

# ECONOMIC BULLETIN

MAR. 2021



BANCO DE  
PORTUGAL  
EUROSYSTEM



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## I Projections for the Portuguese economy: 2021-23

Box 1 The impact of the current lockdown on the Portuguese economy

Box 2 Impact of the Recovery and Resilience Plan for the period 2021-26

Box 3 Alternative scenarios for the Portuguese economy

Box 4 An assessment of the projections for the Portuguese economy over the course of 2020





# 1 Introduction

**The outlook for the Portuguese economy continues to be influenced by developments in the pandemic.** Over the period 2021-23, economic growth is projected to reach 3.9%, 5.2% and 2.4% (Table I.1.1). The recovery that started in the second half of 2020 was temporarily halted, although the impact of the current lockdown has been lower than that seen in the second quarter of 2020 (Box 1). Inflation will remain contained, edging up from 0.7% in 2021 to 1.0% in 2023.

**Underlying the projections, restrictions are assumed to be gradually lifted from the second quarter of 2021 onwards.** The implementation of an effective medical solution is expected to be concluded by early 2022, both in Portugal and the euro area. The rollout of vaccines has strengthened confidence in economic recovery, which is also anchored in the maintenance of a favourable monetary and fiscal policy stance.

**Table I.1.1 • Projections of Banco de Portugal for 2021-23 | Year-on-year percentage change, unless otherwise stated**

	Weights 2020	EB March 2021				EB December 2020			
		2020	2021 <sup>(p)</sup>	2022 <sup>(p)</sup>	2023 <sup>(p)</sup>	2020	2021 <sup>(p)</sup>	2022 <sup>(p)</sup>	2023 <sup>(p)</sup>
Gross domestic product (GDP)	100.0	-7.6	3.9	5.2	2.4	-8.1	3.9	4.5	2.4
Private consumption	64.0	-5.9	2.0	4.8	2.3	-6.8	3.9	3.3	1.9
Public consumption	18.8	0.5	3.7	0.7	0.6	0.4	4.9	0.4	0.7
Gross fixed capital formation	19.0	-2.2	3.6	8.0	3.7	-2.8	4.4	5.2	2.0
Domestic demand	102.0	-4.7	2.7	4.6	2.3	-5.6	3.9	3.1	1.8
Exports	36.7	-18.6	13.7	11.5	5.3	-20.1	9.2	12.9	6.7
Imports	38.6	-12.0	10.2	9.9	5.0	-14.4	8.8	9.1	5.1
Contribution to GDP growth, net of imports (in p.p.) <sup>(a)</sup>									
Domestic demand		-2.3	1.4	2.5	1.2	-2.6	2.6	1.5	0.8
Exports		-5.2	2.5	2.7	1.2	-5.5	1.3	3.0	1.6
Exports of goods		-0.7	1.7	0.3	0.2	-0.7	1.5	0.4	0.3
Exports of services		-4.5	0.8	2.4	1.0	-4.8	-0.2	2.6	1.3
Employment (number of persons) <sup>(b)</sup>		-1.7	0.3	1.6	0.5	-2.3	0.0	1.3	0.9
Employment (hours worked) <sup>(b)</sup>		-9.2	4.9	4.4	0.6	-10.8	7.3	2.9	0.9
Unemployment rate <sup>(c)</sup>		6.8	7.7	7.6	7.2	7.2	8.8	8.1	7.4
Current plus capital account (% of GDP)		0.1	1.5	2.8	2.9	-0.6	0.5	2.3	2.7
Trade balance (% of GDP)		-1.8	-0.9	0.0	0.2	-1.6	-1.9	-0.5	0.1
Harmonised index of consumer prices		-0.1	0.7	0.9	1.0	-0.2	0.3	0.9	1.1
Energy goods		-5.2	3.9	-0.4	-1.3	-5.3	-2.0	0.9	0.5
Excluding energy goods		0.3	0.4	1.1	1.2	0.3	0.5	0.9	1.1

Sources: Banco de Portugal and Statistics Portugal. | Notes: (p) – projected, p.p. – percentage points. The cut-off date for macroeconomic projections is 15 March. (a) The demand aggregates net of imports are obtained by subtracting an estimate of the imports used in each component. The import content calculations were based on 2017 data. For more information on the methodology underlying this calculation, see the Box “Update of the import content of global demand for the Portuguese economy” in the March 2019 issue of the *Economic Bulletin*. (b) According to the national accounts concept. (c) In percentage of labour force.

**This recovery will vary across sectors and expenditure components.** The main contributions to economic growth over the projection horizon stem from exports and private consumption, i.e. the components that have decreased the most. Investment is likely to grow by 5%, on average, benefiting from European fund inflows, particularly under the new Next Generation EU (NGEU) instrument (Box 2). The recovery is expected to be slower in services more reliant on person-to-person contact. The pick-up in activity will lead to improvements in the labour market, with average

employment growth at 0.8% and a decreasing unemployment rate from 2022 onwards. There is still some slack in the labour and product markets, which will decline over the projection horizon.

**Uncertainty is still high, despite the progress in controlling the pandemic.** To illustrate the uncertainty and the risks around the projections, Box 3 presents two scenarios for the Portuguese economy, based on favourable or adverse assumptions for developments in the pandemic in the short run, for changes in household preferences and for the adaptability and resilience of firms to the new circumstances.

## 2 External environment and technical assumptions of the projections

**The upturn in global activity will extend over the projection horizon.** Underlying the international environment assumptions are a 6.2% global economic growth in 2021 and a slowdown to 4.0% and 3.5% in 2022 and 2023 (Table I.2.1). Growth was revised upwards particularly in 2021 due to stronger growth than expected at the end of 2020, the trade agreement between the United Kingdom and the European Union and the fiscal stimulus package announced in December in the United States. For the euro area, the European Central Bank's (ECB) projections point to economic growth of 4.0% in 2021, 4.1% in 2022 and 2.1% in 2023, virtually unchanged from the December exercise. At the end of 2020 and the beginning of 2021, euro area activity has been affected by the surge in the pandemic and the lockdown measures, while their impact is expected to be lower than that observed in the first quarter of 2020.

**Table I.2.1 • Projection assumptions**

		EB March 2021				Revisions compared to EB December 2020			
		2020	2021	2022	2023	2020	2021	2022	2023
<b>International environment</b>									
World GDP	yoy	-2.9	6.2	4.0	3.5	0.6	0.6	0.1	0.1
Euro area GDP	yoy	-6.9	4.0	4.1	2.1	0.4	0.1	-0.1	0.0
World trade	yoy	-9.5	8.4	4.6	3.5	0.0	1.3	0.3	-0.1
External demand	yoy	-12.3	7.4	5.7	3.5	0.3	0.3	0.1	-0.2
Oil prices in dollars	aav	42.3	59.3	55.7	53.7	0.7	15.3	10.0	6.8
Oil prices in euros	aav	37.1	49.1	46.2	44.4	0.6	11.9	7.6	4.7
<b>Monetary and financial conditions</b>									
Short-term interest rate (3-month EURIBOR)	%	-0.4	-0.5	-0.5	-0.4	0.0	0.0	0.0	0.1
Implicit interest rate in public debt	%	2.2	2.0	1.9	1.8	-0.1	0.0	0.0	0.0
Effective exchange rate index	yoy	3.3	1.8	-0.1	0.0	0.1	-0.2	-0.1	0.0
Euro-dollar exchange rate	aav	1.1	1.2	1.2	1.2	0.3	2.1	2.0	2.0

Source: Eurosystem (Banco de Portugal 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 ECB's projection exercise released on 11 March ("ECB staff macroeconomic projections for the euro area", March 2021). Technical assumptions include information available up to 16 February. The technical assumption for oil prices is based on futures markets. Developments in the 3-month Euribor rate are based on expectations implied in futures contracts. The implicit interest rate on public debt is computed as the ratio of interest expenditure for the year to the simple average of the stock of debt at the end of the same year and at the end of the preceding year. The implicit rate includes an assumption for the interest rate associated with new issuances. An increase in the exchange rate corresponds to an appreciation. The effective exchange rate of the euro is computed against 42 trading partner countries. The technical assumption for bilateral exchange rates assumes that the average levels observed in the two weeks prior to the cut-off date will remain stable over the projection horizon. The revision in the euro-dollar exchange rate is presented in percentage.

**The overall growth pattern varies across regions and sectors of activity.** Emerging market economies, particularly China, have grown more robustly than advanced economies. Also, the upturn in world trade is expected to be more muted in services, particularly travel and tourism. In turn, international trade in goods has been more resilient. Against this background, recovery in external demand is expected to be lower than in world trade, growing by 7.4% in 2021 and decelerating to 3.5% in 2023.

**Commodity prices will increase, mostly reflecting the upturn in activity.** Current assumptions include a rise in average oil prices compared to the previous projection exercise, to USD 59.3 per barrel in 2021, gradually dropping to USD 53.7 in 2023. Assumptions include a 1.8% appreciation in the euro in 2021, reflecting the appreciation against the US dollar over the past few months.

**Monetary and financial conditions are expected to remain favourable over the projection horizon, sustained by accommodative monetary policies.** In the euro area, assumptions point to stable short- and long-term interest rates, close to current levels over the entire projection horizon. The implicit interest rate on Portuguese public debt will follow a downward path, from 2.0% in 2021 to 1.8% in 2023.

### 3 The Portuguese economy in 2021-23

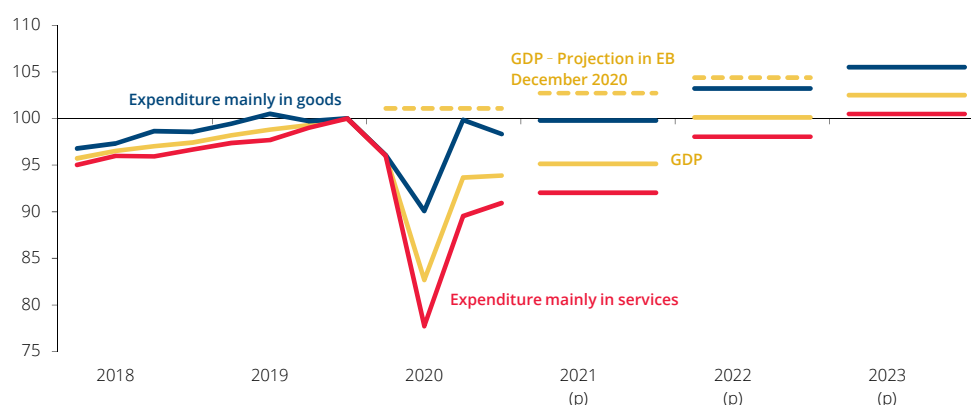
**Despite short-term volatility, activity is expected to recover over the projection horizon.** In the December issue of the *Economic Bulletin*, activity was projected to fall in the fourth quarter of 2020, associated with the emergence of a second pandemic wave and more stringent containment measures. However, the quarter-on-quarter economic growth rate stood at 0.2%, i.e. 2.0 percentage points (p.p.) above that projected in December (Box 4). The deterioration in the health situation in early 2021 and subsequent tightening of the containment measures are likely to result in an unexpected fall in activity in the first quarter of the year. This fall should be lower than that seen in the first quarter of 2020. The greater resilience in activity reflects the lessons drawn by households and firms, a less synchronised and more favourable international environment, and continued decisive action across monetary, fiscal and prudential policies (Box 1). In the year as a whole, gross domestic product (GDP) is projected to grow by 3.9%, with high volatility in quarterly changes. Growth projected for 2022 and 2023 is 5.2% and 2.4% (Table I.1.1). Projections for 2021 and 2023 remained unchanged, while for 2022 they are revised upwards by 0.7 p.p. The Portuguese economy is expected to grow more than the euro area over the projection horizon, after a more marked drop in 2020 and early 2021. At the end of the horizon, cumulative growth since end-2019 will be the same for Portugal and the euro area.

**The recovery is expected to be swift after containment measures are lifted, although uneven across sectors.** Activity is expected to recover strongly as containment measures are gradually lifted and vaccination expands, only to decelerate at the end of the projection horizon. Industrial activity has been more resilient, and a more rapid recovery is expected. The upturn in services and, particularly, in activities related to tourism, culture and entertainment will be more gradual (Chart I.3.1).

**Policy measures have been crucial to mitigate the pandemic crisis and foster economic recovery.** According to the Fast and Exceptional Enterprise Survey (COVID-IREE), 35% of firms, which account for 20% of turnover, have benefited from support measures and would have closed, or would be in operation with low probability, had no action been taken since the onset of the pandemic. This share is higher for microenterprises and small enterprises, whose turnover has fallen more markedly,

and which account for over 90% of the Portuguese business sector. In 2021 the support package to firms and households approved in the State Budget was expanded. Particularly important among the measures targeted at firms were the extension of the support to a gradual return by the end of the first half of the year, the reactivation of the extraordinary support to self-employed workers due to lower activity, the expansion of the “Apoiar” Program and the establishment of new credit lines. With the increase in restrictions to activity, the enterprise population with access to the simplified layoff scheme expanded and the share of compensation benefiting from support increased (both in terms of that measure and the support to a gradual return). Turning to moratoria, which at the end of 2020 corresponded to around 34% of loans to non-financial corporations, the deadline for new accessions was extended to 31 March, while benefits will remain in place for a nine-month period. Firms in the most affected sectors benefit from a further extension of their loan maturity. In the case of households, loans under moratoria correspond to around 16% of total loans as at the end of 2020, with the public moratorium extending up to September 2021.

**Chart I.3.1 • GDP developments | Index, 2019 T4 = 100**

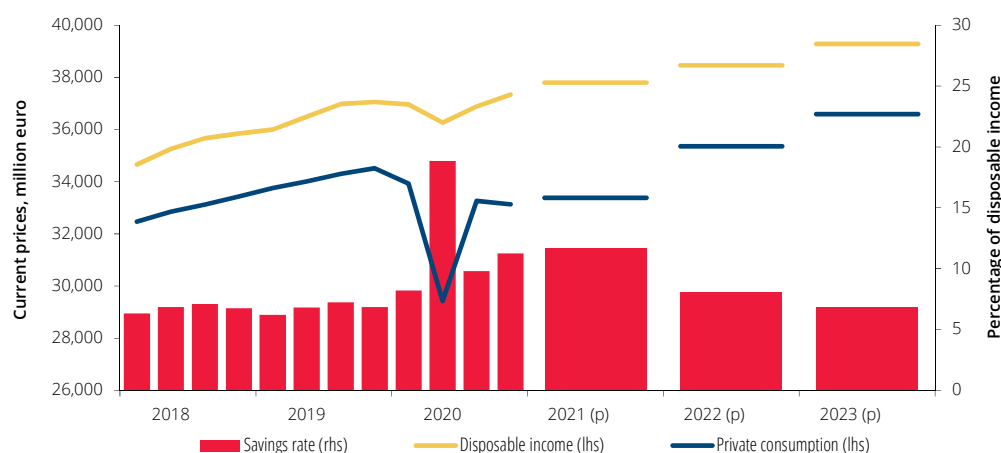


Sources: Banco de Portugal and Statistics Portugal. | Notes: (p) – projected. Over the projection horizon figures refer to the annual average. Expenditure mainly in services includes private consumption of services, public consumption, the share of services in investment, calculated from the information available in the supply and use tables, and exports of services. All components are net of imports, which means that they are obtained by subtracting an estimate of the imports used in each component. The import content calculations were based on 2017 data. For more information on the methodology underlying this calculation, see the Box “Update of the import content of global demand for the Portuguese economy” in the March 2019 issue of the *Economic Bulletin*.

**Private consumption will grow by 2.0%, 4.8% and 2.3% in 2012-23, with a slower recovery in the segments of services requiring social interaction.** Against a background of gradual lifting of restrictions and lower uncertainty, private consumption growth will reflect favourable developments in household real disposable income and the maintenance of benign financing conditions. As in the third quarter of 2020, pent-up demand, particularly in the early stages of the projection horizon, is expected to be stronger in the case of goods. The recoverability of delayed consumption decisions is more limited in the case of services.

**The upturn in consumption will be reinforced by the downward trend in the savings rate over the projection horizon.** The savings rate increased from 6.8% in 2019 to 12.0% in 2020. This increase is not merely due to the usual determining factors, including precautionary reasons, but is largely associated with the concerns and restrictions that limited expenditure and which resurfaced in early 2021. Amid a gradual return to normality, this aggregate savings level exceeds that deemed desirable by households in the future (Chart I.3.2).

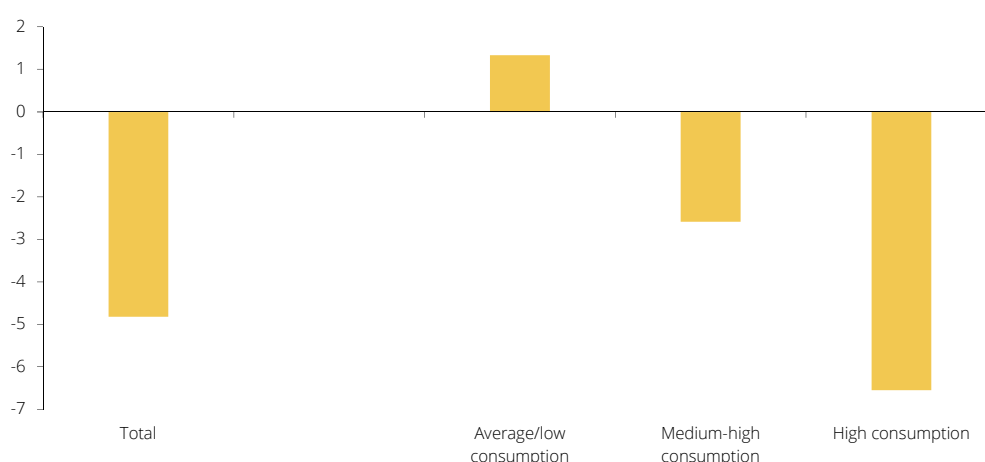
**Chart I.3.2 • Developments in disposable income, private consumption and savings rate**



Sources: Banco de Portugal and Statistics Portugal. | Notes: Disposable income is adjusted for the change in pension entitlements of households. In the fourth quarter of 2020, figures for disposable income and the savings rate are estimates. Over the projection horizon figures refer to the annual average.

**The savings rate will return to its pre-pandemic level by the end of the horizon.** This assumption implies that the savings accumulated during the pandemic raise household wealth in the period 2021-23. Households maintain these additional reserves amid still high uncertainty, where the unemployment rate remains above pre-pandemic levels. Also, the evidence indicates that savings accumulated in 2020 were more concentrated in higher-income households, which have a lower marginal propensity to consume. Purchases with bank cards show that high-consumption individuals cut their expenses more markedly in 2020 than low-consumption individuals (Chart I.3.3). In Box 3, alternative assumptions are put forward for savings rate developments.

**Chart I.3.3 • Payments with cards issued in Portugal by consumption group in 2020 | Annual rate of change, per cent**



Source: SIBS (Banco de Portugal calculations). | Notes: Data cover all purchases made through the physical Multibanco terminal network (point of sale (POS) terminals and ATM) with cards issued in Portugal. The high consumption group corresponds to the fourth quartile of average card expenditure at national level over the previous 12 months, the medium-high consumption group corresponds to the third quartile and the average/low consumption group aggregates the 50% of cards with the lowest average consumption. For more details see the Special Issue "The impact of the pandemic on private consumption: evidence from card spending data" in the December 2020 issue of the *Economic Bulletin*.

**Public consumption will grow by 3.7% in 2021, after a 0.5% increase in 2020.** This acceleration stems from the base effect on staff costs associated with the reduction in hours worked in general government in 2020, exceeding that expected in 2021. This impact is partly offset by the deceleration in expenditure on goods and services, which mirrors (i) the net effect of a return to normal levels of general government purchases/sales and (ii) the smaller impact of pandemic containment measures on health services. Over the remainder of the horizon, the gradual deceleration in public employment and the reversal of the effects of the pandemic in 2022 will result in moderate public consumption growth, if no additional policy measures are taken.

**Residential investment and public investment, which were less affected by the crisis, will continue to grow over the projection horizon.** Residential investment is expected to remain robust, growing by 1.6%, on average, compared with a 1.9% increase in 2020. Although developments in transactions and prices suggest a slight slowdown in the housing market, data on permits as at the end of 2020 indicate an increase in construction plans. Projected growth for housing investment mirrors an economic recovery scenario, with favourable financing conditions and the continued attractiveness of this asset as a placement for savings and sought after by non-residents in a few segments. After an estimated increase of around 17% in 2020, public investment is projected to grow above 20% in 2021, growing dynamically over the remainder of the horizon. Developments in public investment benefit from a rise in the amount of funds received from the EU.

**After a 5.6% fall in 2020, corporate investment will recover, growing by 3.8%, on average, over the projection horizon.** This reflects the momentum in demand, lower pandemic-related uncertainty and the major policy stimuli, more specifically, the monetary policy measures, with favourable financing conditions, and the national and supranational measures anchored in the transfer of massive amounts of EU funds (Box 2). Developments in investment are conditioned by weaknesses in a number of industry segments. The deterioration in the financial position of firms that were highly indebted prior to the crisis and the uncertainty regarding the behaviour of demand contribute to the postponement of investments.

**The recovery in exports combines the favourable dynamics of external demand for goods and the gradual upturn in tourism and related services.** Exports of goods and services will grow by 13.7% in 2021, 11.5% in 2022 and 5.3% in 2023. These developments reflect the slower dissipation of the direct impact of the pandemic on tourism exports, which will only start to gain momentum from mid-2021 onwards, and the sizeable weight of this component, which ranked fourth in the euro area in 2019. At the end of the projection horizon, tourism exports will still remain slightly below 2019 levels. The experience of the pandemic suggests the possibility of a decline in business travel in the next few years, which hampers developments in services-exporting sectors. In turn, exports of goods will grow by 15.1% in 2021 – surpassing the 2019 level – and increase by 4.9% and 3.2% in 2022 and 2023 respectively.

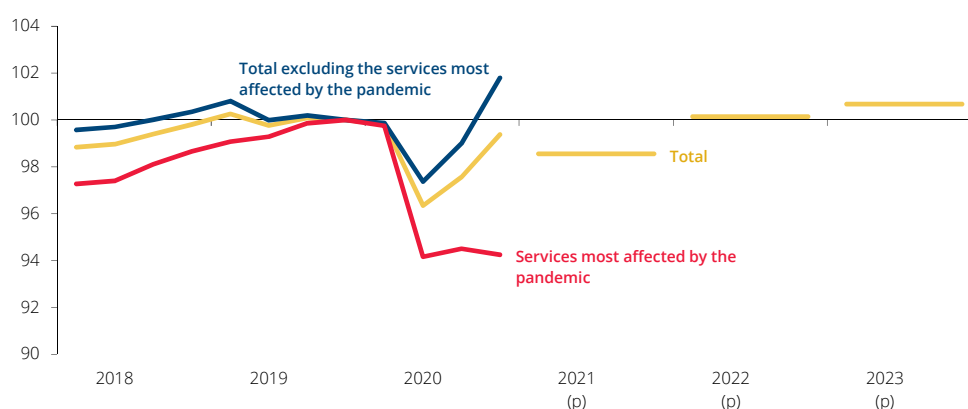
**Imports will grow, on average, by 8.4% in 2021-23, decelerating at the end of the period, in line with developments in overall demand weighted by import content.** Import developments are influenced by the more rapid recovery in goods-based sectors, which have a higher import content. Compared with 2020, elasticity between imports and weighted overall demand is assumed to increase, by contrast to greater rigidity in imports during downturns. However, elasticity is slightly below the historical average, continuing a downward trend seen since before the pandemic.

**The goods and services account deficit will decrease in 2021, to stand close to zero over the remainder of the projection horizon.** This reflects the upturn in services-based sectors, namely tourism, and the greater weight of this component in exports than in imports. In 2021, terms of trade are expected to make a negative contribution, partly due to the rise in oil prices.

**The current and capital account surplus will increase over the projection horizon.** In addition to favourable developments in the goods and services account balance, the income and capital account surplus will increase, benefiting from (i) the one-off effect of the reimbursement in 2021 by the European Financial Stability Facility of €1,088 million paid by Portugal under the Economic and Financial Assistance Programme, (ii) the downward path of public debt interest payments and (iii) the rise in the amount of funds received from the EU. In the period 2021-23, Portugal is expected to receive 3.8% of GDP per year, on average, in EU funds, as a combination of amounts associated with the Multiannual Financial Framework (MFF) 2014-20, the launch of the MFF 2021-27 and NGEU. In particular, NGEU grants are estimated to account for approximately one-third of total funds received.

**Employment will increase by 0.8%, while hours worked will grow by 3.3%, on average, in 2021-23.** The nature of the pandemic crisis and the policy measures adopted have contributed to ease the decrease in employment in 2020, which was much more mitigated than the reduction in hours worked (-1.7% and -9.2% respectively). In tandem with the recovery in activity and at an early stage, firms are expected to use workers already available to address the increase in demand. Hours worked will grow more markedly than employment particularly in 2021 and 2022 (Table I.1.1). Muted developments in employment also reflect demographic challenges and the gradual upturn in the segments most affected by the crisis, namely in sectors that are more exposed to person-to-person contact, more labour-intensive and less apt to use remote working (Chart I.3.4), as well as for younger individuals, with lower qualifications and temporary contracts.

**Chart I.3.4 • Developments in employment | Index, 2019 T4 = 100**



Sources: Banco de Portugal and Statistics Portugal. | Notes: (p) – projected. Over the projection horizon figures refer to the annual average. The services most affected by the pandemic include wholesale and retail trade services, repair services of motor vehicles and motorcycles, transportation and storage, accommodation and food services, arts, entertainment and recreation services and other services (activity sectors G-I and R-U).

**The unemployment rate is likely to edge up from 6.8% in 2020 to 7.7% in 2021, before remaining on a downward path until the end of the projection horizon.** Information available for the beginning of the year suggests a relative stabilisation of the unemployment rate and a reduction in employment and the labour force, similarly to that seen in the second quarter of 2020, although to a lesser extent. In the year as a whole, the unemployment rate is expected to rise, mirroring the increase in the number of individuals that move from inactivity to unemployment. These developments are the result of the increase in the activity rate, associated with the lifting of containment measures and the upturn in economic activity.

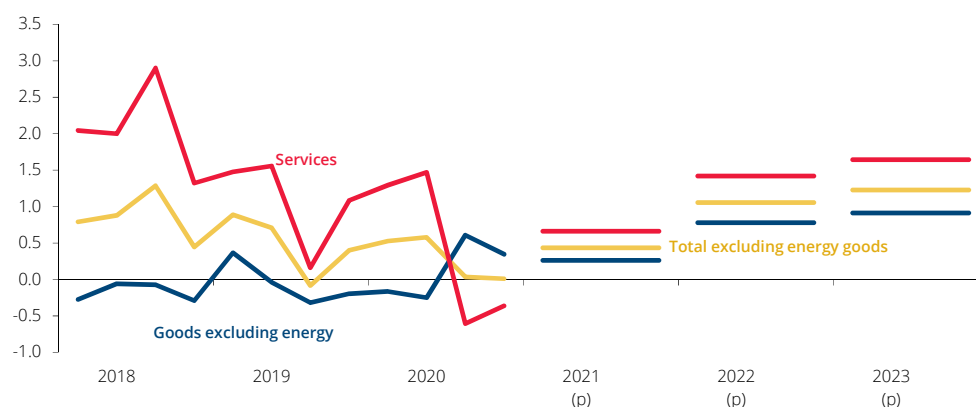
**At the end of the horizon, the unemployment rate is expected to exceed that seen in 2019, although standing far below that observed during the 2011-13 crisis.** While policy measures were successful in mitigating the negative impacts of the pandemic crisis on the labour market, a number of more protracted effects are expected, stemming from possible changes in agents' preferences (for instance, e-purchases, business travel and working from home) and the need to reallocate inputs among sectors.

**Inflation remains contained in Portugal and the euro area.** The rate of change in the harmonised index of consumer prices is estimated to increase from -0.1% in 2020 to 0.7% in 2021, 0.9% in 2022 and 1.0% in 2023 (Table I.1.1). Similarly to 2020, projected developments in prices are more muted in Portugal than in the euro area, with a negative differential of 0.5 p.p., on average, against the projections released by the ECB.

**In the short run, external inflationary pressures are expected to increase.** These developments are influenced by oil price hikes, the acceleration in non-energy commodity prices and the increase in international shipping costs, particularly from Asia to Europe. The rise in oil prices is more substantial than previously assumed, thus contributing to the upward revision of projected inflation in 2021. Following a 1.4% drop in 2020, non-energy import prices are expected to increase by 1.9% in 2021, growing by 1.6%, on average, over the projection horizon.

**The decrease in slack will contribute to a rise in inflation.** Excluding energy goods, inflation will gradually increase from 0.3% in 2020 to 0.4% in 2021, 1.1% in 2022 and 1.2% in 2023. The rise in inflation is associated with the unwinding of the direct impact of the pandemic and the upturn in demand. In 2021, prices in the sectors most affected by the pandemic are expected to increase, namely in tourism-related services, whose prices dropped by around 5% in 2020 (Chart I.3.5).

**Chart I.3.5 • Developments in the harmonised index of consumer prices | Year-on-year rate of change, per cent**



Sources: Banco de Portugal and Statistics Portugal. | Notes: (p) – projected. Over the projection horizon figures refer to the annual rate of change.

**Muted wage growth is projected to persist over the projection horizon, below that seen prior to the pandemic crisis.** The increase of less than 3% in private sector wages in 2020 (4.3%, on average, in the previous two years) reflected factors such as the lower number of salary reviews in collective bargaining agreements and the impact of employment protection policies, namely the simplified layoff scheme. These factors were mitigated by the 5.8% increase in the minimum wage and positive composition effects, as the reduction in employment was more concentrated in lower



salary bands. As the economy recovers, some of these effects will unwind (protection policies) and other effects will tend to reverse, such as composition effects, while average wage growth is projected to exceed 2% over the projection horizon. Current projections include the effect of the 4.7% rise in the minimum wage in 2021.

## 4 Conclusion

Projections point to a recovery of economic activity in the period 2021-23, building on the success of the fight against the pandemic at international level, the strengthening of confidence and the support of national and supranational policy measures.

Although the 2019 level of economic activity is expected to be reached in mid-2022, there will be a loss compared to what would have been seen had there been no pandemic. The crisis caused an interruption in the accumulation of inputs, including human capital, and a lower efficiency in their use, due to concerns about the dissemination of and the fight against the virus. There are also costs from the reallocation of inputs associated with the heterogeneous impact across sectors. Also, the increase in public and private sector debt, which was already high, will pose major challenges to the Portuguese economy.

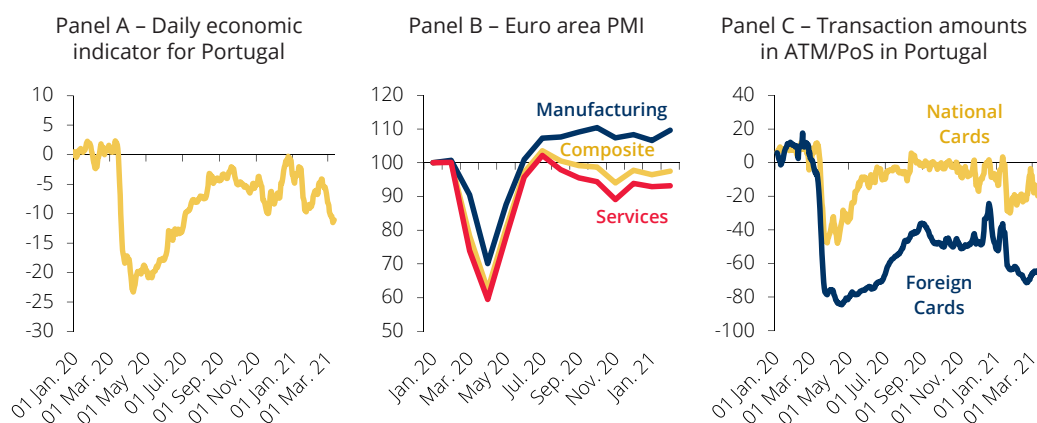
### Box 1 • The impact of the current lockdown on the Portuguese economy

The third wave of the pandemic prompted a new lockdown as from 15 January 2021 with further containment measures imposed as of 22 January. This box analyses the evolution of the Portuguese economy from the beginning of this period to 14 March, comparing with the effects observed in the first state of emergency, which lasted from 18 March to 2 May 2020.

Although this lockdown is lasting longer than the first one, high frequency information available indicates that the decline in activity has been less severe, maintaining some differentiation by component of expenditure and sector of activity.

Between 15 January and 14 March 2021, the decline in the daily economic indicator for Portugal (DEI) corresponded to about 40% of the fall recorded in the first state of emergency (Chart C1.1 – Panel A). The adaptability and learning capacity of economic agents and a more favourable international environment – reflecting a lower synchronisation of the pandemic situation across European countries and the dynamism of the Asian and American economies – may help to explain the smaller effect of the current lockdown on activity. At the beginning of 2021 Purchasing Managers Indexes (PMI) for the euro area maintained steady developments, with a more favourable performance in the industry than in services (Chart C1.1 – Panel B). These developments point to a positive evolution in external demand for Portuguese goods and services, thus implying a minor impact of the current lockdown on exports of goods.

**Chart C1.1 • Economic activity indicators | Year-on-year rates of change and index, January 2020=100**



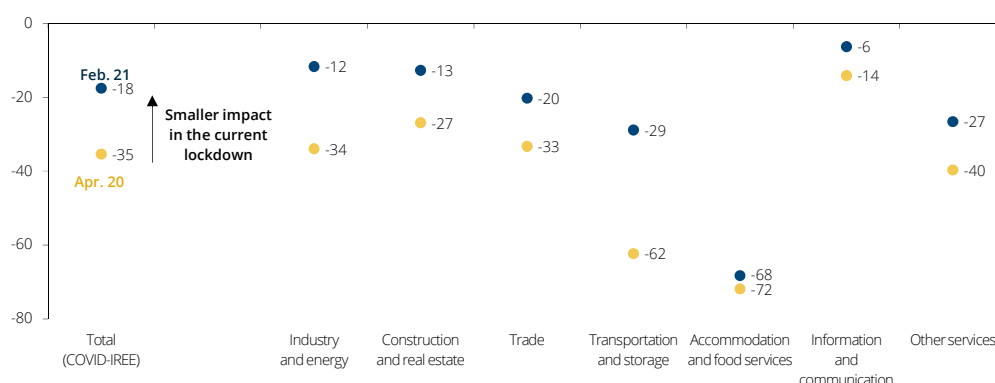
Sources: Banco de Portugal, IHS Markit and SIBS. | Notes: Daily data up to 14 March 2021. High frequency indicators were considered as a 7-day centered moving average. The daily data on transaction amounts in ATM/POS correspond only to withdrawals and purchases with national or foreign cards in Portuguese territory (transactions with national cards represent 91% of the total). For a more detailed description of the Daily indicator for economic activity, see Lourenço and Rua (2020), “The DEI: tracking economic activity daily during the lockdown”, *Working Paper No. 13*, Banco de Portugal.

The impact of this lockdown is more significant on private consumption and tourism indicators, reflecting restrictions on mobility and the closure of shops, restaurants and other establishments. The amount of domestic card transactions at automated teller machines (ATMs) and Point-of-Sale (POS) terminals in Portugal dropped by 20% year on year between 15 January and 14 March 2021, which compares with a 38% reduction in the first lockdown (Chart C1.1 – Panel C). The drop was sharper in transactions using foreign cards in Portugal (66% fall, i.e. about 80% of the fall in the first lockdown). In contrast, consumer confidence in 2021 remained close to that observed at end-2020 and above the April level.

The February edition of the Fast and Exceptional Enterprise Survey (COVID-IREE) confirms the lower economic impact of this lockdown, while sector differentiation persists. Results weighted by the business turnover of respondents show that in the first half of February only 2% of the firms temporarily suspended their business, compared to 8% in April. This share was higher in Accommodation and food services (30%, 22 p.p. less than in the first lockdown), and close to zero in the remaining sectors of activity.

The survey points to an 18% drop in business turnover in the first half of February, compared to a no-pandemic scenario, which represents about half of the decline reported in April (Chart C1.2). This reduction was more pronounced in services sectors more reliant on person-to-person contact. Sales in Accommodation and food services recorded a 68% drop, almost identical to that observed during the first lockdown. Other services declined by 27%, compared to -40% in April, with particular emphasis on the impact on arts, entertainment, and recreational activities and travel agencies. In contrast, the Information and communication sector recorded the smallest drop in turnover. In comparison with the first lockdown, Transportation and storage and Industry and energy stand out for having much smaller decreases in their business turnover. In the first case, the reduction in February was 29% (compared to -62% in April), reflecting, according to firms in this sector, the increase in demand and the smallest impact of the containment measures in place on their activity. As regards Industry and energy, the best position compared to April (12% fall, compared to -34% in April) reflects the adoption of strategies to adapt to the pandemic situation, which prepared firms to continue producing even under the constraints of the new state of emergency. The lower impact of this lockdown on Industry is confirmed by the stability of the confidence indicator in January and February 2021 and by a 5% decline in the industrial production index in January 2021, which compares to -11% in March and -32% in April 2020.

**Chart C1.2 • Impact of the pandemic on firms' business turnover, by sector | Percentage change vis-à-vis a scenario without the pandemic**



Sources: Banco de Portugal and Statistics Portugal (COVID-IREE). | Notes: The results are based on the survey responses to the question regarding the impact of the COVID-19 pandemic on business turnover vis-à-vis a scenario without the pandemic. For each enterprise, the mid-point of the reported interval was considered. Additionally, a -100% change was assumed for enterprises that reported being permanently closed. The responses were aggregated based on each firm's business turnover. COVID-IREE does not cover all sectors of activity and therefore its results cannot be extrapolated to the total economy. In particular, the financial and public sectors are not covered. For more details and a description of the impacts on turnover in April 2020, see Box 2 of the June 2020 *Economic Bulletin*.

The survey also shows that the new lockdown had a negative impact on working staff. In the first half of February firms recorded a 10% fall in effectively working staff compared to the no-pandemic scenario, which corresponds to around a third of the impact in the first lockdown. This smaller

reduction is aligned with the lower drop in business turnover and consequently with a smaller scale use of support measures such as the “Simplified layoff” and the “Extraordinary support for progressive resumption of activity”. According to information from the Ministry of Labour, Solidarity and Social Security, the number of workers covered by the “Simplified layoff” until 12 February 2021 was about one third of those covered in April 2020. Declines in effectively working staff were smaller than 10% in most sectors, contrasting with a 40% drop in Accommodation and food services.

In the context of the current lockdown, and taking into account the support measures in place, firms have proven to be more resilient. In the first half of February 2021, 89% of the firms (weighted by their turnover) reported that they were able to remain in business for more than six months in the current circumstances and in the absence of further support measures (26 p.p. more than in April 2020). The share was above 85% in all sectors, except for Accommodation and food services, where only 45% of firms reported being able to remain in business for more than six months.

The Portuguese economy has been very quick in reacting, showing a significant downturn as the number of outbreaks rises and containment measures are therefore adopted, and then showing ability to adapt throughout the lockdown periods, and in particular when the economic activities gradually reopen. This behaviour tends, nevertheless, to depend on the length of the lockdown periods. After several weeks of the current lockdown, the DEI returned to a downward trend in the first half of March. These developments signal risks to the economy’s ability to recover in view of extended restrictive measures.

## Box 2 • Impact of the Recovery and Resilience Plan for the period 2021-26

The COVID-19 pandemic triggered robust intervention from the economic policy authorities to mitigate the potential destruction of productive capacity and employment. The European Commission (EC) has strengthened its instruments with the creation of the NGEU, which has as its main financial element the European Recovery and Resilience Facility (RRF). Through grants and loans, the RRF finances reforms and investments defined in each Member State's Recovery and Resilience Plan (RRP), to be implemented in the period 2021-26. This financial aid focuses on two priorities previously defined by the EC – digital transition and the fight against climate change – but also covers investment in social support.

This box analyses the macroeconomic impact of the RRP on the Portuguese economy in the period 2021-26. Only the components financed by grants are considered, totalling €13.9 billion, which corresponds to 6.5% of GDP in 2019, the fifth highest percentage in Europe. The RRP considered in this exercise corresponds to the version submitted for public consultation on 15 February; the final version will be submitted by the Government to the EC by 30 April. The results show that the GDP level in 2026 will be between 1.1% and 2.0% higher than in the absence of the RRP (Table C2.1).

**Table C2.1 • Estimates for the macroeconomic impact of the RRP in the Portuguese economy in 2026 | Changes compared to the level that would occur in the absence of the RRP, per cent**

	Medium-term model	PESSOA model	Growth accounting approach
GDP	1.1	1.3	2.0
Employment	0.7	0.2	1.4

Source: Banco de Portugal. | Note: For more details on the PESSOA model see Júlio, P. and Maria, J. (2017), "The Portuguese post-2008 period: a narrative from an estimated DSGE model", *Working Paper No. 15*, Banco de Portugal.

On the basis of information made available, it was assumed that the grants will be used to finance public investment (about two thirds of the total) and private investment. In the short run, the stimulus of the RRP will pass through to the economy by the increase in investment, which triggers an increase in domestic demand, imports and employment. Exports also increase, benefiting from the stimulus being coordinated in Europe. In the medium run, with capital stock accumulation, the productive capacity of the economy increases. In addition, the modernisation of the capital stock and the adoption of new technologies increase the efficiency with which the productive factors are used, i.e. total factor productivity (TFP).

Given the diversity of investments and transmission channels, the assessment of the macroeconomic impact of RRP is a complex exercise. Thus, results are presented based on three complementary approaches. The first exercise is based on the medium-term model of the Portuguese economy, normally used in the projections published by the Banco de Portugal, which mainly captures the effects on the demand side. The second exercise uses a general equilibrium model for the Portuguese economy (the PESSOA model) that allows for the identification of macroeconomic effects of exogenous shocks on the demand or supply side. This model presents a multisectoral production structure, imperfections in the functioning of markets, and real, nominal and financial frictions. The third exercise is based on a sectoral growth accounting approach, on the back of assumptions relating to capital accumulation, changes in the technological coefficients of sectoral production functions and the increase in TFP. This exercise makes it possible to assess the impact on the activity and employment of the sectors at the end of the period, resulting from investments foreseen in the RRP.

In the medium-term model, economic activity in 2026 is 1.1% higher than in the absence of RRP, essentially reflecting a rise in investment and private consumption. Employment is estimated to increase by 0.7% in 2026.

Simulations performed using the PESSOA model point to similar results, estimating that economic activity and employment in 2026 will be 1.3% and 0.2% higher respectively.

In the case of the sectoral exercise, total gross value added will increase by 2.0% at the end of the six-year period. The contributions of capital, labour and TFP are 0.7, 0.8 and 0.4 p.p. respectively. Implicit job creation is 1.4%, which corresponds to around 70,000 jobs.

The estimates show that the implementation of the RRP – in the amounts and timing set – has a significant positive impact on the Portuguese economy, contributing to a faster recovery from the pandemic crisis. However, there are still correlated factors of uncertainty that may affect the results presented: the limitations of the analytical instruments used, particularly for the assessment of the impact on the TFP; the time profile of fund inflows; the absorption capacity, which may influence the degree of RRP overlap with pre-existing plans; the allocation between public investment, private investment or current expenditure; the cyclical position of the economy; possible positive externalities of RRP reforms, in particular in the improvement of business environment and investment attractiveness; the efficiency of the investment made; and the institutional capacity to select and implement viable projects.

The above aspects are largely related to implementation issues – deadlines and speed – and governance – control, transparency and project efficiency – of the RRP. The magnitude of the financial stimulus and the deadlines for implementing the plan are major challenges to its implementation.

The permanent impact of these funds depends on Portugal's ability to absorb available resources and generate a more permanent flow of activity capable of surviving the period in which financial stimulus is available. These financial resources could result in savings in public and private expenditure in the future, which, if used efficiently, will lead to an increase in productive capacity. This effect is not fully captured by the models used. Increased efficiency should be the present and primary objective of the RRP.

### Box 3 • Alternative scenarios for the Portuguese economy

The evolution of the Portuguese economy over the projection horizon remains surrounded by uncertainty. Unlike other periods, the greatest uncertainty is concentrated in the short term and stems from uncertainty regarding pandemic developments and the vaccination process. In the medium term it will mainly be the endogenous reaction of economic agents, in particular the changes in household behaviour and firms' resilience, that adds further uncertainty to the exercise. To illustrate the risks underlying the central projection, a favourable scenario and an adverse scenario have been developed.

In the favourable scenario, external demand for Portuguese goods and services shows stronger growth than in the projections presented in this *Economic Bulletin* and will reach the pre-pandemic level by the end of 2022 (Table C1.1).<sup>1</sup> In the adverse scenario, external demand will grow less in 2021-22, still standing below the pre-pandemic level at the end of the projection horizon. The different pace of recovery in international economic activity will also determine differentiated developments in external prices, with sharper increases in the favourable scenario and more contained increases in the adverse scenario over the whole horizon.

**Table C3.1 • External demand for Portuguese goods and services and GDP in Portugal – alternative scenarios | Annual growth rate, percentage**

	2020	2021 (p)	2022 (p)	2023 (p)
<b>External demand</b>				
Favourable scenario	-12.3	11.5	5.9	3.6
March 2021 EB projection	-12.3	7.4	5.7	3.5
Adverse scenario	-12.3	2.4	3.8	4.0
<b>GDP</b>				
Favourable scenario	-7.6	4.7	5.4	2.3
March 2021 EB projection	-7.6	3.9	5.2	2.4
Adverse scenario	-7.6	1.6	3.2	3.2

Source: Banco de Portugal, Eurosystem and Statistics Portugal. | Notes: (p) – projected, EB – *Economic Bulletin*.

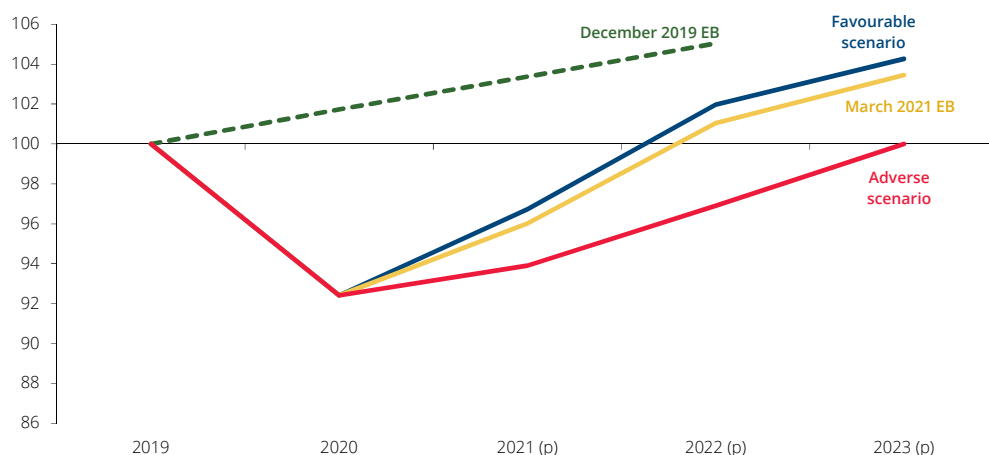
In the favourable scenario, a better control of infections and the faster lifting of containment measures result in less uncertainty and increased confidence amongst economic agents. In this context, the level of private consumption is above what is considered in the projections of this Bulletin (with annual growth rates of 3.1% in 2021, 4.7% in 2022 and 2% in 2023), with the contribution from a temporarily lower saving rate than that observed before the pandemic crisis. It is assumed that households spent part of their accumulated saving in 2020, which was to a large extent “forced” savings. This allows for a faster recovery in pent-up demand. In a scenario of lesser uncertainty, investment is expected to increase further, particularly in 2021. Reflecting highest growth in domestic and external demand, in the favourable scenario the GDP will grow by 4.7% in 2021, 5.4% 2022 and 2.3% in 2023. At the beginning of 2022 GDP will reach the level recorded at end-2019 (Chart C3.1).

In this favourable scenario, the labour market will recover more rapidly, with the unemployment rate returning to pre-pandemic levels at the end of the projection horizon, also contributing to a more

1. The assumptions underlying the international environment are based on the alternative scenarios presented for the euro area in the context of the exercise released by the ECB on 11 March.

marked reduction in precautionary saving. In a more favourable macroeconomic environment, the inflation rate is on average over the horizon 0.1 p.p. above projections presented in this Bulletin.

**Chart C3.1 • Alternative scenarios for GDP | Index 2019 = 100**



Source: Banco de Portugal and Statistics Portugal. | Notes: (p) – projected, EB – *Economic Bulletin*.

In the adverse scenario, it is assumed that more vaccines are rolled out and that the outbreak of new variants remains a threat that may force into new lockdown periods and mobility restrictions at borders throughout 2021. In addition to the negative impact on economic agents' confidence, the maintenance of containment measures and fears of contagion curtails private consumption developments, in particular in services more exposed to physical contact. The saving rate will remain above the long-term rate. In this scenario, private consumption will grow marginally in 2021 (0.4%), while recovering more moderately (3.6% in 2022 and 2% in 2023). Only at the end of the projection horizon will private consumption reach the pre-pandemic level.

Prolonged low levels of domestic and external demand and the persistence of restrictions on firms undermine the feasibility and survival of a larger number of firms. The deterioration in the financial situation of firms, in particular those in the hardest hit sectors and the most indebted, results in job and productive capacity losses. Moreover, higher uncertainty leads to postponed investment decisions, which contributes to lower growth in aggregate demand. These effects are partially mitigated by the strengthening of support measures implemented and the adoption of policies that prevent the financial amplification of the crisis. The effects on public accounts do not endanger the hypothesis of sustainability, but their medium- and long-term effects cannot be ignored.

The deterioration in the international environment, along with the extension of containment measures, will lead to a slower recovery in exports, in particular, of services. GDP will grow at a rate lower than considered in the projections of this *Economic Bulletin* in 2021 and 2022, i.e. by 1.6% and 3.2% respectively, and above in 2023, i.e. 3.2%.

In this adverse scenario, labour market developments are more unfavourable. The unemployment rate will rise over the course of 2021 and stand, at the end of the projection horizon, about 2 p.p. above the figure before the pandemic crisis. GDP will return to the pre-pandemic level by the end of 2023. In a less favourable macroeconomic environment, the inflation rate will drop by 0.1 p.p. on average compared to the projection presented in this issue of the *Economic Bulletin*.

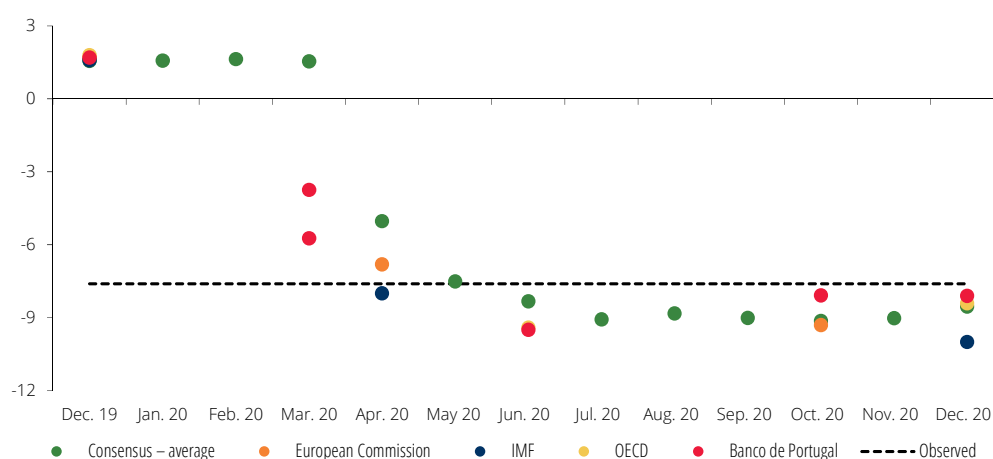


#### Box 4 • An assessment of the projections for the Portuguese economy over the course of 2020

The crisis triggered by the COVID-19 pandemic brought challenges to the monitoring and projection of the Portuguese economy. This box analyses developments in projections for economic activity prepared throughout 2020.

A heightened degree of uncertainty caused by the COVID-19 pandemic resulted in greater dispersion and volatility in forecasts for the Portuguese economy over 2020 prepared by international organisations and private analysts (Chart C4.1). The complexity in making the forecasts was higher than usual, reflecting: (i) the difficulty in anticipating the evolution of the pandemic; (ii) the difficulty in anticipating the emergence and implementation of effective medical solutions; (iii) the succession and scale of policies implemented by the authorities and (iv) the disruption in the usual relationships between macroeconomic aggregates.

Chart C4.1 • Projections for GDP in 2020 by release date | Annual rate of change, in percentage



Sources: Banco de Portugal, Consensus, European Commission, IMF and OECD.

The Banco de Portugal's first projections following the outbreak of the pandemic were published on 26 March, about a week after the state of emergency was declared in Portugal. With the high uncertainty underlying the exercise, in particular the almost lack of economic indicators reflecting the impact of the pandemic and containment measures, two scenarios were published. These scenarios pointed to GDP growth rates of -3.7% in 2020 in the baseline scenario and -5.7% in the adverse scenario (Chart C4.1).

In the June *Economic Bulletin*, the projection for economic activity was revised downwards, anticipating a 9.5% reduction in GDP. This projection led to an unprecedented chain fall in the second quarter of around 15% (after a 4% decrease in the first quarter), and a sharp recovery in the second half of the year.

The contraction in economic activity in the second quarter was less profound than anticipated (quarter-on-quarter change of -13.9%), which determined an upward revision of the GDP projection for 2020 in the October *Economic Bulletin*, to 8.1% (Chart C4.1).

The projection in the December issue of the *Economic Bulletin* incorporated the flash estimate for GDP in the third quarter, published by Statistics Portugal at the end of October, which again

surprised on the upside (quarter-on-quarter rate of change of 13.3% and year-on-year growth of -5.7%). This recovery benefited from the pent-up demand and the recovery in the majority of productive activities, albeit with marked differences across sectors. However, the worsening of the pandemic at the end of the year and the new restrictive measures introduced in Portugal and in other European countries in November led to the maintenance of the projection for the annual GDP growth rate in 2020 at -8.1%.

Economic developments in the fourth quarter were more favourable than anticipated (quarter-on-quarter change of 0.2%), reflecting a weaker impact of the restrictive measures. The GDP growth rate stood at -7.6% in 2020.

Despite the strong fall in GDP in 2020, the Portuguese economy's reaction to the pandemic shock proved to be more favourable than initially anticipated. This behaviour was broadly based across most euro area economies and globally. In Portugal, upward revisions of the GDP projection reflected more favourable than anticipated developments in private consumption, investment and exports.

The greater resilience of the economy reflects on the one hand, the adaptation and learning process of households and firms over the past year. On the other hand, the pandemic crisis highlighted the importance of national and supranational policy measures aimed at preserving productive capacity and the financial situation of households and firms, by creating conditions for a faster and more robust business recovery after the lifting of containment measures.

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## II Special issue

The evolution of the average firm size in Portugal



# The evolution of the average firm size in Portugal

## Introduction

The economic literature presents theoretical arguments that postulate the existence of a positive relationship between the average firm size and the level of development of countries (Lucas, 1978; Gollin, 2008). Recent empirical evidence supports this hypothesis. Studies by Bento and Restuccia (2017) and Poschke (2018) use harmonised databases from several countries to show a strong and positive correlation between the average firm size and the level of income per capita. In addition, larger firms tend to be more productive (e.g. Berlingieri et al., 2020; Banco de Portugal, 2019a), to pay, on average, higher wages (e.g. Oi and Idson, 1999), to have a higher propensity to export (e.g. Wagner, 1995), and a higher survival rate (e.g. Mata et al., 1995).

However, the available studies for the Portuguese economy document a downward trend in the average firm size from mid-80s to late 2000s (Sarmiento and Nunes, 2010; Braguinsky et al., 2011). In a context of major structural changes in the Portuguese economy (Banco de Portugal, 2019b), in particular following the financial and sovereign debt crises, it is important to understand the pattern of recent developments in the average firm size.

This Special issue analyses the evolution of the average size of Portuguese firms over time. As in the above-mentioned studies, the number of workers is used as a measure of firm size. This indicator is commonly used in the literature as it presents fewer limitations than other alternative measures such as assets, turnover, value added, profits, or market share (Delmar et al., 2003). In addition, this measure can be calculated using the microdata set of the *Quadros de Pessoal (QP)/Relatório Único (RU)* which allows access to granular information at firm level and the study of an extended period of time. These are administrative databases collected on an annual basis and cover the universe of Portuguese firms with at least one employee (Box 1).

In this study it is concluded that, for the period 2013-2018, the average size of Portuguese firms increased, in contrast to the known evidence for previous years. This increase is associated with a shift in the size distribution towards higher values.

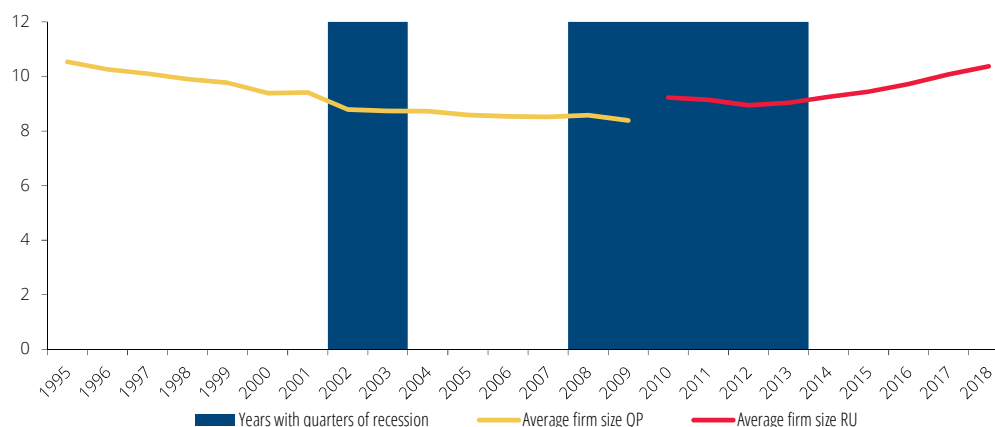
## The evolution of average firm size

Braguinsky et al. (2011) and Sarmiento and Nunes (2010) document that the average firm size shows a clear downtrend for the period from 1985 to 2009. Chart 1 shows the average firm size using *Quadros de Pessoal* up to 2009 and *Relatório Único* from 2010 onwards. This Chart corroborates the results presented in the literature, but it also shows that the firm size has been increasing consistently since 2012.

There are few recent studies showing whether this pattern of evolution in the average firm size is specific to Portugal. For the USA, Choi and Spletzer (2012) and Cao et al. (2020) show that the average size of US firms increased uninterruptedly in the 1980s and 1990s and that from

the 2000s onwards, although the growth trend persists, the average size decreases during and after recession periods. As can be seen from Chart 1, which marks the 2002 and 2007 recession periods (Rua, 2017), the behaviour pattern of the series for the Portuguese case is different from that described for the USA.

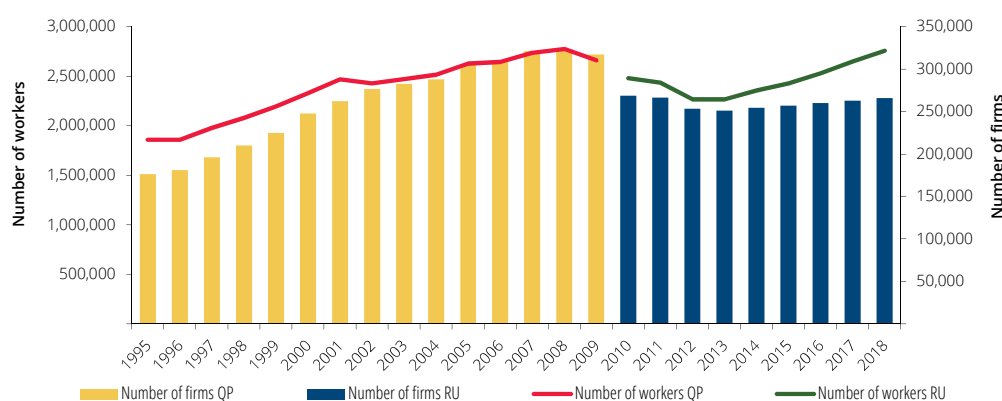
**Chart 1 • Evolution of the average firm size**



Source: *Quadros de Pessoal/Relatório Único* (INE).

Chart 2, which shows the total number of firms and workers over time, helps to understand the evolution of the average size. Until 2008, both series show an upward trend, but the number of firms increases more sharply. After 2010, and during the recessive period, there is a fall in the two series followed by a faster recovery in the number of workers.

**Chart 2 • Number of firms and workers**



Source: *Quadros de Pessoal/Relatório Único* (INE).

The dynamics of job creation and destruction in Portugal differ according to the size of the firms (Centeno et al., 2007). Over such a long period of time, this heterogeneity of behaviours can lead to structural changes with implications for the distribution of the number of workers. Chart 3 shows how the percentage of firms and employment has evolved in four size classes: micro, small, medium and large.

**Chart 3 • Share of firms and workers by size class**



Source: *Quadros de Pessoal/Relatório Único* (INE). | Notes: The left axis shows the share of workers and the right axis shows the share of firms. A micro firm is defined as employing fewer than 10 workers. A small firm employs 10 to 49 workers. A medium firm employs 50 to 249 workers. The firms employing at least 250 persons are classified as large firms.

The share of micro firms increased steadily to a maximum of 86% in 2009, with no similar development in terms of the employment share. These changes are in line with the evidence found by Braguinsky et al. (2011) and Sarmento and Nunes (2010) that the distribution of firm sizes shifted towards a reduction in size until 2009, with an increase in the concentration of small firms. However, after this year, the pattern of evolution presented in Chart 3 does not seem to support this observation. Since 2010, large firms have been consistently strengthening their employment share, while micro firms are moving in the opposite direction. Moreover, from 2013 onwards, the percentage of micro firms decreased consistently, while that of large firms increased.

### Box 1 • Concepts and sources of information

The average firm size ( $\overline{Dim}$ ) is calculated as the ratio of the total number of workers to the total number of firms in a given year:

$$\overline{Dim} = \frac{1}{N} \sum_{i=1}^N \text{Number of workers}_i$$

where  $i$  represents a firm and  $N$  is the total number of firms in the year.

The data source of this Special issue are the *Quadros de Pessoal* until 2009 and the *Relatório Único* from 2010 onwards. These databases are collected by the Ministry of Labour, Solidarity and Social Security on an annual basis and cover the universe of firms with at least one employee. The data make it possible not only to characterise these firms in terms of their main economic activity, founding year and geographical location, but also to follow the same firm over time through a unique identifier. They also include granular information on some characteristics of the establishments and workers of the firms.

The definition of the number of workers includes employees, employers and other residual categories performing tasks in the firm and not absent for more than one month. This information reports to the last week of March until 1993 and to the last week of October as from 1994. In 2010, with the introduction of the *Relatório Único*, the number of workers refer to the month of October of the reference year.

This article uses data for all private firms located in the mainland, except for the agriculture, public administration and international organisations sectors. The total sample includes 1,012,053 firms in the 1985-2018 period, equivalent to a total of 7,522,276 observations.

Table C1.1 below includes a brief description of the variables considered.

**Table C1.1 • Description of the variables**

Variable	Description
Legal form	Categorical variable in which Corporations include General Partnerships (Sociedades em Nome Coletivo), Public Limited Liability Companies (Sociedades Anónimas), Limited Partnerships (Sociedades em Comandita), Private Limited Liability Companies (Sociedades por Quotas). ENI include Sole Proprietorships (Empresários em Nome Individual) and Natural Persons (Pessoas Singulares). Other categories include the remaining categories of legal form.
Sector of activity	Sector of activity reported according to the Portuguese Classification of Economic Activities (CAE Rev. 1 until 1994, CAE Rev. 2 from 1995 to 2002, CAE Rev. 2.1 from 2003 to 2006 and CAE Rev. 3 from 2007 onwards).
Firm's age	Measured as the difference between the reference year and the founding year reported by the firm <sup>1</sup>
Region	Region where the firm is located according to the Nomenclature of Territorial Units for Statistics II (Norte, Algarve, Centro, Lisbon Metropolitan Area and Alentejo).
Number of establishments	Number of establishments reported by the firm. Firms with 4 or more establishments were aggregated in the same category.

1. Firms only started reporting the founding year since 1994. Some statistical corrections were adopted to deal with missing or ambiguous information.



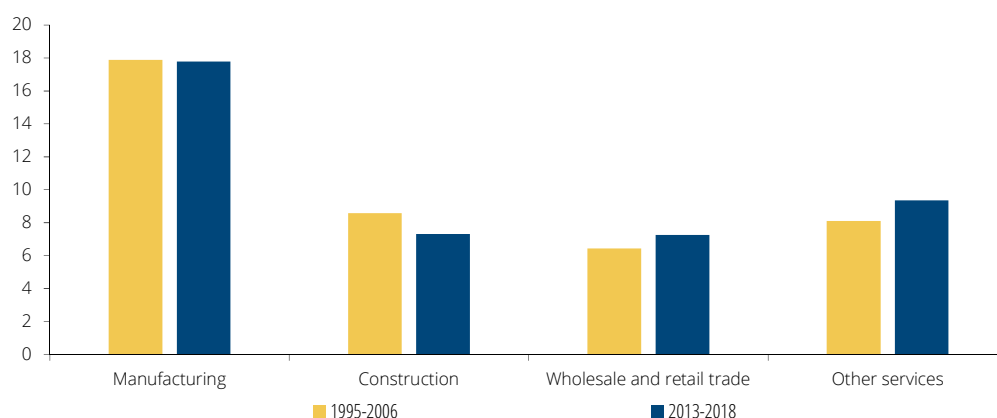
## Heterogeneity by firm characteristics

There are several factors that help characterise the observed heterogeneity of firm size. This section provides a brief analysis of these factors with particular emphasis on those considered most relevant in the literature, namely the sector of activity and the firm's age. Two separate periods will be considered for the purpose of analysis. The first one from 1995 to 2006, during which the average firm size dropped steadily. The second one, from 2013 to 2018, shows a positive trend in the evolution of the average firm size.

### Sector of activity

Chart 4 shows the heterogeneity of the average firm size by sector of activity according to the most aggregated level of the Portuguese Classification of Economic Activities (CAE). As in Braguinsky et al. (2011) and Sarmiento and Nunes (2010), we find that firms in the manufacturing industry have a larger average size than firms operating in the remaining sectors of activity. This heterogeneity is much more pronounced if a higher level of CAE breakdown is considered.

**Chart 4 • Average firm size by sector of activity**



Source: *Quadros de Pessoal/Relatório Único* (INE). | Notes: This chart presents the average firm size in the reference period for the main sectors of activity, excluding the Energy and Mining and quarrying sectors. The classification in effect was CAE Revision 2 between 1995 and 2002, CAE Revision 2.1 between 2003 and 2006, and CAE Revision 3 starting in 2007.

### Age

As already shown for the manufacturing sector by Mata et al. (1995), average firm size increases with age. This observation is confirmed by the analysis of Table 1, which indicates that the average size is increasing with age classes.

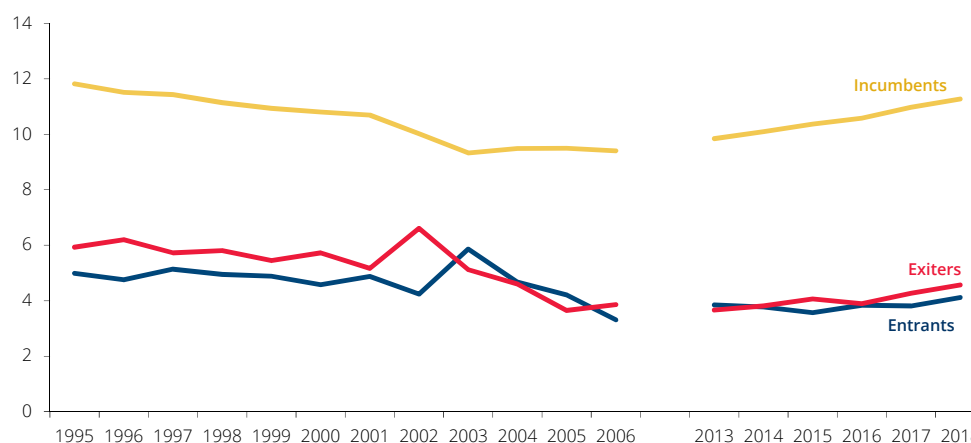
**Table 1 • Average firm size by age class**

	Age [1-5[		Age [5-10[		Age [10-20[		Age 20+	
	$\overline{Dim}$	% N	$\overline{Dim}$	% N	$\overline{Dim}$	% N	$\overline{Dim}$	% N
1995-06	5.4	31.0%	7.6	23.6%	10.1	27.8%	18.4	17.7%
2013-18	4.6	26.0%	6.6	17.5%	8.8	27.9%	17.0	28.6%

Source: *Quadros de Pessoal/Relatório Único* (INE). | Note:  $\overline{Dim}$  represents average firm size and % N represents the share of firms in the class. The values correspond to the period average.

In addition, the average size of firms entering and leaving the market is substantially smaller than that of incumbent firms in the same sector of activity (Cabral, 2007; Felix, 2017). As can be confirmed from Chart 5, over the periods considered, the average firm size is substantially smaller at entry and exit when compared to firms that remain in the sample from one year to the next (incumbent). It is therefore expected that the average number of workers will also be affected by entries and exits of firms.

**Chart 5 • Average size of incumbent firms, entrants and exiters**



Source: *Quadros de Pessoal/Relatório Único* (INE). | Note: Entrants (exiters) are firms that are in the sample in the current (previous) year but not in the previous (current) year.

### Other factors

The firm size also differs according to the legal form of the firms, their number of establishments (Cao et al., 2020) and the region where they are located (Barbosa and Eiriz, 2011). Corporations stand out as having, on average, a higher number of workers than sole proprietors or natural persons (Table A1). Firms with only one establishment, which account for approximately 94 % of the total number of firms, have on average fewer workers than multi-establishment firms (Table A2). The Northern region (Norte), the Lisbon metropolitan area and the Centre region (Centro) not only concentrate the largest share of firms, but they also stand out because they are home to larger firms (Table A3).

## The evolution of the average size: factor contribution breakdown

As documented in the previous sections, the average size of Portuguese firms has changed over time. What stands out from the previous analysis is the growth pattern of the average size evidenced in recent years, which contrasts with the ongoing decline observed until the end of the 2000s. However, the evolution of the average cannot be taken as representative of firms' general behaviour because, as seen before, several factors contribute to justify the heterogeneity of the observed firm size. As expected, shifts in the composition of these factors over time will be reflected in the calculation of the average size. As an example, Table 1 shows that younger firms are, on average, smaller in size. If the proportion of young firms decreases over time, all else equal, then this will be reflected in an

increase in the average firm size, without this indicating that firms are increasing in size. The same logic applies to all factors that contribute to the heterogeneity of the observed firm size. Shifts in the composition of these factors over time may explain, albeit partially, the dynamics of the evolution of the average firm size.

The aim of this section is to try to understand the contributions of these different factors over time. The literature identifies some relatively simple approaches to unravel the effects of the compositional change due to a single factor (e.g. Choi and Spletzer, 2012; Braguinsky et al., 2011). However, those analyses ignore the possibility of simultaneous changes in the various factors that contribute to the evolution of the mean over time. As the database used is quite rich, with information at the firm level, it is possible to evaluate the independent contribution that each factor has to the evolution of the mean, assuming that these factors have an invariant effect over time. To this end, recent developments in the estimation of linear regression models with high-dimensional fixed effects are used (Guimarães and Portugal, 2010). The idea is to specify the size of each firm  $i$  in the year  $t$  as the result of the sum of firm-specific components. More specifically,

$$Dim_{it} = Ind_{(it)} + Age_{(it)} + Natju_{(it)} + Estab_{(it)} + Region_{(it)} + Year_t + Others_{it}$$

where  $Ind_{(it)}$  refers to the classification of the firm's  $i$  economic activity in the year  $t$ , the variable  $Age_{(it)}$  indicates the age of the firm in that year, the variable  $Natju_{(it)}$  represents the legal form,  $Estab_{(it)}$  indicates how the firm is organised in terms of establishments and  $Region_{(it)}$  gives us an indication of the region where the firm is located. Finally, the factor  $Year_t$  absorbs all those components which equally impact the firm size, such as changing macroeconomic conditions or the widespread adoption of new technologies. In the following analysis, all these factors are treated as categorical variables (fixed effects) and are therefore replaced by a set of binary variables, each representing a single category.<sup>2</sup> Since the database used has millions of observations, all parameters are easily identifiable, with the advantage of allowing an adjustment with great parametric flexibility. Finally, the latter term  $Others_{it}$  captures all other idiosyncratic factors and corresponds in practice to the perturbation term of a linear regression.

Once the model is estimated,<sup>3</sup> the annual average size is calculated as the sum of the means of the estimates obtained for the fixed effects for each of the factors. In other words, the following identity is verified by construction:

$$\overline{Dim}_t \equiv \overline{Ind}_t + \overline{Age}_t + \overline{Natju}_t + \overline{Estab}_t + \overline{Region}_t + \overline{Year}_t$$

where  $\overline{Dim}_t$  is the average firm size in the year  $t$ . On the other hand,  $\overline{Ind}_t$  is nothing but the average, for all firms in the year  $t$  of the estimates of the fixed effects associated with the different economic activities of those firms. The same is true for the other factors, which are also the average of fixed effects estimates.

In practice, the decomposition, as shown, has an identification problem because it is always possible to add a constant to one of the terms on the right side of the equation by subtracting it from another term without altering the equality. However, this formulation allows us to realise the impact that shifts in the composition of factors have on changes in the average firm size over time. In other words, if from one year to the next, firms maintain exactly the same allocation across the different sectors

2. For the classification of economic activity, categories are defined at 3-digit CAE. Each year of the Age factor defines a category and from 75 years onwards all firms are included in the same class. For the remaining factors, the categories match those described in Table C1.1.

3. The model was estimated by least squares using the *reghdfe* routine developed by Sérgio Correia for the Stata software.

of activity, then the estimate of  $\widehat{Ind}_t$  will be identical in both years and the industrial composition will not contribute to the change in the average size. On the other hand, if the distribution of firms by sector of activity changes, resulting in greater representativeness of sectors where firms tend to be larger, then the component  $\widehat{Ind}_t$  will increase, which will be directly reflected in the average firm size. Thus, the difference between two years can be calculated and the following decomposition can be used to understand the contribution that each factor has to the evolution of the average size over time,

$$\Delta \overline{Dim} = \Delta \overline{Ind} + \Delta \overline{Age} + \Delta \overline{Natju} + \Delta \overline{Estab} + \Delta \overline{Region} + \Delta \overline{Year}$$

where  $\Delta$  represents the variation between two years.

Table 2 shows changes in firm size by time period and their decomposition based on the equality set out above. The table shows the average annual change to make the comparison between periods easier.

**Table 2 • Decomposition of the annual change in the average firm size**

	$\Delta \overline{Dim}$	$\Delta \overline{Ind}$	$\Delta \overline{Age}$	$\Delta \overline{Natju}$	$\Delta \overline{Estab}$	$\Delta \overline{Region}$	$\Delta \overline{Year}$
1995-06	-0.182	-0.050	0.024	0.062	-0.007	-0.004	-0.207
2013-18	0.268	0.010	0.031	0.024	-0.019	0.002	0.221

Source: *Quadros de Pessoal/Relatório Único* (INE).

In the period from 1995 to 2006, the annual decrease in the average firm size is 0.18 workers per year. During this period the main contribution appears to come from macroeconomic factors. The firms' age factor makes a small contribution, reflecting a stable age structure of the firms. Changes in the industrial composition have a negative, though negligible, effect.

The period between 2013 and 2018 contrasts with the previous one by the sustained increase in the average firm size (including those analysed in other studies mentioned above). In fact, during this period, Portuguese firms increased, on average, around 0.27 workers per year. The decomposition presented helps us realise that the shift in the composition of factors as a whole justifies an increase of 0.05 workers per year. For the first time, there is a positive and common macroeconomic effect for all firms, representing an annual increase of 0.22 workers per year. In other words, in the most recent period the evidence points to an actual increase in the average firm size.

The information previously presented in Chart 3 shows that in recent years large firms have increased their employment share to the detriment of micro firms suggesting that the size distribution has shifted to higher values. It is therefore important to explore in greater depth how the growth of firms has evolved in recent years by breaking it down by size classes.

To this end, another type of decomposition is presented in Table 3. The Table shows how the number of workers per firm size class changed in the period 2013-2018. The first column, **Variation**, shows the increase in the number of workers. The following two columns show how employment evolved for incumbent firms, i.e., those that were present in 2013 and 2018. A distinction is made between **Expansions and Contractions**, which separate the variations in employment between firms that have increased and those that have shrank their labour force. The following columns, **Entries and Exits**, show the decomposition of employment due to firms entering and leaving the sample. Finally, the last two columns of the Table show changes resulting from shifts in size class. It should be noted

that **Entries from other classes** are evaluated with the employment in 2018, while **Exits to other classes** refer to 2013 figures. The last row of Table 3 presents the decomposition for all the firms. The total values for **Expansions and Contractions** now include interclass movements and are therefore not identical to sums per size class.

**Table 3 • Decomposition of the change in employment in the period 2013-2018**

	Change	Expansions	Contractions	Entries	Exits	Entries from other classes	Exits to other classes
Micro	46,973	76,816	-48,032	237,927	-184,401	21,849	-57,186
Small	126,333	79,997	-24,311	134,210	-102,977	142,026	-102,612
Medium	118,974	71,753	-16,870	69,307	-65,145	135,288	-75,359
Large	198,773	145,798	-19,009	51,958	-58,569	97,860	-19,265
<b>Total</b>	<b>491,053</b>	<b>567,854</b>	<b>-159,111</b>	<b>493,402</b>	<b>-411,092</b>		

Source: *Quadros de Pessoal/Relatório Único* (INE).

It can be observed from this Table that most of the positive employment variation for this period was due to expansions. In net terms, only 1 out of 5 new jobs are the result of firm's demographic dynamics, the remainder being allocated to incumbent firms. This employment change was positive for all size classes. More than that, expansions are always greater than contractions, which indicates that the employment growth in incumbent firms extended to all categories. However, this figure should be interpreted with care as changes in the size of the firm may lead to changes in categories.

The analysis of the figures for entries and exits from/to other classes provides evidence to support the idea that the increase in firm size was widespread. The balance between entries and exits is only negative for micro firms and is positive for the other categories. As regards demographic dynamics, entry and exit of firms are particularly important for micro firms, losing relevance as the size class increases. It should be noted that the large firm category is the only one with a negative demographic balance. On the other hand, it is in this category that expansions take on the greatest importance. In short, it is confirmed that the increase in the average size for the period 2013-2018 is observed across all size classes and consistent with the idea that the distribution of firms shifted to higher values.

## Conclusion

Data from the *Quadros de Pessoal/Relatório Único* show that the average size of Portuguese firms, measured in terms of employment, decreased until the end of the 2000s. The main explanation for this decline cannot be attributed to recomposition effects, such as the growth in the relative weight of the service sector or the increase in the entry rate of new firms.

The period 2013-2018 is characterised as a period during which the average size of Portuguese firms increases in a robust manner. Only a small portion of this increase can be attributed to recomposition effects, with clear evidence that, in recent years, Portuguese firms have been growing in terms of the number of workers.

This growth was mainly due to the expansion of the number of workers in incumbent firms and cut across all size classes. As a result, there has been a shift in the distribution of firm size, to generally higher values, which is consistent with the increase in the average size observed for this period.

This Special issue is essentially descriptive in nature, and does not intend to study the causes underlying the evolution of the average firm size. The topic deserves further analysis to understand the relevance that changes in capitalistic intensity, financial conditions, solvency, and productivity may have in explaining the reversal of the trend observed in the evolution of the average firm size.

## References

Banco de Portugal (2019a). "Labour productivity in Portugal over the past decade: a firm-level approach". *Economic Bulletin*, May 2019.

Banco de Portugal (2019b). "Portuguese economic growth: a view on structural features, blockages and reforms". edited by the Economics and Research Department. Banco de Portugal.

Barbosa, N., and Eiriz, V. (2011). "Regional variation of firm size and growth: the Portuguese case". *Growth and Change*, 42(2), 125-158.

Bento, P., and Restuccia, D. (2017). "Misallocation, establishment size, and productivity". *American Economic Journal: Macroeconomics*, 9(3), 267-303.

Berlingieri, G., Calligaris, S., Criscuolo, C., and Verlhac, R. (2020). "Laggard firms, technology diffusion and its structural and policy determinants". OECD Science, *Technology and Industry Policy Papers*, No. 86, OECD Publishing, Paris.

Braguinsky, S., Branstetter L., and Regateiro, A. (2011). "The incredible shrinking Portuguese firm". *NBER Working Paper* 17265.

Cabral, L. (2007). "Small firms in Portugal: a selective survey of stylized facts, economic analysis, and policy implications". *Portuguese Economic Journal*, vol. 6(1), pages 65-88.

Cao, D., Hyatt, H., Mukoyama, T., and Sager, E. (2020). "Firm growth through new establishments". *Working Papers*, Georgetown University, Department of Economics.

Centeno, M., Machado, C., and Novo, A. (2007). "Job Creation and Destruction in Portugal". *Economic Bulletin*, 13(4), Banco de Portugal.

Choi, E. J., and Spletzer, J. R. (2012). "The declining average size of establishments: evidence and explanations". *Monthly Lab. Rev.*, 135, 50.

Delmar F., Davidsson P., and Gartner, W. B. (2003). "Arriving at the high-growth-firm". *Journal of Business Venturing*, 18, 189-216.

Félix, S. (2017). "Firm creation and survival in Portugal". *Banco de Portugal Economic Studies*, Volume III, Banco de Portugal.

Gollin, D. (2008). "Nobody's business but my own: Self-employment and small enterprise in economic development". *Journal of Monetary Economics*, 55(2), 219-233.

Guimarães, P., and Portugal, P. (2010). "A simple feasible procedure to fit models with high-dimensional fixed effects". *Stata Journal*, 10(4), 628-649.

Lucas Jr, R. E. (1978). "On the size distribution of business firms". *The Bell Journal of Economics*, 508-523.

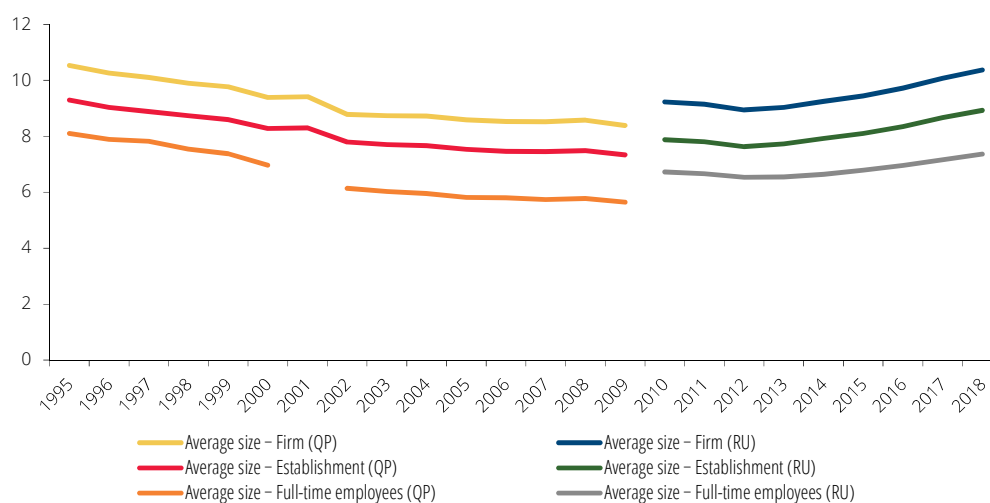
- Mata, J., Portugal, P., and Guimarães, P. (1995). "The survival of new plants: Start-up conditions and post-entry evolution". *International Journal of Industrial Organization*, 13(4), 459-481.
- Oi, W. Y., and Idson, T. L. (1999). "Firm size and wages". *Handbook of labor economics*, 3B, 2165-2214.
- Poschke, M. (2018). "The firm size distribution across countries and skill-biased change in entrepreneurial technology". *American Economic Journal: Macroeconomics*, 10(3), 1-41.
- Rua, A. (2017). "Dating the Portuguese business cycle". *Banco de Portugal Economic Studies*, 3(1), 47-64.
- Sarmento, E., and Nunes, A. (2010). "Getting smaller: size dynamics of employer enterprises in Portugal". *Cadernos Sociedade e Trabalho XV*, Ministry of Labor and Social Solidarity, 69-94.
- Wagner, J. (1995). "Exports, firm size, and firm dynamics". *Small Business Economics*, 7(1), 29-39.

## Box 2 • Robustness of the concept and evolution of average firm size

The conclusions about the evolution of the average firm size in Portugal were drawn using the information for firms reporting the *Quadros de Pessoal/Relatório Único* in the period under study. This Box seeks to confirm whether this evolution pattern is robust to other forms of measurement. Thus, the average size was calculated using the establishment as the unit of analysis and considering only full-time employees.<sup>4</sup>

As can be seen in Chart C2.1, which compares the average size used in this study with the alternative measures, the patterns of evolution are very similar.

Chart C2.1 • Robustness of average size to other observation units



Source: *Quadros de Pessoal/Relatório Único* (INE). | Note: The worker level data that allow to identify the professional status and hours of work are not available in *Quadros de Pessoal* for the reference year of 2001.

4. Only the number of employees with full base wage and working at least 143 normal hours in the reference month is considered.



## Appendix

**Table A1 • Average firm size by legal form**

	Corporations		ENI <sup>5</sup>		Other categories	
	$\overline{Dim}$	% N	$\overline{Dim}$	% N	$\overline{Dim}$	% N
1995-06	12.1	65.6%	2.9	30.8%	17.7	3.6%
2013-18	10.7	78.0%	2.1	17.3%	19.9	4.7%

Source: *Quadros de Pessoal/Relatório Único* (INE). | Note:  $\overline{Dim}$  represents average firm size and % N represents the share of firms in the class. The values correspond to the period average.

**Table A2 • Average firm size by number of establishments**

	1 Estab		2 Estab		3 Estab		4+ Estab	
	$\overline{Dim}$	% N	$\overline{Dim}$	% N	$\overline{Dim}$	% N	$\overline{Dim}$	% N
1995-06	7.2	94.6%	23.7	3.4%	37.6	0.9%	140.6	1.0%
2013-18	6.6	93.9%	23.1	3.9%	52.6	1.0%	167.0	1.2%

Source: *Quadros de Pessoal/Relatório Único* (INE). | Note:  $\overline{Dim}$  represents average firm size and % N represents the share of firms in the class. The values correspond to the period average.

**Table A3 • Average firm size by region**

	Norte		Algarve		Centro		Lisbon M. A.		Alentejo	
	$\overline{Dim}$	% N	$\overline{Dim}$	% N	$\overline{Dim}$	% N	$\overline{Dim}$	% N	$\overline{Dim}$	% N
1995-06	9.8	36.6%	6.1	5.4%	8.2	22.9%	11.1	28.5%	6.7	6.6%
2013-18	8.9	39.4%	6.4	5.8%	8.0	22.8%	13.6	25.9%	7.1	6.1%

Source: *Quadros de Pessoal/Relatório Único* (INE). | Note:  $\overline{Dim}$  represents average firm size and % N represents the share of firms in the class. The values correspond to the period average.

5. ENI means Sole proprietor. This definition also includes natural persons.

