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1 Introduction

After a 7.6% fall in 2020, GDP will grow by 4.8% in 2021 and by 5.6% in 2022. In 2023 GDP will grow 2.4%, closer to pre-pandemic rates. This recovery is based on the assumption of control of the pandemic, including advances in vaccination, and the continued support of economic policies that mitigate the permanent effects of the crisis on productive capacity.

This recovery is faster than that observed in previous recessive episodes. The exogenous nature of the shock, the limited transmission to the financial system and the timely response of fiscal and monetary policy favour the return of GDP to end-2019 levels, projected for the beginning of 2022. However, the shock is expected to have lasting effects on some segments of the economy most affected by the pandemic. Activity will not resume until 2023 the levels of activity projected for that year before the pandemic, although the estimated loss is limited (Box 1).

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

	Weights 2020	2019	2020	EB June 2021			EB March 2021		
				2021 (p)	2022 (p)	2023 (p)	2021 (p)	2022 (p)	2023 (p)
Gross domestic product	100	2.5	-7.6	4.8	5.6	2.4	3.9	5.2	2.4
Private consumption	64	2.6	-5.9	3.3	4.9	2.3	2.0	4.8	2.3
Public consumption	19	0.7	0.4	4.9	0.4	-0.2	3.7	0.7	0.6
Gross fixed capital formation	19	5.4	-1.9	7.6	8.2	5.8	3.6	8.0	3.7
Domestic demand	102	2.8	-4.6	4.5	4.7	2.6	2.7	4.6	2.3
Exports	37	3.9	-18.6	14.5	13.1	4.8	13.7	11.5	5.3
Imports	39	4.7	-12.0	13.2	10.6	5.1	10.2	9.9	5.0
Contribution to GDP growth, net of imports (in p.p.) (a)									
Domestic demand		1.6	-2.3	2.4	2.5	1.3	1.4	2.5	1.2
Exports		0.9	-5.2	2.5	3.2	1.1	2.5	2.7	1.2
Exports of goods		0.2	-0.7	1.9	0.3	0.3	1.7	0.3	0.2
Exports of services		0.6	-4.5	0.5	2.8	0.8	0.8	2.4	1.0
Employment (number of persons) (b)		0.8	-1.7	1.3	1.3	0.4	0.3	1.6	0.5
Employment (hours worked) (b)		1.2	-9.2	5.9	4.1	0.5	4.9	4.4	0.6
Unemployment rate (c)		6.6	7.0	7.2	7.1	6.8	7.7	7.6	7.2
Current plus capital account (% of GDP)		1.2	0.1	0.9	2.1	1.8	1.5	2.8	2.9
Trade balance (% of GDP)		0.7	-1.8	-2.1	-1.4	-1.3	-0.9	0.0	0.2
Harmonised index of consumer prices		0.3	-0.1	0.7	0.9	1.0	0.7	0.9	1.0
Energy goods		-1.7	-5.2	5.6	1.0	-1.3	3.9	-0.4	-1.3
Excluding energy goods		0.5	0.3	0.3	0.9	1.2	0.4	1.1	1.2

Sources: Banco de Portugal and Statistics Portugal. | Notes: (p) – projected, p.p. – percentage points. The cut-off date for macroeconomic projections, prepared in the context of the June 2021 Eurosystem projection exercise is 21 May. (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.

GDP growth in Portugal will be higher than in the euro area. At the end of the projection horizon, cumulative growth compared to 2019 will be similar for Portugal and the euro area. The pace of recovery will be differentiated across countries, constrained by the evolution of the pandemic, the productive structure and the scale and effectiveness of support measures, with a focus on the impact of the Next Generation EU (NGEU).

The recovery is expected to be more buoyant than that projected in March. GDP growth is revised upwards by 0.9 percentage points (p.p.) in 2021 and 0.4 p.p. in 2022. These revisions

stem from a more positive outlook for activity in the short term, mainly related to improved confidence among economic agents, which is reflected in a faster than expected response of economic activity to the lifting of restrictions from March 2021 onwards. The upward revision of assumptions for external demand (Section 2) and investment, public investment in particular, contribute to a more marked recovery.

2 External environment and technical assumptions of the projections

Global economic activity will recover over the projection horizon. In the first quarter of 2021 global GDP slowed to a quarter-on-quarter rate of change of 0.6%, following 2.2% growth in the last quarter of 2020. This reflected the resurgence of the pandemic and the subsequent adoption of containment measures in some economies. Economic activity in the euro area fell in the first quarter of 2021 (-0.3% from -0.6%, quarter on quarter). The projection assumptions include global GDP growth of 6% in 2021, 4.3% in 2022 and 3.5% in 2023 (Table I.2.1). The Eurosystem's projections for euro area GDP growth, revised upwards for 2021-22, point to growth of 4.6% in 2021, 4.7% in 2022 and 2.1% in 2023.

Global trade will show a sharper recovery than that of economic activity. In the first quarter of 2021, world imports of goods continued to grow robustly (3.7% from 4.2%, quarter on quarter), having already surpassed pre-pandemic levels. This rapid recovery is linked to the buoyancy of the industrial sector, which has led to pressures on global distribution chains and trade constraints, including increases in container transport costs and shortages of some intermediate goods such as semiconductors. These disruptions are assumed to have no significant repercussion on the projection horizon. External demand for Portuguese goods and services is projected to grow by 8.6% in 2021, 6.5% in 2022 and 3.4% in 2023 (Table I.2.1).

Commodity prices have been revised upwards. Oil prices remained relatively stable from March onwards, following the recovery observed in the second half of 2020 and early 2021. The assumptions for the price of this commodity in dollars imply annual average rates of change of 55.6% in 2021, -1.9% in 2022 and -4.1% in 2023.

Monetary and financial conditions remain favourable, sustained by accommodative monetary policies. Short-term interest rates remain at historically low levels. The interest rate implied in Portuguese government debt is projected to decline slightly over the projection horizon. According to the assumptions, the euro will appreciate in nominal effective terms and against the dollar in 2021.

Developments in public finances will reflect the pandemic and the normalisation of economic activity. In 2021 the quantification of measures to support the economy and strengthen the health sector is higher than in 2020, which reached approximately 3% of GDP. This impact will fade rapidly in the following years. The implementation of the Recovery and Resilience Plan (PRR) finances part of this stimulus and has important macroeconomic implications (see Box 2 "Impact of the Recovery and Resilience Plan for the period 2021-26" in the March 2021 issue of the *Economic Bulletin*).

Table I.2.1 • Projection assumptions

		2019	2020	EB June 2021			Revisions compared to EB March 2021			
				2021	2022	2023	2020	2021	2022	2023
International environment										
World GDP	yoy	2.7	-2.9	6.0	4.3	3.5	0.0	-0.2	0.3	0.0
Euro area GDP	yoy	1.3	-6.8	4.6	4.7	2.1	0.1	0.6	0.6	0.0
World trade	yoy	0.8	-8.7	10.0	5.5	3.7	0.8	1.6	0.9	0.2
External demand	yoy	1.9	-11.5	8.6	6.5	3.4	0.9	1.2	0.8	-0.1
Oil prices in dollars	aav	64.0	42.3	65.8	64.6	61.9	0.0	6.5	8.8	8.2
Oil prices in euros	aav	57.2	37.1	54.5	53.3	51.1	0.0	5.4	7.1	6.7
Non-energy commodity prices in dollars	yoy	-3.6	3.2	39.0	0.1	-8.0	0.0	20.0	2.2	-6.6
Monetary and financial conditions										
Short-term interest rate (3-month EURIBOR)	%	-0.4	-0.4	-0.5	-0.5	-0.3	0.0	0.0	0.0	0.1
Implicit interest rate in public debt	%	2.6	2.2	2.0	1.9	1.9	0.0	0.0	0.0	0.1
Effective exchange rate index	yoy	-1.5	3.3	2.3	0.1	0.0	0.0	0.5	0.2	0.0
Euro-dollar exchange rate	aav	1.12	1.14	1.21	1.21	1.21	0.0	0.0	0.3	0.3

Source: Eurosystem (Banco de Portugal calculations). | Notes: yoy – year-on-year rate of change, % – per cent, aav – annual average value. The technical assumption for oil and non-energy commodity 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. 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 revision in the euro-dollar exchange rate is presented in percentage. The technical assumption for bilateral exchange rates assumes that the average levels observed in the two weeks prior to the cut-off date will remain stable over the projection horizon.

3 The Portuguese economy in 2021-23

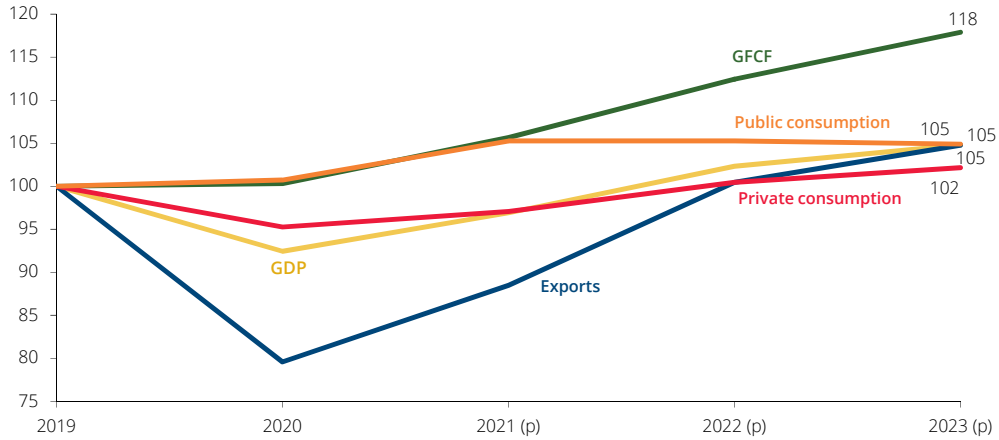
The recovery is broadly based across the various expenditure components, but with differences in intensity. Considering the contributions to GDP growth net of import content, domestic demand – particularly private consumption – will boost economic recovery in the second quarter of 2021. In the second half of 2021 and in 2022, the contribution from exports will be more significant, reflecting the recovery in the services component. In 2023, domestic demand and exports will show similar contributions to economic activity growth.

Private consumption will grow more strongly in 2022, returning to pre-pandemic levels that year (Chart I.3.1). The moderate impact of the pandemic crisis on GFCF in 2020 and the projected momentum for 2021-23 contrast with that observed in previous recessions, even when recessions associated with financial crises are excluded (Chart I.3.2). These developments extend to the public and private components of GFCF, reflecting the fact that the current crisis is the result of an exogenous shock and is temporary in nature. Exports of goods and services will only return to their pre-crisis level in mid-2022, due to the more gradual recovery of services, while the goods component already exceeded this level in the second half of 2020.

Recovery in private consumption varies by type of expenditure. In 2021, consumption will rise by 3.3% and a very significant recovery is projected from the second quarter onwards (Box 2). The annual growth of this aggregate will become more significant in 2022 as the consumption of services recovers. This type of expenditure, which generally involves more social interaction, will recover gradually with vaccination and the lifting of containment measures. In addition, unlike goods, expenditure due to pent-up demand tends to be more difficult to carry out in the case of services. Spending in non-durable goods will evolve more smoothly, as was the case throughout the crisis, while the consumption of durables is expected to be highly buoyant over the projection horizon. In the second half of 2020, demand for durables rebounded strongly, returning to end-2019 levels.

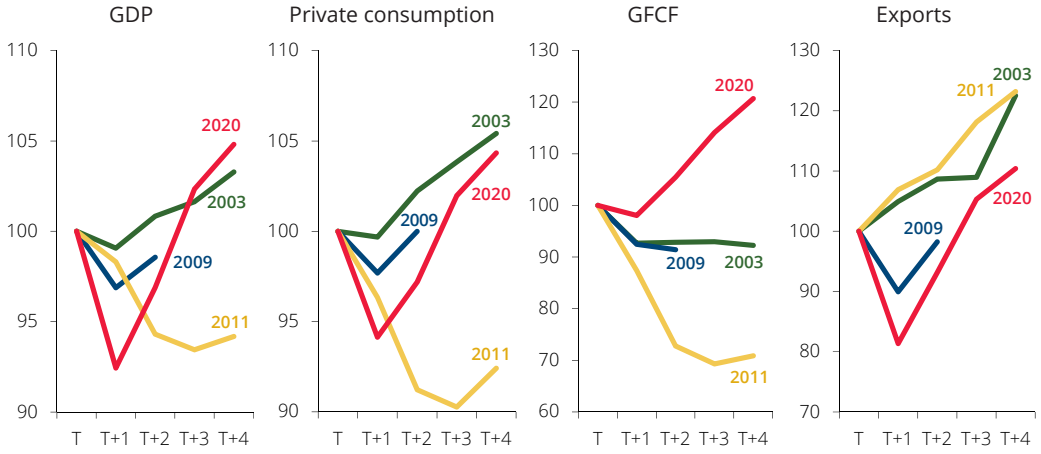
Pent-up demand build up during the crisis is projected to result in high growth of this component over the projection horizon.

Chart I.3.1 • GDP and import content adjusted demand components | Index 2019=100



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

Chart I.3.2 • GDP and main components in periods of recession and subsequent recovery | Index T=100

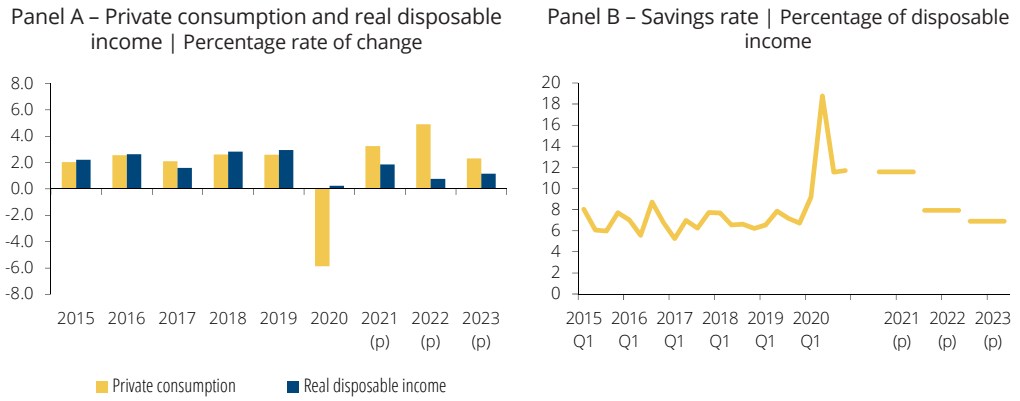


Sources: Banco de Portugal and Statistics Portugal. | Note: The year T + 1 stands for the first year of each cycle in which GDP decreases in annual terms (recession year).

Private consumption will grow at a higher pace than disposable income (Chart I.3.3). In 2021-23, real disposable income will grow by about 1.3% on average, corresponding to an acceleration from 2020 (0.3%). This increase is the result of employment recovery and wage growth, albeit more subdued compared to previous years. In 2020, the 5.9% fall in private consumption resulted in a sharp increase in the savings rate from 7.1% to 12.8%, a peak since 2002 (Chart I.3.3). This increase, in addition to the precautionary reason linked to the context of uncertainty, was the result of involuntary savings associated with the lockdown. The savings rate reached 18.8% in the second

quarter of 2020 and, after moderating in the second half of the year, it probably rose again with the new lockdown in early 2021.

Chart I.3.3 • Developments in private consumption, disposable income and savings rate



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

The savings rate is expected to decline gradually, reaching close to pre-pandemic levels in 2023. Underlying these developments is a gradual dissipation of uncertainty. Savings accumulated by households during the pandemic are assumed to result, in aggregate terms, in a persistent increase in wealth. The characteristics of the main savers –higher incomes and a lower propensity to consume – support this assumption.

Public consumption is expected to grow by 4.9% in real terms in 2021. Underlying this acceleration is the return to normal general government activity, with a lower impact of reduced working hours and an increase in purchases and provision of services. In 2021, expenditure on goods and services directly related to the pandemic is expected to increase slightly due to the costs of the vaccination process, which will be largely financed by European funds. In the following years, the gradual reversal of these measures and the deceleration in public employment will determine the near stabilisation of general government consumption in real terms.

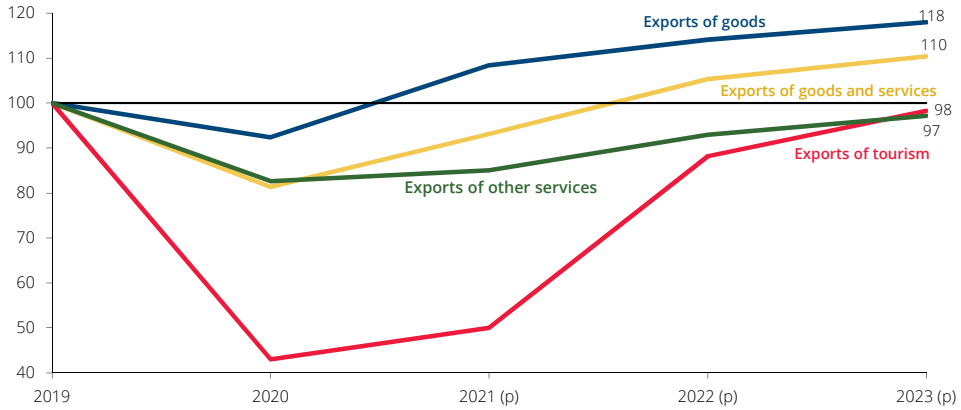
GFCF will grow by 7% on average in 2021-23. In 2020, the 1.9% fall in GFCF was very contained given the drop in activity, with a positive contribution from construction being noteworthy. Corporate GFCF declined by 4.4%, much less than suggested by the high cyclical elasticity of this component in relation to GDP, reflecting the temporary nature of the crisis and the maintenance of very favourable financial conditions. For 2021-23, the average annual change in corporate GFCF is projected to be 6.4%, with a deceleration trend over the horizon. These developments are underpinned by European funds, as well as by the recovery in demand and the gradual reduction in uncertainty. However, the liquidity and solvency position of some companies, notably in the sectors most affected by the pandemic, will limit investment potential in the coming years.

Residential GFCF will grow by 2.9%, on average, in 2021-23. The maintenance of favourable financial conditions and demand from non-residents will continue to support this investment, in contrast to the moderation in disposable income growth compared to pre-pandemic figures. Housing will remain an attractive investment asset, which may be important in a context of significant accumulation of savings (Section 4).

Public GFCF is the component showing the highest growth, around 20% on average in 2021-23, reflecting the implementation of the Recovery and Resilience Plan (RRP) (Box 3). The contribution of the RRP will be particularly significant from 2022 onwards, accounting for around 30% of the planned public investment in 2022-23. In 2023, its effect will be more than offset by a reduction in the funding of the remaining European funds, linked to the transition of multiannual frameworks.

Exports will grow by about 14% in 2021-22 and 4.8% in 2023, with marked differences between goods and services (Chart I.3.4). Following a fall in the first half of 2020, goods exports recovered to pre-crisis levels in the second half of the year, with a slight estimated gain in the market share of goods in 2020 as a whole. For 2021, sharp growth is projected (17%). In the following years, goods exports follow the external demand directed at Portugal.

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



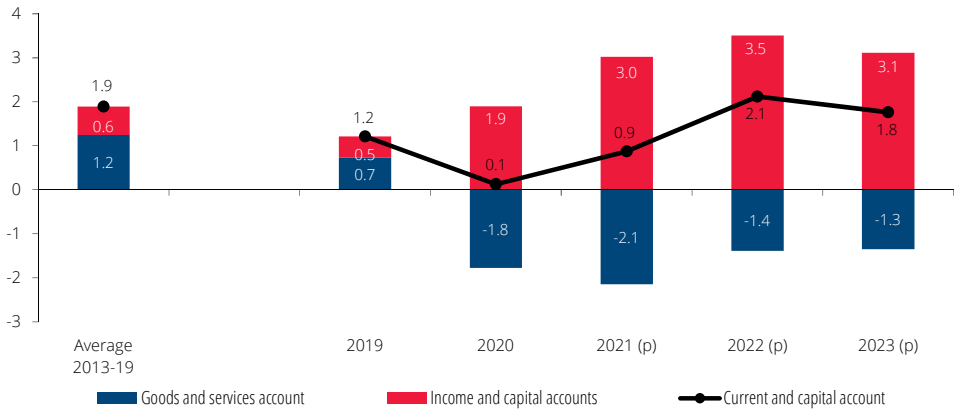
Sources: Banco de Portugal and Statistics Portugal. | Note: (p) – projected.

The recovery in services exports will be slower. Exports of tourism and some associated services, such as transportation, suffered a greater impact from the pandemic crisis in 2020. As such, services exports were around 50% below the pre-pandemic figure in the first quarter of 2021. With a very significant recovery projected for the second half of the year, these exports are expected to be around 30% of the 2019 level for the year 2021 as a whole. This will be the expenditure component with the highest growth in 2022 and the most important contribution to total export growth in 2022-23. At the end of the projection horizon, levels will remain slightly below those recorded in 2019 (Chart I.3.4).

Imports will grow by about 12% in 2021-22 and 5.1% in 2023, reflecting the recovery in overall demand weighted by import contents. Components with a marked recovery path and high import content, such as goods exports, consumption of durables and corporate GFCF, will contribute to these developments.

The current and capital account surplus will increase on average in 2021-23 due to the recovery in tourism and the inflow of European funds. Following a near-zero balance in 2020, the current and capital account will show a surplus of 0.9% of GDP in 2021 and of almost 2% of GDP in 2022-23 (Chart I.3.5). These developments are the result of the increase in surpluses in the services account – most notably in 2022-23 – and in the capital account.

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



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

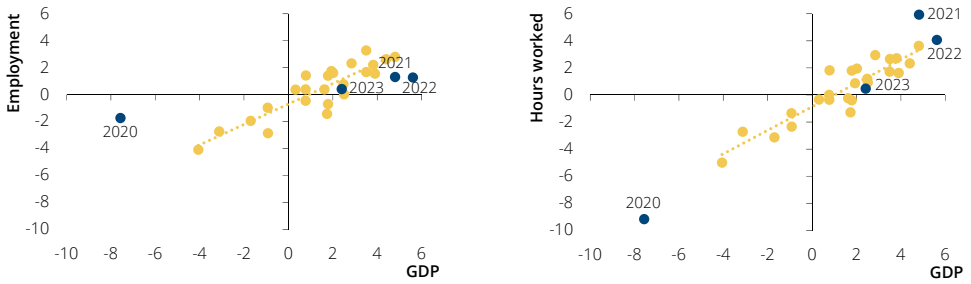
The goods and services account will remain in deficit, albeit to a lesser extent over the projection horizon. This deficit will increase in 2021 to 2.1% of GDP and will decrease in the following years, to 1.3% of GDP in 2023. The services surplus will increase over the horizon, more markedly in 2022-23, reflecting developments in the tourism sector. In trade flows of goods, the deficit will widen over the projection period. In 2021, the widening will largely be determined by a terms of trade effect related to oil prices, while the volume effect will predominate in subsequent years.

The increase in the amount of funds received from the EU will have a positive impact on external accounts. On average, funds received from the EU are expected to account for around 3.9% of GDP in 2021-23 (2.2% on average in 2013-19). These funds will include amounts linked to the Multiannual Financial Framework (MFF) 2014-20, which is in its final phase, and the MFF 2021-27 and transfers under the new instrument of response to the pandemic crisis (NGEU). Other favourable effects on income and capital accounts will stem from the reduction in public debt interest payments abroad and the one-off effect in 2021 of the European Financial Stabilisation Fund's reimbursement of amounts paid by Portugal under the Economic and Financial Assistance Programme (corresponding to 0.5% of GDP).

A gradual improvement in the labour market is expected. In 2020, the reaction of employment to the drop in activity was very modest compared to previous crises. This impact contrasts with a sharp fall in hours worked and is associated with the support measures, such as the simplified layoff scheme and support for self-employed workers. With the gradual return to normal of activity, firms will probably initially use the margins of labour underutilisation, particularly the increase in hours worked, to meet higher demand. The gradual recovery in the segments most affected by the crisis and demographic challenges will also contribute to contained employment growth.

Employment is expected to increase by 1% in annual average terms in 2021-23, while hours worked will grow by 2.5% (Table I.1.1 and Chart I.3.6). The recovery of the economy will go hand in hand with an increase in the labour force, with discouraged individuals re-entering the labour market. At the end of the horizon, employment and the labour force will be above pre-pandemic levels (respectively 1.2% and 0.7% higher than the 2019 average). Productivity per employee will increase by 3.3% per year in 2021-23, which, when combined with a moderate increase in wages, will reduce unit labour costs.

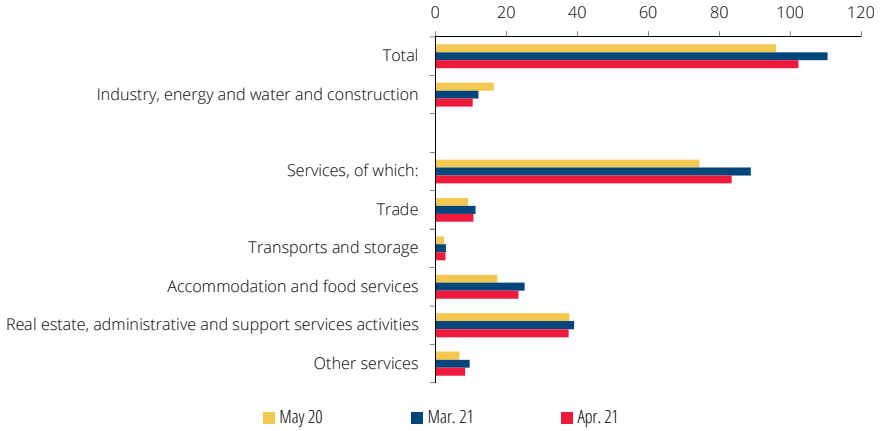
Chart I.3.6 • GDP versus employment and hours worked | Observed and projected annual rates of change, in percentage



Sources: Banco de Portugal and Statistics Portugal. | Note: The yellow lines are the fitted linear regression lines of the two variables represented in each chart, considering the years from 1995 to 2019.

The unemployment rate will increase slightly in 2021, decreasing in 2022-23. Following an increase in 2020 from 6.6% to 7.0%, the unemployment rate will rise to 7.2% in 2021, well below that observed during the two previous recessions. In the following years, it will gradually decrease to stand at 6.8% in 2023 (Table I.1.1). The reduction path in the unemployment rate will be constrained by the slower recovery of activities most affected by the pandemic, which tend to be labour-intensive. Indeed, unemployment data recorded in employment centres up to April 2021 show that unemployment has increased from pre-pandemic levels and remains high, mainly in accommodation and food services, trade and support services (Chart I.3.7). The most buoyant sectors may absorb these workers and this process of reallocation of resources between sectors of activity should be supported by public policies. Thus, it will be possible to mitigate difficulties in re-employment for some individuals.

Chart I.3.7 • Unemployed registered in job centres by sector of activity | Deviation from the 2019 average, in thousands



Source: Institute of Employment and Professional Training (IEFP). | Note: The months of May 2020 and March 2021 correspond to the maximum values of unemployment after the first and second lockdowns, respectively.

Wages will grow more moderately than in the pre-pandemic period. Wages are expected to grow by 2.3% on average in 2021-23, following a change of 2.9% in 2020 and 3.7% in 2018-19. The

persistence of margins of labour underutilisation will be reflected in more contained wage growth. In addition, the recovery of low-wage jobs will lead to negative composition effects on total wages. Conversely, projections include the effect of the 4.7% rise in the minimum wage in 2021.

Inflation will show a subdued rise over the projection horizon. The annual rate of change in the harmonised index of consumer prices, after standing at -0.1% in 2020, will increase to 0.7% in 2021, 0.9% in 2022 and 1.0% in 2023 (Table I.1.1). According to the projections published recently by the ECB, in the euro area inflation will rise to 1.9% in 2021, 1.5% in 2022 and 1.4% in 2023, after 0.3% in 2020. Thus, inflation in Portugal will maintain a negative differential vis-à-vis the euro area, averaging -0.7 p.p. in 2021-23.

In 2021, external inflationary pressures will outweight the negative effects of the pandemic crisis. Underlying the exercise assumptions are strong growth in oil prices in international markets, which will contribute to a 5.6% increase in energy consumer prices (-5.2% in 2020). A significant acceleration in non-energy commodity prices in euro (annual change of 31.1%) is also expected, reflected in a 2.5% increase in non-energy import prices (-1.4% in 2020). Inflation excluding the energy component will remain virtually unchanged in comparison with that observed in 2020, amid a limited recovery in demand in some services sectors, particularly tourism-related sectors. In addition, lower food price growth is expected, following the significant increase in 2020, reflecting supply and demand disruptions.

In 2022-23, inflation excluding energy goods will increase moderately. This increase will mainly be driven by increased momentum in services prices. Following the unprecedented falls in the prices of some services – such as tourism, culture and entertainment – in 2020, these prices are expected to gradually recover as demand increases. Underlying the projection is a recovery of profit margins in 2022-23 following the significant falls during the pandemic period. A dampening factor in inflation is the lower expected growth in non-energy import prices. In this period, the contribution of the energy component will decrease in line with the oil price assumptions.

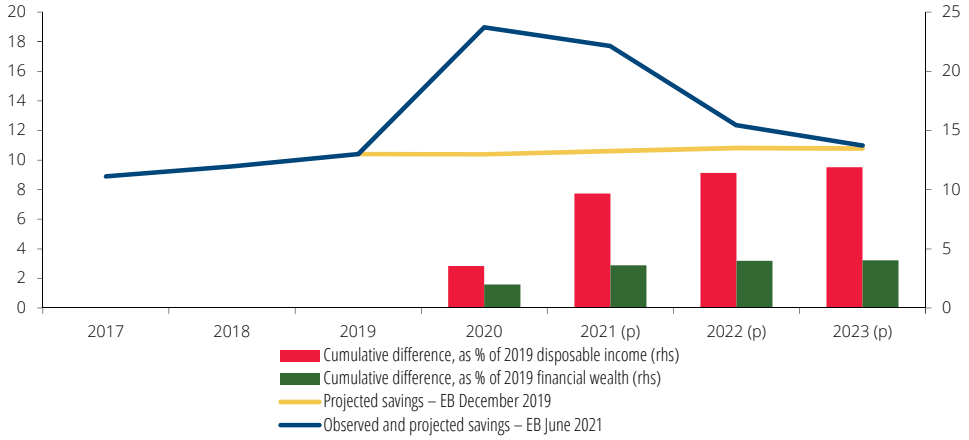
4 Risks

The balance of risks surrounding the projections for activity is skewed upwards in 2021-23. Most notably due to the upside risk stemming from the impact of the pandemic crisis on household savings. There is still a downward risk in the short term driven by an unfavourable development of the pandemic, in particular the emergence and spread of new virus variants, which also conditions the potential for some other risks to materialise. A factor of additional uncertainty in the short term is related to the prospects for tourism exports, which depend on decisions on the international movement of persons in the main countries of origin of Portuguese tourism as well as in Portugal.

The possibility that part of the savings accumulated during the crisis period could be channelled into expenditure constitutes an upside risk to activity. The increase in household financial wealth – observed in 2020 and projected for 2021 and, to a lesser extent, for the following years – largely exceeds the levels projected before the pandemic, which implied a relatively stable savings rate path (Chart I.4.1). Taking into account that the propensity to consume using wealth is much lower than using income and also the profile of the main savers, the central projection assumes that these additional savings will, in aggregate terms, essentially be maintained in the form of financial

assets until 2023. However, the possibility that a portion of these resources may be channelled to consumption cannot be excluded.

Chart I.4.1 • Atual and projected household savings versus *Economic Bulletin* December 2019 projection | In billion euros and percentage



Sources: Banco de Portugal and Statistics Portugal. | Note: Savings are computed as the diference between disposable income and private consumption.

Exports of goods present downside risks due to shortages of some products and supply problems. The rapid recovery of the industrial sector has led to a significant increase in demand for commodities and other intermediate goods such as semiconductors. This has created supply bottlenecks with an impact on production, which could take on a larger scale.

There are downside risks associated with the process of adapting and withdrawing economic support measures, in particular if unbalanced and synchronised across Europe. The crisis has some longer lasting but limited impacts (Box 1). The projection assumes that the adaptation and withdrawal of support measures will not lead to a significant increase in insolvencies or unemployment. However, there is a risk of more persistent consequences for some segments of the economy, with more negative implications in the medium term than those considered in the central scenario, if changes in support measures do not take into account the existing asymmetry and if the withdrawal is premature and takes place in a synchronised manner across Europe.

There are upside risks to the projection of inflation. The increase in demand for commodities referred to above has had an upward impact on prices, which could be stronger and passed down to consumer prices more than assumed in the projection. In the ongoing global recovery process, this upside risk will materialise if demand shocks outweigh those of supply.

5 Conclusion

The projection points to a swift, albeit incomplete, recovery of the Portuguese economy, with the balance of risks being skewed upwards. As in other episodes of recession, the level of activity in the medium term is expected to fall short of what was projected before the crisis, but the estimated gap is comparatively smaller. This loss of activity reflects the more lasting nature of the effects of

the pandemic shock in some segments of the economy, and the resulting need to reallocate and restore input levels. Particular focus should be given to the fragile situation of some groups of individuals in the labour market, with implications in terms of inequality.

The pandemic crisis has boosted the use of digital technologies and new working methods that could contribute to productivity developments in the Portuguese economy. Fiscal and monetary policies play an important role and support should be adapted to the evolution of the crisis so as not to jeopardise the recovery. At this stage, the rebalancing of public finances and support for an efficient reallocation of resources to viable firms should be considered.

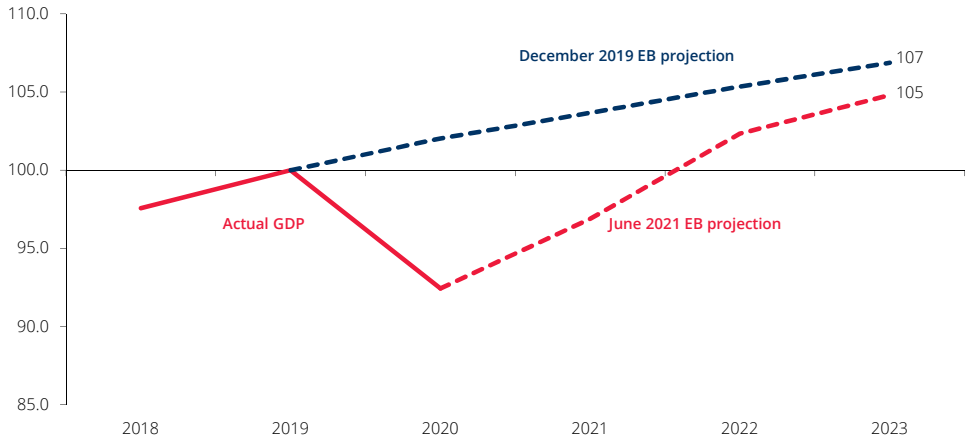
The long-term challenges facing the Portuguese economy include unfavourable demographic developments, the continued strengthening of human capital and productivity, as well as the need to continue to contribute to the global climate sustainability effort. It is essential to ensure that available financial resources are used efficiently in the structural response to these challenges.

Box 1 • The medium-term economic impact of the pandemic crisis

Evidence from past recessions in advanced economies shows that negative effects on activity can be long-lasting, particularly in more severe episodes.[1] This box quantifies the medium-term impact of the pandemic crisis underlying the current projections, and examines the channels through which it materialises.

Compared to previous recessions, the contraction in activity in 2020 was sharper and deeper, but the rebound is expected to be swifter as well. At the end of the projection horizon, GDP still stands approximately 2% below that forecast in a counterfactual no-pandemic shock scenario, which in this box corresponds to the projections released in the December 2019 issue of the *Economic Bulletin* (Chart C1.1).

Chart C1.1 • Actual and projected GDP – comparison with counterfactual scenario (December 2019 EB projection) | Index 2019 = 100



Sources: Banco de Portugal and Statistics Portugal. | Notes: The counterfactual scenario corresponds to the December 2019 EB projection, with GDP levels calculated using the updated value for 2019 and the quarter-on-quarter rates of change implicit in that projection (including for 2023, not published in the December 2019 EB).

The pandemic crisis has features favouring a swift recovery and contained damage to medium-term economic activity. In contrast to crises caused by the build-up of macroeconomic imbalances, the 2020 recession resulted from an exogenous shock to the economy. The maintenance of favourable financing conditions to private agents and the sovereign is also a differentiating factor in light of the evidence of persistent negative impacts of recessions associated with financial crises. The shock was broadly based and synchronised worldwide, implying a sharper fall in activity in 2020, but is expected to boost recovery over subsequent years. The scale, swiftness and coordination of policy responses were key to containing the multiplier effects of the shock and preserving productive capacity and employment, thereby contributing to mitigating the permanent effects of the crisis.

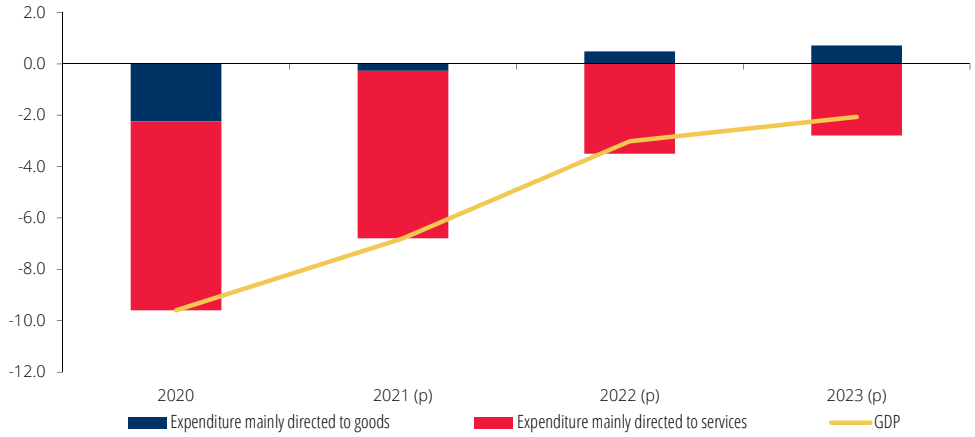
Overall expenditure on services will not return to the levels projected before the crisis. A breakdown of GDP deviations from the projected path prior to the crisis shows that, unlike in any

1. "After-effects of the Covid-19 pandemic: Prospects for medium-term economic damage", *World Economic Outlook*, Chapter 2, IMF, April 2021; "The scarring effects of past crises on the global economy", *Economic Bulletin*, Issue 8, ECB, 2020.

other recession, cuts in expenditure in 2020 disproportionately impacted services (Chart C1.2). The upturn in this type of expenditure is expected to be gradual, in tandem with the lifting of restrictions and reduced fears of contagion in light of the vaccine rollout. The outlook for the travel and tourism sector is affected by changes to the preferences of economic agents stemming from the pandemic. Going forward, business travel is expected to be replaced to some extent by teleconferencing solutions at lower financial and environmental costs.

The contribution of expenditure on goods to the cumulative change in GDP is higher than that projected before the crisis. Current projections assume greater expenditure on goods, reflecting lower barriers to consumption and broader potential for pent-up demand following the pandemic. This increased demand for goods is widespread across economies, implying that momentum in global manufacturing and international merchandise trade over the projection horizon is higher than that expected prior to the crisis. However, the stronger rebound in manufacturing and construction is not enough to offset the gradual and incomplete upturn in services.

Chart C1.2 • Actual and projected GDP versus counterfactual scenario – difference in level and contributions of expenditure on goods and on services | in percentage points



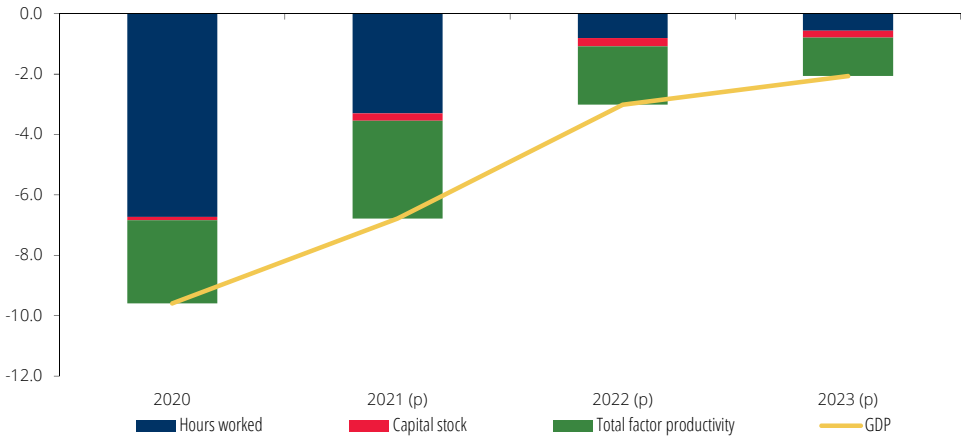
Sources: Banco de Portugal and Statistics Portugal. | Notes: The counterfactual scenario corresponds to the December 2019 EB projection. Expenditure mainly directed to services includes private consumption of services, government consumption, the share of investment that is directed to services, calculated using information from the resource and use balance tables, and exports of services. All components are net of imports, i.e. obtained by deducting an estimate of imports incorporated in each component.

GDP falls short of that projected before the crisis due to the incomplete recovery in hours worked and total factor productivity. A growth accounting exercise shows that the contribution of the accumulation of physical capital to the difference in GDP between the current projection and that prior to the pandemic is negligible (Chart C1.3). This contribution reflects the resilience of investment during the current crisis and the maintenance of a favourable outlook anchored in European fund inflows. Employment, as measured in hours worked, remains below the counterfactual scenario over the projection horizon. The sectors hardest hit by the crisis are labour-intensive, posing challenges to the reallocation of labour towards other sectors of activity and implying that support measures should be tailored to back this process.

The main contribution to the GDP deviation from the counterfactual level in 2023 comes from total factor productivity. Evidence from recessions in advanced economies indicates that this is an important channel, with a long-lasting impact. The pandemic crisis caused an interruption in

the accumulation of inputs, including human capital, and lower efficiency in their use. The boost provided by the pandemic to the use of digital technologies and innovation in general is expected to mitigate the negative impact on total factor productivity. However, this is difficult to quantify at this stage.

Chart C1.3 • Actual and projected GDP versus counterfactual scenario – difference in level and growth accounting contributions



Sources: Banco de Portugal and Statistics Portugal. | Notes: The counterfactual scenario corresponds to the December 2019 EB projection. 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).

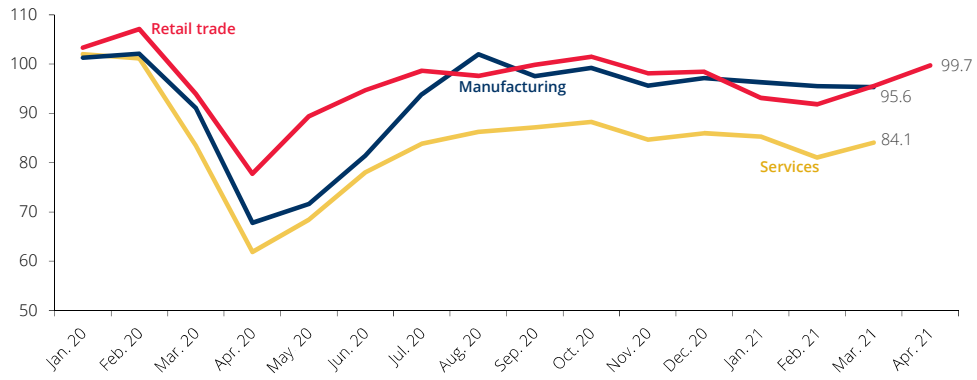
The medium-term consequences of the pandemic crisis are likely to be limited. Given the sudden interruption of economic and social activities, ensuring a rapid resumption of previous conditions regarding the functioning of the economy is of the utmost importance. The rebound is asymmetrical, which means that support directed towards the most affected segments is important to prevent bankruptcies among viable firms. However, there may be damage to productive capacity and the labour market as a result of changes to economic agents' preferences and technological developments. These adjustment costs will be lower if the allocation of the economy's resources is flexible and new technologies are widely adopted. As such, support to the most severely affected sectors and firms should be accompanied by measures to facilitate resource mobility, including training and reskilling of the labour force and speeding up insolvency procedures.

Box 2 • Developments in economic activity in the first and second quarters of 2021

The worsening of the pandemic situation implied a decline in economic activity in the first quarter of 2021, albeit less significant than in the first general lockdown. This smaller impact reflected the adaptation of firms and consumers to the pandemic, the more favourable external environment, the maintenance of the accommodative monetary policy stance and fiscal policy's countercyclical nature. In the first quarter of 2021, GDP posted a quarter-on-quarter rate of change of -3.3%, following slight growth in the previous quarter (0.2%), and the year-on-year rate of change stood at -5.4%. This decline in GDP was more pronounced than that recorded in the euro area average, where developments were very uneven across countries.

The negative impact was concentrated on private consumption and services exports, particularly tourism. These components weigh more heavily in Portugal than in most euro area countries, which amplifies the impact of the pandemic shock. GFCF and goods exports increased compared with the previous quarter. Supply-side indicators – such as turnover indices, industrial production and entrepreneurs' confidence (Chart C2.1 and C2.1, Panel B) – show that services were more affected, particularly those of accommodation and food, transportation and others involving personal contact. In contrast, indicators suggest that activity did not vary significantly in industry and continued to grow in construction.

Chart C2.1 • Sectoral activity indicators | Index 2019=100



Sources: Banco de Portugal and Statistics Portugal. | Notes: Seasonally and calendar effects adjusted data. The indicators Retail Trade and Services correspond to the Turnover Index (deflated in the case of retail trade) and the Manufacturing one to the Industrial Production Index.

In the second quarter, the economic situation improved with the gradual lifting of containment measures. The information available for April and May points to a recovery in activity from the previous quarter. The beginning of the lockdown easing process – with the reopening of restaurants, non-essential trade and cultural events to the public and the return to face-to-face teaching – was reflected in an increase in mobility indicators towards pre-pandemic levels. Between the beginning of April and the third week of May 2021, the Banco de Portugal's daily economic indicator recorded rates of change in comparison to the same period in 2019 (used to circumvent the base effects created by the impact of the pandemic in the same period of 2020) higher than those observed in the first quarter of this year. In May, this rate reached positive values (Chart C2.2, Panel A).

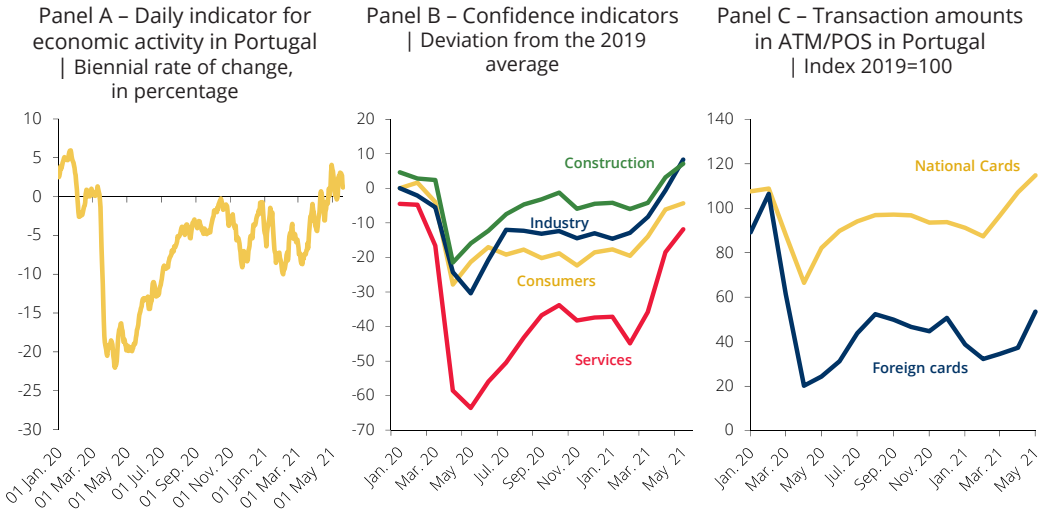
The projected quarter-on-quarter rate of change of GDP for the second quarter more than offsets the fall observed in the first quarter of the year. A relatively broad-based increase in GVA by sectors of activity is estimated. Construction is expected to remain buoyant, following the

growth observed in recent quarters. Compared to the previous quarter, the sectors most affected by the lockdown, particularly those related to tourism and non-essential trade, are expected to grow significantly, despite activity remaining well below that observed in 2019.

Indicators for the second quarter point to a recovery in private consumption compared to the previous quarter, and the maintenance of favourable investment developments. Until May, transactions with Portuguese cards at ATMs and Point-of-Sale terminals (ATM/POS) more than recovered the fall of the previous quarter (average rate of change of 21% in April-May compared to the first quarter, following a 3% quarter-on-quarter decline in the previous quarter). This profile indicates a strong recovery in consumption, reflecting higher consumer optimism and realisation of expenditure which had been postponed. The information available for car sales also suggests an increase in the consumption of durables in the second quarter of 2021. Sectoral confidence indicators showed a general increase in April and May (Chart C2.2, Panel B), a cross-cutting movement in Europe. This improvement and partial data related to investment, such as cement and commercial vehicles sales, suggest continuing favourable developments in this aggregate after the increase in the first quarter of 2021.

Exports are expected to grow compared to the previous quarter, with differences between goods and services in the recovery in relation to the pre-pandemic levels. Goods exports have been growing in recent quarters and, since the fourth quarter of 2020, have been at levels above those observed on average in 2019. In the second quarter, they are expected to continue to grow, as suggested by the strong increase in export order expectations in April and May over the next three months, based on the manufacturing survey. As regards services, withdrawals and payments at ATMs and POS with foreign cards point to an increase in tourism exports compared to the previous quarter, but remaining well below those observed in 2019 (Chart C2.2, Panel C). The average figure of these transactions in April and May increased by 29% compared to the first quarter of 2021 but is around 60% lower than in the same months of 2019.

Chart C2.2 • Economic activity indicators



Sources: Banco de Portugal, European Commission and SIBS. | Notes: Data up to 28 May 2021. Panel A): The rate of change shown is obtained by accumulating the variation, for corresponding days, over a two-year period. The Daily indicator for economic activity is presented as a 7-day centered moving average. For a more detailed description of the Daily Economic Activity indicator , see Lourenço and Rua (2020), "The DEI: tracking economic activity daily during the lockdown", *Working Paper* No 13, Banco de Portugal.

Box 3 • Medium-term fiscal outlook

The Stability Programme 2021-25 (SP2021-25) projects the public debt ratio to return to its pre-crisis level, but the general government budget balance falls short of this benchmark. The deficit target for 2021 increases by 0.2 p.p. from that projected in the 2021 State budget to 4.5% of GDP, almost stabilising against 2020 after excluding the effects of temporary measures. The public debt ratio is expected to return to its downward path in 2021 and stand below 2019 in 2025, but substantially higher than expected towards the end of the horizon in the previous programme update (Table C3.1).

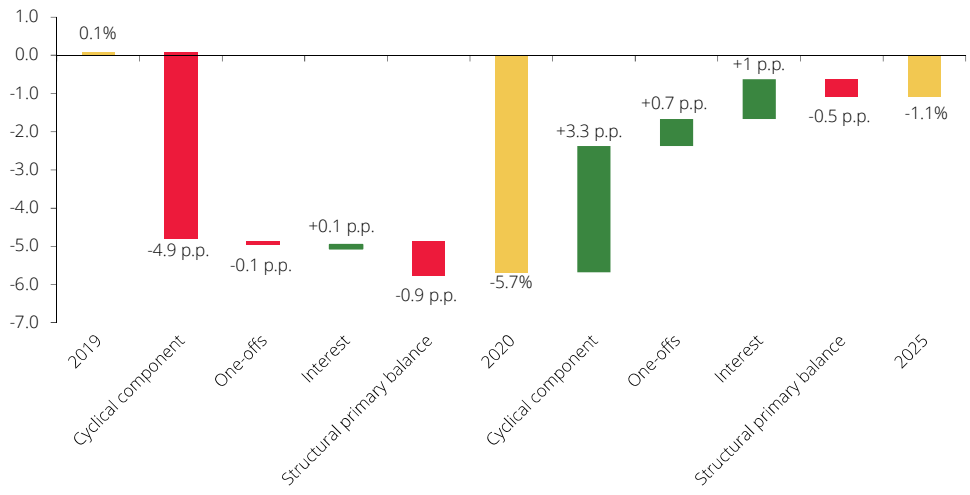
Table C3.1 • Fiscal indicators | Percentage of GDP

	2019	2020	2021	2022	2023	2024	2025	Changes 2025-2019 (p.p.)
Overall balance								
SP 2019-2023	-0.2	0.3	0.9	0.7	0.7			
SP 2021-2025	0.1	-5.7	-4.5	-3.2	-2.2	-1.6	-1.1	-1.2
Revisions	0.3	-6.0	-5.4	-3.9	-2.9			
Public debt								
SP 2019-2023	118.6	115.2	109.0	103.7	99.6			
SP 2021-2025	116.8	133.6	128.0	123.0	120.7	117.1	114.3	-2.5
Revisions	-1.8	18.4	19.0	19.3	21.1			

Sources: INE and Ministry of Finance. | Note: observed figures shaded in grey.

The structural budget balance projected for 2025 is similar to that in 2019. In 2025, the cyclical component of the balance is expected to gradually improve to a figure still 1.6 p.p. lower than in 2019 (Chart C3.1). This outcome stems from the cumulative GDP growth over this period being lower than that of potential output, which is strongly influenced by the estimate for 2020. No temporary measures are planned for 2025, contrary to what happened in 2019, and there is a decline in interest expenditure, both contributing to the improvement of the structural balance by 0.6 p.p. and 1.1 p.p. respectively.

Chart C3.1 • Contributions to the change in the budget balance between 2019-2025 | Percentage points of GDP

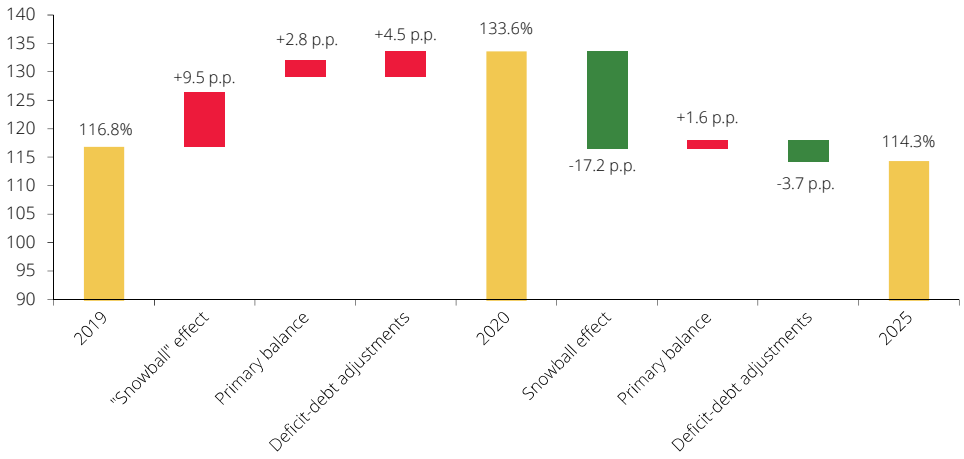


Source: Ministry of Finance (Banco de Portugal calculations).

Between 2019 and 2025, the fiscal policy stance is expansionary. The structural primary balance declines by 1.4 p.p. of GDP between 2019 and 2025. The expansionary policy in the period as a whole is mainly driven by investment developments, posting a 0.3 p.p. of GDP increase per year, with around one third associated with the Recovery and Resilience Facility (RRF). In addition, some of the measures related to the pandemic crisis are of a permanent nature.

The debt ratio trajectory until 2025 benefits from the significant differential between nominal GDP growth and the debt implicit interest rate. An average annual nominal GDP growth of 3% projected between 2020 and 2025, combined with an implicit interest rate of around 2% on average, generates a dynamic effect contributing to a reduction in the debt ratio of 7.7 p.p. between 2019 and 2025. Primary deficits, which stand at 0.7% of GDP on average in the 2020-25 period, mitigate this effect. Deficit-debt adjustments are small over the period, after accounting for 4.5% of GDP in 2020 (Chart C3.2). The materialisation of contingent liabilities generated as part of the pandemic crisis response is low.

Chart C3.2 • Contributions to the change in public debt between 2019-2025 | Percentage points of GDP



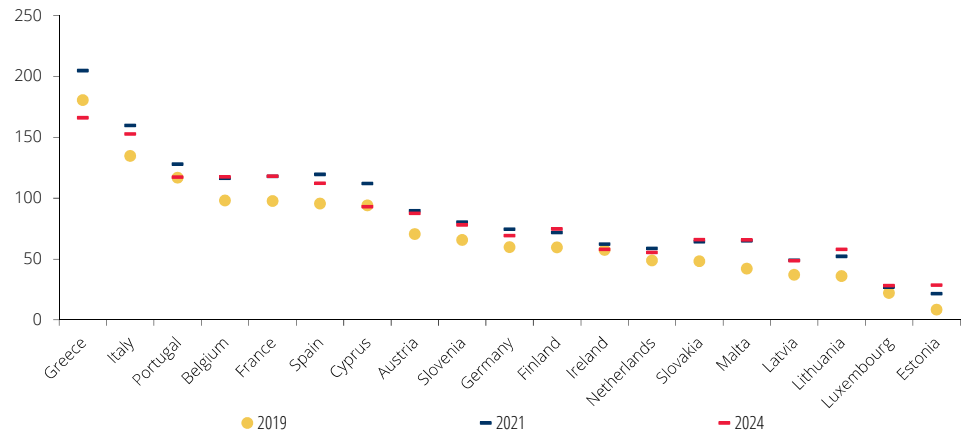
Source: Ministry of Finance (Banco de Portugal calculations). | Note: contributions mentioned above were calculated with the usual debt dynamics equation: $\frac{Debt_t}{GDP_t} - \frac{Debt_{t-1}}{GDP_{t-1}} = \frac{(taxa\ dimplicit\ interest\ rate_t - GDPnominalgrowthrate_t)}{(1 + GDPnominalgrowthrate_t)} * \frac{Debt}{GDP_{t-1}} - \frac{PrimaryBalance}{GDP_t} + DDA_t$.

Most euro area countries do not expect the government debt ratio to return to pre-crisis levels in 2024. Around half of the countries provide estimates of an increase in the debt ratio in excess of 15 p.p. (Chart C3.3). Only four countries project a debt ratio in 2024 similar to or lower than in 2019: Greece, Portugal, Cyprus and Ireland.

According to the recent Communication from the European Commission,[2] the general escape clause will continue to be applied in 2022 and is expected to be deactivated in 2023. The Commission's recommendations maintained a qualitative nature taking into account the high levels of uncertainty. Member States with high debts should use the RRF to finance additional investment in support of the economic recovery, while pursuing a prudent fiscal policy, in particular by controlling the growth of nationally financed current expenditure.

2. https://ec.europa.eu/info/system/files/com-2021-500_en.pdf

Chart C3.3 • Public debt ratio | Percentage of GDP



Sources: Eurostat and Stability Programme updates in 2021. | Note: The reference to the year 2024 stems from the lack of projections for 2025 by several countries, as it is not a requirement of the Stability and Growth Pact.

The balance between the risks of an early withdrawal of measures in response to the pandemic crisis and the sustainability of public finances will be decisive in the coming years. This will be particularly demanding for countries with high government debt ratios and it justifies establishing a more demanding path to reduce the debt ratio, as advocated in the Portuguese programme. Given the uncertainty in the materialisation of estimates over this time horizon, fiscal policy should always bear in mind the high debt and the need to generate primary surpluses in the near future.

II Special issue

Digital currency

Digital currency

Introduction

The emergence of new technologies and a faster digitalisation of the economy have led to a growing use of electronic payments and a decline in cash payments in some jurisdictions. The COVID-19 pandemic has helped to further accelerate the use of digital payments.

Central bank digital currency is not generally available to economic actors and is only available to a limited range of institutions, primarily banks, in the form of central bank reserves. Electronic payments are mostly made through deposits in commercial banks or instruments linked to them, such as payment cards.

Recent years have seen the use of technological solutions to launch new types of payment services, which contribute to more convenient and efficient payments. However, there are still opportunities for progress, for example in cross-border transfers. Associated with the development of distributed ledger technology (DLT) and blockchain, recent years have seen the emergence of crypto-assets, in particular the Bitcoin. Large technology firms such as Facebook have also taken steps to launch stablecoins, in some cases with global reach.

The declining use of banknotes and coins in payments and the large-scale use of other types of private digital currency, in addition to deposits in commercial banks, prompt a shift from the current central bank fiat currency paradigm, which has relied on cash and bank deposits. A number of challenges arise about the definition of currency, access to legal tender and the role of central banks, in particular their responsibility to ensure the safety and efficiency of payment systems, the financial intermediation model and financial stability, and ultimately the transmission and sovereignty of monetary policy.

The need to respond to these challenges and ensure efficient and safe access to and use of money in an increasingly digital age has prompted a response from policy authorities that covers several dimensions. On the one hand, endeavours have been made to enhance and modernise existing payment systems and to respond to regulatory needs associated with emerging market innovations. On the other hand, to make it possible for the general public to continue to have access to central bank currency, but in a way that meets their needs in the digital age, several central banks are working on the possible issuance of widely accessible central bank digital currency.

The central bank digital currency brings opportunities but also risks associated with privacy, illicit activities, the operation of payment systems, monetary policy and financial stability. This paper aims to analyse possible developments in digital currency use, in particular those that may motivate the introduction of a central bank digital currency accessible to all economic actors, and the implications arising therefrom, with emphasis on aspects related to monetary policy.

At the end of this Special issue, an extensive bibliography on this topic is available to the interested reader. Almost all items are freely available on the internet.

The different types of digital currency

This section describes the key characteristics of the various types of digital currency, according to a taxonomy based on the type of associated guarantee and the degree of accessibility (Table 1). It includes the longest-standing types of digital currency, central bank reserves and bank deposits, as well as e-money and crypto-assets.

Table 1 • Simplified taxonomy of digital money

Type of money		Associated guarantee	Accessibility
Central Bank reserves		Sovereign	Banks and other authorized institutions
Commercial bank deposits		Private (partially sovereign)	General
Electronic money		Private	General
Cryptoassets	Stablecoins	Private or asset reserve	General
	Other	No guarantee	General
Central Bank Digital Currency	Retail	Sovereign	General
	Wholesale	Sovereign	Banks and other authorized institutions

Source: Banco de Portugal.

Central banks issue cash accessible to the public, but only allow a selected group of institutions, namely credit institutions, to hold accounts with the central bank. Usually called bank reserves, they are used for these institutions to settle payments among themselves and to access monetary policy operations. Those deposits are a liability of the monetary authority and are remunerated at a variable rate. Bank reserves, together with cash, constitute the monetary base.

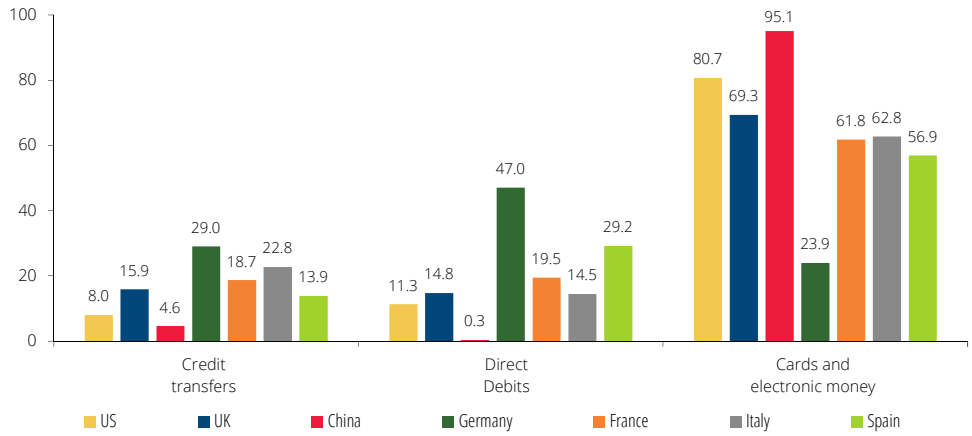
Bank deposits, accessible to all economic actors, are scriptural money in electronic form, reflecting a liability of the issuing banks. Alongside cash, bank deposits play a key role in payment systems. As banks are only required to deposit a fraction of the funds received with the central bank, they are essential for the intermediation process and maturity transformation in the banking sector and in the economy. The responsibility for the funds deposited is mostly private, but partially supported by the sovereign, namely through the obligation to build up mandatory reserves and the provision of liquidity on a regular basis or in emergency situations by the monetary authority. In addition, in the EU, deposits up to one hundred thousand euro are protected by a guarantee common to the banking system.

Electronic money is an electronically stored monetary value corresponding to the amount of cash or scriptural money that is delivered by the purchaser to the issuer and that can be used in payment transactions. However, this currency is not a deposit and cannot bear interest. E-money issuers may grant credit only if it is strictly related to payment services. It should be noted that payment institutions and e-money institutions usually do not have access to central bank liabilities. However, they are subject to regulation and funds received from users must either be held in a separate account at a commercial bank or invested in safe, liquid and low-risk assets and segregated from other credits or interests. In certain jurisdictions, such as China, depositing such funds with the central bank is already mandatory.

Bank deposits and e-money are the basis for digital retail payment instruments. In the euro area and the USA, most digital payments are made with cards linked to bank deposits, while in China mobile payments linked to e-money are predominant (Chart 1).

Crypto-assets are cryptographically protected virtual assets solely present in digital records. Transactions are executed and stored on a computer network, usually based on DLT/blockchain technology. This technology rules out the need for intermediaries in payment transactions, ensures anonymity and allows the introduction of new functionalities in an increasingly robotic economy. However, it is still at an early stage and poses challenges, such as slowness of transactions, which imposes limitations on scalability and a significant energy cost. Usually, there is no entity responsible for funds transacted on these infrastructures and regulation is very limited. The demand for crypto-assets has experienced large swings, making their valuation highly volatile. Bitcoin and Ether are the crypto-assets with the highest market capitalisation.

Chart 1 • Relative importance of digital payment instruments based on banks deposits and electronic money in retail payments | Percentage of total volume in 2018



Source: BIS.

Some crypto-assets try to stabilise their value against a benchmark, in which case they are called stablecoins. The attempt at stabilisation is usually based on the establishment of an asset reserve (of fiat currency, other financial or real assets or other crypto-assets) to ensure that the amounts issued may be redeemed, although the redemption does not necessarily have to be a pre-set value in a certain sovereign currency. If there is a safe and stable assets reserve referring to a single sovereign currency, these instruments come close to the concept of electronic money referred to above. For example, Tether or USD Coin crypto-tokens have the US dollar as a reference and each of these crypto-tokens will tend to be worth one dollar. However, conversion may be costly and not immediate. Reserve assets are generally deposited with a financial institution and, in some jurisdictions, are subject to auditing to ensure that collateral is sufficient to cover the value of outstanding obligations, but it is not yet clear whether this is scrupulously complied with. When stablecoins achieve a global footprint and have a basket of various sovereign currencies as a reference, they are called global stablecoins (an example is Facebook's project to launch such a currency, originally called Libra but renamed Diem).

In recent years, many central banks have begun to reflect on the possibility of introducing new forms of central bank digital currency. According to a survey carried out by the Bank for International Settlements, in 2021, 86% of central banks are conducting research, 60% are experimenting with plausible technological solutions and 14% are already developing pilot projects for possible issuance of a central bank digital currency. About half of the central banks surveyed are still studying two central bank digital currency options.

A first option is to design a central bank digital currency to be used in retail payments, i.e. for households and firms. This would be a way to combine some of the features of the two existing types of central bank currency – cash and reserves – and introduce new functionalities. This currency, like cash, could be made widely available to all economic actors. Like reserves, it would exist in digital format, making it easier to store and use in transactions, and it could also earn interest, depending on its design. This currency would help maintain the sovereign currency as the anchor for payment systems. Since October 2020, the Bahamas has been using this type of currency, the Sand Dollar. It is a digital equivalent of the Bahamian dollar, bearing no interest, intended for domestic use only, and using blockchain technology.

Another option would be a wholesale central bank digital currency for payment service providers only, and probably contemplating a shift in technology infrastructure to DLT/blockchain for the purpose of improving efficiency in transaction settlement and reducing counterparty and liquidity risk. Currently, central banks already allow institutions other than those with access to bank reserves to access the real-time wholesale settlement systems operated by the central bank. This is the case in the euro area for investment firms and supervised clearing and settlement institutions; in the United Kingdom such access is extended to payment institutions and authorised electronic money institutions. Another illustrative example is the Cambodian central bank-sponsored payment system, set up in October 2020, which converts bank deposits into crypto-tokens (called Bakong) using blockchain technology. In this system, apart from the crucial aspect related to the requirement of hedging the amounts issued by commercial banks' deposits at the central bank, payments are settled instantaneously in the central bank's system. Thus, this asset acquires properties close to those of central bank currency, despite not being a direct responsibility of the central bank.

The implications of the emergence of new digital private currencies

Usage factors and market developments

Each type of digital currency has characteristics that determine its functionalities and its differentiated valuation by users. Digitalisation makes it possible to reduce users' switching costs between payment systems or instruments, which facilitates the emergence of alternative solutions that can offer greater convenience of access, lower transaction costs or greater speed, or even access to complementary services. There can be a separation between the usual three functions of money - medium of exchange (a means of payment with a value that everyone trusts), store of value (an asset that preserves purchasing power for the future) and unit of account (it allows a price to be assigned to goods and services). The use of a currency can be considered, for example, mainly as a means of payment, while another currency would be used primarily as a store of value. Other instruments, such as crypto-assets, can operate in another unit of account. Differentiation truly contributes to increased currency competition.

The emergence of payment systems embedded in online platforms can add further differentiating factors. Online platforms are key drivers in the digital economy, where a wide range of digital services are offered, including online intermediation services, such as digital marketplaces or online social networking services, among others. Platforms of an economic or social nature can function as true ecosystems, where data exploitation and information shared and stored therein, notwithstanding the need to safeguard consumers' right to the protection of their data, can generate economies of scale and scope and encourage the re-bundling of monetary functions with other services associated with those platforms. In this case, the difference between currencies will not be only in the monetary functions that may be associated, but also in the functionalities offered by each platform. A digital currency will be inseparable from the characteristics of the platform on which it is exchanged.

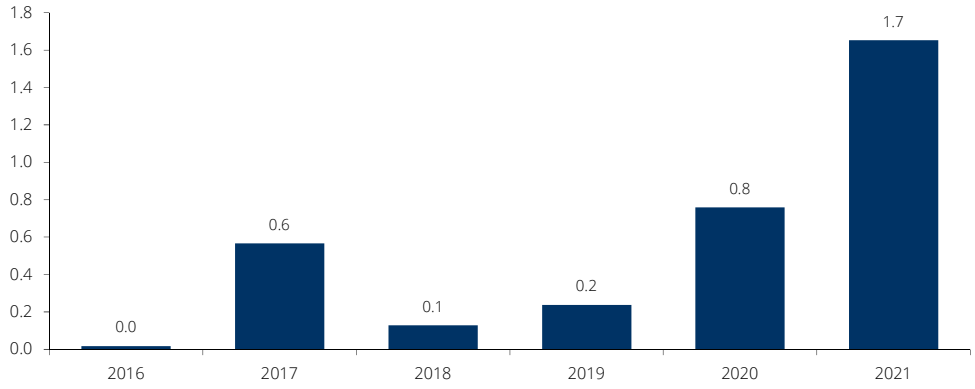
Current payment systems still have recognised limitations in international payments (which are seen as expensive, time-consuming and opaque), which may translate into significant demand for more global payment solutions should they become competitive. Finally, the legal and regulatory environment will also be determinant in the use of emerging alternatives.

The use of e-money is rising, but there are important differences across jurisdictions. In China, e-money payments, in particular those embedded in large online platforms, have in the last decade

become the dominant form of digital retail payments, and are even the main means of payment for the majority of the population. On the other hand, in the euro area, the amounts issued by e-money institutions and payments with this type of instrument are of little importance.

Crypto-assets have so far reached a relatively low usage compared to cash or payment instruments linked to bank deposits. The global market capitalisation of crypto-assets shows a very significant volatility, and its size is still relatively small compared to the amount of cash and deposits in the various economies. Capitalisation has steadily surpassed historic highs in the first months of 2021 (reaching around USD 2.5 trillion on 10 May), but in recent weeks it has fallen sharply (by around 30% between 10 and 26 May). Even so, the 26 May level represented a growth of around 120% compared to end-2020, and around 600% compared to end-2019 (Chart 2).[1] However, it only corresponds to about 8 and 10% of the M2 monetary aggregate in the US and the euro area, respectively.[2] In turn, the market capitalisation of stablecoins represents a very small share of the total market value of crypto-assets (around 5%).

Chart 2 • Cryptoassets market capitalisation | USD trillion

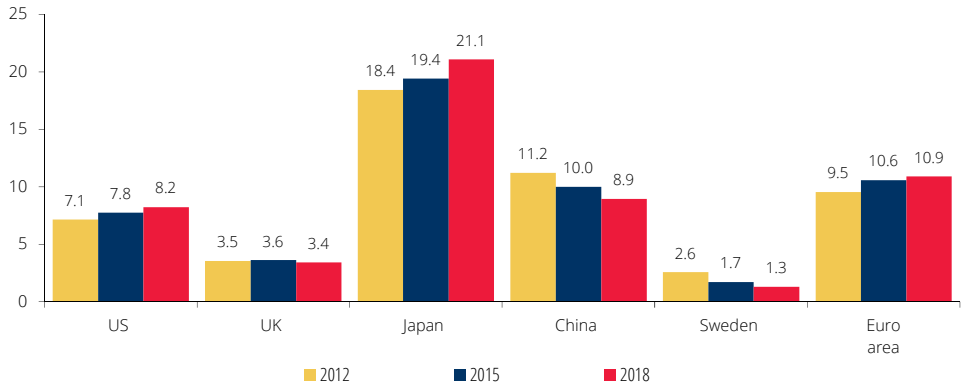


Sources: Statista and CoinMarketCap. | Notes: Values at the end of the year (the value for 2021 corresponds to May 26); market capitalisation of each cryptoasset corresponds to the price of the cryptoasset times the number of coins in the market.

Cash has provided a public alternative in general-purpose payment systems, but technology advancements and the increasing digitalisation of the economy question its suitability to meet the emerging needs of economic actors. In recent years, the availability of cash as a share of GDP has decreased in some jurisdictions, such as China or Sweden (Chart 3). In the euro area, according to an ECB survey on consumer payment behaviour, cash is still the most widely used means of payment in retail transactions, but the share of other instruments in total payments is steadily increasing, albeit at different rates per country. Another survey for the early period of the COVID-19 pandemic suggests that this trend is likely to have accelerated in 2020.[3]

1. According to market data aggregation on specialised websites, namely CoinGecko and Blockfolio.
2. The M2 aggregate includes cash and deposits (including saving deposits in the US and deposits with a maturity of up to two years in the euro area). Since May 2020, the M1 aggregate in the US includes saving deposits, therefore it is significantly closer to the M2 aggregate. The global market capitalisation of crypto-assets corresponds to around 13% of the M1 aggregate in the euro area.
3. *Study on the payment attitudes of consumers in the euro area* (SPACE). SPACE assesses consumers' use of cash and alternative payment instruments for payments in the euro area, including an analysis by different countries of the Monetary Union. In addition, the survey also explores factors influencing individuals' payment attitudes and behaviour, namely consumers' self-reported payment preferences, as well as consumers' access to and merchants' acceptance of various payment instruments.

Chart 3 • Currency in circulation | Percentage of nominal GDP



Source: BIS.

Policy implications

Emerging digital private currencies raise relevant policy implications for the functioning of payment systems, financial stability or monetary policy. Each instrument poses specific challenges given their characteristics and acceptance. Crypto-assets with a highly volatile valuation do not seem to be able to fulfil the various functions of money and will potentially have a little demand in macroeconomic terms. This type of asset is not typically used for payments and its use seems to be mainly based on speculative investment activities, with no tangible impact on the economy and no significant monetary policy implications. In general, they do not pose significant problems to financial stability as long as relevant financial institutions do not acquire considerable exposure to these instruments. On the other hand, e-money and stablecoins can play a relevant role as a means of payment and store of value and, if they reach a significant and global scale, pose risks as to whether public policy objectives are not appropriately taken into account.

Without an attractive public alternative, the emergence of large platforms and of private entities seeking to operate in the payment systems industry on a global scale may have relevant impacts on the functioning of payment systems. Network externalities embedded in platforms and payment systems, and any barriers for their users to exit them, may lead to the prevalence of one platform and services ecosystem and to a decrease in market competition. In the Chinese payments market, the two main payment services, Alipay and WeChat Pay, in connection with specific platforms have grown so dramatically that they have reached a systemic character in digital payments and prompted a reaction from the central bank. Besides the challenges of regulating competition and protecting economic actors against misuse of their data, there are other aspects of public interest, such as systems security and efficiency, which may not be properly addressed. On the other hand, payment information may move away from commercial banks and lead to a less efficient use of information for credit purposes.

Stablecoins referring to a sovereign currency that do not represent an independent unit of account come close to e-money solutions in a crypto-token version. The funds provided by users to acquire digital currency should be invested in a liquid and safe assets reserve denominated in that sovereign currency, notably bank deposits, short-term treasury securities or, if available, in central bank reserves. If funds are deposited in central bank reserves, and if these types of instruments become

significant in size, there may be risks for bank intermediation as banks' funding capacity in the market may fall. If funds are invested in bank deposits or treasury securities, there should be no significant change in the banking system's funding. However, deposits are expected to be held at larger banks, therefore smaller banks' funding capacity may drop.

Furthermore, should these instruments not be remunerated, it might trigger a significant substitution for negative interest-bearing assets. However, given that the assets reserve required as collateral for the amounts issued is also subject to a low or negative rate environment, these instruments would either have to charge fees to avoid significant losses in case they offer a zero interest rate on a sustained basis or, otherwise, they would have to subsidise their payment activities with income from other products or services. In addition, crises of confidence may arise, related for example to the insolvency of market participants (e.g., entities holding assets in custody, providing portfolio services or managing transactions). If a run on this type of instrument happens, its issuers may need to turn to a lender of last resort to meet liquidity needs and mitigate risks to financial stability.

Stablecoins representing new and independent units of account may also emerge. It is conceivable that the owner of a platform on which a stablecoin operates could impose that this asset be the only one accepted for payments on that platform unless there is public intervention. The prospect of viable independent crypto-assets raises concerns to the monetary policy, which is generally considered a public function and which private issuers would perform inefficiently. The massive use of payment instruments not linked to sovereign currency may contribute to a decrease in the effectiveness of monetary policy and ultimately threaten monetary sovereignty itself. In the past, the absence of a fiscal anchor generally led to the failure of private currencies lacking a sovereign collateral. The autonomy of monetary policy lies in its ability to determine the nominal interest rate in the economy, which ultimately depends on the ability to collect taxes to support it. However, if central bank-issued, sovereign-backed currencies are very unattractive, more modern private digital currencies may be less doomed to failure in the future. In a given jurisdiction, the use of one or more stablecoins referenced to another sovereign currency or a basket of sovereign currencies can become widespread.

Emerging private digital currencies pose opportunities and risks that need to be addressed. In some jurisdictions, it can be concluded that the benefits, in terms of greater efficiency, outweigh the associated risks, encouraging the adoption of these types of assets. While bank deposits and e-money are already regulated and supervised, the most innovative alternatives, namely crypto-assets, and in particular stablecoins, pose legal, regulatory and supervisory challenges.

The crypto-assets market needs a legal framework for activities to strengthen legal certainty for all players and the creation of mechanisms to mitigate cybersecurity risks and other operational aspects. Additionally, appropriate information on risks and associated individual obligations, transparency in the price formation mechanism and the adoption of a sound governance should be ensured to protect investors and consumers. Finally, protection against money laundering and funding of illegal activities and tax compliance must be ensured. The response should be commensurate with the risks attached to each instrument. In each case, it should be based on the identification of the nature of the activity carried out and participants involved, applying appropriate rules according to the principle 'same business, same risk, same rules'. Another key aspect will be to ensure interoperability between systems or platforms and convertibility between currencies. In certain jurisdictions, the balance of benefits and risks associated with emerging private currencies may not be as favourable and lead to greater resistance or, alternatively, a different strategic response, as discussed in the next section.

The role and implications of retail central bank digital currency

A significant number of central banks have started to reflect on the possibility and need to extend access to central bank digital currency to the public in general. Central banks provide physical currency in the form of cash, which is accessible to all economic actors, and digital currency in the form of reserves, only accessible to a restricted group of institutions.

Users' perspective

From the users' perspective, central bank digital currency accessible to everyone would replicate many features of private digital currency but would also add some advantages. In many jurisdictions, it would probably not stand out significantly in terms of accessibility, cost of use or security. In terms of privacy, various configurations are possible, but it must be difficult to replicate the guaranteed anonymity offered by cash without raising issues related to the enforcement of laws against money laundering and the funding of illicit activities. It may also not be particularly favourable compared to private alternatives in terms of additional services offered along with its use. The most prominent advantage would be lower credit risk.

The demand for central bank digital currency by economic actors will depend on its features and advantages over private competitors. In emerging economies, where not all economic actors have access to a bank account and the functionalities of a digital currency, the most obvious advantage of retail central bank digital currency seems to be associated with improved accessibility and security of digital currency, i.e. with an increased financial inclusion. In advanced economies, the most outstanding advantage seems to result from a possible decrease in the use of cash and, thus, from a widespread access to sovereign currency. In the case of constraints on cross-border payments, the contribution of central bank digital currency is not evident.

In the case of the euro area, the demand-side motivation for issuing retail central bank digital money does not seem to be very strong. Looking at the use of payment instruments, the demand for euro cash has remained sustained and cash is still a popular means of payment, although non-cash payments continue to grow, particularly among younger generations, and have accelerated with the COVID-19 pandemic. In addition to cash, households and firms have access to a wide range of electronic payment instruments, supported by robust clearing and settlement infrastructures. More recently, the deployment of instant payment solutions also serves as a digital counterpoint to cash. Since November 2018, the TARGET Instant Payments Settlement (TIPS) service has enabled real-time settlement with central bank currency.

Central bank's perspective

From the central bank's perspective, it would be convenient to ensure that the features of cash can be 'shifted' to a digital environment. Cash, for general use and anonymous, plays a key role in payments and as already mentioned, it may become less attractive and less used. On the other hand, the emergence of new forms of crypto-assets, such as global stablecoins, can have far-reaching implications and call into question policy goals, prompting a central bank response.

The issuance of a central bank digital currency may also be prompted as a reaction to its introduction in other jurisdictions. The use of currencies on an international scale reflects the economic weight of the issuing countries, geopolitical factors and the convenience of use of each currency (which derives in particular from significant network effects and synergies in the various mutually reinforcing

functions of money). Central bank digital currency may not bring about a qualitative change in the economic forces that determine the international currency usage, but it may boost the incentives that lead to currency substitution or internationalisation. The use of foreign currencies for domestic transactions depends on the degree of monetary stability and other country circumstances, notably its legal and regulatory framework. In smaller or more fragile economies, the internationalisation of the use of a sovereign digital currency of a globally relevant economy raises concerns about the maintenance of monetary sovereignty. In other larger jurisdictions there are economic and geopolitical concerns about protecting or strengthening the international role of their own currency.[4] For example, in the euro area, a significant number of electronic payment instruments used in retail (such as cards or Paypal) have not European governance, which could pose problems for euro area sovereignty on payments. Finally, central bank digital currency, if developed in a cooperative manner, could also facilitate the linkage with other currency blocks.

Central bank digital currency is suggested as a natural response to introduce elements of integration between the various private or foreign alternatives, while providing access to a monetary anchor. The risks associated with the proliferation and prevalence of some crypto-assets and foreign digital currencies reinforce the need to establish a regime of convertibility between digital currencies and interoperability between payment systems, therefore a regime of strict conversion to a sovereign currency would facilitate global integration. Besides the regulation and supervision of the various private instruments, central bank digital currency is also proposed as a means to regulate competition in the market, allow direct provision of emergency liquidity by the central bank and curtail the monetary policy effects of other potential issuers. Although there does not seem to be an urgency for the introduction of digital currency, the central bank should be prepared to respond to challenges that may come into play.

Retail central bank digital currency can be a monetary policy tool. Although it may weaken the conduct of monetary policy due to potential effects on bank intermediation, it can also allow monetary impulses to reach a wider set of economic actors more directly. If remunerated at a variable rate, it may contribute to improve the monetary transmission mechanism. In that case, as a closer substitute for bank deposits, its rate of return will act as a magnet for households and firms deposit rates, helping to increase the proportion of money directly linked to monetary policy decisions and potentially enhancing the level and speed of transmission to the economy. The effects on monetary policy transmission can occur at various levels: the rate of return on retail central bank digital currency can contribute to setting the lower boundary of interest rates on households' and firms' deposits and allow a faster and more complete transmission of policy reference rates to deposit rates (interest rate channel); the proportion of money in the economy directly linked to monetary policy reference rates can increase (household cash flow channel); and the sensitivity of banks' funding costs and lending rates to changes in policy rates can increase (bank lending channel). Moreover, central bank digital currency could facilitate the reduction of monetary policy interest rates to more negative values than currently, although this would only be possible with cash elimination or restriction. Finally, it is also sometimes suggested that it could facilitate the adoption of a more targeted monetary policy by introducing liquidity more directly into specific segments of the economy.

Central bank digital currency accessible to everyone could have significant implications for the banking sector and for bank intermediation. To the extent that bank deposits may be replaced by central bank

4. The international use of a currency brings substantial benefits to the issuing country, including seigniorage revenue, reduced transaction, exchange rate risk management and funding costs, the strengthening of monetary policy transmission and autonomy, smoother exchange rate shocks on consumer prices and a lower exposure to unilateral decisions by third parties. These benefits appear to outweigh the costs associated with higher volatility of capital flows and exchange rate appreciation in periods of risk aversion or the need to secure liquidity supply lines on a global scale.

currency, banks will potentially see their funding capacity reduced, which could trigger a decline in banks' balance sheets and in economy funding. Banks may react and try to recover lost deposits by increasing the remuneration of bank deposits or by offering additional services. On the other hand, they may seek funding on the wholesale market or issuing securities, which also carries an associated higher cost and greater volatility. Naturally, there should be an increase in banks' funding costs, which may make changes to bank lending conditions, namely increasing costs and cutting amounts borrowed. It should be noted that some authors suggest that, in a situation of imperfect competition in the banking sector, the potential increase in banks' funding costs may increase deposits and not reduce credit, albeit with a decrease in banks' profits. Finally, in the event of reduced funding capacity in the market, banks may try to apply for central bank funding, if available.

The role of the central bank may be crucial in ensuring the continuity of economy funding and financial stability. The central bank can ensure the same funding conditions for banks that lose deposits, in quantity and price, so that restrictions and distribution of wealth among economic actors are not modified, and consequently there is no change in the allocation of resources in the economy and a decrease in credit to the economy ('equivalence between private and public money'). Moreover, there are concerns that, in periods of systemic financial crisis, generally accessible central bank digital currency may facilitate faster substitution of bank deposits, therefore, once again, the provision of central bank liquidity is crucial. In the case of the euro area, this concern is particularly relevant given the possibility of a sovereign debt crisis in a specific jurisdiction. Usually, the economic literature highlights the stabilising role of central bank funding in a financial crisis.

The issuance of a generally accessible central bank digital currency can have significant effects on the central bank's balance sheet. The parity between the various types of sovereign and scriptural money is here considered to be guaranteed and the central bank undertakes to provide the sovereign digital currency upon economic actors' request. Against a backdrop where economic actors replace only cash or a small part of bank deposits with central bank digital currency, it is likely that only the composition of the central bank's liabilities changes (cash and bank reserves decrease while sovereign digital currency increases), without significant additional implications other than those arising for the banking system. On the other hand, if demand for retail sovereign digital currency is rather significant, notably by replacing bank deposits, the central bank may need to purchase assets outright or offer long-term refinancing operations to banks. In that case, there may be interactions with the use of monetary policy instruments and impacts on collateral assets (and resulting changes in collateral policy) that are still understudied. In addition, changes in the composition, and possibly the increase in the size of the balance sheet, will have impact on risk, seignorage revenues and central bank profit, which should be carefully addressed.

The option of some central banks is to adopt a central bank digital currency model closer to cash, which is assumed to be relatively neutral in terms of monetary policy. However, in the case of the euro area, a zero rate of return may still pose difficulties for financial stability and monetary policy in the context of negative interest rates. Central bank digital currency will potentially have a lower associated holding cost than cash and could therefore be the object of considerable demand and contribute to a decrease in deposits at banks and an increase in the effective lower limit on nominal interest rates. In that case, there might be a need to introduce ceilings on their holding (or transfer) or to establish a remuneration policy not related to monetary policy that would discourage their large-scale use, but neither of these options would be without difficult questions to answer. Namely, on how these ceilings would be set, whether they would be equal for all economic actors or whether their existence would pose risks to parity with the other types of currency. Additionally, if sovereign digital currency has limits on holdings that are significantly lower than the existing deposit guarantee (and deposit-based payment instruments are sufficiently attractive) or if its remuneration is set at a negative value, it could become unattractive and raise reputational issues for the central bank.

Finally, the potential cross-border use of sovereign digital currency introduces an amplifying factor in the aforementioned effects. In jurisdictions where currency acts as a safe haven, capital flows and exchange rate appreciation may intensify in periods of risk aversion with increased effects on monetary policy. Similarly, the aforementioned impacts on the central bank balance sheet and collateral will be accentuated. Also, the effects will depend on remuneration and ceilings on holdings by non-residents, as well as on the existence of interfaces with other payment systems. In turn, setting different access conditions for residents and non-residents could give rise to arbitrage possibilities and, in the particular case of quantitative restrictions, raise questions about the free movement of capital.

Wholesale central bank digital currency as an alternative?

The central bank should assess whether economic actors in general need digital payment services in central bank currency or whether the central bank can meet the economy's needs for safe and efficient payment services by using its traditional functions as operator of wholesale payment systems, as well as supervisor of payment systems and instruments and a general efficiency promoter in the payments area.

A plausible alternative to retail central bank digital currency would be the issuance by private institutions of liabilities fully backed by funds held at the central bank (according to some authors, 'synthetic central bank digital currency'). This could occur through institutions whose business consists solely of issuing such instruments, or through segregated accounts in institutions with a broader business.

These instruments would mimic many of the features of retail central bank digital currency but would not be considered central bank currency as they would not be a direct claim on the central bank. However, they would offer a potentially more credible guarantee of redemption at face value than in e-money and bank deposits. These instruments could entail lower costs and risks for the central bank than retail central bank digital currency, while preserving the comparative advantages of the private sector to innovate and interact with customers and of the central bank to provide trust and efficiency in payment systems. On the other hand, the central bank would not hold the record of individual holders of this type of currency, depending on intermediaries to access the information required in the event of a dispute.

This alternative would probably justify extending access to central bank liabilities, and perhaps liquidity lines, to more intermediaries (e.g., fintech and bigtech institutions), also involving appropriate regulation and supervision to ensure equivalent standards to other existing forms of private currency.

Finally, other solutions combining elements of retail central bank digital currency and synthetic central bank digital currency could also be assessed. For example, a model in which widely accessible central bank digital currency is a direct responsibility of the central bank and intermediaries remain the main players in retail payments, keeping track of holders' rights in accounts segregated from their balance sheets, which the central bank should access on a regular basis (hybrid central bank digital currency).

Policy initiatives for digital currency in the European Union

Enhancing existing solutions and regulating innovations

The first dimension of EU digital currency policy relies on supporting and promoting initiatives to enhance existing payment systems. The promotion of the widespread use of instant transfers and the possibility of extending the range of available functionalities are highlighted.

The policy response should also provide a sound and stable regulatory environment for market innovations. In September 2020 the European Commission proposed a legislative package called Digital Finance to foster and support digital finance in terms of innovation and competition, while mitigating inherent risks. Of particular note is the proposal for a regulation on markets in crypto-assets, which adopts a general approach to provide a legal framework for instruments not covered by other pieces of legislation. A separation is suggested between asset-backed crypto-assets (referenced to various legal tender currencies, one or more commodities, one or more crypto-assets or a basket of such assets), e-money crypto-assets (referenced to a single fiat currency) and other crypto-assets. Rules should adopt an increased requirement for crypto-assets considered significant, thus classified according to established criteria. This regulatory proposal is also intended to cover the activities of crypto-assets service providers.

A digital euro?

Finally, the ECB raised the possibility of issuing a central bank digital currency accessible to everyone. The digital euro is made available to the public (households and firms) for use in retail payments. It is intended to be a simple, risk-free and reliable means of digital payment. This is another way for the ECB to offer euro (it is a central bank liability) that is intended to complement, not replace, central bank cash and deposits. There are different scenarios that could trigger the issuance of a digital euro (Figure 1). A number of these relate to the Eurosystem's core functions, where the overriding motivation is to maintain the euro as an accessible, attractive, safe and efficient payment instrument in a more digitalised economy. Another motivation is the need or benefit for monetary policy. There are also scenarios related to the EU's broader objectives, notably its aim to strengthen the international role of the euro and to foster improvements in overall cost and environmental footprint of payment systems. Each scenario poses specific requirements for the design of the digital euro and, in view of the potential effects associated with its issuance, additional requirements of a more general nature and not necessarily linked to each scenario are set out. The design of the digital euro also assesses its functional possibilities, including remuneration, access model (through accounts directly at the central bank or supervised intermediaries), privacy requirements, restrictions on its use as a large-scale investment (through ceilings on holding or trading it or the application of a tiered remuneration), access restrictions (e.g. to non-residents), transfer mechanism (account-based or token-based system), payment devices and availability and usability offline, legal tender and, finally, type of infrastructure (same as other payment instruments or parallel; centralised, decentralised or hybrid). The prevailing motivation for any issuance of a digital euro will inevitably determine its design. Over the past few months, the Eurosystem has developed a public consultation and initiated a dialogue with industry, while continuing its conceptual and experimental work. In the public consultation on the possible future digital euro, the aspect most valued by participating citizens and professionals was privacy, followed by security, the absence of extra costs, offline usage and its use across the euro area. Integration into existing banking and payment solutions and the offer of additional services beyond basic payments, notably the possibility of programming, were also considered relevant by the majority of respondents. The ECB is expected to decide by mid-2021 whether or not to launch a project on the digital euro. Should the project go ahead, it will start with a research phase to develop a minimum feasible product capable of meeting Eurosystem's requirements and the needs of potential users. The aim is to ensure that the Eurosystem is prepared to issue a digital euro should it decide to do so in the future.

Figure 1 • Reasons to issue a digital euro

1. Promotion of digitalisation and independence of the European economy
2. The role of cash as a means of payment declines significantly
3. A form of money becomes a credible alternative as a medium of exchange and a store of value in the euro area
4. Conclusion that the issuance of a digital euro is necessary or beneficial from a monetary policy perspective
5. Mitigate the probability of extreme events to hinder the provision of payment services
6. The international role of the euro gains relevance as a Eurosystem objective
7. Improvement in the overall costs and ecological footprint of the monetary and payment systems

Source: ECB, *Report on a digital euro*, October 2020.

Conclusion

The payments market has seen an increased use of digital means which are bringing about significant changes, notably through the emergence of new forms of digital currency. Digital currency accessible to everyone has been offered by the private sector, mainly through bank deposits, and to a lesser extent by e-money, always subject to a tight regulation and supervision. The use of e-money has been growing in the EU but is still of little importance. New digital private crypto-assets solutions have emerged, but their use in payments is reduced. On the other hand, there is potential for the emergence of global stablecoins. In the future, the possible decline in the use of cash and the over-reliance on private solutions in payment systems may impact on the security and efficiency of payments, financial stability or monetary policy. Emerging private digital currencies thus pose opportunities and risks that need to be addressed. The first dimension of policy response can be based on supporting and promoting initiatives to enhance existing payment systems. Another dimension of policy response relates to the need to provide a sound and stable regulatory environment for market innovations, with particular emphasis on crypto-assets and, especially, global stablecoins. Finally, the central bank may deem it appropriate the issue of a new form of central bank digital currency, accessible to all economic actors, which ensures that cash features are 'shifted' to a digital environment. This type of central bank digital currency is suggested as a response to introduce integration elements among the various private alternatives, or other foreign central bank digital currencies, while providing access to a monetary anchor, but it is not without risks. One of the issues to be carefully analysed is whether most economic actors need digital payment services in central bank currency. Another issue is whether the central bank can meet the needs of the economy for safe and efficient payment services by using its traditional functions as a wholesale payment system operator, possibly by extending access to its liabilities to more institutions. In this context, several digital currency policy initiatives are under way in the EU, and the Eurosystem has started to work on the option of a potential digital euro in the future.

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