COVID-19 and the Fed's Monetary Policy

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COVID-19 and the Fed's Monetary Policy

Robert L. Hetzel

Abstract: The quantity theory, which posits a causal relationship between money and prices, is among the oldest theories in economics. Starting in March 2020 as the COVID-19 pandemic affected the United States, money surged at a historically rapid pace. Historical experience, most recently with the Great Inflation of the mid-1960s through the 1970s, suggests that an uncontrolled surge in inflation is coming. Other factors in the intellectual and political environment are also reminiscent of the Great Inflation. The Federal Reserve has reverted to its 1950s "cost and availability" view of monetary transmission. There also exists a widespread belief that inflation is a nonmonetary phenomenon. In Keynesian terms, because the Phillips curve, which relates inflation and unemployment, is presumed to be flat, the Fed can push the unemployment rate to historically low levels. Federal Open Market Committee (FOMC) chair Jerome Powell asserts that the course of the recovery will be dictated by the behavior of the virus. That makes sense in that the recession arose as a shock to potential output. Powell and the FOMC, however, treat the recession as if it originated in a large negative aggregate-demand shock requiring extremely stimulative monetary policy. The FOMC should follow a rule that ensures that the spring 2020 bulge in money dissipates.

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From March through June 2020, money growth in the United States reached levels that in the past would have created high rates of inflation. For the three months ending in June 2020, annualized M1 and M2 growth rates amounted to 92.0 percent and 56.0 percent, respectively. At times in the past, most recently over the decade and a half starting in 1965, rapid money creation led to inflation.

Is it a foregone conclusion that the United States will emerge from the COVID-19 recession with high inflation? Not necessarily. Households and corporations may be holding the additional money as precautionary balances. It is possible that households are holding relatively high amounts of money as a way of saving for the day when currently unavailable consumer goods again become available. Friedman and Schwartz (1963, 559) attributed the decline in monetary velocity between 1942 and 1945 to the unavailability of consumer durables. Because

interest rates were low, money balances were a convenient way to save for purchases when the war ended. However, the optimistic possibility that velocity will remain low to keep inflation in check is not assured. The Federal Reserve needs to follow a rule to ensure that the spring bulge in money is reversed.

The wide extent of the programs introduced to intervene in credit markets in March 2020 represents a departure from the Fed's past reluctance to become involved in allocating credit (Hetzel 2020a). In one respect, however, these programs represent a return to the traditional Fed view that policy works through its influence on financial intermediation. Board of Governors vice chair Richard Clarida (2020) stated, "When it comes to the size of our balance sheet, . . . there is no limit in terms of what we can purchase. . . . Obviously, our policy works through financial markets. . . . [O]ur focus is on [the] question, 'Can companies get access to the funding, the financing, to stay open.'" Jerome Powell (2020a), chair of the Federal Open Market Committee (FOMC), explained the role of the Fed as correcting the failure of financial markets to perform their role as intermediaries: "When the economy is well on its way back to recovery, and private markets and institutions are once again able to perform their vital functions of channeling credit and supporting economic growth, we will put these emergency tools away."

The Fed's current philosophy resurrects the "cost and availability" view the Fed held in the 1950s (Hetzel 2008). At that time, the belief was that monetary policy influenced the spending of the public through its influence on the extension of bank credit. It influenced bank credit by controlling free reserves (excess reserves minus borrowed reserves). The current policy extends the Fed's influence on financial intermediation to a wide variety of credit markets, not just the bank loan market, and replaces free reserves with open-market purchases of Treasury

securities and MBS (mortgage-backed securities) and with special lending facilities created under the authority granted to the Fed by section 13(3) of the Federal Reserve Act. Powell stated,

> The Federal Reserve has also been taking broad and forceful actions to more directly support the flow of credit in the economy for households, for businesses large and small, and for state and local governments. . . . These programs benefit the economy by providing financing where it is not otherwise available. In addition, by serving as a backstop to key credit markets, the programs appear to have significantly increased the extension of credit from private lenders. We are deploying these lending powers to an unprecedented extent. (Board of Governors 2020f)

This paper contrasts the Fed view of policy as sustaining financial intermediation with the monetary control view, embodied in the quantity theory. At issue is whether the Fed's credit view can ensure that the country emerges from the COVID-19 recession with monetary stability. Section 1 summarizes the quantity theory framework used in inquiring when money creation is inflationary. Section 2 examines the sources of the increase in money, which started in March 2020. It asks whether the increase in purchasing power created by the spring money bulge will be extinguished by a reversal of the bulge or through inflation. Section 3 summarizes how the FOMC has endeavored to implement an expansionary monetary policy. Section 4 poses the puzzle of why Chairman Powell initiated a range of 13(3) programs without evidence of a breakdown in financial intermediation. Section 5 explores the sources of Powell's and the FOMC's understanding of monetary policy. Given this background, one can conjecture whether current monetary policy is likely to avoid the mistakes that led to earlier inflations.

1. Making the Quantity Theory Relevant When the Fed Targets an Interest Rate

For quantity theorists, it has always been a challenge to make their framework, which is encapsulated in the equation of exchange, relevant to a monetary regime in which the central bank uses an interest rate instrument rather than using bank reserves as the instrument. The challenge is to explain monetary policy in terms of monetary control rather than in the more

intuitive terms of how the central bank influences of the cost and availability of credit. Phrased alternatively, quantity theorists need to explain why monetary stability requires control of money creation even in a monetary regime of interest rate targeting.

The equation of exchange is expressed as follows:

$$MV = Py,$$

where M is the stock of money, V is velocity, P is the price level, and y is real output. Given the rate of turnover of money for expenditure on goods and services (V), an exogenous increase in money (M) produces an increase in dollar expenditure (Py), which produces inflation if it is not proportioned to the growth of real output. In the traditional exposition, money creation arises independently of the other variables and forces changes in dollar expenditure. The issue is how to interpret "independently" when central banks use the interest rate as their instrument. A conceptual framework is necessary for generalizing the view embodied in Friedman's ([1963] 1968) dictum that "inflation is always and everywhere a monetary phenomenon."[1]

A quantity-theoretic conceptual framework starts with the nominal-real distinction. Nominal variables are measured in dollars. Real variables are physical quantities or relative prices (the price of a good in terms of another good rather than in terms of money). The distinction is fundamental because money, a nominal variable, is intrinsically worthless. (Without loss of generality, money here is taken to be identical to bank deposits because central banks guarantee convertibility between bank deposits and currency.) The marginal cost of creating a dollar, in terms of real resources, is zero. Only the Fed, therefore, not market forces, can limit the quantity of money.

[1] Friedman (1969, 4) and Bernanke (2002) illustrated money creation with a helicopter drop thought experiment.

To do so, the Fed must follow a rule with two interrelated aspects. First, households hold money because they believe that it will possess value by virtue of its ability to facilitate future transactions. The rule must therefore provide for nominal expectational stability, most naturally, in the form of the expectation of price stability—a stable nominal anchor. Second, because the Fed uses an interest rate as its instrument, it must have procedures that set its rate target in a way that respects the role played by the real (inflation-adjusted) rate of interest in regulating real aggregate demand intertemporally to keep output at potential. In sum, to provide for macroeconomic stability, the Fed must have a rule that ensures nominal expectational stability and respects the working of the price system.

Banks, not the Fed, create money (deposits). Money is created through the bookkeeping operation of banks when they credit customer accounts by extending loans or when they buy an asset such as a Treasury security. Banks creating deposits are concerned about the loss of reserves when customers draw on their deposits. Banks need to maintain a ratio of reserves to deposits sufficiently large to allow them to clear interbank transactions. An individual bank can replace lost reserves in numerous ways. Traditionally, the fed funds market was the most important. To control the reserves creation of the banking system, the Fed must set its interest rate target, which sets the marginal replacement cost of reserves for banks, in a way that controls credit creation by banks. In Wicksellian terms, the required discipline means that the Fed must have a rule that causes the real funds rate to track the natural rate of interest.[2]

A monetarist version of the quantity theory assumes that the price system works well to give real variables unique, equilibrium values (Friedman [1968] 1969). The relevant benchmark

[2] Nothing changes in this respect with the payment, by the Fed, of interest on bank reserves (IOR). There remains an opportunity cost to the loss of reserves (the IOR).

for assessing the Fed's interest rate target is the natural rate of interest, the real (inflation-adjusted) interest rate that keeps real output growing at potential. By using a rule that causes the real funds rate to track the natural rate of interest, the Fed turns over to market forces the determination of real variables such as employment and output.[3] With this rule and assuming the benchmark case of price stability, the growth in real money demand follows the growth in real output. With its interest rate target, the Fed accommodates changes in banks' reserves demand and banks create the deposits that accommodate the public's demand for money. With nominal money growing in line with real money demand, price stability obtains.

To apply these ideas, first consider an example that abstracts from the existence of a banking system. Households hold cash and corporations issue bonds. By setting its interest rate target below the natural rate of interest, the central bank creates an excess supply of bonds from corporations. To maintain its rate target, the central bank must purchase (monetize) this excess. Households now have a portfolio of assets (more money relative to bonds) that is more liquid. Households then attempt to rebalance their portfolio by purchasing illiquid assets with their "surplus" money. Friedman ([1961] 1969) detailed the process.[4]

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[3] There is an intellectual continuity between the monetarist ideas in Friedman (1960) and the New Keynesian ideas in Goodfriend and King (1997). Friedman advocated that the Fed follow a rule of steady money growth. With the stable, interest-insensitive real money demand that existed until the early 1980s, the rule would have provided for a stable nominal anchor and for the determination of real variables by market forces. In Goodfriend and King, the optimal policy is price stability. Necessarily, if the sole objective of the Fed is price stability, the Fed turns over the determination of real variables to market forces—that is, the real business cycle core of the economy.

[4] Friedman ([1961] 1969, 255) explained the portfolio rebalancing that occurs when the central bank undertakes open-market purchases and how that rebalancing stimulates expenditure:

> The [public's] new balance sheet [after an open-market purchase] is in one sense still in equilibrium . . . since the open-market transaction was voluntary. . . . An asset was sold for money because the terms were favorable; however . . . from a longer-term view, the new balance sheet is out of equilibrium, with cash being temporarily high relative to other assets. Holders of cash will seek to purchase assets. . . . The key feature of this process is that it tends to raise the prices of sources of both producer and consumer services relative to the prices of the services themselves; for example, to raise the prices of houses relative to the rents of dwelling units, or the cost of purchasing a car relative to the cost of renting one. It therefore encourages the production of such sources (this is the stimulus to "investment" . . .) and, at the same time, the direct acquisition of services rather than the source (this is the stimulus to "consumption" . . .).

When the central bank fails to set its interest rate target in a way that tracks the natural rate of interest, the resulting money creation sets off a rebalancing effect. In evaluating the consequences of the rebalancing, it is necessary to depart from the standard assumption of only one interest rate. Given the expectation of price stability, the resulting money creation through the open-market purchase of illiquid assets raises the prices of a range of physical assets and lowers their yields, making monetary policy more expansionary. Monetary policy cannot be completely described by the behavior of "the" interest rate relative to the natural rate of interest but must include a complex of real yields, including the exchange rate of the dollar.[5]

Interest on reserves (IOR) gives the impression that the Fed can separate monetary policy (setting the funds rate) and credit policy (the size of its balance sheet). Each is supposedly a separate tool in the Fed's tool kit. However, as the example illustrates, the open-market purchases of illiquid assets by the Federal Reserve's Trading Desk make monetary policy more expansionary even given an unchanged funds rate (IOR). That happens through an increase in Friedman's portfolio rebalancing (or, equivalently, in Tobin's Q).

With the funds rate equal to the natural rate of interest, money is not helicopter money (determined independently of real money demand). Assume, for example, that households desire to reduce their money holdings. They spend the excess money and it passes to other parties. At some point it, it reaches a household that pays down its bank debt—a loan or credit card debt. Alternatively, a firm pays off its bank loan. The result is to reduce bank deposits (money). Banks have fewer liabilities and fewer assets. However, if the Fed is keeping the funds rate *below* the natural rate of interest, banks have an incentive to extend loans or to buy debt, and the resulting money creation offsets their money extinction.

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[5] Brunner and Meltzer (1972) stressed this point in discussing money creation in the context of a liquidity trap.

The payment of IOR and a binding zero lower bound (ZLB) for the funds rate complicate the story without altering any basic principles. What changes with IOR is that the Fed can make an open-market purchase of, say, an MBS, which increases bank reserves, without reducing the funds rate. IOR effectively sterilizes the additional reserves by paying banks to hold them. What is important is that there remains a portfolio balance effect. It derives from the replacement in households' asset portfolio of an illiquid asset (the MBS) with a liquid asset (a bank deposit). At the ZLB, the same portfolio balance effect also holds.[6] The portfolio balance effect gives monetary policy its power even at the ZLB.

Some FOMC participants doubt the power of monetary policy. One reason these participants give is that a secular decline in the level of interest rates implies that the FOMC has little margin to implement a stimulative monetary policy by lowering the funds rate. Another reason given is the assumed ineffectiveness of quantitative easing (QE)—open-market purchases of long-term securities. The assumption is that QE lowers the yield on long-term Treasury securities. It does so by lowering their term premium, which is the excess yield beyond the risk-free interest rate. The excess yield compensates for the risk that interest rates will increase over their lifetime. However, term premiums are already negative.[7] The FOMC minutes for the June 2020 meeting (Board of Governors 2020e, 4) stated,

> Participants agreed that asset purchase programs can promote accommodative financial conditions by putting downward pressure on term premiums and longer-term yields. Several participants remarked that declines in the neutral rate of interest and in term premiums over the past decade and prevailing low levels of longer-term yields would likely act as constraints on the effectiveness of asset purchases.

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[6] The ZLB does not necessarily turn money creation into helicopter money. If markets anticipate that the money and reserves will be extinguished when the Fed begins to raise the funds rate, the strength of the portfolio balance effect will depend on how distant markets expect the liftoff to be.

[7] The Kim and Wright (2005) model yields a value of −0.91 for July 24, 2020. See Board of Governors, "Term Premium on a 10 Year Zero Coupon Bond [THREEFYTP10]," available on FRED (Federal Reserve Bank of St. Louis), https://fred.stlouisfed.org/series/THREEFYTP10.

It is true that with historically low long-term interest rates, an open-market purchase of a bond does not increase the liquidity of investors' portfolios to the extent that a similar purchase would if long-term rates were higher. On July 31, 2020, the 10-year US government bond yield was only 0.53 percent. However, the massive amount of Fed purchases starting in March 2020 likely made up for the relatively small difference in liquidity between a bond and a bank deposit. Continuing purchases of long-term bonds by the Fed make the portfolio balance effect increasingly expansionary. For a given funds rate, even at the ZLB, the complex of real yields declines relative to the natural rate of interest.

2. The Spring 2020 Money Bulge: Helicopter Money or Self-Extinguishing Money?

This section examines the sources of the money creation that started in March 2020. The money creation starting in March 2020 had several sources. One source was Fed purchases of the Treasury securities and agency MBS disgorged by hedge funds and real estate investment trusts (Hetzel 2020a). To preserve "market function," the New York Desk bought huge quantities of these securities. Dealers had difficulty digesting the securities sold by these funds because of the Basel III SLR (supplementary leverage ratio) regulation (Hetzel 2020a). As shown in figures 1 and 2, the Fed's security holdings rose dramatically during and after March 2020 in comparison to how they rose during the prior three QE programs. Over the two-month period from the statement week ending March 11, 2020, to the week ending May 13, 2020, securities held outright by the Fed (Treasury securities and MBS) increased by $1,783 billion (from $3,890 billion to $5,673 billion). The Fed also added $44 billion of corporate securities to its portfolio as of July 23, 2020.

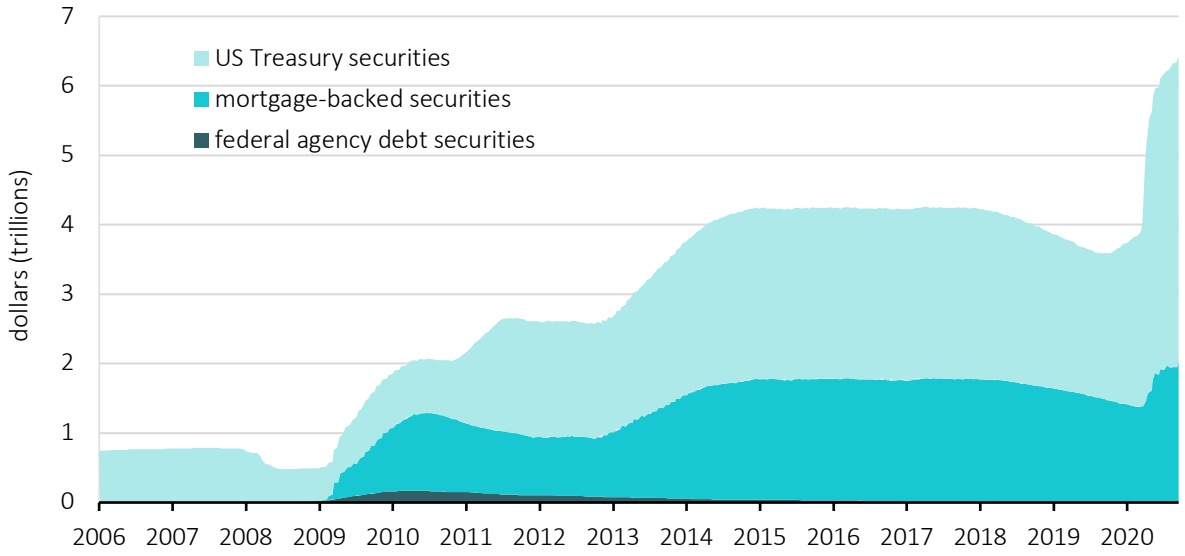
It is important to know how much "duration" these purchases removed from the market. Removing duration by adding long-term bonds to the Fed's portfolio makes the portfolios of

investors more liquid by replacing illiquid bonds with bank deposits. The effective lengthening of the maturity of the Fed's portfolio produced by these asset purchases can be summarized in terms of the addition of 10-year securities. Lorie Logan (2020), executive vice president of the Federal Reserve Bank of New York's Markets Group, reported that "the total duration included in our Treasury purchases so far [through mid-July 2020] represents the equivalent of about $1 trillion in 10-year securities."

Figure 1 plots the sum of the Fed's US Treasury securities held outright, MBS, and agency debt from January 11, 2006, through June 17, 2020. The three initial upward-sloping sections resulted from the Fed's earlier QE programs. Figure 2 highlights the sharp increase in the pace of open-market purchases relative to earlier QE programs. As Hilsenrath and Timiraos (2020) reported, "Between March 16 and April 16 [2020], it [the Fed] bought Treasury and mortgage securities at a pace of nearly $79 billion a day. By comparison, it bought about $85 billion a month between 2012 and 2014, the third QE program (QE3)."

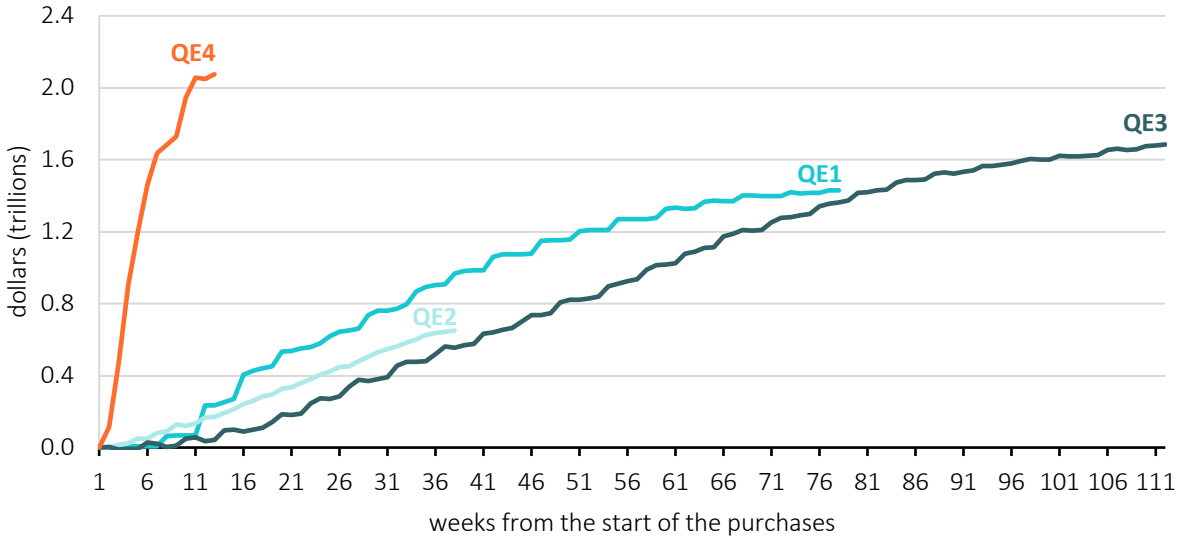
Figure 3 shows the levels of bank deposits and bank reserves, and figure 4 shows the growth rate of bank deposits. Beginning in summer 2014, the FOMC started to reduce the size of its asset portfolio, and continued reducing it until fall 2019. Deposit growth declined during this period. After December 2018, the FOMC ceased raising the funds rate as part of its "normalization" program. After it lowered the funds rate starting in summer 2019, growth in bank deposits revived. In fall 2019, the spike in repurchase (repo) rates indicated that the Fed had reached the minimal portfolio size consistent with efficient market functioning. What is striking is the sharp jump in deposits starting in March 2020 and the support given to that jump by the increase in reserves.

Figure 1. Federal Reserve Security Holdings



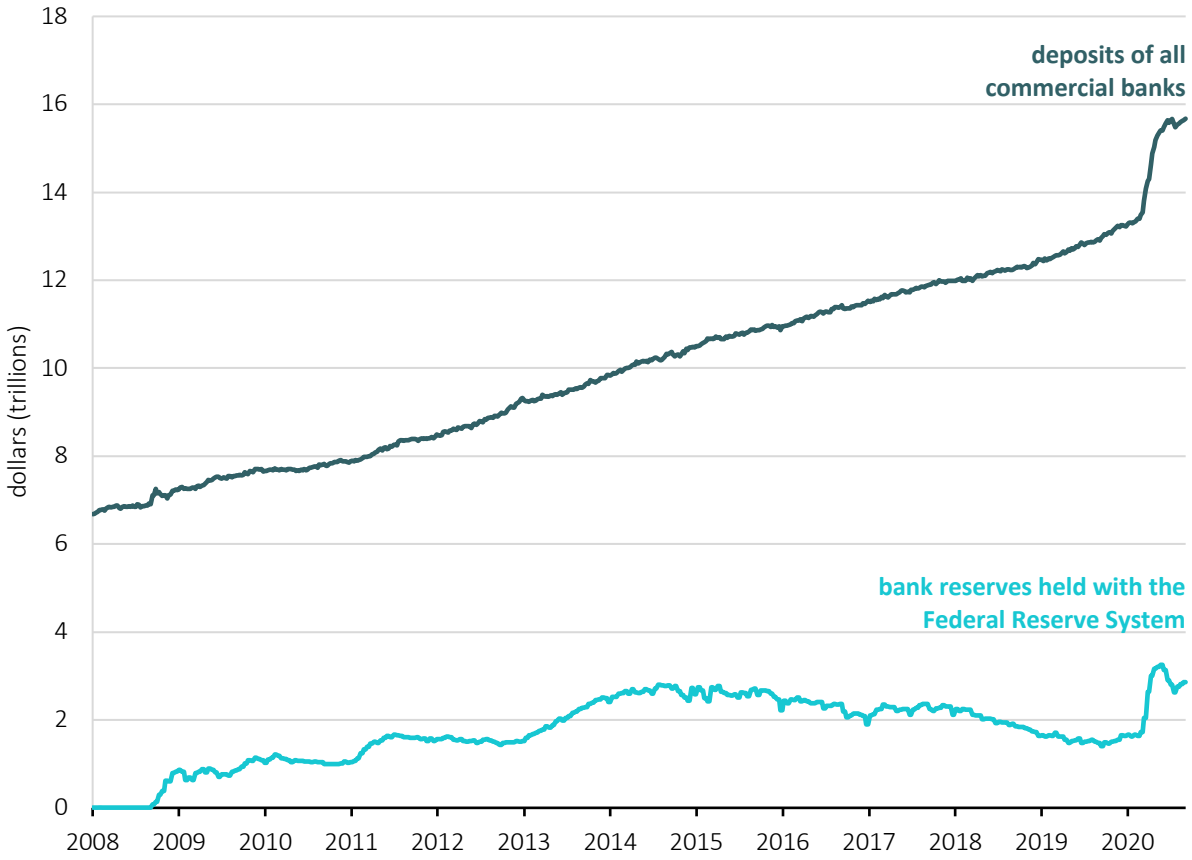
Source: Series retrieved from FRED (Federal Reserve Bank of St. Louis): "Assets: Securities Held Outright: U.S. Treasury Securities: All: Wednesday Level [TREAST]," "Assets: Securities Held Outright: Mortgage-Backed Securities: Wednesday Level [WSHOMCB]," "Assets: Securities Held Outright: Federal Agency Debt Securities: All: Wednesday Level [FEDDT]," all accessed July 2020.

Figure 2. Asset Purchases for Quantitative Easing (QE) Programs



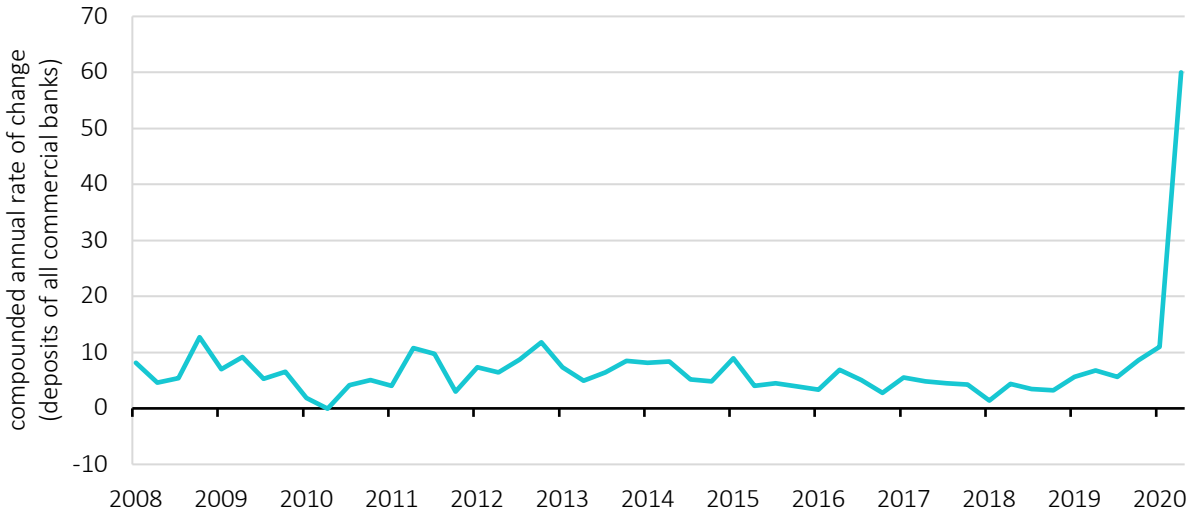
Note: The series plot the sum of US Treasury securities and mortgage-backed securities shown in figure 1. QE1 lasted from December 2008 to June 2010, QE2 lasted from November 2010 to June 2011, QE3 lasted from September 2012 to October 2013, and QE4 lasted March 11, 2020, to June 13.
Source: Hilsenrath and Timiraos (2020). Data are from same source as in figure 1.

Figure 3. Bank Reserves and Deposits



Source: Board of Governors of the Federal Reserve System, "Total Reserve Balances Maintained with Federal Reserve Banks [RESBALNSW]" and "Deposits, All Commercial Banks [DPSACBW027SBOG]," retrieved from FRED (Federal Reserve Bank of St. Louis), accessed July 2020.

Figure 4. Growth of Bank Deposits



Note: The chart shows quarterly observations of annualized growth of deposits of all commercial banks.
Source: Board of Governors of the Federal Reserve System, "Deposits, All Commercial Banks [DPSACBW027SBOG]," retrieved from FRED (Federal Reserve Bank of St. Louis), accessed July 2020.

A second source of money creation, in addition to the Fed purchases of the Treasury securities and agency MBS disgorged by hedge funds and real estate investment trusts, came from two provisions of the Coronavirus Aid, Relief, and Economic Security (CARES) Act. The act added $600 per week to the unemployment benefits paid by the states. The increased unemployment benefits augmented payments to households for the months of April and May by about $100 billion (Stanley 2020). In addition, the act mandated the issuance of rebate checks. Subject to income limitations, single adults received checks for $1,200 and married couples received checks for $2,400 plus $500 for dependent children. Payments to individuals totaled about $300 billion, and most of the payments were made in April (Stanley 2020). The checks stimulated spending. Lower-income households, with less of an ability to sustain an essential level of spending by drawing on savings and by cutting back on the discretionary

spending available to wealthier households, restored their pre-pandemic spending when the checks went out.[8]

A third source of money creation can be found in deposit creation at banks from corporations drawing on their lines of credit. These corporations wanted to be liquid to deal with possible cash flow shortages. The *Wall Street Journal* (Benoit 2020) reports that "much of the $1 trillion flowed into the banks in a two-week span in March. . . . Banks' loan books grew sharply in March, largely a result of companies draining their credit lines."

Are these three sources of money creation (Fed open-market purchases, CARES Act payments, and corporate draws on lines of credit) likely to be spent or to dissipate? Consider each in turn. The Fed's open-market purchases set off portfolio rebalancing, as described in section 1. By lowering the complex of real yields, they move monetary policy in the direction of stimulus, even with an unchanged funds rate. The strength in equities in summer 2020 and weakness of the dollar is consistent with portfolio rebalancing caused by QE (Melcangi and Sterk 2020).

Next, consider payments made under the CARES Act. Are they helicopter money? If the payments are financed by issuing Treasury debt to the public, the answer is no. Debt issuance extinguishes the bank deposits created from the special payments. However, to the extent that the Fed buys the debt, the created bank deposits remain.

Look at the sequence of events initiated by a CARES Act rebate check. Through electronic bookkeeping, the Treasury creates a deposit for a household and a corresponding amount of reserves for the household's bank. The Treasury loses that amount of reserves in its

[8] See "% Change in Average Consumer Credit and Debit Card Spending, Indexed to January 4, 2020," from Hugo Ste Marie, Portfolio & Quantitative Strategy Global Equity Research, Scotia Capital (reproduced in Borodovsky 2020).

account at the New York Fed. If the Treasury issues debt to the public to restore the lost amount, the process reverses and banks end up with no additional deposits or reserves. The household buying the Treasury security loses a deposit and the bank loses reserves. However, if the Treasury sells the security to the Fed, the Fed credits the Treasury's account at the Fed. The addition to household deposits and to bank reserves remains intact. The question then is, Who buys the Treasury debt issued to restore the Treasury's deposit at the Fed—the Fed or the public? In March and April 2020, the Fed monetized Treasury debt at a rate significantly in excess of Treasury net issuance (Deutsche Bank 2020).

Finally, consider the third source of money creation: the increase in deposits that occurred as firms drew down their lines of credit. If firms hold the deposits as precautionary balances, they do not increase spending in the economy. Similarly, there is no increase in spending if firms issue bonds and use the proceeds to pay down the newly created deposits. However, firms contribute to spending if they use the deposits to deal with cash flow shortages.

3. When Does Expansionary Monetary Policy Become Inflationary?

The point of the preceding section is that the spring 2020 bulge in money will not be self-reversing without a monetary policy that keeps the funds rate in line with the natural rate of interest. In that event, debt repayment by households and firms to banks will extinguish the bulge in money. That result, however, is rendered unlikely if the FOMC pursues a purposefully stimulative monetary policy by keeping the funds rate at the ZLB and engaging in extended QE.

The large amount of open-market purchases starting in March 2020 increased monetary stimulus. Between the statement weeks ending March 11, 2020, and June 11, 2020, the amount of securities held outright by the Fed increased by almost $2.1 trillion. Much of the increase was in longer-term Treasury securities and MBS. Treasury securities with maturities of five years or

longer increased by $661 billion, while MBS with maturities of five years or longer increased by $463 billion (Board of Governors, "Statistical Release H.4.1"[9]). One reason that these open-market purchases are stimulative is that the FOMC has signaled that they are unlikely to be reversed for a long time. By announcing at its June 2020 meeting that net asset purchases would continue at about $120 billion per month, the FOMC signaled to markets that it would not unwind the prior large expansion in its securities holdings. LHMeyer (2020e) reported that the FOMC wanted "to reassure markets that the premature Fed withdrawal is not likely."

The "dot plot" for the June 10 Summary of Economic Projections (figure 2 in Board of Governors, 2020d) showed that only two FOMC participants believed that the funds rate should increase from its near-zero value before the end of 2022. Selling securities would be inconsistent with maintaining a stimulative policy. This kind of Fed communication to markets effectively committed the FOMC to an expansionary monetary policy in the absence of a surge in inflation. Backing away from such communication would produce a discrete change in market expectations that could cause the yield curve to rise and produce an unpredictable tightening of monetary policy. The "taper tantrum" of May 2013 offers an example of a discrete rise in bond yields when markets interpreted the reduction in the pace of the FOMC's QE purchases as an earlier-than-anticipated liftoff of the funds rate.

Finally, Chairman Powell has effectively used forward guidance to commit to an extended expansionary monetary policy by emphasizing the Fed's commitment to use monetary policy to achieve socially desirable goals. LHMeyer (2020d, 3–4) reported,

> Powell has repeatedly emphasized that the Fed can contribute to lowering income inequality and narrowing unemployment rate gaps by a monetary policy that lowers the overall unemployment rate to a very low level. And the FOMC had done this during the long expansion, during which the unemployment rate declined from 10% to 3½%. All

[9] See section 2, "Maturity Distribution of Securities, Loans, and Selected Other Assets and Liabilities."

> those gains have been reversed in just a couple of months. As a result, Powell has now seemingly set a 3½% target for the unemployment rate because of the social benefits of such a tight—let's say "hot"—labor market. Of course, there is a caveat that the policy must not undermine the Fed's inflation mandate. But his attitude about the NAIRU [nonaccelerating inflation rate of unemployment] seems to be that "you'll know it when you see it." And the FOMC didn't see it when the unemployment rate was 3½%.

The Summary of Economic Projections (table 1 in Board of Governors, 2020d) for the June 2020 FOMC meeting displays the median forecast of PCE inflation for 2022 as 1.7 percent, just above the 1.5 percent for 2019 (four-quarter percentage change ending 2019Q4). Why is the FOMC unconcerned that a monetary expansion might cause inflation? The answer seems to be that it considers that the appropriate measure of the output gap should use pre-pandemic unemployment. By that measure, as of June 2020, the magnitude of the output gap was large.

The COVID-19 recession, however, is unlike earlier recessions in which a negative aggregate-demand shock created a negative output gap. In the COVID-19 recession, potential output declined because of the virus. For example, the ability of restaurants to deliver hygienically safe meals declined. A high unemployment rate does not reflect sticky wages interacting with disinflation caused by contractionary monetary policy. Instead, it reflects workers waiting to be called back to their former jobs when an abatement of the virus restores the loss in potential output. Unlike in past recessions, the cyclically high unemployment rate is likely to exaggerate the magnitude of the output gap. Expansionary monetary policy could turn a negative output gap into a positive one even with significant unemployment.

4. The Onset of the Crisis

From early March to mid-March 2020, the COVID-19 virus went from a perceived minor economic irritant disrupting international supply chains to a major threat to the world economy—a threat of frightening, almost unimaginable proportions. The Fed's March 4 *Beige*

Book (Board of Governors 2020a, 1) mentioned only an interruption of tourism and of supply chains dependent on China. “There were indications that the coronavirus was negatively impacting travel and tourism in the U.S. Manufacturing activity expanded in most parts of the country; however, some supply chain delays were reported as a result of the coronavirus and several Districts said that producers feared further disruptions in the coming weeks.”

Reports from the World Health Organization document the suddenness with which the world gained an awareness of a major spread of the virus outside China. A bulletin from early February (World Health Organization, Feburary 1, 2020) reported only 132 confirmed cases outside China. The February 16 bulletin reported 683 cases outside China, the March 1 bulletin 7,169 cases outside China, and the March 7 bulletin 21,110 cases outside China. The dramatic increase in awareness of the potential harm of the virus became apparent in the March 21 bulletin, which reported on the countries “requesting individuals to stay at home in self-quarantine.”

Within the compressed time frame of three weeks at the start of March 2020, markets had to undertake a fundamental reassessment of the risk produced by the unexpected, sudden, and overwhelming emergence of the threat posed by the COVID-19 virus. In the first half of March, the spread of the virus created the possibility of millions of deaths and the collapse of the domestic and world economy. Can it be a surprise that markets wanted to become more liquid and that risk premiums increased until the spread of the virus became clearer (Hetzel 2020a)?

Initially, the Fed’s response involved its traditional tools of monetary policy. On March 15, in a telephone conference, the FOMC lowered the funds rate to near zero and committed to massive open-market purchases of Treasury securities and agency MBS. As announced by the Board of Governors of the Federal Reserve System (2020c), “over coming months the

Committee will increase its holdings of Treasury securities by at least $500 billion and its holdings of agency mortgage-backed securities by at least $200 billion." On March 16, the Board approved a reduction of the discount rate to 25 basis points. Shortly thereafter, on March 17 and then again on March 23, the Board exercised its authority under section 13(3) of the Federal Reserve Act to initiate what would become a series of programs designed to influence the flow of credit (Hetzel 2020a). The extension of these programs beyond money markets represented a departure from the Fed's traditional focus on monetary policy.

The Fed's announced credit programs changed the public perception and political expectations of the role of a central bank. A headline in the *Wall Street Journal* (Hilsenrath and Timiraos 2020) illustrated the change: "The Federal Reserve Is Changing What It Means to Be a Central Bank." Ironically, at least at the time, the credit programs were a diversion. Overwhelmingly, the Fed's role was that of providing reserves to satisfy the market's increased demand for liquidity. Although the Fed's 13(3) credit programs dominated the news, in terms of actual lending, they were inconsequential. As of the statement week ending June 17, the total amount lent from these programs amounted to only $100.7 billion.[10] By contrast, in the same statement week, dollar swaps with foreign central banks, which are an indirect way of lending to foreign banks, amounted to $352.6 billion ($446 billion the previous week, ending June 10).

What is puzzling is how the Board of Governors and Chairman Powell could have interpreted the market's reassessment of risk in March as a breakdown in financial intermediation. Later, Powell (2020a) would claim that market "dysfunction" motivated the

[10] As of June 17, 2020, the amounts for the various programs were as follows: PDCF (primary dealer credit facility), $5.6 billion; MMLF (money market mutual fund liquidity facility), $25.6 billion; PPPLF (paycheck protection program liquidity facility), $57.0 billion; CPFF (commercial paper funding facility), $4.3 billion; CCF (corporate credit facilities), $7.0 billion; MSLF (main street lending facility), $0; MLF (municipal liquidity facility), $1.2 billion; TALF (term asset-backed securities loan facility), $0 (Board of Governors, "Statistical Release H.4.1").

series of 13(3) programs. The decision that financial intermediation had become dysfunctional occurred on or before March 17, however, when the Board initiated its programs. Within such a short time frame, there is simply no way that Powell could have had evidence that financial markets could no longer transfer resources from households to businesses and municipalities. And yet the Board assumed that financial markets would only function with a vast Fed backstop.[11]

The explanation offered in this paper for such a vast intervention without evidence of a breakdown in the ability of financial markets to intermediate credit is that Chairman Powell viewed the interventions as a tool of macroeconomic stabilization equal in importance to monetary policy.[12] Moreover, his views are not original, but originated most directly with former FOMC chairman Ben Bernanke and the Fed's response to the Great Recession. A sea change occurred in the understanding of stabilization policy during the Great Recession, as suggested by the alternative label, the Great Financial Crisis. Subsequent to the Great Recession, management by the Fed of the flow of credit to sectors of the economy likely to be adversely affected by the increase in risk that accompanies a recession became accepted as a standard tool of macroeconomic stabilization policy. Allocating credit became a tool for managing aggregate demand. The fundamental issue, then, is whether the Fed should stick with monetary policy in a recession or whether programs of credit intervention should become standard tools of macroeconomic stabilization.

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[11] The mid-March 2020 turmoil highlighted the incomplete reforms of Dodd-Frank. Moral hazard still creates a shadow banking system that amplifies instability during periods of financial stress. That instability, which reflects the government's failure to regulate the prime money funds in the same way as the banks they mimic, was a regulatory failure. It did not reflect an inability of markets to assess risk (Hetzel 2020a).

[12] This hypothesis can explain why the Fed bought bonds issued by corporations with ready access to capital markets. The top issuers of bonds bought by the Fed as of mid-July were (in order of importance) Apple, Verizon, AT&T, General Electric, Toyota Motor Credit Corp., Volkswagen Group of America, Daimler Finance, Comcast, Microsoft, and General Motors Financial Co. (LHMeyer 2020a).

5. Policy as the "Cost and Availability of Credit"

Historically, the Fed has understood its role in stabilizing economic activity to be influencing the cost and availability of credit. In the pre–World War II period, under the real bills doctrine, the policy was to allocate credit away from speculative uses and toward productive uses financed by the short-term debt (real bills) used to get goods to market. In the post-1951 Treasury-Fed Accord period, under the free-reserves policy, the policy was to influence the cost and availability of bank loans in a way designed to counter the business cycle. The Fed would do so by making free reserves (the difference between excess reserves and reserves borrowed from the discount window) plentiful during recessions and restrictive during booms (Hetzel 2008).

In characterizing Fed policy, Chairman Powell talks of a "toolkit" with two tools. One tool is the funds rate, which is kept near zero with an IOR rate of 0.1 percent. This tool keeps the "cost" of credit low. The other tool is the Fed's balance sheet, which allows the Fed to make loans to various sectors of the economy. According to Powell (LHMeyer 2020g provides a transcript of Powell's interview on the NBC *Today Show* on March 26, 2020), the Fed possesses a "limitless" ability to expand its balance sheet and its lending capacity.[13] The Fed can direct credit to various sectors of the economy to ensure its availability.

Powell did not explain the expanded open-market purchases that began in March as reserves provision to meet a temporarily elevated demand for liquidity. Such an explanation would have implied that the Fed would withdraw the reserves with the disappearance of market volatility. Instead, Powell explained them as intended to restore pre-pandemic conditions in markets to

[13] Selgin (2020a, loc. 725, Kindle) argues that such advertising can mislead Congress into believing that financing spending by borrowing from the Fed is somehow a "free lunch." He recommends that the Fed abandon IOR and thus forgo the ability that IOR permits to increase the size of the Fed's balance sheet without reducing the funds rate. That is, he recommends that the Fed return to a corridor system for controlling the funds rate rather than using a floor system. See also Hetzel (2020a).

maintain the flow of credit. LHMeyer (2020b) recorded reporters' questions and Powell's answers at the June 10 press conference. To the question "Why is the FOMC buying assets today?" Powell replied, "to sustain smooth market functioning and thereby foster the effective transmission of monetary policy to broader financial conditions." Asked "Why continue purchases, given that market function has improved?" Powell answered, "There have been gains in market function, although not fully back . . . [to where market function was] before the pandemic arrived."

Similarly, the minutes for the June 9–10 FOMC meeting report,

> Participants also agreed that, to support the flow of credit to households and businesses, over coming months it would be appropriate for the Federal Reserve to increase its holdings of Treasury securities and agency MBS and agency CMBS [commercial mortgage-backed securities] at least at the current pace to sustain smooth market functioning, thereby fostering effective transmission of monetary policy to broader financial conditions. (Board of Governors 2020e, 12)

Powell contrasts the Fed's role in influencing financial intermediation ("lending powers") with fiscal policy ("spending powers" involving "direct fiscal support"), which is reserved to Congress.[14] Powell (2020a) stated,

> I would stress that these [13(3) programs] are *lending* powers, not *spending* powers. . . . The Fed can only make secured loans to solvent entities with the expectation that the loans will be fully repaid. . . . But there will also be entities of various kinds that need direct fiscal support rather than a loan they would struggle to repay. (italics in original)

Daleep Singh (2020, reported in LHMeyer 2020c), chief of the New York Fed Markets Group, made the following argument:

[14] The distinction is arbitrary, because intervening in credit markets to affect the allocation of credit among competing users is tantamount to fiscal policy in that the Fed is redistributing income (Hetzel 2020a; Selgin 2020a). One also needs to be skeptical of the argument that the Fed has the legal authority to lend to private entities as long as it is assured of repayment. The fact that something is legal does not necessarily make it desireable, and such action can involve the Fed in fiscal policy. For example, in the past, the Fed's bailout of large banks involved default-free lending. In 1974, the Fed bailed out Franklin National Bank, and in 1984, Continental Illinois. The Fed did so through large discount window loans that allowed short-term debt holders to flee without loss. The Federal Deposit Insurance Corporation then took over the insolvent banks and paid off the Fed's loans. Although they were default free, Fed loans exacerbated moral hazard.

> The [13(3)] facilities represent a full partnership with the Treasury Department. . . . The close alignment of the Fed and Treasury served as a "force multiplier" in transmitting stimulus. . . . [T]he true test of the facilities' effectiveness will be if they are used when needed in dysfunctional market conditions.

There is a direct connection between the views of Chairman Powell and those of his predecessor, Ben Bernanke, FOMC chairman from February 2006 through January 2014. During the Great Recession, drawing on his work on the Depression, Bernanke emphasized the restriction of output through a credit channel. Bernanke (2015, 200, 206, and 208) believed that the Great Recession, which began after December 2007, originated in financial instability, not contractionary monetary policy:

> Animal spirits, sentiment, psychology . . . was central to the economic and financial story in February and March [2008]. . . . [T]he economy and credit markets were increasingly mired in their own destructive feedback loop—bad economic news fueled financial turmoil, and the turmoil in turn disrupted the flow of credit that powered economic activity. . . . [F]inancial instability, contracting credit, and falling confidence were seriously damaging the economy. . . . [M]arket turmoil was . . . what I called "self-feeding liquidity dynamics." In other words, fear begat fear.

Henry Paulson (2010, 337), Treasury secretary during the first year of the Great Recession, expressed the Bernanke "credit channel" view of using credit policy to counteract recession:

> The [Troubled Asset Relief Program] money would stretch much further if it were injected as capital that the banks could leverage. . . .[15] [Assuming] banks had a ten-to-one leverage ratio, injecting $70 billion in equity would give us as much impact as buying $700 billion in assets. This was the fastest way . . . to get them [banks] lending again.

Bernanke also argued that at the ZLB the Fed should turn to credit policy rather than monetary policy. Bernanke (Board of Governors 2008, 25, 27) told the FOMC:

> What we're doing is fundamentally different from the Japanese approach. . . . The Japanese approach, the quantitative easing approach, was focused on the liability side of the balance sheet—specifically the quantity of bank reserves. . . . The theory behind quantitative easing was that providing enormous amounts of very cheap liquidity to banks . . . would encourage them to lend and that lending, in turn, would increase the broader

[15] The Troubled Asset Relief Program consisted of the $700 billion Congress appropriated initially to buy MBS from banks. In the event, the Treasury used the money to put equity into banks.

> measures of the money supply, which in turn would raise prices and stimulate asset prices, and so on, and that would suffice to stimulate the economy. . . . I think that the verdict on quantitative easing is fairly negative. It didn't seem to have a great deal of effect, mostly because banks would not lend out the reserves that they were holding. . . . Rather than looking at . . . [policy] as a single number, as a measure of the liability side of the balance sheet, I think we ought to think about it as a portfolio of assets, a combination of things that we are doing on the asset side of our balance sheet, that have specific purposes.

In a speech delivered in London, Bernanke (2009) said,

> The provision of ample liquidity to banks and primary dealers is no panacea. Today, concerns about capital, asset quality, and credit risk continue to limit the willingness of many intermediaries to extend credit, even when liquidity is ample. Moreover, providing liquidity to financial institutions does not address directly instability or declining credit availability in critical nonbank markets, such as the commercial paper market or the market for asset-backed securities, both of which normally play major roles in the extension of credit in the United States. To address these issues, the Federal Reserve has developed a second set of policy tools, which involve the provision of liquidity directly to borrowers and investors in key credit markets.
>
> The unwillingness to consider a negative funds rate reflected the Fed's credit view.

Former Fed governor Alan Blinder (2012) remarked that a negative IOER (interest on excess reserves) is "viewed at the Fed as a frightening prospect . . . but for the life of me I can't understand why." The article that quoted Blinder also quoted a Fed official: "'You're going to put the money funds out of business' if the Fed stops paying a positive IOER. . . . [C]utting the IOER to zero or making it negative 'takes away the margin they need to keep going.'"

To a significant extent, Bernanke accepted themes common in the Great Depression. The fundamental conceptual error during the Depression was to understand the role of the Fed as influencing the financial intermediation of banks. The belief was that because of the uncertainty of their sales and possible interruption of their cash flow, businesses became unwilling to borrow from banks. Banks were not lending the reserves supplied to them by the Fed not only because of lack of demand for loans but also because they worried about their own capital adequacy. The

low level of interest rates presumably indicated the ample supply of reserves to banks by the Fed (Hetzel 2012, chapters 3–4).

Because monetary policy was understood through the lens of financial intermediation, the presumed breakdown of financial intermediation during the Great Depression encouraged a general presumption that monetary policy was impotent. On the basis of this (mis)understanding, policy turned toward encouraging financial intermediation. Congress created the Reconstruction Finance Corporation in 1932 to supply capital to banks. (It was the forerunner of the Troubled Asset Relief Program created in September 2008.) Also in 1932, the Federal Home Loan Bank Act created the Federal Home Loan Bank Board, the Federal Savings and Loan Insurance Corporation, and the Federal National Mortgage Association (Fannie Mae). The Farm Credit Administration, created in 1933, provided credit to farmers. It also put the 13(3) language into the Federal Reserve Act.[16]

Similarly, in the Great Recession, through fall 2008, the FOMC believed that monetary policy was "accommodative" because with a funds rate of 2 percent and with underlying inflation (core PCE) just above 2 percent, the real rate of interest was zero. The FOMC therefore believed that the recession came from an interruption to financial intermediation. As a result, the Fed concentrated its efforts on programs to promote financial intermediation, especially after the disruption caused by the failure of Lehman Brothers on September 15, 2008.[17]

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[16] Fettig (2002) wrote, "Tucked inside a highway construction bill in 1932 was an amendment to the Federal Reserve Act allowing the Fed to allocate credit to individuals, partnerships and corporations in emergency situations. . . . This 1932 emergency authority . . . was used sparingly, and just 123 loans were made over four years by all 12 banks, totaling about $1.5 million." See also Selgin (2020b).

[17] Hetzel (2012) argued that contractionary monetary policy caused the Great Recession. Although the Fed supplied reserves through its various credit programs, it did so at an interest rate that exceeded the natural rate of interest. Banks held the additional reserves to satisfy a desire for increased liquidity. If Bernanke had wanted the banks to "lend out the reserves that they were holding" (Board of Governors 2008, 25, 27), by summer 2008 he should have let the funds rate drop to the ZLB and flooded the market with reserves. The FOMC lowered the funds rate to a range of 0% to 0.25% only in December 2008. The economy of the industrialized world had already entered a severe recession in summer 2008 before the financial disruption caused by Lehman Brothers' bankruptcy on September 15, 2008.

In sum, in fall 2008, Bernanke believed that because of impaired capital, banks were restricting their lending. As a result, there was a negative feedback loop: bank loan restriction weakened the economy, which led to market pessimism and hence to additional bank loan restriction. Powell extended this logic to all financial intermediation, not just that of banks. Although in 2020 banks were adequately capitalized, the logic went, the great uncertainty about the duration of the COVID-19 pandemic created uncertainty about future defaults and future capital adequacy. The riskiness of the future impedes the willingness of banks and all financial intermediaries to lend. By taking risk onto the combined Fed-Treasury balance sheet (a grand "Powell put" that went well beyond any presumed Greenspan put on the stock market), the 13(3) programs would presumably ensure the continued flow of credit and prevent disruptions in financial markets that would impede the return to a normal economy.

The Bretton Woods era offers an earlier example of the belief on the part of the Fed that, left on their own, financial markets are unstable. When there is an increase in risk, markets lose the ability to price risk, and the Fed must intervene. Without that intervention, markets are likely to settle on a bad equilibrium among the multiple possibilities. Yeager (1966, 189) summarized the Fed's belief that speculation would make floating exchange rates a source of instability (see also Coombs 1976):

> The most common worry about free exchange rates [is] that disruptive speculation might dominate the market. . . . When a currency shows signs of depreciating or appreciating, speculators may hasten to sell or buy it and so intensify the movement. Even commodity trade might react perversely: the rise of import and export prices expressed in a currency depreciating under speculative pressure, instead of checking the country's imports and spurring its exports in the normal way, might breed expectations of further price movements and so hasten imports and retard exports. With exchange speculation and perverse responses of trade reinforcing each other, even the country's internal economic conditions might be disrupted.

Milton Friedman (1953) challenged this view by arguing that central bank intervention to maintain fixed exchange rates regardless of fundamentals creates the appearance of destabilizing

speculation. Offered a one-way bet in which a currency could only depreciate, speculators would take advantage of central bank intervention to purchase the central bank's own currency with dollars, thereby obtaining a stronger currency. In periods of stress, under Bretton Woods, investors fled overvalued exchange rates.

The view of monetary policy operating through the cost and availability of credit combines with a nonmonetary theory of inflation. The minutes for the June 2020 Board of Governors meeting make no mention of money. Nothing in Fed communications about monetary policy—for example, the "Statement on Longer-Run Goals and Monetary Policy Strategy"—makes any reference to monetary control. This combination of views encourages the popular view expressed in Modern Monetary Theory (Kelton 2020; Selgin 2020a, loc. 313, Kindle). Modern Monetary Theory revives the Keynesian consensus that held sway in the economics profession in the 1950s and 1960s, especially as formulated by Abba Lerner (1944, chapters 23–24). In terms of the Hicksian IS-LM model, the LM schedule is horizontal at a low rate of interest, reflecting a liquidity trap for money. The IS or aggregate real demand schedule shifts to the right with increased government deficit spending. With the IS schedule determining output through the intersection with the LM schedule at a level of output below full employment, the role of the Fed is to finance the government deficit.

In a press release issued on March 17, 2020, Speaker of the House Nancy Pelosi (2020) reported, "I spoke with Federal Reserve chairman Powell. . . . I was encouraged by the Chairman's perspective that with interest rates at nearly zero, Congress is enabled to think big fiscally as we craft a robust response." LHMeyer (2020f) noted,

> The new troika in D.C. is now Mnuchin-Powell-Pelosi. . . . Bernanke gave the most relevant speech of 2020 in 2002. . . . As Bernanke noted, "a pledge by the Fed to keep the Treasury's borrowing costs low . . . might increase the willingness of the fiscal authorities to [provide fiscal stimulus]. . . ." That's exactly what Powell said to Pelosi today."

Powell obviously cares deeply about his role in dealing with the crisis. Powell (2020a) said, “None of us has the luxury of choosing our challenges; fate and history provide them for us. Our job is to meet the tests we are presented.” Probably for that reason, he has departed from the prior Fed practice of not commenting on fiscal policy. Implicitly, however, he is jeopardizing Fed independence by communicating that Congress need not worry that a significant deficit will raise the interest costs of financing the government deficit.

Another aspect of the revival of Keynesian thinking and its nonmonetary theory of inflation is the assumption that policymakers can control inflation in a predictable way through manipulation of excess capacity—that is, through exploitation of a Phillips curve relationship. While he was chairman of the Council of Economic Advisers, Joseph Stiglitz (1997, 9–10) challenged Greenspan’s policy of preemptive tightening by arguing that the FOMC should cause the economy to run above potential and lower the unemployment rate until it actually observed inflation:

> If the economy heads a little below the NAIRU, then we can expect a little more inflation. This view stands in opposition to the view, more common in academic circles, that the NAIRU is like a precipice: take one step over it, and you fall into a spiral of rapidly accelerating inflation. . . . [I]f you hold the unemployment rate below the NAIRU for a year, the inflation rate rises by about .3 to .6 of a percentage point per year. . . . [T]he magnitude by which inflation rises does not increase when the unemployment rate is held down for a prolonged period of time.

The reference to “rapidly accelerating inflation” is an implicit criticism of Friedman’s ([1968] 1969) accelerationist hypothesis: that maintaining the real rate of interest below its natural value will raise inflation and produce higher expected inflation, which will lower the real rate of interest further below its natural counterpart and produce an undesirably high rate of inflation.

Lael Brainard (2020) of the Board of Governors repeated the Stiglitz argument against preemptive policy:

> And with inflation exhibiting low sensitivity to labor market tightness, policy should not preemptively withdraw support based on a historically steeper Phillips curve that is not currently in evidence. Instead, policy should seek to achieve employment outcomes with the kind of breadth and depth that were only achieved late in the previous recovery.

LHMeyer (2020h) noted, "That's fully in line with what Powell has previously said."

6. Avoiding Repetition of Previous Inflations

Should one expect a revival of inflation when the country emerges from the COVID-19 crisis? Since its founding, the Fed has created three major inflations. The first two originated in financing wartime deficits and the third in a willingness to trade off inflation for a socially desirable "low" rate of unemployment (Hetzel 2008). These episodes share some features with the current situation.

The first inflation came from Fed financing of World War I deficits. During US participation in World War I, which started in April 1917, through the last Victory Loan drive in April 1919, the Fed set the discount rate of the regional Reserve Banks below the rate on Treasury bonds. Banks purchased the bonds, which they used as collateral to borrow from the discount window to finance the purchases. They also extended loans to the public to buy bonds. The result was money creation and inflation (CPI), which averaged 22.4 percent over the four quarters 1919Q3 to 1920Q2. During World War II, the Fed pegged the term structure of interest rates. After the end of the war, prices (CPI), suppressed during the war with price controls, rose by 30 percent from January 1946 through January 1948.

The third inflation, the Great Inflation, lasted from the mid-1960s until the beginning of the 1980s. Its origin shares similarities with the current period. First, monetary policy became expansionary in the United States after 1964 when the political system united in its opposition to any increase in interest rates because of a presumption that an increase would nullify the

stimulative impact of the 1964 tax cut (Hetzel 2008, chapter 7). The Fed will be under the same pressure at present. Moreover, with a greatly expanded federal debt, the interest cost of financing the debt will increase. As of April 2020, publicly outstanding government debt that will reach maturity within two years amounted to almost $7 trillion. Combined with the vast increase in debt in 2020, an increase in interest rates would greatly increase the interest costs of servicing the government debt.[18]

Also, the firmly embedded expectation of price stability will cause stimulative monetary policy to increase inflation only with a lag. On the basis of the behavior of money, Friedman (1989, 31) estimated the lag to be two years. (See also Hetzel 2008, figure 23.3.) In the Volcker-Greenspan era, the Fed solved this problem by preempting the appearance of inflation in economic recoveries. However, given its desire to raise inflation, the FOMC has rejected a preemptive strategy (Powell 2020b; Board of Governors 2020b).

Monetary policymakers have responded to the shortfall of inflation from the 2 percent target by considering flexible average inflation targeting. However, none of them has explained how average inflation targeting translates into an actual reaction function. It seems likely that the practical counterpart of average inflation targeting will be to keep the funds rate at the ZLB and continue with QE until inflation rises well above 2 percent for a significant period. In the past, the FOMC has raised inflation, but never in a controlled way. During the Great Inflation, the FOMC stumbled over the "long and variable lag" phenomenon. That is, it maintained an expansionary monetary policy for too long.

[18] Deutsche Bank (2020) noted, "The fiscal cost of these policies is likely to be immense. Under our baseline scenario, the fiscal deficit will balloon to more than $4tn in fiscal year 2020, about 21% as a share of GDP. Debt-to-GDP is likely to rise to 100% this year, reaching a level not seen since the mid-1940s. By the end of the decade, debt-to-GDP is likely to near 125% under our base case."

Governor Brainard (2020) argued for keeping the funds rate at the ZLB (or at the ELB, the effective lower bound, which is relevant if the FOMC were to adopt a negative interest on reserves) until inflation rises:

> As we saw in the United States at the end of 2015 and again toward the second half of 2016, there tends to be strong pressure to "normalize" or lift off from the ELB preemptively based on historical relationships between inflation and employment. A better alternative would have been to delay liftoff until we had achieved our [inflation] targets.

Nick Timiraos (2020), a reporter for the *Wall Street Journal*, foretold that the FOMC's framework review would incorporate a desire to engineer low unemployment by exploiting a flat Phillips curve with a "low" nonaccelerating inflation rate of unemployment:

> Any changes the Fed makes would coincide with a deeper emphasis on the benefits of very low levels of unemployment. For years, officials were concerned that allowing unemployment to fall too low could generate undesirable levels of inflation, which occurred after the 1960s. In the most recent expansion, however, officials were surprised to find unemployment falling to levels associated with higher prices, but without the anticipated inflation.
>
> By raising rates based on a forecast of higher inflation, the Fed risks short-circuiting a labor-market expansion when many of the most disadvantaged workers are finally getting jobs or raises. That can be costly if inflation doesn't materialize, said Atlanta Fed President Raphael Bostic on Twitter last month. . . . The changes under consideration "would be very meaningful because it would be memorializing their commitment to working toward a tighter labor market . . ." said Rep. Denny Heck (D., Wash.), who is on the House Financial Services Committee. "It would be a huge break from the past."

Representative Heck's statement is correct in that the move away from a preemptive policy would be a break with the Greenspan policy. It would, however, revive a feature of the 1970s policy of go-stop monetary policy (Hetzel 2008, 2012).

7. What Rule Can Ensure Monetary Stability as the Country Emerges from the Recession?

Whether the spring 2020 bulge in money dissipates or forces an uncontrolled increase in inflation depends on monetary policy. That policy must necessarily be expressed as a consistent strategy (rule) for responding to incoming information on the economy (Hetzel 2019; Hetzel,

forthcoming). Formula (1) expresses a benchmark reaction function (Hetzel, forthcoming; Orphanides 2003, 2019):

$$i_t = i_{t-1} + 0.5(\pi_{t+3|t} - \pi^*) + 0.5(y_{t+3|t} - y^*_{t+3|t}) + .5og_{t+3|t}. \quad (1)$$

The funds rate for quarter t is i_t. $\pi_{t+3|t}$ is forecasted inflation for the quarter three quarters ahead at time t, and π^* is the inflation target. Real GDP and potential GDP (in logarithms) are q_t and q^*_t, respectively. Quarterly annualized real GDP growth is $y_t = (q_t - q_{t-1}) \cdot 400$ and the potential growth counterpart is $y^*_t = (q^*_t - q^*_{t-1}) \cdot 400$. $(y_{t+3|t} - y^*_{t+3|t})$ is forecasted three-quarter-ahead quarterly real GDP growth minus potential growth. The output gap is $og_t = (q_t - q^*_t) \cdot 100$. Formula (1) is from the Board of Governors (2011, 43), but adds the output-gap term. (See also Orphanides 2003 and 2019, 26; Hetzel 2019; Hetzel, forthcoming.)

According to the formula, the FOMC moves the funds rate away from its prevailing value on the basis of forecasts of whether it (the FOMC) is on track to achieve its goal for price stability and for output growth along a sustainable path (that is, with steady rates of resource utilization—an output gap of zero). Explanation of the formula starts with the benchmark rule, which evolved under William McChesney Martin, who was FOMC chairman from March 1951 through January 1970. Termed "lean against the wind" (LAW), it entailed raising the funds rate in response to sustained growth in the economy above potential, as evidenced by a persistent increase in rates of resource utilization (such as a declining rate of unemployment). That is, the FOMC would raise the funds rate above its prevailing level if $(y_{t+3|t} - y^*_{t+3|t}) > 0$. Conversely, the FOMC would lower the funds rate below its prevailing value in response to sustained weakness in the economy. The output gap term allows for growth above potential during economic recoveries. The rule rests on the efficacy of the price system in that output growth above potential indicates that the real rate of interest lies below its natural counterpart and thus

must rise. Conversely, output growth below potential indicates that the real rate of interest lies above its natural counterpart and thus must decline. The practical difficulty for policy is that lags in the impact of changes in the real rate of interest on output obscure the extent to which the real interest rate (funds rate) must change to equal the natural rate.

Historically, the two variants of LAW were "LAW with tradeoffs" and "LAW with credibility" (Hetzel 2008, 2020b). LAW with tradeoffs characterized the "go-stop" period from the mid-1960s to the end of the 1970s. During economic recoveries, the FOMC raised the funds rate only hesitantly for fear of "aborting the recovery." In these "go" phases, the spirit of monetary policy was to keep the unemployment rate at a stable, low level (4%). The FOMC became willing to raise the funds rate significantly only with the actual appearance of inflation. It then raised the funds rate until recession developed. Out of fear of sending the wrong signal about the inflation rate it would tolerate and thus permanently raising expected inflation, the FOMC began to lower the funds rate only when a serious recession became evident. Given its nonmonetary view of inflation, the FOMC allowed inflation to ratchet up across business cycles (Hetzel 2008, 2012).

LAW with credibility emerged during the time that Volcker and then Greenspan headed the FOMC. The objective of monetary policy changed to maintaining low, stable expected inflation—that is, to the restoration of the nominal expectational stability lost with the prior go-stop monetary policy. LAW with credibility imposed two kinds of discipline. The first came from the need to eliminate the market's association between cyclical strength in the economy and the later emergence of inflation. To eliminate this association, the FOMC had to remove from its interest rate target the cyclical inertia that had characteristized the earlier period. The second kind of discipline came from the extrapolation by financial markets of actual inflation to

expected inflation. The FOMC moved to a policy of preemption so that the inflation did not emerge. During economic recoveries, it raised rates in response to cyclically tight labor markets, treating them as a harbinger of inflation. That is, the FOMC interpreted cyclically tight labor markets as indicative of a positive output gap even without the emergence of inflation (Hetzel 2008, 2012).

As was foretold in the Brainard quotation in section 6 and made formal in the Powell (2020b) speech, the FOMC has returned to the LAW with tradeoffs policy of the go-stop period. Consider the context of Brainard's views. Under FOMC chair Yellen, the FOMC had wanted to raise the inflation rate (core PCE) from around 1.5 percent to 2 percent. At the same time, the FOMC wanted to "normalize" the funds rate by moving it up from the ZLB. The compromise strategy was to raise the funds rate at half the rate that was normal in past recoveries to find a balance between moving to a "normal" funds rate and allowing the economy to grow above trend to lower the unemployment rate. That caution in raising the funds rate made sense, given the secular decline in the natural rate of interest. At the same time, the FOMC assumed that growth moderately above trend would eventually lower the unemployment rate below its "natural" or NAIRU value and that, in a controlled way, inflation would rise to 2 percent. The rationale for the strategy went back to the Modigliani and Papademos (1975) Phillips curve model that related changes in inflation to the difference between actual unemployment and its full employment value.

The FOMC first raised the funds rate away from the ZLB in December 2015, but weakness in the world economy delayed further increases until December 2016. After a succession of funds rate increases, at the meeting in December 2018, the FOMC moved the funds rate to 2⅜ percent (the midpoint of the range from 2¼ percent to 2½ percent). Markets

signaled their concern that the FOMC was following a preset course of raising the funds rate against the background of a weakening in the global economy produced by a trade war between the United States and China. Because of fear that global weakness would spread to the United States, the yield curve inverted.

At its July 2019 meeting, despite a strong domestic economy, the FOMC began lowering the funds rate as insurance against the possibility that weakness in the global economy would spill over into the United States. Core PCE inflation (year over year) had been weak in the spring and was averaging about 1¾ percent at the time of the July meeting. A reasonable inference is that the FOMC was setting the funds rate as a one-way downward ratchet until inflation rose in a sustained way to 2 percent. That is, it had already moved to the policy announced a year later by Powell (2020b).

On March 16, 2020, the FOMC effectively lowered the funds rate to the ZLB. In a June 10, 2020, press conference, Powell (Board of Governors 2020g) noted that in the pre-pandemic period the unemployment rate was extremely low (3.5% in February 2020) and inflation never exceeded 2 percent. The implication was that the FOMC could maintain the funds rate at the ZLB at least until the unemployment rate approached its pre-pandemic level. Powell (Board of Governors 2020g, 9–10) stated,

> We saw a lot of great things happening in the [pre-pandemic] labor market, things that we'd love to get back to. We didn't see any problems with price inflation. . . . [W]e'd . . . welcome very low readings . . . on unemployment just based on what we . . . saw . . . in the last expansion. . . . We're not even thinking about thinking about raising rates.

The FOMC has reverted to LAW with tradeoffs. Pursuing a stimulative monetary policy to push the unemployment rate below 3.5 percent with the intention of creating a positive output gap to raise inflation is reminiscent of go-stop monetary policy.

8. What Is at Stake

During the recovery from the Great Recession, the funds rate remained at the ZLB for seven years. The unemployment rate fell to 3.5 percent in February 2020 while inflation remained below the FOMC's 2 percent target. In this environment, policymakers and markets seemed to have forgotten that sustained expansionary monetary policy causes inflation. At the onset of the COVID-19 crisis in March 2020, it was important for monetary policy to be expansionary to avoid deflation. Monetary stability, however, requires that policy allow the March 2020 bulge in money to unwind. If significant inflation does emerge, the country is unlikely to tolerate another recession to eliminate it. The United States will then be in danger of moving from a monetary environment of price stability to one of endemic inflation.

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