

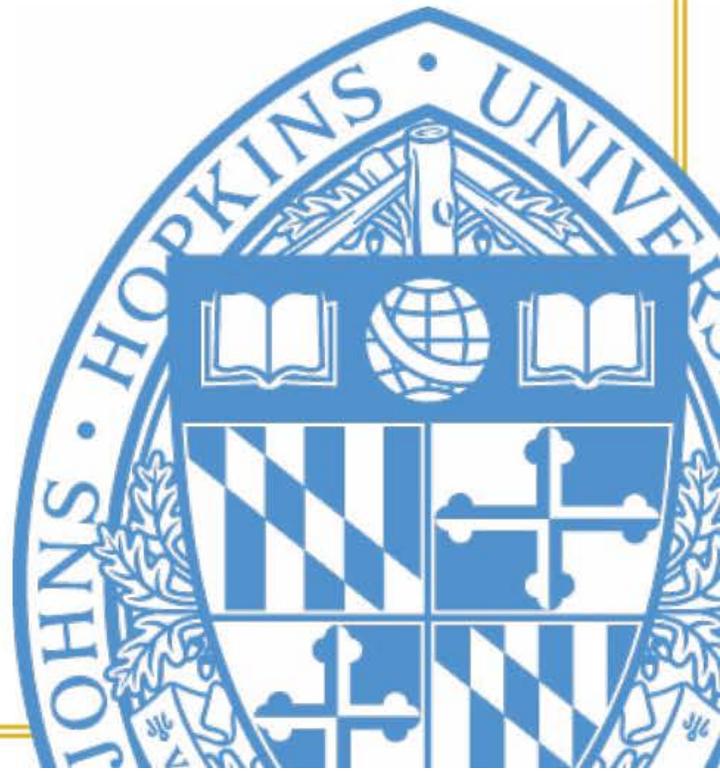
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Studies in Applied Economics

**THE FEDERAL RESERVE AND
INTEREST RATES**

Thomas R. Saving

Johns Hopkins Institute for Applied Economics,
Global Health, and the Study of Business Enterprise



The Federal Reserve and Interest Rates

By Thomas R. Saving

About the Series

The Studies in Applied Economics series is under the general direction of Prof. Steve H. Hanke, Founder and Co-Director of The Johns Hopkins Institute for Applied Economics, Global Health, and the Study of Business Enterprise (hanke@jhu.edu). The views expressed in each working paper are those of the authors and not necessarily those of the institutions that the authors are affiliated with.

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Saving received his Ph.D. from the University of Chicago in 1960. Prior to joining the economics faculty at Texas A&M University in 1968, he was on the faculty at University of Washington in Seattle and Michigan State University. He attained the rank of full professor at Michigan State University in 1966, six years after the award of this Ph.D. in 1960.

In 2000, President Clinton appointed him as a Public Trustee of the Social Security and Medicare Trust Funds. On May 2, 2001, President Bush named him to the bipartisan President's Commission to Strengthen Social Security. On April 19, 2006, President Bush appointed him to an unprecedented second term as a Public Trustee of the Social Security and Medicare Trust Funds which expired in December 2007.

His early research was on Monetary Theory and Policy. During that time he co-authored two books with fellow colleague Boris P. Pesek, *Money, Wealth and Economic Theory*, Macmillan, 1967 and *Foundations of Money and Banking*, Macmillan, 1968. He has published in all major US economics journals.

He is a co-editor of *Medicare Reform: Issues and Answers*, University of Chicago Press, 1999, the co-author of *The Economics of Medicare Reform*, W.E. Upjohn Institute, 2000 and *The Diagnosis and Treatment of Medicare*, AEI Press, 2007. His current research on Federal Reserve policy has resulted in his newest book, *A Century of Federal Reserve Monetary Policy: Issues and Implications for the Future*, World Scientific Press. He has published editorials in the *New York Times*, the *LA Times*, the *Washington Post* and the *Wall Street Journal*.

THE FEDERAL RESERVE AND INTEREST RATES

Thomas R. Saving

It's the Interest on Reserves not the Fed Funds Rate that Matters

Each time the Federal Reserve Open Market Committee met in 2022, the financial press has trumpeted that the Federal Reserve is raising interest rates, presumably to control inflation. The interest rate being discussed is not an interest rate at all but is the upper bound of the Federal Reserve's range for what is called the Fed Funds rate. The Fed Funds market is an overnight market for financial institutions to trade reserves. Thus, no individual or firm borrows or lends in this market.

Before going further, a bit of a history lesson will prove useful. Before the tremendous Federal Reserve expansions, the Great Recession and Pandemic expansions, Federal Reserve member banks had to meet reserve requirements but holding reserves reduced the amount that banks could invest in income earning assets. As a result, reserves in excess of the required level were minimal. But a bank's reserves were affected by the actions of its customers, meaning that unexpected withdrawals would deplete a bank's reserves, while at the same time increasing another bank's reserves. The Fed Funds market allowed banks with excess reserves to lend overnight to banks that needed reserves to meet the required level. Thus, historically the Fed Funds market participants were Federal Reserve member banks.

In that pre-2008 world, the Federal Reserve could affect the scarcity of reserves, and thus the Fed Funds interest rate, through open-market operations. Open market purchases injected money into the economy and increased bank reserves, reducing the Fed Funds rate. Open market asset sales took money out of the economy and reduced reserves. Reserve scarcity then increased the Fed Funds rate. In that world, Federal Reserve announcements of changes in their "target" Fed Funds rate would indicate future Federal Reserve actions in asset markets. An increase in the Federal Reserve target for the Fed Funds rate would signal that the Federal Reserve was going to sell assets and reduce bank reserves.

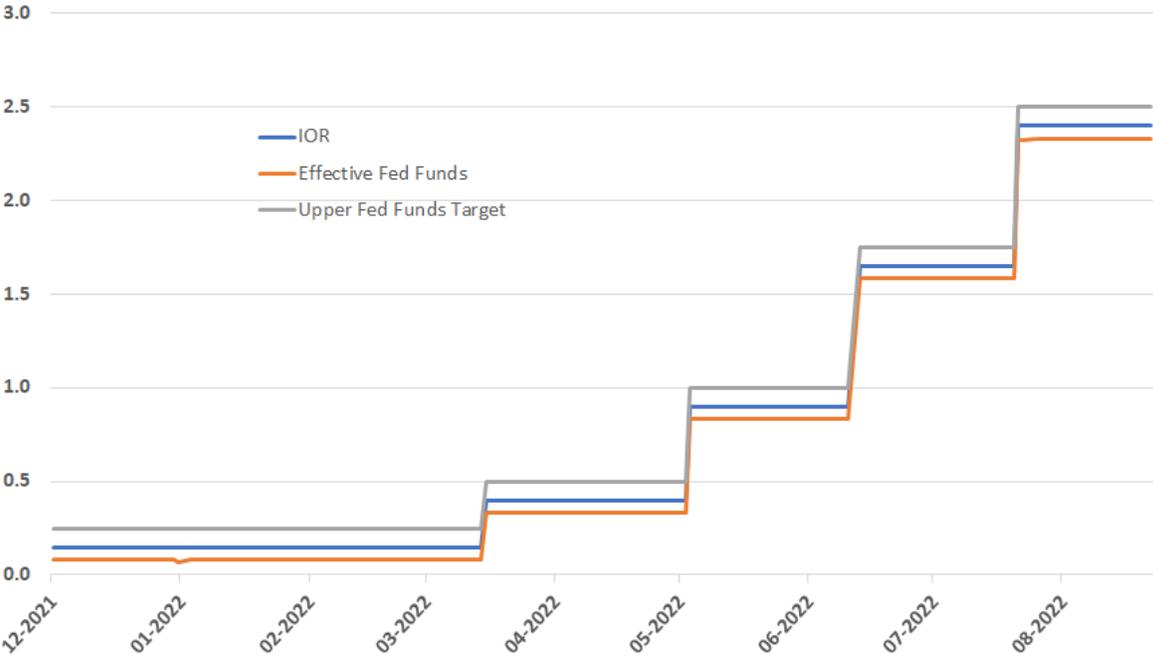
The introduction of the Federal Reserve paying banks interest on member bank reserve accounts changed the Fed Funds market in two ways.¹ First, the Federal Reserve response to the 2008 financial crisis resulted in member banks being awash in

¹The federal funds market consists of domestic unsecured borrowings in U.S. dollars by depository institutions from other depository institutions and certain other entities, primarily government-sponsored enterprises. (Federal Reserve Bank of New York)

reserves. The introduction of paying interest to banks to hold reserves, also known as the interest rate on reserve balances or IORB, was necessary to prevent the tremendous Federal Reserve asset expansion from causing inflation as reserves became a market investment for IORB eligible financial institutions, essentially banks that are member of the Federal Reserve. Thus, there is no reason for a member bank to be on the borrowing side of a Fed Funds transaction. No bank would lend in the Fed Funds market at a rate of interest less than the level of the interest rate on reserves. Thus, the IORB sets a floor on the Fed Funds rate that IORB-eligible financial institutions would lend in the Fed Funds market.

Second, if member banks have large reserve holdings, who are the players in the Fed Funds market? On the supply side are the GSE's, Fannie Mae and Freddie Mac for example, which have master accounts at the Federal Reserve but are not eligible to receive interest on their deposits at the Federal Reserve would be suppliers of Fed Funds. But then, who are the borrowers? In this case, foreign banks borrow in this market and if the Fed Funds rate is less than the IORB, these banks can deposit the borrowed funds at the Federal Reserve and receive the IORB. Essentially, they benefit from the difference between the IORB and their borrowing rate in the Fed Funds market. Figure 1 shows the Federal Reserve's upper Fed Funds target, referred to by the press as the Federal Reserve's bank rate, the effective Fed Funds rate, the weighted average interest rate for all Fed Funds transactions, and the interest rate on bank reserves, the IORB.

Figure 1. Upper Fed Funds Target, IOR and Effective Fed Funds Rate
December 1, 2021 to September 7, 2022

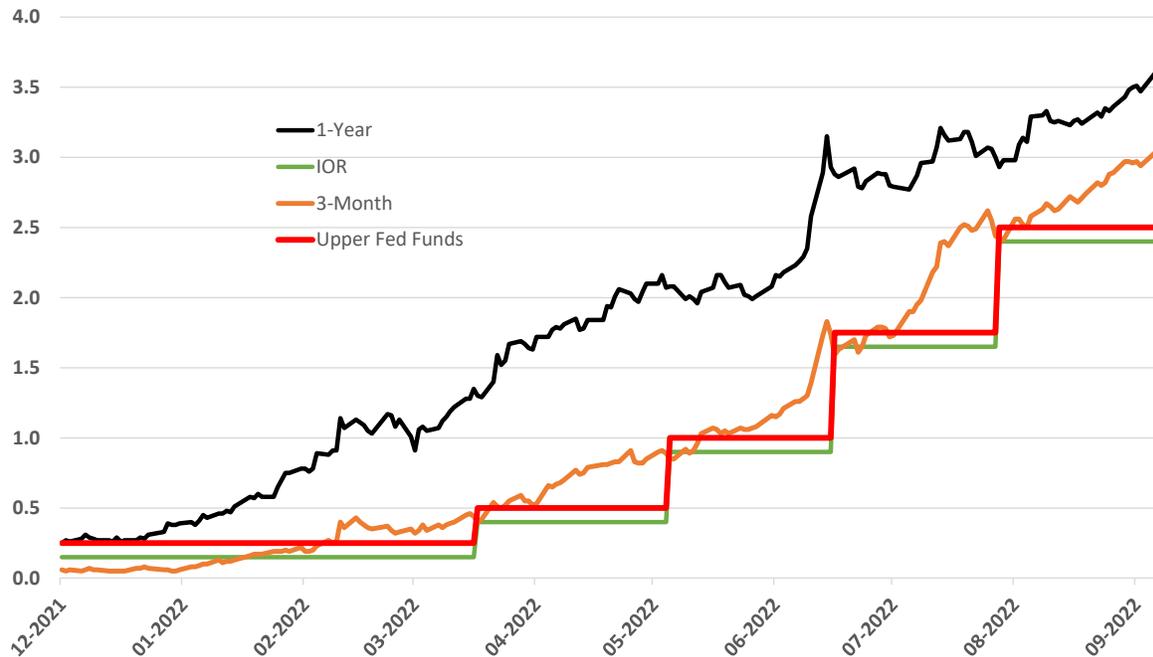


Even a casual inspection of Figure 1 shows that the effective Fed Funds rate is essentially determined by the IORB. In fact, with only two exceptions the effective Fed Funds is always seven basis points below the IORB.² Thus, it's clear that the important interest rate is the IORB. Indeed, the Fed Funds upper target is not even an interest rate. Moreover, the IORB is important not just because it determines the effective Fed Funds rate, a rate that plays no real role in the economy, but because it affects bank market activity. Bank reserve holdings are greatly affected by the level of the IOR relative to market interest rates. Importantly, bank reserves are printing press money just waiting to be released into the economy. If the Federal Reserve allows market interest rates to rise without responding with an increase in the IORB, bank reserves will enter the private market, the equivalent of the Federal Reserve printing money.

Ultimately, the control of inflation requires the control of the Federal Reserve money printing press and that requires that the market interest rates-IORB differences be set to control bank reserves. If the Federal Reserve is doing its job, changes in the IORB will follow market interest rate changes. Figure 2 shows how this has worked since December 2021 to the present. At the outset, the 15-basis point IORB was between the 25- basis point return on 1-year Treasuries and the 6- basis point return on 3-month Treasuries. Then market interest rates began a steady rise so that by the time the Federal Reserve responded in March by raising the IORB 25 basis points, from 15 basis points to 40 basis points, 1-year Treasuries had risen to 135 basis points and 3-month Treasuries were at 44 basis points. Each of the press touted Federal Reserve interest rate increases have moved the IORB to the level of 3-month Treasuries. Then, quickly the 3-month Treasuries rose above the new higher IORB.

² The effective federal funds rate (EFFR) is calculated as a volume-weighted median of overnight federal funds transactions reported in the FR 2420 Report of Selected Money Market Rates. See <https://www.newyorkfed.org/markets/reference-rates/effr>.

Figure 2. 3mth, 1yr Treasury Upper Fed Funds Target and IOR
December 1, 2021 to September 7, 2022



It is apparent from both Figures 1 and 2 that what the press terms a 'Federal Reserve interest rate', the upper Fed Funds target, is not important. Indeed, it is not an interest rate. The real Federal Reserve set interest rate is the IORB, and it is important! The IORB affects banks willingness to supply investments and loans to the market. Further, bank reserves are Federal Reserve printing press money just waiting to affect market demand and inflation. Thus, increases in the interest rate the Federal Reserve controls, the IORB, are important, but not because they make market interest rates higher, they do not, but because they control the Federal Reserve money printing press.

As an indication of just how important the Federal Reserve increases in the IORB are, current member bank reserves exceed \$3.3 trillion. To put this level of reserves in perspective, consider that total commercial bank credit is \$17.3 trillion. Thus, member bank reserves are just under 20% of total commercial bank credit. Now imagine the effect on credit markets if the member banks moved these reserves into the bank credit market. If you think we have inflation now, a release of new, Federal Reserve-printed money of this magnitude would make the inflation of the late 1970' seem small.

The Federal Reserve and the Economy

Only central banks have the power to print money. They do so by buying market assets and paying for these assets by issuing titles to legal tender. When the Federal Reserve increases its issued stock of money, it does so by buying securities from the public, referred to as “open-market” purchases, using not actual printed money but titles to printed money. These titles to printed money are deposited in the financial institutions of the financial asset sellers.

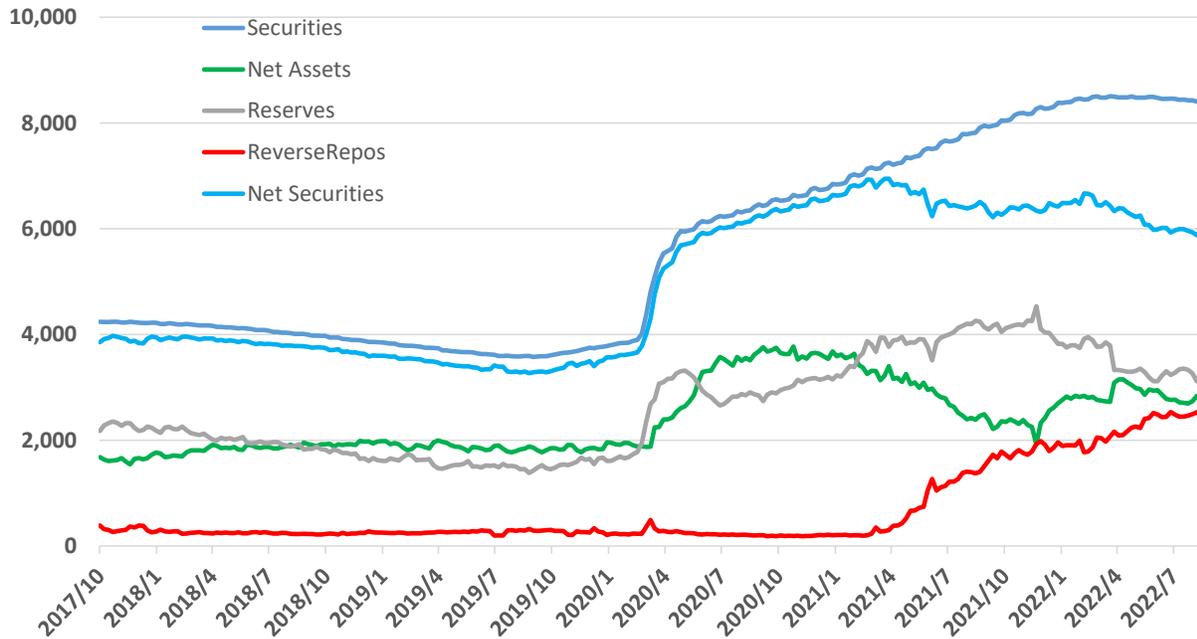
These titles may be actual currency but more often are deposits at financial institutions. In effect, the Federal Reserve creates wealth as it buys assets from the public and compensates the public with newly issued titles to legal tender. As a result, the public’s wealth remains the same while the Federal Reserve’s wealth rises by the full amount of the asset purchases. However, since the Federal Reserve must transfer all income less the cost of operation to the U.S. Treasury, the Federal Reserve is essentially owned by the public. As a result, all increases in the Federal Reserve’s net assets are increases in the nation’s wealth. It’s all just printing press-created money.

In the world before paying banks interest to hold reserves, essentially potential printing press money, Federal Reserve printing press money would equal total Federal Reserve holdings of securities. After interest on reserves, the potential level of printing press money equaled the total Federal Reserve assets less bank reserves. Then in September of 2014, the Federal Reserve began a program of overnight sales of their assets to eligible partners. These overnight repurchase agreements are referred to as reverse repo sales and are a reduction in Federal Reserve assets and the potential level of printing press money. Thus, the components of Federal Reserve net assets consist, on the positive side, of all securities held outright by the Federal Reserve. Then on the liability side lies bank reserves that receive interest, reducing the Federal Reserve yield on its securities holdings and the total of reverse repos.

Figure 3 shows the path of the components of Federal Reserve printing press money for the period from October 2017 through September 7, 2022. The maximum possible level of printing press money is the level of Federal Reserve securities held outright, the top line in the figure. The figure also shows net Federal Reserve securities asset holdings, securities held outright less those sold in the overnight market, or reverse repos. To get to net Federal Reserve assets, the level of potential printing press money, the remaining Federal Reserve liability, reserves, must be subtracted from net securities holdings because they reduce the maximum level of printing press money.

Figure 3. Federal Reserve Assets and Liabilities
October 2017 - September 7, 2022

\$Billions



The time period covered in Figure 3 begins with the Federal Reserve’s first effort to reduce its securities holdings, from October 2017 through the summer of 2019. At least through the winter of 2018, the Federal Reserve set the interest on reserves so that the draw of higher market interest rates resulted in member banks reducing reserves more than the Federal Reserve’s sales of securities. The success of this program is evident in the rise of Federal Reserve net assets from October 2017 through March of 2019. In fact, net assets grew even faster than the 4% annual growth rate required to meet the Federal Reserve’s goal of 2% inflation. The ultimate failure of this securities reduction plan was due to Federal Reserve mismanagement of the IORB as they allowed the difference between market interest rates and the IORB to fall, resulting an end to the reductions in member bank reserves. The end of member bank reserve reductions led to falling Federal Reserve net assets and ended the securities reduction program.³ In fact, the Federal Reserve began buying securities to achieve positive net asset growth by August 2019. All this demonstrates that the IORB is the most powerful policy tool in the Federal Reserve’s inflation control arsenal.

³ For a detailed discussion of the Federal Reserve’s attempt to get back to its past levels of assets see Thomas R. Saving “The Failed Federal Reserve Attempt to get Back to the Past,” PERC Policy Study 2002, May 2020. <https://perc.tamu.edu/publication?id=195>

The unprecedented Coronavirus pandemic asset response is especially evident in Figure 3. The Federal Reserve securities holdings almost doubled from the March 2020 level of \$3.8 trillion to their March 2021 level of \$6.8 trillion. More importantly, in the first six months of the pandemic asset acquisition splurge Federal Reserve net assets doubled from a March 2020 level of \$1.87 trillion to October 2020's level of \$3.75 trillion. The inflation potential of this level of printing press money was quickly mitigated by rising member bank reserves and the Federal Reserve's use of the reverse repo market to dispose of almost \$2 trillion of earning assets. The result shows up very clearly in Figure 3 as falling Federal Reserve net securities and rising reverse repos.

Over the period from August 2020 to December 2021, bank reserve rose 70% from \$2.68 trillion to \$4.52 trillion. As a result, by December 2021 Federal Reserve net assets had returned to their pre-pandemic level. That downward trend in Federal Reserve net assets has since reversed. From December 2021 to May 2022, Federal Reserve net assets grew 67% from the December 2021 level of \$1.9 trillion to a peak in May 2022 of \$3.3 trillion. Since May 2022, Federal Reserve net assets have been falling as increases in the IORB have resulted in stable bank reserves and the Federal Reserve has increased temporary securities sales, reverse repos, that are now \$2.5 trillion.

The reason for the rapid net asset increase in early 2022 was the rapid decline in bank reserves as banks responded to the fact that market interest rates rose significantly relative to the IORB as is clear in Figure 2. To make this point clearer, Figure 4 shows the difference between market interest rates and the IORB for the period from December 1, 2021 through September 7, 2022. In the figure the market advantage is shown as the basis point spread between 1-year Treasuries and the IORB and 3-month Treasuries and the IORB. In mid-December 2021, the 1-yr-IORB spread was under 15 basis points but then began a rapid rise. By mid-January it was 50 basis points and on its way to a mid-February level of 100 basis points. Thus, the decline in reserves is not surprising as market interest rates rose faster than the Federal Reserve was increasing the IORB.

Figure 4. 1yr Treasury - IOR, 3mth Treasury - IOR
January 1, 2015 to September 7, 2022

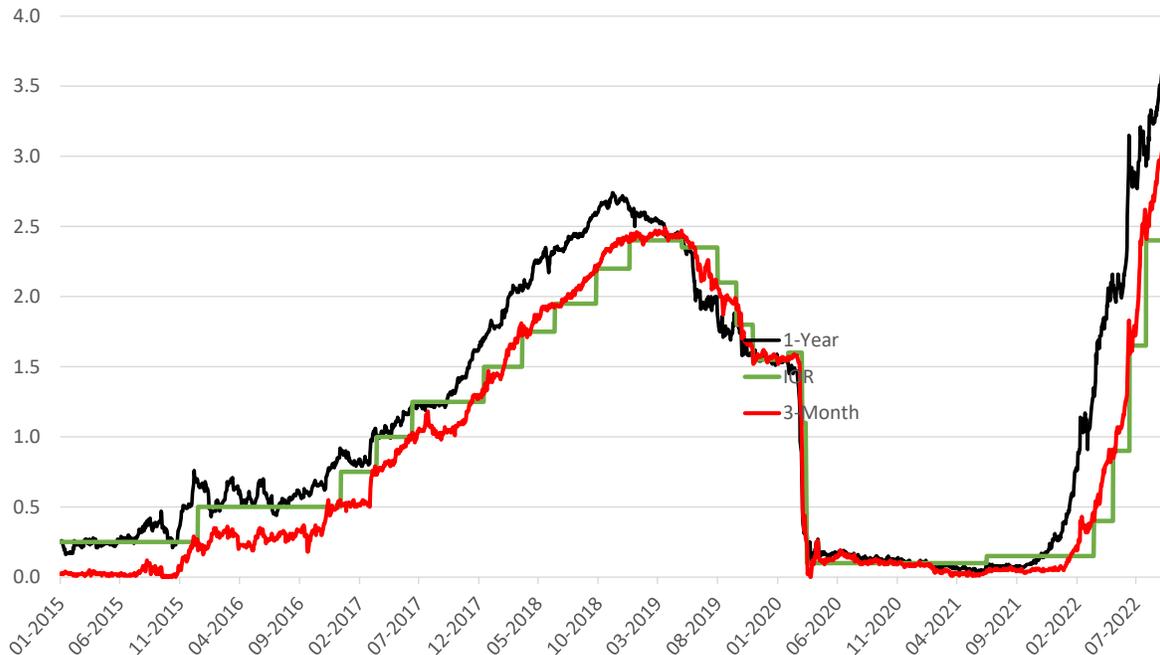


The press keeps reporting that the Federal Reserve intends to, as the press terms it, 'raise interest rates significantly,' but interest rates are rising and have been since December 2021, as is apparent from inspection of Figure 3. Both the 1-year and 3-month Treasuries have risen significantly. As late as mid-December 2021, the 1-year Treasuries rate was 26 basis points and 3-month Treasuries were at 5 basis points. At that time, the IORB was at 15 basis points, above the 3-month Treasury rate and below the 1-year Treasury rate. Then market interest rates began to increase, and that increase has not abated. The Federal Reserve finally recognized the market at its March 2022 FOMC meeting and raised the IORB to 40 basis points followed by further increases in May to 90 basis points, in June to 1.65% and then in late July to 2.4%. Clearly this increase was too little and too late. On September 7, 2022 the 1-year Treasury rate was 3.6%, 120 basis points above the 2.4% IORB.

To get a long-term perspective on the Federal Reserve's IORB actions, Figure 5 shows 1-year and 3-month Treasury rates along with the Federal Reserve's Fed Funds upper bound target and the IORB from January 1, 2015 through early-September 2022. Four important conclusions can be reached through inspection of the figure. First, the Federal Reserve is an interest rate follower rather than a determiner of market interest

rates. Second, for the period of successful Federal Reserve asset reductions, November 2017 through spring 2019, they allowed the difference between 1-year Treasuries to be significantly greater than any time before the current period. In fact, that large market advantage is what allowed the Federal Reserve to sell assets and still have their net assets rise as banks took advantage of the market-rate-IORB spread and reduced reserves more than the Federal Reserve reduced its asset holdings. Third, market interest rates began falling as early as November of 2018, well before the chaos of the pandemic government shutdown of the economy. The falling market interest rates were followed, but with a considerable lag, by Federal Reserve reductions in the IORB. In fact, it was this lag that spelled the doom of the Federal Reserve asset reduction program. Fourth, the rate of the current rise in market interest rates is unprecedented.

Figure 5. 1yr Treasury, 10-yr Treasury , Fed Funds Upper Bound and IOR
January 1, 2015 to September 7, 2022



Conclusion

Much of the press's reporting of the Federal Reserve's efforts to fight inflation is measured by how much the Federal Reserve is raising interest rates. The press's measure of interest rates is in terms of the Federal Reserve's upper bound target for the Fed Funds rate, not about the Fed Funds rate itself. A casual look at the data shows that market interest rates are not influenced by Federal Reserve decisions about its upper Fed Funds rate target. Rather, the Federal Reserve so-called 'interest rate increases' have

followed significant increases in market interest rates, not led these market interest rates.

The real question is by what mechanism does an increase in market interest rates affect the price level? Inflation is ultimately caused by central banks running their money printing press, usually to finance government expenditures. Essentially, running the central bank printing press is easier than paying for government expenditures through taxation. Inflation then becomes the tax that finances government.

How might the Federal Reserve increase the market yield on assets it holds? The answer is through large open market sales of these assets. These sales represent an increase in the supply of these assets to the public and reduce their price, thereby increasing their yield, the interest rate. But the effect on the price level is not because interest rates have risen but because the sale of Federal Reserve assets makes the public poorer. Controlling inflation is all about controlling the Federal Reserve money printing press - the Federal Reserve's contribution to the monetary wealth of the nation. One measure of this contribution is the level of Federal Reserve net assets. The Federal Reserve asset position is totally under its control through the combination of its open-market sales and purchases of securities, the level of the IORB that determines banks holdings of reserves and the level of reverse repos that are essentially short-term open-market sales of securities.