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UNITED STATES: WILL THE FED'S QT2 BALANCE SHEET REDUCTION PROGRAMME LAST THE COURSE?

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In June 2022, the US Federal Reserve kick-started a programme to reduce the size of its balance sheet (QT2). However, banking regulations could hinder its ambitions. The first quantitative tightening (QT1) programme, which was launched by the Fed in October 2017, had already been curtailed early due to the liquidity requirements imposed on banks. Balance sheet constraints could in turn bring QT2 to an early end. The tightened leverage standard is already reducing the ability of banks to act as intermediaries in the secondary markets for US Treasury securities while federal government financing needs continue to grow.

US: WILL THE FED'S QT2 BALANCE SHEET REDUCTION PROGRAMME LAST THE COURSE?

In June 2022, the US Federal Reserve kick-started a programme to reduce the size of its balance sheet (QT2). However, banking regulations could hinder its ambitions. The first quantitative tightening (QT1) programme, which was launched by the Fed in October 2017, had already been curtailed early due to the liquidity requirements imposed on banks. Balance sheet constraints could in turn bring QT2 to an early end. The tightened leverage standard is already reducing the ability of banks to act as intermediaries in the secondary markets for US Treasury securities while federal government financing needs continue to grow.

Record inflation levels during 2022 convinced the US Federal Open Market Committee (FOMC) that it needed to tighten its monetary policy. From March to December 2022, the FOMC raised the federal funds target range by 425 basis points (bps). This is the most aggressive monetary tightening seen in the United States since the 1980s. In addition, since 1 June 2022, the Federal Reserve (Fed) has been reducing the size of its balance sheet by limiting the reinvestment of debt repayments in its securities portfolio, a process called "quantitative tightening" (QT) in contrast to securities purchases called "quantitative easing" (QE).

The Fed had already attempted a quantitative tightening programme from October 2017 to August 2019 (QT1). However, the arrangements for this second round (QT2) differ in a number of ways. First of all, it is happening earlier. QT1 only began three years after QE3 ended and two years after the initial rate hikes, while QT2 was launched only less than three months after QE4 was curtailed and monetary tightening began.

This second round of quantitative tightening is therefore more ambitious, just like the QE preceding it. At the beginning of QT1, in October 2017, the reduction in the Fed's balance sheet was limited to USD 10 billion per month, with this ceiling gradually raised every three months to USD 50 billion in October 2018. During the first three months of QT2, the programme limited the reduction in the Fed's balance sheet to USD 47.5 billion. Since the start of September, this ceiling has been raised to 95 billion[1].

This increase reflects the exceptionally high value of the Fed's securities portfolio. As a result of the severe shock caused by the COVID-19 pandemic, on 23 March 2020, the Fed committed to purchase as many securities as needed in order to stabilise financial conditions, while the US Treasury issued record amounts of securities in order to finance its economic support plans. This resulted in an unprecedented increase in the size of the Fed's balance[2] sheet (Chart 1) and in banks' reserves with the central bank (Chart 2). While the Fed's total assets stood at 23% of GDP in the lead-up to QT1, they were 37% of GDP in the lead-up to QT2. According to debt-repayment projections for the coming months (Logan, 2022), the Fed's balance sheet reduction could stand at USD 398 billion in 2022[3] and then hit 1.03 trillion in 2023, all other things being equal[4]. Three to four years of quantitative tightening are thought to be needed in order to bring the value of the Fed's securities portfolio back down to 20% of GDP (Ennis and Kirk, 2022; FRBNY, 2022)[5].

This new round of QT is also occurring against a weaker economic and financial backdrop, with major uncertainties. During 2022, monetary institutes raised their key interest rates with a degree of synchronicity not seen over the past fifty years. Even though this widespread monetary tightening is needed, it is fuelling fears of a global recession and is threatening financial stability. The decline during recent months of liquidity in the Treasuries market (Adalsaro, Hördahl, Zhu, 2022; Fleming and Nelson, 2022; Liang, 2022), from which the Fed is gradually withdrawing, is attracting particular attention.

THE US FEDERAL RESERVE'S BALANCE SHEET

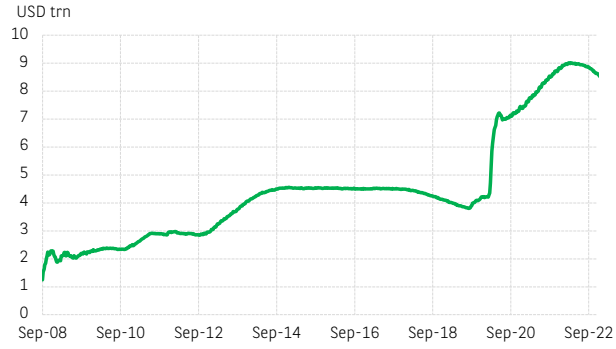

CHART 1 SOURCE: FEDERAL RESERVE (H.4.1), BNP PARIBAS

RESERVE BALANCES OF DEPOSITORY INSTITUTIONS WITH THE FED

CHART 2 SOURCE: FEDERAL RESERVE (H.4.1), BNP PARIBAS

1 The Fed plans to reduce its US Treasury debt security holdings by USD 60 billion per month and is also expected to reduce its holdings in debt securities and mortgage-backed securities (MBSs) issued by the federal guarantee agencies Fannie Mae and Freddie Mac by USD 35 billion per month. If the amount of maturing T-bonds is less than this ceiling, the Fed could make up the difference by not renewing its T-bills portfolio. Net sales of agency MBSs could also be considered.

2 The value of the Fed's Treasuries portfolio has grown 2.7 times, while the value of the Agency securities portfolio has increased 1.8 times.

3 USD 315 billion worth of Treasuries and USD 84 billion worth of MBSs

4 USD 650 billion worth of Treasuries and USD 380 billion worth of MBSs

5 In theory, the Fed's withdrawal as a marginal investor will place upward pressure on long-term yields. At the start of June, Crawley, Gagnon, Hebden and Trevino (2022) predicted that the effect of reducing the Fed's balance sheet by USD 2.5 trillion over the coming years on term premiums would be roughly equivalent to the effect of a "long-term" increase in the target-rate range for federal funds by 50 basis points. The study's authors emphasise that this outcome is dependent on how quickly the Fed's balance sheet is reduced and on the US Treasury's refinancing strategy (dependent, implicitly, on how much duration risk is transferred to the market). However, their analysis overlooks the potential strengthening or mitigating effects that could be triggered by the two forms of tightening (monetary and quantitative) when combined, favours a scenario of reducing banks' reserves and ignores the scenario of reducing other liabilities on the Fed's balance sheet (in particular, money market fund repurchase agreements) and, finally, assumes that newly issued securities will be smoothly absorbed by investors.

Finally, this second round of quantitative tightening is beginning while the capacity of investors (other than the Fed) to absorb Treasuries seems low compared to the size of the federal debt to be financed[6]. The Congressional Budget Office, which is responsible for projecting the federal budget, estimated that the public debt burden, net of the Fed's holdings, could increase by 10 bps in just three years, rising to 86% of GDP by 2025 (compared to 75% in 2022 and 64% in 2017, in the run-up to QT1). However, buyers may not be forthcoming, while the balance sheet constraints imposed on banks are testing the Treasury markets' intermediation conditions.

Here, we are analysing the impact of QT2 on the Fed's and US banks' balance sheets[7]. Just like with the previous round of quantitative tightening, the reduction in the Fed's securities portfolio will also automatically destroy some of the liquidity created during the last quantitative easing (QE4) programme. In the long term, the extent of the effects on bank balance sheets will depend in particular on whom the ultimate holders of the newly issued securities are and on the type of resources used to finance these purchases.

However, the micro-prudential framework introduced in the wake of the 2008 great financial crisis, known as "Basel 3", could hinder the Fed's ambitions. The first risk is that liquidity could dry up on the money markets. The reduction in the Fed's balance sheet results in depository institutions' reserves with the central bank being destroyed. However, a potential shortage in central bank money as regards the liquidity requirements imposed on banks would make them less able to lend to money markets, a development that forced the Fed to curtail QT1 prematurely in 2019. The second risk is that liquidity could dry up on the Treasuries markets. For a number of reasons, the demand for Treasuries is shrinking, while the federal government's financing needs continue to grow. However, the tightened leverage constraint is reducing banks' abilities to absorb the excess securities issued and to facilitate the circulation of collateral on secondary markets. Due to their balance sheet constraints, banks could find it more challenging to fulfil their responsibility of ensuring that Treasuries markets operate smoothly. A number of measures have been put in place, or are being considered, by the monetary authorities (repurchase agreements) and the regulatory authorities (reducing the leverage constraint and broadening the scope of centralised clearing on Treasuries markets) in order to mitigate these risks.

"SMOOTH" QUANTITATIVE TIGHTENING

To begin, we will set out the theoretical effects of quantitative tightening on central bank and commercial bank balance sheets. In this case, other investors will take the Fed's place in order to absorb the securities issued by the US Treasury. The process will not be derailed by liquidity pressure on the money markets or the Treasuries markets. We refer to this as "smooth" QT.

According to the typology of net "buyers" and net "sellers"[8] of Treasuries during the previous round of quantitative tightening (Charts 3 to 8), three types of agents could purchase the newly issued securities: commercial banks, some resident non-bank agents (households[9], hedge funds, pension funds, investment funds and money market funds) and non-residents. Investors' interest in Treasuries will depend in particular on the relative yields offered (net of currency hedging fees for non-residents), the maturity of the securities issued (money market funds, for example, invest more heavily in short-term securities, while non-resident investors prefer long-term securities) or the potential need for high-quality liquid collateral.

In order to make our report easier to understand, we will discuss the effects of QT using simplified balance sheets. Irrespective of whom the investors are, QT has the same initial effects on balance sheets.

At the start of the day, the US Treasury issues debt securities (stage 1 in Figure 1). Subscription for the newly issued securities[10] by primary dealers results in a reduction in their holdings with Bank of New York Mellon (BONY, which acts as clearing bank with primary dealers). When settling purchases made by primary dealers, the BONY transfers cash from its account with the Fed to the US Treasury General Account (TGA). At the end of this first stage, banks' reserves with the Fed (in particular, BONY's reserves) have decreased, while Treasury's holdings with the Fed and debt have increased.

As a second step, the US Treasury then draws on its holdings in order to repay the Fed for the maturing securities[11] (stage 2 of Figure 1). Here, we are assuming that the worth of the earlier issue is equal to the worth of the debt repayment (meaning that the US Treasury debt remains unchanged). We are also assuming that the Fed is not reinvesting this debt repayment (the reduction in the size of the Fed's balance sheet is therefore the same as the debt repayment amount). At the end of this second stage, the value of the Fed's Treasuries portfolio has fallen.

During the third stage, primary dealers place the securities newly issued by the US Treasury with an investor, a bank or one of its customers (stage 3 of Figure 1). The placing of securities generates a cash transfer from the purchasing bank's current account with the Fed to the BONY account. The BONY reserves with the Fed, as well as primary dealers' holdings with BONY, are reconstituted.

As we will see later, depending on the type of resources used by the end owner to purchase the newly issued securities, the reduction in the Fed's balance sheet will ultimately be recorded on the liability side of the Fed's balance sheet either through the destruction of bank reserves, or by a fall in outstanding amounts from the Fed's reverse repurchase agreements[12], or by a combination of the two (Chart 9).

6 During QT1, money market funds had played a crucial role. As a matter of fact, the 2016 money market funds reform led to a large-scale transfer of resources from prime funds to government funds, which had largely invested their holdings in Treasuries, therefore helping, in a very timely manner, to finance the increased public deficit (and the withdrawal of the Fed).

7 We are focusing our analysis on the impact of the FOMC decision to cease reinvestments of maturing Treasury securities . The effects of reducing the Fed's MBS portfolio are discussed in Choulet (2018).

8 As the US government deficit has continued to grow, the Fed has been able to purchase Treasuries without other agents having to reduce their holdings by an equivalent amount during the QE phases.

9 In the Fed's financial accounts, the household sector includes not only individuals and non-profit institutions serving households, but also resident hedge funds and private equity funds.

10 Primary dealers are the US Treasury's preferred counterparties for all its operations on the markets. Their tasks include participating in the US Treasury auctions, placing securities and ensuring the liquidity on the secondary markets (cash and repo markets) for Treasury securities. They do not have any accounts with the Fed. They traditionally finance their "purchases" by drawing on their accounts with the BONY and rebuild their holdings by selling securities to investors. They finance the expansion of their inventories with secured borrowings from money market funds on the BONY's "tri-party" repo platform. There are 25 primary dealers, which are mainly subsidiaries of US or foreign systemic banks.

11 We ignore interest payments, which constitute revenue rather than principal.

12 A repurchase agreement, a type of temporary disposal of securities, can be considered, from an economic viewpoint, as a secured loan (cash against securities, less a discount on its value); from the standpoint of the lender of the cash, it is a reverse repurchase agreement; from the standpoint of the borrower, it is a repurchase agreement. The repurchase agreement for a security comes with a commitment to repurchase it in future at an agreed price. The interest rate, or repo rate, is equal to the difference between the sale price and the repurchase price. The Fed defines the transaction as a function of its effect on its counterparty. Therefore, from the Fed's point of view, a repo is similar to a secured loan and recorded as an asset, while a reverse repo is a secured borrowing and recorded as a liability.

NET CUMULATIVE PURCHASES (+) AND SALES (-) OF TREASURIES* FROM SEPTEMBER 2008 TO DECEMBER 2014 (QE1,QE2,QE3)

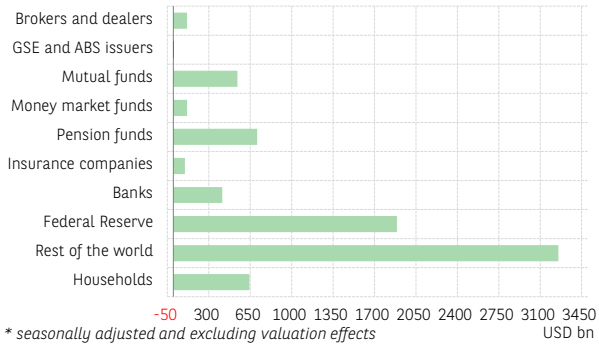

CHART 3 SOURCE: FEDERAL RESERVE (FOF), BNP PARIBAS

CHANGE IN US TREASURY HOLDINGS FROM SEPTEMBER 2008 TO DECEMBER 2014 (QE1,QE2,QE3)

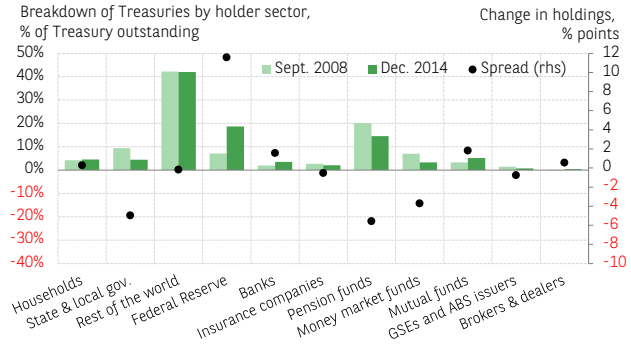

CHART 4 SOURCE: FEDERAL RESERVE (FOF), BNP PARIBAS

NET CUMULATIVE PURCHASES (+) AND SALES (-) OF TREASURIES* FROM SEPTEMBER 2017 TO SEPTEMBER 2019 (QT1)

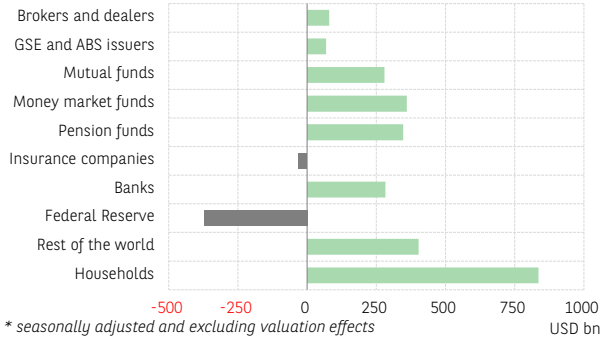

CHART 5 SOURCE: FEDERAL RESERVE (FOF), BNP PARIBAS

CHANGE IN US TREASURY HOLDINGS FROM SEPTEMBER 2017 TO SEPTEMBER 2019 (QT1)

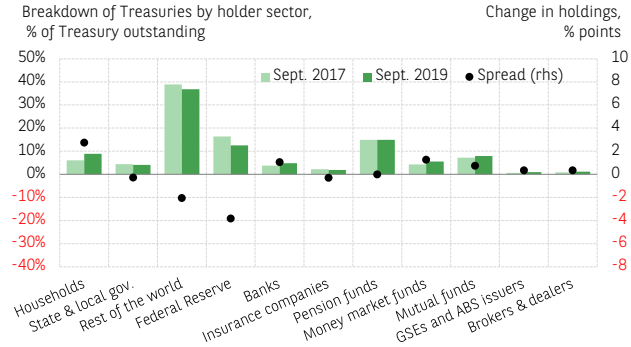

CHART 6 SOURCE: FEDERAL RESERVE (FOF), BNP PARIBAS

NET CUMULATIVE PURCHASES (+) AND SALES (-) OF TREASURIES* FROM SEPTEMBER 2019 TO MARCH 2022 (QE4)

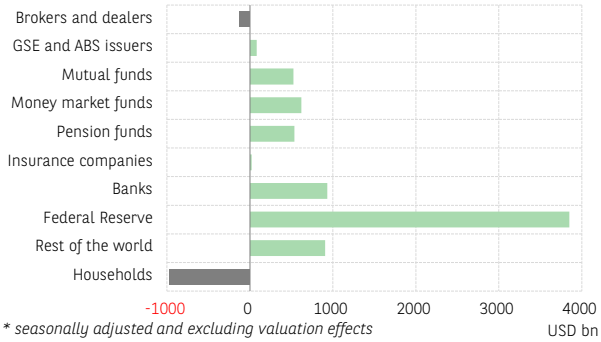

CHART 7 SOURCE: FEDERAL RESERVE (FOF), BNP PARIBAS

CHANGE IN US TREASURY HOLDINGS FROM SEPTEMBER 2019 TO MARCH 2022 (QE4)

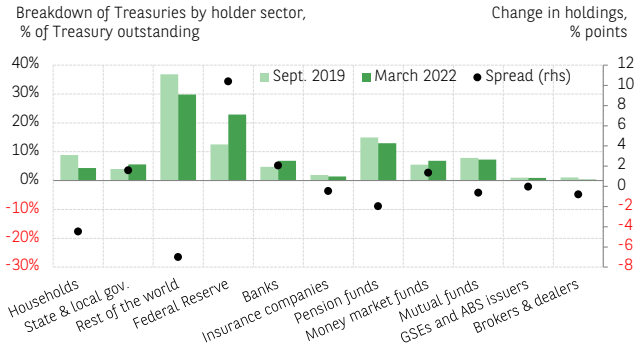

CHART 8 SOURCE: FEDERAL RESERVE (FOF), BNP PARIBAS

CHANGE ON THE LIABILITY SIDE OF THE FED'S BALANCE SHEET

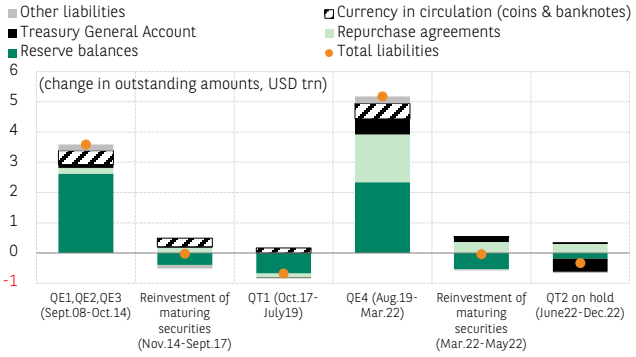

CHART 9 SOURCE: FEDERAL RESERVE (H.4.1), BNP PARIBAS

Subscription for securities by a bank

When a commercial bank subscribes for the US Treasury issue for itself, then a simple change to its holdings (securities against reserves) occurs, with no effect on the size of its balance sheet (stage 3 of Figure 1). The Fed's balance sheet shrinks through a simultaneous reduction in its securities portfolio (on the assets side) and in banks' reserves (on the liabilities side).

In practice, it seems unlikely that banks will expand their Treasuries portfolios further. The previous increase in their exposure and the uncertainty about the draining speed on reserves, viewed as the most liquid assets in a regulatory sense (cf. below), are the main obstacles. In addition, the unrealised losses recorded on banks' bond portfolios, following the rise in long-term interest rates, are decreasing CET1 common equity ratios and are disincentivising securities purchases (40% of US G-SIB Treasuries portfolios were recorded at their market value in the "Available for Sale" category during Q3 2022).

Subscription for securities by a resident non-bank agent

When a resident non-monetary investor (household, hedge fund, pension fund or investment fund) subscribes for a security issue by drawing on its deposits, the commercial bank also makes a transfer from its current account with the Fed to the BONY current account and debits the same amount from its customer's deposit account[13] (Figure 2). In this case, as a result of the debt repayment no longer being fully reinvested, reserves with the Fed are destroyed, the size of the commercial bank's balance sheet decreases and broad money is destroyed (decrease in customer deposits).[14]

Therefore, while the purchase of assets by a central bank from non-banking agents (QE) results in the "monetisation " of long-term debt securities, and therefore in the creation of broad money (customer deposits), QT leads to the "demonetisation" of securities[15] and the destruction of money when other non-banking agents take the central bank's place and purchase the newly issued securities. In this case in point, QT destroys some of the deposits created by QE (Choulet, 2021a; Box 1).

Subscription for securities by a money market fund

Depending on the resources available to it, a money market fund mainly shifts between holding T-bills and offering secured loans (reverse repurchase agreements) to other financial institutions, such as banks, broker-dealers, hedge funds or the Fed (under the Overnight Reverse Repo Facility, ON RRP)[16]. As we will see, since March 2021, the hierarchy of yields has led money market funds (MMFs) to increase their participation in Fed reverse repos significantly, moving away from T-bills and reverse repos with private counterparties.

Assuming that the yields offered by US Treasury securities are more than the interest from the ON RRP facility, MMFs may choose to reallocate some of the cash deposited with the Fed to the T-bills. In this scenario, the Fed would record a reduction in its repo borrowings (on its liabilities, Figure 3). In return, it would credit the current account of the intermediary bank (custodian bank), which in turn would credit the money market fund's deposit account[17]. The assets of the bank (reserves) and the money market fund (deposits) would temporarily increase. The subscription of the securities by the money market fund would result in a decrease in the fund's deposits and a transfer from the intermediary bank's account to the BONY account with the Fed. The size and composition of the intermediary bank's balance sheet would ultimately remain unchanged. In this case, the reduction in the Fed's balance sheet would solely be due to a reduction in its repo borrowings from money market funds.

Subscription for securities by non-resident investors

Non-resident investors in US Treasury securities mainly include central banks and financial institutions, such as hedge funds, insurance companies, pension funds and investment funds. With given resources, non-resident agents may, in the same way as resident agents, increase their exposure to Treasuries by drawing on their deposits, by withdrawing from other investments or, for foreign central banks specifically, by reducing their cash "deposits" with the Fed (under the FIMA Reverse Repo Pool, FRRP). The effects would be identical to the effects set out in Figure 2, in the first two cases, and to the effects set out in Figure 3, in the third case.

13 The effects of the purchase of securities newly issued by hedge funds, that finance these purchases through secured borrowings with dealers or money market funds, are analysed below.

14 The effects are the same if the investor chooses to shift away from another investment to Treasuries. If an agent sells corporate equities in order to invest in Treasuries of a completely equivalent value, its own deposit account remains unchanged. However, with given resources, this arbitrage assumes that another agent purchases the corporate equities being sold by drawing on its deposits. On the scale of the economy as a whole, stocks of deposits and reserves with the central bank fall as in Figure 2.

15 No longer fully reinvesting maturing debt in a central bank's securities portfolio (QT) is similar to a net sale of securities in accounting terms.

16 As part of its ON RRP programme, the Fed places the US Treasury securities that it holds on its balance sheet under repurchase agreements with counterparties (banks, primary dealers, Government Sponsored Enterprises and money market funds) and is committed to repurchasing the securities when the agreement expires. Through this facility, banks or non-banks provide a secured "loan" (cash against Treasuries) to the Fed. Another way to view this transaction is viewing a financial institution as making a "deposit" with the Fed in exchange for the transfer of ownership of the securities being used as collateral for a specified period. This type of transaction transits through bank balance sheets, in such a way that it reduces the reserves held by banks with the Fed. The Fed records the reverse repo in its liabilities as a debt and debits the intermediary bank's current account (reserves with the central bank) for the same amount. Under this programme, each eligible counterparty can, on its own initiative, "lend" up to USD 160 billion in cash to the Fed on a daily basis. These "deposits" have borne interest at a rate of 4.3% since 15 December. The Fed performs most of its reverse repo transactions (via banks) with money market funds, which are the only institutions with an incentive to take advantage of them. While the interest rate for these transactions remains below the IORB reserve rate, banks have little incentive to take advantage of them. The facility may of course be of interest to banks looking for very high-quality collateral for financing or for meeting initial margin requirements. However, at a prudential level, reserves and Treasuries (as well as Treasury-secured repos) are most favourably treated. In addition, even though the RRP interest rate is similar to an IORB for non-banks, the participation of GSEs (in particular, Federal Home Loan Banks, FHLBs) is limited for regulatory reasons. Therefore, the programme mainly involves (almost 90%) money market funds (access to a high-quality counterparty and collateral, and easier compliance with SEC requirements).

17 In practice, when a money market fund reduces the amount of cash that it "deposits" with the Fed, the Fed debits a smaller amount from the commercial bank's current account, which debits a smaller amount from the money market fund's deposit account, as repo transactions are renewed daily.

IMPACT ON BALANCE SHEETS OF NOT REINVESTING TREASURIES: A COMMERCIAL BANK UNDERWRITES THE NEW US TREASURY ISSUE ON ITS OWN ACCOUNT

Stage 1: The US Treasury issues 100 units of debt securities

Stage 2: 100 units of Treasury debt securities held by the Fed mature

Stage 3: the primary dealer places the securities issued with a commercial bank

Central Bank

Assets		Liabilities	
Securities	-100	Reserves	-100
			-100
			+100
		TGA	+100
			-100
		ON RRP	
		FRRP	

Balance sheet size: -100 (Reserves -100)

BONY

Assets		Liabilities	
Reserves	-100	Deposits	- 100
	+100		+100

Balance sheet size unchanged

US Treasury

Assets		Liabilities	
TGA	+100	Debt	+100
	-100		-100

Balance sheet size unchanged

Primary dealers

Assets		Liabilities	
Deposits	-100	Repo	
	+100	Other liabilities	
Securities	+100		
	-100		
Other assets			

Balance sheet size unchanged

Commercial bank

Assets		Liabilities	
Reserves	- 100	Deposits	
Securities	+100	Other liabilities	
Loans			

Balance sheet size unchanged

Foreign central bank

Assets	Liabilities
Securities	Reserves
FRRP	Other liabilities
Deposits	
Other assets	

Money market fund

Assets	Liabilities
Deposits	Fund shares
ON RRP	
Securities	

Customer

Assets	Liabilities
Deposits	Loans
Securities	Repo
Fund shares	
Other assets	

FIGURE 1

IMPACT ON BALANCE SHEETS OF NOT REINVESTING TREASURIES
A NON-BANKING INVESTOR SUBSCRIBES FOR THE NEW US TREASURY ISSUE BY DRAWING ON ITS DEPOSITS

Stage 1: The US Treasury issues 100 units of debt securities
Stage 2: 100 units of Treasury debt securities held by the Fed mature
Stage 3: the primary dealer places the securities issued with a household

Central Bank

Assets		Liabilities	
Securities	-100	Reserves	-100
			+100
			-100
		TGA	+100
			- 100
		ON RRP	
		FRRP	

Balance sheet size: -100 (Reserves -100)

BONY

Assets		Liabilities	
Reserves	-100	Deposits	- 100
	+100		+100

Balance sheet size unchanged

US Treasury

Assets		Liabilities	
TGA	+100	Debt	+100
	-100		-100

Balance sheet size unchanged

Primary dealers

Assets		Liabilities
Deposits	-100	Repo
	+100	Other liabilities
Securities	+100	
	-100	
Other assets		

Balance sheet size unchanged

Commercial bank

Assets		Liabilities	
Reserves	- 100	Deposits	- 100
Securities		Other liabilities	
Loans			

Balance sheet size unchanged

Foreign central bank

Assets	Liabilities
Titres	Reserves
FRRP	Other liabilities
Deposits	
Other assets	

Money market fund

Assets	Liabilities
Deposits	Fund shares
ON RRP	
Securities	

Customer

Assets		Liabilities
Deposits	- 100	Loans
Securities	+ 100	Repo
Fund shares		
Other assets		

Balance sheet size unchanged

FIGURE 2

IMPACT ON BALANCE SHEETS OF NOT REINVESTING TREASURIES
A MONEY MARKET FUND SUBSCRIBES FOR THE NEW US TREASURY ISSUE AND REDUCES ITS REVERSE REPOS WITH THE FED

Stage 1: The US Treasury issues 100 units of debt securities

Stage 2: 100 units of Treasury debt securities held by the Fed mature

Stage 3: The money market fund reduces its reverse respos with the Fed

Stage 4: The primary dealer places the securities issued with a money market fund

Central Bank

Assets		Liabilities	
Securities	-100	Reserves	-100
			+100
			-100
			+100
		TGA	+100
			- 100
		ON RRP	- 100
		FRRP	

Balance sheet size: -100 (ON RRP – 100)

BONY

Assets		Liabilities	
Reserves	-100	Deposits	- 100
	+100		+100

Balance sheet size unchanged

US Treasury

Assets		Liabilities	
TGA	+100	Debt	+100
	-100		-100

Balance sheet size unchanged

Primary dealers

Assets		Liabilities
Deposits	-100	Repo
	+100	Other liabilities
Securities	+100	
	-100	
Other assets		

Balance sheet size unchanged

Commercial bank

Assets		Liabilities	
Reserves	+ 100	Deposits	+ 100
	- 100		- 100
Securities		Other liabilities	
Loans			

Balance sheet size unchanged

Foreign central bank

Assets	Liabilities
Securities	Reserves
FRRP	Other liabilities
Deposits	
Other assets	

Money market fund

Assets		Liabilities
Deposits	+ 100	Fund shares
	- 100	
ON RRP	- 100	
Securities	+ 100	

Balance sheet size unchanged

Customer

Assets	Liabilities
Deposits	Loans
Securities	Repo
Fund shares	
Other assets	

FIGURE 3

The impact of QT will depend in particular on the profile of net issues of US Treasury debt securities by maturity, on yield differentials between securities and Fed reverse repos with money market funds and foreign central banks, and even on the spread between yields on money market fund shares and bank deposit rates for households.

THE IMPACT OF QT2 ON MONEY SUPPLY

For more than a year and a half already, M2 money supply has been slowing in the United States (+1.1% year-on-year in October 2022, compared to +27.1% in February 2021, Chart 10).

This slowdown is mainly due to reduced purchases of US Treasury debt securities and mortgage-backed securities by the Fed and banks (blue and hatched green bar charts)*. The Fed's reverse repo transactions with money market funds (grey bar chart) and the increase in US Treasury holdings with the Fed (hatched blue bar chart) have contributed to money being (temporarily) destroyed. After being depressed by a major base effect in 2021 (97% of outstanding amounts of guaranteed loans to enterprises, originated in 2020, were wiped out in 2021), bank loans (green bar chart) have boosted money supply growth since the start of 2022.

During QT1, growth in customer deposits (and, more broadly, money supply) had slowed, but had not entered negative territory, with outstanding loans contributing positively. However, the current climate is weaker. On the one hand, the hike in key interest rates makes the Fed's reverse repo facility more attractive for money market funds. On the other hand, the sharp rise in loan costs (especially mortgages) and fears of recession may weaken the lending channel. In the most recent Fed lending survey, the banks surveyed stated that they had tightened their lending criteria and had seen a drop in demand for loans (for commercial and industrial loans from companies, and for mortgages from households).

COUNTERPARTS' CONTRIBUTIONS TO THE ANNUAL GROWTH RATE OF M2* IN THE US

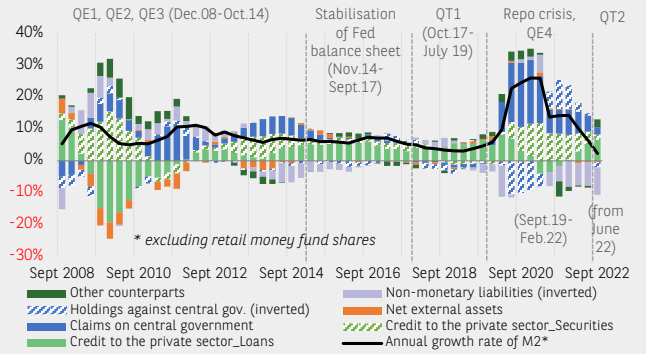

CHART 10 SOURCE: FEDERAL RESERVE, BNP PARIBAS CALCULATIONS

*Our method for identifying counterparts of money supply is set out in Choulet (2021a). The negative effect of QT, which began on 1 June, is not yet clear in the quarterly breakdown for counterparts of money supply. During the early months of QT, the reduction in the Fed's balance sheet was not as large as the implemented announced programme suggested due, on the one hand, to adjustments in the value of Treasury inflation-protected securities (TIPS) on its balance sheet and, on the other hand, to the delayed recording of MBS purchases made before the start of QT (The "How and When" of the Fed's Balance Sheet Runoff | by New York Fed | New York Fed | Sep, 2022 | Medium).

BOX 1

"BUMPY" QT: THE RISK OF A SHORTAGE IN CENTRAL BANK MONEY

As previously mentioned, the reduction in the Fed's balance sheet will automatically destroy some of the reserves created during the quantitative easing programme. However, for this reason, the first round of Fed quantitative tightening (QT1), which began in October 2017, had to be curtailed after just 22 months, far earlier than the Fed had planned[18]. It had exhausted the stock of "excess" reserves held by banks beyond their liquid asset needs[19], preventing them from meeting demands for cash on the money markets. In September 2019, the money markers seized up, meaning that cash overnight borrowing rates on the repo markets hit record levels and the Effective Fed Funds Rate rose to outside of the FOMC target range for the first time. In order to ease these pressures, the Fed injected emergency liquidity through repurchase agreements and reactivated its outright asset purchase programme (Choulet, 2019; Afonso, Cipriani, Copeland, Kovner, La Spada, Martin, 2021; Copeland, Duffie and Yang, 2021).

A comfortable liquidity position at first glance

Banks' central bank money needs are driven by a range of constraints. Reserves are first and foremost a way of settling payments on the interbank market. Since the Liquidity Coverage Ratio (LCR) was introduced in 2015, banks have also had to hold reserves (or, more generally, High-Quality Liquid Assets, HQLA) to cover the net cash outflows over 30 days that would be triggered by a severe liquidity crisis (based on notional outflow or non-renewal rates, as set by the regulator). The regulatory requirements around central bank money for the very large American banks are all the more extensive, as the regulator has required them, on the one hand, since 2013, as part of the resolution plans, to cover their theoretical net cash outflows on an intra-day basis, rather than a daily basis, and, on the other hand, since 2014, to be subject to liquidity stress tests over various horizons (overnight, 30 days, 90 days and 1 year). However, these regulatory requirements can only be met through large holdings with the central bank. The internal management of liquidity risk, delays between large dealers' incoming credit and outgoing debit payments, and shallow money markets at the end of the day also affect demand for reserves (Copeland, Duffie and Yang, 2021; Afonso, Duffie, Rigon and Shin, 2022).

Given the large liquidity pool available to banks, the Fed's ambition to maintain an "ample" reserve supply and the facilities introduced by the US central bank in order to prevent any shortfall in reserves, the risk of shortage seems small for the time being.

A large liquidity pool

The current stock of reserves with the Fed (around USD 3 trillion in mid-December 2022, compared to USD 1.38 trillion when the repo market crisis occurred in September 2019) is actually a large liquidity pool that will be able to absorb the quantitative tightening shock.

In addition, the size of the Fed's reverse repos (ON RRP facility) confirms that there is abundant cash available: since mid-June 2022, money market funds have deposited almost USD 2.2 trillion in the Fed every day (45% of their total assets) as there is no more profitable investment on the market[20] (Chart 11).

18 QT1 only reduced the Fed balance sheet and commercial banks' reserves by USD 700 billion.

19 Reserve requirements have been removed from US monetary policy since March 2020.

20 According to our estimates (Choulet 2021b), the current outstanding reverse repurchase agreements by money market funds are close to the maximum cash amount (USD 2.8 trillion) that

THE EFFECTS OF REALLOCATING CASH DEPOSITED WITH THE FED BY MMFS TO PRIVATE REPO MARKETS

A MMF repo loan to a private investor, in order to finance its purchase of Treasuries, would result in a reduction of the money market fund's participation in the ON RRP facility (at a given balance sheet size) (Figure 4). As a result of reducing its repo borrowing, the Fed would credit the intermediary bank's account (reserves), which in turn would credit the money market fund's account (deposits). The money market fund would lend the released resources to a hedge fund on the tri-party market, which would acquire the securities issued. All things being equal, the reduction in the Fed's balance sheet would involve neither a reduction in bank reserves held with the central bank nor a destruction of customer deposits.

BOX 2

IMPACT ON BALANCE SHEETS OF NOT REINVESTING TREASURIES
A HEDGE FUND UNDERWRITES THE NEW US TREASURY ISSUE BY BORROWING FROM A MONEY MARKET FUND

Stage 1: The US Treasury issues 100 units of debt securities
Stage 2: 100 units of Treasury debt securities held by the Fed mature
Stage 3: the money market fund makes a repo loan to a hedge fund (and reduces its reverse reposwith the Fed)
Stage 4: the primary dealer places the securities issued with the hedge fund

Central bank

Assets		Liabilities	
Securities	-100	Reserves	-100
			+100
			-100
			+100
		TGA	+100
			- 100
		ON RRP	- 100
		FRRP	

Balance sheet size: -100 (ON RRP – 100)

BONY

Assets		Liabilities	
Reserves	-100	Deposits	- 100
	+100		+100

Balance sheet size unchanged

US Treasury

Assets		Liabilities	
TGA	+100	Debt	+100
	-100		-100

Balance sheet size unchanged

Primary dealers

Assets		Liabilities
Deposits	-100	Repo
	+100	Other liabilities
Securities	+100	
	-100	
Other assets		

Balance sheet size unchanged

Commercial bank

Assets		Liabilities	
Reserves	+ 100	Deposits	+ 100
	- 100		- 100
Securities		Other liabilities	
Loans			

Balance sheet size unchanged

Foreign central bank

Assets	Liabilities
Securities	Reserves
FRRP	Other liabilities
Deposits	
Other assets	

Money market funds

Assets		Liabilities
Deposits	+ 100	Fund shares
	- 100	
ON RRP	- 100	
Repo	+ 100	
Securities		

Balance sheet size unchanged

Hedge fund

Assets		Liabilities	
Deposits	+ 100	Loans	
	- 100	Repo	+ 100
Securities	+ 100		

Balance sheet size unchanged

FIGURE 4

DAILY FED REVERSE REPO (RRP) VOLUMES WITH BANKS, GSES AND MONEY MARKET FUNDS

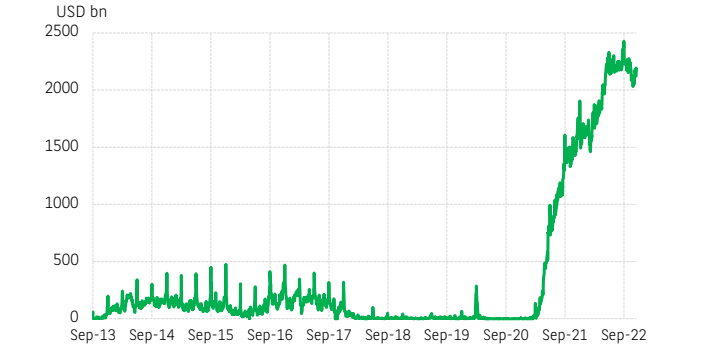

CHART 11 SOURCE: FEDERAL RESERVE BANK OF NEW-YORK, BNP PARIBAS

REALLOCATION OF MONEY MARKET FUND PORTFOLIOS

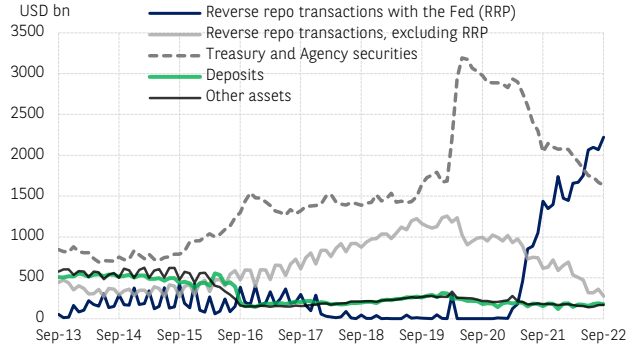

CHART 12 SOURCE: INVESTMENT COMPANY INSTITUTE, OFFICE OF FINANCIAL RESEARCH, BNP PARIBAS

The increased importance of this facility has, in fact, and in line with the Fed's objective[21], largely led to MMF holdings being reallocated (away from securities portfolios and repo loans to private counterparties), rather than their resources being increased[22] (Chart 12). Since the hike in key rates on 3 November 2022, the ON RRP facility's yield has become slightly less appealing[23] and MMF cash "deposits" with the Fed have decreased somewhat. Yet, rebalancing their portfolios would cushion the effect of QT on banks' reserves with the Fed, delaying the risk of a central bank money shortage[24].

In particular, MMFs could expand their agency debt security portfolios again. As a matter of fact, the slowdown in customer deposit growth (Box 1) is prompting banks to seek financing from Federal Home Loan Banks (FHLBs), which have been issuing more debt securities in recent months. As the Treasury announced T-bill net issues would resume, MMFs could also re-allocate their holdings to US Treasury securities (Figure 3). Finally, primary dealers could request further financing from MMFs in order to lend on foreign-exchange swap markets or on repo markets or, if there is not enough appetite among investors for the long-term securities issued, in order to finance the increase in their long (buy) positions. Other financial organisations, such as hedge funds, could also finance their Treasuries purchases by borrowing from money market funds or dealers, even if price volatility is dampening their appetite (Box 2). Additional demand for secured loans would push repo rates upwards and reduce the relative attractiveness of the ON RRP facility for money market funds. Just as the Fed drained the excess liquidity created during QE (and prevented downward pressure on money market rates), it could resupply the repo markets with liquidities, by lowering the authorised transaction ceiling or reducing the interest rate for the ON RRP facility.

Assuming the extreme hypothesis that MMF cash "deposits" with the Fed are completely exhausted, the theoretical worth of central bank money which could offset the effect of reducing the Fed's balance sheet could amount to USD 5.36 trillion (combined total of banks' reserves and MMFs deposits with the Fed as at 14 December 2022), compared to USD 1.38 trillion three years earlier.

Maintaining an "ample" reserves system: a new monetary policy ambition

After being left reeling by the unexpected repo market crisis during QT1 (Pozsar, 2018; Choulet, 2018), the Fed intends to manage the reduction in the size of its balance sheet better[25]. This involves destroying some of the reserves created during QE4, all while maintaining a sufficiently "ample" reserve supply, i.e. large enough to eliminate any stress risk that would require it to inject central bank liquidity urgently.

However, it is still a challenge, even for banking regulators, to estimate the optimal amount of reserves (neither too little nor too much) required for the money markets to operate smoothly. The Federal Reserve Bank of New York monitors two indicators that can assess whether there are too few or too many reserves. According to these two indicators, the current stocks of reserves with the Fed could, for the time being, be described as "ample".

In its latest monetary policy operations report published in May 2022 (FRBNY, 2022), the Federal Reserve Bank of New York (FRBNY) characterises an "ample" reserves system as one with a reserve-to-GDP ratio above the level recorded in December 2019 (8%). With an average of USD 2.96 trillion in reserves during the final week of September 2022 and a reserve-to-GDP ratio of 12%, based on this indicator, the Fed would have room for manoeuvre in order to reduce the size of its ba-

MMFs eligible for the facility can deposit with the Fed under the extreme assumption that all of their Treasuries and Agencies stocks are not renewed and their resources stabilise.

21 The COVID-19 shock in 2020 caused large inflows to money market funds (+USD 1.3 trillion between March and May 2020), which were very heavily invested in T-bills and FHLB debt securities. However, the inability of MMFs to renew their maturing portfolios (the T-bill market drying up, and banks' reduced refinancing needs with FHLBs in the form of secured loans and, therefore, lower FHLB debt securities issues) threatened to cause an excessive cash supply on private repo markets. By reactivating the ON RRP programme in March 2021, the Fed set a floor for short-term market rates, by encouraging MMFs to "lend" some of their cash to it rather than to the repo markets.

22 Between March 2021 (the date when the ON RRP facility was reactivated) and September 2022, the increase in ON RRP outstandings (+2.22 trillion) was mainly due to MMF securities portfolios (-1200) and repo loans (-745) shrinking, while their resources only increased moderately (+200 billion).

23 When rates were hiked on 3 November, the interest rate for Fed reverse repurchase agreements with MMFs (ON RRP facility rate) was increased to 3.8%. On the same date, the median Secured Overnight Financing Rate (SOFR) stood at 3.8%, the Effective Federal Funds Rate stood at 3.83% and the 3-month T-Bill yield rate stood at 4.06%.

24 At an aggregated level, the stock of reserves with the central bank is dependent on changes in the size of the central bank's balance sheet and the structure of its liabilities. An increase in the central bank's balance sheet results in an increase in the reserves held by banks with it and/or other liabilities; at a given balance sheet size, the increase in one of the central bank's liabilities results in a reduction in banks' reserves. QE4 increased the Fed's holdings by almost USD 5.18 trillion, but "only" increased banks' reserves with the Fed by USD 2.3 trillion (Chart 9). The effect of QE4 on reserves was partially offset by the increase of cash in circulation (+510 billion), the US Treasury account (+510 billion), GSE and central clearing counterparties deposits with the Fed (+280 billion) and, most of all, reverse repos with MMFs (+1.58 trillion). Fed's reverse repos led to a sterilisation of central bank money as they transit through bank balance sheets. The Fed records the transaction in its liabilities as a debt and debits the intermediary bank's current account (reserves) for the same amount. The intermediary bank debits the MMF's deposit account in turn. Conversely, by reducing the Fed's reverse repos, previously sterilised central bank money can be freed up (see Figure 3).

25 And limit the losses caused by rising interest rates

lance sheet (on that date, the reserve stock was above the 960 billion threshold that acts as the boundary between sufficient and insufficient reserves). By making a number of conservative assumptions about the likely changes in other liabilities on the Fed's balance sheet, and by using the median of primary dealers' macroeconomic assumptions, the FRBNY believed that, in order to avoid a shortage in reserves, the reduction in the Fed's balance sheet should be curtailed by mid-2025[26]. By that time, the Fed's balance sheet should be around USD 5.9 trillion (22% of GDP) and reserves should be around 2.3 trillion (9% of GDP). At the end of a year in which the Fed's balance sheet size is expected to remain unchanged, the asset purchase programme would be reactivated in order to keep the reserve stock at 8% of GDP. Assuming both the value of the Fed's securities portfolio and the value of reserves grow at the same rate as GDP by 2030, at the end of the forecast horizon, the Fed's balance sheet would stand at USD 7.2 trillion and reserves would stand at 2.7 trillion (i.e. 1.43 trillion and 470 billion less respectively than on 14 December 2022).

In support of the simulations of the reserve demand curve, Afonso, Giannone, La Spada and Williams (2022) estimated that, based on data covering the period from 1 January 2009 to 29 March 2021, the new liquidity requirements gradually introduced following the major financial crisis and the new tools for controlling short-term money market rates[27] shifted this boundary between abundant and scarce reserves. As a result, if, between 2010 and 2014, a reserve-to-bank-asset ratio of more than 8% was sufficient to be classified as an "ample" reserves situation, then, between 2015 and 2020, this same threshold stood at 11%. Therefore, standing at 13% on 30 November 2022, the reserve-to-bank-asset ratio still looked comfortable (even though the additional reserves only stood at USD 530 billion at this time). Developments beyond the forecast horizon for their study (a second increase in the ON RRP transactions ceiling in September 2021, and the zero or slightly positive gap between the ON RRP rate and the SOFR since June 2021) could pushed the threshold upwards, however[28].

A facility for injecting reserves should there be pressures

With the creation of the Standing Repo Facility (SRF), the Fed also has a new tool for detecting and preventing potential shortages in central bank money (Choulet, 2021b). The facility mirrors the ON RRP facility[29]. All other things being equal, it increases reserves with the central bank and enlarges banks' (and the Fed's) balance sheets. It enables banks with central bank liquidity needs to temporarily "monetise" securities and aims to eliminate the risk of a comparable incident to the one that occurred in September 2019.

Challenges with assessing central bank money needs

However, caution is still needed. The most recent round of QE did not improve the liquidity coverage ratios (LCRs). Instead, just like QT1, QT2 could negatively affect these ratios. Furthermore, QE4 changed the structure of banks' balance sheets in such a way that the thresholds reached during the September 2019 repo crisis (level of reserves, reserve-to-GDP ratios and reserve-to-bank-asset ratios) could become less relevant. Finally, the SRF has a number of shortcomings that could make it less effective should there be pressures.

QT2 could negatively affect liquidity coverage ratios

Due to the confidential nature of some information, such as the liquidity risk management in resolution plans or the results of liquidity stress tests, detailed analysis of central bank money needs cannot take place. In view of the short-term Liquidity Coverage Ratio (LCR) requirement under Basel III, which is less crucial but the only one observable, the (immediately available) liquidity position for the eight largest American banks (JP Morgan, Bank of America, Citigroup, Wells Fargo, Goldman Sachs, Morgan Stanley, BONY and State Street) improved during the third quarter of 2022. The theoretical net cash outflows (the denominator in the ratios) contracted more sharply than the value of the liquid-asset portfolios[30] (the numerator in the ratios). Therefore, the average LCR of the 8 G-SIBs increased over the quarter. Standing at 119.2% during Q3 2022 (compared to 116.3% during Q2 2022), this ratio was greater than the prudential requirements (100%) and the level recommended by the Fed (115%). However, it was only 100 bp higher than at the time of the repo market crisis (Q3 2019). Yet, even though QE4 did not improve the LCRs of the big American banks[31], QT1 gradually negatively impacted these ratios (Chart 13).

Increased exposure to liquidity risks?

Contradicting the position of most economists (Copeland, Duffie and Yang (2021), Afonso, Cipriani, Copeland, Kovner, La Spada and Martin (2021)), who argue in favour of maintaining a sufficiently abundant level of reserves, Acharya, Chauhan, Rajan and Steffen (2022), by contrast, believe that repeated injections of central bank money create a moral hazard and could alone fuel potential liquidity pressures on money markets liquidity. They claim that, during the various rounds of QE, banks, which felt confident about the abundant stock of central bank liquidity available, increased the liquidity service that they provided to their customers (by increasing customer demand deposits in their liabilities and lines of credit to corporations in their off-balance sheets).

26 These estimates are based on the assumption that there will be zero ON RRP outstandings by the end of 2025. QT2 could be curtailed earlier if these outstandings remained positive to this horizon.

27 The introduction of the ON RRP facility, by offering an alternative to GSEs and MMFs for investing their assets, would have strengthened their negotiating power against banks on money markets.

28 In a more recent publication, Afonso, La Spada and Williams (2022) estimated that the slope of the reserve demand curve has been close to 0 (i.e. the reserve demand was not affected by the gap between the Federal Funds rate and the interest rate on reserve balances with the Fed) since mid-2020, suggesting, according to them, that the amount of reserves at the start of September 2022 (around USD 3.2 trillion) could still be described as abundant.

29 Under the SRF, some counterparties (primary dealers and depository institutions) place Treasuries, debt securities and MBS issued by GSEs and public agencies on repo with the Fed. The Fed records the repo in its assets as a receivable and credits the intermediary bank's current account (reserves with the central bank) in its liabilities. When a bank enters into a repo transaction with the Fed on its own behalf, the transaction results in a debt to the Fed (the repo) being recorded as a liability on its balance sheet and an increase in its reserves held at the central bank in its assets. Where a bank is acting on behalf of a primary dealer, it credits its customer's deposit account. Each eligible counterparty can "borrow" up to USD 120 billion in cash from the Fed on a daily basis. Transactions are charged at the marginal lending facility rate (4.5% since 15 December) and capped overall at USD 500 billion.

30 Decrease in the reserves with the central bank and unrealised losses on Treasuries and Agency MBS portfolios

31 QE4 has admittedly led to an increase in American banks' reserves with the Fed (defined as the most liquid assets within the meaning of the LCR) and in their customers' deposits, which, when deemed stable, receive special treatment under the LCR (with theoretical low outflow rates). However, the unprecedented scale of this QE negatively affected the LCRs of large banks. In order to counteract the downward pressure on short-term market rates caused by the excess central bank liquidity injected, the Fed destroyed some of this liquidity through its reverse repurchase agreements with money market funds (via the ON RRP facility), which limited the increase in the stock of liquid assets (the numerator for LCR). In addition, even though net issues of Treasuries were very widely used to finance stimulus and economic support plans, the US Treasury sterilised some of the resources raised in its deposit account with the Fed. However, at the same time, the exceptional increase in money supply, and, therefore in bank deposits, significantly increased the level of theoretical net cash outflows (the denominator for LCRs). Banks have obviously redirected some of their institutional customers' deposits (non-operational deposits) to money market funds. However, a fairly small number of these deposits were ultimately redirected, compared to ON RRP outstandings. In the end, the latest round of QE in the United States led to the LCRs of five of the US 8 G-SIBs (JP Morgan, Goldman Sachs, Morgan Stanley, Bank of New York Mellon and State Street) dropping sharply, and the ratios of the other three G-SIBs (Bank of America, Wells Fargo and Citigroup) improving slightly. On average, the 8 G-SIBs' LCRs fell by 187 basis points between Q3 2019 and Q2 2022, dropping from 118.1% to 116.3%.

However, the reduction in banks' holdings with the Fed, caused by QT1, did not lead to an equivalent reduction in banks' demandable liabilities, which, according to them, would have caused the pressure seen on the repo markets in September 2019, and then on the Treasuries market in March 2020, to happen earlier. The liquidity "available" should there be market pressures is thought to be much lower than suggested by the banks' stocks of reserves with central bank, as, according to the authors, these banks willingly increased their commitments to provide cash to their customers. They conclude that if there is not a sharp reduction in demandable claims on the banking sector, QT2 risks exposing the financial system to further pressure, which will force the Fed to inject further central bank liquidities and increase banks' dependence on the Fed.

AVERAGE LCR RATIO OF THE 8 US G-SIBS

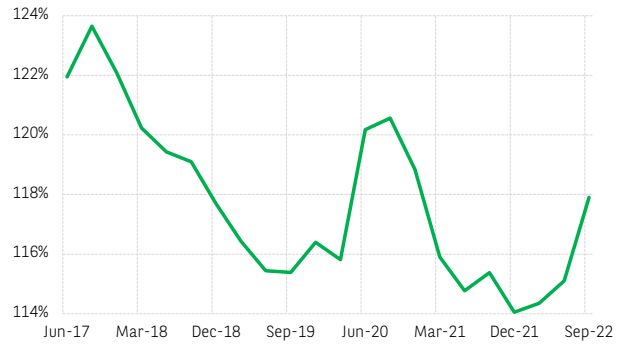

CHART 13 SOURCE: LCR DISCLOSURES, BNP PARIBAS

CHANGE ON THE ASSET SIDE OF BANKS' BALANCE SHEET

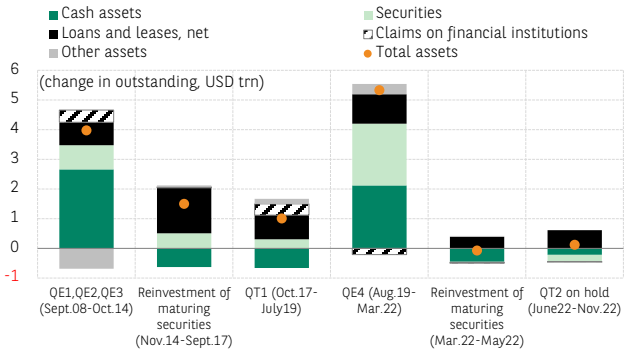

CHART 14 SOURCE: FEDERAL RESERVE (H.8), BNP PARIBAS

CHANGE ON THE LIABILITY SIDE OF BANKS' BALANCE SHEET

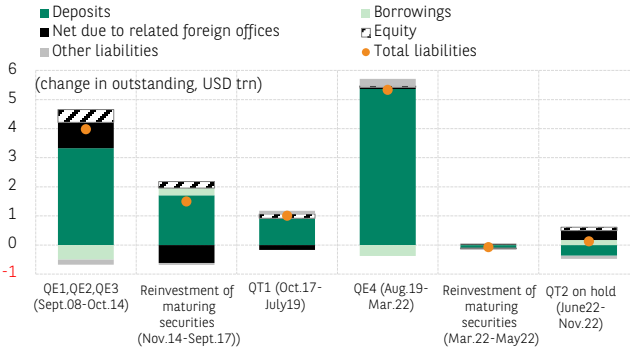

CHART 15 SOURCE: FEDERAL RESERVE (H.8), BNP PARIBAS

Of course, banking activity, in its most traditional forms (granting loans and collecting deposits), exposes banks to maturity transformation and liquidity risks, in particular. The introduction of new liquidity regulatory requirements in the wake of the 2008 great financial crisis aimed to reduce these risks and improve banks' abilities to absorb shocks. Even though, as the authors point out, these regulations have increased liquid-asset requirements (as reserves with the central bank), they have also prompted banks to rely more heavily on deposits, particularly from retail customers, which are rightly viewed as more stable than market financing. In addition, the high weighting of deposits in the liabilities of bank balance sheets is, in practice, closely linked to monetary policy measures. During the various rounds of QE, the Fed's securities purchases automatically increased the total stock of deposits in the economy (newly created money), while the drop in rates reduced the convenience cost of holding liquid savings with little or no interest paid on them (such as demand deposits). In 2020 and 2021, support packages for American businesses (PPP guaranteed loans) and households (stimulus checks), financed by US Treasury holdings with the Fed and increasing deficits (partly "absorbed" by the Fed as part of QE), boosted growth in deposits. Of course, periods of monetary tightening should prompt customers to shift towards longer and more profitable investments, while quantitative tightening should automatically destroy some of the money created during QE. However, during QT1, the economic climate was suitable for resuming lending (the traditional channel of money creation), meaning that the weighting of deposits on bank balance sheets fell only slightly. Customer deposits currently account for more than 65% of bank liabilities in the United States, which is beneficial during a period where the cost of market resources is increasing.

This study by Acharya, Chauhan, Rajan and Steffen (2022), however, highlights that the distortion of bank balance sheets (Charts 14 and 15), caused by successive rounds of QE, has probably altered banks' demands for central bank money. Bank balance sheets have clearly been amended to accommodate the likely fall in reserves and customer deposits for a few months now. Banks' use of secured borrowings (advances) and unsecured loans (federal funds) with GSEs has increased since the start of 2022. FHLBs' current accounts and the interest on them have also grown.

The SRF's limitations

Banks are still not greatly involved with the Fed's SRF. By mid-December 2022, the list of the Fed's SRF counterparties contained 17 depository institutions, which are subsidiaries of very large American banks or branches of large foreign banks. There are some limitations to the facility (Choulet, 2021b). The first pitfall is that borrowings from the Fed cannot be centrally cleared (cf. infra). As we approach the closing of accounts, the liquidity offered by the Fed through the SRF may therefore be inaccessible to primary dealers or depository institutions experiencing the most stringent constraints under their leverage requirements. Even in 2019, on their own, the Fed's interventions

were not able to ease the pressures that had arisen. Beyond the USD 256 billion of liquidity "borrowed" from the Fed, as part of its repo transactions on 31 December 2019, dealers had partially refinanced their inventories of securities through repo loans from MMFs, which were cleared via the Fixed Income Clearing Corporation (FICC, a subsidiary of the Depository Trust & Clearing Corporation) at USD 276 billion (cf. infra). In March 2020, faced with rapidly deteriorating financial conditions, the Fed significantly increased the ceiling for its repo transactions. However, demand from primary dealers remained low when compared against the Fed's liquidity supply, and only the promise of "unlimited" outright security purchases, followed by the removal of reserves and Treasuries from the leverage ratio calculation[32] (see infra), helped to stabilise the markets and lower the Treasuries yield (Eisenbach and Phelan, 2022). The second pitfall of the SRF is the risk of stigmatisation associated with using it.

"BUMPY" QT: THE RISK OF INTERMEDIATION CONDITIONS FOR TREASURIES MARKETS DETERIORATING

Traditionally viewed as the deepest and most secure market, the Treasuries market has experienced episodes of severe pressure over the past decade[33]. The liquidity of the cash market (where securities are traded) has declined since the start of 2022. Against the backdrop of monetary tightening and fears of a recession, the strengthening of the dollar and the high yield volatility are putting off investors, irrespective of whether they are from the United States or abroad. This climate makes the Fed's task of reducing its portfolio more complicated. Given the size of the debt to be financed (USD 24 trillion of marketable debt), the prudential constraints limiting the capacity for intermediation by primary dealers are an aggravating factor (Duffie, 2020 ; FSB, 2022).

Reduced appetite among non-residents

After flagging over the past few years, non-residents' interest in Treasuries has declined due to the sharp increase in the cost of currency hedging since the start of 2022. The terminal federal funds rate will have to be reached for Treasury yields net of hedging costs to become attractive to non-residents again. Even though it has been designed to provide foreign central banks that do not have swap lines with the Fed with access to dollars, the FIMA repo facility has only slightly encouraged central banks to expand their Treasuries portfolios.

Non-residents: the main creditors of the US federal government

Non-residents are the main holders of US Treasury securities. Their (valued) holdings stood at almost USD 7.3 trillion at the end of September 2022, which equates to 31% of US marketable federal debt (29% of the total stock of Treasuries). By way of comparison, the Fed held 22% of the marketable outstanding, while other resident financial sectors held 37% (pension funds 14%, banks 7%, mutual funds 7% and money market funds 5%, Chart 16).

However, the attractiveness of US Treasuries to foreign investors has been in decline for many years now[34]. Even though the value of their portfolios, which are mainly made up of long-term securities, has grown over the past 20 years (buoyed by valuation effects), the weighting of

BREAKDOWN OF TREASURIES BY HOLDER SECTOR

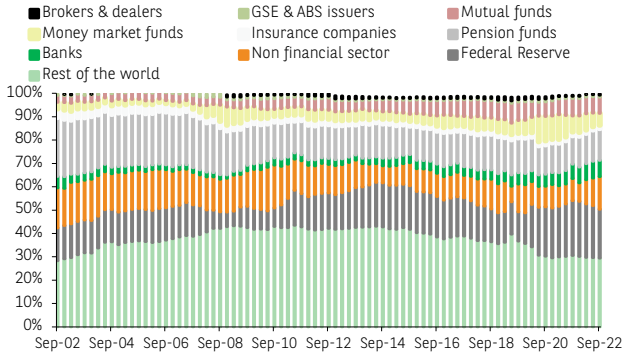

CHART 16 SOURCE: FEDERAL RESERVE (FOF), BNP PARIBAS

NET PURCHASES OF TREASURIES

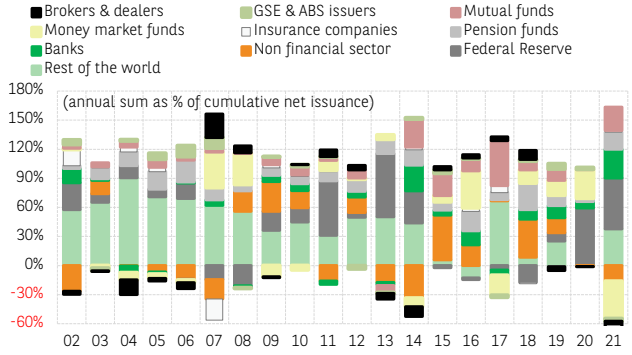

CHART 17 SOURCE: FEDERAL RESERVE (FOF), BNP PARIBAS

US TREASURY HOLDINGS BY THE REST OF THE WORLD

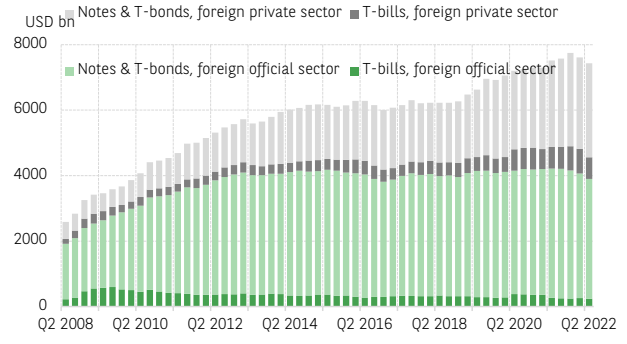

CHART 18 SOURCE: BEA (IIP TABLES), BNP PARIBAS

32 The exemption granted enabled the Fed to limit its outright purchases.

33 The 2014 "flash rally", the September 2019 repo market crisis and the "dash for cash" following the COVID-19 shock in March 2020.

34 The United States' net international position vis-à-vis the rest of the world is negative and increasing (with inflows of foreign capital outpacing outflows). At the end of June 2022, it stood at USD 16.309 trillion, accounting for 67% of US GDP. Reflecting the growing involvement of private investors among non-residents, the weighting of Treasuries in the overall exposure of non-residents to the American economy (in the form of securities, loans and deposits) has fallen since the end of 2012 (23% of receivables in Q2 2022, compared to 30% in Q4 2012), with investors shifting to riskier assets, such as equities and fund shares (36% compared to 24%, respectively).

their holdings in the total US federal debt has been falling since the end of 2008 (they then held 57% of the stock of marketable Treasuries and 43% of the total outstanding). Their net purchases of Treasuries have decreased (in particular between 2015 and 2020), both in terms of volume and in proportion to net issues of US Treasury securities[35] (Chart 17).

Non-resident official investors are reducing their exposure

The drop in the proportion of non-residents among Treasuries investors is solely due to the official sector (central banks, governments, sovereign funds, international organisations, development banks and public financial bodies). After having gradually grown over a number of years, the value of their portfolios has remained broadly stable since March 2013 (USD 3.903 trillion at the end of June 2022, of which 77% were held in custody by the Fed, Chart 18). However, it fell sharply in proportion to the stock of marketable Treasuries (17% in June 2022, compared to 42% at the end of 2008, Chart 19). Central banks and foreign governments have to some extent turned away from Treasuries, and more generally from the US dollar, in an effort to diversify their foreign exchange reserves[36]. Conversely, Treasuries holdings by the non-resident private sector (insurance companies, pension funds and hedge funds), have increased in value over the past fifteen years (buoyed by net purchases and valuation effects standing at USD 3.528 trillion at the end of June 2022), all while accounting for a relatively stable proportion of the total Treasuries outstanding (15% compared to 14% respectively, Chart 19). Therefore, while the official sector was the US Treasury's primary foreign counterparty in 2008 (74%), in June 2022, it held only 53% of the federal debt held abroad (26% and 47% respectively for the non-resident private sector) [37]. However, as private investors generally have a shorter investment horizon than official investors, their growing weighting could lead to greater interest rate volatility.

THE DECLINE IN THE WEIGHT OF FOREIGN OFFICIAL INVESTORS AMONG HOLDERS OF TREASURIES

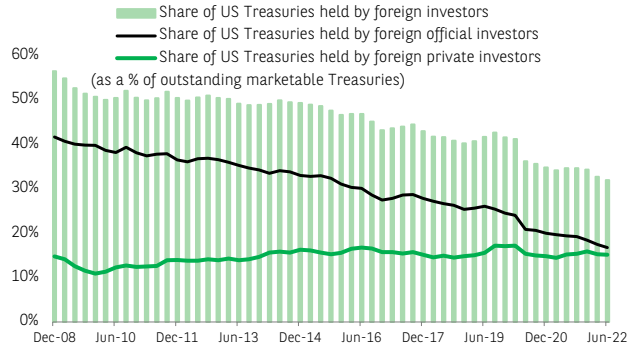

CHART 19 SOURCE: BEA (IIP TABLES), FEDERAL RESERVE (FOF), BNP PARIBAS

The reduction in non-residents' exposure to the US Treasury (in proportion to the stock of Treasuries) is entirely due to Asia, with Japan and China accounting for the biggest reductions. However, Japan (USD 1.12 trillion in September 2022) and China (USD 933 billion), all agent types included (both official and unofficial, financial and non-financial), are still the two largest creditor economies for the US federal government, far ahead of the UK (663 billion) and Belgium (325 billion)[38]. At the end of June 2022, 49% of US Treasury securities owned by foreign agents were held in Asia, with 34% held in Europe (18% were held in the eurozone), 10% in North America and 5% in South America.

Just like the SRF, the FIMA repo does not appear to have generated strong support or an incentive to increase exposure to Treasuries

In order to provide access to dollar liquidity with a greater scope than swap lines alone[39], the Fed introduced a new facility on 31 March 2020[40]. It was first introduced temporarily and was eventually made permanent on 28 July 2021. It enables foreign central banks and international monetary authorities with a FIMA account with the Federal Reserve Bank of New York (FRBNY) to place their portfolios of Treasuries into repurchase agreements with the Fed. This easy access to dollar liquidity for many countries (in particular, emerging markets), with no bilateral swap agreements with the Fed, aims to eliminate, should there be stresses, the risk of their Treasuries portfolios being sold at low prices[41] or of their repo borrowing with dealers, particularly American dealers, enlarging. The facility therefore aims to stabilise both the Treasuries and repo market, by freeing up space on dealers' balance sheets to allow financing of hedge funds and asset managers[42]. The authorised transaction volumes are determined bilaterally between the Fed and the central bank of the relevant country or, failing that, capped by the volume of Treasuries held with the FRBNY.

Therefore, this facility indirectly aims to encourage emerging economies to expand their portfolios in order to enhance their drawdown potential if necessary. The Fed does not provide an exhaustive list of central banks that have obtained access to the FIMA repo facility.

35 Non-residents purchased 40% of the net issues of marketable securities from the US Treasury in 2021, which is, of course, higher than the average during the 2015-2020 period, but lower than the average over the previous 20 years

36 Between 2015 and 2021, the fact that the price of the US dollar against major currencies remained largely unchanged, while its share in global currency reserves fell illustrates that foreign central banks have gradually been turning away from the dollar (https://blogs.imf.org/2021/05/05/us-dollar-share-of-global-foreign-exchange-reserves-drops-to-25-year-low/). After peaking at the end of 2015 (at 37.4%), the weighting of Treasuries portfolios in global official foreign exchange reserves (expressed in US dollars) steadily fell, hitting 32.2% at the end of 2021, which is its lowest level since 2008.

37 Even though investment portfolios of foreign official investors in US securities still heavily focus on US Treasury debt securities (65%), private investors are favouring equities and fund shares (57%) over Treasuries (19%).

38 The breakdown of Treasuries holdings by country is slightly misrepresentative. Some foreign investors task institutions not located in the United States or in their country of residence with holding their portfolios. For example, if a German investor purchases a US Treasury security held with a Swiss bank, it will increase the value of the Swiss Treasuries portfolio. This skew is the reason why there are large Treasuries portfolios in major security-custodian locations, such as Belgium, the Caribbean, Ireland, Luxembourg, Switzerland and the United Kingdom. The eight largest foreign holders of Treasuries also include the main domiciles for speculative funds (hedge funds and private equity funds), such as the Cayman Isles, Ireland and Luxembourg Private Fund Statistics, Third Quarter 2021 (sec.gov)

39 In mid-March 2020, the Fed reactivated the swap agreements signed in 2008 during the great financial crisis with 14 other central banks (Choulet, 2020a). Permanent swap lines with central banks in the eurozone (ECB), England (BoE), Japan (BoJ), Switzerland (SNB) and Canada (BoC) remained unlimited; temporary swap lines with central banks in Australia (RBA), Brazil (BCB), South Korea (BoK), Mexico (BdM), Singapore (MAS) and Sweden (Riskbank), on the one hand, and in Denmark (DanNB), Norway (Norges B.) and New Zealand (RBNZ), on the other hand, were limited to USD 60 billion and USD 30 billion each, respectively (until they expired on 31 December 2021).

40 The high cost of this repo facility discouraged foreign central banks from taking advantage of it in 2020.

41 While they had been net buyers during the major financial crisis, non-residents were heavily involved in the emergency sales in 2020 during the pandemic shock, alongside mutual funds (USD 246 billion sales) and the household sector (USD 90 billion), which includes hedge funds (Duffie, 2020, Vissing-Jorgensen, 2021, He and Krishnamurthy, 2020). Net sales of securities by non-residents stood at USD 287 billion during Q1 2020, with two thirds made by the official setor (182 billion), and one third made by the private sector (107 billion). Sales solely involved securities with long-term maturities (net sales of T-bonds and T-notes of USD 300 billion and net purchases of T-bills and certificates of USD 13 billion). In March 2020, in an act of precaution, but also looking to meet domestic demand for financing in dollars and to counteract foreign exchange pressures, foreign central banks sold securities, while non-resident hedge funds were forced to unwind their positions (on derivatives) given the high market volatility. After adjusting the valuation effect to support the methodology proposed by Vissing-Jorgensen (2021), we estimate that China (76 billion), the Cayman Islands (41 billion), Brazil (40 billion), Saudi Arabia (32 billion), Ireland (29 billion) and Luxembourg (25 billion) made the largest sales.

42 Which, along with dealers, supply dollars to private non-residents on the FX swap markets

However, some central banks provided this information: the central banks of Indonesia (08/04/2020), Colombia (20/04/2020), Hong Kong (22/04/2020), Chile (24/06/2020) and Peru (17/07/2020). The central banks of Sweden (20/12/2021) and South Korea (23/12/2021), which are among the nine central banks that were able to access temporary swap lines in 2008 and 2020, also signed repurchase agreements with the Fed.

We have aggregated the value of the Treasuries portfolios for countries that are home to the five central banks which have permanent swap lines with the Fed (hereafter referred to as "PSL countries"), the nine central banks which have temporary swap lines with the Fed ("TSL countries") and the five central banks which do not have swap agreements with the Fed but do have access to the repo facility ("FIMA countries")[43]. On an aggregated level, these three groups of countries have seemingly increased their holdings over the last ten years (between +25% and +70%, Chart 20), while the value of portfolios for countries that do not have any agreement with the Fed has only risen slightly (+3%). In March 2020, during the COVID-19 shock, all groups of countries reduced their Treasuries holdings (the valuation effect was also able to play a role), but this reduction was more moderate for PSL countries, however (Goldberg and Ravazzolo, 2022). Subsequently, despite obtaining access to the FIMA repo, the value of the portfolios for "FIMA countries" continued to shrink. However, these aggregations conceal major disparities[44]. Since the FIMA repo was put in place, South American countries (Chile, Colombia and Peru), which have had no limit placed on their potential repurchase agreements with the Fed, have, according to the information available, significantly expanded their portfolios (+24% between December 2019 and September 2022, Chart 21), while Asian countries (Hong Kong and Indonesia), whose access to the FIMA repo is capped (USD 10 billion and USD 60 billion, respectively), have reduced them (-30%).

US TREASURY HOLDINGS OF FOREIGN COUNTRIES

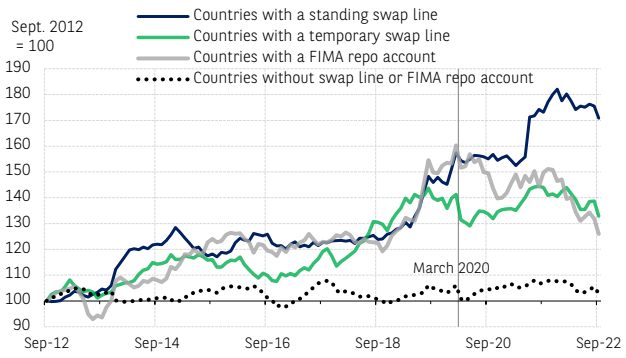

CHART 20 SOURCE: TIC DATA, BNP PARIBAS CALCULATIONS

ONLY SOME COUNTRIES WITH ACCESS TO THE FIMA REPO HAVE EXPANDED THEIR TREASURY PORTFOLIOS

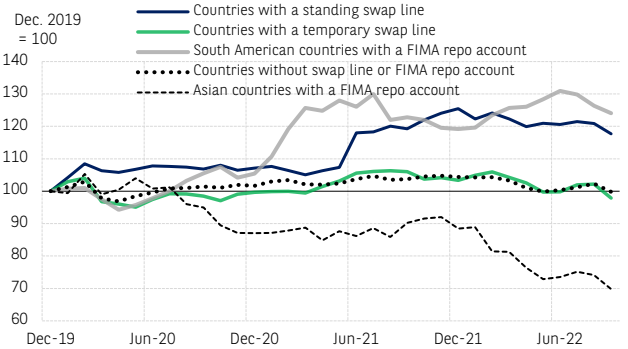

CHART 21 SOURCE: TIC DATA, BNP PARIBAS CALCULATIONS

Limited balance-sheet space for primary dealers

The reduction in the Fed's Treasuries portfolio will make the US Treasury much more reliant on markets for funding. However, the Basel 3 agreements have reduced primary dealers' market-maker capabilities on the Treasuries (cash and repo) markets, whether for intermediating the purchase or sale of securities by their counterparties on the secondary cash markets, for warehousing securities which do not find any underwriters onto their balance sheets (as part of outright sales or repurchase agreements), or even for facilitating the circulation of cash and collateral on the repo markets. Two regulatory adjustments (the easing of the SLR leverage constraint and the more common usage of centralised clearing on Treasuries markets) are under consideration. These two adjustments could significantly help to alleviate banks' capital requirements and should mitigate the risk of the balance sheet constraint exacerbating the stress that may arise should there be an external shock[45] (Chen, Liu, Rubio, Sarkar and Song, 2021).

Reduced market-intermediation abilities

Market-making involves entering a large inventory of securities and many repurchase and reverse repurchase agreements onto market makers' balance sheets. However, Basel 3 significantly increased the capital requirement linked to the size of bank balance sheets (in particular through the SLR leverage standard[46]). As a result, it increased the balance sheet cost associated with primary dealer activity, even while the federal government's financing needs were growing. This not only changed their position, but also significantly affected yields on the financial markets on which primary dealers trade (Duffie, 2020; Jermann, 2020; Du, Hébert and Li, 2022; Du, Hébert and Huber, 2022; Favara, Infante and Rezende, 2022; He, Nagel and Song, 2022).

43 This analysis suffers from methodological bias. The US Treasury reports the value of the Treasuries portfolios held in each country, all sectors included. Therefore, the data available are not granular enough to identify the holdings of central banks alone in each country (and the amounts held in custody with the FRBNY by each of them). The growth in private non-residents' portfolios, as mentioned above, may blur the analysis in particular.

44 The stability of "TSL countries " portfolios also conceals the major heterogeneity between the countries, as New Zealand (-32%), Brazil (-18%) and Denmark (-12%) reduced their exposure to Treasuries, in contrast to Norway (+25%), Australia (+22%) and Singapore (+23%).

45 The leverage constraint increased the stress seen in September 2019 on repo markets (linked to a lack of central bank money) and in March 2020 on Treasuries markets (linked to emergency sales).

46 The Supplementary Leverage Ratio (SLR) is intended to ensure that a bank's assets or commitments, irrespective of the risks associated with them, do not exceed a specific multiple of its capital. It expresses the Tier 1 capital amount as a ratio of the total exposure, which includes all balance sheet assets, in accordance with the accounting rules in force (excluding derivatives and securities financing transactions, which are dealt with separately), and a simplified off-balance sheet commitment measure. Derivative exposures and securities financing transactions are recorded on the basis of gross values; some items may only be cleared under restrictive conditions. In the United States, the enhanced SLR is set at 5% for G-SIBs and at 6% for their depository institution subsidiaries.

As a result, while they favoured Treasuries borrowings (short net positions) until 2008, primary dealers have since become Treasuries holders (long net positions, Chart 22) [47]. In addition, the stricter regulations have led primary dealers to choose more unequivocally between market making on the Treasuries market and supplying dollars on the foreign exchange market, and to require higher risk premiums. The reduced Treasuries absorption capacity among primary dealers would therefore have played a role in denting the "convenience yield" linked to holding an asset viewed as the safest and most liquid, at both a national level[48] (negative swap spreads, even on very long maturities[49]) and an international level (major deviations from the covered interest rate parity)[50]. For many months now, primary dealers' total exposure to Treasuries has been high (Chart 23). Yet, as with during QT1, the flattening of the yield curve could result in primary dealer inventories expanding further (compensating for the lack of investor appetite for the securities issued, Chart 22 and Box 3).

Relaxing the SLR leverage constraint[51]

The first regulatory amendment that could ease primary dealers' balance sheet constraints would involve relaxing the SLR leverage standard (Chart 24; Liang and Parkinson, 2020; Favara, Infante and Rezende, 2022).

Fearing that it would hinder banks' abilities to lend and act as market makers on the Treasuries market while QE4 significantly enlarged bank balance sheets, regulators temporarily eased it during the COVID-19 crisis (Choulet, 2020b). From 1 April 2020 to 31 March 2021, banks' reserves with the Federal Reserve and US Treasury securities, irrespective of whether they were pledged as collateral or not, were deducted from the denominator for the leverage ratio for large bank holding companies and their depository institutions. Raised by regulators in March 2021, the issue of a long-term review of the standard has not yet been resolved.

Given the size of the Treasuries market and the large amount of reserves required for the money markets to operate smoothly, recalibrating the standard would seemingly be an appropriate step, however. In March 2014, when the US SLR standard was being finalised, the outstanding marketable federal debt was half of its current level. At that time, the Fed was also anticipating the overall stock of reserves to be reduced to just USD 25 billion by the end of 2021 (Quarles, 2021); however, its outstanding stood at almost USD 3 trillion by mid-December 2022 and was overwhelmingly held on the balance sheet of the largest banks, which provide liquidity for the money and Treasuries markets.

According to Eisenbach and Phelan (2022), if there was no QE[52], easing the leverage constraint would stabilise the Treasuries market, provided that this was established as a long-term measure. Otherwise, investors

PRIMARY DEALERS' NET POSITIONS IN TREASURIES AND INTEREST RATE SPREADS

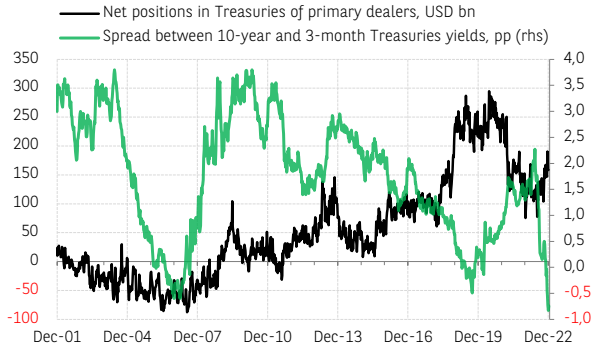

CHART 22 SOURCE: FEDERAL RESERVE BANK OF NEW YORK, FRED, BNP PARIBAS

PRIMARY DEALERS' OVERALL EXPOSURE TO TREASURIES

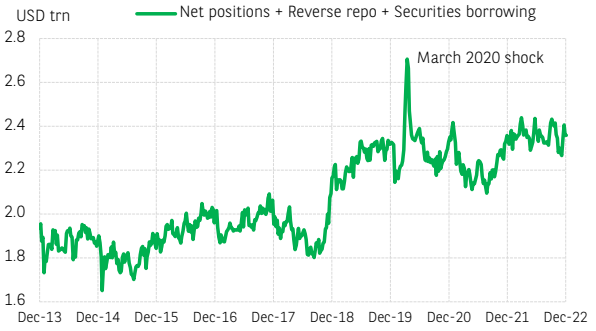

CHART 23 SOURCE: FEDERAL RESERVE BANK OF NEW YORK, BNP PARIBAS

who are not hugely exposed to liquidity risk but fear a future drop in the price of securities would be prompted to sell their assets should there be a shock. According to these authors, in March 2020, before the "unlimited" QE was announced by the Fed, uncertainty about whether dealers would be able to absorb net sales of securities from investors in need of cash would have prompted some financial institutions, without genuine liquidity needs, to sell their portfolios preemptively, thereby making their expectations self-fulfilling. These authors conclude that the more stringent dealers' balance sheet constraints are, the more fragile the markets of assets viewed as safe, such as Treasuries, become, due to potential runs on these markets.

47 In practice, balance sheets will enlarge as a result of increasing a short or long position. For long positions, primary dealers buy a specific quantity of Treasuries, which they place in repurchase agreements with money market funds (repo borrowing). These transactions expand their balance sheets by recording the securities purchased in the assets and recording the repo borrowing in the liabilities. When the repos expire, primary dealers sell the purchased securities and pay back their borrowing. For short positions, primary dealers temporarily borrow a specific quantity of Treasuries against a cash deposit and sell the borrowed securities. The transaction also expands their balance sheets, as dealers record repo loans to security lenders in the assets and the debt corresponding to the value of the securities to be delivered to security lenders in the liabilities. When security borrowing agreements expire, primary dealers buy back the securities and return them to security lenders.

48 The swap spread is the difference between the fixed rate of a swap agreement and the yield of a sovereign bond with the same maturity. An interest rate swap is a derivative contract that can be used to hedge against interest rate risks. One of the two counterparties makes a series of notional fixed interest payments, with the term and frequency agreed in advance (payment of the "fixed leg") and receives floating-rate interest payments in return. In theory, the swap spread is positive because a swap agreement includes a larger credit risk (pertaining to the bank serving as a counterparty to the investor) than the sovereign issuer's credit risk.

49 According to the covered interest-rate parity, it exists a relation between the difference in interest rates for risk-free assets denominated in two currencies and the difference in spot and term exchange rates. Entering into a foreign exchange swap (foreign currency units are loaned by collateralising local currency units at the spot exchange rate by committing to a reverse swap at the forward exchange rate in future) and investing in a risk-free security denominated in the foreign currency being borrowed provides, in the long term, the same yield as investing in a risk-free security denominated in the local currency now. Since 2014, this parity has no longer been verified due to increased demand for currency hedging and dealers' reduced abilities to supply dollars on foreign exchange swap markets.

50 The "convenience yield" is the value attributed to liquidity and security services offered by Treasuries.

51 Other regulatory requirements are constraining primary dealers' activity, such as the specific capital surcharges for G-SIBs (the size score includes the value of Treasuries portfolios recorded on the balance sheet while the complexity score includes the value of security lending/borrowing transactions), the Stress Capital Buffer (the standardised measure of counterparty risk penalises large balance sheets) and even the risk exposure limits (through calculating the Value At Risk). Internal profitability and risk tolerance or even the high procyclicality of margin calls from central clearing houses may also prompt them to limit their exposures.

52 The temporary relaxation of the leverage standard eased pressures, as it occurred at the same time as QE.

Broadening the scope of centralised clearing on Treasuries markets

The second solution would involve broadening the scope of centralised clearing of transactions by primary dealers on secondary (cash and repo) Treasuries markets.

In the United States, just one clearing house (CCP), the Fixed Income Clearing Corporation (FICC, a subsidiary of Depository Trust & Clearing Corporation), acts as the central counterparty on Treasuries markets[53]. Operating based on the novation principle, the FICC takes the legal place of the original seller (or borrower) or buyer (or lender), thereby becoming the buyer for each seller and the seller for each buyer. The trading terms are specified bilaterally during negotiations. Nevertheless, the confirmation of transactions and the delivery-settlement process are delegated to the FICC, which ensures that the transaction is successfully finalised[54]. Through the FICC's involvement, multilateral clearing of positions (netting) can also occur. For each type of underlying asset given, it calculates the net balance of the positions (subject to clearing) for each of its clearing members[55] (or "direct participants") vis-à-vis all of their counterparties. Centralised clearing enables members not only to reduce their exposure to (counterparty and operational) risks and unrealised cash flows when transactions are settled, but also to reduce their balance sheets and capital needs[56]. Participants benefit from the clearing service for a set of costs (initial margins and variation margins, FICC operational and liquidity requirements, operating costs, contribution to the FICC default fund and commitment to financing it should there be stress). For the time being, the FICC requires its clearing members to route only transactions between themselves through centralised clearing.

Primary dealers are de facto FICC clearing members. Since 2005, the FICC has also had the Sponsored Service in place, which has enabled some clearing members to act as Sponsoring Members[57]. As a result, they can sponsor some of their counterparties (such as money market funds and hedge funds) into "indirect" FICC memberships[58] and route their transactions on the repo market through centralised clearing. Sponsoring Members are guarantors for the payment and performance obligations of Sponsored Members[59] (or "indirect participants"). Thanks to the programme, the sponsored counterparties can enjoy attractive rates and the FICC agreement-performance guarantee, even if their sponsor defaults. However, the Sponsored Service is struggling to expand, as the criteria for joining the programme are strict, the programme is limited to overnight operations, sponsorship can be costly and the haircuts imposed by the FICC (2% for Treasuries) are higher than the haircuts applied on the bilateral market (Hempel, Kahn, Nguyen and Ross, 2022).

REACTIVATING THE EASING ALLOWED IN 2020 WOULD IMPROVE SLRS BY 90BP ON AVERAGE

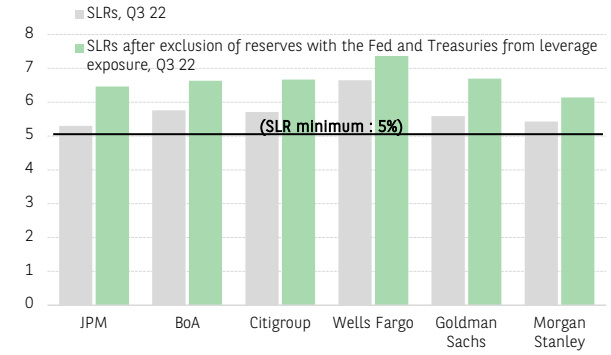

CHART 24 SOURCE: FFIEC 101 REPORTS, BNP PARIBAS CALCULATIONS

THE MAJORITY OF PRIMARY DEALERS' REPO TRANSACTIONS ARE NOT CENTRALLY CLEARED

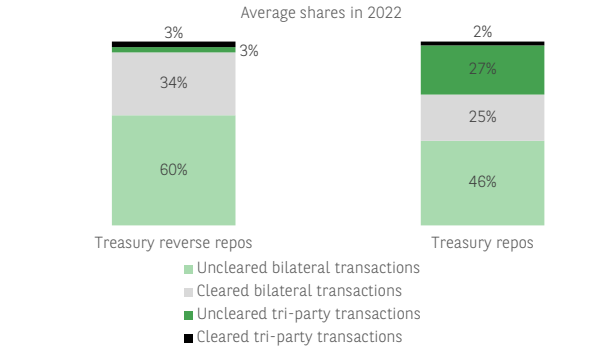

CHART 25 SOURCE: FEDERAL RESERVE BANK OF NEW YORK, BNP PARIBAS

The majority of primary dealers' repo transactions are not currently routed through centralised clearing (Infante, Petrasek, Saravay, Tian, 2022; Kahn and Olson, 2021). On average, during 2022, 46% of the Treasuries repurchase agreements by primary dealers, as well as 60% of their reverse repurchase agreements were entered into bilaterally, with no involvement from the FICC. 25% of their repo borrowings and 34% of their repo loans were cleared centrally with the FICC.27% and 3% of these transactions, respectively, were cleared on the tri-party market, with no centralised clearing. Finally, 2% of their repo borrowings and 3% of their repo loans were entered into on the tri-party market and cleared centrally with the FICC (Chart 25).

53 Data on the bilateral market for Treasuries repurchase agreements are still patchy, meaning that it is difficult to assess the proportion of transactions cleared centrally accurately. Around half of bilateral transactions are estimated to be centrally cleared, and slightly less for tri-party transactions. The regulators' working group responsible for monitoring the Treasuries market estimated that, during the first half of 2017, just 13% of cash transactions were cleared centrally, 68% were bilaterally cleared (without a CCP between the seller and the buyer) and 19% were cleared using a "hybrid " approach, where only one counterparty, affiliated with the FICC, routes its transaction through the CCP, while the other counterparty, which is not affiliated, has its transaction cleared bilaterally.

54 The replacement arrangement is designed to prevent a member's default from directly affecting the defaulting member's customers and other members. The central counterparty continues to fulfil the defaulting party's obligations (such as payment and delivery) towards its other members.

55 The Government securities division of the FICC has 209 clearing members, FICC-GOV Member Directories | DTCC. These include dealers (both affiliated with banks and not), banks and interdealer brokers.

56 Under US GAAP accounting rules, repo and reverse repo transactions with the same counterparty and backed by the same collateral may be recorded at their net value provided that the parties have signed a master netting agreement.

57 Membership of the programme has only really grown since April 2019. At the end of 2021, 30 clearing members (banks and broker-dealers only) had Sponsoring Members status, DTCC-2021-Annual-Report. The DTCC does not provide a list of names. While initially focused on just bilateral transactions, the programme has also covered tri-party transactions since September 2021.

58 Do not qualify as clearing members or do not wish to become clearing members

59 Sponsored Members must meet the definition of "qualified institutional buyers" under Rule 144A of the Securities Act of 1933. At the end of 2021, the list of Sponsored Members included 1,800 institutions. The "sponsored lenders" group is mainly made up of money market funds, insurance companies, pension funds, small banks and Federal Home Loan Banks, and the "sponsored borrowers" group is made up of hedge funds and other investment funds. For some participants, direct affiliation with the FICC as a clearing member cannot be an alternative to indirect membership, via the Sponsored programme. For example, the regulatory framework applying to money market funds prohibits them from mutualising the losses of other clearing members, as currently required by the FICC's rules.

THE EFFECTS OF AN EXPANSION IN DEALER INVENTORIES

In the event of a lack of investor appetite for newly issued long-term securities, primary dealers could be forced to keep the excess securities issued on their balance sheets. This expansion of inventories would require them to seek new repo borrowings from money market funds in particular (Figure 5). This would broaden their balance sheet. But most such primary dealers are subsidiaries of major banks, whose leverage ratios are already flirting with minimum regulatory requirements (Chart 24). With the exception of BONY and State Street which have benefited since the second quarter of 2020 from an easing in the method of calculating their leverage ratio, all the GSIBs have in fact seen their Basel leverage ratio deteriorate compared with the fourth quarter of 2019.

BOX 3

IMPACT ON BALANCE SHEETS OF NOT REINVESTING TREASURIES PRIMARY DEALERS FINANCE THEIR SECURITIES HOLDINGS WITH MONEY MARKET FUNDS

Stage 1 : the US Treasury issues 100 units of debt securities

Stage 2 : 100 units of Treasury debt securities held by the Fed mature

Stage 3 : the primary dealer keeps the securities on its balance sheet and finances itself with money market funds

Central Bank

Assets		Liabilities	
Securities	-100	Reserves	-100
			+100
			-100
			+100
		TGA	+100
			- 100
		ON RRP	- 100
		FRRP	

Balance sheet size: -100 (ON RRP – 100)

BONY

Assets		Liabilities	
Reserves	-100	Deposits	- 100
	+100		+100

Balance sheet size unchanged

US Treasury

Assets		Liabilities	
TGA	+100	Debt	+100
	-100		-100

Balance sheet size unchanged

Primary dealers

Assets		Liabilities	
Deposits	-100	Repo	+100
	+100	Other liabilities	
Securities	+100		
Other assets			

Balance sheet size unchanged

Commercial bank

Assets		Liabilities	
Reserves	+ 100	Deposits	+ 100
	- 100		- 100
Securities		Other liabilities	
Loans			
Repo			

Balance sheet size unchanged

Foreign central bank

Assets	Liabilities
Securities	Reserves
FRRP	Other liabilities
Deposits	
Other assets	

Money market fund

Assets		Liabilities
Deposits	+ 100	Fund shares
	- 100	
ON RRP	- 100	
Repo	+ 100	
Securities		

Balance sheet size unchanged

Customer

Assets	Liabilities
Deposits	Loans
Securities	Repo

Balance sheet size unchanged

FIGURE 5

Following various recommendations made to address these issues (Duffie, 2020; Liang and Parkinson, 2020; Group of Thirty, 2021; Inter Agency Working Group on Treasury Market Surveillance, 2021 and 2022), on 14 September 2022, the SEC proposed a rule[60] which would require the FICC to take the necessary steps to force its clearing members (i.e. all primary dealers) to route all of their Treasuries repurchase and reverse repurchase agreements and a very large amount of their Treasury purchases and sales through central clearing[61]. This reform, which is very ambitious, is likely to increase dealers' intermediation capacities by lightening their balance sheets. According to the SEC, it would be a step towards all-to-all trading platforms, where buyers (lenders) and sellers (borrowers) can come together without any intermediaries[62]. Even though the rule allows the margin requirements imposed on clearing members to be adjusted[63], it does, however, risk significantly increasing the costs borne by their counterparties not affiliated with the FICC. Some analysts or lobbyists have already warned that this rule may lead to shallower Treasuries markets, as a result of disincentivising some participants from taking advantage of them.

***

The possibility that the Fed will not be able to implement QT2 for the entire planned period due to a major downturn in market liquidity cannot be ruled out[64]. In this regard, taking into account the impact of regulatory constraints imposed on banks, the main intermediaries on money and Treasuries markets, seems essential. During the QT1 programme, liquidity management constraints had hindered the Fed's plans to reduce its balance sheet. Now, the balance sheet constraints could in turn curtail QT2.

A number of monetary policy or regulatory provisions, aimed more broadly at preventing liquidity risks and boosting the resilience of the Treasuries market, could alleviate these constraints. Some pitfalls may limit the scope of these provisions, however. This is the case in particular for the two repurchase facilities put in place by the Fed (the Standing Repo Facility and the FIMA repo). By providing the opportunity to convert securities into liquidity should there be stress, these facilities were designed, implicitly, to encourage small banks and foreign central banks which do not have swap agreements with the Fed to enlarge their Treasuries portfolios, automatically reducing the proportion of securities that are likely to remain on primary dealers' balance sheets. Due to, in particular, some of their arrangements (the incapacity to clear positions and the stigmatisation risk for the Standing Repo Facility, the high cost of the FIMA repo facility), membership applications for these two facilities are rare however.

This is the case, then, for the regulatory changes considered. Potentially easing the SLR leverage constraint would give large banks, which are involved in market making, the opportunity to free up balance sheet capacity. However, with no additional review of the method for calculating the surcharges based on systemic importance scores, and given the projected growth in US federal debt, we do wonder whether easing it in such a way would be appropriate. Ambitiously broadening the scope for Treasuries markets' central clearing would significantly help to reduce primary dealers' balance sheet constraints. However, it could have the serious drawback of eroding the liquidity on the Treasuries market, by disincentivising some participants from taking advantage of it. It would also take several years to fully implement.

Completed on 15 December 2022

Céline Choulet

60 It is undergoing a 60-day consultation period.

61 The FICC would have to require centralised clearing for: (i) Treasuries repurchases or reverse repurchases when a FICC member participates in them, (ii) Treasuries purchases and sales when a FICC member acts as an interdealer broker; and (iii) purchases and sales between a FICC member and a broker-dealer, a government securities dealer, a government securities broker, a hedge fund or a levered account. Transactions where one of the counterparties is a central bank, a sovereign entity, an international financial institution or a natural person would be exempted.

62 For this purpose, the SEC rule also requires the FICC to extend its clearing services to as many participants as possible on the secondary market for Treasuries (pension funds, asset managers and investment firms).

63 The rule stipulates that the FICC collects its margin requirements for its members' own transactions separately from the margins collected for transactions on their customers' behalf. Under some conditions, the rule would allow broker-dealers to include a debit in the customer reserve formula when delivering customer cash or Treasuries to meet the margin requirement at FICC.

64 If the American economy experiences an overly hard landing or if there is a serious risk of financial instability triggered by the geopolitical backdrop, this would likely curtail money tightening programmes, such as quantitative tightening, early.

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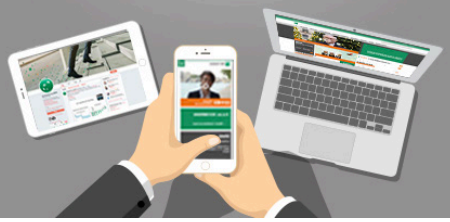

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