Recent Monetary History, A monetarist perspective.

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Introduction – monetary developments before and after the GFC and Covid

Reports on the death of the Quantity Theory of Money now (February 2022) appear highly exaggerated. The extraordinary burst of additional money issued by the Fed intended to ameliorate the damage to incomes and economic activity caused by the Covid inspired lockdowns of March 2020 have been followed by a surge in inflation. The increase in the prices facing consumers in the US was running at over 7% p.a. by the end of 2021 The inflation of 2021 appears to have surprised all observers other than the near extinct tribe of monetarists.

The Fed, in two recent policy initiatives, injected very large amounts of central bank money into the US banking system. The first was intended to relieve what had become a Global Financial Crisis (GFC) in 2008. The second, even larger such intervention was taken in response to the economic lockdowns of 2020. The additional supply of central bank money did not lead to more inflation after the GFC – indeed the inflation rate in the US declined for most years after 2010. This was because the money supply growth (broadly defined to include the deposits held with commercial banks that make up the bulk of the money supply, as defined by the Fed) did not increase at a significantly faster rate after the GFC. The deposits of the commercial banks with the Fed are excluded from the definition of M1 or M2, the broadly defined money supply. Between 2000 and 2007 the money supply (M2) increased at an average annual rate of 6.2% p.a. calculated quarterly. Between 2008 and 2010, the years of the financial crisis, M2 grew at an average rate of 5.7% p.a. thereafter between 2010 and 2019, the growth in the money supply rate was a similar average 5.9% p.a.

The growth in the money supply has been at a much faster rate since the lockdowns of March 2020. Annual growth in M2 was 6.7% in January 2000, it was up to 22% by May 2020 and peaked at 27.1% in February 2021. By December 2021 the growth in M2 had slowed to 13.1%, off the higher base of the year before, even as the monthly growth rate were a very high 1.2% in November 2021 and 0.94% in December 2021. In 2020-21 the additions to short-dated commercial bank deposits, were of a much larger order of magnitude in 2020-21 than after 2008. Bank deposits included in M1 grew spectacularly, by as much as 11 trillion dollars in April 2020, as the income relief payments provided by the Treasury were posted and then deposited in banking accounts.

It was a highly stimulatory mix of aggressive fiscal policy accompanied by injections of cash by the Fed and the Treasury. Large sums of additional money were not scattered by the proverbial helicopter but

came in the form of checks drawn on the US Treasury Account with the Federal Reserve System, delivered in the mail and then deposited in bank accounts. We explain why the money supply responses by the commercial banks were more muted after the GFC and have been much more vigorous in 2020-2021.

These experiments in extreme central bank reactions to the state of the financial markets in 2008, and to the state of the economy in 2020, came after an extended 30 year period of declining and low inflation rates in the US. Inflation in the US trended lower after the high and variable inflation rates experienced in the US and much of the global economy during the nineteen seventies. US, CPI Inflation averaged 7.1 per cent per annum between January 1970 and December 1979 when the inflation rate reached 13.25%. Between 1980 and 2007 the monthly inflation rate fell to an average 3.1% p.a. Between 2008 and 2019, GDP inflation, calculated quarterly as annual growth in the GDP deflator, averaged a lower 1.61% p.a.

We compare the monetary supply initiatives and outcomes observed after the Global Financial Crisis (GFC) of 2008-09 with developments after the Covid crisis of 2020. We explain why and how the system for supplying money to the US economy underwent an important structural change after the Global Financial Crisis (GFC) of 2008. The ratio of the money supply to GDP that was close to one before the GFC, has risen significantly and has increased further after Covid. What may become a revised, and to degree predictable, relationship between money and incomes is still to be determined, assisted in some degree by an increase in the prices of goods, services, including the services of labour, and of the value of assets. This process of higher prices helping to equilibrate the demand for money with an increased supply of money, now well under way in the US, is a much discussed theme of traditional monetary theory.

We offer an interpretation of the Quantity Theory of Money, drawing on the work of Milton Friedman the pioneering modern monetarist. We show why the relationship between the supply of money and the performance of the US economy after the GFC can be explained in terms that are consistent with the Quantity Theory of Money, when attention is properly paid to the demand for as well as the supply of central bank money and the money supply, more broadly defined.

Money may matter but it has not been the focus of monetary policy

The two recent episodes in the creation of large additional amounts of central bank money, held in the form of deposits held by the commercial banks with the central bank, provide very clear cases of monetary policy leading and economic activity following. The direction of causation under more normal economic conditions may well run in the opposite direction – from the real economy to the money supply. Demands for bank credit can well lead supplies of additional central bank cash needed to satisfy cash reserve requirements and demands of the banking system. Cases of the economy leading and the money supply adapting to the additional demands for bank credit and money become more likely when the growth in the money supply or bank credit are *not* regarded as an instrument of monetary policy or as a specific target of the monetary authorities. And when the commercial banks can borrow extra cash from a central bank to satisfy their cash reserve requirments.

Money supply targets have not been an objective of monetary policy either before or since the convertibility of the US dollar to gold and at fixed exchange rates was abandoned in the early nineteen seventies. This departure from a fixed exchange rate system that demanded balance of payments led

adjustments to interest rates and the money supply, necessary to sustain the convertibility of a domestic currency into foreign currencies at a fixed rate of exchange, represented a sea change in the monetary system of the US and many other economies. The replacement of fixed with largely market determined flexible exchange rates gave the Fed and other central banks the opportunity to target the money supply as an objective of their policies. As was recommended by the monetarists in response to the much higher rates of inflation of the nineteen seventies. This recommendation was largely ignored.

In due course, controlling Inflation became an explicit target of the Fed and other central banks, and the primary instrument of monetary policy in the US and widely elsewhere, took the form of adjustments to short term interest rates as set and made effective by the central bank. Freed of responsibilities to maintain the convertibility of the domestic currency into gold or other currencies, the mandates of central banks could have been a dual one as it is with the Fed, to maintain low rates of inflation and help achieve the growth potential of the economy. Or the mandate could be a more limited one, to control inflation within a narrow range - without explicit concern for the state of the economy- as has been the objective of the European Central Bank.

The relationship between interest rates and the demand for and supply of money

For the monetarist the supply of money matters directly for the state of the economy and not only for the purpose of setting interest rates. For the monetarists changes in the money supply can affect spending on goods and services. Money holdings are an on alternative to other financial or real assets in portfolios and can be substituted for money in ways that influence their their valuations. Interest rates will also influence the demand for goods and services and for assets. However interest rates will also influence both the supply of and demand for money and the demand for and supply of central bank money. The essential monetarist or quantity theory proposition is that the demand for money can be estimated reliably as a function of a few key explanatory variables, including interest rates, incomes, prices, wealth and inflation expected. Therefore it is not the supply of money that matters for the economy but the excess supplies of money over the predictable demand to hold money, that will lead to more spending and higher prices.

Milton Friedman in 1956 had offered an interpretation of the oral tradition of the Quantity Theory of Money as taught and discussed at the University of Chicago when he was a member of the Economics Faculty. [1] In the paper he offered the following important assertion about the theory.

*'The Quantity theory is in the first instance a theory of the **demand** for money. It is not a theory of output, or of money income, or of the price level. Any statement about these variables requires combining the quantity theory with some specifications about the conditions of supply of money and perhaps about other variables as well'*

We follow this advice and specify the changing conditions that have affected the supply of money in the US since the GFC. We would argue that the lower inflation rates in the US after the high inflation nineteen seventies were realized because the growth in the money supply and bank credit has been broadly consistent with the increased demands to hold money. This implies that interest rate settings in

[1] Milton Friedman, The Quantity Theory of Money- A Restatement in Studies in the Quantity Theory of Money (Chicago: University of Chicago Press, 1973) Milton Friedman ed; cash

the US and Europe have on average been consistent with less inflationary money supply and bank credit trends and perhaps somewhat accidentally so- given the lack of official attention paid to the trends in the growth of money and bank credit . Yet, despite what may be regarded as Fed actions and reactions that successfully brought inflation under control, money supply and income growth and inflation in the US have remained variable, more variable than might be regarded as desirable. Lower inflation has not clearly not eliminated the business cycle.

At any point in time there could be a policy determined interest rate, consistent with a non-inflationary increase in the money supply, because it satisfies the demand to hold money. That is helping to engineer not too much, nor too little supplies of money to meet the demand to hold money. But it is an exacting task for central banks to estimate the interest rate that will equilibrate the demand for and supply of money without threatening too much or indeed too little inflation. Setting interest rates at a level that is consistent with a non-inflationary increase in the supply of money therefore requires accurate forecasts of incomes and prices and inflation expected, among the other economic forces that might affect the demand for cash reserves by the banks, the demand for credit from the banks and the demand for and supply of money, that is mostly of bank deposits. Successful monetary policy, ensuring money supply growth remains consistent with non-inflationary demands for money, will require accurate predictions of the demand for money and for the demand for cash reserves of the banking system.

Monetarists, led by Milton Friedman, became highly prominent in the high inflation nineteen seventies, arguing with much evidence to support them, that the supply money mattered for the business cycle, that is for the growth in output and incomes, as well as for the level of prices and inflation. In 1963 Friedman with Anna Schwartz produced a monumental monetary history of the United Sates 1867-1960.[2] They concluded in the summing up of their study (Chapter 18) that

1) *Changes in the behavior of the money stock have been closely associated with changes in economic activity, money income, and prices*

2) *The interrelation between money and economic change has been highly stable*

3) *Monetary changes have often had an independent origin; they have not been simply a reflection of changes in economic activity*

These common elements of monetary experience can be expected to characterize our future as they have our past. In addition, we can expect the future like the past to give further examples of the less specific generalization that:

4) *In monetary matters, appearances are deceiving; the important relationships are often precisely the reverse of those that strike the eye.*

[2] A Monetary History of the United States 1867-1960, National Bureau of Economic Research 1963. Chapter 18

Illustrating the challenge to forecasters when attempting to control the money supply with interest rate settings

The forecasting challenge for central banks can be illustrated as follows in the diagram below. (Figure 1) Interest rates are shown on the Y axis of the chart and the money supplied and demanded on the X axis. The demand for money is shown as a negative function of interest as in L0-L0. The demand for money is also dependent on incomes and prices (positively) and inflation expected (negatively) in addition to interest rates, as captured in the diagram. The demand for money will also depend positively on the wealth of money holders. Any increase or decrease in these variables other than interest rates that help explain the demand for money, at any point in time, can be illustrated by a shift, out or in, of the demand for money functions indicated in the diagram. As for example by an outward shift in the LL curve to L1-L1, when the demand for money increases independently of prevailing interest rates. Or illustrating a reduced demand for money in response to lower incomes, prices or more inflation expected, which is expressed as an inward shift of the demand for money function L2 -L2.

The intersection of the original demand for money function Lo-Lo with MSo, a presumed target for the money supply, indicates an equilibrium relationship between the demand for and intended supply of money MSo, realized with a policy determined interest rate R0. This illustrates that it is theoretically possible for a central bank to select an interest rate consistent with a predetermined (non-inflationary) money supply target. However, should incomes or prices increase in ways not expected by the central bank, the demand for money would increase, illustrated by the outward shift in the L-L schedule to L1-L1 and the money supply will then increase automatically from MS0 to MS1 to satisfy the extra demands for cash - at the same policy pre-determined interest rate (R0) The extra cash will automatically come from the central bank accommodating the banking system with additional loans at their request.

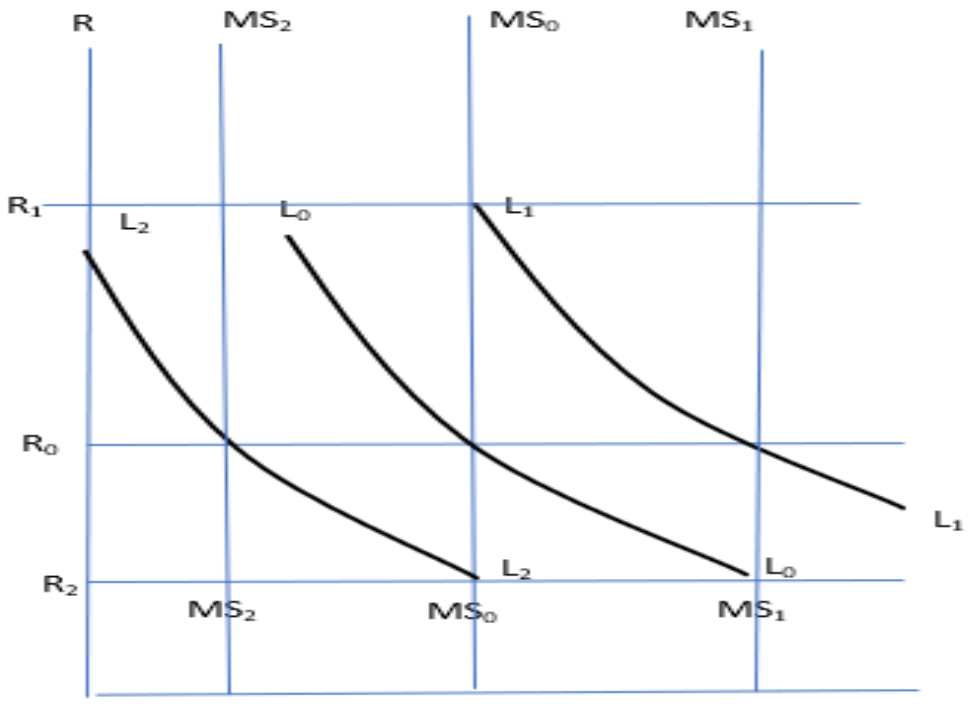
The interest rate that would have been required to avoid this unintended increase in the money supply should therefore have been set higher –in advance - at the level where the L1-L1 curve intersects the MS0 line (R1) By contrast an unexpected decline in incomes or prices or an increase in inflation expected, would mean that interest rates had been set too high – and the money supply would contract automatically to meet the lower demands for money. The L-L curve would then have shifted inwardly to L2-L2 and the money supply would contract as illustrated to M2. Unless that is interest rates were set lower at R2 in anticipation of the decline in demand for money advance.

The possibility of pro-cyclical money supply developments becomes obvious with the selection of an interest rate by the central bank designed as would be the intention to stabilize the economy. That is for the money supply to grow unintentionally faster when incomes are picking up and demands for money are increasing or vice versa when the income are growing more slowly given the policy directed interest rate. When interest rates are set below what would have been an equilibrium, money supply growth will accelerate unexpectedly with the cycle- and slow down with incomes and prices should interest rates be set too high.

Solving for the right equilibrium interest rate consistent with the right amount of money to satisfy the demand for money and no more or less, requires accurate forecasts of the demand for money function, and therefore accurate forecasts of the other variables, incomes, prices etc. that also influence the

demand for money. Is not a simple task in practice, as demonstrated by the variability of the supply of money.

Fig.1; The supply and demand for money. An Illustration



Responding to recent financial and economic crises- similarities and differences

Extra central bank cash, in the form of additional deposits held by commercial banks with the Fed, after the GFC and the Covid lockdowns were created through the purchase by the Fed of government bonds and mortgage-backed securities on a very large scale, a process known euphemistically as Quantitative Easing (QE) It might have been described more honestly – as printing money- in a good cause naturally. The extra cash supplied to the economy, led to very different reactions by the commercial banks after the GFC, when compared to their reactions after the Covid crisis. Understandably so because in the financial crisis, it was the potential failure of the banks that seriously threatened the health of the economy. In 2020, the economy was locked down in response to the Covid epidemic. The banks, especially after the stimulus provided so rapidly in 2020, were not at risk of failure. Thus, the risk tolerance of the banks themselves has proved quite different in the two episodes of central bank money creation, and understandably so.

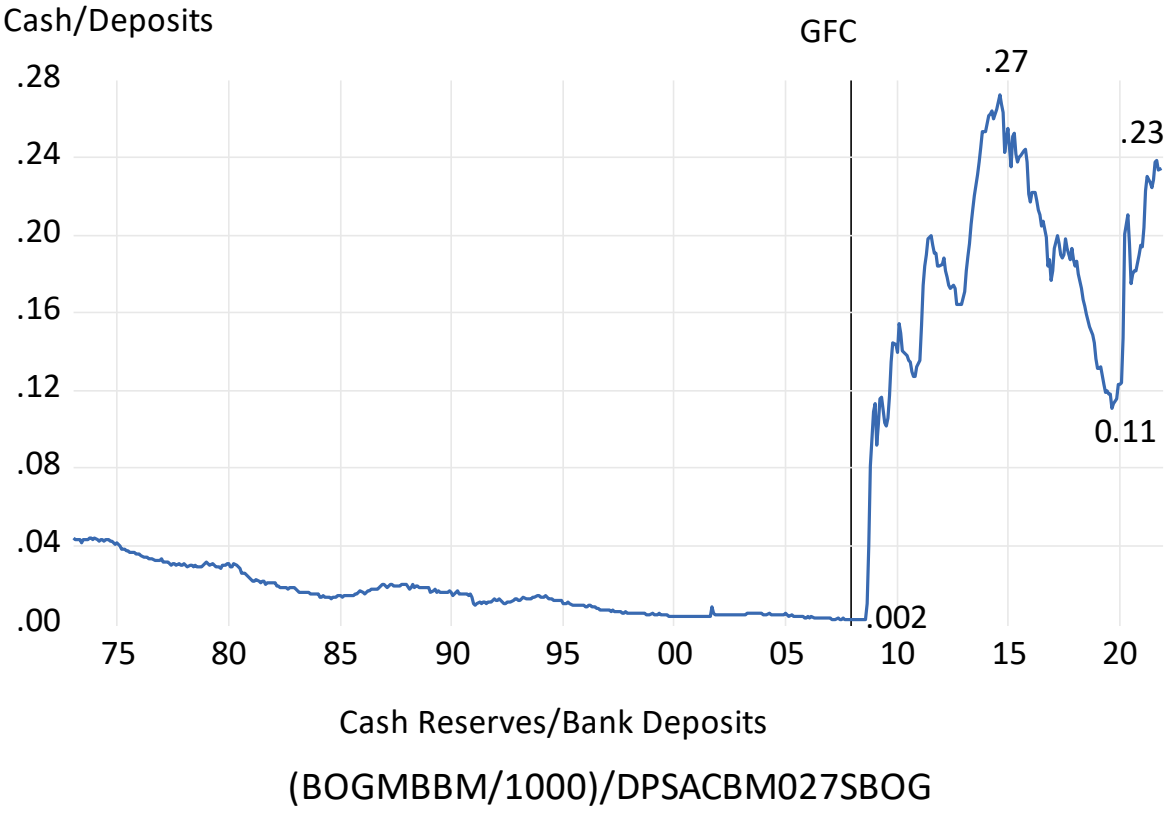
After the GFC, the banks increased their demands for the extra cash reserves supplied so generously and uniquely by the Fed, in an equally unprecedented way. They used the extra cash to guarantee their solvency. The commercial banks therefore did not however convert extra cash into extra loans, as they might ordinarily have been expected to do. Hence the banks undertook very modest amounts of additional lending, converting cash into overdrafts and the like. As a result, the supply of bank deposits did not accelerate meaningfully after the GFC.

In the five years after the GFC, between 2008 and 2012, the money supply M2 increased modestly by 40% or at an annual average compound rate of 6.6%. Bank deposits over this five-year period grew at a significantly slower rate, by only 2.3% p.a. on average. Therefore - other forms of money- currency in circulation, outside the banking system, grew at a significantly faster rate than bank deposits. Prices, represented by the GDP deflator, rose at an annual average rate of 1.7% p.a. over the five post GFC years, at a significantly slower rate than the money supply broadly defined, but not dissimilarly to the growth in bank deposits. This slower rate of increase in deposits held by households and firms, excluding additional holdings of currency, may be considered to have muted the impact of money on spending in the US. These developments after the GFC were also accompanied by a stronger dollar, a supply side force that would have helped restrain prices.

The money base, the sum of cash reserves plus currency in circulation supplied by the Fed, grew much faster than the money supply, by over 23% p.a. on average over the five years post GFC. It was central bank rather than private bank deposits that grew very rapidly after 2008. The cash reserves held as deposits by the banks with the central bank however are not counted as part of the money supply. Only the currency held outside the banks is the part of the money base defined to be part of the money supply.

In 2020 -21 before and after the Covid crisis the banks had continued to hold cash reserves that were far greater than the cash reserves they were required to hold as a reserve against their deposit liabilities. Though as we show in figure 2. below, the cash reserve to deposit ratio of the banks had declined markedly by 2019. That is from a peak ratio of 27% of deposits by 2014 down to 11% of deposits by 2019. The cash reserve to deposits ratio of the commercial banks declined in response to the reversal of QE in 2015 the reduction in the supply of central bank money and the smaller balance sheets of the Federal Reserve System.

Fig 2; US Commercial Banks; Cash to Deposit ratio



Source; Federal Reserve Bank of St.Louis (Fred) and Investec Wealth and Investment

By contrast, more of the extra cash supplied to the banking system by the Fed in 2020 and 2021 were converted into extra bank lending and have led to additional bank deposits. Total bank credit increased by 2.298 trillion dollars, or by 14% over the period January 2020- November 2021, and the money supply, broadly defined to include bank deposits, grew very rapidly by 36%, and prices facing consumers by 8%. Bank deposits grew by 29% between January 2020 and November 2021. The rapid increase in

the money supply in 2020-2021 clearly contributed to increases in aggregate spending and higher prices for financial assets as predicted by monetarist theory – to be further elaborated upon below.

Explaining in words the money supply process- the ratio between the supply of money broadly defined – to the cash supplied by the central bank

Bank deposits an alternative to currency make up the great bulk of the money supply in any developed economy. The necessity of banks to hold cash reserves depends on the structure of the payments system. The more bank deposits are likely to be cashed in and exchanged for currency- or exchanged for deposits in foreign banks- the more cash any bank and the banking system will be required and wish to hold to meet such withdrawals. The smaller the cash reserves the banking system decides to hold, or is required by regulation to hold, as cover against their deposit liabilities, the more lending the banks will be able to do and the more deposits they will supply to the economy. A loan provided by one bank is very likely to lead to an extra deposit at another bank, or even at the same bank if it is a large one, rather than lead to a withdrawal of cash from the banking system.

The general substitution of bank deposits for currency by households and businesses, for their safety and convenience as a medium of exchange evolves gradually over time as an economy develops. Offering a money transfer service, as well as a financial asset, in the form of an easily transferred bank deposit, provides profitable opportunities to banks to expand their offerings on both sides of their balance sheets. In any final analysis, it is the profitability of banking that will determine the real size of a banking system and of the deposits it will supply, as James Tobin explained in a seminal paper[3]. The ratio of bank assets and liabilities to GDP would reflect the economic importance of the bank system as it would any sector of the economy. Profits or return on capital invested and re-invested in banks will depend upon the opportunities the banks have to borrow – mostly in the form of deposits provided by their customers -and on the demand for their loans as determined by their customers. The real cost of facilitating payments and receipts on behalf of customers, preventing fraud for example, will also partly determine the appeal of deposits and the profits of banks and their long-term growth prospects. The financial health of the banks that facilitate the payments system is crucial to economic stability. A banking crisis threatens the payments system without which a modern economy could not function. It is this danger that makes banks different to other financial intermediaries, and well worth protecting in times of crisis.

Deposits are supplied by profit seeking banks and are not *"created"* costlessly or magically by them. And holding a deposit in a bank represents as much a savings decision, or a sacrifice of consumption, however temporary, as would saving and investing the savings in the securities of any financial intermediary. While the real size of the banking system is determined by real forces, it is the demand for and supply of cash reserves as well as the supply of cash reserves provided by a central bank that is likely to be responsible for an additional, or more rarely a declining supply of bank deposits over any business cycle. That is at the margin, given the established structure of the banking system, central bank

[3] The seminal Tobin paper is *Commercial Banks as Creators of ""Money"*, Reprinted from Banking and Monetary Studies,edited by Deane Carson, for the Comptroller of the Currency, U.S.Treasury (Homewood,Ill; Richard D. Irwin,Inc., 1963), pp 408-419. Reprinted in Financial markets and Economic Activity, Donald D. Hester and James Tobin, editors, Cowles Foundation for Research in Economics at Yale University, Monograph 21, John Wiley and Sons, New York (1967)

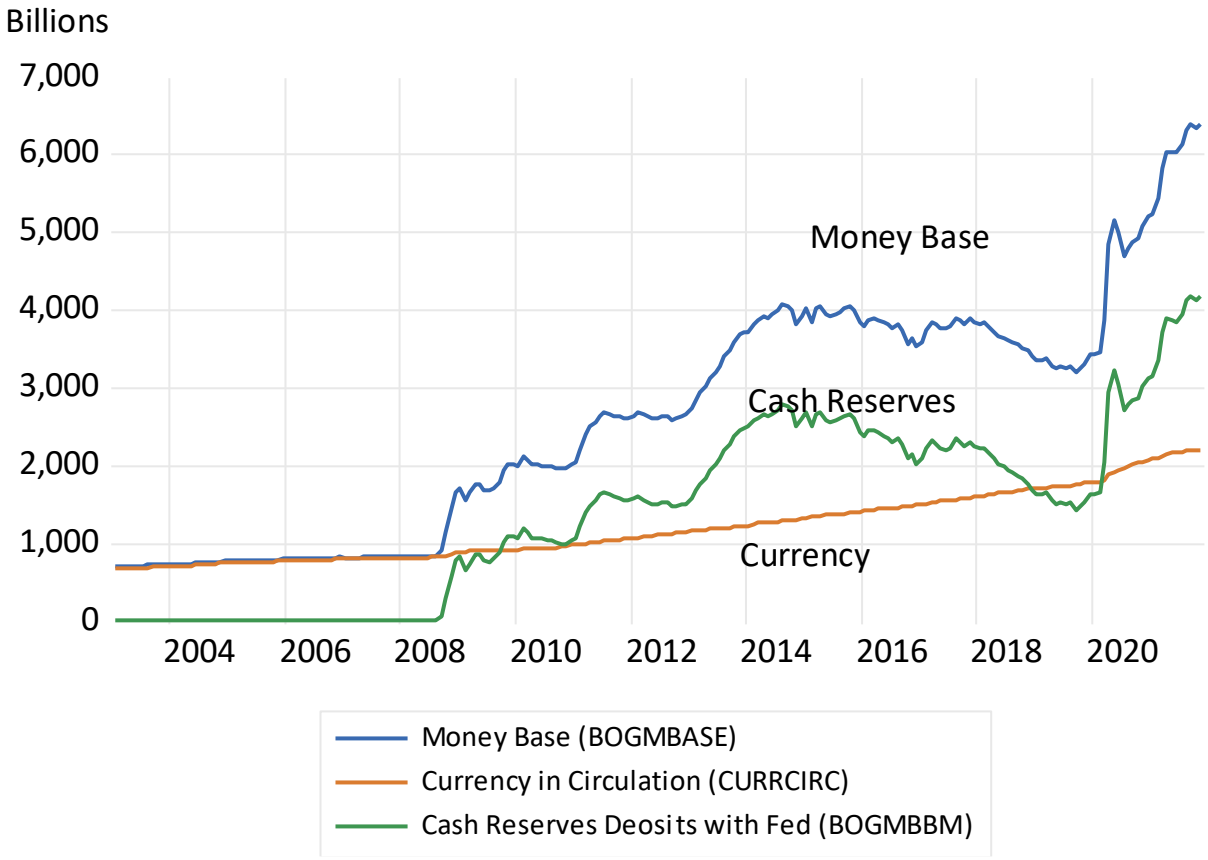
action taken to increase or decrease the cash reserves they supply the system, will have short term repercussions for the economy, depending on the reactions of the banks to the cash being made available. The banks may hold additional cash reserves supplied to them, in which case the money supply, that is the deposits of the banking system, may remain largely unaffected by an injection of central bank money, as was largely the case after the GFC. Should the banks utilize the extra cash made available to them to increase their loans, bank deposits and the money supply will increase at a faster rate. Should a central bank reduce the stock of cash by open market operations, that is when selling rather than buying securities in the market, doing the reverse of Quantitative Easing (QE) a bank might draw down their cash reserves to undertake more lending and more deposits, As was the case after 2015 when QE was reversed and the supply of Fed money, deposits at the Fed, declined.

All change on the monetary front after the GFC.

In response to the increased supply of cash initiated by the Fed and the increase in the demand for cash reserves by the commercial banks after 2008, the relationship between the money base supplied by the Fed (currency in circulation plus bank deposits with the Fed) and the deposits supplied by the commercial banks, changed dramatically and probably permanently. A system that ensured that the banks operated with minimal cash reserves, that is cash reserves held in addition to required, regulated, cash reserve to deposit ratios, became a system after the GFC where banks now hold large reserves of cash in the form of deposits with the Fed. (see figure 2 above)

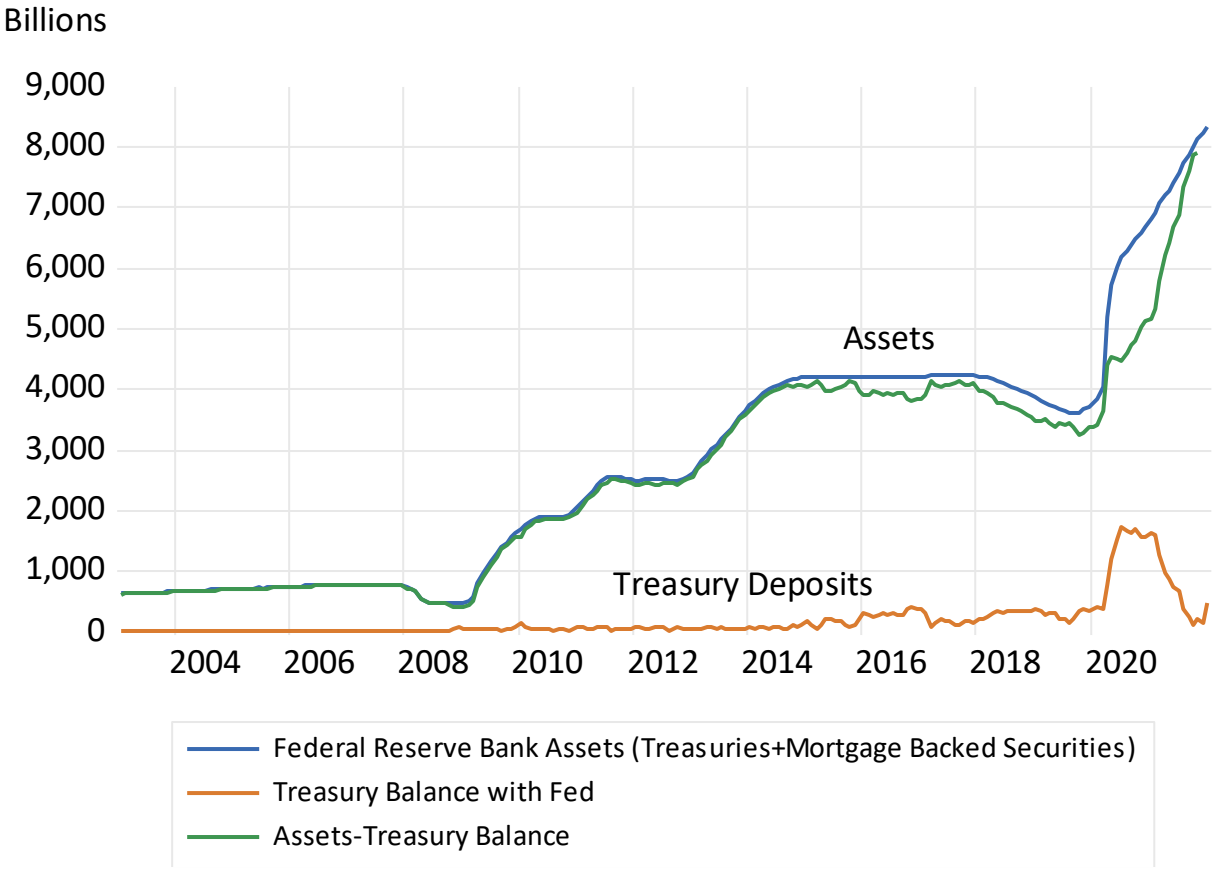
The system of money supply control before the GFC was one that enforced the Fed's interest rates settings, the Fed Funds rate, by keeping the banks permanently short of cash reserves through what were known as open market operations by the Fed and dependent on the Fed for additional supplies of cash. The Fed before the GFC bought or sold securities to offset flows of cash into or out of the money market emanating from the Treasury balance with the Fed and possibly the balance of payments. Other forces acting on the money base remaining the same, an increase in the Treasury balances with the Fed will reduce the deposits of the commercial banks, for example as taxes are raised or new bonds are issued. As the Treasury draws on its accounts with the Fed to fund expenditure or repay bonds maturing, commercial bank deposits with the Fed increase as the Treasury checks are deposited in banking accounts. The most unusual behavior of the Treasury account with the Fed in 2020 is deserving of notice. Early in 2020, pre-Covid lockdowns, the Treasury deposits grew very rapidly- draining the cash reserves of the banks and reducing the money base. The Treasury then sharply reduced its balance with the Fed to pay the Covid related benefits while also raising additional debt to fund the extraordinary increase in benefits provided. (see figures 3 and 4 below)

Fig. 3; The composition of the US Money Base. Monthly Data



Source; Federal Reserve Bank of St.Louis (Fred) and Investec Wealth and Investment

Fig.4; Federal Reserve Banks; Sources of Changes in Money Base. Monthly Data

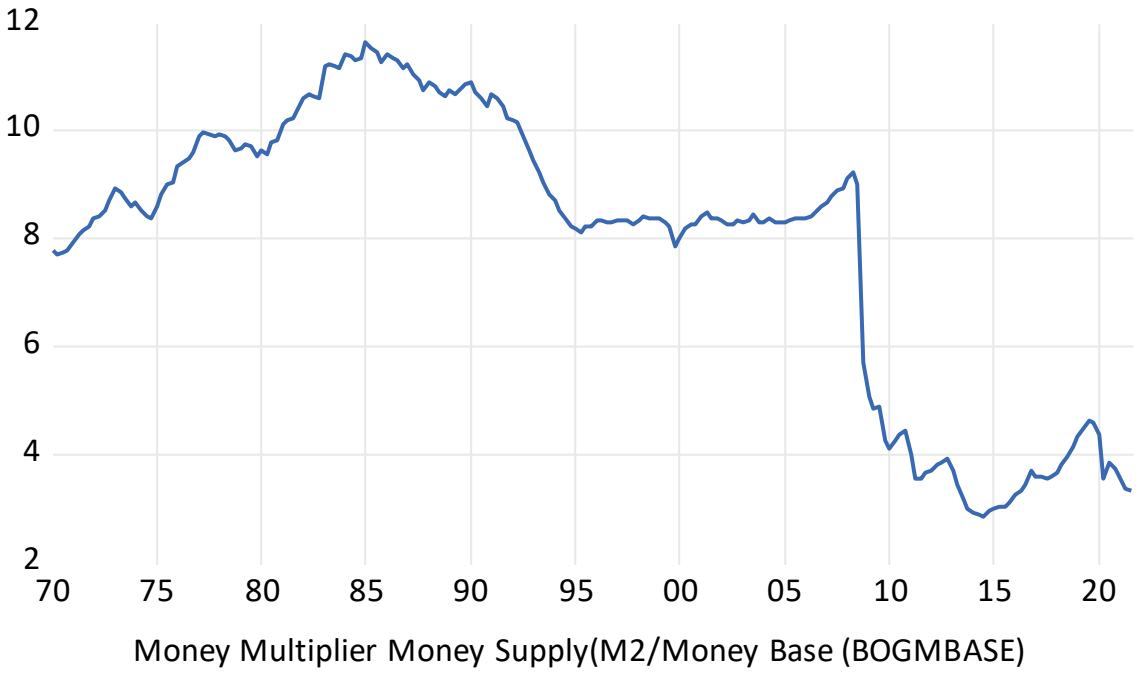


Source; Federal Reserve Bank of St.Louis (Fred) and Investec Wealth and Investment

The Fed- a borrower rather than a lender be – to and from the member banks

To maintain their control of short-term interest rates, given the excess supply of cash reserves after the GFC, the Fed began to offer interest on these deposits. In a world of abundant cash reserves held by the banks, it is now the Fed's borrowing rather than its lending rate that sets the basis for short term interest rates. The money multiplier, the statistical relationship between cash supplied by the central bank and deposits supplied by commercial banks M2/Money Base, that was nearly twelve times in 1980, has shrunk away to the current ratio of less than four, as the supply of and demand for cash reserves increased. Thus, so called high-powered money is not nearly as high powered as before the GFC. (see figure 5 below) Its future direction should be of much interest to the Fed.

Fig.5; The US money multiplier M2/Money Base



Source; Federal Reserve Bank of St.Louis (Fred) and Investec Wealth and Investment

It will be revealed in time if the interest rate offered on these cash reserves will be consistent with non-inflationary supplies of bank credit and deposits and act usefully in an anti-rather than a pro-business cycle way. That is will policy determined interest rates be set high or indeed low enough to deter the banks supplying too much extra credit to their customers when demand for credit is buoyant, or too little when credit demand is weak- so exaggerating the business cycle? It is accurately predicting the demand for excess cash reserves that will be the objective of interest rate settings designed to control the supply of money.

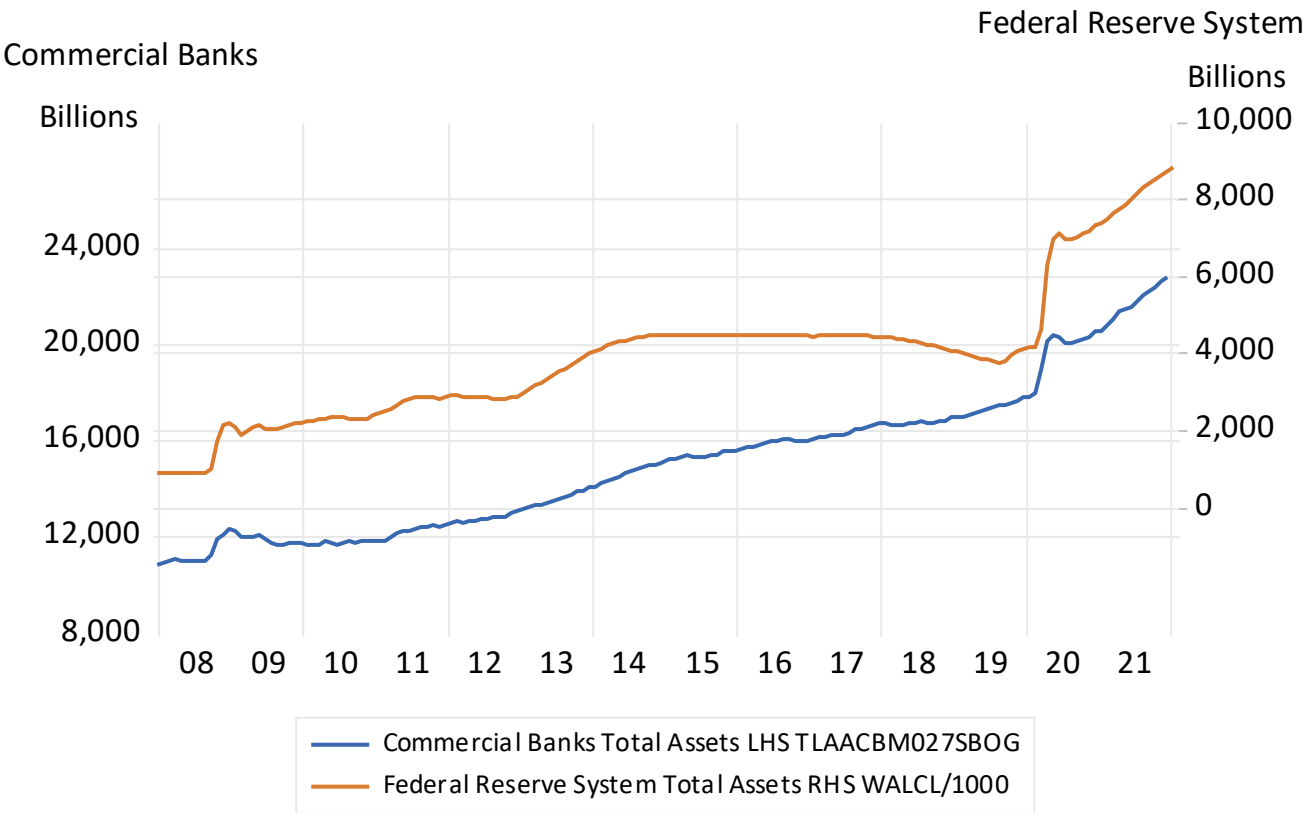
Tapering and then reversing Quantitative Easing. The impact on the balance sheets of the Fed and the commercial banks- a case study

The Fed began to reverse its bond and other asset purchase programs in 2015. This meant a decline in the size of the Fed balance sheet. The quantity of cash reserves held by the banks declined accordingly. Yet the balance sheets of the commercial banks continued to increase as the banks drew on their still vast excess cash reserves to advance credit. Loans replaced cash, to a degree, on the asset side of the commercial bank's balance sheets. And these additional loans found their way into increased deposits on the liability side. The increase in the money multiplier after 2015 following a decline in the cash

reserve to deposit ratio made up for the decline in the money base as may be seen in figures 3 and 4 above and figure 6 below.

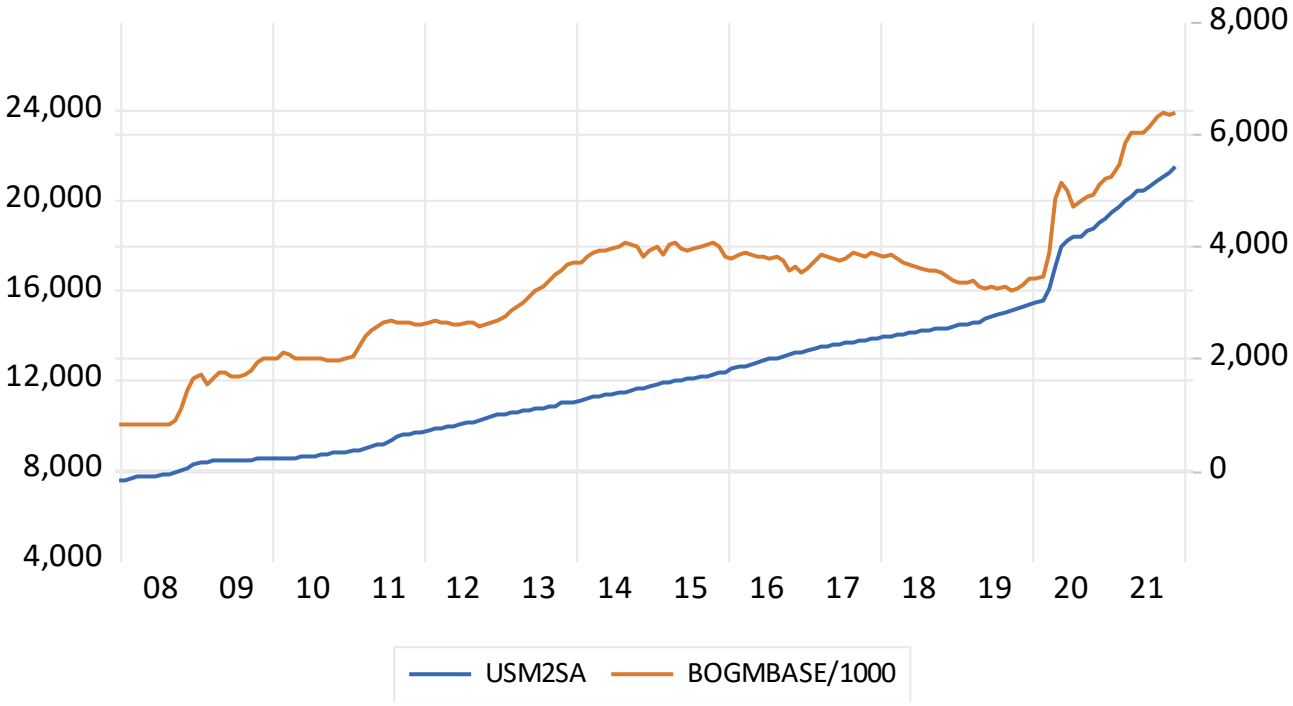
We can expect the same trends as the FED begins to taper and then reverses its purchases of bonds in 2022 which will lead to a reduction in the size of its balance sheet. This smaller Fed balance sheet is unlikely to be followed by a shrinking commercial banking system and a decline in commercial bank deposits and M2, unless the demand for bank credit goes into reverse. The banks are likely as before to fund the growth in their loan books by drawing on their cash reserves, reducing the cash to deposit ratio and increasing the supply of deposits. It is the buoyancy of demands for bank credit, at policy determined interest rates, that will, as always, determine the supply of deposits and money. Reducing the cash reserves of the banks will not be sufficient to the purpose of slowing down the growth in the money supply, broadly defined.

Fig.6; Assets of the US Commercial banks and the Federal Reserve System 2008-2021. Monthly Data Billions



Source; Federal Reserve Bank of St.Louis (Fred) and Investec Wealth and Investment

Fig.6; The Money Supply M2 (Left Hand Scale) and the Money Base (RHS) Billions



Source; Federal Reserve Bank of St.Louis (Fred) and Investec Wealth and Investment

Inspecting the critical relationships

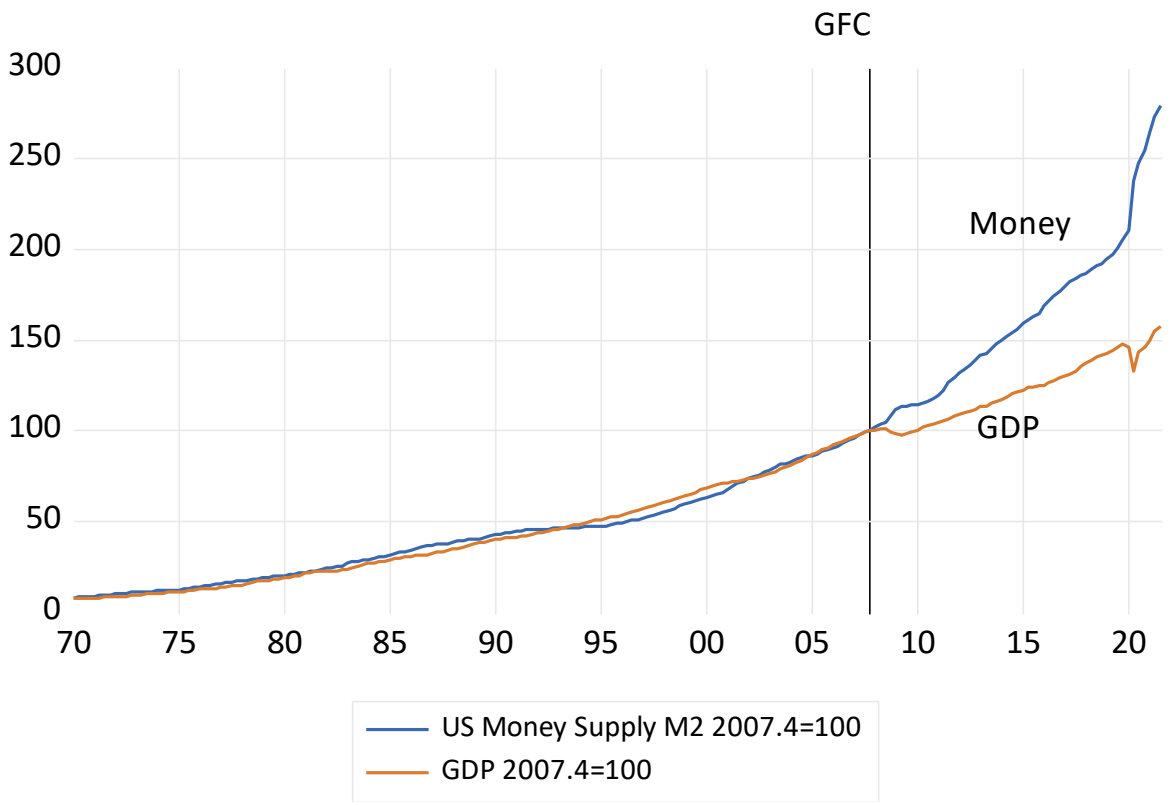
Despite this much lower multiplier the relationship between the broader definitions of the US money supply (M1 or M2)4 and the economy, represented by nominal GDP, has increased significantly since 2008. There is significantly more money (M2) relative to US incomes (GDP) than before 2008. There is now 80% more money (M2) supplied by the monetary system, per unit of GDP, than there was in the nineteen eighties as may be seen in figures 6 and 7. The ratio of M2 to GDP increased by 80% between Q4 2007 and Q3 2021. It seems clear that the GFC and the injection of excess cash reserves has led to a systemic change in the relationship between money and incomes. As may be seen in figure 7 below the money supply and GDP sustained a near one-to-one relationship until the GFC. All changed after that with the policy reactions to the GFC and the Covid crisis. But it would seem clear that the linkages between money and the economy would require a somewhat different explanation before and after the GFC. Changes in the supply of money rather than the demand for money has initiated this different relationship.

[4] Beginning May 2020, M1 consists of (1) currency outside the U.S. Treasury, Federal Reserve Banks, and the vaults of depository institutions; (2) demand deposits at commercial banks (excluding those amounts held by depository institutions, the U.S. government, and foreign banks and official institutions) less cash items in the process of collection and Federal Reserve float; and (3) other liquid deposits, consisting of OCDs and savings deposits (including money market deposit accounts). Seasonally adjusted M1 is constructed by summing currency, demand deposits, and OCDs (before May 2020) or other liquid deposits (beginning May 2020), each seasonally adjusted separately.

M2 comprises M1 plus (1) savings deposits (including money market deposit accounts); (2) small-denomination time deposits (time deposits in amounts of less than $100,000), less IRA and Keogh balances at other depository corporations; and (3) balances in retail money market mutual funds, less IRA and Keogh balances at money market mutual funds. Seasonally adjusted M2 is constructed by summing savings deposits, small-denomination time deposits, and retail money funds, each seasonally adjusted separately, and adding this result to seasonally adjusted M1.

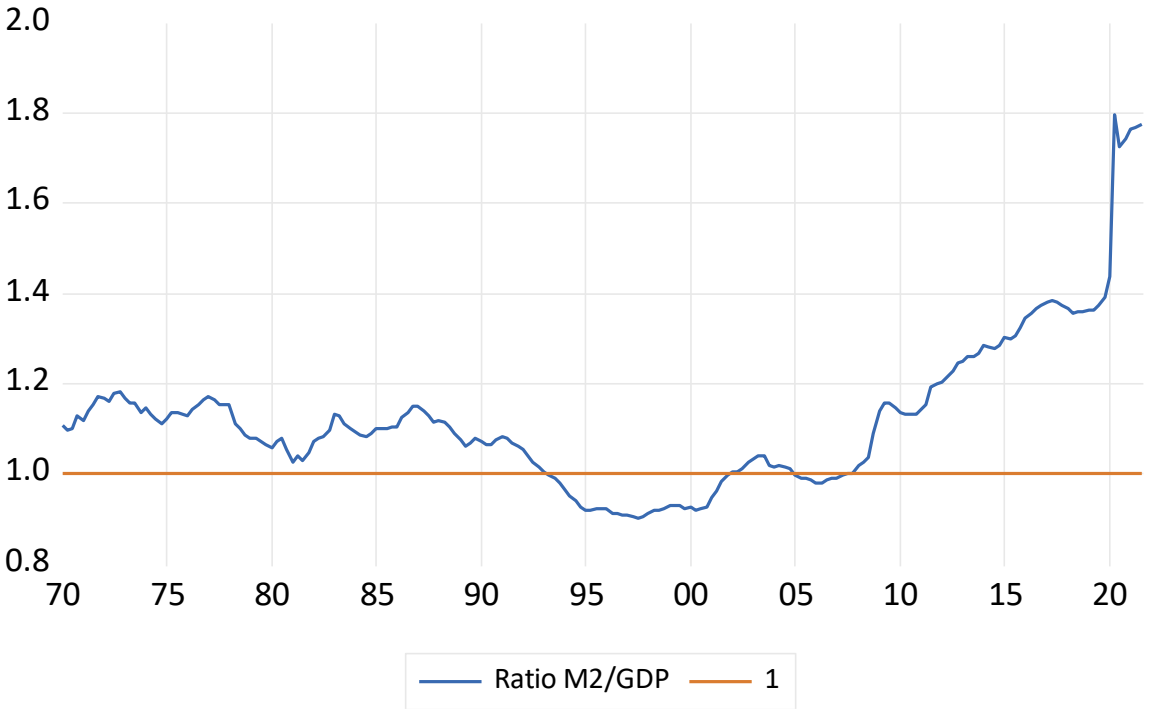
Source; Board of Governors of the Federal Reserve System (US), M1 [M1SL], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/M1SL, January 5, 2022.

Fig. 7; US Money Supply M2 and GDP (2007 Q4 =100) Quarterly data



Source; Federal Reserve Bank of St.Louis (Fred) and Investec Wealth and Investment

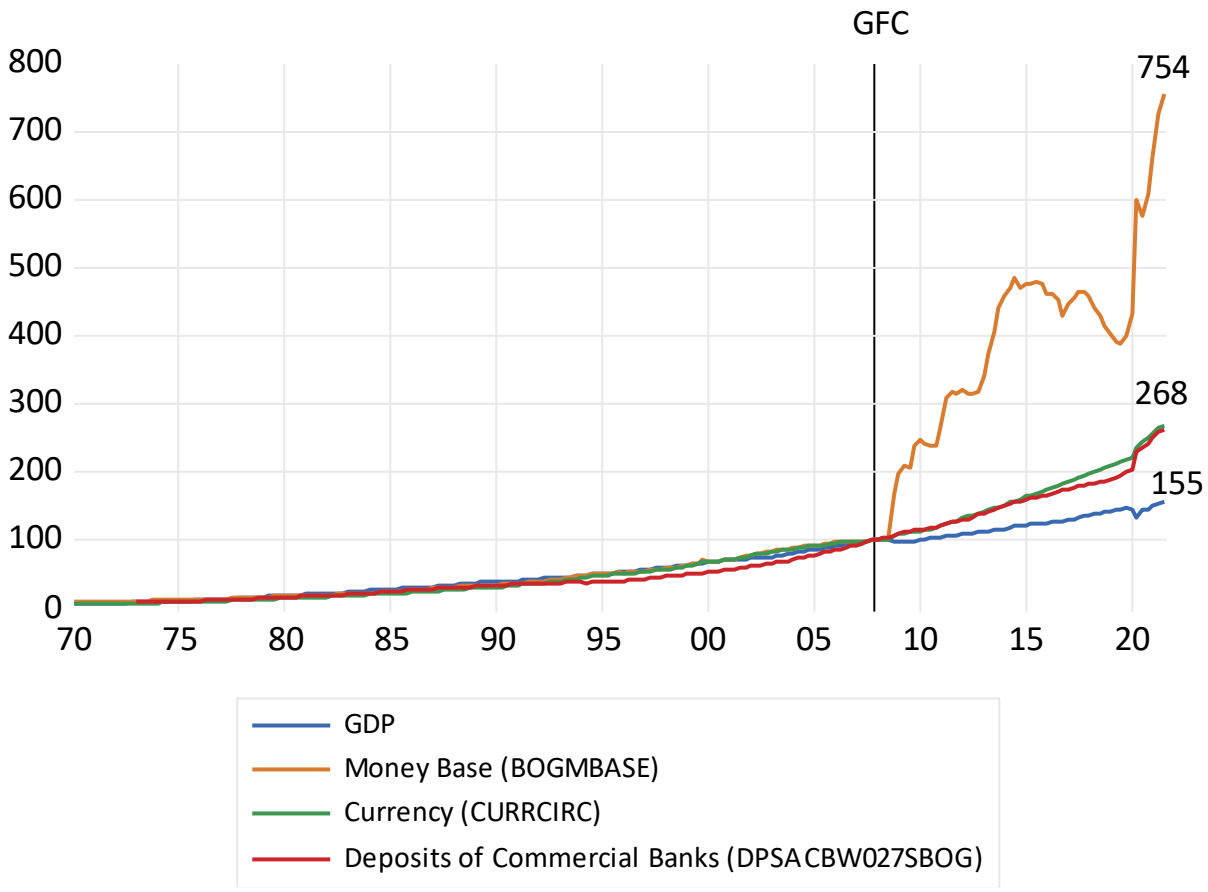
Fig.8; Ratio Money (M2) to GDP 2007=1



Source; Federal Reserve Bank of St.Louis (Fred) and Investec Wealth and Investment

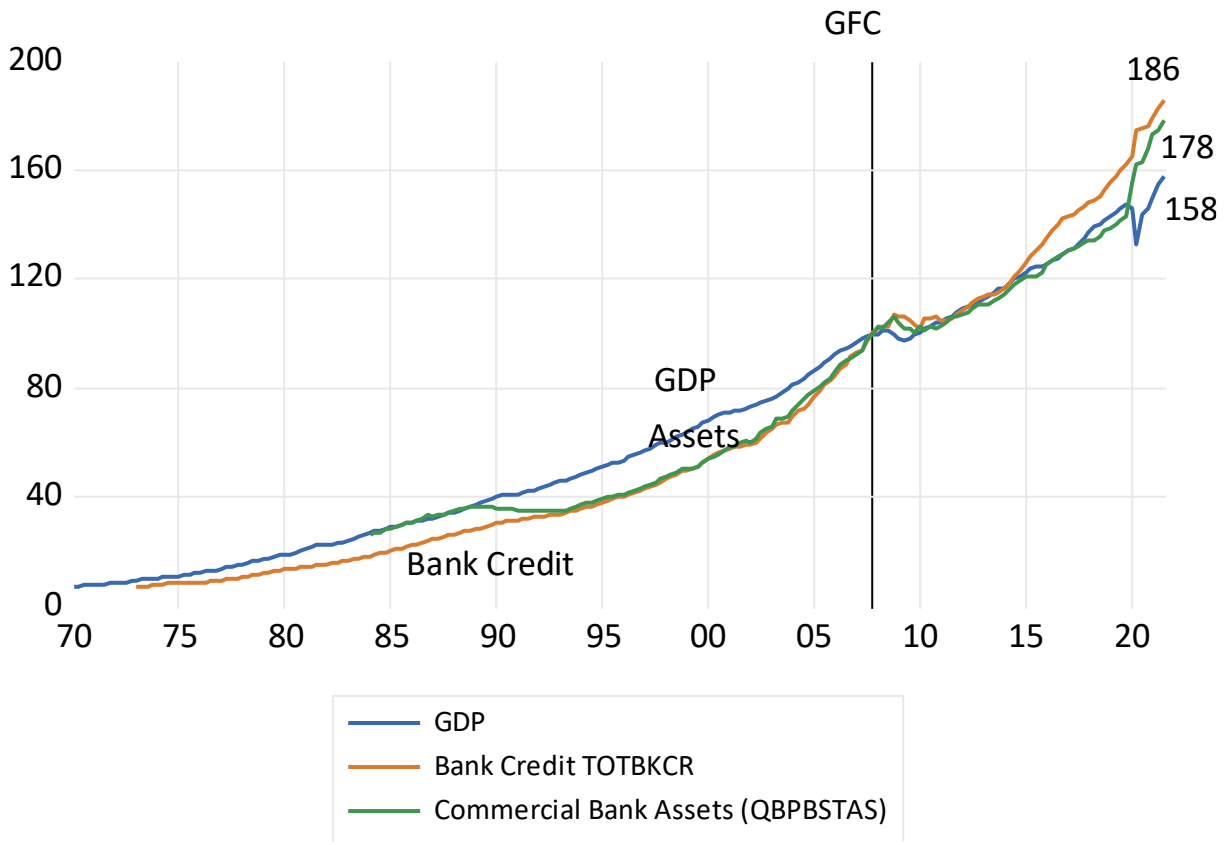
Of further interest is that the demand for currency, notes and coins has not declined relative to nominal GDP despite all the improvements and innovations in the technology of making payments. The ratio of currency in circulation to GDP is also up, by nearly 70% since Q4 2007. US notes have always circulated widely outside the US so perhaps it is the growth in global incomes that explain the increased demand for greenbacks. If so the extra notes in circulation could not be expected to have the same impact on the US economy as extra money held by US residents. The relative importance of the banking system for the US economy as measured by the ratio of bank credit or banking assets to GDP. These ratios have also grown since 2008. As may also be seen the money supply ratio to GDP that has exploded since 2007 is that of the money base, that is central bank money to GDP. (See figures 8 and 9 below)

Fig.9; A variety of monetary Indicators – compared to GDP Q4 2007=100



Source; Federal Reserve Bank of St.Louis (Fred) and Investec Wealth and Investment

Fig. 10; The Banking System; Assets and Liabilities Compared to GDP (2007=100)



Source; Federal Reserve Bank of St.Louis (Fred) and Investec Wealth and Investment

Unique monetary experiments.

The recent monetary and fiscal experiments to save the financial system after the GFC in 2008 – that proved not to be inflationary- and in 2020 to relieve the economy from the effects of a forced lock down of normal economic activity that has led to higher rates of inflation, must be regarded as unique events in the monetary history of the US. They are experiments in very substantial increases in the supply of central bank money. Unambiguously they are cases of central bank money supply leading, on a very large scale, and the economy following. Very low policy determined interest rates, consistent with the creation of much additional central bank money, have been bit players in these dramas. They have changed – perhaps permanently - the quantitative relationship between the supply of money, the demand for money including the demand from banks for cash reserves, and the wider economy.

This direction of causation – from money to the economy- rather than the economy leading and the money supply following – is ordinarily not that obvious. There are for example endogenous forces determining the demand for currency to which the supply responds automatically. The banks supply the notes their customers demand from them drawing on their deposits and the banks keep currency in the tills or ATM's to do so. If there is a drain of currency from the banking system the banks would draw

upon their cash reserves, their deposits at the central bank, to obtain more notes to do so. That the supply of currency, a part of the money supply and the money base, depends on the demand for currency seems obvious and easily accepted.

There may well also be a large degree of endogenous determination of the other component of the money base, the cash reserves of the banks. That is under normal economic conditions when the central bank pursues as best it knows how its dual or single mandates, with tilts on the interest rate tiller that are closely observed and anticipated by participants in the financial markets. It is important to recognize that the money supply or the supply of bank credit will not have been a specific target for monetary policy.

The necessity to set short term interest rates before the GFC typically called for arrangements (open market operations by the Fed) to keep the banks short of cash reserves needed to meet regulated cash reserve requirements and to make the commercial banks reliant on the central bank as a source of additional cash. The cash could be found from other banks in the market for Federal Funds or as a final resort at the central bank's discount window, as it was once called in the UK, in exchange for securities that qualified for the purpose. Repurchase arrangements became the order of the day. Open market operations by the central bank- buying or selling government bonds – would be undertaken to offset increases or decreases in the supply of cash that could emanate from the balance of payment flows or as the Treasury drew on or ran its own deposits with the central bank conducting its fiscal operations. Open market operations were designed to ensure that the banks would have to call upon the central bank enough to make its policy determined interest rates, the repo-rate, effective in the money market.

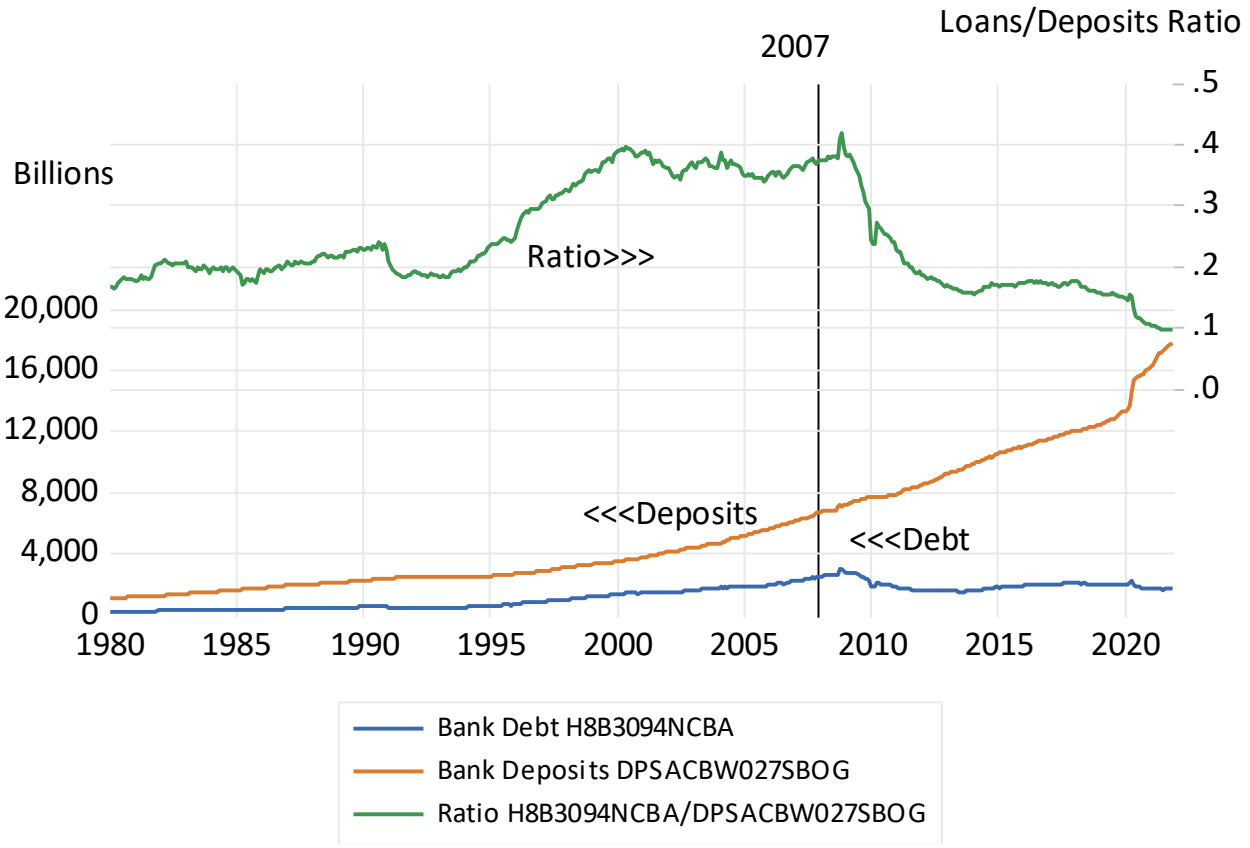
Access to extra cash made available by the central bank however provides the opportunity for the deposit taking banks to lead the process of money creation rather than to react to changes in the money supply. The banking system taken as a whole, when constrained by their limited cash reserves, might wish to satisfy additional demands for credit by their customers. They could do so borrowing more from the central bank, or from foreign banks. In such cases the demand for bank credit would be leading the supply of money and the business cycle. Causation could then run from GDP to the money supply rather than the other way round. Interest rate settings in such circumstances of an expanding cycle of money and credit and GDP growth could be judged (with hindsight) to be too accommodating and perhaps unnecessarily pro-cyclical. The reverse could also happen. The demands for bank credit could be falling away and the demand for cash by the banks might be declining in response. The business and money cycles could then be going in reverse and the interest rate settings judged as too restrictive to moderate the business cycle.

Bank leverage before and after the GFC

There was further reason for US banks to be cautious after the GFC that was of their own making. The US Banks had come to rely increasingly on debt in addition to deposits to fund their loan books including their mortgages. The ratio of bank debt to deposits peaked immediately before the GFC and has declined significantly since then. Bank deposits had fallen to about 60% of all bank assets by 2007 and debts to the equivalent of 40% of bank deposits. (see figure 11 below) The debts of banks, unlike their deposits, will have to be repaid on schedule. Only an unlikely run on a bank will require a bank to redeem its deposits for cash. The banking system, taken as a whole, is very unlikely to see a decline in its

deposit liabilities. Their debts are a much more vulnerable source of finance. And when home values are in sharp retreat such indebtedness was particularly dangerous. Holding on to as much the abundant cash injected to deal with a mortgage finance related financial crisis would surely have seemed an essential survival strategy.

Fig. 11; Some US Banking ratios before and after 2008; Identifying the role of bank debt (Debt/Deposits ratio)



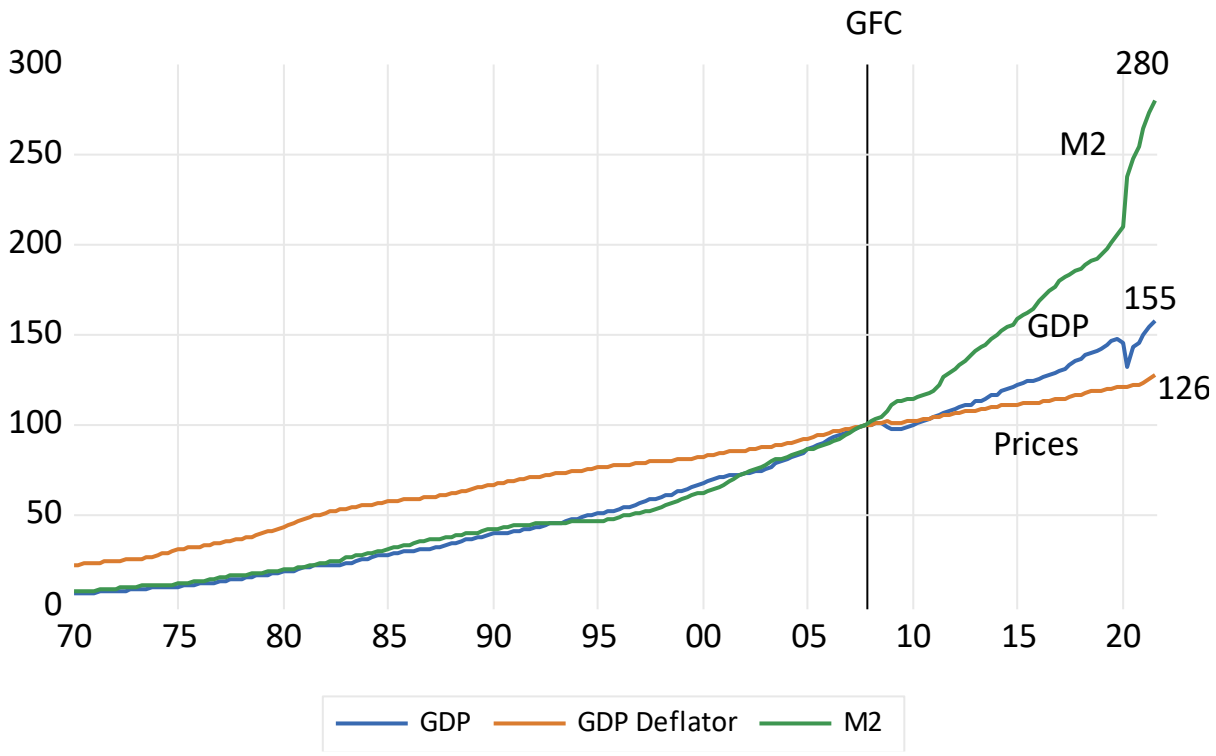
Source; Federal Reserve Bank of St.Louis (Fred) and Investec Wealth and Investment

Money and prices- a regular but not a constant relationship

The relationship between the US money supply and the price level, represented by the GDP deflator is demonstrated below. Prices as may be seen since 1970 have increased at about half the rate at which the money supply has grown over the past fifty years. The ratio of money to prices (M2/GDP Deflator) has more than doubled since 2007. This ratio (M/P) has risen further and sharply since 2020. As demonstrated in the figures 12 and 13 below the relationship between the money supply (M2) and the level of prices in the US as represented by the GDP deflator (M/P) has been rising consistently over many years. This rising ratio may be thought to vitiate the traditional quantity theory that implies something of a one- to-one long-term relationship between money and prices. The prediction of the

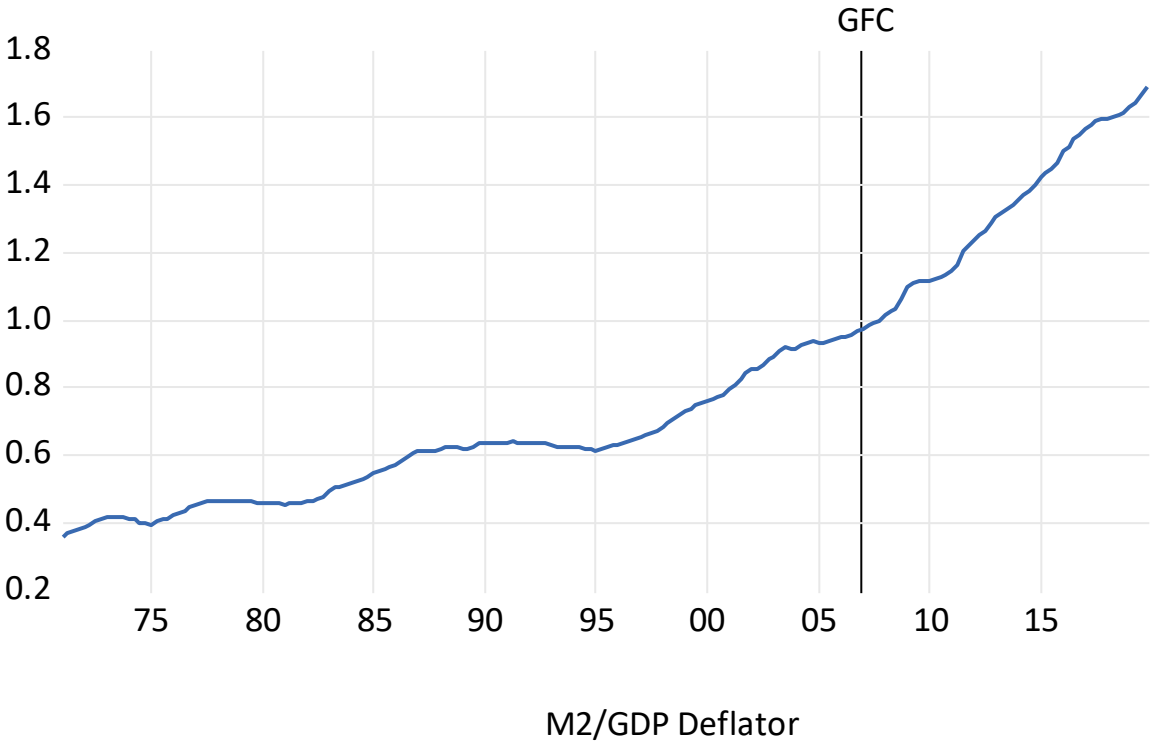
General Equilibrium theory of money, as for example comprehensively elaborated by Don Patinkin in the nineteen fifties and sixties, that a doubling of the money supply would take a doubling of prices to restore equilibrium, has not been the case in practice. A *predictable* increase in the ratio of money to prices, would however be consistent with a predictable demand for money, not necessarily a constant one.

Fig.12; US GDP, Money Supply (M2) and Prices (GDP Deflator) 2007 Q4=100 (Quarterly Data)



Source; Federal Reserve Bank of St.Louis (Fred) and Investec Wealth and Investment

Fig.13; The Ratio of Money (M2) to Prices (GDP Deflator) 2007 Q4 =1 (Quarterly Data)



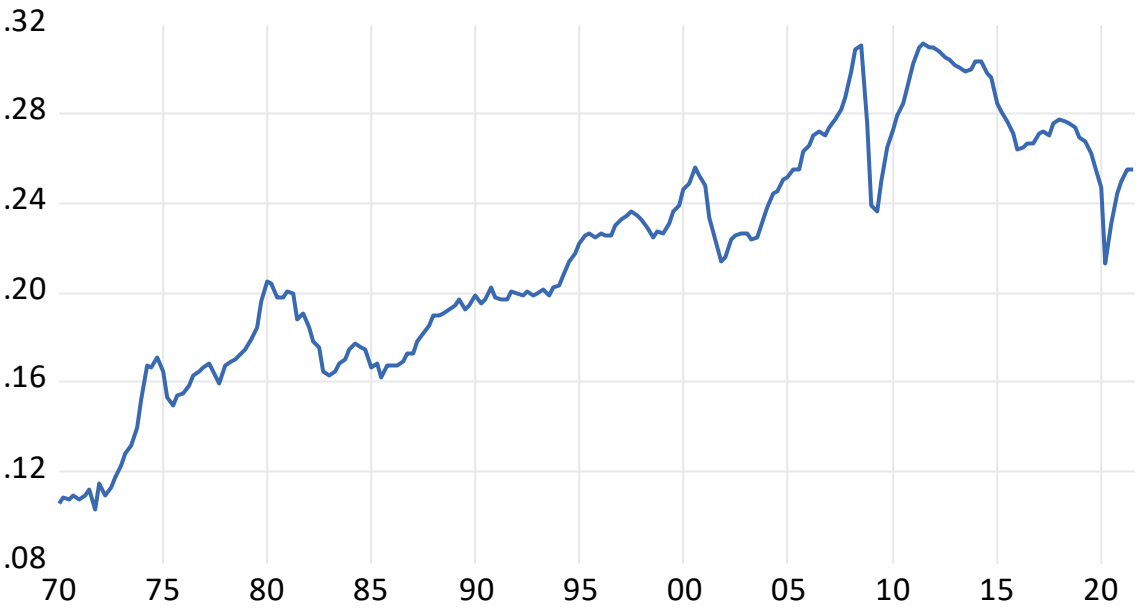
Source; Federal Reserve Bank of St.Louis (Fred) and Investec Wealth and Investment

The growing role of foreign trade in the US economy

One reason for the lower US inflation rates and the increase in the M/P ratio is the ever more significant role imports and exports now play in determining the aggregate supply of goods and services in the US economy and hence prices. Such trends may be regarded as the equivalent of a favorable supply-side shock to prices. The US economy became decidedly and consistently more open over the years after 1970 making the market determined, flexible exchange rate of the USD with other currencies more important as a force influencing prices. However, the US dollar exchange rate cannot be regarded as conforming closely to purchasing power parity. The dollar price of Euros or Yen have not tracked the CPI closely as revealed by fluctuations in real exchange rates.

An economy more open to imports and exports would mute the relationship between extra spending, and average prices. The presumed monetarist transmission mechanism is more money, more spending and therefore higher prices, other things equal, including exchange and interest rates. Clearly interest rates also influence spending, again other things, including the money supply and inflation rates remaining unchanged

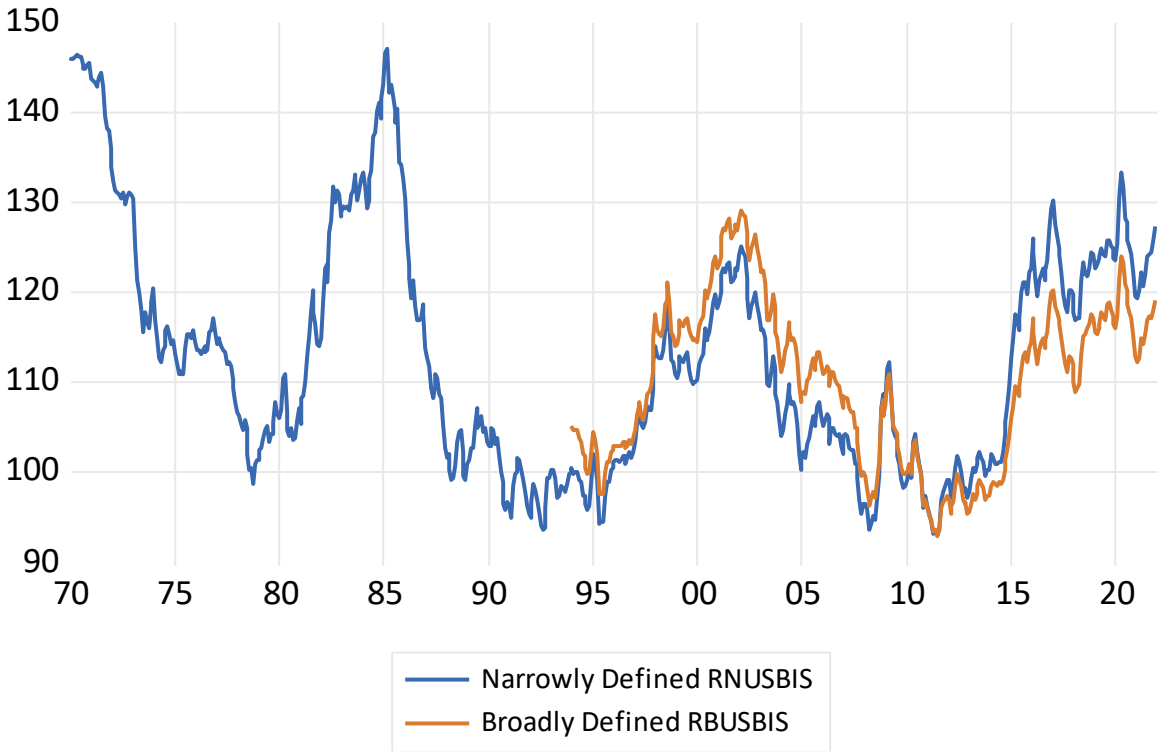
Fig.14; US GDP; Share of exports and imports; Quarterly Data 1970-2021.



Source; Federal Reserve Bank of St.Louis (Fred) and Investec Wealth and Investment

The playing field for US exporters and importers has been anything but level as judged by the movements in the real exchange rate- nominal exchange rates adjusted for differences in inflation rates between trading partners. An improving real dollar exchange rate as between 2010 and 2021 would have reduced inflationary pressures in the US. The variability of the real price of exports and imports must be regarded as an unsatisfactory feature of the lower inflation decades after 1980.

Fig.15; The real foreign exchange value of the US dollar- adjusted for differences in inflation between trading partners

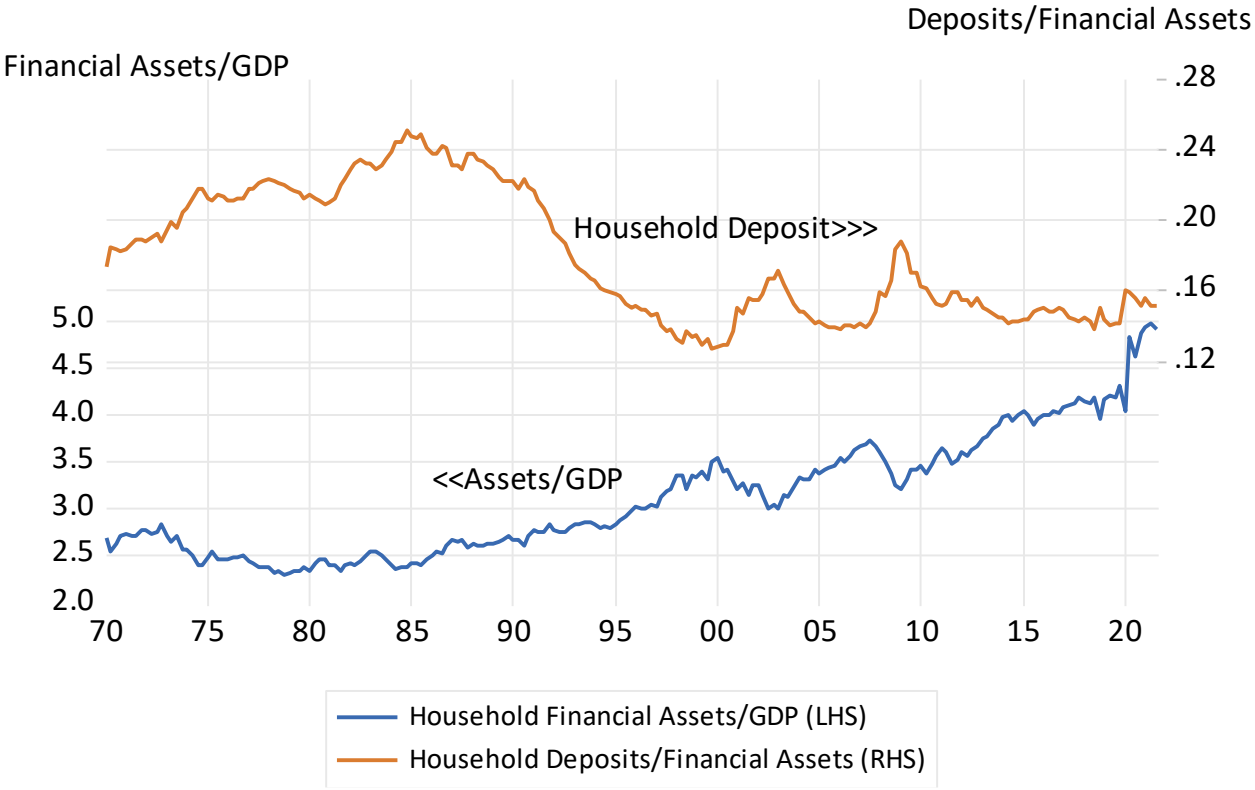


Source; Bank for International Settlements, Real Broad Effective Exchange Rate for United States [RBUSBIS], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/RBUSBIS, January 22, 2022.

The portfolio demands for money

The increased demand for and supply of money relative to prices in the US might seem counter intuitive given the improvements in the technology of making payments. It however suggests that the transactions demand for money is not its only motivation. Money is held widely and held to balance portfolios. Traditional monetary theory would define money as a means of exchange, a unit of account, and a store of value. Or alternatively as transactions and precautionary demands for money. It is the precautionary, rather than the transactions demands for money, that explains the increased demand for money, both absolutely and relative to prices. The more wealth created over time and the larger the money value of the portfolios to be managed, the greater the demand for money as a component of them – and the supply of money has accommodated such demands. Financial Assets owned by US households have increased from 2826 billion in 1970 to 114057 billion in 2021- or from 2.7 times GDP to nearly five times by Q3 2021. The share of these financial assets held as bank deposits has stabilized le at about 15%. (see figure 16 below)

Fig.16; US Households Financial Assets to GDP and Deposits to Financial Asset Ratios

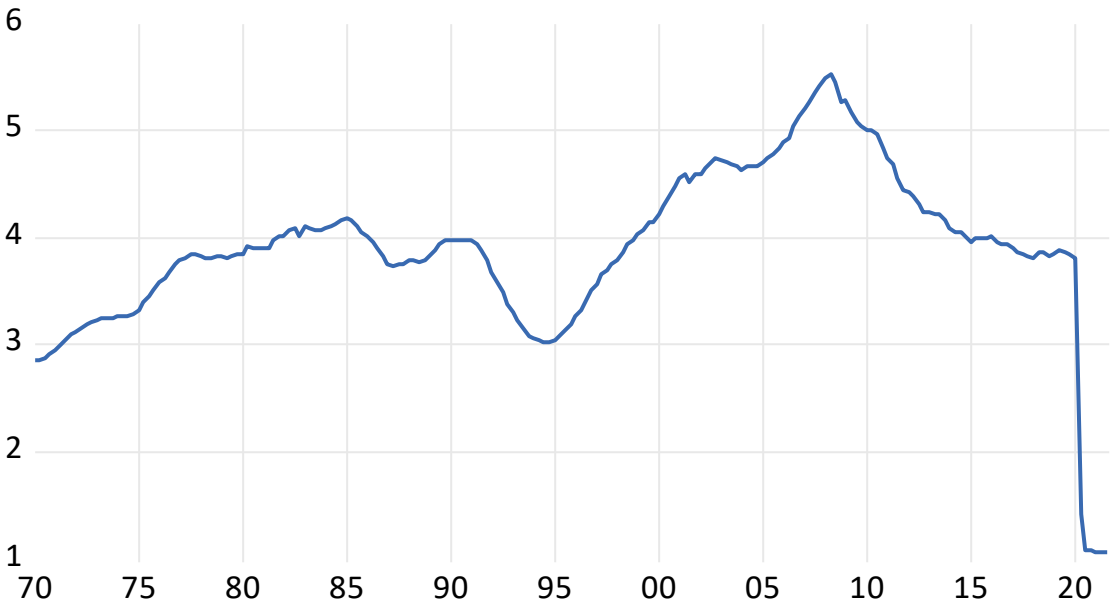


Source; Federal Reserve Bank and Investec Wealth and Investment

The relationship between M1 and M2

The M2/P ratio is significantly more stable than the M1/P ratio. M1 and M2 can follow very different paths as we show in figure 17 below. The relative attractions of longer dated deposits and money market funds clearly improve as interest rates rise. The broader definition of money, that incorporates these switches between different deposit categories is the better representation of the weight of money in portfolios over the long run. M2 is clearly more strongly associated with the long-term trends in GDP and prices than M1.

Fig.17; Money Supply Ratios for the US - M2/M1



Source; Federal Reserve Bank and Investec Wealth and Investment

Money is wealth – it has wealth effects on spending. As do government bonds.

Creating an inconvertible central bank or government money used to fund government expenditure has no opportunity cost. Nothing is given up when the stock of currency or bank deposits held with the central bank is increased, no consumption is sacrificed when a government creates more money and exchanges the money for goods and services. It is an offer of money that will not be refused and the money created will remain in circulation until the government may decide to reduce the supply of its cash through an offer of bonds in exchange for money- reversing QE- or running a budget surplus – tax revenues greater than expenditure - that adds to the Treasury balance at the Fed and simultaneously reduces private deposits. Adding money to portfolios has wealth effects. Extra wealth of which money is a component is likely to reduce savings and encourage spending and vice versa.

Money has been described as the non-interest- bearing debt of governments. Though, as we notice, zero-interest debt can be more expensive for taxpayers than issuing bonds with negative interest rates. Issuing cash is an alternative source of funding for the government that could raise taxes or debt to fund expenditure. As with all economic activity it is the real, inflation adjusted value of an asset that matters. Higher or lower prices for goods services or assets reduces or increases the real value of money held in

portfolios and should be regarded as part of the adjustment process, part of the movement to a new general equilibrium of prices, interest rates, and wages that will have been disturbed by an excess or a deficiency of money supplied to the system. The adjustments of prices generally in response to changes in the exogenously, central bank determined supply of money, were known in monetary economics as the real balance effect. A comprehensive analysis of these real balance effects within the general equilibrium framework was published in the nineteen fifties and sixties by Don Patinkin[5] .

Bonds issued by a government to fund its expenditure, or to repay previously incurred debts, are an important component of portfolios, assets that are widely represented on balance sheets, particularly those that serve the requirements of savings for retirement held by pension funds and their like. As with equities held for similar purposes, their changing valuations can be expected to have wealth effects on spending. But debts are not ordinarily regarded as adding to the wealth of their issuers. Debts incurred are usually regarded as reducing the wealth attributed to any individual or the net asset value of any firm. It is the productive uses to which debt capital is applied that may prove wealth creating or destructive. The debts issued by governments are a liability of its taxpayers. They are obliged to pay the agreed interest on the debt and repay the principle – these are clearly wealth reducing expectations.

Bonds can be as wealth creating as money

However as pointed out by John Cochrane in his highly innovative government debt driven approach to the causes of inflation *Fiscal Theory of Prices*,[6] the bonds issued by governments may be understood by taxpayers as not ever having to be repaid. That the bonds issued by government are regarded as permanent rather than temporary by taxpayers responsible for repaying the principal and paying interest on the debt. They are liabilities of the taxpayer that are easily rolled over in exchange for further issues of bonds. If so assets and expected liabilities do not cancel out and the bond issue, like money, can be regarded as an important component of wealth. Being able to issue bonds at very low interest rates, perhaps even at negative interest rates, as governments in the developed world have been able to do, post the GFC, makes the distinction between non-interest- bearing money and the bonds issued by the government irrelevant as Cochrane emphasizes. Especially should the cash reserves held by the banks with the central bank, clearly a money, pay interest, as, post the GFC, they now do in the US. Issuing money or bonds therefore can both have wealth effects as Cochrane concludes.

A similar argument can be made about the deposits issued by banks. These deposits clearly are very close substitutes and much more convenient substitutes for holding currency for the purpose of conducting transactions. They are regarded as serving the purpose of money in portfolios. But they are formally the liabilities of the banks, that is of their shareholders. The banks are obliged to convert theses deposits into cash or more likely exchanged for deposits in rival banks. But as with the bonds issued by governments, the deposits issued by the banking system will not be expected to be repaid by the owners of banks. Deposits too therefore are not only a money, they can also be regarded as a component of wealth with wealth effects.

[5] Don Patinkin, Money, Interest and Prices, An integration of monetary and value theory, A Harper International Edition, Second Edition 1965

[6] John H. Cochrane, The Fiscal Theory of the Price Level Hoover Institution, Stanford University

Persistently high and rising rates of inflation always have a fiscal connection

A fiscal theory of inflation is highly consistent with the history of periods of persistently high rates of inflation and especially when they converge to hyper-inflation and the destruction of the value of money and its usefulness to its potential holders. When money is worth less to its issuers than the paper on which it is printed, it will cease to be supplied or demanded and be replaced by other monies. Or be counterfeited. As has been the recent history of money in Zimbabwe. Zimbabwe illogically continued to print its consistently less valuable notes on similarly good quality paper, despite the many more zeros that had to be added to their face value. The government of Zimbabwe, as did the Weimar Republic of Germany after the First World War, issued as much money as they did because the alternative fiscal arrangements were regarded as politically impossible. They were unable to raise taxes or issue bonds or reduce their spending. The interest rate they would have had to pay to raise debt, and the consequent debt-service costs had become prohibitive. And so printing money became the only means to fund government expenditure that was out of control. Inevitably, runaway inflation followed as monetary demands came to exceed real supplies of goods and services until the money and bonds in issue have no exchange value.

Inflation is most likely to happen when countries face a fiscal crisis and may have to resort to money creation in the absence of a market for their bonds – to creating more money than households and firms would be willing to hold. The ratio of debt to incomes and the consequent debt service costs that taxpayers would be called upon to fund, at the expense of other more politically palatable government spending, deserves to be closely observed. The possibility of a debt default by inflation is never absent. And the more likely it becomes, the higher will become the expected rate of inflation and the higher will be the interest rates that will be needed to attract genuine lenders, that is other than the central bank. The connection between money creation and the state of government finances has always been obvious to classical monetary theorists. The evidence derived from war-time financial arrangements has always been compelling and when abandoning the convertibility of the currency or bank deposits into gold became inevitable.

Conclusion

The full implications of the latest burst in money creation and fiscal deficits in the US are still to be revealed. They will depend in part on the willingness of banks to convert extra cash into extra loans. It will also be determined by the reactions of the Fed and the US Treasury should the extra money and bank credit add to the demands for goods and services enough to continue to put strong upward pressure on spending and in turn on prices. Persistent inflation at rates well above 2% p.a. the Fed target, will call for a reversal of monetary and fiscal policy settings

Neither the persistence of inflation nor of policies designed to reduce inflation rates can be taken for granted. We wait to see the direction of policy in response to the acceleration in the rate of inflation in the US. We regard a marked slowdown in the pace of money creation as essential to the purpose though such objectives may not feature in fed despatches. A further requirement for permanently lower inflation rates will be for the US Treasury to contain the debt to GDP ratios that have exploded in recent years. Slowing down the growth in the money supply will require higher short term interest rates and higher interest payments by the Treasury. Debt service payments will rise rapidly – given the short duration of Federal Debt, much of it, some 20% of the debt is now held by the Federal Reserve System being funded by deposits with the Fed that currently earn very low interest rates. The duration of US

government debt is very short and there will be no escape for taxpayers from rising short term rates. Debt service is now about 500 billion dollars a year and is a small percentage of the Federal Budget of 9% but will rise dramatically with rising interest rates. By about 250 billion of extra interest will have to be paid out for every-one per centage point increase in the average cost of funding treasury debt- now less than 2% p.a. on average. The challenges to fiscal and monetary policy in the US, given a debt to GDP ratio of well over 100% are clear and obvious.