



US Monetary Shrinkage Requires Inflation Re-assessment

By John Greenwood

Introduction and Overview

- In December the US M2 money supply declined yet again. The month-on-month change was -0.7%; the 3-month annualised rate was -5.4%; and the 6-month annualised rate was -3.7%. Even the year-on-year percentage change for December turned negative (-1.3%).
- In an asset counterpart or accounting sense the sources of the decline in M2 growth are the declines in reserves and in securities holdings of the banks.
- At a deeper level, the underlying factors driving the declines are (1) the Fed's QT policy which is indirectly reducing reserves and (2) the incentives that are encouraging banks to reduce their holdings of securities or (3) slow their lending.
- More challenging, the 3-month and 6-month annualised declines in M2 are accelerating. What has happened in the monetary system to cause this very unusual and persistent decline in money growth?
- I suggest a hypothesis that the source of the problem is the payment of interest on reserves (IOR) at 4.40% (equal to the lower end of the Fed funds range plus 15 basis points) in an environment where the yield curve has become inverted.
- Under the "ample reserves" system, banks are incentivised to hold reserves rather than make loans or hold securities, leading to the accelerating decline in M2. Under the old "scarce reserves" system, this would not have happened.
- These considerations require a re-assessment of the inflation outlook, bringing forward the date by which any excess money balances will have been used up in higher spending and inflation.

International Monetary Monitor Ltd

*The IMM Newsletter offers economic research written by John Greenwood, founder and Chief Economist of International Monetary Monitor Ltd. John was also the publisher, editor and lead author of **Asian Monetary Monitor**, a bi-monthly publication that he operated for 20 years from Hong Kong between 1977 and 1996. He was a pioneer of monetary research in Asia. From 1999 to 2021 he was Chief Economist at Invesco, based in London.*

To access my research please email your request to IMM@eri-c.com

1. Dramatic decline in US broad money growth

Last Tuesday, January 24th, the Fed released the monetary statistics for December. Yet again broad money (M2) was down, this time by a substantial \$147.4 bn.

Figure 1. US M2 Growth has Plunged by \$532 bn since March 2022

	M2	CHANGE				
		\$ BN	% MOM	%3M AR	%6M AR	%YOY
March	21739.7	31.3	0.1%	4.7%	7.5%	9.5%
April	21644.2	-95.5	-0.4%	-0.1%	4.8%	7.6%
May	21649	4.8	0.0%	-1.1%	2.8%	6.0%
June	21607.3	-41.7	-0.2%	-2.4%	1.1%	5.6%
July	21636.1	28.8	0.1%	-0.1%	-0.1%	5.0%
August	21631.9	-4.2	0.0%	-0.3%	-0.7%	3.8%
September	21503.3	-128.6	-0.6%	-1.9%	-2.2%	2.6%
October	21415.5	-87.8	-0.4%	-4.0%	-2.1%	1.3%
November	21354.8	-60.7	-0.3%	-5.0%	-2.7%	0.0%
December	21207.4	-147.4	-0.7%	-5.4%	-3.7%	-1.3%

As the table above shows (with figures in red for negative numbers), the monthly decline is a little erratic, but the 3-month annualised rates and the 6-month annualised rates are accelerating downwards. With the latest figure for December, even the year-on-year percentage change has fallen into negative territory. These numbers are unprecedented in the post-World War 2 monetary history of the US, surpassing even the declines of 1948-49.

The table in Figure 1 starts with the absolute peak level of the M2 money supply in March 2022 (in blue). The data show its dramatic decline since March 2022. In the period from March to December, M2 declined in seven out of nine months, amounting to an absolute decline of \$532.3 billion, or -2.4%. Since M2 grew at an average rate of 16% p.a. in the two years 2020 and 2021, this represents an extraordinarily abrupt slowdown. (IMM Newsletter #2, dated August 1st, 2022, explained why M2 was declining despite the continued strong growth of commercial bank loans.)

In December the month-on-month change of M2 at an annualised rate was -0.7%; the 3-month annualised rate was -5.4%; and the 6-month annualised rate was -3.7%. Even the year-on-year percentage change for December turned negative (-1.3%).

In the following commentary I will examine the sources of the decline in M2 growth in an asset counterpart or accounting sense and the underlying forces driving the declines. This will compel a re-assessment of the near-term prospects for the US economy and for inflation.

2. Sources of the Monetary Contraction

A helpful way to look at the drivers of M2 is to break out the asset counterparts of broad money from the assets of the commercial banks (as opposed to listing the liability-side components of changes in money). The reason is that this enables us to pinpoint the actions of the central bank or the commercial banks which “explain” the resulting rate of money growth. The basic equation is:

$$\Delta M = \Delta L + \Delta S + \Delta R + \Delta \text{Others (net)}$$

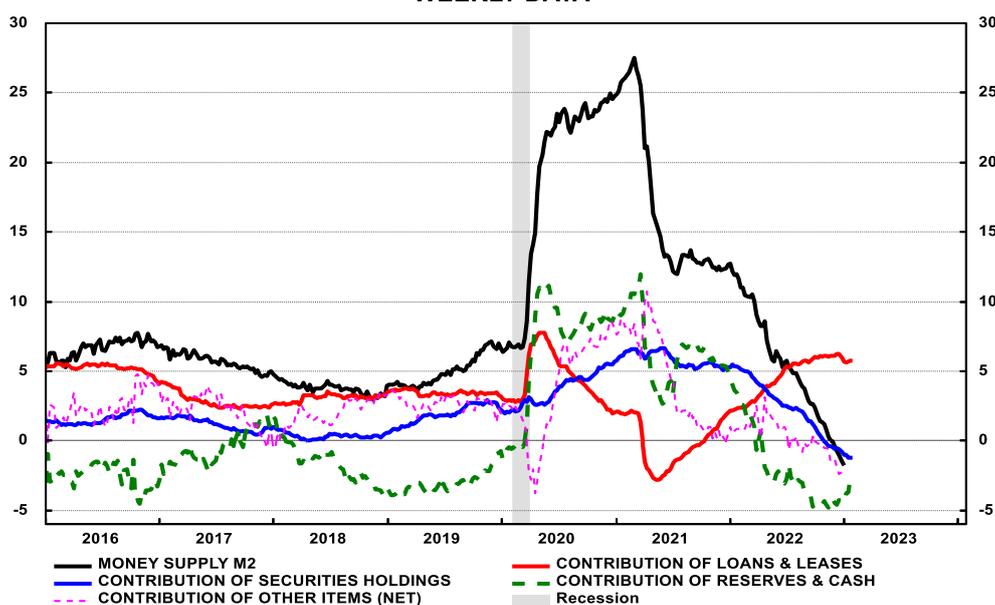
where M is the broad money supply (M2 or a proxy for M3 in the US), L is total bank lending, S is bank holdings of securities, R is bank reserve balances at the central bank, and the residual Others (net) includes all other changes on the asset or liability side of the consolidated balance sheet of the banking system, but importantly excluding the central bank. The results are shown in Figure 2.

Note that in this formulation the residual “ Δ Others (net)” includes a counterpart for changes in the cash currency holdings of the non-bank public, which is part of broad money but is not reflected in the first three items on the right-hand side of the equation. Also, commercial banks’ balance sheets may change for other reasons such as debt or equity issues by banks which can lead to increases in bank credit that do not correspond to changes in the deposits comprising broad money.

Note also that this version of counterpart analysis differs from the Bank of England’s or the ECB’s standard counterpart analysis (which includes the assets and liabilities

Figure 2. The Declines in Reserves and Securities Holdings are the Main Sources of the Current US Monetary Contraction

US: CONTRIBUTIONS TO ANNUAL CHANGE IN M2 (%YOY)
WEEKLY DATA



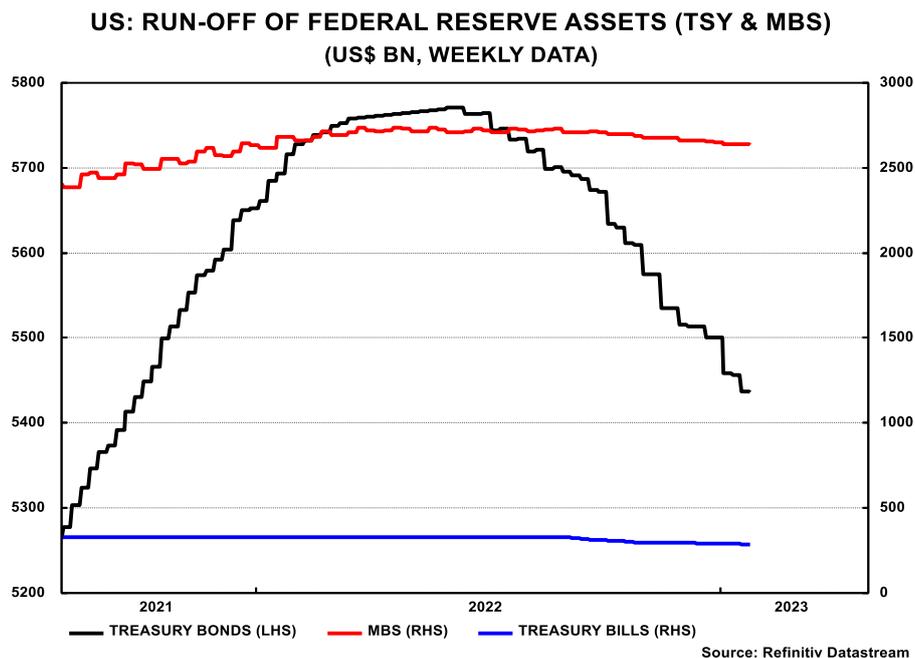
Source: Refinitiv Datastream

of the central bank), but it enables the analyst to see more clearly the drivers of change – actions by the commercial banks to increase lending and investments or actions by the central bank to increase broad money through QE or bank reserves.

Figure 2 shows the year-to-year percentage contributions of the variables in the equation on the previous page to the annual percentage changes in M2. The chart is compiled so that the sum of the components at any point in time is equal to the rate of growth of M2 over the previous year. Prior to the Covid crisis most of M2 growth was explained by loan growth. At the onset of the crisis many companies drew down credit lines (amounting to \$600-800 billion), but soon found they did not need the additional funds and therefore repaid the new loans and some pre-existing debt with the result that the contribution of loan growth briefly turned negative. Fast forward to 2022-23 and bank lending is buoyant once more, contributing +5.7% to M2 growth of -1.8% (at December 30, using weekly data). Reserves accounted for -4.5% while the decline in securities holdings accounted for -1.0%, with other items (net) accounting for -2.0%.

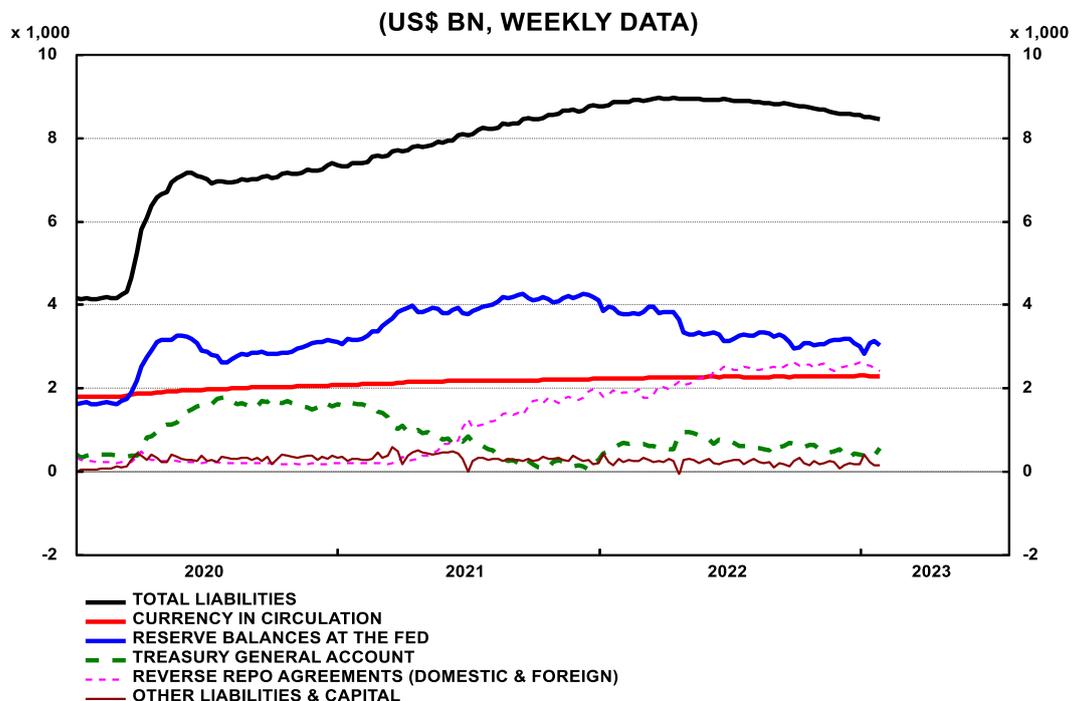
There are two reasons for the decline in reserves: (1) QT, and (2) the build-up of O/N RRP. (1) QT follows from the Fed’s decision to reduce the size of its balance sheet, starting in June 2022 at \$47.5 bn from June to August and scaling up to \$95 bn per month (\$60 bn in Treasuries and \$35 bn in MBS) from September 2022. Between September and the end of January 2023, however, Fed assets declined from \$8,822 bn to \$8,471 bn, or by \$70 bn per month, well short of the target. The reason, as shown in Figure 3, was the Fed’s inability to dispose of MBS in a rising interest rate environment since the lack of demand for refinancing means there have been few redemptions.

Figure 3. The Fed has been unable to dispose of MBS at the desired rate.



(2) The second reason for the decline in reserves is the transfer of funds from reserves to the overnight reverse repo (O/N RRP) account of the Fed. As shown in Figure 4, the usage of the O/N RRP facility (pink dashed line) has expanded massively since it was made available to domestic entities such as Federal Home Loan Banks (FHLBs) and Money Market Funds (MMFs) from March 2021, rising to over \$2 trillion by June 2022. (Previously the Fed’s reverse repo or overnight deposit facility against collateral had only been available to foreign official institutions such as central banks or governments. The amounts were typically in the range \$200-300 billion.) At the end of December, the combined balance reached \$2.6 trillion.

Figure 4. The Fed controls the size of its balance sheet, but not the composition of its liabilities.
US FEDERAL RESERVE LIABILITIES



Source: Refinitiv Datastream

If these are the statistical explanations for the recent accelerating contraction in M2, what are the underlying economic incentives?

I propose the following hypothesis.

The underlying driver is the Fed’s offer of interest on reserve balances (IORB) at 15bp over the lower end of the Fed funds range, i.e., currently $4.25\% + 15\text{bp} = 4.40\%$. Since the Fed has been raising rates from March 2022 and the yield curve has become inverted, the banks are incentivised to sell Treasuries (or other long-term securities) and instead to hold reserves earning a safe 4.40%.

The effect of this is to encourage banks to hold reserves rather than Treasuries or other long-term securities. When a bank sells a security to a non-bank, deposits in the system decline as the buyer's deposit account is debited, reducing the money supply. The full set of transactions are set out in T-form balance sheets in the Appendix pp.10-11 ("Bank transactions for a bank purchase or sale of securities"). Since April, the securities held by US banks have declined by \$300 billion, reducing the M2 money supply by a similar amount. So basically, as the Fed raises rates and inverts the yield curve, the decline in the money supply accelerates.

As readers will know, the current system operated by the Fed is known as an "ample reserves" regime. Under the previous regime of "scarce reserves" (i.e., one in which the Fed did not pay interest on reserves), the abrupt contraction of M2 in this way would not have happened.

3. Unintended consequences of the "ample reserves" regime

Aside from the unexpectedly sharp downturn in M2 growth, there are also other unintended consequences of implementing the current "ample reserves" regime.

The first unintended consequence derives from the Fed offering highly favourable rates on overnight reverse repos (O/N RRP) at 5bp over the lower end of the Fed funds range, i.e., currently 4.25% +5bp = 4.30%. This rate is available to Federal Home Loan Banks (FHLBs) and Money Market Funds (MMFs). MMFs now hold nearly half their total assets overnight with the Fed (over \$2 trillion out of total assets of \$4.7 trillion). Since the Fed controls the total size of its assets or liabilities but does not control the composition of its liabilities, the increase in RRP also reduces the reserves of banks. This happens when funds (e.g., held by a MMF at a bank) are transferred from a bank deposit to the RRP account at the Fed, requiring the bank in question to draw down its reserves.

The second unintended consequence is that the Fed is now running substantial losses as it pays out the IORB rate of 4.40% on reserve balances of \$2 trillion to banks and 4.30% to MMFs and FHLBs on Overnight RRP facilities also of \$2 trillion, but the yields on Treasuries and MBS on its balance sheet are much less. In the nine months prior to last September, the Fed transferred \$76 billion in profits to the US Treasury. That came to an abrupt halt in September, when the Fed's cost of operations started to outstrip its earnings. Since then, Federal Reserve banks [have racked up an estimated](#) \$18.8 billion in losses and have suspended remittances to the US Treasury.

Projecting forwards, these losses are likely to continue this year at a rate of some \$2 billion per month and will increase if the Fed funds rate is raised further.

How did things go so wrong? It was not just that Fed economists failed entirely to forecast the inflation and hence the rise in interest rates and the negative yield gap between the Fed's earnings and its expenses. There was something more fundamental. Their response to the crisis was out of line with the classical remedy.

When the Fed was founded in 1913, one of the key justifications was to provide an “elastic” currency – a system that would expand the stock of money when needed and withdraw it subsequently. However, instead of expanding the amount of money and then withdrawing it after the Covid-related panic of March 2020 had passed, the Fed produced an unprecedented amount of money and never withdrew it. The Fed should have followed the Bank of England template of 1825, as described by Jeremiah Harman and approvingly quoted by Walter Bagehot in “*Lombard Street*”:

The way in which the panic of 1825 was stopped by advancing money has been described in so broad and graphic a way that the passage has become classical. “We lent it,” said Mr Harman on behalf of the Bank of England, “by every possible means and in modes we have never adopted before; we took in stock on security, we purchased Exchequer bills, we made advances on Exchequer bills, we not only discounted outright, but we made advances on the deposit of bills of exchange to an immense amount, in short, by every possible means consistent with the safety of the Bank, and we were not on some occasions over-nice.”¹
(Bagehot, 1873, p. 26)

Without doubt, there was a financial panic at the onset of the Covid-19 pandemic. In the US and elsewhere investors began to perceive the risk of substantial losses as the government decided to impose lockdowns on large parts of the economy and social life. One manifestation was a “dash for cash” or at least a dash for safe securities.

To a large degree the Fed’s policymakers could have replicated the response of the Bank of England in 1825. The table below lists the instruments mentioned in the quotation above and their modern equivalents.

Figure 5. How the Fed could have replicated the Bank of England’s 1825 response to panic.

1825 measures	Modern equivalents
“Took in stock on security”	Loans against collateral
“Purchased Exchequer bills”	Purchase Treasury bills
“Made advances on Exchequer bills”	Repo loans against Treasury bills
“Discounted outright”	Purchased securities outright (with haircuts)
“Advances on the deposit of bills of exchange”	Repo loans against private commercial bills or other private sector securities

The unique feature of the 1825 measures was that they were all self-liquidating within a short period. The effect was that although the Bank of England created a substantial amount of new money in response to the panic, within a few weeks or months the loans or securities on the books of the Bank had either matured or been repaid, and therefore disappeared from the Bank’s balance sheet.

¹ The clause “we were not on some occasions over-nice” means that the Bank did not discriminate too carefully as to the quality of the underlying security. The priority was to inject money into the market.

In other words, the excess money created to calm the panic of 1825 and injected into the economy had been withdrawn without leaving any inflationary overhang. The expansion of the money supply had been “elastic”, expanding when needed and contracting back to its previous size when the panic was over. Note, too, that there was no mention in Jeremiah Harman’s testimony of interest rates having been lowered to near zero.

There appears to be no reason why the Fed (or the Bank of England itself) should not have adopted the same strategy in 2020. Instead, the FOMC lowered the Fed funds rate in two big steps on March 3 and 15, 2020 to 0-0.25%, and soon after began to purchase securities outright across the full maturity spectrum of the Treasury market and in the long-term mortgage-backed securities (MBS) market. These purchases had the effect of rapidly increasing the money supply (M2) throughout 2020, 2021, and until March 2022.

Moreover, because the Fed showed no intention to dispose of the securities once the panic had subsided, the additions to the money supply were effectively permanent. Inflation has been the result.

In addition, because the Fed has built up a seriously mismatched balance sheet with overnight liabilities funding long-term assets that generate only a low yield, as soon as short-term market rates increased it was facing substantial losses. Because the average maturity of the Fed’s assets is about 5-6 years, these losses will exacerbate the funding problems of the federal government over the next several years at least, making the deficits bigger, enlarging net interest expense on the debt, and bringing the debt ceiling problem closer.

4. Inflation Re-assessment

The abrupt slowdown and shrinkage of US M2 since March has required me to re-assess the inflation outlook. My position had been that the excess money created by the Fed and the US banking system in 2020-21 and in the early months of 2022 meant that money balances held by US households and firms were still roughly 15% above their pre-Covid trend in the third quarter of 2022, and that this would translate into inflation persisting at above-target levels through all of 2023. The recent release of the GDP data for the fourth quarter enables me to update this calculation, giving an estimated 12% excess of money balances above the pre-Covid trend in the final quarter of 2022.

Further, the shrinkage of M2 during 2022 means that nominal GDP growth in 2023 will now be considerably less than I had previously forecast, with both the real growth and inflation components lower than I had expected. These numbers mean that the excess of money balances available to fuel inflation will be burned off earlier than expected, and the inflation rate (measured year-on-year) will fall faster than I had previously projected. Indeed, by yearend 2023 my projections suggest that inflation will have fallen to virtually zero, implying no spill-over into 2024.



Already the *level* of prices has been virtually unchanged since June 2022. In that month the overall index for the seasonally adjusted CPI was 296.311 and in December it was still at 296.797 (1982-84=100). A strong case can be made that already the upward momentum has been stalled, and that Fed policymakers are focusing too much on year-on-year rates of change which are still high but are reflecting the big increases in month-by-month inflation that occurred in the early months of 2022.

In the first six months of 2022 the monthly increase in the seasonally adjusted CPI averaged +1.02% per month amounting to +10.8%, whereas in the second six months the monthly increases averaged only +0.03% per month amounting to just +0.4%. Even allowing for some randomness in the data, headline CPI inflation plunged from over 10% in the first half of 2022 to less than half of one percent in the second half of the year!

If, as a result of the effect of the very slow M2 money growth experienced since March 2022, the current rate of negligible price increase persists through the first six months of 2023, the year-on-year rates of inflation will fall to virtually zero by June. It is projections like this which lead me to the view that inflation will be largely over by mid-2023 and could be falling in the second half of 2023. Such a scenario would surely be accompanied by steep declines in economic activity and a drastic reconsideration of policy by the Federal Reserve.

Summary and Conclusions

- The declines in US M2 money supply have been such as to make even the year-on-year percentage change for December turn negative (-1.3%).
- At one level the sources of the decline in M2 growth are the declines in bank reserves and in the securities held by the banks.
- At a deeper level, the underlying factors driving the declines are (1) the Fed's QT policy, which is indirectly reducing reserves, and (2) the IOR payments from the Fed that are encouraging banks to reduce their holdings of securities.
- Under the old "scarce reserves" system, banks were not paid interest on their reserves, but under the current "ample reserves" regime, they are paid 15 bp over the lower end of the Fed funds range - currently 4.40% (= 4.25% + 15 bp).
- With the yield curve inverted, it is safer and more profitable to hold reserves than loans or securities. The result is an accelerating decline of M2.
- The prospect of further monetary contraction in 2023 requires a re-assessment of the inflation outlook, bringing forward the date by which any excess money balances will have been used up in higher spending and inflation.
- Without excess money in the system, inflation will not magically stay high because of expectations or because workers demand higher wages. If wages do continue to rise, this will be at the expense of profit margins.
- The accelerating M2 decline threatens a more severe downturn and a higher unemployment rate than is needed to end the current bout of inflation.

Appendix: Balance sheet transactions for a bank purchase or sale of securities

Part 1: Bank purchase of securities

Fed, bank and non-bank transactions for a bank *purchase* of Treasury securities.

FED	BANK A	BANK B	NON-BANK
R -	R -	R +	Tsy -
R +	Tsy +	D +	D +

Step 1: Bank A draws down on its reserves (R -) to purchase an existing Treasury security (Tsy +); its balance at the Fed is debited (R -). Bank A's total assets are unchanged.

Step 2: The non-bank seller of the Treasury security (Tsy -) receives a payment from Bank A which he/she/it places on deposit at Bank B (D +). The non-bank's total assets are unchanged. NB broad money has increased due to Bank A purchasing securities.

Step 3: Bank B seeks settlement by presenting the customer's check from Bank A at the Fed. Bank B's reserves are credited (R +) while Bank A's reserves are debited. The size of the Fed's balance sheet remains unchanged.

When a bank makes a loan, it is widely understood that this creates new credit or money in the banking system. The credit is the loan obligation to the bank; the new money is the deposit that is credited to the borrower's account at the bank. Subject to meeting its capital and other ratios, the bank does not need to draw on reserves to make the new loan; it simply writes up both sides of its balance sheet with the new asset (the loan) and the new liability (the deposit credited to the borrower).

When a bank purchases a security, the process is similar, except that in this case the bank must make a payment to the seller of the security whose account may be maintained at another bank. The payment is made by drawing down on Bank A's reserves held at the Fed. The T-form balance sheets above show the transactions involved in the purchase of a security (a Treasury bond) by Bank A from a non-bank customer of Bank B.

The transactions highlight three features of the process that are important for a proper understanding of the macro-economic effects:

1. The total assets of the bank acquiring the security (Bank A in our example) do not increase; similarly, its liabilities do not increase.
2. The money supply is increased as a result of the payment from Bank A's reserves to the seller of the security who deposits the check from Bank A in his account at Bank B. There are now more deposits held by non-banks in the system.



3. While Bank A has seen its reserves at the Fed decline, Bank B's reserves are increased by an exactly matching amount, with the result that the size of the Fed's balance sheet is unchanged.

Part 2. Bank sale of securities

Fed, bank and non-bank transactions for a bank sale of Treasury securities.

FED	BANK A	BANK B	NON-BANK
R +	R +	R -	Tsy +
R -	Tsy -	D -	D -

- Step 1:** Bank A sells a Treasury security (Tsy -) from its portfolio to a non-bank, expecting to add the proceeds to its reserves. Bank A's total assets are unchanged.
- Step 2:** The non-bank purchaser of the Treasury security (Tsy +) makes a payment from his/her Bank B (D -) to Bank A. The non-bank's total assets are unchanged. NB broad money has now decreased due to Bank A selling securities.
- Step 3:** Bank A passes the non-bank's payment check to the Fed where the reserve account of Bank A is credited (R+) and the reserve account of Bank B is debited (R -). The size of the Fed's balance sheet remains unchanged.

When a bank sells a security, the process is similar, except that in this case the bank receives a payment from the purchaser of the security whose account may be maintained at another bank. The T-form balance sheets above show the transactions involved in the sale of a security (a Treasury bond) by Bank A to a non-bank customer who maintains his/her account with Bank B. The payment is made by drawing down on the deposit of the purchaser at Bank B.

The transactions highlight three features of the process that are important for a proper understanding of the macro-economic effects:

1. The total assets of the bank selling the security (Bank A in our example) are unchanged; its reserves increase while its holdings of securities decline. Similarly, its liabilities do not change.
2. The money supply decreases as a result of the payment from the purchaser's deposit account at Bank B to the reserve account of Bank A at the Fed. There are now less deposits held by non-banks in the system. The disposal of the security by Bank A has decreased the money supply.
3. While Bank A has seen its reserves at the Fed increase, Bank B's reserves are decreased by an exactly matching amount, with the result that the size of the Fed's balance sheet is unchanged.

Disclaimer

The information in this report has been prepared by International Monetary Monitor Ltd. (IMM). Materials available herein have no regard to the specific business objectives, financial situation or particular needs of any specific recipient. The research is published for information purposes and is not to be construed as a solicitation or an offer to buy or sell any securities or related financial instruments. The opinions, estimates and projections in this report reflect the current judgment and express views of the author as at the date of the report. They do not necessarily reflect the opinions of IMM and are subject to change without notice. Unless specifically stated otherwise, all price information is indicative only. No representation or warranty, either expressed or implied, is provided in relation to the accuracy, completeness, or reliability of the materials, nor are they a complete statement of the securities, markets or development referred to herein. The material should not be regarded by recipients as a substitute for the exercise of their own judgment. The financial instruments discussed in this report may not be suitable for all investors.

Copyright © 2023 International Monetary Monitor, not for distribution without express permission.
Registered office: c/o PKF Littlejohn, 15 Westferry Circus, Canary Wharf, London E14 4HD, UK.