity will grow by 5.9% and external demand by 8.5%, which imply a downward revision from what was envisaged in the October issue of the *Economic Bulletin* (Table I.2.1). In 2022-24, the growth pace of global GDP and external demand for Portuguese goods and services is expected to moderate gradually, as the recovery phase is passed and the effect of the support policies dissipates. These projections assume a gradual easing of the pandemic and the progressive normalisation of goods supply chains from the second half of 2022 onwards. Global GDP will reach the pre-pandemic level in 2021, and external demand is assumed to do the same in 2022. These assumptions provide a benign framework for the recovery of the Portuguese economy, albeit slightly less favourable than that observed in the aftermath of the 2011-13 recession, reflecting the more idiosyncratic nature of the sovereign debt crisis, as opposed to the global nature of the pandemic shock and its strong impact on trade, particularly of services (Chart I.2.2).

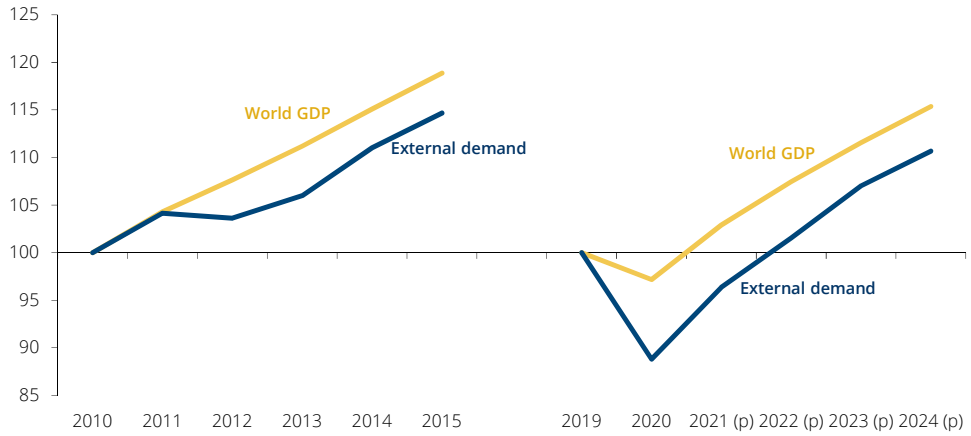
Table I.2.1 • Projection assumptions

		December 2021 projections					EB October 2021	EB June 2021			
		2020	2021	2022	2023	2024	2021	2020	2021	2022	2023
International environment											
World GDP	yoy	-2.8	5.9	4.4	3.8	3.4	6.1	-2.9	6.0	4.3	3.5
World trade	yoy	-8.3	10.2	4.5	4.9	3.7	11.2	-8.7	10.0	5.5	3.7
External demand	yoy	-11.2	8.5	5.4	5.4	3.4	9.1	-11.5	8.6	6.5	3.4
Oil prices in dollars	aav	41.5	71.8	77.5	72.3	69.4	67.8	42.3	65.8	64.6	61.9
Oil prices in euros	aav	36.3	60.8	68.5	63.9	61.3	56.9	37.1	54.5	53.3	51.1
Non-energy commodity prices in dollars	yoy	3.5	34.4	5.7	-2.2	-2.1	37.9	3.2	39.0	0.1	-8.0
Monetary and financial conditions											
Short-term interest rate (3-month EURIBOR)	%	-0.4	-0.5	-0.5	-0.2	0.0	-0.5	-0.4	-0.5	-0.5	-0.3
Implicit interest rate in public debt	%	2.2	2.0	2.0	1.9	1.8	2.0	2.2	2.0	1.9	1.9
Effective exchange rate index	yoy	3.3	1.2	-2.0	0.0	0.0	1.5	3.3	2.3	0.1	0.0
Euro-dollar exchange rate	aav	1.14	1.18	1.13	1.13	1.13	1.19	1.14	1.21	1.21	1.21

Source: Eurosystem (Banco de Portugal's calculations). | Notes: yoy – year-on-year rate of change, % per cent, aav – annual average value. Technical and external environment assumptions as well as projections for euro area GDP and inflation coincide with those in the Eurosystem's projection exercise released on 16 December (see "Eurosystem staff macroeconomic projections for the euro area", December 2021) and include information available up to 25 November. Assumptions for oil prices are based on futures markets. Developments in the 3-month Euribor rate are based on expectations implied in futures contracts. The implicit interest rate on public debt is computed as the ratio of interest expenditure for the year to the simple average of the stock of debt at the end of the same year and at the end of the preceding year. The implicit rate includes an assumption for the interest rate associated with new issuances. An increase in the exchange rate corresponds to an appreciation of the euro. The efective exchange rate of the euro is calculated vis-a-vis a group of 42 partners. The technical assumption for bilateral exchange rates assumes that the average levels observed in the two weeks prior to the cut-off date will remain stable over the projection horizon.

Rising commodity prices contribute to higher inflation in advanced economies. The Eurosystem assumptions consider that international prices of energy and non-energy commodities will remain high in 2022, after surging in 2021, and decline over the subsequent years. These assumptions were revised upwards in comparison to the June and October projection exercises. Reflecting not only the sharp rise in energy prices, but also the impact of supply constraints on various goods, as well as the recovery of the services most affected by the pandemic, inflation has been increasing in several advanced economies. In the euro area, the Eurosystem projections point to inflation increasing from 0.3% in 2020 to 2.6% in 2021 and 3.2% in 2022, and to a decline to 1.8% in 2024. This projection is determined to a large extent by the energy component. Inflation excluding energy goods will rise to 1.5% in 2021 and 2.1% in 2022, coming down to 1.9% in 2024.

Chart I.2.2 • Comparison of the pandemic crisis with the 2011-13 crisis – World GDP and external demand for the Portuguese economy | Index 2010= 100 and 2019 = 100



Sources: Eurosystem (Banco de Portugal calculations). | Note: Base indices for 2010 and 2019 refer to the years prior of the recessions in Portugal.

Monetary and financial conditions in the euro area are expected to remain favourable. The ECB's balance sheet as a percentage of euro area GDP stood at around 70% in the third quarter of 2021, 30 p.p. above the pre-pandemic figure, which is largely linked with the temporary pandemic emergency purchase programme (PEPP). Short-term interest rates will increase slightly from 2023 onwards, but they will remain very low. The implicit interest rate on Portuguese government debt will stand at around 2% over the projection horizon.

Following the non-approval of the draft State Budget for 2022, the assumptions for public finances are largely based on a no policy-change scenario.

3 The Portuguese economy in 2021-24

The Portuguese economy is expected to remain on a recovery path, reaching its prepandemic level in the first half of 2022. Quarter-on-quarter growth for the fourth quarter of 2021 is estimated at 2%, slowing down in early 2022 due to the worsening of the pandemic in Europe (Box 2). In the following quarters, activity growth increases, resulting in an annual rate of change of 5.8% in 2022 (4.8% in 2021). In 2023-24, the pace of growth will decline, moving closer to the estimated long term growth of the Portuguese economy.

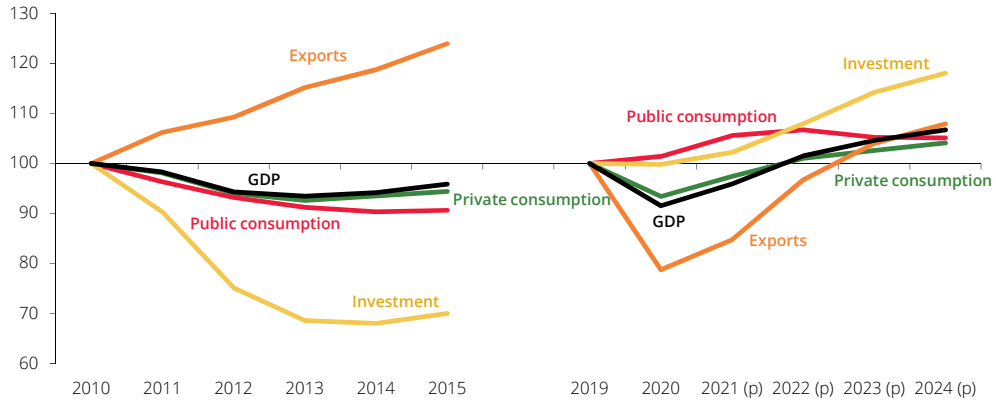
Growth extends to most expenditure components, albeit at different paces. In terms of contributions net of import content, services exports are expected to contribute 3 p.p. to GDP growth in 2022 – largely explaining the acceleration in activity – and 1.2 p.p. in 2023 (Table I.1.1). The contribution from domestic demand will account, on average, for about half of GDP growth over the period 2022-24.

The projected recovery will be faster than that observed in the wake of the 2011-13 recession. Developments in GDP and its main components in the two recessions reflect the different nature of the underlying shocks, the distinct starting point in terms of macroeconomic imbalances and the policy measures implemented (Chart I.3.1). In the pandemic crisis, the shock was of a temporary and nonsystemic nature, and the policy response was immediate, massive and coordinated at national and European level. The importance of avoiding the crisis contagion to the financial sector should be highlighted, maintaining financial stability and the financing conditions of all economic agents. These factors, as well as their interconnectedness, have dampened the multiplier effects of the shock and safeguarded the productive capacity and employment.

The measures adopted supported households' aggregate income and a faster recovery in private consumption. Resilient investment and increased public consumption contrast with the behaviour observed in the previous recession. The different evolution of exports is largely the result of the pandemic restrictions imposed on mobility, with had a disproportionate impact on international tourism flows.

Private consumption will rise by 5% in 2021 and 4.8% in 2022, decelerating in the period 2023-24 to 2.2% and 1.8%. The level recorded at the end of 2019 will be attained in the fourth quarter of 2021. High growth in 2021-22 is partly associated with a strong recovery in services spending – which benefited from the lifting of containment measures and increased confidence due to advances in the vaccination process – and is expected to continue recovering over the projection horizon. Consumption of durable goods is also expected to be buoyant, reflecting the materialisation of pent up demand build up during the crisis.

Chart I.3.1 • Comparison of the pandemic crisis with the 2011-13 crisis – GDP and main components net of the import content | Index 2010 = 100 and 2019 = 100



Sources: Banco de Portugal and Statistics Portugal. | Notes: (p) – projected. The 2010 and 2019 base indices refer to the years preceding the recessions.

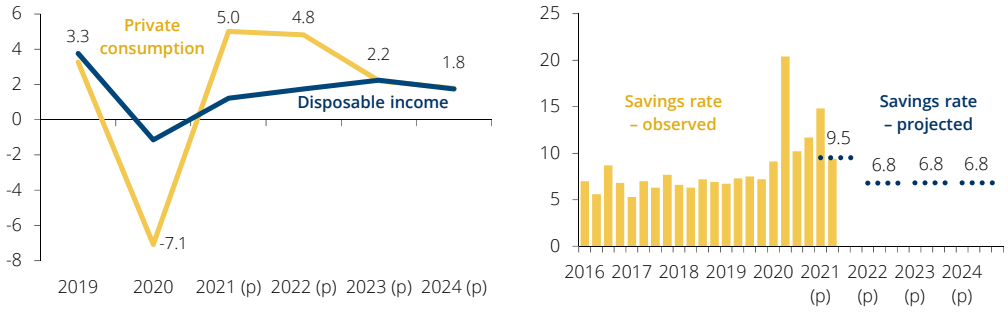
Private consumption is underpinned by real disposable income growth, favourable financial conditions and wealth accumulated during the crisis (Chart I.3.2). The projections point to an increase in real disposable income of 1.2% in 2021 and an average growth of around 2% in 2022-24, reflecting gains in employment, albeit progressively smaller, and the momentum in wages. Disposable income reaches its prepandemic level in early 2022, reflecting the rapid and complete recovery in wage compensation together with the increase in social benefits. However, the corporate and property income component remains below the prepandemic level.

The savings rate will decrease in 2021-22, after peaking at 12.8% in 2020. Savings increased during the lockdowns, reflecting precautionary motives and involuntary savings due to constraints on consumption. In the second quarter of 2021, the savings rate declined and is projected to decline further in the second half of the year. The results of the 2020 Household Finance and Consumption Survey show that the savings accumulated during the pandemic were more concentrated in higher income households, which tend to have a lower marginal propensity to consume (Box 3). These households represent a significant fraction of total savings.[2] The projections assume that savings accumulated by households during the pandemic will not be spent, resulting, in aggregate terms, in a persistent increase in wealth. This assumption is surrounded by uncertainty and represents an upside risk to the projection.

Public consumption is expected to grow by 4.8% in 2021, accelerating from the previous year (0.4%). This development is largely explained by the increase in hours worked in general government. The moderate growth in public consumption in 2022-24 stems from the reduction of pandemic related health expenditure and the assumption of a gradual stabilisation of public employment. In 2022 these effects are expected to be partly offset by the implementation of the Recovery and Resilience Plan (RRP).

2. See Special issue: "An interpretation of household saving rate developments in Portugal", *Economic Bulletin*, May 2016.

Chart I.3.2 • Private consumption, disposable income and savings rate | Rate of change in percentage and in percentage of disposable income

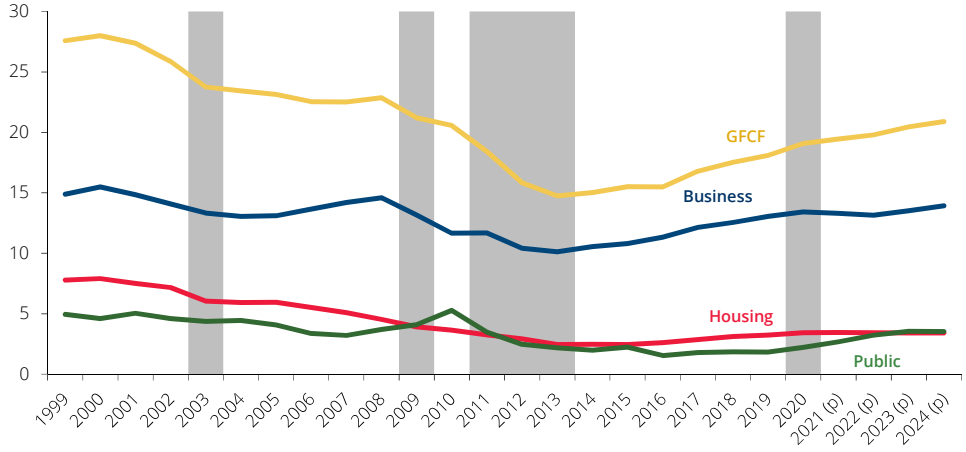


Sources: Banco de Portugal and Statistics Portugal. | Notes: (p) – projected.

Investment grows at strong rates over the horizon, benefiting from the inflow of EU funds, demand recovery prospects and favourable financing conditions. Gross fixed capital formation (GFCF), after a contained fall in 2020 – compared to previous recessions and to the euro area – is expected to increase 4.9% in 2021, followed by an average growth of 6.9% in 2022-23. For 2024, growth is projected at 3.9%. Such momentum extends to the public and private components, with emphasis on the public component growth in 2021-22 (Chart I.3.3). Over the next few quarters, investment is expected to remain constrained by problems in global supply chains, namely shortages of materials and equipment and an increase in their cost. In this context, corporate GFCF is expected to grow by 4.4% in 2022 (3% in 2021) and 6% in 2023, and to slow down to 4.8% in 2024. These developments will translate into an increase in the corporate capital stock over the coming years.

In real terms, public investment grows by around 16%, in annual average terms, over the period 2021-24, in line with the updated Stability Programme. These developments reflect the implementation of projects foreseen in the RRP and structural investments. Because of their magnitude, the implementation of these projects is expected to interrupt the downward trend of public capital stock. The deceleration in public investment projected from 2023 onwards reflects the reduction in European funds associated to the transition between multiannual financial frameworks (MFF).

Chart I.3.3 • GFCF and components | In percentage of GDP



Sources: Banco de Portugal and Statistics Portugal. | Notes: (p) – projected. Shaded areas mark years of falling GDP.

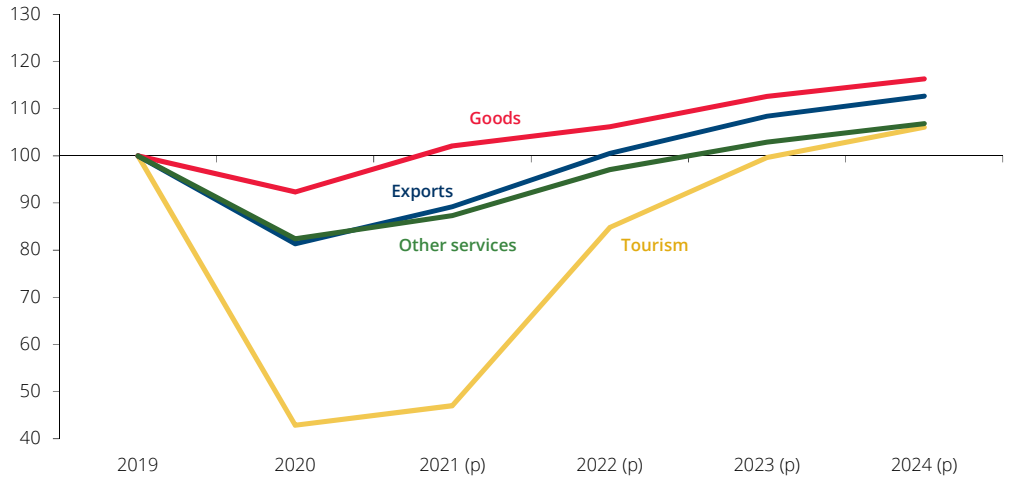
After a relative stabilisation of residential GFCF in 2021, an average growth of 2.3% is expected for the period 2022 to 2024. Growth is supported by an increase in disposable income, favourable financial conditions and the attractiveness of this type of investment in the context of the accumulation of savings in the past year and a half. Higher demand from nonresidents in some segments and for tourism purposes, in the context of the sector's recovery, may also contribute to a buoyant housing market, with an impact on prices (Box 4).

Exports will grow by 9.6% in 2021, 12.7% in 2022 and 5.9%, on average, in 2023-24. The recovery in exports differs between goods and services, with goods exports exceeding their prepandemic level at the end of 2021 (Chart I.3.4). Disruptions in the supply of commodities and intermediate goods have had a negative impact in recent quarters on the exports of some relevant sectors, in particular on the car sector. After growing by 10.6% in 2021, goods exports will grow by 3.9% in 2022, followed by 6.1% growth in 2023, reflecting the gradual dissipation of the disruptions over the course of 2022. Goods exports will grow by 3.3% in 2024, in line with external demand for Portuguese goods and services.

Reflecting the lifting of restrictions on international mobility and rising confidence, services exports – particularly tourism and associated transport services – have been recovering sharply after the steep fall in 2020 and early 2021. The recent worsening of the pandemic in Europe means tourism flows will be more restrained in the coming months. From the second quarter of 2022 onwards, tourism exports are assumed to grow strongly again, and services exports are expected to increase by 35.1% in 2022 (7.2% in 2021), followed by more moderate growth in 2023-24 (11.3% and 5.1%). This will be the expenditure component with the most important contribution to GDP growth in 2022, at 3 p.p. Services exports should return to prepandemic levels by the end of 2023.

Goods imports are expected to grow in line with global demand weighted by import content, with stronger growth in the services component being anticipated, reflecting the marked evolution of tourism. Following a 10.3% surge in 2021, imports will continue to grow over the horizon but at gradually more subdued rates.

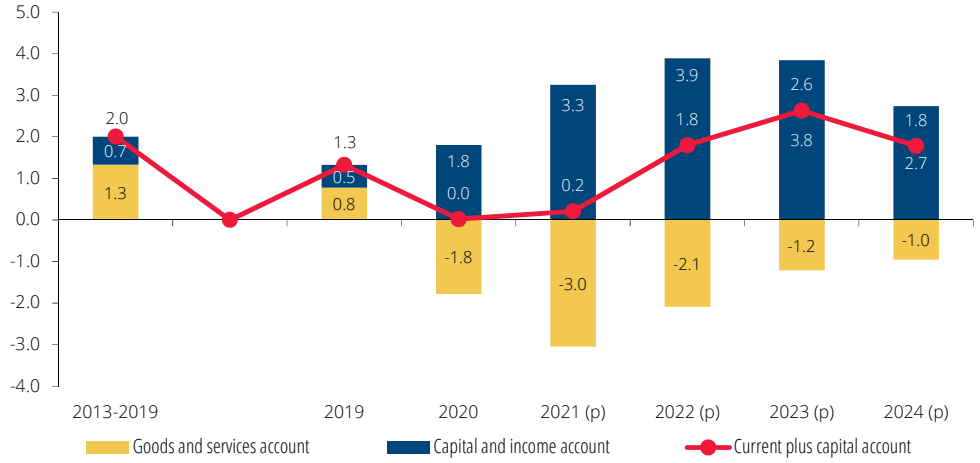
Chart I.3.4 • Exports: overall and components | Index 2019 = 100



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

The current and capital account surplus will increase from 0.2% of GDP in 2021 to an average of 2.1% in 2022-24, due to the recovery in tourism and higher EU fund inflows. The goods and services account deficit will gradually decrease over the projection horizon (Chart I.3.5). The reduction of this deficit, to 1% of GDP in 2024, reflects the increase in the services account surplus associated to developments in the tourism sector. Despite this improvement, the services account surplus at the end of the horizon is still expected to stand below prepandemic figures. The surplus in the income and capital accounts increases from 1.8% in 2020 to 3.4% on average in 2021-24. Inflows of European funds are expected to account for 3.8% of GDP on average in 2021-24 (2.2% on average in 2013-19). These funds will include amounts linked to the MFF 2014-20, which is in its final phase, to the MFF 2021-27 and to transfers under the new instrument of response to the pandemic crisis (NGEU). The reduction in public debt interest payments abroad will also have a positive impact on external accounts over the period.

Chart I.3.5 • Current plus capital account | In percentage of GDP



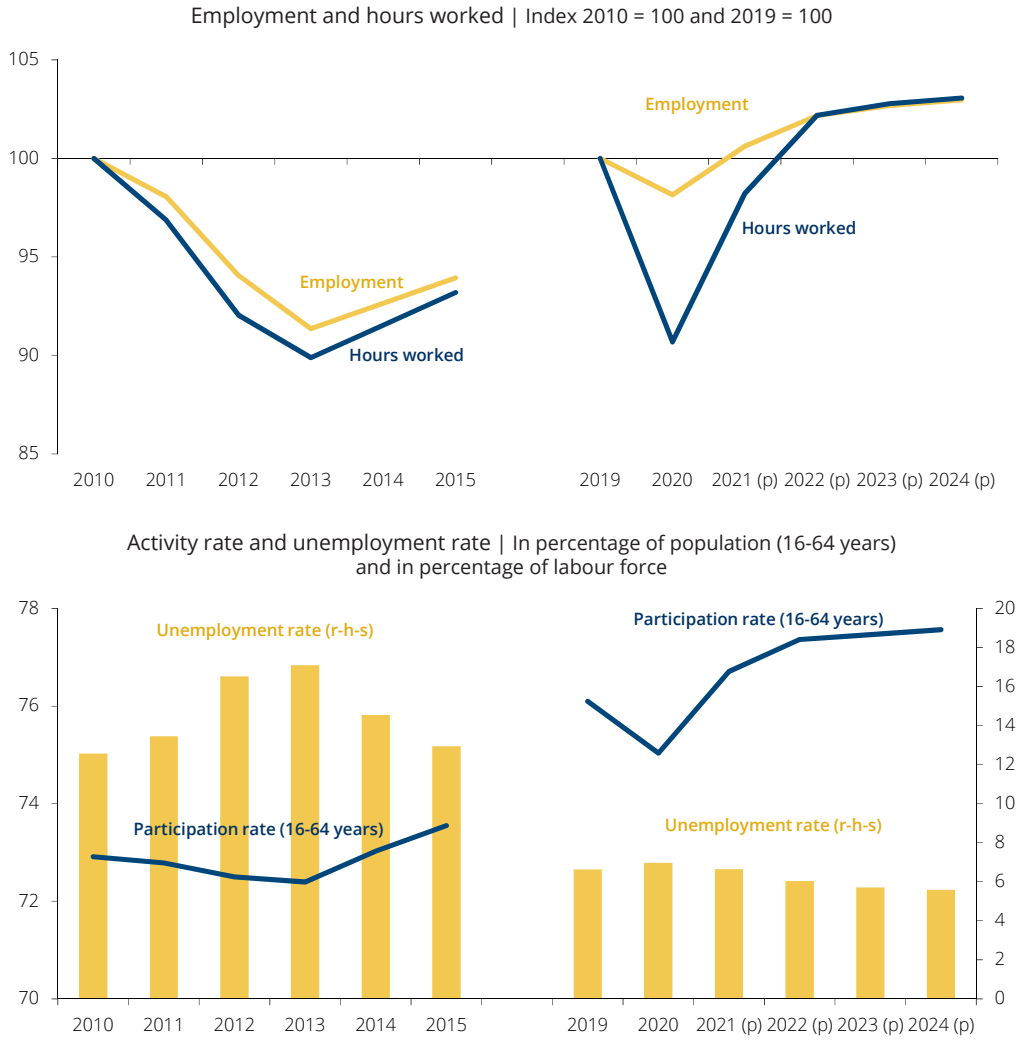
Sources: Banco de Portugal and Statistics Portugal. | Notes: (p) – projected.

Labour market behaviour during the pandemic crisis stands in stark contrast to that observed in the previous crisis, with adjustment in employment and increase in the unemployment rate very contained in the recent recession. The profile of total hours worked also varied between the two episodes (Chart I.3.6). These developments largely reflect the measures to preserve employment relationships adopted during the pandemic crisis, which also supported the faster subsequent recovery in hours worked. Total employment exceeded its prepandemic level in the second quarter of 2021 and the average number of hours worked per person is expected to reach that level by the end of 2021. The recovery in employment has differed across sectors – with the number of employed persons in the most affected services standing below precrisis levels – and age groups (Box 5).

Employment continues to increase in the coming years, albeit at a gradually slower pace, affected by labour supply constraints. After rising by 2.5% in 2021, employment is projected to growth 1.6% in 2022 and 0.4%, on average, in the period 2023-24. Expected employment developments result from an increase in the labour force and a reduction in the number of unemployed, albeit with declining contributions over the projection horizon. The working

age population is estimated to broadly stabilise over the period 2021-24, with net migration largely offsetting the negative natural population balance. The participation rate will increase by around 1 p.p. in cumulative terms in 2022-24, owing to an increase in the retirement age and female participation. In 2021, the participation rate already stands above its prepandemic level, a historically high level and above that of the euro area, so room for further increases in the labour supply by this means is limited in the medium term. The labour underutilisation rate is at the lowest level of the past ten years, suggesting that the margin for employment to grow by incorporating unemployed or discouraged individuals has narrowed in the most recent period. According to the European Commission's Opinion Surveys, the percentage of firms indicating labour shortages as a factor limiting production increased in the most recent period in manufacturing and construction, to close to or above prepandemic levels, while remaining below in trade and services.

Chart I.3.6 • Comparison of the pandemic crisis with the 2011-13 crisis – Labour market

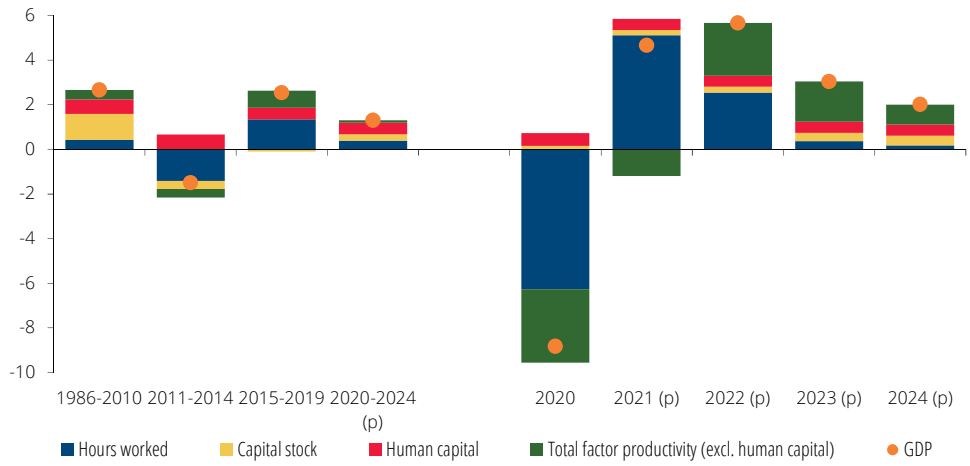


Sources: Banco de Portugal and Statistics Portugal. | Notes: (p) – projected.

After a slight increase in 2020, the unemployment rate will edge downwards over the projection period, dropping to 5.6% in 2024. The reduction in the unemployment rate benefits from the expected recovery in economic activity in the services sector.

Growth in economic activity will largely reflect the contributions from the recovery in hours worked in 2021-22 and from total factor productivity in 2022-24. A growth accounting exercise shows that, in 2023-24, hours worked will make a smaller contribution to GDP growth, against a background of a slowdown in employment (Chart I.3.7). The capital stock contributes positively to GDP growth, benefiting from buoyant investment in the coming years. The positive trend in the contribution of human capital continues over the horizon, reflecting the catching up of the average number of years of schooling in Portugal to the euro area average. Total factor productivity, after the fall in 2020 and in 2021, is projected to be the main driver of economic growth in the following years, standing at the end of the horizon close to that observed before the pandemic. The pandemic crisis resulted in production inefficiencies and lower accumulation of physical and human capital, but also created opportunities, for example faster dissemination of new technologies and investment in R&D, areas that will also be boosted by European funds from the NGEU. Positive effects are also expected from the reallocation of resources to more productive sectors and firms.

Chart I.3.7 • Annual rate of change of GDP and growth accounting contributions | Percentage and percentage points



Sources: Banco de Portugal and Statistics Portugal. | The growth accounting exercise is based on a Cobb-Douglas production function and decomposes the change in GDP into the contributions of labour (hours worked) and capital factors and their combined efficiency (total factor productivity). The bars on the left correspond to the average values for the periods indicated.

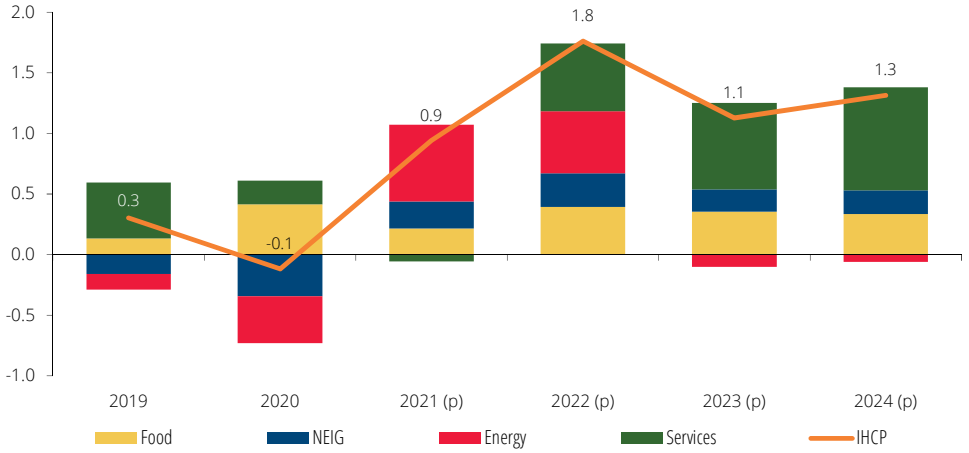
Over the projection horizon, wages will grow by around 3%, slightly below the rate recorded before the pandemic. The projections include a 6% minimum wage increase in 2022, following a 4.7% increase in 2021. The more moderate wage growth compared to the prepandemic period reflects the recovery in low wage jobs, which generates negative composition effects on total wages. This effect is partly offset by upward pressure associated with the reduction of the slack in the labour market.

Inflation will rise to 0.9% in 2021 and 1.8% in 2022, standing at 1.1% in 2023 and 1.3% in 2024 (Chart I.3.8). This upward profile followed by some moderation largely reflects developments in energy prices, which track international oil prices. After falling by 5.2% in 2020, the HICP for energy goods will increase by 7.8% in 2021 and 6.3% in 2022, and decline by 1.0% on average in 2023-24.

Excluding the energy component, inflation increases over the horizon, from 0.3% in 2020 to 1.5% in 2024, reflecting rising external pressures, recovering demand for services and the

buoyancy of wages. The rise in prices of commodities and intermediate goods and in transport costs will continue to contribute to the increase in import prices, particularly in the first half of 2022, exerting upward pressure on goods prices in Portugal. In addition, over the projection horizon, the recovery in tourism related services will lead to prices returning to the levels observed in the prepandemic period. This rebound is expected to have a significant impact on inflation in 2022 and, to a lesser extent, in 2023. Finally, the reduction in labour market slack is anticipated to result in higher wages and in some pressure on prices. Underlying the projection is a recovery of profit margins in 2022-24 following significant falls during the pandemic.

Chart I.3.8 • HICP annual rate of change and main contributions | Percentage and percentage points



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

Compared to the Eurosystem's projections for the euro area, consumer prices increases will be lower in Portugal. The inflation differential is expected to become less negative over the horizon, from 1.7 p.p. in 2021 to 0.5 p.p. in 2024. In 2021, the differential mainly results from more subdued growth in services and energy prices in Portugal, the former reflecting a higher impact of depressed demand for tourism related services and the latter a lower passthrough of the increase in international oil prices and other energy costs. These effects fade over the horizon, amid a recovery in the tourism sector and a drop in international oil prices.

4 Risks

The balance of risks surrounding the projections for activity is skewed downwards in the short term. The predominant downside risk is associated with a further worsening of the pandemic situation, requiring more restrictions, with impact on economic agents' confidence and on activity. The greater persistence of global supply chain disruptions remains an additional factor of uncertainty.

Over the medium term, risks to activity are balanced. On the one hand, there is an upside risk arising from part of the savings accumulated during the pandemic being channelled into private consumption, which would contribute to stronger growth in activity. Since the beginning of 2020 and until the second quarter of 2021, households' additional accumulation of savings – against a scenario using the pre-pandemic savings rate – amounted to €11.5 billion, 5.4% of GDP. On the

other hand, there is a risk that the consequences of the crisis may be more persistent for the economic sectors most affected by the pandemic.

Risks to inflation are skewed upwards. These risks stem mainly from the possibility of a greater pass-through of the increases in commodity and intermediate goods prices to consumer prices. The recent rise in inflation, together with hiring difficulties experienced by some sectors, may also imply stronger wage pressures than envisaged in the projection. The possibility of minimum wage rises in 2023-24 also constitutes an upside risk to inflation.

5 Conclusions

Following the historic fall in GDP in 2020 (–8.4%), the Portuguese economy is expected to recover strongly in 2021 (4.8%) and 2022 (5.8%), keeping a more moderate pace of expansion in 2023 and 2024. Economic activity will rebound to pre-crisis levels in the first half of 2022, but the recovery is asymmetric across economic sectors. In 2024 economic activity will stand approximately 7% above its 2019 level, implying contained losses compared to the trend projected prior to the pandemic.

The Portuguese economy faces major challenges over the next few years, with the economic policy response being crucial to ensure sustained growth and the return to convergence with Europe. The predictability of economic policy decision-making processes (monetary, fiscal, regulatory) is essential to counterbalance the heightened uncertainty usually experienced at the exit of economic crises. At present, the need to control the pandemic accrues to the uncertainty.

The efficient execution of projects under the Recovery and Resilience Plan (RRP) and the implementation of associated reforms are key factors, given the multiplier effects on activity and the impact on potential growth. This is a unique opportunity to speed up the Portuguese economy's pace of long-term growth in a context where the direct impact on national indebtedness is essentially null.

The economic conditions necessary for the reallocation of physical and human resources in response to digital and climate transitions should be nurtured, notably in the context of the RRP. The country should resume the declining trend on indebtedness, particularly in the public sector, after the interruption required by the pandemic.

Adverse demographic trends – with prospects of continuing negative natural balances and population ageing – mean that labour force growth in the coming years is conditional on the ability to ensure positive net migration, by attracting foreign labour and retaining domestic workers. These flows have been positive since 2017 and their maintenance or even reinforcement is a crucial factor for the sustained growth of the Portuguese economy.

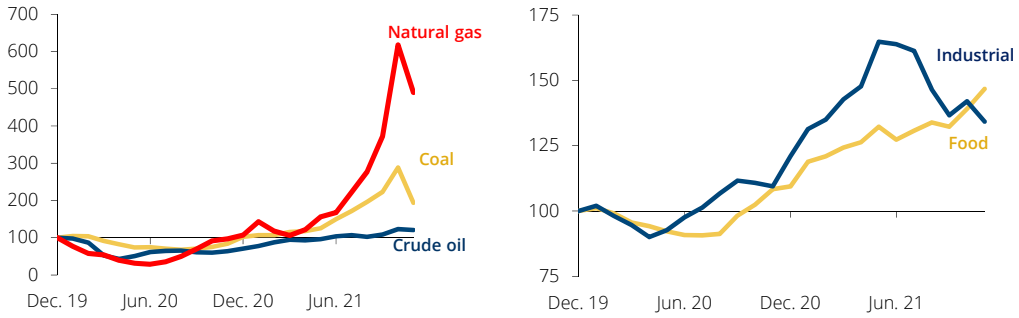
Finally, the increase in skills is a key collective objective. This requires an increase in the share of young people completing at least secondary education and the design of active policies that make it easier for workers to adapt to ongoing changes.

The attainment of these objectives will result in an increase in productivity, the only result that guarantees, amidst the challenges faced by the Portuguese economy, sustained and inclusive growth and the return to the process of real convergence with the euro area.

Box 1 • Rising commodity prices in 2021

Commodity prices rose broadly and markedly in 2021, following the low levels reached in the previous year (Chart C1.1). Natural gas prices increased fivefold and coal prices doubled, reaching record highs in Europe and Asia, with the global dimension of these increases being unprecedented. Oil prices in euro rose by 72% between the beginning of the year and the end of November. Food and industrial commodity prices also grew in the same period by 34% and 11%, respectively. In the case of wood, iron and steel, prices stood at record highs by mid-year. There has been a slowdown in most commodities' prices in the most recent period.

Chart C1.1 • Price of commodities | Index 2019 December = 100



Source: Hamburg Institute of International Economics (HWWI). | Notes: HWWI price commodity index, in euros, is an indicator for the prices of major commodities traded internationally.

A common factor to these increases is the speed and synchronicity of the global expenditure rebound – more oriented towards goods instead of services, with an impact on demand for commodities and other intermediate goods – and the slower expansion of supply (Chart C1.2). This slow reaction is linked to low investment – which was already visible in some sectors, such as oil exploration, in the period preceding the pandemic and that became more pronounced during the crisis – as well as disruptions caused by adverse weather conditions, infrastructure maintenance works and pandemic control measures.

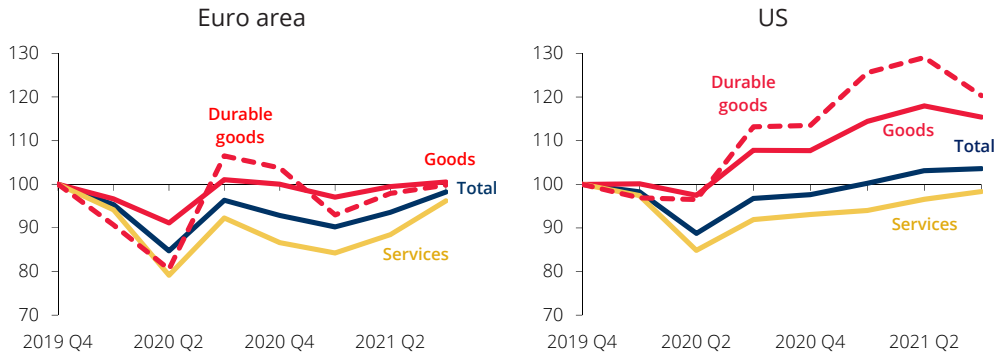
The rise in natural gas prices partly reflected the weather conditions that constrained hydro and wind energy production. This also implied increased pressure on prices of other primary sources of power and heating generation, such as oil and coal, due to insufficient supply. In the case of oil, production remained constrained by OPEC decisions. Rising energy prices led to higher costs for the metallurgical industry, also affected by the increase in emission prices, and for the food sector through fertiliser prices. In the case of food and agricultural commodities, unfavourable weather conditions affected several harvests. The increase in prices of this type of goods also reflected export restrictions and stock building in response to the pandemic, as well as strong demand for biofuels.

There are also signs of relative scarcity of other intermediate goods. An important example is the semiconductors industry, a crucial supplier for the manufacturing of computer and electronic equipment and cars. Problems in the transport of goods have been an additional factor, affecting firm costs and extending delivery times. This has been evident in sea transport, reflecting the scarcity of containers and the bottlenecks in key ports, partly associated with health restrictions.

The pressures on the prices of commodity and other intermediate goods should be temporary. In addition to the adaptation of supply and the gradual dissipation of supply chain bottlenecks,

a reorientation of global expenditure from goods to services is expected as the recovery continues, which will help moderate the global demand for commodities. According to the Eurosystem's assumptions, based on futures markets, oil prices in 2022 will remain above the 2021 average, but decrease in 2023 and 2024. Non-energy commodity prices in euro, after a sharp rise in 2021, will remain high in 2022 and decline in the following years. However, these prices will stand above those of 2020 by the end of the horizon and there are risks of a higher degree of persistence of the supply-side problems.

Chart C1.2 • Breakdown of private consumption – euro area and US | Index 2019 Q4 = 100



Sources: Eurostat and Federal Reserve Bank of St. Louis. | Notes: Data in volume. Euro area aggregation based on available data.

The impact of the increases in commodity prices on consumer prices in the euro area has been limited. The effect is most visible in the most volatile HICP components, particularly in energy goods. The correlation between changes in the HWWI commodity price index, in euro, and changes in energy consumer prices is close to 90% (Table C1.1). However, it should be noted that the transmission of the increase in oil prices and, in particular, in gas and electricity prices, to consumer prices has varied across euro area countries, reflecting differences in national policies on pricing and taxation. The correlation between commodity prices and core inflation (i.e. excluding energy and food) is quite small, not exceeding 25%. Notwithstanding, the magnitude and scope of current pressures, including on other intermediate goods' prices and transport costs, may result in a lower absorption capacity of firm costs, which, associated with demand buoyancy, may translate into a higher pass-through to consumer prices.

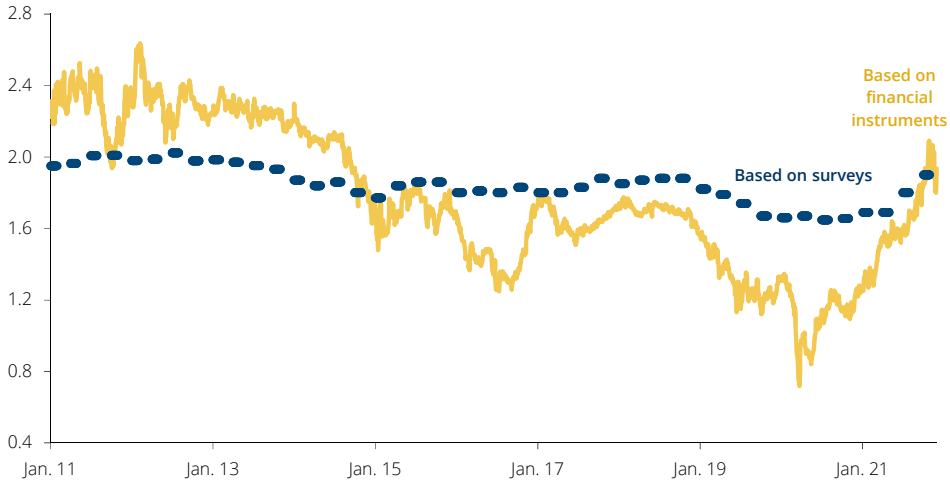
Table C1.1 • Correlations of year-on-year changes between commodities' prices and consumer prices | Per cent

		Inflation expectations	HICP			
			Total	Energy	Excluding food and energy	Non energy industrial goods
Index of commodities	At t	48	67	87	13	22
	At t-6	44	63	67	25	20

Sources: Eurostat and Hamburg Institute of International Economics (HWWI). | Notes: Monthly correlations of year-on-year changes between HHWI index and HICP and between HHWI index and inflation expectations for average inflation during 1 year based on financial instruments 1 year-ahead. Correlations for the period between January 2002 and November 2021 (as from 2005 in case of inflation expectations).

The recent increase in inflation in the euro area mainly reflects temporary factors. Year-on-year inflation rose to 4.9% in November (-0.3% in December 2020), largely reflecting the energy component. Inflation excluding food and energy also increased, albeit to a lesser extent (from 0.2% in December 2020 to 2.6% in November 2021). In addition to the sudden rise in energy prices, the increase in inflation is linked to a recovery in demand above that of supply and to base effects, in particular the VAT increase in Germany. These factors should dissipate over the course of 2022. For now, there are no significant second-round effects on wages, which likely reflects the margin of resources still available in the labour market. However, labour market structure changes in the post-pandemic period may imply upside risks on wages. Moreover, despite long-term inflation expectations having risen recently, they remain anchored in the ECB's objective of maintaining inflation at 2% in the medium term (Chart C1.3).

Chart C1.3 • Long term inflation expectations in the euro area | Per cent



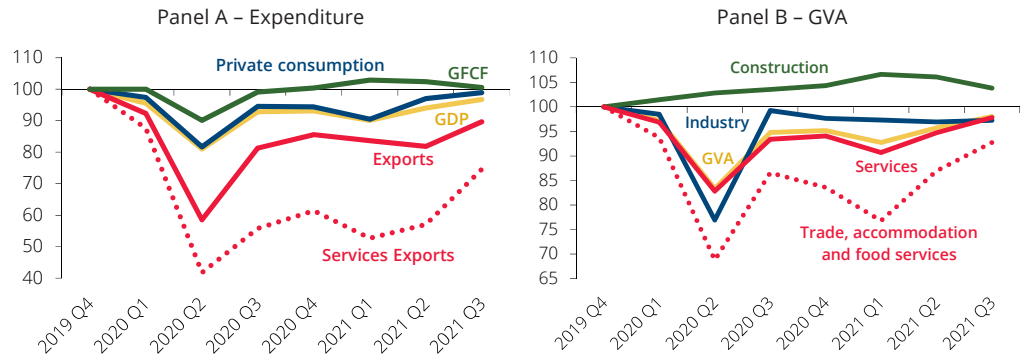
Sources: ECB (Survey of Professional Forecasters), Refinitiv and Banco de Portugal's calculations. | Note: Expectations for 5-year average inflation rates based on financial instruments 5 year-ahead. Expectations for 2-year average inflation rates based on surveys 4/5 years ahead.

Box 2 • Developments in economic activity in the third and fourth quarters of 2021

Economic activity grew 2.9% in quarter-on-quarter terms in the third quarter, with a 2% quarter-on-quarter growth being expected in the fourth quarter. These developments continue the recovery observed in the second quarter (quarter-on-quarter rate of change of 4.4%), following the 3.3% fall in GDP at the beginning of the year, related to the worsening of the pandemic and the implementation of general lockdown. The recent recovery reflects the gradual loosening of containment measures and the rise in confidence due to progress with vaccinations.

The recovery in the third quarter was export-driven, although domestic demand continued to grow. Export growth reflected the strong recovery in services, particularly tourism (Chart C2.1 – Panel A). Domestic demand grew at a slower pace than that of the previous quarter (quarter-on-quarter rate of change of 1.0%, after 4.9%). Private consumption slowed down, following a strong recovery in the second quarter that had been partly driven by the realisation of expenditure postponed during the lockdown at the beginning of the year. A drop in investment was recorded once again, of 2.2%, extended to construction components and also machinery and equipment components.

Chart C2.1 • Developments in economic activity | Index 2019 Q4 = 100



Source: Statistics Portugal (Quarterly National Accounts). | Notes: Seasonally and calendar effects adjusted data.The service exports series in Panel A differs from the one published by Statistics Portugal as it includes the totality of tourism exports (goods and services). Cut-off date of 30 November 2021.

Activity developments remained differentiated by activity sector (Chart C2.1 – Panel B), with GVA recording a relative stabilisation in industry (quarter-on-quarter rate of change of 0.3%), a 2.1% decrease in construction and a 3.3% growth in services, particularly strong in trade, accommodation and food (6.7%).

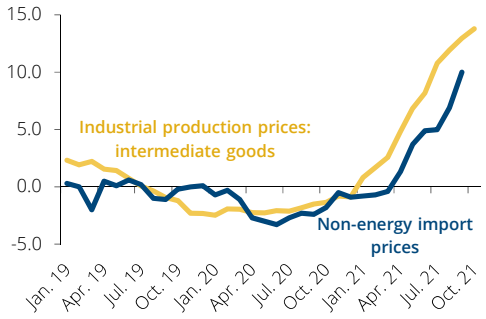
Global supply chain disruptions are reflected in the lack of commodities and intermediate goods for Portuguese producers, together with an increase in their prices (Chart C2.2). In October, the lack of materials was mentioned as an obstacle to production by 20% of firms in construction and 14% in industry. However, in the manufacture of computer and electronic products and motor vehicles, this percentage exceeds 30% (Chart C2.2 – Panel B). In the car sector, there were interruptions in production due to the lack of components, with an impact on the volume of exports.

The information available for the fourth quarter points to a continuation of the recovery in economic activity. Exports, especially services exports, and domestic demand components contributed to this growth. Confidence in services improved in October and November – moving closer to the 2019 average – reflecting a greater optimism regarding future demand developments (Chart C2.3 – Panel A). In industry, confidence stabilised in the same period, after a decrease in the third quarter. The

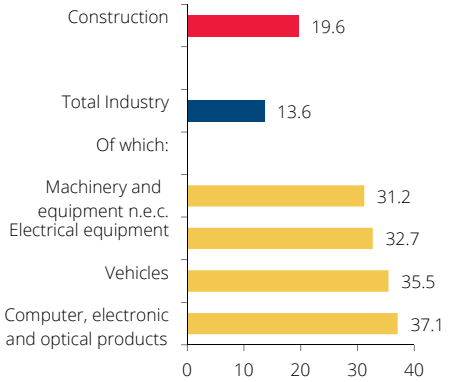
confidence of construction entrepreneurs has remained relatively unchanged, benefitting from a favourable outlook on demand related to the increase in European funds.

Chart C2.2 • Evidence on supply bottlenecks: Portugal

Panel A – Industrial production and import prices | Year-on-year growth rates, in percentage



Panel B – Shortage of material and/or equipment in industry and construction | Percentage of companies that refers this factor as limiting production in each sector/subsector in 2021 Q4 (november in the case of construction)

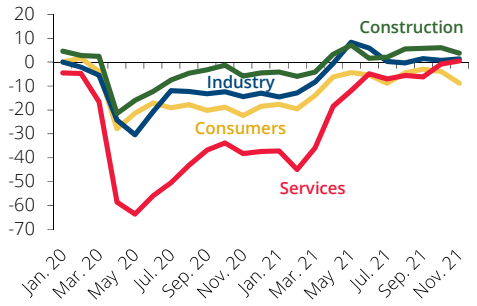


Sources: European Commission and Statistics Portugal.

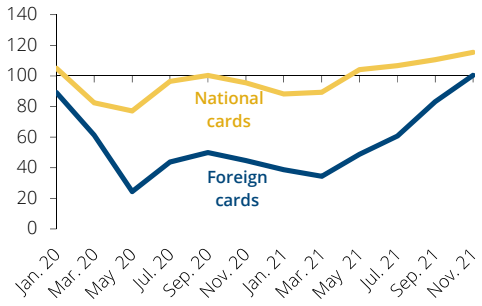
In terms of tourism exports, the indicator of withdrawals and payments with foreign cards continued to recover markedly in October and November (Chart C2.3, Panel B). Developments in the same indicator relating to Portuguese cards suggest that the consumption expenditure of residents continued to recover. However, consumer confidence decreased in November, mainly reflecting the most pessimistic expectations about the general economic situation in the coming months. These seem to be related to the recent worsening of the pandemic in Europe and the announcement of new restrictive measures in several countries. Developments in the pandemic situation imply heightened uncertainty about developments in economic activity at the end of the fourth quarter and in the first months of 2022, particularly in terms of private consumption and tourism exports.

Chart C2.3 • Recent developments in economic activity

Panel A – Confidence indicators | Deviation from the 2019 average



Panel B – Transaction amounts in ATM/POS in Portugal | Index 2019=100



Sources: Banco de Portugal, European Commission and SIBS. | Notes: Seasonally and calendar effects adjusted data. For November, the monthly estimate for transaction amounts in ATM/POS is based on the non-seasonally adjusted daily data available at the cut-off date (30 November).

Box 3 • Household saving during the pandemic crisis

The pandemic crisis was marked by an increase in the household saving rate, from 7.2% in 2019 to 12.8% in 2020 and 11.5% in the year ending in the second quarter of 2021. This rise in savings resulted in an increase in household wealth, reflected in accumulated deposits. With large amounts of accumulated savings, the outlook for private consumption and economic activity is conditional on decisions by households on how to use them over the projection horizon.

Consumption, saving and the characteristics of shocks and households

Household decisions are influenced by their characteristics as well as the nature of shocks. Following positive, temporary and unexpected wealth shocks, households in a sounder financial situation generally have a lower propensity to consume compared with households with limited financial resources.

Two brief considerations should be made in the context of the pandemic. The first relates to the percentage of the increase in savings resulting from postponing consumption decisions. This postponement was not mainly the result of income shocks, but rather of the inability to incur certain consumption expenditures. These expenditures may or may not materialise once the pandemic crisis is over. The second relates to the theory of consumption and permanent income, as suggested by Milton Friedman in 1957. Household decisions depend on the permanent or temporary nature of the shock; this includes increased uncertainty about the future, which is in itself an income shock. Faced with a temporary shock, households are expected to resume their previous consumption and saving patterns. How they adjust – a smooth or abrupt transition – is in itself relevant to the economic outlook.

The 2020 Portuguese Household Finance and Consumption Survey, which was conducted between October 2020 and February 2021, includes questions to characterise the saving behaviour of households in different financial situations during the pandemic crisis, providing an outlook for developments in private consumption.

Changes in savings

In the 2020 survey, households were asked whether the amount they had saved in the 12 months prior to the interview was lower, equal to or higher than usual. In this type of qualitative question, there is a tendency for most households to report unchanged situations and negative developments. In the 2020 survey, 59% of households found that their savings were the same as usual; 30% reported lower savings than usual and 11% higher savings (Table C3.1). However, compared with 2017, the share of households with higher than usual savings increased from 4% to 11% in 2020.

This increase was broadly based across all income quintiles, levels of education and age groups, but was more significant in the 35-44 age group, in tertiary education and in the last income quintile. In 2020 the share of households that saved more than usual displays a growing profile with income more marked than in 2017. While in the first income quintile 3% of households reported having saved more than usual (2% in 2017), in the last quintile this share stood at 22% (8% in 2017). Of the households saving more than usual, 39% are in the highest income quintile and 50% have tertiary education. By age groups, these households are concentrated in the 35-64 age group.

Among the households that saved more than usual, 55% reported a decline in expenditure, 20% reported an increase in income and 25% reported both situations (Table C3.2). The preponderance of changes in expenditure is broadly based across all groups of households, with the exception of households in the 35-44 age group. Compared to 2017, these data reflect more reductions

in expenditure than increases in income. In addition, the variability of these two factors among different types of households is generally lower in 2020 compared with 2017.

Table C3.1 • Comparison of savings with the usual amount | Percentage of households

	2020					*Memo:* 2017			
	Lower	Equal	Higher	Total	Higher (composition of the households)	Lower	Equal	Higher	Total
Total	30	59	11	100	100	33	63	4	100
Age of the reference person									
<35	33	53	15	100	7	30	56	14	100
35-44	35	45	19	100	31	39	55	6	100
45-54	35	55	11	100	21	38	58	3	100
55-64	32	57	11	100	21	30	66	4	100
65-74	24	67	9	100	14	30	69	1	100
>=75	23	73	4	100	6	25	74	1	100
Education of the reference person									
Lower than secondary	29	65	6	100	31	30	68	2	100
Secondary	37	52	11	100	19	34	59	6	100
Tertiary	29	49	22	100	50	40	51	9	100
Income percentile in 2019									
<=20	32	65	3	100	5	31	67	2	100
20-40	37	58	6	100	11	30	67	3	100
40-60	29	63	9	100	16	32	65	3	100
60-80	28	56	16	100	30	34	60	6	100
>80	26	52	22	100	39	36	56	8	100

Source: ISFF 2017 and 2020. | Note: In the ISFF 2020, households were asked about the amount of savings in the last 12 months and in ISFF 2017 about the amount of savings in the last three years.

Table C3.2 • Source of savings in excess of the usual amount | Percentage of households

	2020				*Memo:* 2017			
	Increase in income	Decline in expenditure	Both situations	Total	Increase in income	Decline in expenditure	Both situations	Total
Total	20	55	25	100	41	34	25	100
Age of the reference person								
<35	17	30	53	100	51	21	28	100
35-44	35	35	29	100	39	32	29	100
45-54	12	60	28	100	41	51	8	100
55-64	8	71	21	100	30	35	35	100
65-74	19	68	13	100	16	69	15	100
>=75	13	77	10	100	41	29	30	100
Education of the reference person								
Lower than secondary	17	62	21	100	31	47	22	100
Secondary	27	49	24	100	45	24	31	100
Tertiary	19	53	29	100	47	27	26	100
Income percentile in 2019								
<=20	27	53	20	100	33	58	9	100
20-40	24	58	18	100	22	51	27	100
40-60	11	67	22	100	47	16	37	100
60-80	13	51	37	100	37	38	26	100
>80	26	52	21	100	50	26	24	100

Source: ISFF 2017 and 2020.

Reasons to save

In 2020, of total households that saved more than usual, 69% reported that this was unplanned, 23% reported that they had saved more mainly because they were more uncertain about the future,

and 7% stated other reasons (Table C3.3). The importance of unplanned savings has increased as compared to 2017 and become the main reason for the increase in savings across all groups of households. This reflects the common nature of the shock and suggests that the pandemic containment measures and contagion fears have been key determinants of savings.

Table C3.3 • Reason for saving more than usual amount | Percentage of households

	2020				*Memo:* 2017			
	Without having planned	Uncertainty	Other	Total	Without having planned	Uncertainty	Other	Total
Total	69	23	7	100	46	37	16	100
Age of the reference person								
<35	77	20	3	100	42	42	16	100
35-44	51	35	13	100	51	28	22	100
45-54	77	18	5	100	56	19	25	100
55-64	77	20	2	100	39	52	9	100
65-74	75	15	10	100	37	62	1	100
>=75	89	11	1	100	55	45	0	100
Education of the reference person								
Lower than secondary	65	25	11	100	37	38	25	100
Secondary	63	30	8	100	55	40	5	100
Tertiary	75	20	5	100	49	35	15	100
Income percentile in 2019								
<=20	46	27	27	100	39	47	14	100
20-40	73	23	4	100	26	42	32	100
40-60	70	21	9	100	39	43	17	100
60-80	68	27	5	100	46	44	10	100
>80	72	21	7	100	58	26	16	100

Source: ISFF 2017 and 2020.

Savings investment

Finally, households that saved more than usual were asked how they invested the additional funds. In 2020, 66% of households invested these funds in deposits, savings/Treasury certificates or cash, 18% in other financial assets, 14% in real assets and 16% used the additional savings for extraordinary debt repayments (Table C3.4). Compared to 2017, these data reflect an increase in investment in deposits, savings/Treasury certificates or cash and, to a lesser extent, in debt repayments and a decline in investment in other assets. The increase in investment in deposits was broadly based across all types of households.

Potential impact of accumulated savings on consumption

The outlook for consumption is partly dependent on households' decisions on how to use the wealth accumulated during the pandemic crisis as well as on the unwinding of the pandemic and the degree of intertemporal substitution of postponed consumption. In a context where the increase in savings is likely to have been mostly involuntary and is mainly invested in highly liquid assets, there may be a higher pass-through to consumption in the short to medium term than in past shocks. However, there are reasons why a significant share of the accumulated savings may not translate into higher consumption. While the increase in savings during the pandemic crisis was broadly based, it was more concentrated among the groups of households with higher savings and a lower propensity to

consume, such as households with higher income and education levels and in middle age classes. In addition, the wealth increase observed during the pandemic will probably not imply changes to consumption, given the temporary nature of the underlying shock. Finally, after an unexpected negative shock, households may choose to keep higher amounts of precautionary wealth than in the past.

Table C3.4 • Investiment of the savings in excess of the usual amount | Percentage of households

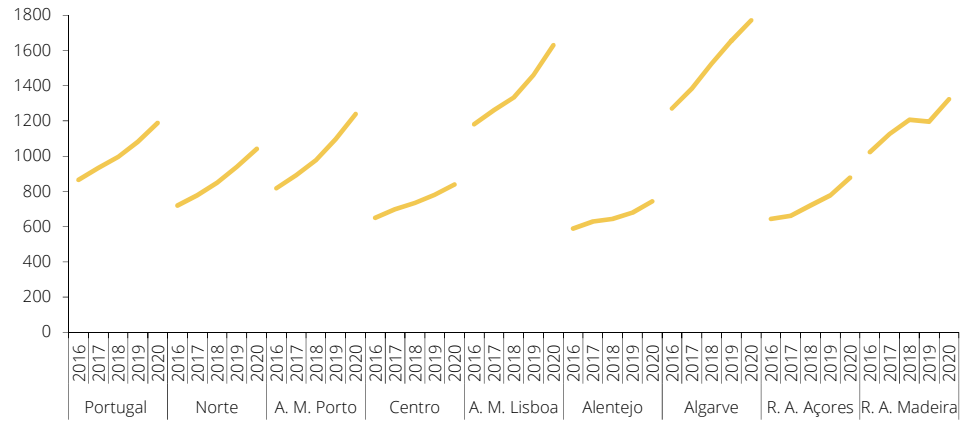
	2020				*Memo:* 2017			
	Real assets (eg real estate properties, businesses, cars)	Deposits, saving certificates, Treasury certificates and cash	Other financial assets (eg investment funds, retirement savings plans, shares, bonds)	Extraordinary debt repayments	Real assets (eg real estate properties, businesses, cars)	Deposits, saving certificates, Treasury certificates and cash	Other financial assets (eg investment funds, retirement savings plans, shares, bonds)	Extraordinary debt repayments
Total	14	66	18	16	26	41	28	10
Age of the reference person								
<35	15	79	6	0	31	46	16	8
35-44	9	63	18	13	30	30	34	10
45-54	19	62	16	9	28	45	28	12
55-64	14	67	23	3	15	51	26	13
65-74	17	61	21	2	26	35	46	1
>=75	6	87	15	1	1	15	75	9
Education of the reference person								
Lower than secondary	21	58	21	2	28	41	17	17
Secondary	12	73	9	12	37	38	21	5
Tertiary	11	67	19	7	18	43	40	7
Income percentile in 2019								
<=20	19	74	1	0	15	55	11	2
20-40	11	51	15	25	41	17	15	28
40-60	14	57	20	12	32	47	16	5
60-80	13	67	22	2	25	54	22	3
>80	14	71	15	5	22	35	40	10

Source: ISFF 2017 and 2020.

Box 4 • Impact of non-resident investment and tourist accommodation on house prices at the local level

According to the House Price Index published by Statistics Portugal, the annual average growth rate of house prices in Portugal in 2017-20 stood at 9.4%. The median value per square metre grew by 37.2% in cumulative terms over that period. At NUTS II level, and despite the general upward trend, the magnitude of changes varied. The Área Metropolitana do Porto stands out with a 51.6% increase in median value. In the Área Metropolitana de Lisboa, the Algarve and the Região Autónoma dos Açores, prices increased in line with the country as a whole, while in the Centro region, the Região Autónoma da Madeira and Alentejo growth was close to 30%. The Algarve and the Área Metropolitana de Lisboa have the highest median values per square metre, exceeding €1,600 in 2020 (Chart C4.1).

Chart C4.1 • House prices at the local level by NUTS II | Median value in EUR/m²



Source: Statistics Portugal (House Price Statistics at Local Level). | Note: The Área Metropolitana do Porto belongs to the NUTS III (Nomenclature of Territorial Units for Statistics) classification, being included in the Norte region in the NUTS II classification.

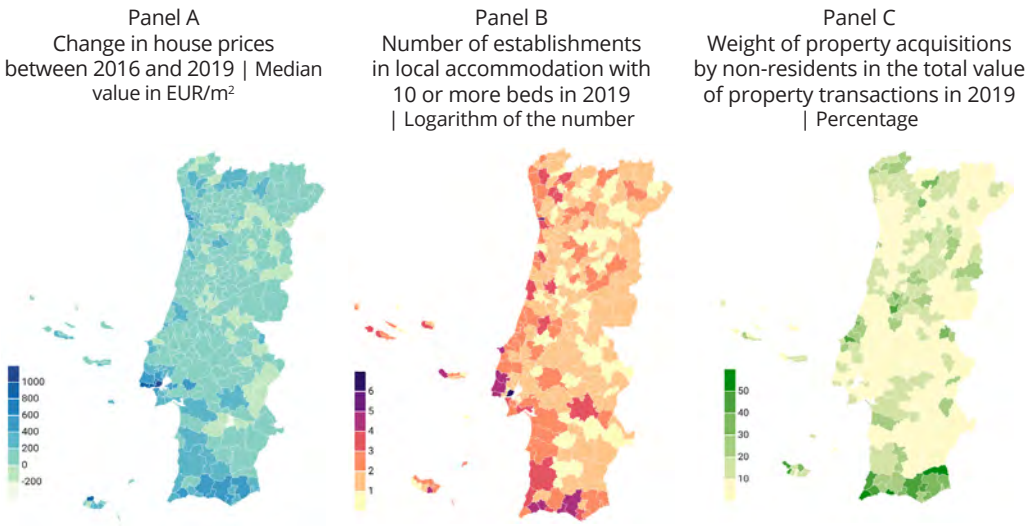
The role of non-residents has been pointed out as relevant to the momentum in house prices in Portugal, directly via their investment, or indirectly through the demand for tourist accommodation services. Purchases of real estate by non-residents rose by 14.8% in annual average terms over the period 2016-19. The weight of purchases by non-residents in the total value of transactions increased by around 1 p.p. over the period under review, reaching 13.3% in 2019. Driven by buoyant tourism, the number of local accommodation establishments also followed an overall upward trend, with an average annual increase of 25% in 2016-19, notably in the Área Metropolitana de Lisboa region.[3] The magnitude of the effect of these factors can be assessed by exploiting the heterogeneity across municipalities of house prices, tourism investment in local accommodation and house purchases by non-residents.

House prices tend to be higher on the coast than in the countryside, where there was also the largest increase between 2016 and 2019 (Chart C4.2 – panel A). At the same time, local accommodation

3. The data refer to local accommodation establishments with ten or more beds surveyed by Statistics Portugal in the context of Tourism Statistics. The authors would like to thank Statistics Portugal for swiftly making available these data as well as other information used in this box. The use of information included in the *Registo Nacional de Alojamento Local* (Portuguese registry of local accommodation) was also considered. This also covers establishments with less than ten beds, but includes all registered establishments, even those not in operation. The results of the regression analysis presented in this box are not materially affected by this option.

establishments are mainly concentrated in the municipalities of Lisboa and some of the Algarve, with little expression in the rest of the country (Chart C4.2 – panel B). The Algarve region is also where purchases of real estate by non-residents have greater weight in the total value of real estate transactions (Chart C4.2 – panel C).

Chart C4.2 • Maps by municipality



Source: Statistics Portugal. | Note: Municipalities with no available data are omitted from the maps.

To measure the impact on house prices of investment in local accommodation and purchases by non-residents, a regression model was estimated with quarterly panel data by municipality from 2016 to 2019. Descriptive statistics of the variables included in the regression are presented in Table C4.1.

Table C4.1 • Database descriptive statistics

	Unit of measurement	Average	Standard deviation		
			Total	Between	Within
House prices at local level (*HPLL*)	Median value of sales, in euros per square meter	621	347	337	87
Local accommodation establishments with 10 or more beds (*LA*)	Number	6	24	22	8
Weight of property acquisitions by non-residents in the total (*WeightNResid*)	Percentage	11	11	10	5
Resident population (*Pop*)	Number of individuals	35 235	57 069	57 164	388
Stock of deposits held by residents (*Dep*)	Millions of euros	469	1528	1530	68

Sources: Banco de Portugal and Statistics Portugal (authors' calculations). | Notes: The sample covers the period 2016 Q1-2019 Q4 and includes data for 288 municipalities, excluding R. A. Açores. Given the annual frequency of the series ***WeightNResid*** and ***Pop***, we considered a constant weight of non-resident acquisitions and population throughout the year in each municipality. The decomposition of the standard deviation results from the evaluation of the dispersion of the values of each variable x_{it} into an intermunicipal component, considering the dispersion of the average over time by municipality $(\bar{x}_i - \bar{x})$ and into an intramunicipal component $(x_{it} - \bar{x}_i + \bar{x})$, where $\bar{x}$ corresponds to the overall national average (unweighted).

The regression results are as follows:

$$\ln HPLL_{i,t} = \underset{(7.17)}{0.05} \ln LA_{i,t} + \underset{(4.02)}{0.17} WeightNResid_{i,t} + \underset{(13.6)}{3.1} \ln Pop_{i,t} + \underset{(5.63)}{0.12} \ln Dep_{i,t} + \alpha_i + \mu_t + \varepsilon_{i,t},$$

$i = 1, \dots, N \;\; e \; t = 1, \dots, T$

$$R^2 = 0.98 \qquad F(4, 4274) = 63.64\ [0.00]$$

HPLL corresponds to house prices per municipality, ***LA*** to the number of local accommodation establishments, ***WeightNResid*** to the weight of real estate purchases by non-residents in the total value of real estate transactions, ***Pop*** to the resident population and ***Dep*** to the stock of deposits held by residents. α_i denotes the fixed effect of the municipality ***i***, whereas μ_t corresponds to a time fixed effect. $\varepsilon_{i,t}$ corresponds to the regression residual. The inclusion of these fixed effects implies that the other determinants help to explain the deviations from the average over time of each municipality. ***ln(.)*** denotes the natural logarithm of the respective variable and ***t*** indexes time. To take into account the relative importance of municipalities in determining national prices, observations were weighted by the number of transactions carried out in each period. Robust t-ratios are reported in brackets for the estimated coefficients, the coefficient of determination ***(R^2)*** and the ***F***-statistic of global significance of the model, with the respective probabilistic value.

The results show a positive and statistically significant impact of (i) the number of local accommodation establishments and (ii) the weight of purchases by non-residents on house prices. The contribution of each variable to the national average change in house prices can be approximately computed as the product of its average annual change by the respective estimated coefficient. As such, around 1 p.p. of the 7.6% average annual national change in house prices is due to developments in local accommodation (approximately ⅛). The contribution of the weight of purchases by non-residents to house price developments is marginally positive. The estimated coefficient for the demographic variable shows that municipalities with the strongest growth in the resident population tend to have higher price increases and vice versa. Given the decline in the Portuguese population over this period, the resulting potential impact on demand was -1.5 p.p. for the average annual change in house prices. Deposits are used as a proxy for financial wealth, contributing on average 0.1 p.p. to annual house price growth. The remaining average change in national prices is explained by determinants not explicitly included in the model, e.g. those related to credit conditions. These determinants, when common to all municipalities or constant over time in each municipality, are captured by fixed effects per time period and per regression unit of observation.

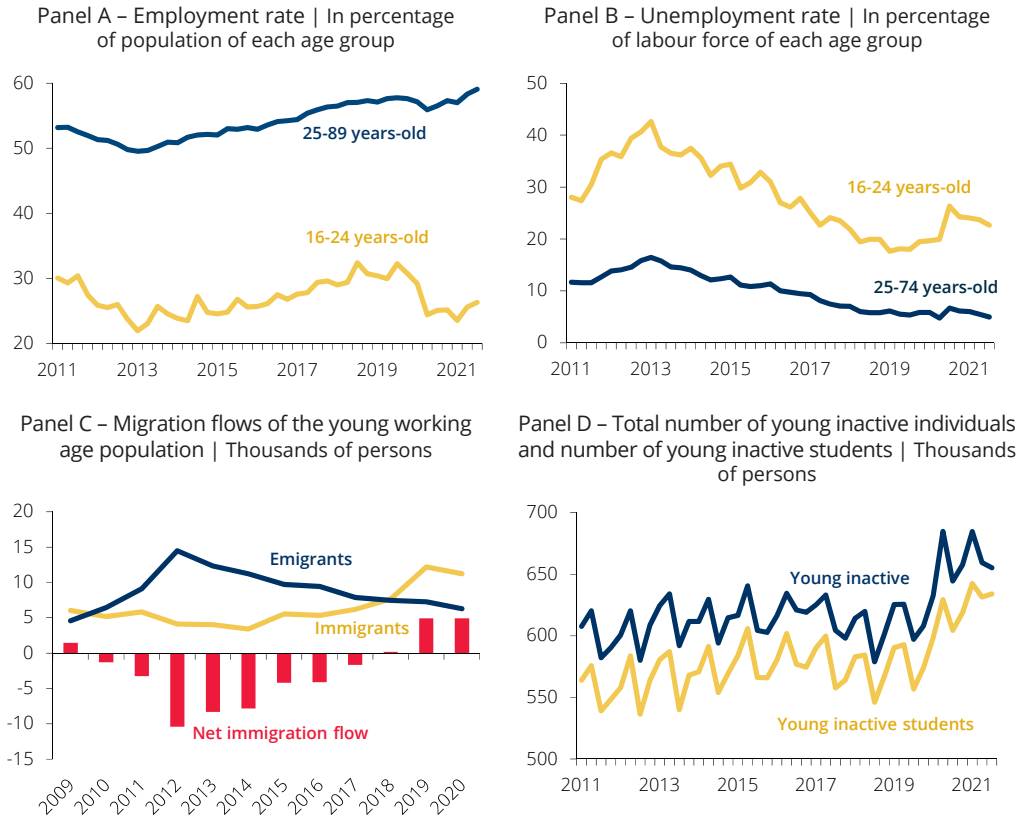
Results should be interpreted with caution, in particular due to the short sampling period of quarterly data with municipal granularity. Nevertheless, several robustness checks with alternative specifications were carried out, corroborating the conclusions presented.[4]

4. These include considering the one-period lagged variable ***WeightNResid*** as an alternative regressor, given the possibility of endogeneity between the price and the value of real estate transactions. The median value of gross reported income declared by taxpayers was also included in the model as a control variable, but the estimated coefficient was non-significant, which can be due to its low variability over the sampling period in each municipality. The stock of dwellings and the number of unemployed persons per municipality were also considered as regressors, but their information content for the regression is similar to that of the variable ***Pop***.

Box 5 • Labour market outcomes for young people during the pandemic

The labour market outcomes for young people during the crisis were characterised by a slower recovery in employment and by prolonged education and training. With the onset of the pandemic crisis, the employment rate of young people aged 16-24 fell more sharply and remains below pre-pandemic levels (Chart C5.1). The youth unemployment rate declined in the first three quarters of 2021, but remains above that seen at the end of 2019.

Chart C5.1 • Indicators of the evolution of the labour market by age group



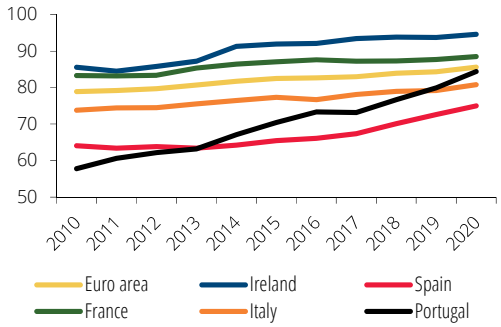
Source: INE (Labour Force Survey and Demographic Statistics). | Note: The age groups used for employment and unemployment are the relevant ones in the Labour Force Survey. The migration flows refer to permanent immigration/emigration, that is, the number of individuals which, during the reference period, entered/left the country with the intention of changing their residence for a uninterrupted period greater or equal to one year.

The resident young working-age population increased slightly due to net migration. In 2020, youth migration flows for persons aged 16-24 decreased, reflecting mobility restrictions during the pandemic. Both permanent emigration and permanent immigration declined, but maintained a positive balance similar to that of the previous year (Chart C5.1). In recent years, migration flows have helped to halt the sharp downward trend in the young population that had been in place since the early 2000s. As such, the resident population aged 16-24 has remained relatively stable since 2016.

With the pandemic, the number of young people studying or in training rose markedly. This increase boosts progress in the share of young people with upper secondary or higher education in Portugal compared to most European countries (Chart C5.2). This share is already very close to the euro area average for young people aged 25-29 and even higher for those under 25. Data from the Labour Force Survey (LFS) show that the rise in the inactive young population by 58.1 thousand

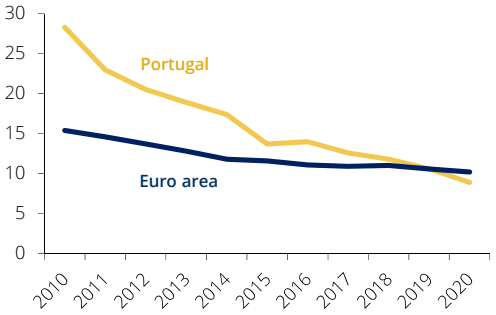
reflected the increase in youth studying or in training (62.8 thousand), which peaked in the first three quarters of 2021, accounting for 95% of inactive young people aged 16-24 (Chart C5.1). The lower employability of the less educated may have encouraged young people to extend their studies or increase their training. Despite stemming from the crisis, this behaviour is expected to continue in the future and to contribute to reducing the skill gap of the Portuguese labour force.

Chart C5.2 • Percentage of young population aged 25 to 29 with upper secondary or tertiary education



Source: Eurostat. | Note: The data includes the educational attainment levels 3 to 8 of the ISCED (2011) classification.

Chart C5.3 • Early leavers from education and training | Percentage



Source: Eurostat. | Note: Share of the young population aged 18 to 24 with at most lower secondary education who have not continued their studies or training.

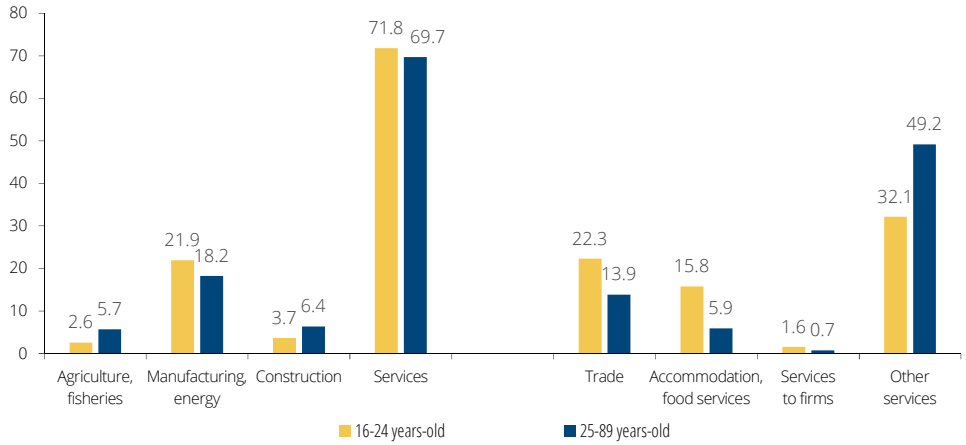
The completion rate for upper secondary education, the number of students enrolled in higher education and the number of young people in vocational training have all peaked. According to the Directorate General for Education and Science Statistics, in the 2019/20 school year, the completion rate for upper secondary education peaked at 85% (66% in 2010/11). In the 2020/21 school year the number of students enrolled in higher education reached a record high of 412 thousand, an increase of 26.7 thousand students compared to 2018/19. In turn, data from the Portuguese Institute for Employment and Vocational Training (IEFP) show an increase of 4 thousand young job seekers in special employment programmes (vocational training) over the past two years, amounting to close to 20 thousand in September 2021.

The number of jobless young people neither in education nor in training increased in 2020, but subsequently decreased to pre-pandemic levels. At European level, it is very common for young people to participate in the labour market only on a seasonal or part-time basis. Although lower than in other European countries, the share of young people working part-time is significantly higher than for the remaining age groups (20.5% on average in the first three quarters of 2021, compared with 6.6% in the population aged over 24). Most young people state that they work part-time to combine work with study, with this motive increasing in importance by 6 p.p. on average up to the third quarter of 2021. One of the major problems with the education system and therefore the increase in productivity in Portugal has acknowledgedly been the large number of early school leavers. The progress made in the last decade to reduce the share of early school leavers is a very positive indicator of the situation of young people in the Portuguese labour market (Chart C5.3).

The greater relative concentration of young employees in sectors particularly affected by the pandemic crisis has exacerbated their vulnerability. In 2019, the share of young people working in trade, accommodation and food service activities and business services was higher than for the remaining age groups (Chart C5.4). Of all the youths who lost their jobs during this crisis, 23.9%

were employed in trade and 21.9% in accommodation and food service activities, thus exceeding the weight of youth employment in these sectors. In comparison, of all workers aged 25-54 who lost their jobs during this crisis, 11.8% were employed in trade and 13.9% in accommodation and food service activities.

Chart C5.4 • Sectoral employment distribution by age group in 2019 | In percentage of employment in each age group by activity sector



Source: INE (Labour Force Survey).

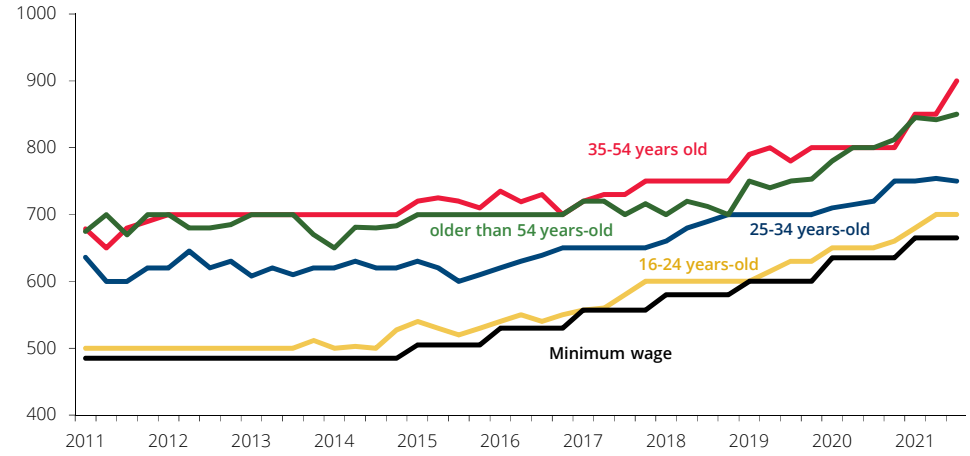
There is a higher prevalence of fixed-term contracts among younger workers, and such contracts are the most impacted type of contract in times of crisis. In 2019, 55.7% of young employees were on a fixed-term contract and 6.4% were on a contract for the provision of services. Using constant samples from the LFS, average flows show that, between the first quarter of 2020 and the third quarter of 2021, of all young employees who lost their job over this period, 57.4% were on fixed-term contracts and 20.7% were on a contract for the provision of services. For young people who found a job during this period, 70.6% did so through a fixed-term contract and 14.1% through a contract for the provision of services. However, considering all labour market flows, i.e. flows with a constant sample plus the effect of the quarterly renewal of the LFS sample, this dynamic resulted in a gradual reduction in the share of young people under fixed-term contracts, which stood at 52.7% of employees in the third quarter of 2021. In the first years of entry into the labour market there is, as a rule, a higher labour turnover. This turnover is usually associated with a better matching of skills and job characteristics and tends to stabilise throughout working life.

The median net wage of young people has been increasing in recent years, in tandem with the rise in the national minimum wage (Chart C5.5). This is also the case of the net wage for new young employees. Note that the entry-level median net wage of young people with higher education exceeds that in other levels of education (Chart C5.6). By sector of activity, there is also some heterogeneity, with the lowest value in construction and the highest in the most qualified services.

The increase in unemployment during the pandemic was higher among young people and has not yet reversed. According to the LFS, between the third quarter of 2019 and the third quarter of 2021 youth unemployment rose by 9.5%. Youth unemployment recorded in the Portuguese Institute for Employment and Vocational Training's employment centers rose mainly for those with upper secondary education and looking for new jobs who had worked in the services sector (Chart C5.7). The non-renewal of fixed-term contracts was the main reason for the increase in youth

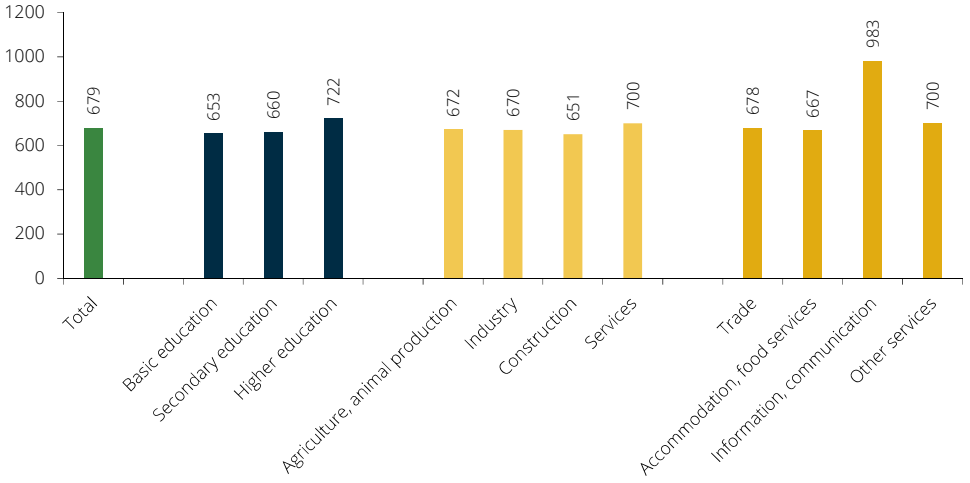
unemployment – accounting for around 60% of the increase – followed by the difficulty in finding a first post-study job, which represents approximately 20%. By seniority, almost half of the increase was among those registered for less than a year, but about 75% for those registered for less than 18 months. In geographical terms, the Algarve was the region on the Mainland most affected by youth unemployment, with a growth of 79%, followed by Lisbon Metropolitan Area, where it increased by 64%. These are regions where the services most affected during the crisis are strongly represented. These flows resulted in a change in the composition of youth unemployment, which before the pandemic crisis consisted mostly of young job seekers, particularly post-study. These situations have become scarcer and now have a similar weight to those of new job seekers due to the increase in the non-renewal of fixed-term contracts and, to a lesser extent, dismissals.

Chart C5.5 • Reported net salary by age group | In euros, of population of each age group



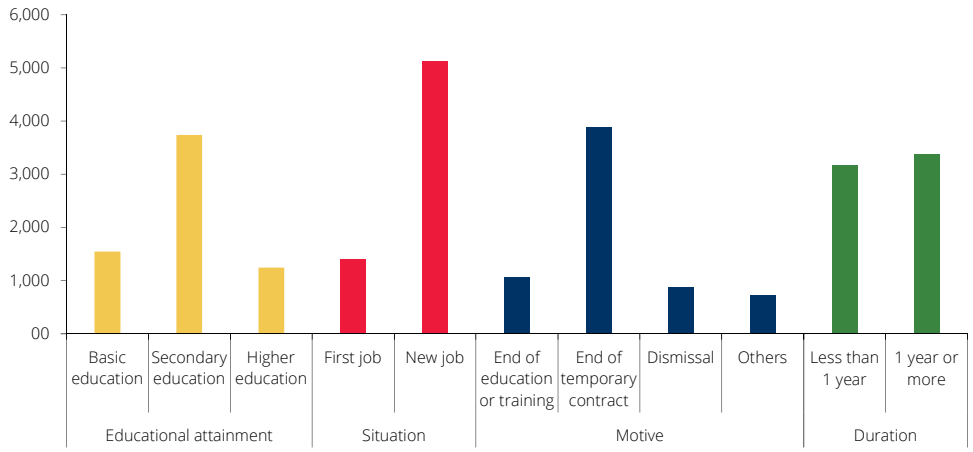
Source: INE (Labour Force Survey), Ministry of Employment, Social Security, and Solidarity, and calculations by Banco de Portugal. | Note: The values refer to full-time employment. The national minimum wage is reported in gross terms while the salaries reported in the Labour Force Survey are net of taxes and social security contributions.

Chart C5.6 • Median net salary of newly employed young workers by education and activity sector | Average of first three quarters of 2021 in euros



Source: INE (Labour Force Survey) and calculations by Banco de Portugal. | Note: the values refer to full-time employment. The salaries reported in the Labour Force Survey are net of taxes and social security contributions.

Chart C5.7 • Registered youth unemployment | Change beetween September 2019 and September 2021 (Number of people aged 16 to 24)



Source: IEFP. | Notes: Data for Mainland, which represents 92% of total youth unemployment recorded for Portugal in September 2021 and 95% of the total increase *vis-à-vis* September 2019. The educational attainment refers to the maximum completed level (basic, i.e. lower secondary level, upper secondary level or higher level). In spite of the concepts difference, during this period, the total change in the number of young unemployed registered at IEFP for Portugal (6.9 thousand persons) is very close to the one of the LFS (6.6 thousand persons).

II Special issue

Dynamics of productivity per worker in Portuguese firms over the 2014-19 period

Dynamics of productivity per worker in Portuguese firms over the 2014-19 period

Introduction

Productivity per worker in firms is one of the key elements in describing the economic situation. This Special issue seeks to analyse the evolution of productivity per worker in Portuguese firms between 2014 and 2019, which corresponds to the period between the end of the economic and financial assistance programme for Portugal and the onset of the pandemic crisis. This period of economic upturn was characterised by an increase in productivity and the maintenance of macroeconomic equilibrium in both public and external accounts.

The analysis of this Special issue is based on microdata (data per firm) and focuses on the evolution of employment and gross value added (GVA) from a sectoral perspective. In the sectors considered, productivity grew 0.6% on average – measured as GVA per worker – over the 2014-19 period.

Productivity and employment are very heterogeneous across firms in the economy. The distribution of these variables in 2019 (Charts 1 and 2) corroborates the fact, well documented in literature, that there is a high density at the lowest levels of productivity and employment and a relatively small number of firms with high values for these variables. In the productivity distribution and, above all, in the employment distribution, the average is higher than the median (profile similar to that of the Pareto distribution). In the presence of such heterogeneity, which is reinforced by sectoral differences, the analysis of productivity developments and the contribution of the two variables that are used in its calculation is a complex exercise, in particular when attempting to make the link with aggregate developments.

Chart 1 • Productivity distribution in 2019

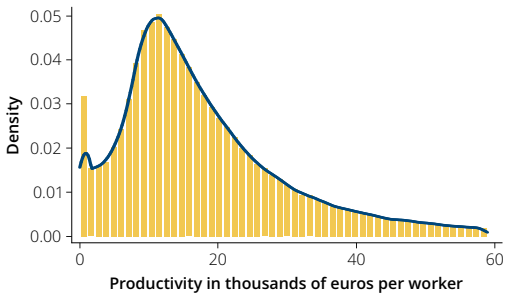
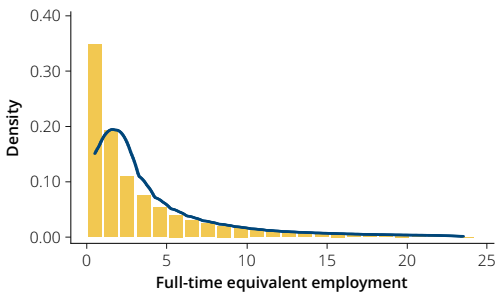


Chart 2 • Employment distribution in 2019



Source: Informação Empresarial Simplificada. | Note: To facilitate the reading of the graph, the productivity and the employment distributions are truncated at the 95th percentile.

Aggregate productivity developments reflect not only different sectoral developments, but especially very distinct behaviours along the productivity and the employment distributions. Aggregate productivity developments result from the evolution of the variable in each of the firms individually considered, but it is also influenced by the trajectories of firms with different weights in employment,

as well as by the reallocation of labour between firms with different productivity levels. When productivity dynamics are stronger in firms with a higher employment share, or when there is a reallocation of labour towards firms with higher productivity, this will contribute to more favourable aggregate productivity developments. The characteristics of the firms entering and exiting the market each year also contribute to the aggregate dynamics.

In this Special issue, these effects were analysed for a wide range of sectors in the 2014-18 period, for which the necessary information was available. Aggregate productivity varied by 0.6 per cent, on annual average. This figure can be decomposed in a positive contribution (5.5 percentage points) from the productivity variation of incumbent firms individually considered, i.e., excluding the impact of the allocation of labour between incumbent firms, and a negative contribution (-4.8 percentage points) from the interaction between productivity and employment, which can be understood as a structure effect. This structure effect resulted from two factors having a negative impact on aggregate productivity. The change in productivity was relatively greater in firms with a lower share of employment and, in parallel, the most productive firms lost share in employment. In turn, the contribution of business demography (entry and exit of firms from the market) was small, corresponding to -0.1 percentage points.

These results point to the importance of productivity growth across all firms, including the largest ones. Despite their lower contribution to aggregate productivity, the steady favourable trend in smaller firms, as observed in the period under consideration, will bring them closer to those with larger scale and better productivity performance.

Data

In this Special issue the main variable of analysis is productivity per worker, adjusted for part-time employment, i.e., the number of workers is measured against full-time working hours, an option that allows for comparison with previous work where the dynamics of Portuguese firms' productivity are discussed.[1] The use of productivity per hour worked would also have advantages, but this information by firm is less reliable. The use of total factor productivity (TFP) would also be a possibility. However, TFP is a different and equally relevant concept. Assuming a structure for the output function, TFP assesses the contribution to output growth not resulting from the accumulation of productive factors and is therefore computed as a residual. However, the greatest methodological complexity hinders the communication and interpretation of results.

The *Informação Empresarial Simplificada* (IES, simplified corporate information) is the dataset used in this analysis, combined with GVA deflators, with a 2-digit disaggregation, as released by Eurostat. It should be noted that the GVA deflation exercise is not completely accurate, not only because it is not based on information from individual firms but also because it does not allow for quality effects. For instance, if firms sell products with better technology and better quality at prices similar to the previous ones, this does not translate into improvements in productivity per worker. Therefore, although the opposite can also occur, productivity developments are likely to be underestimated by not taking these quality effects into account.

The IES contains information on the balance sheet and profit and loss account of the universe of Portuguese non-financial corporations, excluding sole proprietors. The dataset also includes ancillary information on the number of employees and the percentage of those working part-time. The analysis considered the firms that have reported on a regular basis, as well as those which

1. This topic was debated, inter alia, in the Special issues of the *Economic Bulletin* of October 2018 and May 2019.

stopped reporting for a maximum of one year.[2] The firms that reported having no employees were excluded (some missing observations in this variable were interpolated).

To ensure the robustness of the results, some tests were performed with different dataset compositions. For instance, to assess the impact on the distribution of variation in productivity and employment of the dynamics of entry and exit of firms in the market in each year, an analysis was carried out considering only the subset of firms in the dataset every year. As in the other cases, this robustness test concluded that the options taken for the data have no significant impact on the results reported in this Special issue.

This study includes firms from six sectors of activity covering most non-financial market activities: (a) manufacturing; (b) construction; (c) trade and repair; (d) transport and communications; (e) accommodation and food services; (f) other services and consultancy. The sectors considered yield around two thirds of the Portuguese economy's GVA. Due to specificities in the calculation of GVA or to the limited coverage in the IES, the primary sector, the financial sector, the electricity, gas and water sector, and the predominantly non-market activities (education and health) were not considered.

Productivity and employment over the 2014-19 period

This section analyses productivity and employment during the economic upturn, by considering groups of firms defined by the quartiles of the distribution of these variables, to capture the heterogeneity of Portuguese businesses. This option is due to the fact that these distributions are right-skewed, with a large mass of low-productivity and/or employment firms, with the average being heavily influenced by a small set of firms located on the right-hand side of distribution. Under these conditions, an emphasis on the variation of the average would convey an incomplete picture of the behaviour of firms across the various distribution segments.

The evolution of productivity

Table 1 shows that there was considerable sectoral differentiation in the evolution of overall average productivity. Most sectors showed increases, particularly strong in the case of trade and repair and accommodation and food services (17.5% and 9.4%, respectively, in cumulative terms between 2014 and 2019). In turn, other services and consultancy and, especially, the transport and communications showed productivity reductions, in cumulative terms, throughout this economic upturn. Accumulated productivity growth was 2.8% across all sectors.

Average productivity is not very different across sectors in the first three quartiles. In the last quartile, a few differences stand out, particularly in transport and communications, where average productivity is considerably higher. The variation in productivity between 2014 and 2019 was lower in the most productive firms, i.e., the rates tend to fall throughout the distribution, in all sectors.

Table 2 presents productivity by quartile of the employment distribution. As expected, there tends to be a monotonic relationship between productivity and firms' size (except for other services and consultancy). Overall, productivity growth was clearly lower in the top quartile of the employment distribution – an evolution that was particularly striking in construction, accommodation and food services and in other services and consultancy.

2. Firms with exactly two observation periods, interspersed with a single missing observation, were subject to a linear interpolation procedure; the remaining firms, with two or more missing observations, were not considered in the analysis.

Table 1 • Average productivity by quartile of productivity distribution and sector and variation between 2014 and 2019 | Euros per worker and percentage

	2014					Rate of change 2014-2019				
	p1-p25	p25-p50	p50-p75	p75-max	Total	p1-p25	p25-p50	p50-p75	p75-max	Total
Manufacturing	3,231	10,124	16,172	44,757	29,436	46.5	17.7	18.9	7.5	5.6
Construction	2,603	9,929	15,999	40,364	22,543	64.7	18.6	18.8	2.7	3.4
Trade and repair	1,692	9,886	16,655	43,092	28,006	63.9	20.4	19.3	12.9	17.5
Transport and communications	2,981	9,849	16,647	71,657	57,146	17.4	18.5	18.6	-2.2	-8.6
Accommodation and food services	2,639	9,773	15,904	33,917	15,680	78.8	17.7	17.5	13.3	9.4
Other services and consulting	3,097	9,945	16,172	56,346	27,381	27.3	17.7	15.6	-1.6	-3.4
Total	2,623	9,952	16,263	48,894	28,905	53.8	18.0	18.2	4.8	2.8

Source: Informação Empresarial Simplificada. | Notes: In the calculations related to the first quartile, the firms at the 1st percentile were removed, as otherwise the average productivity would assume, in some sectors, negative values or close to zero, biasing the calculation of change rates in the lower quartile. Note that the total, shown in the last column, is not the result of a simple average of the variation in productivity in the different quartiles, but depends, in particular, of the variation in the relative weight of employment in each quartile.

Table 2 • Average productivity by quartile of employment distribution and sector and variation between 2014 and 2019 | Euros per worker and percentage

	2014					Rate of change 2014-2019				
	min-p25	p25-p50	p50-p75	p75-max	Total	min-p25	p25-p50	p50-p75	p75-max	Total
Manufacturing	6,291	16,784	18,928	30,351	29,436	15.3	11.5	-0.2	5.5	5.6
Construction	5,226	18,130	14,929	24,712	22,543	30.0	45.1	32.5	-2.0	3.4
Trade and repair	5,325	15,982	18,216	32,140	28,006	20.3	24.4	37.2	12.9	17.5
Transport and communications	8,496	19,669	28,163	63,733	57,146	-12.4	7.9	24.2	-9.8	-8.6
Accommodation and food services	3,223	8,338	9,485	18,207	15,680	42.9	47.5	29.0	2.6	9.4
Other services and consulting	6,979	24,180	22,590	29,334	27,381	38.4	23.9	31.0	-9.3	-3.4
Total	6,014	18,188	18,196	31,707	28,905	27.8	28.3	28.8	-0.5	2.8

Source: Informação Empresarial Simplificada. | Note: In the employment distribution, there is a large mass of firms with 1 worker that covers the entire first quartile and part of the second; the cutoff point between these two quartiles was based on the distribution of productivity of these firms. Note that the total, shown in the last column, is not the result of a simple average of the variation in productivity in the different quartiles, but depends, in particular, of the variation in the relative weight of employment in each quartile.

Overall, the moderate rise in productivity in the economic upturn was based on a differentiated behaviour of firms across the productivity and employment distributions. Productivity was more buoyant in the less productive firms and with a lower weight in employment.

Evolution of employment

Employment dynamics point to a shift in favour of larger employers (Table 3), common to all sectors except transport and communications. These developments fit into a general trend towards an increase in the average size of Portuguese firms.

The analysis of employment dynamics by quartiles of productivity distribution (Table 4) shows that firms in the last quartile lose weight in employment to firms in the second and third quartiles, despite some differentiation between sectors. Thus, although the largest employers have increased their share of employment, this has not happened with the most productive firms, which have seen their share decline. It should be noted that there is a strong, but not total, correspondence between the group of the largest and the most productive firms, and a divergence occurred in this period concerning the evolution of employment in the two groups. By contrast, as seen above, productivity evolved similarly in these groups of firms.

Table 3 • Weight on employment by quartile of employment distribution and sector and respective change between 2014 and 2019 | Percentage and percentage points

	2014					Change 2014-2019			
	min-p25	p25-p50	p50-p75	p75-max	Total	min-p25	p25-p50	p50-p75	p75-max
Manufacturing	1	2	5	93	100	0.0	-0.1	-0.2	0.4
Construction	3	5	13	79	100	-0.4	-0.3	0.3	0.4
Trade and repair	4	7	15	75	100	-0.7	-1.0	-1.1	2.8
Transport and communications	3	5	7	85	100	0.7	-0.4	-0.2	-0.1
Accommodation and food services	3	6	17	74	100	-0.6	-1.7	-2.7	5.0
Other services and consulting	4	7	11	79	100	0.1	-0.2	-0.4	0.4
Total	3	5	11	82	100	-0.1	-0.4	-0.4	1.0

Source: Informação Empresarial Simplificada. | Note: In the employment distribution, there is a large mass of firms with 1 worker that covers the entire first quartile and part of the second; the cutoff point between these two quartiles was based on the distribution of productivity of these firms.

Table 4 • Weight on employment by quartile of productivity distribution and sector and respective change between 2014 and 2019 | Percentage and percentage points

	2014					Change 2014-2019			
	min-p25	p25-p50	p50-p75	p75-max	Total	min-p25	p25-p50	p50-p75	p75-max
Manufacturing	4	16	28	52	100	-0.2	3.0	1.1	-3.9
Construction	11	19	32	39	100	-2.1	3.3	4.7	-5.9
Trade and repair	8	12	29	51	100	-2.4	-0.4	1.7	1.2
Transport and communications	4	6	14	76	100	1.4	1.6	4.9	-7.9
Accommodation and food services	17	28	33	22	100	0.5	6.9	-3.7	-3.7
Other services and consulting	10	27	27	36	100	1.4	6.4	-4.4	-3.4
Total	8	18	28	46	100	0.0	3.8	0.2	-4.0

Source: Informação Empresarial Simplificada.

Firm demographics

High rates of entry and exit of firms from the market may reflect the emergence of firms testing new ideas and products. In a competitive environment, less efficient firms tend not to survive, feeding outflows and freeing up productive resources for those that are able to grow. However, the existence of high entry and exit rates may read less benignly where such rotation results from inefficiencies in the functioning of markets that protect incumbent firms. The size and relative productivity of these firms allow some inferences to be drawn in this respect.

The analysis of firm demographics was carried out by reference to consecutive pairs of years, including: (a) the incumbent firms, which remain in the market during these two years, t-1 and t; (b) the firms entering in t (present in the market in t, but not in t-1); (c) the firms exiting in t-1 (present in the market in t-1, but not in t). Table 5 presents the average entry and exit rates of firms in the market as well as the size (in terms of employment) and relative productivity of these firms.[3]

3. The dataset used ends in 2019. However, the latest year does not yet include all firms in the IES universe, so the results for 2018-19 would be distorted, with the volume of market exits being magnified by the absence of statistical reporting from some firms. It was therefore decided to end the analysis of market dynamics in 2018.

Table 5 • Market dynamics and characteristics of entry and exit firms *vis-à-vis* incumbents, by sector of economic activity | Average values for the period 2014-2018

	Manufacturing	Construction	Trade and repair	Transport and communications	Accommodation and food services	Other services and consulting
Entry rate	6.3	8.8	7.9	7.2	12.2	12.6
Entrant relative size	23.4	38.3	30.3	20.4	42.5	30.7
Entrant relative productivity	43.9	55.8	38.1	22.0	28.5	45.3
Exit rate	5.4	7.3	7.2	0.7	1.8	2.4
Exiting relative size	39.8	50.7	36.0	31.3	41.3	52.9
Exiting relative productivity	44.6	65.3	43.6	33.6	46.7	55.7

Source: Informação Empresarial Simplificada. | Notes: The entry rate and the entrant relative size are calculated with the firms entering the market in year t *vis-à-vis* incumbents. The exit rate and the exiting relative size are calculated with firms exiting the market in year t-1 *vis-à-vis* incumbents. The entrant and the exiting relative productivity is calculated *vis-à-vis* the incumbent firms. Size is measured in terms of the number of workers (full-time equivalent).

The market dynamics show strong sectoral differentiation. The entry rate of firms in manufacturing and transport and communications is lower than that of firms in other services and construction. Moreover, firms from these two sectors enter the market with a relative size in terms of number of workers, which is below that of other sectors. These regular features are related to the nature of industrial activity and transport and communication services, which simultaneously entail higher entry costs than in other sectors and more steep scale gains throughout the lifetime of the firms. The services sectors, namely accommodation and food services and construction are characterised by higher relative entry sizes.

The accommodation and food services and the other services and consultancy sectors have particularly high entry rates. These activities are also characterised by low exit rates (a feature shared by the transport and communications sector), resulting in an increase in the number of firms over the period. The construction sector has been experiencing a sharp increase in entry rates in recent years, and a drop in exit rates, on a path of recovery from the significant shutdown of construction firms during the preceding crisis.

Average exit rates have been lower than average entry rates across all sectors, resulting in an increase in the number of firms in the economy. This is typical of economic expansion phases. Firms exiting the market have on average been larger than new ones, except for accommodation and food services. This is particularly evident in manufacturing, transport and communications and in other services and consultancy sectors.

The relative productivity of new firms against incumbents also shows sectoral differentiation, ranging from a minimum of 22% in the transport and communications sector to a maximum of around 56% in the construction sector. Such differentiation is the result of sector-specific production technologies, which affect the point of entry and the convergence of new firms *vis-à-vis* incumbents. The relative productivity of exits ranges from a low of around 34% in transport and communications to a high of over 60% in construction.

Average productivity, structure effects and market dynamics

Aggregate productivity is the average of individual firms' productivity, weighted by the share of each firm in the total of this employment variable. This calculation can be decomposed as the sum of the unweighted average of firms' productivity with the covariance between firms' productivity and their

share in employment, which can be construed as a structure effect, arising from the interaction between productivity and employment (equation 1). This decomposition of aggregate productivity was first suggested by Olley and Pakes (1996) and captures the idea that an increase in average productivity can be countered (reinforced) if the largest firms are also the least (most) productive. This decomposition is arithmetic in nature but allows to distinguish productivity differences that arise from resource allocation (employment) from variations originating from gains in the productivity of individual firms. Melitz and Polanec (2015) extended this decomposition to a dynamic context, where the change in productivity between two years results from the contribution of the change in average productivity and the contribution of changes in the interaction between productivity and employment. On top of these two contributions, there is the net impact on the productivity of the firms entering and exiting the market in that period (equation 2). This impact is associated with productivity levels and the relative size of firms entering and exiting the market versus incumbents, as discussed in the previous section. It should be noted that the calculation of the covariance between firms' average productivity and their share in employment depends on the set of firms under consideration, and therefore piecemeal decompositions cannot be aggregated.

Decomposition of aggregate productivity:

$$P_t = \sum_{i=1}^{N} p_{it}\omega_{it} = \overline{p_t} + Cov(p_{it}, \omega_{it}) \qquad (1)$$

where aggregate productivity, P_t, corresponds to the average of individual firms' productivity, p_{it}, weighted by each firm's employment share, ω_{it}. Aggregate productivity can be decomposed as the sum of the unweighted average of firms' productivity, $\overline{p_t}$, with the covariance between firms' productivity and their employment share, $Cov(p_{it}, \omega_{it})$.

$$\Delta P_t = \Delta\overline{p_S} + \Delta Cov_S + \omega_{E,t}(p_{E,t} - p_{S,t}) + \omega_{X,t-1}(p_{S,t-1} - p_{X,t-1}) \qquad (2)$$

The terms $\Delta\overline{p_S}$ and ΔCov_S represent, respectively, the contributions of the change in unweighted average productivity and of the change in resource allocation efficiency among surviving firms (S) to the change in aggregate productivity, ΔP_t. The terms $\omega_{E,t}(p_{E,t} - p_{S,t})$ and $\omega_{X,t-1}(p_{S,t-1} - p_{X,t-1})$ represent, respectively, the contribution to aggregate productivity change of new firms (E) and exiting firms (X). New firms contribute positively if they exhibit higher productivity, $p_{E,t}$, than surviving firms, $p_{S,t}$ in the same period when the entry occurs, t. In turn, exiting firms contribute positively to the aggregate productivity change if they have a lower productivity, $p_{X,t-1}$, than that of surviving firms, $p_{S,t-1}$, in the period when the entry occurs, *t-1*. The terms $\omega_{E,t}$ and $\omega_{X,t-1}$ represent, respectively, the employment share of entering firms in t and exiting firms in *t-1* in the total of this variable.

This type of decomposition has been applied to several variables of firm performance, such as total factor productivity or sales, with different time horizons and sectoral breakdowns. Examples include the work of Linarello and Petrella (2017) for Italy, Decker et al. (2017) for the US, and Banco de Portugal's Special issue of the October 2018 *Economic Bulletin*, which can be used as a starting point for the current analysis, and which addressed this issue for the Portuguese economy in the 2006-15 period based on total factor productivity and by splitting the analysis between tradable and non-tradable sectors.

These productivity decomposition exercises make it possible to separate the effects on the (unweighted) average from the structure effects. In practice, both contributions result from the combined effect of variations in institutional and regulatory factors that affect the functioning of markets, such as the level of competition, labour market legislation, the quality of corporate management, access to financing by firms or the legal framework regulating economic activity.

Table 6 shows the results of the Melitz and Polanec (2015) decomposition for the 2014-18 period. The first two columns identify the contribution of average developments in productivity and reallocation to the aggregate productivity growth rate. The results point to a very positive evolution of unweighted average productivity, which accounted on average for 5.5 percentage points to the change in aggregate productivity. On the other hand, the structure effect had a negative contribution to the change in aggregate productivity, corresponding, on average, to -4.8 percentage points. This outcome reflects the increase in the share of employment of firms with lower productivity (Table 4) with less favourable productivity developments in firms with higher employment shares (Table 2).

Business demographics show a negative contribution of entries, equivalent to 1.8 percentage points, which results from new firms having lower productivity than the incumbents' average, as referred to above. The contribution of firms exiting is positive, at 1.7 percentage points. This is also an expected outcome, as exiting firms perform worse than incumbents. In net terms, the effect of demographics is slightly negative, at -0.1 percentage points.

Table 6 • Results of Olley-Pakes dynamic decomposition

	Surviving firms		Firm demography			Aggregate productivity
	Unweighted average productivity	Structure effect	Entry (1)	Exit (2)	Net (1) + (2)	
2014-2015	4.9	-5.0	-2.0	1.8	-0.2	-0.3
2015-2016	4.8	-3.9	-1.7	1.8	0.1	1.0
2016-2017	8.9	-7.1	-1.6	1.4	-0.2	1.7
2017-2018	3.5	-3.2	-1.8	1.7	-0.2	0.1
Média	5.5	-4.8	-1.8	1.7	-0.1	0.6

Note: Variation in aggregate productivity in percentage and respective contributions in percentage points.

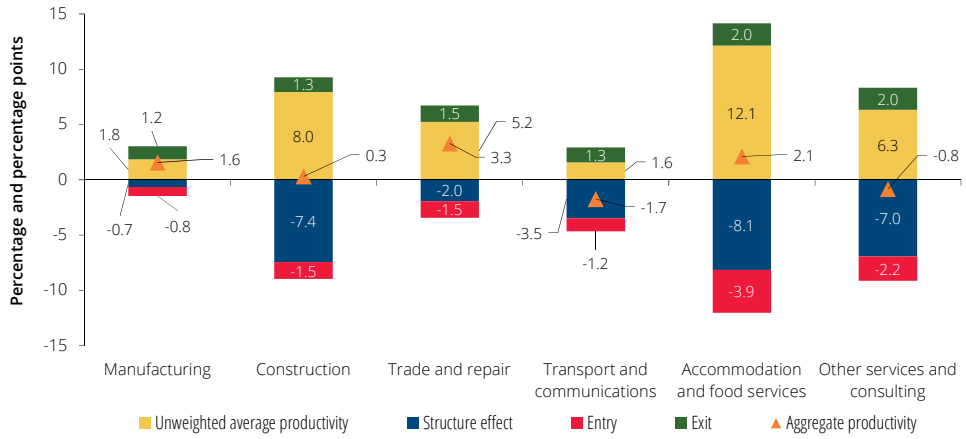
The fact that the analysis variable is productivity per worker, which differs across sectors as a result of their technological features, namely as regards capital intensity, warrants a more detailed sectoral analysis. Thus, the covariance change between average productivity and the weight of the firm in the industry is calculated on a set of potentially more comparable firms. Chart 3 shows the decomposition of the average annual change in productivity by sector of activity.

Aggregate productivity in manufacturing grew 1.6% on average. Although the sectoral change in unweighted average productivity is among the smallest, the contribution of the interaction between productivity and employment is less negative, and the positive contribution of business demographics is also noteworthy. These markets are exposed to international competition, therefore any problems arising from barriers to market operations and reallocation tend to be minor.

The construction sector is usually quite affected by cyclical economic fluctuations, having experienced a strong contraction in the Portuguese economy's adjustment process post 2010. In the 2014-2018 period, aggregate productivity recorded an average annual growth of 0.3%. This

evolution benefited from the strong contribution of the annual average productivity of firms in the sector, which stood at 8.0 percentage points. However, the contribution of the structure effect was negative, corresponding to -7.4 percentage points. The reduced employment share of firms with higher productivity and the less favourable evolution of the productivity of firms with a higher employment share have had a highly negative impact on this effect. The net effect of the entry and exit of firms has had a negative contribution in recent years, mainly connected with the lower productivity of entering firms.

Chart 3 • Contributions to the evolution of sectoral productivity for the average of the period 2014-2018



The trade and repair sector showed an average growth of 3.3% in aggregate productivity. This is the highest figure in the sectors considered. This performance results from the contribution of the average productivity of firms (5.2 percentage points), partially offset by the negative contribution of the structure effect, with a figure of -2.0 percentage points. However, in the latest year analysed, this contribution improved significantly, turning positive. In turn, the contribution of business demographics was nil.

In the transport and communications sector, the performance of aggregate average productivity was the most adverse, showing a drop of -1.7%. The effect of the interaction between productivity and employment contributed very strongly to this result, -3.5 percentage points, more than offsetting the contribution of the increase in the average productivity of firms (1.6 percentage points).

In the accommodation and food services sector, aggregate average productivity grew by 2.1%, benefiting from the high contribution of the average productivity of firms which, despite the decline recorded in 2018, was the highest of all sectors. The negative contributions of the remaining components were also among the largest. The highly negative contribution of the entry of new firms in this market, with lower productivity than the incumbents, should be highlighted. This sector, which is closely associated with tourism, experienced strong expansion over the period.

In the other services and consultancy sector, which includes very diversified activities, there was a 0.8% drop in aggregate average productivity, which corresponds to the second worst sectoral performance. Despite the significant contribution of the average productivity of firms, estimated at 6.3 percentage points, a more adverse evolution was observed in the component associated to the structure effect and a contribution of -0.2 percentage points from the entry and exit of firms.

Final considerations

Some relevant conclusions can be drawn from the analysis of the evolution of productivity in the Portuguese economy over the 2014-19 period. First, a strong increase in firms' average productivity is observed, not considering the allocation of employment between them. Second, the productivity change was relatively lower in firms with a higher employment share, which had a negative impact on aggregate productivity. Furthermore, the most productive firms lost weight in employment, which increased the deviation observed between employment-unweighted and weighted average productivity. The impact of business demographics was negligible. A high magnitude of structure effects is not unusual *vis-à-vis* what has been observed in the past and in other economies, but it alerts to the need to foster a correct allocation of resources in the economy.

These results underline the importance of creating the conditions for increasing the dynamics of firms' productivity, including the largest ones which, starting from higher productivity levels, tend to contribute more intensely to the overall performance of the economy. Moreover, the design of policies must take into account their capacity to provide employment with the necessary qualifications and to invest, which will allow these gains to be amplified. For smaller-sized firms the road is longer but necessary for them to reach the scale and productivity of the largest ones. Firms are born small and convey business ideas that are tested on the market. Their success should result in growth and greater use of resources available in the economy, but their failure should also mean the exit from the market and release of resources for other more productive activities.

The set of policies that enables this progress to be made is well known and needs to be reinforced. Such initiatives entail increasing competition in product markets, reducing context costs, improving access to financing and improving the functioning of the labour market. These structural reforms pose design and implementation challenges but must be pursued on an ongoing basis.

Finally, it will be important to assess the behaviour of productivity and sectoral efficiency in the post-pandemic period. This crisis will prompt major changes in the relative weight of sectors of activity and of the business models and technologies used by firms. Furthermore, public policies have been used with the dual objective of preserving productive capacity and creating the right conditions for economic restructuring and recovery. Maintaining a focus on improving the functioning of markets will tend to allow gains that, in turn, may make it easier to respond to the various challenges posed to the Portuguese economy.

References

Banco de Portugal, Special issue "Reallocation of resources and total factor productivity in Portugal", *Economic Bulletin*, October 2018.

Banco de Portugal, Special issue "Labour productivity in Portugal over the past decade: a firm-level approach", *Economic Bulletin*, May 2021

Decker, R. A., Haltiwanger, J., Jarmin, R. S. and Miranda, J. (2017). "Declining dynamism, allocative efficiency, and the productivity slowdown." *American Economic Review, 107(5)*, 322-326.

Linarello, A. and Petrella, A. (2017). "Productivity and reallocation: evidence from the universe of Italian firms." *International Productivity Monitor*, 32, 116-136.

Melitz, M. J. and Polanec, S. (2015). "Dynamic Olley-Pakes productivity decomposition with entry and exit." *The Rand Journal of Economics*, 46(2), 362-375.

Olley, G. S. and Pakes, A. (1996). "The dynamics of productivity in the telecommunications equipment industry." *Econometrica*, 64(6), 1263-1297.