



The increase in the money supply during the Covid crisis: analysis and implications

Following the Covid crisis, the money supply grew at historically high rates in the euro area and in the United States in 2020, before reverting to a more moderate growth trend in 2021. These developments were due to significant money creation by central banks and commercial banks, supported by purchases of government securities. In parallel, government debt issuance also reached peak levels amid efforts to cope with the consequences of the health crisis. This article explains the main mechanisms driving these developments and explores the relationship between this additional monetary creation and the price level.

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JEL Codes
E31 and E51

12%

the growth rate of the euro area money supply more than doubled at end-2020 (5% in 2019), before falling back to 7% at end-2021

25%

the growth rate of the US money supply increased fivefold at end-2020 (5% on average in 2019), before falling back to 13% at end-2021

Growth of euro area and US monetary aggregates

(% growth rate, year-on-year)



Sources: European Central Bank, United States Federal Reserve (Fed).
Note: The US aggregate is M2, as the Fed stopped publishing M3 in 2006.



Between 2019 and 2020, the growth rate of the money supply (M3, a broad aggregate capturing potential transfers between liquid assets, see definition in the appendix) in the euro area increased markedly from 5% to approximately 12%, corresponding to an annual flow of EUR 1,589 billion. This 7 percentage point (pp) increase over one year was the fastest ever recorded since the euro's inception. An even more pronounced increase was observed in the United States, where the M2 growth rate climbed from roughly 5% to 25% (see Chart 1). This sustained pace of money expansion has raised concerns among economists about possible inflationary pressures.¹

Monetary dynamics in 2020 were primarily fuelled by the fiscal response to the Covid crisis, which was itself facilitated by large-scale purchases of government debt securities by monetary financial institutions (MFIs),² and, in particular, by central banks. The unique nature of this period is highlighted by the subsequent normalisation trend that began in early 2021, as the annual growth rate eased to approximately 7% in the euro area in

December 2021. This article explains the main mechanisms driving these developments and explores the relationship between this additional monetary creation and the price level, with a focus on the initial phase of the crisis, which featured the most pronounced developments.

1 A sharp increase in euro area monetary aggregates, mainly fuelled by massive purchases of government debt by MFIs

Strong growth in deposits held by households and non-financial corporations

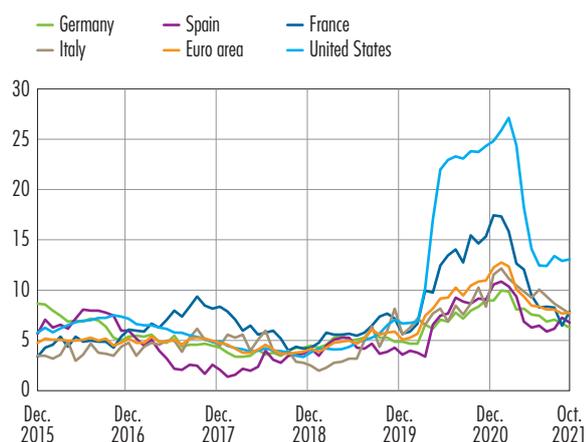
In the euro area, the money supply (or broad money) is defined as the sum of all banknotes and coins, deposits and short-term debt securities and money market fund shares/units held by resident agents other than MFIs and central government.³ The money supply is recorded on the liabilities side of the MFI balance sheet. The deposits of non-financial corporations (NFCs) grew the most over the recent period in the euro area, followed by household deposits. In 2020, the growth rate of deposits was fairly similar across euro area countries, with the exception of France, where it was much higher, echoing a pattern seen in 2017 (see Box 1).

Euro area NFCs accumulated deposits of EUR 518 billion in 2020, including EUR 445 billion in the first three quarters of the year. This corresponded to an increase of around 20% over one year in the outstanding amount (compared with 6% in 2019), even though many companies saw their activity slacken, or halt outright, for several months in 2020, which might have led them to draw more heavily on their cash reserves. However, these reserves were bolstered by a variety of government assistance schemes.

Households also increased their liquid savings by EUR 607 billion in 2020, including EUR 423 billion in the first three quarters of the year.

Chart 1 Growth of euro area and US monetary aggregates

(% growth rate, year-on-year)



Sources: European Central Bank, United States Federal Reserve.
Note: The US aggregate is M2, as the Fed stopped publishing M3 in 2006.

1 For example, Morgan Stanley was quoted by CNBC as saying: "Fed may not be in control of Money Supply growth which means they won't have control of inflation either, if it gets going".
2 See the *Banque de France website* for a definition of MFIs.
3 Specifically, households, non-financial corporations (NFCs), general government excluding central government, insurance companies and pension funds, non-money market funds and other various non-MFI financial corporations.



BOX 1

Money growth in France in 2020

Since 2016, France's contribution to euro area M3 growth has increased at a faster pace than the euro area average. In 2020 in particular, this gap exceeded 3.3 percentage points on average. The French contribution was driven by households' overnight deposits and Livret A passbook accounts (+EUR 150 billion) and by NFC deposits (+EUR 167 billion). This EUR 317 billion flow represented 28% of overall euro area flows of overnight and equivalent deposits (EUR 1,116 billion) and 20% of M3 flow for the period (EUR 1,589 billion).

For households, much of this accumulation of deposits stemmed from financial saving, i.e. excess disposable income after consumption and real estate investment. Their net financial assets thus increased by EUR 115 billion in 2020, probably reflecting the restrictive impact of health-related consumption constraints (closure of restaurants and shops, travel put on hold) together with the positive impact on income of measures introduced by the French government to assist firms in continuing to pay wages, including the job retention scheme and the solidarity fund notably.

Non-financial corporations were granted more than EUR 130 billion of government-backed loans at favourable cost conditions in 2020, in addition to loans at market conditions.

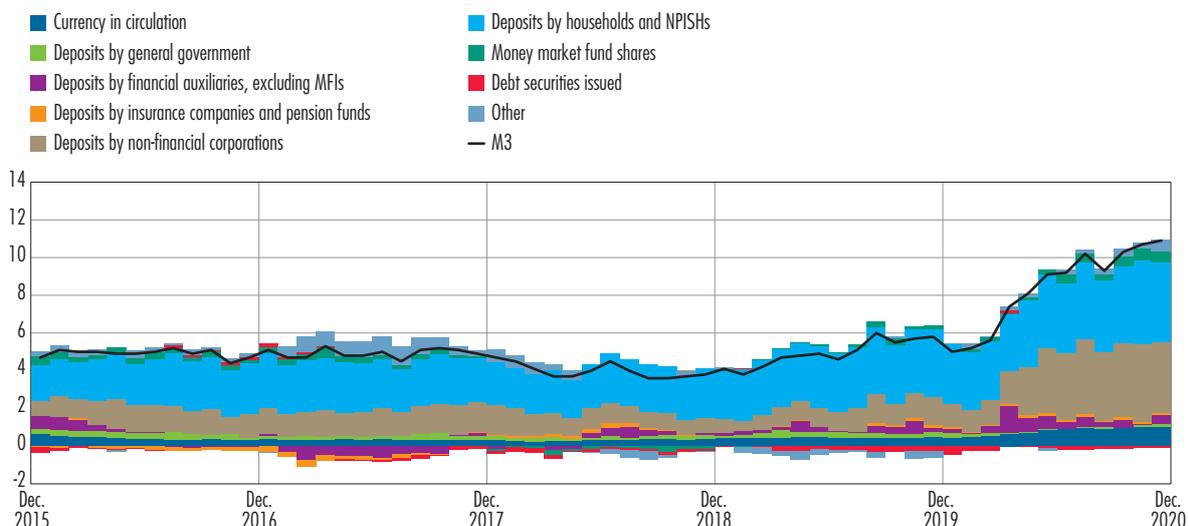
Overall, French **monetary financial institutions** (MFIs) contributed to a very large extent to euro area monetary dynamics, accounting for 42% of credit flows to the euro area private sector and 22% of credit to government. Putting this in context, France accounts for 20% of euro area GDP.

The deposits of these two categories of agents, which accounted for 70% of the increase in M3 in 2020 (see Chart 2), thus rose by EUR 1,125 billion, compared

with an average annual increase of EUR 407 billion from 2015 to 2019, which equates to additional deposits of around EUR 700 billion.

C2 M3 growth rate and contribution of each component to the growth rate

(%)



Source: European Central Bank, SDW, monetary statistics.

Notes: All liabilities included here (e.g. repos, debt securities, etc.) are components of M3.

MFIs: monetary financial institutions; NPISHs: non-profit institutions serving households.



Massive purchases of government securities by MFIs provided the main source of M3 growth in the euro area

Faced with a collapse in economic activity, euro area governments launched huge fiscal packages, including transfers to households and companies, particularly through job retention schemes, business subsidies and social benefits,⁴ as well as tax deferrals. The total amount of government transfers net of taxes received by households and companies came to over EUR 500 billion in 2020.

These transfers, together with a steep fall in tax revenues, resulted in a substantial increase in the euro area fiscal deficit, which rose from 0.6% of GDP in 2019 to 7.2% of GDP in 2020, leading to significant government bond issuance. Most of these bonds were acquired by MFIs and, in particular, by the Eurosystem (see table), triggering significant money creation (see Box 2 on the link between the MFI balance sheet and money).

By looking at M3 counterparts,⁵ that is, essentially the changes in MFI balance sheet items that form the

Acquisition of securities by monetary financial institutions (MFIs) in 2020 in the euro area

(EUR billions)

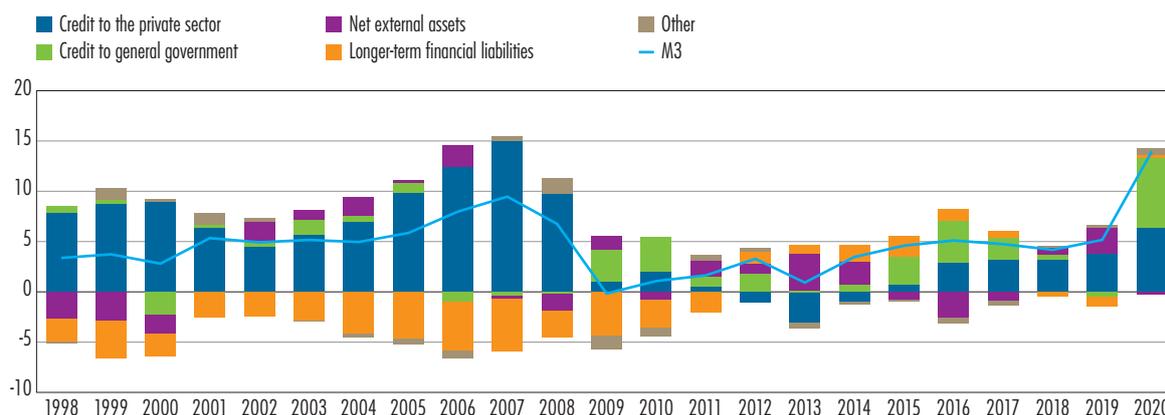
MFI purchases of government securities	1,063
of which:	
Commercial banks	319
Central bank (Eurosystem)	744
Increase in government debt	1,037
of which:	
Deposits with the central bank	538
Government transfers	499

Source: Eurosystem, MFI balance sheet, statistics on securities holdings.

counterparts of money growth, Chart 3 shows that the exceptional increase in the money supply in 2020 can be explained primarily by massive purchases of government securities by MFIs. Annual flows of credit to general government as a share of GDP reached their highest level since the euro area was created. Credit to the economy also rose sharply, notably due to the growth of lending to NFCs, chiefly in the shape of government-backed loans.

C3 Change in M3 and M3 counterparts

(annual flows, % of GDP)



Source: Eurosystem, MFI balance sheet.

Note: Credit to the private sector includes loans to non-MFI sectors excluding general government and MFI holdings of securities issued by those sectors. Credit to general government includes loans to general government and securities issued by general government, net of central government deposits with MFIs. Longer-term financial liabilities represent the non-monetary liabilities of MFIs. "Other" includes capital and reserves.

⁴ Haroutunian et al. (2021).

⁵ See El Amri et al. (2021).



BOX 2

The MFI balance sheet reflects money creation

The sources of money creation can be analysed by looking at the balance sheets of the banking sector and of the non-financial sector. In the examples below, we limit the MFI universe to banks, while the non-financial sector is considered to make up non-MFIs.

In the stylised example below (Diagram a), the main assets of the banking system are loans and securities. The non-financial sector's deposits make up the main liability of banks. Conversely, the non-financial sector mainly holds bank deposits and owes loans to the banking sector.

Diagram a
Assets and liabilities of the banking system and of the non-financial sector (initial situation)

Bank assets and liabilities

Securities	Deposits
Loans	
	Equity

Non-financial sector assets and liabilities

Deposits	Loans
	Net worth

Source: Banque de France.

In Diagram b, we represent the balance sheets of banks when they decide to purchase additional securities (purple area) and to grant more loans (green area). As can be seen, additional lending from the banking sector results in additional deposits because when a loan is granted, the funds are typically credited to the borrower's account, a process summed up by the saying: "loans make deposits".

In a situation where a bank buys a sovereign bond, two steps take place: (i) the purchase of the bond by the commercial bank during the debt issue by the Treasury; and (ii) the payment (job retention scheme, etc.) by the government of the borrowed funds to the deposit accounts held by households with banks. Only during this second step will deposits of the non-financial sector, and therefore M3, increase.

At this stage, as regards the consolidated banking sector balance sheet, no distinction is made between the central bank and commercial banks.¹

If the central bank buys government bonds from commercial banks, it will transfer central bank money to the commercial banks. The central bank's balance sheet will thus increase (government securities on the assets side and increase in the commercial bank's deposits on the liabilities side). The commercial bank will see a decrease in its holding of government securities and a corresponding increase in its central bank account balance.

.../...

¹ Note that the Eurosystem (ECB and the 19 euro area national central banks) is authorised to purchase bonds only on the secondary market, i.e. from investors. The secondary market is distinct from the primary market on which central government issues bonds to investors.



The deposits of the non-financial sector, and therefore M3, will be unchanged. In this example, only the purchases of government securities by commercial banks create money, but massive central bank refinancing, as observed in 2020, facilitates these purchases.

Diagram b

Assets and liabilities of the banking system and of the non-financial sector after banks buy government securities and grant additional loans

Bank assets and liabilities

+ Securities	+ Deposits
Loans	+ Deposits
Securities	Deposits
Loans	
	Equity

Bank purchases of government securities
+ government transfers

Bank loans (due inter alia
to government-backed loans)

Non-financial sector assets and liabilities

+ Deposits	Net worth
+ Deposits	Loans
Deposits	Loans
	Net worth

Source: Banque de France.

This is different from the situation in 2016, when credit to general government also increased following the central bank's Public Sector Purchase Programme (PSPP), but without significant growth in government debt. Back then, MFIs mainly purchased government securities from non-residents (Kojien et al., 2017), resulting in a deterioration in net external assets, without any impact on M3. Conversely, in 2020, there was little change in the external counterpart, as most of the government securities acquired by MFIs were newly issued securities (Sirello, 2020). A similar episode featuring a sharp rise in both government debt and the "credit to general government" counterpart took place in 2009-2010, in the wake of the financial crisis. At that time, however, M3 did not grow much because banks ramped up their

issuance of long-term securities,⁶ which are not part of M3.

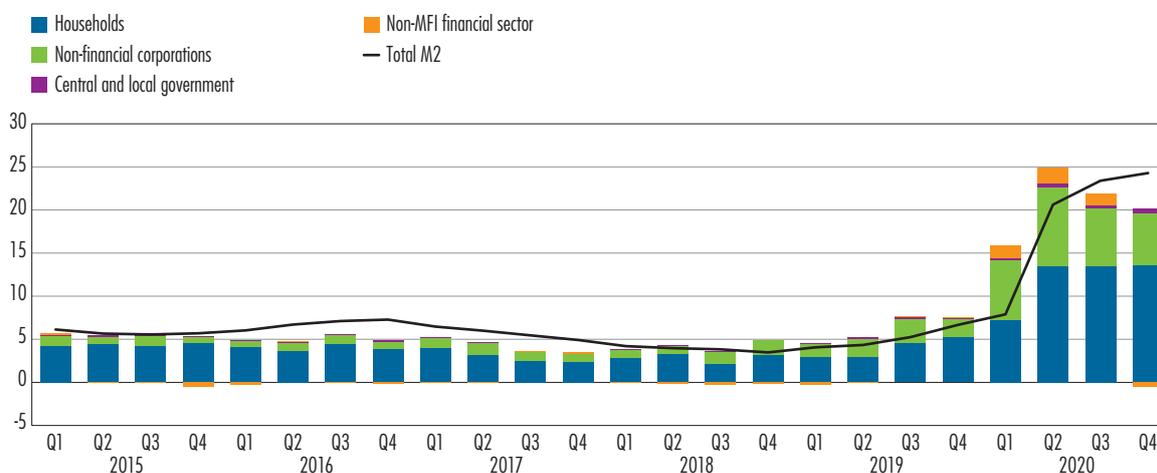
In the current context, it is worth asking why households and NFCs have not reduced their deposits by purchasing insurance products or securities. In standard models of household financial investment, liquid deposits (included in M3) are assumed to pay a lower interest rate (often zero) compared with the return on other financial or real assets. However, risk-free assets currently yield negative interest rates in the euro area and the yield curve is quite flat. Accordingly, holding liquid deposits does not imply heavy losses (or a high opportunity cost) for households. They may therefore have preferred to hold their financial wealth in the form of deposits during a time of uncertainty.

⁶ See European Central Bank – ECB (2010): "Data suggest that until early 2010 the sharp adjustment seen in the relevant risks and returns led to financial investment being shifted towards non-monetary instruments [...] investment in longer-term MFI instruments also increased".



C4 Sector contributions to M2 growth in the United States

(% growth rate, year-on-year)



Source: Proxy based on flow of funds levels data published by the Fed.
Note: MFIs, monetary financial institutions.

2 An even sharper surge in the US money supply, chiefly driven by household deposits

Monetary assets increased by more in the United States than in the euro area

By the end of 2020, M2⁷ was increasing at an annual rate of 25%, after an average of 5% in 2019 (see Chart 4). That growth rate was 20 pp faster than in 2019 (significantly more than the 7 pp acceleration in the euro area) and almost twice as high as the previous fastest growth rate in the modern era, reached during the 1970s.

For the United States, the most recent episode of strong money growth dates back to 2011-2012, when M2 accelerated from 6% to 10% a year (and to a lesser extent in 2016, when M2 grew above 7%). At the time, sizeable liquidity injections by the Fed created a surge in bank reserves, but did not lead to a pick-up in M2, as this liquidity stayed in the banking system and was

only weakly deployed in the private sector. In 2020 by contrast, Congress was the main player driving money supply growth. Unlike in the previous episode, issuance of government securities by the federal government financed direct transfers to households and corporates, thus increasing their deposits. The Treasury department issued USD 4,582 billion of government securities in 2020. This massive public borrowing was possible due to the Fed's open-ended asset purchase programme launched in March 2020, which ultimately led the US central bank to buy USD 2,533 billion of Treasuries in 2020. As Chart 5 below shows, the holding of government securities by MFIs, and especially the Fed, was by far the most dynamic counterpart of M3.

A particularly pronounced increase in cash holdings by households

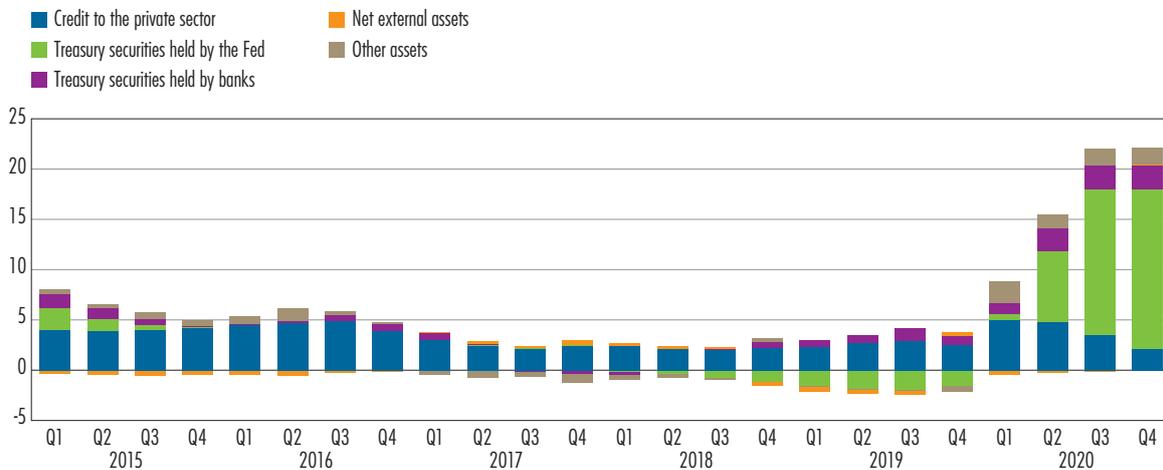
In contrast to the euro area, where NFCs were the main contributors to the increase in cash, it was primarily the household sector that drove the surge in M2 in the US

⁷ In the United States, M2 comprises currency, overnight deposits, savings deposits, small-denomination time deposits (deposits in amounts of less than USD 100,000) and balances in money market mutual funds, held by domestic sectors, excluding the US government and MFIs. The Fed stopped publishing the M3 aggregate in 2006.



C5 M2 counterparts in the United States and growth contribution

(%)



Source: Proxy based on flow of funds levels data published by the Fed.
Note: Fed, US Federal Reserve.

in 2020,⁸ with NFCs contributing to a lesser extent (see Chart 4). Households, which account for three-quarters of total bank deposits, increased their deposits by 23% in 2020 compared with 2019. NFCs also increased their deposits by 24% in 2020. The liquidity preference may also have affected M2 dynamics. Due to unprecedented levels of uncertainty, some agents preferred to swap time deposits (some of which are not included in M2, such as those above USD 100,000) for more liquid overnight deposits (included in M2).

The overrepresentation of households as money holders in the United States in 2020 is due to the specifics of the US fiscal stimulus, which particularly targeted households and less so NFCs. Stimulus measures consisted of direct transfers to households and forgivable loans to companies to pay wages, whereas Europe mainly used job retention schemes and government-backed loans. While loans are generally seen as a source of new deposits, the amount of loans taken out by US households in 2020 was significantly less than

the amount of new deposits that they recorded: USD 655 billion of new loans supplied only one-quarter of the USD 2,526 billion increase in deposits. The rest essentially came from government transfers, with households receiving around USD 1,133 billion in additional net transfers (direct cheques, unemployment benefits, food stamps, tax reductions) in 2020. For NFCs, as expected, loan dynamics matched deposit dynamics closely, with USD 714 billion of additional loans compared with USD 792 billion of new deposits for NFCs. Public support for businesses was smaller in the United States, not just relative to households, but also compared with similar support measures rolled out in Europe. Emergency lending facilities set up by the Fed and comparable to the euro area's government-backed loan schemes had little take up. The Paycheck Protection Program, one of the main vehicles of support for US businesses, actually acted as an indirect transfer to households, by providing small and medium-sized enterprises (SMEs) with forgivable loans to pay workers' wages.

⁸ US monetary statistics do not include money supply series by sector as in the euro area. We can proxy the change in M2 by sector by aggregating from the financial accounts of different sectors (households, NFCs, financial sector other than MFIs and local government) their holdings of currency and overnight deposits, time deposits and MMF shares/units. This calculation is approximative but offers a relatively good reflection of the overall change in M2.



Compared with euro area debt issues, the US Treasury disbursed a greater share of the funds collected through debt issuance. However, the amount in Treasury's account with the Fed remained extremely high at the end of 2020, standing at USD 1,744 billion.⁹ Subsequent disbursement of this cash, as observed in 2021, continued to spur M2 growth.

3 Money supply growth does not translate into an automatic price increase

The previous sections illustrate that the increase in broad money, in both the euro area and the United States, was predominantly the result of fiscal stimulus measures, which fuelled growth in deposits and demand. Although there is uncertainty about future developments, they are likely to involve a reduction in fiscal stimulus.

Looking forward, what may happen to these non-financial sector deposits? Is an increase in inflation inevitable? Inflation did indeed go up in 2021 in the euro area and even more so in the United States, but it cannot necessarily be concluded that this increase was solely or mainly due to changes in demand: other supply-side factors are also in play, such as higher energy prices or restrictions to productive capacities connected in particular with the health situation. The existing literature is also mixed on the possible connections between money and inflation.

Several remarks are thus worth taking into consideration:

- Growth of the money supply went hand in hand with the major fiscal stimulus measures in the euro area and the United States, and suggests that the net effect of these measures was to increase the net financial wealth of NFCs and households, which could positively affect their spending and, ultimately, inflation. This effect is at least partly offset by an increase in the implicit tax liabilities of residents of the countries concerned, consistent with the
- theory of Ricardian equivalence,¹⁰ which should curb consumption;
- The portion of funds raised through government debt issuance that has not been spent and remains in government accounts at the central bank has no impact on the money supply.¹¹ If these funds are spent, the money supply will likely increase even further;
- Households may also prefer to use their excess deposits to pay down debt (and thereby destroy money) rather than increase consumption or fuel non-monetary or real estate-related financial investments, which would tend to drive up asset prices rather than the prices of goods and services. Nevertheless, the same incentives to hold deposits when interest rates are low also reduce the incentive to pay down debt. **Household** money holdings (rather than total monetary aggregates) seem to have a closer connection to inflation than total monetary aggregates, as shown by Bricongne (2015) using reconstructed sectoral money holdings for the United States, the United Kingdom, France and the euro area.¹² This mitigates the risks associated with the portion of money growth of non-household money-holding sectors, particularly in the euro area, where corporate deposits fuelled money growth by more than in the United States, relative to households. Meanwhile, the increase in these household holdings during the Covid-19 period is atypical and could well be treated by households as a one-off transfer. If this were the case, the increase should have limited effects on expected income and current consumption (see Box 3 below);
- Expectations are among the factors that may, traditionally, fuel inflation, and surveys of households by the European Commission indicate that projections for prices and major purchases over the next 12 months remained stable in the euro area (see Chart 6 below) over 2020, notwithstanding limited differences between Member States and a one-off increase around 2020Q2 during the first lockdown. Although

⁹ Part of the cash buffer could be attributable to funds earmarked for the Paycheck Protection Program, which are disbursed by the Treasury to banks only when the loan is actually forgiven.

¹⁰ According to Ricardian equivalence, when general government takes on debt in order to undertake fiscal stimulus, economic agents are capable of anticipating a future tax increase and thus reduce their consumption.

¹¹ Central government deposits at the central bank are not counted in M2/M3.

¹² <http://data.leo-univ-orleans.fr/media/search-works/2296/dr201518.pdf>



BOX 3

Several studies confirm that one-off transfers have a limited impact on consumption and inflation expectations

Based on a survey of Dutch households, van Rooij and de Haan (2019) suggest that only a small share of transfers is likely to be spent (around 30%), the rest being mostly saved or used to repay debt. They also conclude that such transfers, whether from the central bank or the government, have little effect on inflation expectations.

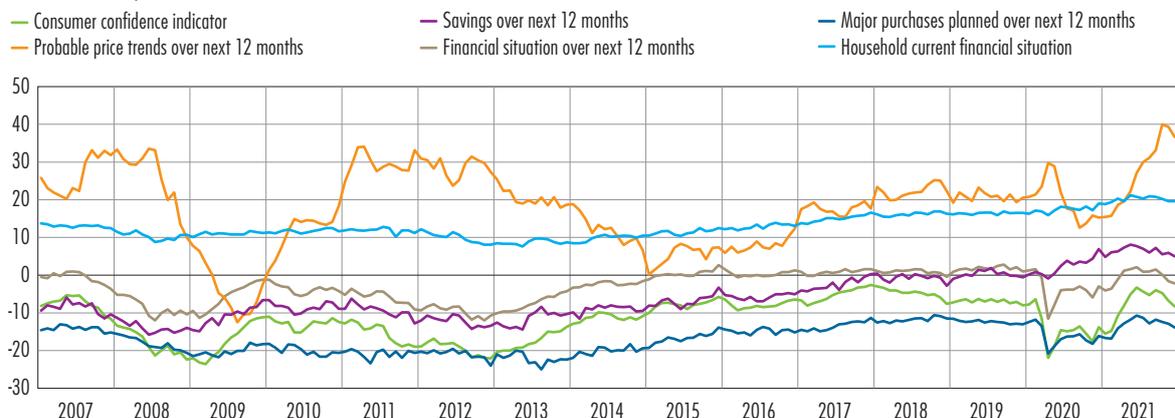
Using large-scale surveys of US households, Coibion et al. (2020) and Baker et al. (2020) investigate how Americans used the direct cheques received in 2020. They conclude that American households spent between 30% and 40% of the cheques received, with the rest being equally distributed between savings and debt repayment.

These orders of magnitude for the US are consistent with Bilbiie et al. (2021) who underline that “available estimates of the propensity to consume out of the CARES Act¹ transfers are between 25% and 40%. [...]. As it turns out, these estimates are broadly in line with those based on previous transfers of this kind”. Bilbiie et al. (2021) also argue that US household savings are not that excessive when considered against the backdrop of the unprecedented government interventions and that “they are unlikely to generate a surge in demand post-pandemic” [and thus in inflation].

¹ Coronavirus Aid, Relief and Economic Security Act.

C6 Euro area survey of consumer confidence

(balance of answers)



Source: European Commission.

euro area household inflation projections increased over 2021, peaking in October, according to the European Commission survey, it is tricky to distinguish the contribution made by growth in monetary aggregates from other factors;

- The literature has extensively explored the link between monetary aggregates and inflation, with mixed

conclusions. Financial innovation and the difficulty of disentangling the different motives for holding money are among the factors that make estimating the relationship challenging. Binner et al. (2010), for example, ask whether money matters in inflation forecasting, while McCallum and Nelson (2010) and Berger and Österholm (2008) find evidence for a connection between money growth and inflation.



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Appendix

Excerpt from box in *Banque de France Bulletin* No. 234/2, March-April 2021

Who creates money, who holds it?

In the euro area, defining a common framework for the implementation of monetary policy requires a harmonised definition of the money-issuing and money-holding sectors.

The money-issuing sector consists of monetary financial institutions (MFIs) resident in the euro area: the ECB, national central banks, including the Banque de France, credit institutions, money market funds (MMFs) and all resident financial institutions whose business is to take deposits and/or close substitutes for deposits from non-financial agents. The money-holding sector includes euro area resident agents excluding MFIs and central government¹ (considered to be money-neutral), mainly households, non-financial corporations, insurance companies and non-MFI financial intermediaries.

The money supply is measured by restating and consolidating the balance sheets of money issuers. It is also within this framework that the ECB has defined three main monetary aggregates harmonised at the European level, which describe and rank, in decreasing order of liquidity, the money held by economic agents.

- M1 represents money in the strict sense and includes assets that can be used immediately as means of payment, i.e. currency in circulation (fiduciary money) and overnight deposits;
- M2 includes M1 as well as deposits that can be converted quickly and without cost into a means of payment with a notice period of less than or equal to three months (for France: Livret A and Livret Bleu, home savings accounts, *livrets de développement durable et solidaire* (LDDS – sustainable development passbooks), etc.) and deposits with an agreed maturity of up to two years;
- M3 or the broad aggregate covers, in addition to M2, short-term negotiable instruments issued by MFIs that have a high degree of liquidity with little risk of loss of capital in the event of liquidation (money market fund shares/units, debt securities with a maturity of up to two years, repos).

The monetary base, also known as central bank money, includes cashless money as well as cash deposited by banks under the deposit facility, reserve requirements and excess reserves. Banknotes and coins are different from cashless money.

Cashless money is also known as “**scriptural**” money, from the Latin root meaning “to be written”, and is created by bookkeeping entries. Whereas the term “**fiduciary**” money, i.e. banknotes and coins, stems from the Latin root meaning “of trust”. For example, a payment by bank card involves only cashless money.

.../...

¹ Central government includes the state and various state-controlled bodies with national jurisdiction.



When a credit institution grants a loan to a company or household, the amount of the loan is added to the customer's bank account. A new loan therefore corresponds to a new deposit, which is added to the existing cashless money. This accounting procedure is summarised by the adage "loans make deposits".²

The bank's customer can then use this cashless money to make payments, for example by bank transfer, credit card or cheque. The money created by banks, which stems from the financing needs of economic agents, then circulates in the economy.

Depending on the behaviour of their customers, some commercial banks find themselves in a surplus situation (deposits exceeding loans) and others in a deficit situation (loans exceeding deposits). An asymmetry is created, for example, when a household with an account at bank A makes a payment to a merchant with an account at bank B. To ensure their liquidity balance, commercial banks can go to the interbank market or use their own account at the Banque de France, where central bank money is deposited.

² See Banque de France (2019), "Who creates money?", *Economics in brief*, January.

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