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The Covid Pandemic Federal Reserve

By Thomas R. SAVING †

Abstract. The major tool of Federal Reserve monetary policy in non-crises has historically been open-market operations in securities markets. To stimulate the economy, the Federal Reserve injects monetary wealth into the economy by buying securities with what could be termed "freshly printed" money. To cool an overheated economy, the Federal Reserve withdraws monetary wealth from the economy by selling securities and, in effect, destroys its newly acquired money. At almost the onset of the effects of the pandemic, the Federal Reserve engaged in a massive asset expansion that was truly unprecedented. In just the first three months of the pandemic, March, April and May of 2020, the Federal Reserve bought $2.13 trillion in securities. But they didn't stop there so that by April of 2022 the money injection reached $4.76 trillion, almost 20% of 2022 GDP! What is more astounding is that unlike the Great Recession interventions, there were no undergoing financial crises that triggered this massive expansion. The massive expansion was not only unprecedented and harmful as it has resulted in the end of the Federal Reserve's annual transfers to the U. S. Treasury that in 2022 equaled 30.5 % of the net interest cost of the federal debt. The Covid-19 Federal Reserve actions will go down in monetary history as the worst Federal Reserve policy in the more than 100-year history of the Federal Reserve.
Keywords. Covid pandemi; Federeal reserve; Economic growth.
JEL. E43; E51; G38.

1. Introduction

The primary role of the Federal Reserve at its inception was to ensure an elastic currency, rediscount commercial paper and supervise banking in the United States. The first two roles go together as when a member bank experienced a deluge of depositors demanding currency, a bank run, the newly established Federal Reserve could exchange that bank's commercial paper for the currency being demanded. When the crisis subsided, the bank would buy back the assets it used as collateral for the Federal Reserve supplied currency. Subsequently, legislation expanded the Federal Reserve's policy role to achieve maximum employment, stable prices, and moderate long-term interest rates.

The major tool of Federal Reserve monetary policy in non-crises has historically been open-market operations in securities markets. To stimulate the economy, the Federal Reserve injects monetary wealth into the economy by buying securities with what could be termed "freshly printed" money. To cool an overheated economy, the Federal Reserve withdraws monetary wealth from the economy by selling securities and, in effect, destroys its newly acquired money.

At almost the onset of the effects of the pandemic, the Federal Reserve engaged in a massive asset expansion that was truly unprecedented. In just the first three months of the pandemic, March, April and May of 2020, the Federal Reserve bought $2.13 trillion in securities. But they didn't stop there so that by

† Department of Economics, Texas A&M University, Texas, USA.

April of 2022 the money injection reached $4.76 trillion, almost 20% of 2022 GDP! What is more astounding is that unlike the Great Recession interventions, there were no undergoing financial crises that triggered this massive expansion. It was not only unprecedented, but uncalled for, and has resulted in the end of the Federal Reserve's annual transfers to the U. S. Treasury that in 2022 equaled 30.5 % of the net interest cost of the federal debt.

The fact that the pandemic massive monetary expansion did not result in severe inflation is that the tools of monetary policy changed fundamentally in the 21st century as the Federal Reserve began to pay banks to hold reserves and to borrow reserves from non-bank financial institutions. These changes have allowed the Federal Reserve to almost micro-manage the inflationary effects of open-market asset purchases by incentivizing financial institutions not to use their increased reserves to expand their investments in the economy. These tools allowed the Pandemic Federal Reserve to avoid the hyper-inflation that would have followed such a massive expansion monetary expansion. In fact, increases in bank reserves and Federal Reserve borrowings from non-bank financial institutions kept $3.74 trillion of the $4.76 trillion expansion from entering the economy.

2. The Covid Pandemic Era

The world-wide reaction to the Covid-19 pandemic placed the Federal Reserve in a policy dilemma of how to reduce the economic effect of the pandemic-induced government shutdowns throughout the world? Even recognizing that real changes in the economy's production frontier cannot be offset through monetary actions, the question was whether the Covid-19 pandemic was a real reduction in the world's production frontier. To get a feel for what the policymakers at the Federal Reserve faced at the beginning of Covid-19, Figure 1 shows the paths of consumer and production prices, the PCE, CPI and PPI, and the paths of real production frontier elements, industrial production and total employment, for the period January 2019 through June 2023 in the United States. By the close of March 2020, the economy was in dire straits. Industrial production and employment were falling rapidly. In fact, industrial production fell 20% and employment fell 18% in just two months, in February and March of 2020.

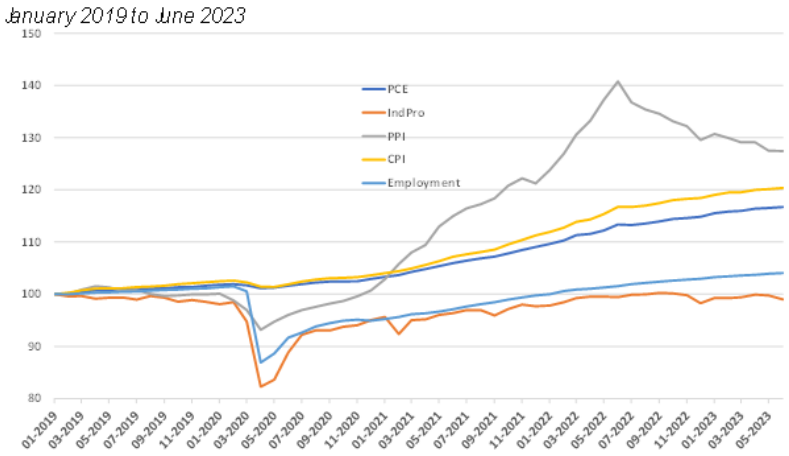

Figure 1. *PCE and producer price indexes compared to industrial production and employment index*

With the economy potentially in shambles, the decision for the Federal Reserve played out in two parts. First, could a pure monetary expansion affect the real economy? In normal times, monetary expansion cannot change the real production frontier. But these were anything but normal times! Furthermore, would the world-wide economic shutdown create a financial crisis to compound the observed real crisis? While there was no financial crisis in evidence the decision of the Federal Reserve was not to wait for a financial crisis, but to increase the monetary wealth of the country. Additionally, they decided that the dire economic situation required a massive monetary injection. The scale of this monetary injection made all previous Federal Reserve open-market operations pale in comparison. All it did was prove that real economic problems cannot be solved by monetary expansion no matter how large. It also corroborated what monetary economists have long known: that massive money supply increases create, rather than solve, problems.

Figure 2 shows Federal Reserve monthly Treasury purchases and Treasury deficits for the federal fiscal year 2020. In February, March and April of 2020, the Federal Reserve bought over $2.1 trillion in Treasuries increasing its total securities held outright by more than 50%. The Federal Reserve continued to add to its securities holdings through 2021 until the total monetary expansion reached over $4.7 trillion and total securities holdings exceeded $8.5 trillion, a 220% increase in just two years.

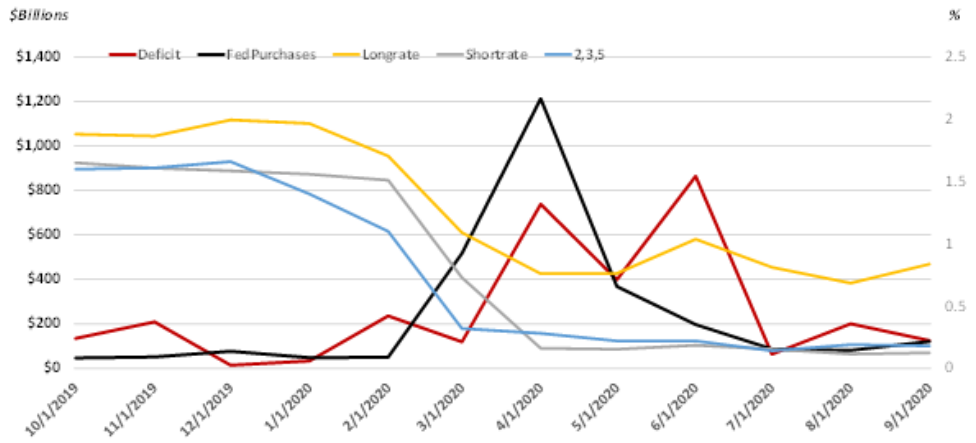

Figure 2. *Fiscal 2020 monthly treasury deficits and fereral reserve treasury purchases*

The massive Federal Reserve purchases of Treasuries represented a rightward shift in the demand curve for Treasuries and led to a significant increase in the price of Treasuries and plummeting Treasury interest rates.

Figure 3 shows the 3-month and 1-year Treasury interest rates that resulted from Federal Reserve actions for the period from November 2017 to October 4, 2023. The Federal Reserve weekly sales and purchases of Treasuries are denoted as "Delta Treasuries" in the figure. November 2017 was the beginning of implementation of the Federal Reserve's decision to return to its traditional level of assets relative to GDP. The effect of those Treasury reductions on Treasury prices and interest rates is apparent in the figures. Those sales ended in August 2019 and Treasury prices and interest rates stabilized.

Then the massive Federal Reserve securities purchases in March, April, and May saw Treasury prices skyrocket and Treasury interest rates plummet. In fact, the 3-month and 1-year Treasury rates reached lows of less than 10 basis

points as Federal Reserve Treasury purchases continued through 2021. As the purchase rate eased, interest rates began a slow recovery, then in mid-2022, the Federal Reserve began selling Treasuries and Treasury interest rates began to rise. As these Treasury sales accelerated, Treasury interest rose rapidly. The Treasuries sales by early October 2023 amounted to $833 billion, as shown in Figure 3. In addition, mortgage-backed securities' (MBS) sales were $234 billion, making the total reduction in Federal Reserve securities holdings since mid-2022 over $1 trillion. The $803 billion in Federal Reserve Treasuries sales, along with the Treasury's deficit financing of just under $1 trillion, were the principal factors in the fall of Treasury prices and rise of Treasury interest rates shown in Figure 3.

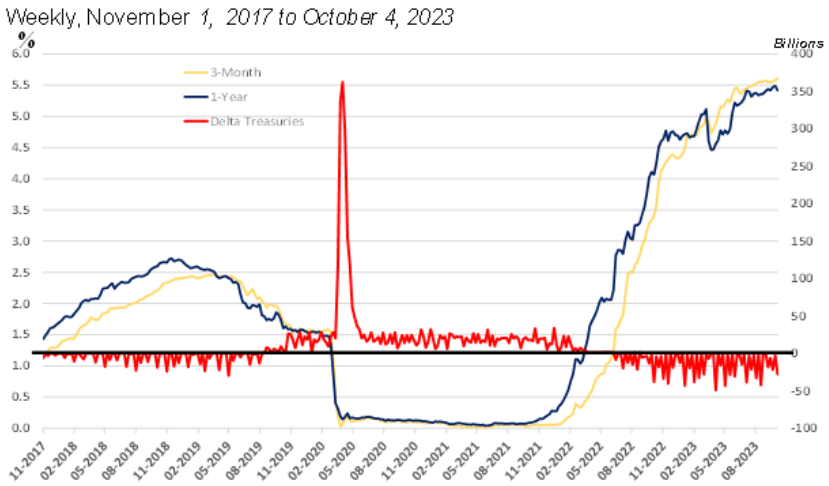

Figure 3. *1-yr treasury, 10-yr treasury, ON RRP, IORB and Federal Reserve treasury market operations*

To see how the massive Federal Reserve securities expansion affected the money supply, Figure 4 shows the path of the M2 money supply and Federal Reserve assets (holdings of securities, loans and investments), Federal Reserve liabilities (bank reserves and reverse repos), and Federal Reserve net assets from January 1, 2020 to October 4, 2023. The figure also shows the path of member bank reserves and path of Federal Reserve borrowings from non-bank financial institutions, reverse repos. Finally, the figure shows Federal Reserve net assets, its total assets less its liabilities.

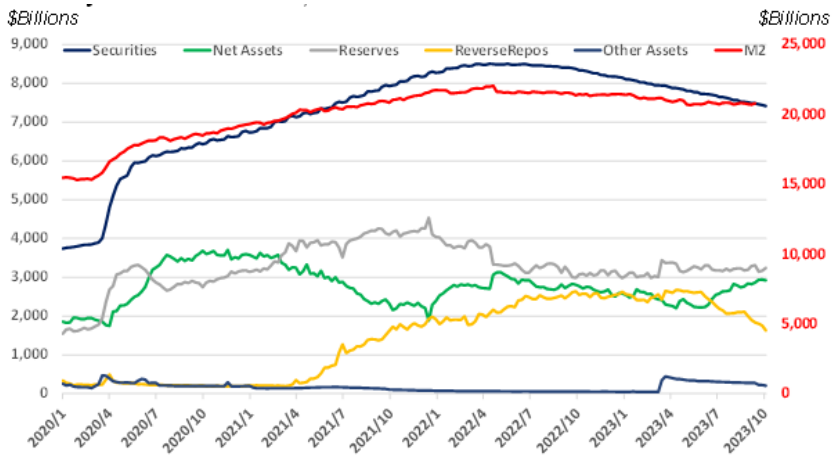

Figure 4. *M2 and Federal Reserve net assets January 2020-October 4, 2023*

The initial massive expansion of Federal Reserve assets is easily discernable in Figure 4. From March through May 2020, securities holdings increased $2.13 trillion, a 55% increase, M2 increased 17%, an annual growth rate of 86%, bank reserves doubled to $3.31 trillion, and Federal Reserve net assets rose 44% to $2.73 trillion. But the expansion did not end there. It continued through the rest of 2020, all of 2021, and the first quarter of 2022, adding another $2.55 trillion. By that time, the Federal Reserve securities expansion had reached $4.76 trillion and total Federal Reserve securities holdings reached $8.5 trillion, 120% greater than their pre-pandemic level.

In the first three months of the asset expansion, the M2 money stock grew 16%, an annual rate of 86%! While the rate of growth of both the Federal Reserve asset expansion and M2 slowed, the asset expansion continued through the first quarter of 2022. By then, the Federal Reserve securities expansion was $4.61 trillion, a 220% increase. Furthermore, M2 at the end of the securities expansion had grown by 40%, an annual growth rate of just under 20%!

As Figure 1 shows, the recovery was well underway by September 2020 although it was at the close of 2022 before industrial production and employment reached their January 2019 levels. Also, both consumer and producer prices were on the rise. The challenge facing the Federal Reserve was how to prevent the massive monetary injection from resulting in 1970's level of inflation. The solution involved the fact that the proceeds of Federal Reserve securities purchases, no matter how large, initially become deposits in the nation's financial institutions. These deposits are made at the time of the exchange of securities for cash and become reserves in the receiving financial institutions. To prevent these financial institutions from adding to the money supply required the Federal Reserve to find a way to somehow absorb their reserves.

The answer to this problem was two-fold. First, continue to pay member banks to hold reserves by making the interest rate on reserve balances, the IORB, competitive with market interest rates. Second, offer the eligible non-bank financial institutions an overnight rate, the ON RRP, competitive with market interest rates to lend their reserves to the Federal Reserve.

In the Great Recession, a much smaller but longer rate of asset expansion was controlled by paying banks to hold reserves rather than investing in the economy and adding to the money stock. In retrospect, that was an easy solution as the continued asset expansion kept Treasury prices high and Treasury interest rates low. It allowed for a 25 basis point interest rate on reserve balances, the IORB, to be enough to incentivize the banks to hold just over 80% of the asset expansion as reserves. As a result, Federal Reserve net assets rose just slightly faster than real GDP, so inflation over the seven-year asset expansion period was less than the 2% Federal Reserve target.

Despite the massive Covid-19 pandemic Federal Reserve 120% money injection, M2 had risen only 44%, just over one-third of the percent rise of the Federal Reserve asset expansion. Figure 3 also shows the reason for the failure of M2 growth to match the Federal Reserve money injection as the initial home of the money injection is as reserves of the nation's financial institutions. Bank reserve holdings rose $2.7 trillion so that the demand deposit expansion that could have been supported by these reserves did not occur. Then, Federal Reserve borrowings from non-bank financial institutions rose $1.82 trillion, preventing these institutions from investing in the economy and adding to

M2. The Federal Reserve's paying banks to hold reserves and paying non-bank financial institutions to lend their reserves to the Federal Reserve absorbed $4 trillion of the expansion that would have supported an increase in M2 and led to significant inflation.

The expressed goal of the Federal Reserve is to achieve a 2% rate of inflation. Assuming that real GDP growth is 2%, the Federal Reserve inflation goal will require a 4% growth in its monetary injections, basically the growth in its net assets. Federal Reserve securities holdings peaked at $8.5 trillion in March 2022 and remained at that level though mid-June 2022. Then the Federal Reserve began to sell of its securities and reduced their securities holdings in the first year by $800 billion. As of August 30, 2023, the Federal Reserve had reduced its securities holdings by just over $973 billion, still well short of the $4.7 trillion expansion. However, they have continued to manage the effect of their actions on the level of their net assets and M2 through setting the IORB and the ON RRP rates so that their liabilities fell by more than their asset reductions, allowing net assets to rise.

There are two principal players in the supply of Treasuries: U.S. Treasury new issues and Federal Reserve Treasury securities actions. The Federal Reserve Treasury expansion peaked in March 2022 and then by the end of June 2022, the Federal Reserve began a gradual reduction in their securities holdings. By August 2023, the Federal Reserve had reduced its Treasury holdings by $800 billion. That $800 billion increase in the supply to the market of Treasuries plus the $1 trillion in new issues by the U.S Treasury represented a significant increase in the supply of Treasuries and a resulted in a fall in the prices of Treasuries and increases in their yields. As shown in Figure 3, the massive Federal Reserve expansion caused a huge increase in Treasuries demand and led to an almost unprecedented increase in the prices of Treasuries and reductions in Treasury interest rates. It also shows that the current level of Federal Reserve Treasuries sales and U.S. Treasury new issues have reduced the price of Treasuries and increased Treasury interest rates.

The Federal Reserve changes in the rate of interest on reserves and the overnight offering to non-bank financial institutions were necessary to prevent financial institutions from using their reserves to invest in the market and increase the M2 money supply. But the Federal Reserve reporting of the interest rate increases always emphasized their Fed Funds upper bound target. Additionally, the Federal Reserve rhetoric emphasized the increases in interest rates as necessary to fight inflation. Clearly, they were right in that the failure to increase the IORB and the ON RRP when interest rates rose would have resulted in a rapidly rising M2 and inflation. In actuality, the Federal Reserve followed market interest rates up rather than raising market interest rates.

The increase in market interest rates were the result of Federal Reserve massive sales of Treasuries on the price and the yield on Treasuries. Thus, in a way, the press was right in that the Federal Reserve's massive sales of Treasuries caused the rise in the interest rates on Treasuries. That rise in Treasury interest rates then forced the Federal Reserve to raise both the interest rate they paid to banks, the IORB, and the offer rate to non-bank financial institutions, the ON RRP. The goal was to allow Federal Reserve liabilities to fall more than the Federal Reserve asset reductions so that net assets could rise at the desired 4% rate but fall enough to allow the money supply beyond the rate required for the desired 2% inflation.

Figure 4 showed the results on bank reserves and non-bank financial institutions loans of the Federal Reserve determined interest rate on reserve balances, IORB and the overnight offering to non-bank financial institutions, ON RRP. What Figure 4 does not show is how these rates were determined. Figure 5 shows how the Federal Reserve managed these important rates as their Treasury market activities affected market interest rates. Clearly, both rates had to be competitive with the market alternatives available to the banks and other financial institutions to control their moving into market investments and expanding M2.

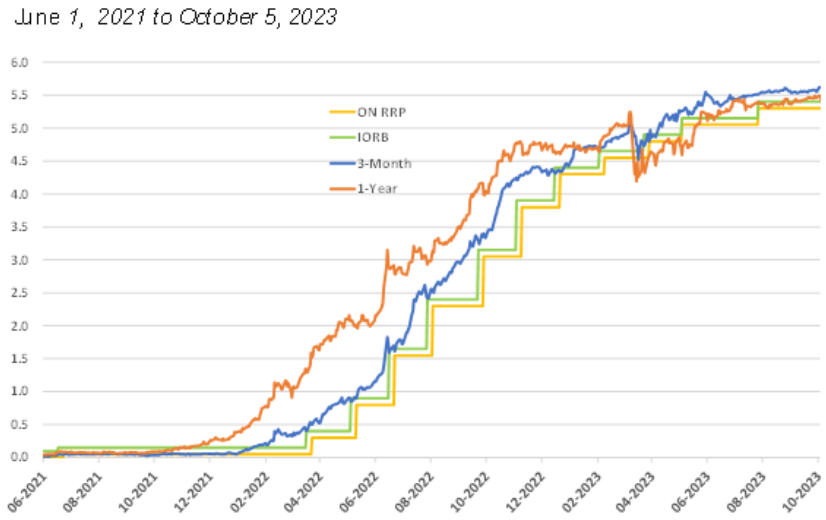

Figure 5. *1-yr treasury, ON RRP rate and IORB*

Beginning in 2022, the Federal Reserve began to reduce its Treasury holdings and increase the supply of Treasuries. Those Treasury sales, coupled with the Treasury's new issues to support the federal deficit, resulted in falling Treasury prices and the interest rate increases shown in Figure 3. The Federal Reserve-controlled IORB and ON RRP were set to almost match these rising market rates, especially the 3-month rates. The increases in the IORB and the ON RPP were hardly mentioned in the press as their emphasis was always on the Federal Reserve announcements on the upper bound for the Fed Funds rate. The press releases were always in the form of the necessity of the rate increases to fight inflation. In fact, the Federal Reserve was fighting inflation with the interest rate increases in the IORB and the ON RRP, as they were preventing the banks and non-bank financial institutions from expanding their investments in the market and adding to the M2 money supply.

The only break in the rising Treasury interest rates from Federal Reserve Treasury sales and Treasury deficit financing on the market for Treasuries is the March 2023 banking collapse of Silicon Valley Bank and Republic Bank. The fear of a general collapse of the banking system led to an increase in the demand for safe assets, Treasuries. Thus, the brief collapse of rising 1-year and 3-month Treasury rates was due to the Bank failures in March 2023 as the public moved to safe assets - increasing the demand for Treasuries and increasing the price of Treasuries and reducing Treasury interest rates. The 1-year Treasuries were more affected by the collapse as the 3-month Treasury interest rates returned to their previous trend within two months. It could be argued that the massive Covid purchases and the subsequent decision to

reduce Treasury holdings were the cause of the March 2023 bank failures. The purchases that took place during Covid-19 resulted in almost zero returns on Treasuries, when at the same time, Silicon Valley and Republic Bank were seeing huge increases in deposits. To cover these deposit increases they bought Treasuries. But then the Federal reserve began selling Treasuries, which resulted in rapidly rising Treasury yields. In order to retain deposits, both Silicon Valley Bank and Republic Bank had to raise the return to depositors - the result being losses that required Federal Reserve intervention.

3. Where do we go from here?

Even with the significant reduction in its asset holdings in the last year, the Federal Reserve is holding at least $3 trillion in what might be termed excess securities. But the Federal Reserve is facing a dilemma in that its significant Treasury sales coupled with the Treasury deficit financing, an outward shift in the supply of Treasuries, will further reduce the price of Treasuries and continue to increase Treasury interest rates.

The problem that the Federal Reserve faces is similar the problem faced by Silicon Valley Bank in March 2023. As Figure 3 shows, much of the Federal Reserve's asset expansion was done at peak prices of Treasuries and therefore rock-bottom yields, just as with the assets of the rapidly expanding Silicon Valley Bank. And just as with Silicon Valley Bank, Federal Reserve liabilities, deposits for Silicon Valley and Bank reserves and borrowings, reverse repos for the Federal Reserve, must be paid at current interest rates. But the Federal Reserve has a tremendous advantage over Silicon Valley Bank as it has the only money printing press, the equivalent of infinite capital!

Both bank reserves and Federal Reserve borrowings from non-bank financial institutions are Federal Reserve liabilities. The total of these Federal Reserve liabilities on August 23, 2023 was $5.29 trillion. The bank reserve portion, $3.18 trillion, costs the Federal Reserve at the IORB rate of 5.4%, $171.58 billion annually. The reverse repo portion of total liabilities, $2.11 trillion, costs the Federal Reserve at the ON RRP rate of 5.3%, $111.96 billion annually. Thus, Federal Reserve liabilities at current IORB and ON RRP rates imply an annual cost of $283.542 billion.

On the asset side, Federal Reserve securities held outright on an acquisition cost basis were $7.522 trillion on August 23, 2023. The Treasury securities portion was $5.006 trillion, and the MBS share was $2.513 trillion. The share of the Treasury portfolio purchased prior to 2020, $2.513 trillion, was acquired when 20-year Treasury interest rates, for example, averaged 3.5%, or an annual income of $86.59 billion. The $2.73 trillion of Treasuries purchased since February 2020 have yields at or below 1.5%, Using 1.5% for this $2.73 trillion of Treasuries implies an annual income of $40.94 billion. Therefore, the Treasuries portion of Federal Reserve securities holdings is yielding at most $127.5 billion annually.

The Federal Reserve's MBS holdings were $1.371 trillion at the end of February 2020. During the period from the beginning of Federal Reserve purchases of MBS to February 2020, mortgage rates hovered about 4%, which suggests an annual income of $54.9 billion. The $1.2 trillion of MBS purchased since February 2020 had higher prices and lower yields that approximated 3%, implying an annual income of $36.1 billion. Total Federal Reserve MBS annual income is no more than $91 billion.

The total Federal Reserve annual income from its holdings of securities is $218.5 billion. Federal Reserve liabilities cost, on an annual basis, $283.5 billion. Thus, before any other consideration, the Federal Reserve is losing just over $65 billion a year.

But the Federal Reserve has other income earning assets that are significant during the period of financial stress related to the Pandemic. The August 23, 2023 level of these assets was $250 billion. Assuming these assets earn market short rates of interest that for 1-month Treasuries on August 23, 2023 was 5.44%, the monthly non-securities Federal Reserve investments would yield $13.6 billion per year. Thus, adjusting for the income other Federal Reserve earning assets, still leaves the Federal Reserve with a loss of just over $51 billion annually. Essentially the Federal is creating new money on a flow basis to meet these losses.

If the Federal Reserve was a regular commercial bank, any monthly losses would have to be covered by bank capital. Obviously, at $5 billion a month, all pre-loss capital would quickly be gone and the bank would be bankrupt. But the Federal Reserve is not a regular commercial bank. In fact, because the Federal Reserve has exclusive title to the official money printing press, it has, in effect, infinite capital. Thus, the Federal Reserve is printing the equivalent of $5 billion new dollars a month. Additionally, there is no limit to how long they can continue this money injection. Remember, in just three months of 2020 they injected $2.1 trillion. At the current loss rate of $5 billion a month, or sixty billion a year it will take 35 years to inject as much as the Federal Reserve did in March, April and May of 2020!

Given that the Federal Reserve owns the money printing press, do these losses really matter? Surprisingly, the answer is yes! In some sense, the U.S. Treasury is the owner of the Federal Reserve as it is the recipient of all Federal Reserve net income. To get an idea of the past importance of this ownership position, Figure 6 shows the Federal Reserve annual transfers to the Treasury, net interest federal debt servicing cost and the share of that servicing cost paid by the Federal Reserve transfers for 2008-2022. These transfers are the equivalent of federal government tax receipts, and their loss must be replaced by general taxpayers.

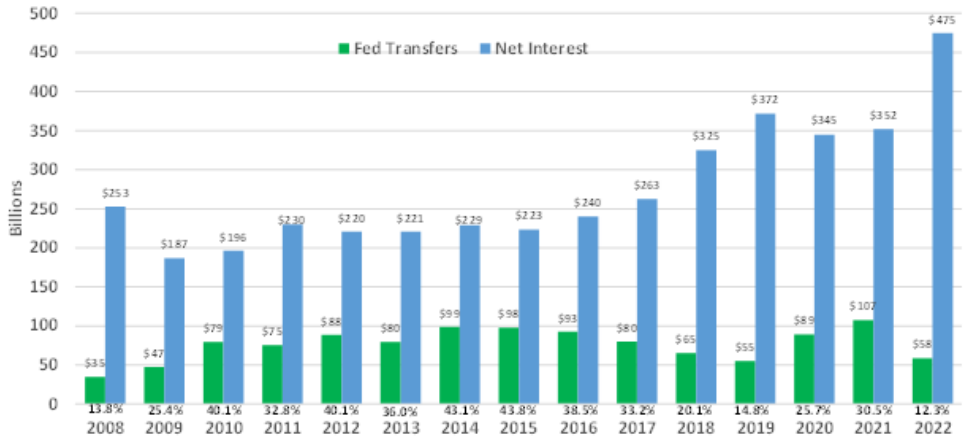

Figure 6. *Net debt servicing cost and Federal Reserve treasury distributions 200-2022*

Clearly, the long history of Federal Reserve transfers of revenue over cost to the Treasury is over. In fiscal year 2020, the Federal Reserve transferred

$88.8 billion to the Treasury. That amount covered just over 25% of the net interest cost of the federal debt. In fiscal year 2021, the Federal Reserve transferred a record $107 billion to the Treasury, over 30% of the net interest cost of the federal debt. The beginning of the end of these transfers is seen in the 2022 transfer $57.2 billion. From the above discussion it is clear that, at least for the foreseeable future, such transfers will be zero. Thus, the Federal Reserve's out of proportion response to only a possible financial crisis has cost the country the valuable resource that the pre-crisis Federal Reserve once was.

Currently the Covid-19 Federal Reserve is digging itself out of deep hole is selling Treasuries at an average monthly rate of just over $58 billion. During this same time the Treasury was selling new Treasuries at an average rate of $138 billion. Thus, for the last year the supply of Treasuries has been rising at more than $195 billion a month. Is it any wonder that Treasury prices have been falling and Treasury interest rates rising. The Federal Reserve is also selling MBSs at an average monthly rate of just under $16 billion. Thus, the Federal Reserve in the last year has been reducing its securities holdings at by $74 billion a month and has reduced its securities holdings in the last year by just over $921.9 billion. That said Federal Reserve securities holdings are almost 9.88% of 2022 GDP down from the 11.55% of one year ago.

Assuming that the goal of the Federal Reserve is to achieve net asset growth too support a 2% inflation rate which assuming a 2% growth in real GDP requires a 4% growth in net assets. The Federal Reserve has managed its liabilities, bank reserves and reverse repos through setting the IORB and the ON RRP so that its net assts have risen in the last year by 5.6%. Two additional years of securities sales at $921.2 billion would bring Federal Reserve securities holdings to 5.7% of GDP, what would have been considered normal before the Great Recession expansion.

But the real problem for returning to the Federal Reserve that was a contributor to the Treasury and thus the taxpayers of this nation would still be its liabilities. Even after three years of securities sales and liabilities decline to achieve 4% net asset growth Federal Reserve liabilities would still exceed $2.7 trillion. Letting liability reductions finance future 4% net asset growth it would take 14 years to eliminate Federal Reserve liabilities and restore the Federal Reserve to its role of transferring net profits to the Treasury. Clearly, the Covid Pandemic Federal Reserve radical expansion of assets was massively costly to the economy.

4. A Great Recession Comparison

The total Federal Reserve expansion during the period of the "Great Recession" began more than a year after the onset of the Great Recession and occurred in the five-year period from March 2009 through 2014. The total expansion was just over $3.723 trillion, $1.736 trillion of which were Mortgage-Backed Securities. In comparison, the Covid-19 Federal Reserve expansion was $4.76 trillion in just under two years. The Great Recession Federal Reserve faced conditions similar to those faced by the Federal Reserve during the pandemic, but the actions taken were much more reserved. The maximum monthly expansion in the Great Recession response was just over $204 billion and that was almost entirely Mortgage-Backed securities in response to the Mortgage-Backed securities financial crisis of September 2008. In contrast, the Covid-19 maximum monthly expansion in March 2020 was just over $517

billion, but in the following three months, it purchased another $1.146 trillion Treasuries, all with no financial crisis in sight.

Figure 7 is the Great Recession equivalent of the Covid-19 Figure 1. The Great Recession began in December 2007 and its effects are obvious, as both industrial production and employment fell significantly. It is important to note that monetary policy cannot affect the real economy but can affect financial markets significantly.

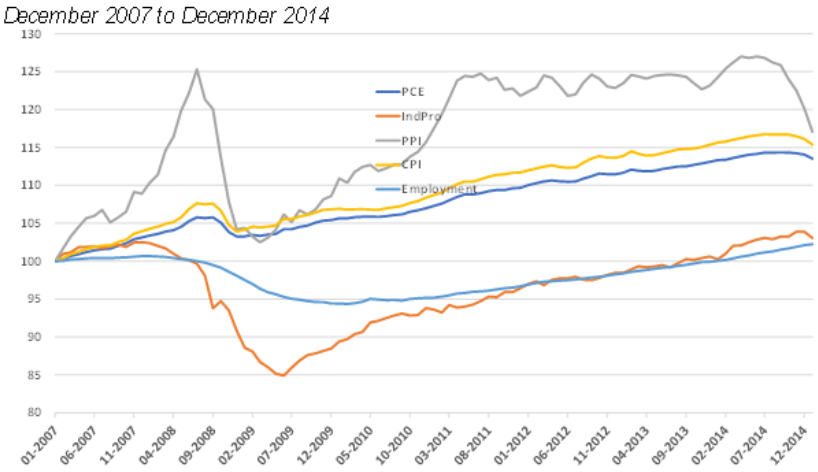

Figure 7. *PCE and producer price indexes compared to industrial production and employment indexes*

What was the Great Recession Federal Reserve's response to the coming crisis? Figure 8 shows the Great Recession Federal Reserve's response. Rather than engaging in an unprecedented monetary expansion as the Covid-19 Federal Reserve did, the response was targeted to the financial issues as they evolved. In fact, the Great Recession Federal Reserve initially sold Treasuries while investing heavily in the economy. They replaced the Treasury portion of their portfolio with interventions to rescue failing aspects of the financial world with more than $1 trillion of market assistance the detail of which is in Figure 9. They only began buying securities in February 2009 and by June 1, 2009, had purchase just over $545 billion. This is compared to the Covid-19 Federal Reserve's massive expansion of $2.18 trillion, $1.7 trillion Treasuries and $447 billion MBSs. Furthermore, 80%, or $420 billion, of the Great Recession Federal Reserve expansion was in support of the Mortgage-Backed Securities market that all but vanished in September 2008. In fact, it was not until August 2010 that the Great Recession Federal Reserve Treasury holdings reached the level they were just before the Great Recession began. The total Great Recession Federal Reserve Treasury expansion over the five-year expansion period was $1.68 trillion, just about equal to the first three months of the Covid-19 Federal Reserve's expansion.

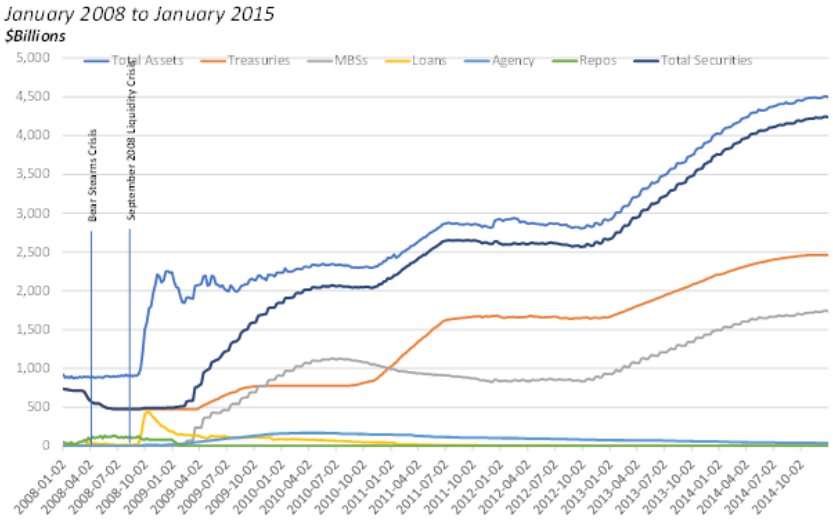

Figure 8. *Total assets, total securities, treasuries and MBSs*

Figure 9 shows the Great Recession Federal Reserve actions. The recession began in December 2007 and its early responses to supplying cash to banks were repurchase agreements and the Term Auction Facility. But the September 2008 financial crisis is clearly seen in the figure and the effect of the crisis was a tremendous public demand for cash. As a result, financial institutions, money market funds for example, had to liquidate their commercial paper assets and that market all but disappeared. The Great Recession Federal Reserve came to the rescue with huge support of the commercial paper market. At the same time, it increased its economic support by increasing loans and the scale of the Term Auction Facility. As the mortgage market collapsed in July 2008, the Federal Reserve established the first of three LLCs, titled Maiden Lane I and issued loans to support the principal mortgage insurer, AIG. After the September 2008 collapse of Mortgage-Backed-Securities market, the Federal Reserve quickly added two additional Maiden Lane LLCs to further aid AIG. Only the three Maiden Lane LLCs and the Term Asset Backed Securities Loan Facility remained beyond six months of the onset of the financial crisis.

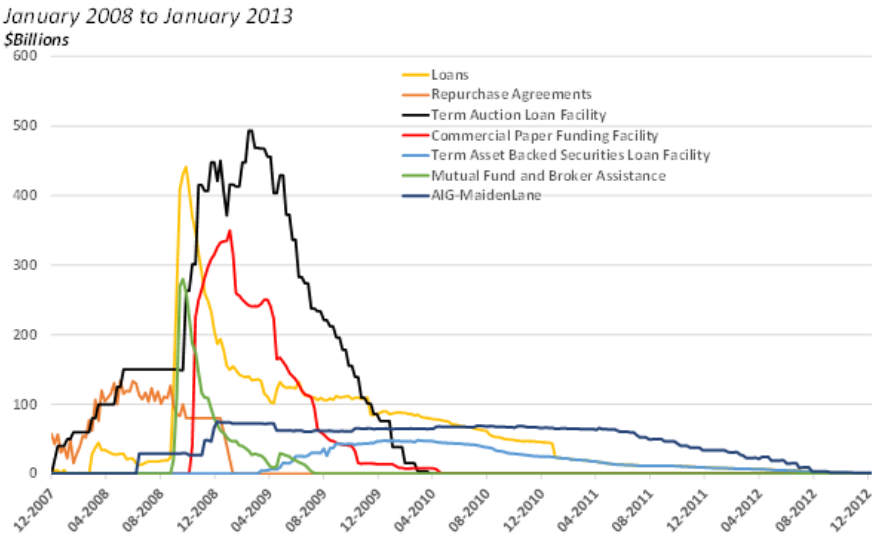

Figure 9. *Great recession Federal Reserve interventions*

The Great Recession Federal Reserve then began a series securities purchase referred to as quantitative easing. From the first quarter of 2009 through the close of 2014 they increased Treasuries holdings from $474 billion to $2 trillion! Then, for the first time they added private securities to their holdings in the form of Mortgage-backed securities. From early 2009 through 2014, the Great Recession Federal Reserve bought $1.68 trillion Mortgage-backed securities making the total Federal Reserve holdings of securities at the close of 2014 $4.23 trillion. This level of demand for Treasuries had the expected effect of keeping the prices of Treasuries high and Treasury interest rates low. Figure 10 shows the Great Recession Federal Reserve Treasury sales and purchases from December 5, 2007 to December 30, 2014. Both the level and length of these open-market operations far exceeded anything the Federal Reserve had ever done.

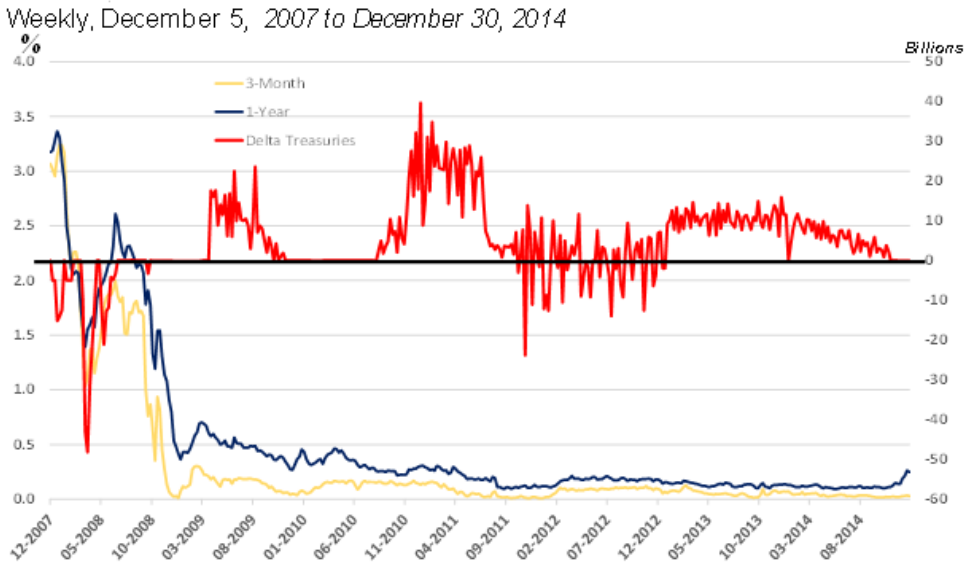

Figure 10. *1-yr treasury, 10-yr treasury, ON RRP, IORB and Federal Reserve treasury market operations*

The bill establishing the Federal Reserve precluded it from financing government expansion by buying Treasury debt directly from the Treasury. However, this episode shows that extended periods of market purchases of federal debt is equivalent to buying directly from the Treasury, in effect, financing government. The inflation that would be expected from such large injections of money didn't happen, as paying banks even 25 basis points to hold reserves absorbed $2.8 trillion of the total $4.23 trillion Treasuries plus Mortgage-backed securities expansion. Since the net revenue from the Mortgage-backed securities is also transferred to the Treasury, MBSs are the equivalent of Treasury holdings. Importantly, during the entire expansion period of the Great Recession, the Federal Reserve never lost its role as a contributor to the public as they transferred $503.7 billion to the Treasury. Those transfers to the public covered more than 32% of the net interest cost of the federal debt!

In contrast to the Federal Reserve's measured responses to the Great Recession, the Covid-19 Federal Reserve never waited to see what financial issues the Covid-19 crisis might cause. Even though monetary economics has long known that massive injections of money into the economy cannot change

anything real, the Covid-19 Federal Reserve ignored this long-standing knowledge and injected massive amounts of money into the economy. To prevent this massive money injection from resulting in hyper-inflation, they paid financial institutions to either hold their new deposits or lend these new deposits to the Federal Reserve. This new Federal Reserve is no longer a public asset at all. It is now virtually a slave to member banks and non-member financial institutions using what would have been the public's money to incentivize them not to expand. It will decades before it will be possible to restore the public asset role of the Federal Reserve.

5. Conclusion

The massive Covid-19 pandemic expansion of the Federal Reserve is now behind us. That expansion gave us a Federal Reserve that was double its Great Recession expansion level. To prevent this massive expansion from causing an inflation rate never seen in the United States, yes even greater than the double-digit inflation of the late 1970s, the Federal Reserve paid banks to hold reserves rather than make loans and expand the money stock. They then borrowed from non-bank financial institutions to prevent them from using the great surge they had in reserves from putting them out in the economy. We are paying for this inflation protection by losing the annual contribution that the Federal Reserve was making to the Treasury.

Clearly, the scale of the Covid-19 Federal Reserve asset expansion was unnecessary but is reversible. The question is what, if anything, should be done to restore the Federal Reserve to its pre-pandemic level? The Federal Reserve's announced goal of 2% inflation requires 4% annual growth in its net assets assuming a 2% growth rate of real Gross Domestic Product. Before the existence of Federal Reserve liabilities, 4% growth in Federal Reserve net assets simply required 4% growth in its securities holdings. In that simpler world, 4% net asset growth would lead to ever larger Federal Reserve transfers to the Treasury. In the seemingly impossible a world of a balanced federal budget, eventually these increasing transfers to the Treasury would totally cover net interest cost of the federal debt.

It is clear from the Federal Reserve securities sales of the past year that it has decided to bring down its massive Covid-19 increase in securities holdings. But these securities sales when added to the Treasury deficit financing have resulted in increasing Treasury interest rates. If member banks and other financial institutions would have responded to these higher market returns, the money supply would have risen, and inflation increased. To prevent that result, the Covid-19 Federal Reserve increased the rate of interest it pays banks and the rate it pays non-bank financial institutions. These increased payments have resulted in the Federal Reserve losing money. While losing money is not a problem for the Federal Reserve as they have the only money printing press, it has stopped all Federal Reserve transfers to the Treasury. The American people have lost a Federal Reserve that was a real positive as a source of Treasury funding.

The Covid-19 Federal Reserve actions will go down in monetary history as the worst Federal Reserve policy in the more than 100-year history of the Federal Reserve, even worse than the late Great Recession decision to raise reserve requirements. That decision was justified as necessary as the banking system had been increasing its excess reserves. Thus, to prevent these reserves

from entering the economy and causing inflation that Federal Reserve made much of the excess reserves, required. What they ignored was the banking experience of the early 1930s where the Federal Reserve failed to discount bank paper when the public demanded cash, resulting in the famous "bank holiday." Thus, the late 1930s excess reserves were reserves the banks considered necessary, not excess, in case of another sudden public demand for cash. They remembered the last time they needed cash the Federal Reserve failed them.

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