

# MONEY SUPPLY, SAVING & HOARDING: WHAT YOU SEE IS NOT WHAT YOU GET

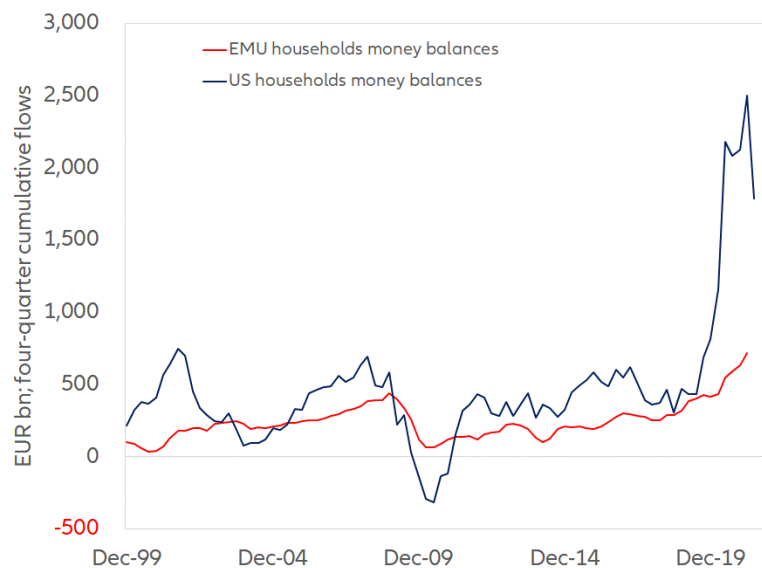
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In response to the Covid-19 outbreak, monetary policy and fiscal policy have striven to safeguard the nominal incomes of households and businesses. At the same time, lockdowns and the shock to confidence have prevented households and businesses from spending as much money as they used to. As a result and as shown in Figure 1, the money balances held by private agents, first and foremost the balances held by households, have increased, in the EMU, by EUR 715 bn during the four quarters to Q1 2021. In the US, they have increased by EUR 1,784 bn during the four quarters to Q2 2021.

Figure 1 – Four-quarter cumulative change in households' money balances in the US and the EMU



Sources: Refinitiv, Allianz Research

According to many an analyst, such an unusually large increase in privately held money balances indicates excess saving. The argument follows that when people tap into their savings, which they will inevitably do to correct the current excess, money balances will fall, unleash pent-up demand and a strong recovery will ensue.

As a matter of fact, one could (and actually should) deepen the excess saving argument by better distinguishing the two components of what laymen as well as some experts loosely call saving, namely:

- saving proper, or outlays other than consumption outlays,
- and (marginal) hoarding, or money not spent at all because it has been added to preexisting precautionary money balances.

If one hastily defines saving as that part of income that is not spent on consumption, one may be led to falsely believe that hoarding is part of saving, confusing money that is spent, but not on consumption, with money that is not spent at all. Focusing on the hoarding of precautionary balances, this investigation claims that the increase in outstanding money balances that inspires the excess saving argument systematically under- or overestimates the firepower set aside by private agents.

As a matter of fact, the excess saving argument underestimates by about 20% the quantity of money withdrawn from circulation and set aside by people in response to the Covid-19 shock. Saving proper has not really increased, but hoarding has, and much more than suggested by the cumulative increase in aggregate money balances since Q1 2020. Relevant to the growth and inflation outlook is the fact that the excess saving argument also underestimates the challenge of unleashing the purchasing power that people have stored for rainy days. The unlocking of hoarded money balances is not as straightforward as assumed by those who let the money supply alone guide their inflation expectations, at the risk of ignoring the demand for money. If people now held money balances above and beyond what they desire to hold, they would strive to get rid of excess liquidity and money velocity would increase. This has yet to happen. If there is something for policy to deter, it is hoarding; and if there is something to stimulate, it is saving.

#### ***Some money balances count more than others***

On the one hand, at any time, the money supply consists of the money balances held by households, and of the money balances held by businesses. On the other hand, at any time, households and businesses have two motives to hold money balances: the transactions motive, and the precautionary motive.

It follows that the money supply can also be split into transactions balances (balances that do circulate because people and businesses pay their bills with them), and precautionary balances (balances that do not circulate because people and business hoard them as a precaution against a possible fall of their nominal income). For the sake of completeness, let us add that precautionary balances should be understood to include the money balances that people hold for speculative purposes. As long as people expect asset prices to fall further, such speculative balances do not circulate either.

The numerical example presented in Appendix A shows how we could directly measure transactions balances and precautionary balances (or aggregate hoarding). It defines marginal hoarding as an increase in precautionary balances and shows that such an outcome is possible even when aggregate money balances are constant. That hoarding can happen even when the money supply does not increase at all invites caution when interpreting increases in money supplies such as the ones

observed in 2020. The dual nature of the money supply means indeed that a variation in the money balances held by households and businesses, an easy-to-observe phenomenon, may have two not-so-easy-to-disentangle causes: a variation in the demand for transactions balances, or a variation in the demand for precautionary balances, or a combination of both. Like it or not, we cannot draw any conclusion about the magnitude of hoarding from an increase in the money balances held by private agents, since we have two variables, but only one equation. If transactions balances have decreased, the mere increase in money balances underestimates the quantity of money set aside, or withdrawn from circulation, by private agents.

Appendix A further shows that hoarding causes money velocity to fall and that, to quantify marginal hoarding, one needs to estimate the demand for money. In what follows, we investigate the behavior of both money velocity and the demand for money since early 2020.

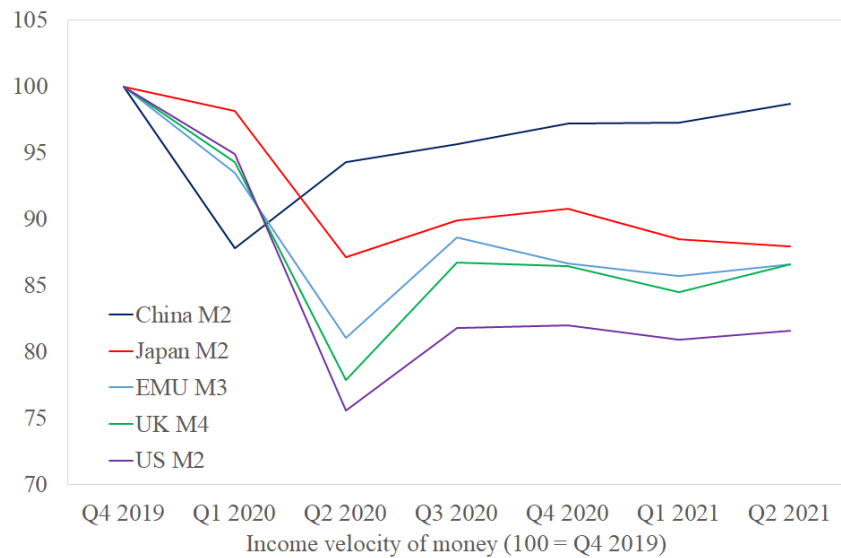
### ***Hoarding leaves an unmistakable footprint on money velocity***

If hoarding can occur even when the money supply does not vary, a fortiori can it occur when, as seen since early 2020, the money supply does increase. As we have just seen, we can infer from the decrease or increase of money velocity whether hoarding or dishoarding is happening. The sharp decline of money velocity in the early stages of the crisis, its limited recovery in Q3 2020, and its stability ever since indicate that hoarding, rather than saving proper, has been and remains the hallmark of the current economic and monetary environment.

Hoarding (or dis-hoarding) indeed leaves an unmistakable footprint on nominal spending and money velocity. To see that, let us start from Newcomb-Fisher's equation of exchanges, which says that nominal spending (a flow of money) equals the money supply (a stock of money) times its velocity, that is, how frequently money changes hands during a given period.

In a perfect world, we should tally all transactions: the transactions on final goods and services that make (nominal) GDP as well as transactions on intermediate goods and services, and securities transactions. At the risk of neglecting the transactions settled with bank notes and coins (for a large part, the money of the black economy), the sum of the debits on bank accounts during a given period could provide an estimate of aggregate nominal transactions. With that, economists could compute the transactions-velocity of money. For lack of such comprehensive measurement, economists are content to take nominal GDP as a proxy for aggregate nominal transactions and to compute the income-velocity of money (the ratio of nominal GDP to the money supply). Such is the approach followed in the present investigation.

Figure 2 – Income-velocity of money in major economies since Q4 2019 (=100)



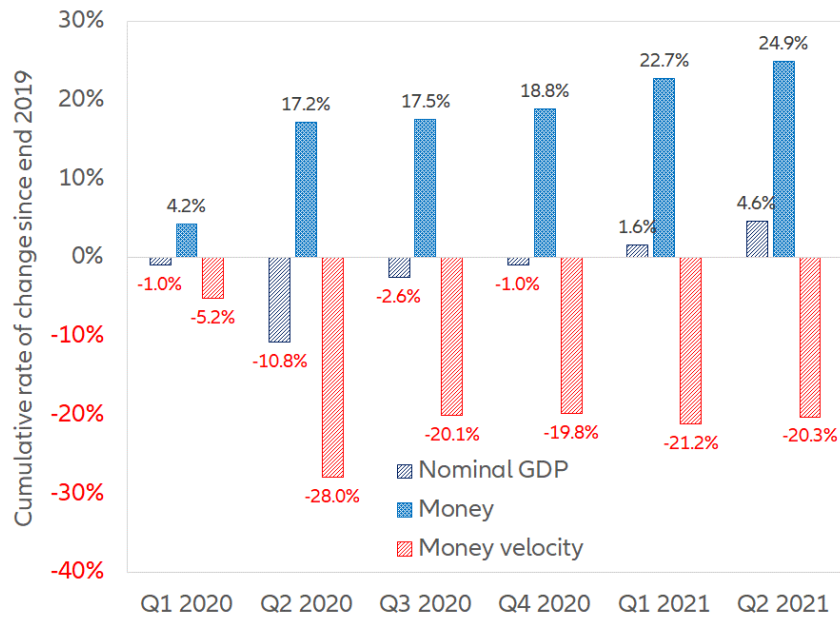
Sources: Refinitiv, Allianz Research

As shown in Figure 2, in major economies, except China, the income-velocity of money fell sharply in Q1 and Q2 2020. It partially recovered in Q3 2020. Since then, it has remained stable, but 15 to 20% lower than its pre-Covid level. In other words, dishoarding has not yet occurred. Less rigorously said, people have not yet depleted their “excess savings”. What has then enabled nominal spending to recover? The increase in the money supply.

As we mentioned above, according to the Fisher-Newcomb equation of exchanges, nominal spending equals the money supply times its velocity. It follows, as shown in Figures 3 and 4, that the rate of change of nominal spending equals the rate of change of the money supply plus the rate of change of money velocity. If, as it has been the case since Q4 2020, money velocity is more or less constant, the rate of change of nominal spending roughly equals the rate of change of the money supply. What has then enabled the money supply to grow?

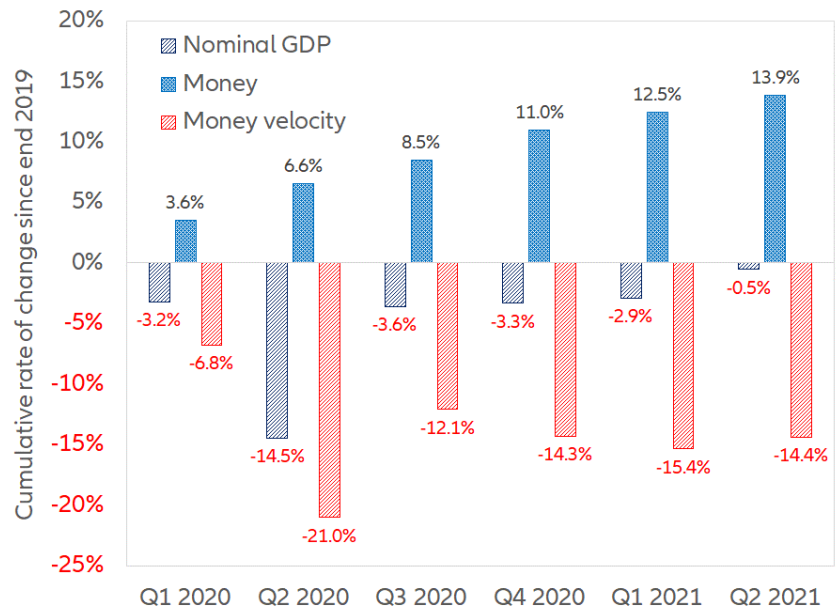
In our fractional reserve banking systems, “loans make deposits”; money creation depends on the banks’ willingness and ability to lend as well as on their clients’ willingness and ability to borrow. Since the outbreak of the Covid crisis, the bulk of the increase in central banks’ and commercial banks’ assets has stemmed from an increase in their claims (loans proper and bond purchases) on governments. Put differently, combining easy monetary policy with fiscal expansion has been and still remains the recipe that has enabled money supplies to grow. Confident, if not exuberant, expectations have not done it, yet.

Figure 3 – Cumulative rates of variation in nominal GDP, the money supply and money velocity in the USA since end 2019



Sources: Refinitiv, Allianz Research

Figure 4 – Cumulative rates of variation in nominal GDP, the money supply and money velocity in the EMU since end 2019



Sources: Refinitiv, Allianz Research

A fall in money velocity is to hoarding what fever is to a disease: it is a symptom that indicates a problem, but it does not explain it, nor does it quantify it. This being said, money velocity does not fluctuate randomly.

Economists are not short of plausible explanations of its long-term downward trend. With long-term interest rates being as low as they are, the opportunity cost of holding money balances is in turn low. More generally, the prices of all kinds of financial assets being as elevated as they are, people may rather hold cash than risky assets. An increasing concentration of income and wealth in a few hands could increase the velocity of money in asset markets, but not necessarily in the markets for goods and services.

The link between inflation expectations and money velocity is a typical chicken and egg problem that may involve positive feedback loops. Like short-term inflation expectations, long-term inflation expectations tend to be backward-looking. But on top of that, despite the recent acceleration of inflation, they are still low and rather inelastic. Alongside a rising sentiment of economic insecurity, subdued long-term inflation expectations may incite people to cling to their money balances. A thorough discussion of the long-term decline of money velocity is beyond the scope of this investigation, the subject matter of which is the cyclical fluctuations of money velocity around its long-term trend.

In the shorter term, money velocity increases when people hold more money balances than they desire and strive to get rid of excess liquidity. A policy that would aim at pushing up the velocity of money, a policy for that matter still unconventional, should therefore ensure that the supply of money exceeds its demand. This may require some continued coordination between monetary policy and fiscal policy.

Failing such a nudge, the unleashing of the money set aside (hoarded) in 2020 is unlikely to happen and we will be waiting for Godot. The recent discrepancies between the money supply and the demand for money are too small to generate significant fluctuations of the velocity of money and, by the same token, of nominal growth.

### ***Searching for an estimate of the demand for money***

When the demand for money exceeds its supply, people strive to close such a liquidity gap by hoarding more money balances: this is what they did in response to the Covid-19 crisis. Conversely, when the supply of money exceeds its demand, people strive to get rid of such excess liquidity by dishoarding money balances: this is what they have not done yet. That being said, estimating the demand for money remains an unsettled issue in economics.

It seems rather intuitive to assume that the (real) demand for money (the sum of transactions balances and precautionary balances) should increase with the size of (real) transactions, the cost of trading money and financial assets for each other, and with risk aversion, while it should decrease with (current or expected real) interest rates. Plausible assumptions are not in short supply, but the models built upon them yield results that are not compatible with observed data. In particular, interest rates do not impact the demand for money as much as generally assumed.

The demand for money function that underpins the present investigation, the function proposed by Nobel laureate Maurice Allais, does not stray from such assumptions, but it tweaks them. It assumes the nominal demand for money  $M_D$  to be commensurate with nominal spending  $D$ , up to a time-varying (or context-dependent) nominal spending multiplier  $\Psi(Z)$ , the role of which is to account for people's confidence in the future.

Past experience, that is, the present value  $Z_n$  of the sequence of past rates of growth in nominal spending  $(x_n, x_{n-1}, x_{n-2}, \dots)$  is assumed to shape confidence like this: when nominal spending has been consistently increasing, confidence increases, and vice versa. Recent observations are given more weight than the more distant ones (exponential weighting), but the weight given to the most recent observations increases when nominal growth consistently accelerates (exponential weighting at a time-varying, context-dependent rate of decay).

The nominal spending multiplier is assumed to be a decreasing bounded non-linear (i.e. logistic) function of the present value of past rates of nominal growth

$$\Psi(Z) = \frac{2}{1 + e^Z}$$

In other words, the lower people's confidence in the future, the higher the ratio of the demand for money to nominal spending, the higher the need for precautionary balances.

$$M_D = \phi_0 \Psi(Z) D$$

The constant  $\phi_0$  is the ratio of  $M_D$  to  $D$  when  $\Psi(Z) = 1$ , that is, when  $Z = 0$ , a situation in which confidence is neutral.

What can we see when we look at the last six quarters through the lens of Allais' framework? We can see a long-lasting shock to people's confidence, a jump in the nominal spending multiplier  $\Psi(Z)$ , and a substantial increase in the demand for money  $M_D$ . Now equipped with an estimate of the demand for money, we can estimate hoarding. We know indeed that the variation of precautionary balances  $\Delta M_H$  during a given period equals the variation of total balances  $\Delta M$  minus the variation of transactions balances  $\Delta M_T$ .

$$\Delta M_H = \Delta M - \Delta M_T$$

We also know that the variation of transactions balances during a given period equals the difference between the money supply  $M$  and the demand for money  $M_D$  at the beginning of the period.

$$\Delta M_T = M - M_D$$

Hence, the variation of precautionary balances during a given period (i.e. marginal hoarding) equals the variation of total balances during the period minus the difference, at the beginning of the period, between total balances and the demand for money.

$$M_H(n) - M_H(n-1) = M(n) - M(n-1) - [M(n-1) - M_D(n-1)]$$

**Since Q1 2020, marginal hoarding has been larger than the increase in aggregate money**

Figures 5 and 6 show the conclusions to which Allais’s demand for money function leads. Since Q1 2020, even though the money supply has increased a lot, in the EMU as well as in the US, hoarding has outpaced its expansion by about 20%. Dishoarding has not followed the jump in hoarding observed in Q1 2020. In fact, hoarding has remained the order of the day, but at a slower rate.

Figure 5 – Cumulative increase in the money supply and hoarding in the EMU since Q1 2020

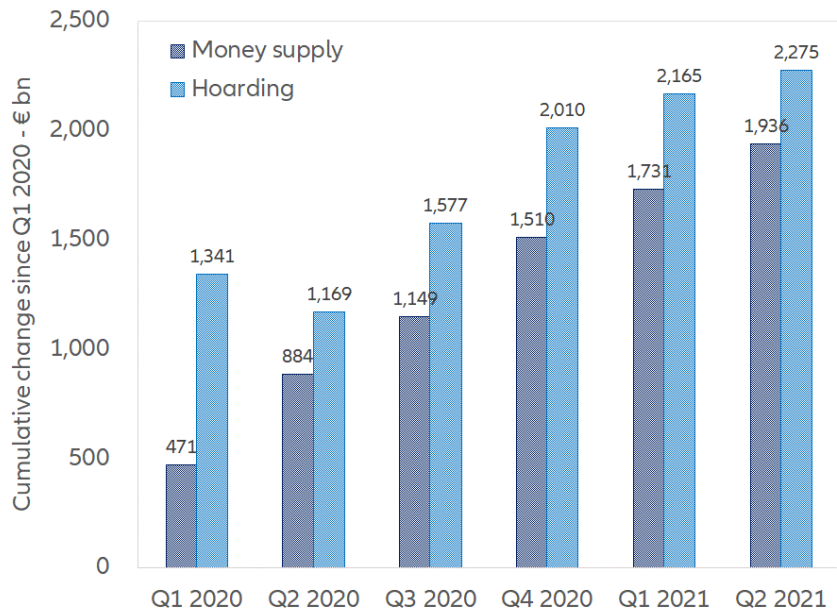
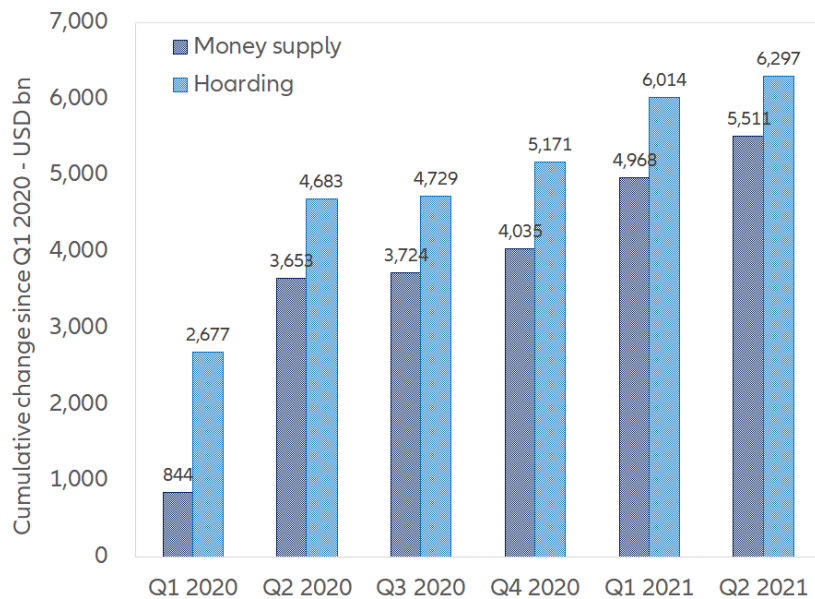


Figure 6 – Cumulative increase in the money supply and hoarding in the US since Q1 2020



Sources (for figures 5 and 6): Refinitiv, Allianz Research



### *Nothing is more different from saving than hoarding*

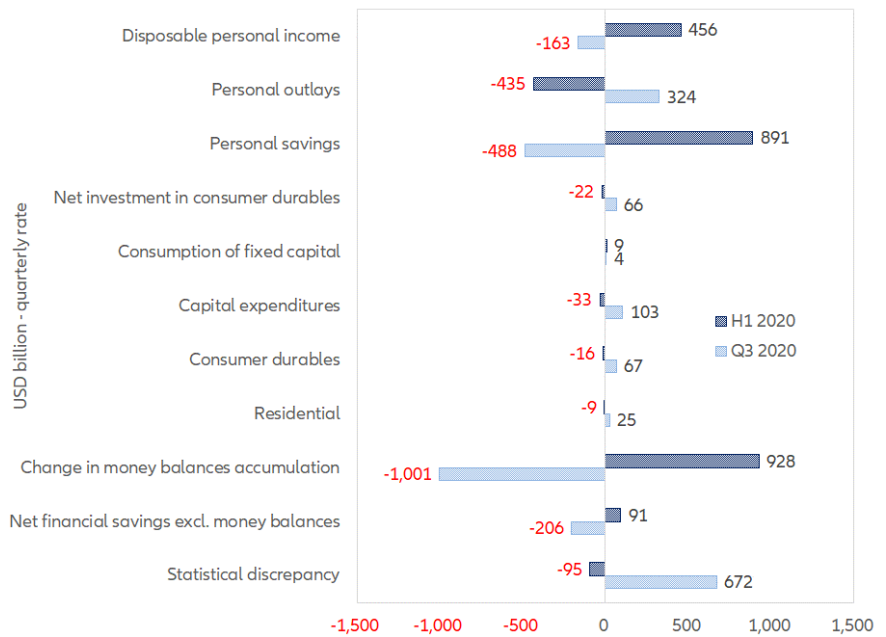
As shown in Appendix B, households (as well as businesses) spend part of the difference between income and consumption, their so-called “saving”, on investment goods and net purchases of securities. In other words, saving does not imply a general lack of spending; it implies that some of the income is spent on goods other than consumption goods, either directly on investment goods, or indirectly, when securities transactions transfer purchasing power from buyers to sellers.

Saving proper transfers purchasing power by transferring means of payment from savers to sellers of investment goods and securities. It requires some confidence in the future, even when it is allocated to sovereign government bonds. It also requires some coordination through capital markets between the people who save and those who invest, even if saving proper and investment are often the two sides of a single decision made by a single decision-maker (e.g. someone buying a house with some equity or paying back a loan, or a business financing investment with internal funds). Hoarding sterilizes purchasing power. It reflects a fear of the future. It does not require any coordination between people to be put into effect. Hoarding makes a dent in both consumption expenditures and savings expenditures. Consumption expenditures and savings expenditures are not a zero-sum game.

Of the fact that spending and saving do not boil down to a zero-sum game, the behavior of U.S households in the first half of 2020 provides a case in point. As shown in Figure 7, consumption expenditures (personal outlays) and saving expenditures (net investment in consumer durable goods and residential investment) both declined when the Covid-19 crisis broke out. In aggregate, they fell by USD 505 bn, a number much larger than the increase (USD 91 bn) in the flow of net financial saving excluding money balances. In contrast, the flow captured by money balances increased by USD 928 bn, a number almost equal to “saving” (USD 891 bn) as defined by Keynes and national accountants (i.e. disposable income minus consumption expenditures).

And in Q3 2020, as shown again in Figure 7, consumption outlays, net investment in consumer goods and residential investment all increased at once. Households kept on accumulating cash balances but at a slower rate than in H1 2020 (USD 266 bn against USD 1,267 bn) as a result of which money balances accumulation (the second difference of money balances) changed from USD 928 bn to minus USD 1000 bn. The flow of net financial saving excluding money balances also contracted, but much less than the increase in consumption and capital expenditures. Such a choreography between consumption and saving expenditures on one side, and money balances on the other side, is too adjusted to be accidental.

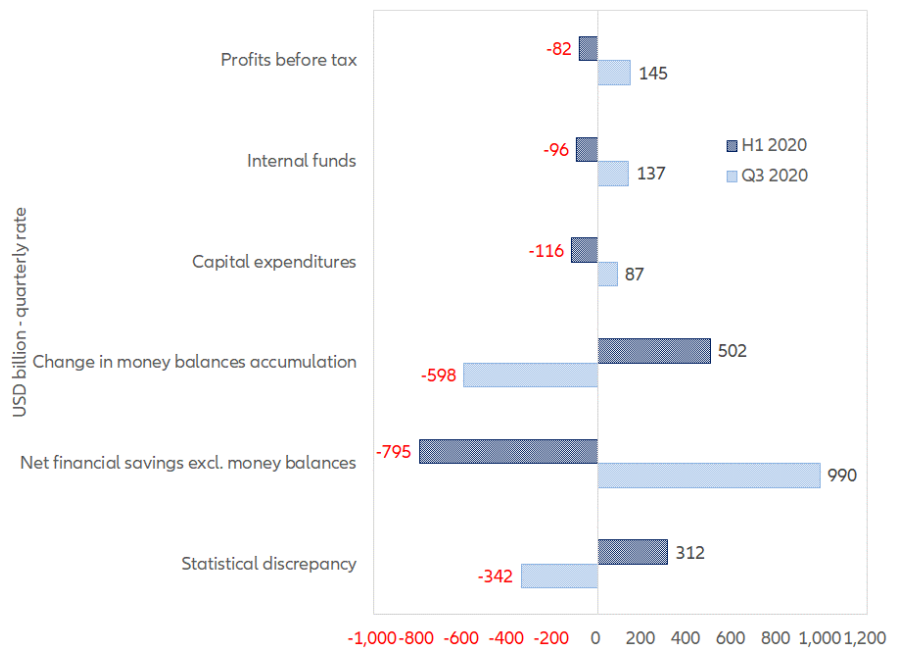
Figure 7: Financial accounts of U.S households



Sources: Refinitiv, Allianz Research

As shown in Figure 8, the non-financial corporate business sector also exhibits exactly the same pattern as the households sector. In H1 2020, non-financial corporate businesses raised their cash balances by USD 502 bn, while – faced with declining savings – they were cutting capital expenditures and net financial saving excluding money balances. In Q3 2020, the signs of all the variables shown in Figure 8 changed at once.

Figure 8: Financial accounts of the U.S non-financial corporate businesses



Sources: Refinitiv, Allianz Research

What does this mean for policymakers? Hoarding and saving proper are so antithetic that, Keynes notwithstanding, it can only be misleading to bundle them into one single notion and misname it “saving”, be it intended (ex ante) or realized (ex post) saving. Economists deem, for example, the high “saving” rates posted by Asian economies as a key driver of their outstanding long-term performance. If so, why should elevated “saving” now be detrimental to growth in the Western part of the world? If excess “saving” puts a lid on US growth, why should a “saving” shortage explain at the same time the deficit on the US current account balance? To which extent is the “saving” glut a hoarding glut? Absent the distinction between saving and hoarding, it is impossible to reconcile such seemingly contradictory statements and to answer such questions.

Hoarding and saving being different in both their essence and their impact on nominal spending, they call for different policies. On the one hand, we need policies that stimulate saving. On the other one, we need policies that impede hoarding. A detailed discussion of policy options is beyond the scope of this investigation. We can however list the general ideas that should inspire them: as prominent economists have already proposed some solutions, there is no need to reinvent the wheel.

To stimulate saving, one needs to reduce institutional as well as economic uncertainty. Ensuring that inflation does not inadvertently transfer wealth between lenders and borrowers deserves special attention. Generalizing the use of indexation in loans and bonds would be a move in the right direction. Index-linked bonds should have a significant weight in the portfolios of risk-averse unsophisticated savers.

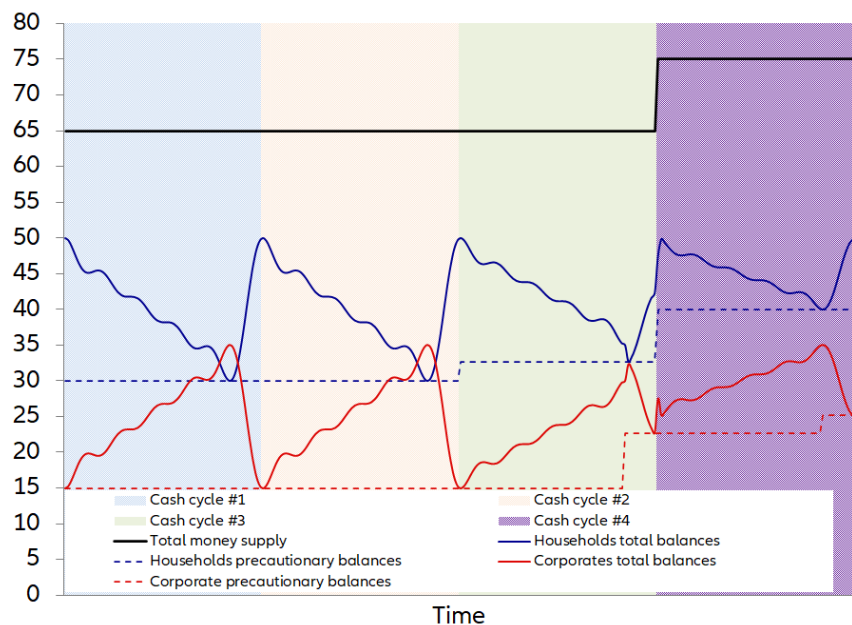
To impede hoarding, one needs to ensure that money balances depreciate a little, year in, year out. Neither inflation, nor negative interest rates should be used to that end. It rather is a matter for taxation.

**Appendix A - How to directly measure precautionary balances (if we wanted to and IT permitting)**

Neither transactions balances, nor precautionary balances are tagged as such. The standard taxonomy of money aggregates (*M1*, *M2*, etc...) does not really go to the heart of the matter. For examples, sight deposits are part of *M1*, because they are supposed to circulate, while term deposits are part of *M2* because they are not supposed to do so. But the turnover of sight deposits does vary through time.

The distinction between transactions balances and precautionary balances is so easy to grasp and insightful that it calls for measurement. We omit, however, to directly measure the two components of money balances. Thanks to contemporary IT resources, we could, yet, easily measure them, if we really wanted to do so. The numerical example presented in Figure A should suffice to make that point.

Figure A – Transactions balances, precautionary balances under a constant money supply assumption



Sources: Refinitiv, Allianz Research

To measure the stock of precautionary balances, we would just need to daily monitor balances on deposit accounts at banks. As shown by the blue line in Figure A, we would observe that the bank accounts of wage earners typically exhibit a (monthly) liquidity cycle. They reach a high-water mark when people receive their wages. Then, as people pay their bills, their money balances gradually decline to a low-water mark, the horizontal dotted blue line in Figure A. The low-water mark in a given liquidity cycle would measure the households' precautionary balances during that cycle (30 "whatever" in our example during the first two liquidity cycles). At any time during the cycle, the difference between the households total balances (the blue line) and their precautionary balances (the dotted blue line) would measure their transactions balances. In our example, during the first two liquidity cycles, the households' transactions balances would vary between 20 and 0, and average 10.

Symmetrically, since someone's outlays necessarily are proceeds to someone else, as the households deplete their bank accounts, the businesses replenish them dollar for dollar, as shown by the red line in Figure A. Symmetrically again, the balances on the bank accounts of businesses would also not fall below a certain low-water mark, the dotted red line in Figure A, which would measure the businesses' precautionary balances during the same liquidity cycle (15 in our example during the first two cycles). At any time during the cycle, the difference between the businesses total balances and their precautionary balances would measure their transactions balances. In our example, during the first two cycles, the businesses' transactions balances would vary between 0 and 20.

Add the households' precautionary balances (30) to the businesses' precautionary balances (15) to get the aggregate precautionary balances (45) during the first two cycles. Add the households transactions balances to the businesses transactions balances to get the aggregate transactions balances: in our example, 20 at any time during the first two cycles. Add the aggregate transactions balances (20) to the aggregate precautionary balances (45) during the first two cycles to get aggregate money balances (65), the horizontal black line in Figure A.

Note that, by definition, aggregate precautionary balances have not circulated during the first two cycles; they have not been saved either; they were already there, but they were like dead or inexistent; they have not contributed at all to the aggregate transactions (20) carried out during each of the first two cycles. The households have received 20 (in wages, and dividends, and interest) and paid out 20 (in consumption goods, and investment goods, and investment in corporate equities and bonds). Likewise, businesses have received 20 (in sales of goods, and sale of corporate equities and bonds) and paid out 20 (in wages, and dividends, and interest). Put differently, as transactions balances have changed hands twice during each liquidity cycle, their velocity – the ratio of nominal transactions-to-transactions balances (40/20) has equaled 2. And the velocity of aggregate balances (40/65) has equaled 0.62, the weighted average of 2 for transactions balances and 0 for precautionary balances  $([2 \times 20 + 0 \times 45] / 65)$ .

The excess saving argument has it that the increase in aggregate money balances measures the quantity of money that people have set aside. Such an argument implies that, absent an increase in the money supply, people cannot set fresh money aside. The numerical example presented in Figure A proves this idea to be wrong. Even when the money supply is constant, people can decide to alter the allocation of their money balances between transactions balances and precautionary balances.

Assume, for example, that – for whatever reason making households less confident – they decide, at the beginning of cycle #3, that their precautionary balances should no longer be as low as 30 but should rise to 32.70. As we assume the money supply to be constant, the decision to hoard precautionary balances to the tune of 2.7 decreases transactions balances by the same amount. It also decreases households spending by 2.7 to 17.3, be it consumption outlays, or savings outlays (residential investment, purchases of equities and bonds). By symmetry, it decreases businesses proceeds by 2.7, be it through current operations or financial transactions. The ratio of transactions-to-transactions balances (34.6/17.3)

still equals 2. Last but not the least, the velocity of aggregate money balances ( $34.6/65$ ) falls from 0.62 to 0.53, the weighted average of 2 for transactions balances and 0 for precautionary balances ( $[2 \times 17.3 + 0 \times 47.7]/65$ ).

In the example shown in Figure A, during liquidity cycles #1 and 2, the average money balance held by households is 40, 30 of which consisting of precautionary balances and 10 of transactions balances. And the average money balance held by businesses during cycles #1 and #2 is 25, 15 of which consisting of precautionary balances and 10 of transactions balances. But at the beginning of cycle #3, households now desire to hold on average higher money balances: 32.7 instead of 30, which leads them to add on average 2.7 to their hoarding during cycle #3. As households have not bothered to give businesses the heads up that they were about to hoard money balances, businesses own less balances at the end of cycle #3 than they desired at its beginning. This is why they plan to cut their spending in cycle #4.

Simple as it may be, this example shows that, absent an estimate of the money balances that households desire to hold (32.7), that is, absent an estimate of their demand for money, it is impossible to quantify hoarding (30-32.7 in our example) or dishoarding.

## Appendix B – How relevant is a two-sector model?

The two-sector economy in our example is of course a simplification of the real world. We have, for example, assumed that households do not borrow any funds from the banks. The government as well as the rest of the world are absent. It would, however, be easy to complete our two-sector economy with any of such missing parts without altering any of the propositions made in this investigation. For example, we could include the government in the business sector, considering that it is selling services (defense, justice, solidarity ...) against taxes.

The sources of funds for households consist of wages, interests and dividends. Their applications of funds consist of consumption expenditures, investment expenditures (e.g residential real estate), net purchases of bonds and equities, and the variation of their money balances. In accordance with double-entry bookkeeping, applications of funds equal sources of funds.

***Wages + Interests + Dividends = Consumption expenditures  
+ Investment expenditures + Net purchases of bonds and equities  
+ Variation of money balances.***

As for businesses, the sources and applications of funds read

***Sales (of consumer goods, intermediate goods and investment goods) +  
Net sales of bonds and equities + New bank loans = Wages + Interests +  
Dividends + Purchases of intermediate goods + Purchases of investment  
goods + Variation of money balances***

We have assumed that households and businesses settle upon their spending plans at a moment close to the zenith of their respective liquidity cycle. The two liquidity cycles being symmetric, they do not reach their peak at the same moment: households and businesses do not (or even cannot) settle upon their spending plans at the same moment.

Of the possible applications of funds, the variation of money balances is the most likely to be misinterpreted. It is a residual after consumption expenditures and saving expenditures. It is therefore not part of saving proper. But it does not account for marginal hoarding either. The money balances held by households consist indeed of transactions balances and precautionary balances. An increase in their money balances is as likely to correspond to an increase of their transactions balances as to an increase of their precautionary balances. Most of the time, it consists of a combination of both.

The example shown in Figure A shows that the size of the households' transactions balances, and by the same token, the size of their total balances, both vary through the cycle. In the real world, total balances are the only thing we do observe. Their variation between two moments depends on the position of these moments in the liquidity cycle. If we compare the low point in the liquidity cycle to the high point that precedes it, we might be tempted to conclude that households have dishoarded money balances. But, hasty as it is, such a conclusion would be wrong. And it would be as wrong to conclude that, at the same time, businesses have hoarded money balances.

In other words, the level of money balances at a given moment is not telling us anything about what use people have made of them before that moment.

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