

Split Rock Capital Management

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To: All Investors

Re: Annual Letter 2019, Letter to Investors

Dear Investors:

In 2019 Split Rock Capital Management returned 12.44% net of fees.¹ Our annualized return since inception is 9.83% vs 14.59% for the S&P 500 (dividends included). \$100,000 invested at inception has grown to approximately \$146,130 vs. \$173,500 if invested in the S&P 500 (dividends included).

Year	S&P 500 ²	Split Rock (Gross) ³	Split Rock (Net) ⁴
2015 ⁵	1.18%	(0.42%)	(0.47%)
2016	11.96%	13.19%	12.19%
2017	21.87%	19.47%	18.47%
2018	(4.41%)	(1.68%)	(2.68%)
2019	31.49%	13.43%	12.44%
Cumulative Return Since Inception	73.50%	50.18%	46.13%
Annualized Return Since Inception	14.59%	10.57%	9.83%

**Please refer to the disclosures (1 to 5) at the end of this letter as well as the disclaimer on the page 38*

**All results have not been audited*

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Chapter 1: General Stock Market Conditions

The COVID-19 pandemic has certainly driven markets to some of the most extreme moves we've ever seen. We have nothing useful to say on the virus front, except to say that we should be spending whatever we need on virus fighting measures (largely fiscal). We believe there should be much more testing and are hopeful that therapies and vaccines can be introduced as soon as safely possible.

Regarding the stimulus packages so far passed, we think they are decent first steps but still leave much to be desired. Unfortunately, what is needed is a quick bill that does all we can to keep employees on payroll for however long the lockdowns last. It may already be entirely too late for many workers. While of course we should expand unemployment benefits for those workers who were laid off, we'd much prefer those workers don't get laid off in the first place. Some sort of small (and large) business grant/loan, that is 100% payable by the US government based on workers kept on payroll, would have been ideal weeks ago. The bill should also do as good a job as possible in making sure that firms without serious drops in revenue do not receive the grants/loans.⁶ We fear it's already too late and many companies will go out of business. The longer we wait on competent fiscal policy, the more money it will cost. This is not the time for half measures. We wouldn't be surprised if the total fiscal package (future phase 4 included, if it passes) topped \$5 trillion. We would add an important point that we think the Treasury should be paying these bills.⁷ Recent workarounds like the \$1 trillion platinum coin should be avoided.⁸ The Fed should maintain its objectives and the massive amounts of (needed) fiscal injections should be paid for in the normal way: by issuing new debt (Treasury bonds).

Regarding monetary policy, while true that monetary policy can't directly fight the virus, we believe monetary policy has been entirely too tight. Many believe that the Fed has acted quickly and appropriately. While we agree with many of the steps done so far (as well as the quick response) we believe much more is needed. Current 2020 NGDP forecasts on Hypermind predict 0% NGDP growth for 2020! In addition, the low 10-year Treasury yield also implies that we are going to have lower NGDP growth for many years to come. As usual, we desire a NGDP level target of 4 or 5% based on 2019 NGDP. It's important to note that keeping NGDP growth steady will further aid banks, etc. in making necessary loans. Banks will be much more likely to make loans to struggling businesses if they can be sure that NGDP growth will be steady.⁹ Keeping NGDP per capita up will result in lower layoffs than would otherwise result, by minimizing the need for painful nominal wage cuts.¹⁰

Many have debated whether the economy would be best helped with fiscal or monetary measures.¹¹ We think it should be both. Fiscal has been too timid. Monetary policy has been too timid. We need much more on both fronts.

We also add that the Fed paying interest on reserves (IOR) complicates the 'quantity effect' of injections of new money/reserves. While a bit oversimplistic: the more you pay via IOR, the more MB you need to inject into the system. The Fed took its balance sheet up to \$4 Trillion after 2008 but also paid IOR.¹² In theory, if the Fed didn't pay any IOR, it could've gotten the same stimulative effect with a much smaller injection of reserves (IOR makes banks more prone to hoard reserves, which in turn neuters the hot potato effect and growth effect of newly printed reserves). That said, this view of letting any/all banks or companies fail as long as NGDP is steady, runs into some potential problems as Matt Waters notes [here](#).¹³ Many banks in 2008 had counterparty agreement issues that likely would have caused problems, even if NGDP growth were kept at 5% (albeit less so). Given the asymmetric risk of deflation, it's likely that both some coordinated fiscal injections to troubled banks combined with "do whatever it takes" attitude to NGDP would have been ideal given the 2008 market conditions. That said, we don't think fiscal policy alone can help boost growth in normal environments (see "[Monetary Offset](#)").¹⁴ The sorts of coordinated fiscal injections to financial institutions that Matt argues for are likely only needed in times of severe market stress and will be mostly ineffectual at most other times. Of course, there are many other misconceptions that we address further in the footnotes.¹⁵

One of the most critical mistakes with monetary policy that we've seen so far in 2020, is the Fed's decision to keep interest on excess reserves (IOER) at 0.1% instead of dropping it to 0%. As George Selgin has pointed out, this seemingly minor move may have major consequences. As George Selgin guesses, the decision to leave IOER at 0.1% may signal that the Fed is still serious about maintaining its floor system and has every intention of raising IOER when NGDP growth starts up again.¹⁶ Instead, we believe the Fed should explicitly state that they are pegging IOER at 0%, or at the very least, promise to keep IOER below the Fed Funds Rate in the future.¹⁷ Negative IOER would also be welcome and would likely stoke much needed NGDP growth.¹⁸

Regarding low bond yields worldwide, we should note that there are demographic issues at play here as well. Let's examine Germany: If we look at German bond yields from 1960-2000 vs. NGDP growth in Germany for the same timeframe we see bonds yields 1.75% below NGDP. NGDP growth was $\approx 8.5\%$ a year vs. an average 10-year German bond yield of $\approx 6.75\%$. Since 2005, annual German NGDP growth has averaged $\approx 3\%$ while German bond yields have averaged $\approx 2.25\%$.¹⁹ The difference in this case is only 0.75%. Given the plausible scenario of less than 3% German NGDP growth going forward, one could argue that: 0% or even negative yields on German bonds more than compensate bond investors. German 'savers' are not being ripped off. The low bond yields are almost entirely explained by low NGDP growth in Europe. Bond investors can't simply look only at bond yields when evaluating the attractiveness of a bond. One must compare this bond yield to the expected future economic growth (as well as the risk of default)

The numbers in the United States point to a similar pattern. From 1915 to 2000, United States annual NGDP growth averaged $\approx 6.75\%$ with 10-year government Treasury yields averaging $\approx 5.5\%$. Given our best guess of 4% U.S. NGDP growth going forward, the 1.5% to 3% Treasury yields we've seen in 2019 seem more than fair to savers (The sub 1% 10-year yields we've seen in March of 2020, signal that NGDP may be left permanently below trend, with the Fed targeting NGDP off the 2020 NGDP bottom instead of the higher 2019 NGDP levels). The 1.25% difference between NGDP growth and bond yields that we saw from 1915 to 2000 would imply that, under the 4% NGDP growth regime going forward, we should expect bond yields to average $\approx 2.75\%$. Pundits blame the Fed for long bond yields because of 'easy money'. That's only half correct: The Fed is to blame for low bond yields, but the reason is not easy money. Instead, *money has been too tight*, which has caused low expected NGDP growth and in return, lead to lower bond yields. If we want higher (nominal) bond yields, we should be arguing for easier monetary policy, not tighter.²⁰ This is even more applicable in Europe and Japan, where monetary policy has been even more tight than in the United States.²¹ With the recent COVID-19 epidemic, the sub 1% yields on 10 year treasuries may imply sub 3% NGDP growth for the next decade! We also note that bond yields have been falling the last few days despite the odds of "over 1 million COVID cases in the U.S." also falling.²²

We continue to argue for a NGDP target (via NGDP future market – see [2017 and 2018 letters](#)). Under this regime, instead of targeting only the money supply (as the original monetarists argued for) the Fed would target the growth rate of the, *velocity adjusted*, monetary base (i.e. NGDP).²³ The fatal flaw of the monetarist school is that it only focuses on the *supply* of money and does not account for changes in the *demand* for money (which will affect the velocity of money). NGDP targeting, advocated by the Market Monetarists, remedies this deficit by compensating for any changes in money velocity – keeping NGDP from deviating off its growth path. We also note that, because of technology (among other things), that (in the future) the monetary base could be quite small and yet still provide an anchor for the nominal economy, prices, etc.²⁴

Since we don't have the NGDP futures market we desire, we are confronted with looking at various other interest rate phenomena like the recent yield curve inversion. Signals from interest rates are less clear given that the expected future path of interest rates is much more important than any snapshot in time (or any one move by the Fed to alter the Fed Funds Rate). As an example, the yield curve inverted in 2019, yet it wasn't necessarily clear what these interest rates alone were telling us. George Selgin put it well: "The inversion only suggests that cuts are coming, not that the cuts will prove inadequate to fend-off recession. **Recessions don't happen because policy rates decline. They happen because they don't decline enough**".²⁵

Chapter 2: Open Market Operations: Just an Asset Swap, or Something More?

In this section we dive into the claim made by many that open market operations (that is, when the Fed swaps reserves for treasuries or other securities) sometimes are ineffectual. We argue that, if done right, open market operations (OMOs) can always be effectual and always stoke nominal growth. However, in order to explain our reasoning, a basic (and admittedly oversimplified) explanation of the basics of commercial banking is required.

Commercial Bank Basics

Let's imagine a basic commercial bank. The bank is formed by selling common shares to the public. This sale of common stock gives the new bank \$300 billion in cash to buy buildings, equipment, salaries for day to day operations of the bank, etc.²⁶ Let's assume at the start that \$290 billion of this equity is put into Treasury bonds, and the other \$10 billion is used for buildings, salaries, etc. After some time let's assume that \$2 trillion in cash has been given to this bank by new customers for storage (we call these demand deposits). We may pay some of these customers a low rate of interest for our use of their money. Let's say \$700 billion of the \$2 trillion goes to *checking* accounts which pay 0%, while the other \$1.3 trillion goes to *savings* accounts which pay customers 3% annually, however these savings accounts come with some minor restrictions on when the money can be withdrawn.

At this point the bank is full reserved: for every dollar of deposit there is either vault cash on hand at the bank or the bank has Federal Reserve Deposits. Federal Reserve Deposits, in addition to vault cash, make up the monetary base. One of the primary functions of these Federal Reserve Deposits is to allow clearing between banks (as well as increase efficiency – eliminating the commercial banks need to store large amounts of physical cash and instead store it/transfer it electronically). Federal Reserve Deposits can be converted to physical cash on demand. The total reserves are \$2 trillion (in Federal Reserve Deposits and/or vault cash). The total equity remains at \$300 billion (still \$290 billion in Treasury bonds and \$10 billion in buildings).

Of course, the bank won't idly store this cash as its very unlikely that more than say 10% of customers will ever want to withdraw their cash at the same time. Without lending out any money, the bank won't make any income simply storing all the depositor's cash. Instead it will lend it out the idle 90% of funds to other customers in need of a loan. These customers are charged a percentage rate fee on that loan, say 6%. The spread between what the bank pays customers for storing their money vs. the percentage charged by the bank (to customers) for loans, is the primary method of how banks make income. As the saying goes: "The 3-6-3 rule describes how bankers would give 3% interest on depositors' accounts, lend the depositors money at 6% interest, and then be playing golf at 3 PM".²⁷ The critical question here is determining how much to lend. Let's assume in this case, the bank makes loans of \$2 trillion. In addition, we convert \$100 billion (of our original \$290 billion in Treasury bonds) to reserves (some combinations of Federal Reserve Deposits and cash) in order for us to still be able to fulfil any withdraw requests from our depositors. This leaves our capital adequacy ratio unchanged at 13%, since all we did was convert one of our assets (original cash from depositors) into another type of asset (a loan to another customer). The \$2 trillion in liabilities that we still owe to the original depositors still exists, and we still have \$300 billion in equity (albeit part of that equity has now been converted from Treasury bonds to Federal Reserve Deposits/cash).

Of course, our reserve ratio has now dropped significantly. Before we made the loans, our reserve ratio was 100%. All the depositors could've showed up to our bank on the same day and withdrawn all their money. Now however, we only have \$100 billion in reserves. Our reserve ratio is \$100 billion / \$2 trillion from original depositors = 5% reserve ratio. If more than 5% of our depositor come to withdraw their money, we could have temporary funding issues. It's important to note, that in this case of more than 5% redemptions, our bank is not bankrupt. We are not insolvent: Our assets (\$2.3 trillion) are still larger than our liabilities (\$2 trillion). We are simply having liquidity issues. If more than 5% of customers demanded money, it may take a few days, but our bank could gradually call in loans, sell buildings, etc. in order to get cash for our depositors withdraw requests. In summary, on the asset side we have \$100 billion in reserves/cash + \$10 billion in buildings + \$190 billion in treasuries + \$2 trillion in loans outstanding. On the liability side we have \$2 trillion in demand deposits owed to customers. For a better and even more detailed explanation of the difference between reserve ratios and capital ratio, we highly recommend the blog post "[Reserves and Capital Confused?](#)" by Bill Woolsey.²⁸ In this blog post, Mr. Woolsey covers some other interesting thought experiments such as hypothetical banks with a: 10% capital ratio but 0% reserve ratio; 10% capital ratio but 500% reserve ratio; or even 100% capital ratio and *undefined reserve ratios!*²⁹ Our example so far is

a bit oversimplistic. In addition, as we'll see later, loans usually proceed deposits (and really its simultaneously), however we follow Bill Woolsey's example (with *deposits preceding loans*) above in order to establish a base level of understanding by imagining deposits first, and loans second.³⁰

While still oversimplified, we'll complicate our example a bit by diving into the types of assets and loans the banks make. The loans to be paid back are listed as assets on the bank's balance sheet. However, under most circumstances there isn't much tangible for the bank to claim. If I make \$100 loan to a neighbor, I still list the \$100 (that eventually will be paid back) as an asset on my personal balance sheet. However, at the moment, I don't have much to claim. Furthermore, depending on the neighbor, the likelihood that I get my money back may vary depending on the neighbor's individual circumstances. For a very trustworthy neighbor I can likely claim the full \$100 is still on my personal balance sheet. However if the neighbor is more risky, I may only want to claim \$90 to account for the risk that some or all of my original \$100 is not paid back (of course I'll charge the riskier neighbor a higher interest rate in order to compensate me for the risk I'm taking).

In a similar way, not all commercial bank loans are the same. Some loans, say short term loans to AAA rated companies, are very likely to be paid back. Other loans (think subprime mortgages made in 2004-2007) are much riskier. To model these differences, various banking regulations require that banks risk-weight their assets based on the perceived risk of those loans.^{31 32} Very safe assets like cash and government bonds get a 0% risk weighting (our \$100 billion in reserves would be in this category). For our example, slightly riskier assets, like say mortgage loans get a 50% risk-weighting. Riskier loans still, say to small businesses, etc. receive 100% risk-weighting. Let's assume that of the original \$2 trillion in loans, that \$500 billion was mortgages and \$1.5 trillion was "other loans". Using these assumptions, we can now calculate our risk-weighted assets as follows: Risk-weighted assets = 0%*\$300 billion Reserves/Cash/Treasuries/Buildings + 50%*\$500 billion in mortgage loans + 100%*1.5 trillion in "other loans" = \$1.75 trillion in risk-weighted assets.³³ This new risk adjusted, equity to asset ratio (otherwise known as the capital adequacy ratio or "CAR") is as follows: \$300 billion in equity / \$1.75 trillion in risk adjusted assets = 17.14% capital adequacy ratio.³⁴

We can see that if we switched all our "other loans" to safer mortgages, our capital adequacy ratio would *increase* to 30% ($\$300 \text{ billion} / [50\% * \$2 \text{ trillion in mortgage loans}] = 30\%$). On the other hand, if we switched all our mortgages to the more risky "other loans" category, our capital adequacy ratio would *fall* to 15% ($\$300 \text{ billion} / [100\% * \$2 \text{ trillion in "other loans"}] = 15\%$). Of course, our income would tend to move in the *opposite* direction of our capital adequacy ratio. While not always true in the real world, in our example, when our CAR rises, income falls and vice versa. Maintaining a balance between profitability (maximizing income) while at the same time keeping the bank safe (keeping CAR high enough so as not to go bankrupt) is a critical task for banks.³⁵ Again, we point out the difference between capital and reserves. "Capital is a source of funds not a use of funds".³⁶ Capital can be in illiquid assets (like buildings or bank vaults) which aren't very helpful to a customer who is trying to withdraw money out of an ATM now. A bank with 10% capital ratio (let's assume all of the capital stored in a building) but 0% in reserves (cash, etc.) is still *solvent* (that is, in the long run it owns more than it owes with its assets being larger than its liabilities). However, since it has no cash on hand (and buildings take a while to sell), this bank can't meet its short-term day to day funding goals and can't pay its short-term obligations.³⁷ Its *illiquid*.³⁸ It can't pay even one customer who comes in today requesting their money out of the ATM.³⁹ It's important to note that mandated minimum reserve ratios (by law) have become less important over time, with some countries abolishing reserve requirements and only relying on capital requirements.⁴⁰ The Fed recently reduced reserve requirements to 0% on March 15, 2020.

How a Central Bank Interacts with Commercial Banks

Now that we have a basic understanding of commercial banks, we move onto how a central bank interacts with commercial banks. Specifically, we address how a central bank implements monetary policy. While commercial banks are the main financial intermediaries for the private economy, a central bank is critically important in a few ways. The most critical element of a central bank is that it controls the supply of the medium of account (the monetary base – which in the U.S. consists of physical cash as well as electronic Federal Reserve Deposits). We discussed this at a high level in our [2017 letter](#).

Diving deeper here: when the Fed uses its main monetary instrument, called open market operations, it either sells or buys government Treasury bonds in exchange for Federal Reserve Deposits (less commonly, the Fed will also buy

other instruments held on the bank's balance sheet, such as mortgage backed securities, etc.). In order to stoke growth, The Fed will create new reserves and with these reserves, it will buy Treasuries from the commercial banks. After this transaction, the Fed has more treasuries on its balance sheet, and commercial banks have more Federal Reserve Deposits (and less Treasuries). In this case, commercial banks now have more 0% yielding assets (Federal Reserve Deposits) which makes the commercial bank's balance sheet marginally less profitable (and slightly more safe as Federal Reserve Deposits are marginally more safe than Treasuries). If the Fed continues open market operations, it will make the commercial bank's balance sheet less and less profitable (reducing leverage of the commercial bank along the way as well). To counteract this, the commercial bank will generally seek to "re-risk" its balance sheet by bringing its leverage back up to a more normal level.

While not necessarily a problem at an individual bank level, the central issue at hand (for the commercial banking sector as a whole) is that these Federal Reserve Deposits can't be disposed of to the general public or other non-bank institutions. Commercial banks are the only institutions that can hold these Federal Reserve Deposits. Otherwise, the commercial banks could simply go to the public and buy more Treasuries with their excess Federal Reserve Deposits. But they are not allowed to do this. **The Federal Reserve Deposits are "stuck" in the commercial banking sector.** In sense, these Federal Reserve Deposits are like a hot potato that the commercial banking system can't get rid of.⁴¹ **The more permanent reserves the Fed injects, the hotter the potato gets.** So how will these commercial banks as a whole "re-risk" their balance sheets and bring their leverage and profitability levels back up to normal after these Fed injections of reserves? The only way for commercial banks (as a whole) to respond is to increase their loan levels until leverage ratios (and/or reserve ratios, etc.) are brought back in line. In this roundabout way, the Fed is able to stoke nominal growth in the private economy despite having no direct influence on private sector borrowing. Again, the Fed can only inject reserves into commercial banks and these banks can't directly lend out these reserves to the public. It takes the 2nd order (but no less real) effect of commercial banks making more loans in response to these Fed injections, in order for the private economy to be affected by Fed actions. George Selgin states it better:

"Other banks that then find themselves with excess reserves (you're talking about a fresh increment of reserves into a system that already had what it wanted), they'll pass the reserves on like a hot potato by lending them. This process will go on until total deposits in the system do increase by a multiple of the new injection of reserves. Somebody ends up holding the hot potato... What makes me (as a bank) want to make the loan, is that the excess reserves are a hot potato that is costing me in potential interest. So, I want to pass the hot potato on. I do so by making a loan, to you or anyone else."⁴²

An example is helpful. In the below table we've laid out the various steps that occur when the Fed injects reserves. In addition, we show various balance sheet metrics for our bank at each step along the way. We'll explain each step in the process after the table. In this example, we also note that, unlike our earlier example in which deposits *proceed* loans, in this example we list the more realistic scenario where "loans create deposits". In addition, our scenario below will consist of a closed economy with only one commercial bank (and one central bank). As we noted earlier, since reserves are "stuck" in the commercial banking system, using only one bank in our example will make it easier to understand. Later, we'll add in multiple commercial banks to our example. In addition, let's assume that interest on reserves is 0%.

Figure 1: Step by Step Interaction between Central Banks and Commercial Banks

Step #	Action	Various Metrics (After "Action")							
		Capital Adequacy Ratio	Reserve Ratio	Assets	Liabilities (all demand deposits in this case)	Equity	Reserves	Treasury Bonds Owned	Bank Loans Outstanding (Asset)
1	Create bank with \$300 billion in equity	100%	N/A	\$300 Billion	\$0	\$300 Billion	\$100 Billion	\$200 Billion	\$0
2a	Make mortgage loans of \$2 trillion	100%	N/A	\$2.3 Trillion	\$0	\$2.3 Trillion	\$100 Billion		\$2 Trillion
2b	Accept \$2 trillion in demand deposits (from home sellers)	13%	5%	\$2.3 Trillion	\$2 Trillion	\$300 Billion	\$100 Billion	\$200 Billion	\$2 Trillion
3	Fed injects \$100 billion in new reserves	13%	10%	\$2.3 Trillion	\$2 Trillion	\$300 Billion	\$200 Billion	\$100 Billion	\$2 Trillion
4a	Commercial bank makes \$2 trillion additional loans	53%	10%	\$4.3 Trillion	\$2 Trillion	\$2.3 Trillion	\$200 Billion		\$4 Trillion
4b	Commercial bank accepts \$2 trillion in new deposits	7%	5%	\$4.3 Trillion	\$4 Trillion	\$300 Billion	\$200 Billion	\$100 Billion	\$4 Trillion
5	Sell common stock to public (totaling \$300 billion)	≈14%	≈5%	\$4.3 Trillion	\$3.7 Trillion	\$600 Billion	\$200 Billion	\$400 Billion	\$4 Trillion

In our first step, we form a bank with \$300 billion in equity (let’s assume this is broken down into \$100 billion of Federal Reserve deposits, and the remaining \$200 billion in Treasury bonds). Next, we begin making loans. Let’s assume we loan out \$2 trillion in mortgages (seen in step 2a). Since our economy has only one commercial bank, it’s very likely the money we give to the *seller* of the home will deposit this money right back in our bank as a demand deposit (seen in step 2b) (in theory the home seller could keep the cash under the mattress and not deposit it back in our bank, but for simplicities sake, we’ll assume they don’t store it under the mattress). At this point we’ll assume we have \$100 billion in reserves for a 5% reserve ratio (Reserve Ratio = “Reserves” / “Liabilities” in table above), and our capital ratio is at \$300 billion / \$2.3 trillion = 13%.⁴³ At this stage, we are essentially where we were in our first banking example, with the difference in this example being that *loans preceded deposits*. Also note that the drastic increase (to \$2.3 trillion) in equity (step 2a) followed by the drastic decrease (back to \$300 billion) in step 2b is used only for illustrative purposes. In reality, this will be done over a more gradual timeline with much smaller loans. Slowly but constantly over time, step 2a and step 2b would happen over many loans and deposits. You wouldn’t see the drastic changes that we illustrate here. Small amount of loans are constantly being written and small amounts of deposits are constantly being made, making the large changes in equity much less in the real world vs. what we show in our example. In a sense, steps 2a and 2b happen continuously, at the same time.⁴⁴ Similarly, steps 4a and 4b happen constantly, and at the same time.⁴⁵ We’ve broken them out here to show a distinction and illustrate a point.

Moving on, we now imagine that the Fed wants to stoke nominal growth and does so by injecting \$100 billion in new reserves into the system in step 3. Notice our reserves go up by \$100 billion and our Treasury Bonds go *down* by the same \$100 billion (our missing Treasury Bonds are now on the Fed’s balance sheet). However now we have a problem. We have too many reserves for the size of our balance sheet. Our reserve ratio is 10%. We want it to go back down to 5%. But alas, reserves are stuck in the banking system and we can’t get rid of them. If we had more than one bank, we could potentially pass our reserves off to another bank. However, the reason we are imaging a one bank economy is because it shows how, for an economy as a whole, the banks (in aggregate) can’t get rid of reserves. Our only solution is to increase the size of our balance sheet to bring the reserve ratio back down. As in step 2a and 2b, we again begin the process of making loans and accepting deposits. In this case, in steps 4a and 4b, we make \$2 trillion in additional mortgage loans and accept \$2 trillion in additional deposits. Both steps operating in a similar manner as steps 2a and 2b, with the same caveat applied: Steps 4a and 4b are likely to work out gradually over multiple small loan/deposit increments and happen simultaneously.

After step 4b we have accomplished our goal of reducing our reserve ratio back down to 5%. Total loans in the economy have increased as a result of the Fed injection of reserves and the hot potato effect of these reserves on our commercial bank balance sheet. However, we now run into another issue: our capital adequacy ratio has fallen to 7%. We increased our balance sheet, but we forgot that our equity of \$300 billion remained unchanged. We must increase our equity to account for the larger balance sheet and meet minimum capital requirements set by our regulators. While there are many options for increasing equity, in this case we simply offer \$300 billion of *new shares* for sale to the public. Again, since our bank is the only commercial bank in our closed economy, the likely

buyers for these new shares are likely already depositors at our bank. In this case, we simply take our shareholder accounts and deduct their deposits by \$300 billion (for \$600 billion in equity). Of course, these depositors will receive shares in our bank instead. While their deposits have been reduced by \$300 billion, these new investors are now entitled to a percentage share of the future *income* of our bank. Also note that the original existing equity owners (who put up the original \$300 billion in step 1) have now been diluted. They own less percentage of the bank. However, the bank is now bigger. They own a *smaller* percentage basis of a *larger* company. To see how this could be beneficial: imagine owning 5% of a \$100 billion business vs 100% of a \$4 billion business. The combination of percentage ownership as well as raw business size is what's critical. Other options for increasing equity include retaining earnings, etc.⁴⁶

We have now returned our bank capital adequacy ratio back to close to its original level ($\approx 13\%$ originally, $\approx 14\%$ now) as well as getting back to our original $\approx 5\%$ reserve ratio we saw in step 2b. In addition, our economy has grown in nominal terms as a result of the Fed injections.

Other Special Considerations or Concerns

In this section we'll go over some special situations and caveats to our above examples, which were admittedly quite basic. To draw clear distinctions, we'll number these considerations and concerns.

- 1) ***Interest on Excess Reserves*** - Of course, the above example is under perfect conditions. There are many other factors to consider. The Fed can begin to pay interest on reserves which, in addition to being contractionary, can also lead to many more problems (see George Selgin's great book, "[Flooded](#)" for a detailed explanation).⁴⁷ While currently, interest is paid on both reserves and excess reserves, in this section we'll largely focus on "Interest on Excess Reserves (IOER)". To illustrate: We assumed reserves yielded 0% while treasuries yielded 2%. If instead, the Fed starts paying interest of 2% on the reserves as well, then commercial banks have little incentive to "re-risk" their balance sheets. The commercial banks lose the 2% yielding Treasuries during OMOs but instead get an almost identical financial asset in the form of 2% yielding Federal Reserve Deposits. It's no surprise that, since banks don't need to "re-risk", that paying IOER leads to very little (if any) increase in nominal spending in the private economy. Paying IOER cools the hot potato and leads to less commercial bank lending and less nominal growth. The quantity effect of increased reserves is largely cancelled out by the contractionary payment of interest on reserves.⁴⁸ George Selgin addresses the false notion that paying interest on reserves was *not* contractionary (IOER certainly was contractionary in our view):

"This is another argument I've had with Fed economists. I wrote to the Fed and said: 'look, you've got it wrong. There is a distinction between the *determance of excess reserves* and the *determance of reserves*. It's not the same. Banks can, in principal, always have low excess reserves by creating enough deposits.' His (a Fed economist) response was: 'well, when the magnitude of deposit creation is such, as it was under all three rounds of Q.E., then it's no longer possible for banks to make that many loans. There's not enough loan possibilities out there.' And I wrote him back and said: 'well excuse me, but in the German hyperinflation, the order of magnitude of increase of bank reserves was many times *greater* than in Q.E., as fantastic as Q.E. was. Yet, not only did the German banks expand deposits as rapidly as reserves and keep the same low ratio of reserves...the German banks actually lowered their reserve ratios. They created *more* deposits. They're always able to get rid of non-interest earning reserves as long as there are other assets that earn more interest'...He didn't have an answer to that'⁴⁹

As Mr. Selgin points out: banks are very good at getting rid of excess reserves by increasing loan amounts. Indeed, they did so very well prior to 2008. The banks only stopped creating more loans in the face of excess reserves because the Fed paid interest on these excess reserves, making the potato less hot. If IOER were reduced or eliminated (or even better, made negative), the banks would have no problem creating loans and getting rid of excess reserves, just as they did prior to 2008. It is not a lack of loan demand or other factors cited by pundits. Commercial banks won't simply sit on reserves, as many claim they would, if IOER were 0%. Yes, it is "just an asset swap" when you take 2% IOER reserves and swap them with 2% yielding treasuries (though even then, if expectations are managed correctly, it becomes *far more than just an asset swap*, even if IOER = Treasury yields). Of course, the correct conclusion from this is not to say:

“monetary policy is impotent”. *The correct solution is to move away from a floor system and stop paying interest on excess reserves!* Indeed, the Fed itself said the primary reason it started paying IOER in 2008 was to quell the inflation that would likely result from such an increase in the monetary base.⁵⁰ In the 12 years since then, inflation has remained *below* the Fed’s own target.

Furthermore, if the Fed is unclear about whether these open market operations are permanent, then that too can hinder a commercial bank’s need to “re-risk” its balance sheet and create more loans. A commercial bank is unlikely to “re-risk” its balance sheet if the Fed injects a bunch of reserves, but at the same time the Fed implies (or outright says, say via a fixed inflation target) that it will remove these reserves if growth rises at all (or if the Fed promises to raise IOER at the first signs of economic growth – which the Fed has implied of late). Commercial banks are smart, and only will “re-risk” their balance sheet and extend more loans if they think the Fed will let growth run (which is only possible if reserve injections are permanent).⁵¹

To prevent this, a central bank can either pay 0% on excess reserves or even set the IOER rate to a *negative* amount!⁵² This negative IOER would certainly make the potato very hot indeed and encourage banks to lend even more! These negative yielding reserves would be, in a sense, burning a hole in the pocket of the commercial banks – their only solution would be to make more loans to lessen the impact of this hot potato (i.e. negative yielding reserves).⁵³

- 2) **Does a central bank really act first and inject reserves like you mention in your example? Don’t instead, commercial banks ask Fed for reserves and in return the Fed accommodates?** – Yes, to the later question. Under most circumstances the day to day changes in the amount of reserves is set by commercial banks, not the Fed. The commercial banks go to the Fed and in a sense, ask for the amount of reserves they require. However, the Fed still has input. One of the determining factors that will determine just how much reserves a commercial bank will require, is the Fed’s growth targets. Hopefully, these targets are clear and constant so that neither the commercial banks nor the Fed are surprised by reserves required, etc. (i.e. there are no growth shocks). We simply use the extreme example of a Fed driven reserve injection to show that, ultimately, no matter the scenario, the Fed can drive nominal growth rates. Under most circumstances, if the Fed is correctly managing expectations, it is indeed the commercial banks the will drive and request any new reserves from the Fed. Stated differently, “under most circumstances, the day to day changes in reserve amounts is driven by the commercial banks and their requests from the Fed for more reserves. Of course, this is still ultimately constrained by the Fed, especially under extreme scenarios.”⁵⁴

As an example, let’s assume the Fed says, “starting in January 2021, we will commit to a new 10% NGDP level target”. It’s our contention that *starting today*, commercial banks would ease loan standards and expanding their balance sheets. These commercial banks would likely go to Fed and ask for more reserves and the Fed would accommodate. It would look like it’s the commercial banks who are setting the reserve levels and the Fed is simply obliging. However, these changes in commercial banks’ lending criteria (and their demand for nominal reserve amounts) was almost entirely affected by the Fed policy announcement targeting 10% NGDP growth. The public’s willingness to take out loans, as well as the bank’s willingness to make those loans, is largely affected by the expectations that the customers and bankers have about future NGDP growth/future Fed policy and actions. It is still ultimately the Fed that is setting policy. The commercial banks are largely reacting despite, what appears to be at first glance, the commercial banks setting reserve amounts/levels.⁵⁵

- 3) **Isn’t there a limit to monetary policy? Doesn’t monetary policy eventually resemble “pushing on a string”?** - Many pundits claim that eventually monetary policy leads to pushing on a string, where no amount of reserve injections can stoke nominal growth rates. Many argue that this impotency is especially true when bond yields are at 0%. They claim that when bond yields are equal to the yield on reserves, this it is truly just an asset swap with no stimulatory effect. We disagree with this. Many of these pundits point to Japan or Europe and point to the large central bank balance sheets as a sign of the impotency of monetary policy. We disagree. Both Japan and Europe (and to a lesser extent the U.S.) have increased their central bank balance sheets, but at the same time, have implied that they won’t let growth run and implemented contractionary monetary policy (0% 10-year bond targets, etc. which snuff out growth before it can start). As we’ve pointed out in our [2017 annual letter](#), if these pundits truly believe monetary policy has (nominal) growth limits, then we’d have found a financial perpetual motion machine: If unlimited purchases of

financial assets by a central bank caused *no increase* in nominal growth rates, then there would be no need to collect taxes at all. The Treasury could fund all government expenditures via new issuance of Treasury bonds, which would be immediately bought up by the Fed in full. In reality, any hint of something even approaching this type of policy would result in an almost immediate rise in inflation. The financial version of the first law of thermodynamics holds and is not violated.⁵⁶ A financial perpetual motion machine is not possible: inflation will eventually rise under such unlimited purchases of Treasuries by the Fed.⁵⁷

Other pundits claim that private citizens won't take out more loans, no matter what the Fed does. However, we would again disagree. Our argument builds on the example in the previous paragraph: assume the Fed tomorrow promises to buy up all the Treasuries on the commercial banks' balance sheet. The Fed also promises to buy any new treasuries that the Treasury issues (Fed would still buy through commercial banks, using these commercial banks as intermediaries between the Fed and Treasury). Would none of us go out and try to get as many mortgages at 4% rates as possible? We certainly would, and we believe almost everyone else would as well, which would push up nominal growth rates, etc. In practice, market forces would react so fast that it would be difficult for individuals to take advantage of and profit off these low mortgage rates. Mortgage rates would skyrocket in anticipation of higher nominal growth rates and nominal house prices. Again, when pundits claim that the Fed can't make the public take out loans, they are right only if one is looking at the Fed's *direct, first order effects*. By looking at *second order effects*, it's obvious that Fed actions have a clear impact on the terms (amounts of loans, rates on loans, etc.) that private citizens are willing to borrow at. One set of Fed actions may result in bank customers taking out a large mortgage at 10% mortgage rates. A different set of Fed actions may lead these same bank customers to be *unwilling* to take out *even a small* mortgage at low 2% rates! Expectations and Fed actions are critical to the nominal economy.

Some claim that banks will simply hoard reserves. They point to the hoarding that has taken place since 2008. However, Mr. Selgin addressed this above. The large hoarding and building up of excess reserves is primarily the fault of the Fed. Specifically, paying interest on excess reserves has been the primary cause of the hoarding. Any similar injection of reserves (but without IOER) would have led banks to create much more loans and caused a much more robust economic recovery after 2008. Those claiming that banks will always sit on reserves (even if IOER is 0% or negative!) are implicitly imagining a world where bank balance sheets could be *entirely composed of Federal Reserve Deposits*. In our mind, this is a farfetched and unlikely scenario indeed!

To use another example: if you and I swap 5 apples for 10 oranges, there is no change in the general price level because neither apples nor oranges are the unit of account. We never go to the electronics store and ask, "how many apples would it take for me to buy that TV?". We ask: "how many dollars would it take to buy that TV?" Dollars are the unit of account. This is what makes open market operations (OMOs) different from our "apples for oranges" trade. In the case of OMOs, one of the assets being swapped is the unit of account (reserves). The other asset (treasuries) is not part of the unit of account. Said differently, under open market operations, one of the assets being swapped is the exact asset we all use to quote the price of TVs, houses, cars, and everything else in the economy. When we swap "apples for oranges" we are only changing how a fixed size pie is divided up (i.e. how many pieces the pie is cut up into). We aren't changing the size of the pie. Similarly, when I buy a TV at the Best Buy the total amount of money in the system doesn't change. On the other hand, with open market operations, we are changing the *actual size of the pie*, not just how many pieces it's cut up into. With OMOs we are changing the total amount of money in the system.⁵⁸ Open market operations are far more than just an asset swap, even at the zero-lower bound!

As a final example: If an economy has 100 widgets in existence, with \$100 floating around, then the price will be \$1/widget (assume constant velocity of 1). If we suddenly increase the dollars floating around to \$200, but keeping the amount of 100 widgets the same, then the price per widget is now \$2. We don't have more widgets than before; we aren't any better off in (real) terms. We simply changed the (nominal) price. No, commercial banks don't create money in the true sense of the meaning. Again, we look to George Selgin:

“This is, in a sense, how private commercial banks are true intermediaries. They don't create money out of thin air, in a way that a central bank can do it. Commercial banks have to have resources to lend. A central bank creates reserves. It can create all it wants (of reserves). It doesn't run out (of reserves). It is creating the ultimate reserve medium itself. No commercial bank is in a position to create settlement media that pay other banks what it owes them. That's a crucial difference (between central banks and commercial banks)”⁵⁹

- 4) **What if there aren't enough Treasuries and the Fed runs out of Treasuries to buy?** - Some pundits claim that there aren't enough Treasury securities for the Fed to buy to stoke growth. In theory this is a valid concern, though we point out that under such unlikely circumstances, the Fed could buy other types of financial assets (despite current questions regarding the legality of such actions).⁶⁰ In practice, the Fed needing to buy anywhere close to 100% of outstanding Treasuries would imply that expectations have been horribly mismanaged. The U.S. attained 10% and more inflation in the early 1980s, with a miniscule Fed balance sheet of 5% of G.D.P. Conversely, Japan can barely get any inflation at all, despite a massive central bank balance sheet of 100% of G.D.P.⁶¹ It's counterintuitive, but these two contrasting examples show the critical importance of central banks correctly managing expectations. The market in 1980 expected inflation, so the Fed didn't need to drastically increase reserves (in fact it took a disproportionate *reduction* in reserves by Paul Volker to get inflation (expectations) back down). The Japanese market now expects 0% inflation, so despite any massive increase in reserves, it's very difficult for the BOJ to get any inflation at all. No amount of QE will help if expectations aren't managed.
- 5) **What Happens if all our depositors withdraw all their cash at the same time?** – Let's go back to our example table on page 8. At step 2b we have \$100 billion in reserves and \$2 trillion in demand deposits. Someday, all our customers come to our branch and demand their \$2 trillion in cash. Unfortunately, we only have \$100 billion. Luckily for us the Fed has a solution. The Fed agrees to let any bank withdraw new reserves from the Fed if needed (called the Discount Window).⁶² Of course, we'd also have to call in all our loans to accommodate this massive increase in reserves on our balance sheet. After we've wound down our loans and gotten the \$2 trillion of reserves from the Fed, our balance sheet would have \$2.3 trillion in assets, \$2 trillion in reserves, \$0 loans outstanding, and \$300 billion in equity. After we hand out the cash, our balance sheet reverts all the way back to step 1, where we have only \$300 billion in equity/assets with no liabilities.

Regarding the \$2 trillion in new reserves, the Fed will charge an interest rate for this, however as we'll see, this may not result in a rise in the discount rate (or other interest/inflation rates). This is because, what matters is the long-term path of the entire monetary base. In this case we are certainly increasing the monetary base from \$100 billion to \$2 trillion (basically all of M2 is converted into MB).⁶³ However, *what's important is the future path of MB.*⁶⁴ In this case, if we assume the Fed remains steadfast in its inflation target, then this increase in MB is a onetime event with little inflation likely to result. Like the separate scenario of temporary increases in MB, this one time increase in MB because of mass ATM withdrawals, is not likely to change inflation expectations. This is obviously an extreme example, but an interesting thought experiment none the less.

- 6) **In our example above, what happens if our commercial bank and a customer agree to a massive \$200 trillion loan with no input from the Fed?** – We list this example to address the upper bound constraint on lending, imposed by the Fed. Some are under the impression that “private banks create money, not the Fed”. This is true in one sense, but untrue in another more important sense. It is true, that M2 (largely created by commercial banks) is larger than MB (created by the Fed). While there are variations in the ratio between MB and M2, there are limits. A commercial bank cannot create unlimited amounts of M2 (at least not without the Fed's help). Private banks do indeed create money with the important caveat: this private

money creation is still ultimately subject to constraints by the Fed.⁶⁵ In our example, let's assume that reserves stay at \$100 billion. But in steps 2a and 2b, instead of making \$2 trillion in loans, our banks make \$200 trillion in mortgage loans? Again, we'll assume that the \$200 trillion comes back in deposits to our bank. We now have \$200.3 trillion in assets, but only our same \$300 billion in equity and \$100 billion in reserves. Our capital adequacy ratio is a minuscule $\$300 \text{ billion} / \$200.3 \text{ trillion} = 0.15\%$! Our reserve ratio is 0.05%! If even 1 out of 2000 customers comes to withdraw cash, we are in trouble! If our risk weighted asset models are off by even \$1 in \$600 then we are insolvent!⁶⁶ Clearly no bank would lend out \$200 trillion in this scenario. The ultimate check here is the amount of reserves. As we'll see in #7 (directly following), a \$200 trillion loan becomes more likely if reserve injections by the Fed are increased by a proportional amount. In addition, the miniscule 0.15% capital ratio would require a massive amount of new equity from the commercial bank. Ultimately, regulators demand minimum capital ratios which further prevents a real life bank getting anywhere close to the absurdly small 0.15% capital ratio in the example above.

Indeed, this illustrates the larger point: M2 and private bank money creation follows the monetary base over the long term. The monetary base is the nominal anchor, not M2/private bank money. Its possible (albeit odd) for the Fed to get NGDP to say \$500 trillion very soon, without any help from private banks (M2 equals MB, with all physical cash, etc.). Conversely, it is *impossible for private banks* on their own to get NGDP anywhere close to \$500 Trillion anytime soon, unless the Fed accommodates (by increasing MB). Again, private bank money creation follows the Fed's creation of the monetary base.

- 7) **Assuming the purchase is permanent, what happens if the Fed bought up all of our \$2 trillion in mortgage loans after step 3 in our example above?** – This hypothetical scenario aims to address the massive reserve injections by the Fed (hopefully further showing that monetary policy is never out of ammo). In this case we assume that, at step 3 in our example above, as opposed to the Fed injecting \$100 billion in reserves by buying \$100 billion in treasuries, instead the Fed injects \$2 trillion in reserves by *buying up all our mortgage loans* (after all, the Fed did put mortgage backed securities on its balance sheet after 2008). Our bank now has assets of \$2.3 trillion but reserves make up a massive \$2 trillion of that \$2.3 trillion. Our reserve ratio is 100% (reserves of \$2 trillion / deposits of \$2 trillion = 100% reserve ratio). As we discussed earlier, our bank is now entirely too safe and unprofitable. Our bank needs to make some loans. After a series of loans similar to steps 2a/2b (as well as steps 4a and 4b) our bank would need to make loans of \$40 trillion in order bring our reserve ratio back down to 5%! We aren't quite at our \$200 trillion in loans we mentioned in bullet point #6, but we are close (simplistically, with a 5% reserve ratio, \$200 trillion in loans would require reserves of \$10 trillion!)
- 8) **Could a rogue commercial bank use the discount window to massively and permanently increase the amount of Reserves/monetary base and cause runaway inflation?** – The discount window comes with a penalizing interest rate attached. A bank can create new reserves, but will be charged an interest rate for doing so (higher than most other rates like the Fed Funds Rate). A bank could momentarily create new reserves, but if it continued to do so, the interest rate charged (relative to the low NGDP growth path set by a credible target from the Fed) would make it very unprofitable for the bank to do so. At an extreme, if the Fed signals that its inflation target is 2%, but a rogue commercial decides to try and create massive reserves at the discount window, then initially this commercial bank could borrow at say 2%. But the bank would certainly struggle to make ever increasing amounts of *profitable* loans off this discount window borrowing (assuming the Fed is managing its goals correctly). In theory, if a bank started perpetually borrowing from the discount window and making more loans to the point where NGDP started growing rapidly, then Fed could simply raise the Discount Rate even higher to discourage this and keep NGDP growth lower (though again, it's almost impossible to imagine such a scenario, as the banks desire to make *profitable* loans would make this situations extremely unlikely
- 9) **You've addressed how the Fed constrains lending on the upper bound. What constrains lending on the lower bound?** – In theory you could have banks that are fully reserved with no lending. That said, the lower bound is primarily set by the banks desire to make money (subject to capital requirements etc.). A bank will, in general, make as many loans as it can while remaining safe. The lower bound is constrained therefor, by a banks desire to make money, which it does primarily by making loans. Of course, the Fed

could also reduce the amount of MB to zero, which would provide the ultimate lower bound to the economy (leading to a massive depression in the process).

- 10) **Can you modify our example to include the more realistic scenario where there are multiple commercial banks in our economy?** – Let’s modify our example from our table on page 8, and now assume that our economy has three commercial banks (still only one central bank). Let’s assume they each have about the same amount of assets, ratios, etc. We’ll next assume that Bank A writes a mortgage loan for its customer. The seller of this home takes the money and deposits it at Bank C. This would result in some imbalances as Bank A has seen loans increase by the mortgage amount and Bank C has seen its deposits increase by a similar amount. Our ratios begin to get out of whack. Of course, in reality, it’s very likely that there are many loans like this being written all the time. In addition, much of the time, these loans may indeed cancel each other out: that is: concurrent to our original Bank A loan, we now assume that Bank C writes another mortgage loan and this seller deposits the amount in bank A. In this case the transactions between the banks net out to zero.

This leads us to our next question: did Bank A and Bank C have to transfer reserves between each other in order to keep reserve ratios, etc. in line? In theory they certainly could, however in practice, banks usually just write IOUs to each other for these reserves and only settle occasionally (again, if these IOUs net out after a certain period of time, its more efficient to not transfer reserves between the banks).⁶⁷ These IOUs are called repos and are traded constantly among banks. In fact, in our example here, its possible Bank A and Bank C might not even trade repos directly with one another.⁶⁸ Bank B could be an intermediary with Bank A buying/selling repos from Bank B as well as Bank C only buying/selling repos from bank B. These repos have their own markets and interest rates and are an efficient settlement mechanism for the commercial banking system. That said, reserves and the power of the Fed are still critically important. IOUs for reserves can never fully replace reserves themselves. In times of crisis, etc. commercial banks are likely to demand reserves themselves, and not simply accept IOUs for reserves.⁶⁹ Commercial bank repos are not the medium of account and are not the ultimate nominal anchor that reserves are.

Chapter 3: Odds and Ends

In this section we'll quickly go over some other market insights that didn't fit in the other sections of our letter:

- This past year we have been reading through Wall Street Journal articles from the 2008 Financial Crisis. In past letters we've noted that, while Japan appeared to want higher inflation, their actions and statements sometimes pointed to a *tighter* monetary policy. In particular, we found this statement from the August 26th, 2009 WSJ to be illuminating and illustrates that, in fact Japan may desire the low inflation they've gotten:

“Democratic Party of Japan President Yukio Hatoyama reiterated over the weekend that the party doesn't plan to increase new bond issues to finance its huge stimulus package if it takes power in Sunday's election. Speaking on television, he said a DPJ-led government ‘would not increase issuance’ of bonds next fiscal year and that ‘naturally, we must strive to cut’ Japan's large public debt.”⁷⁰

From December 2009, more evidence that many were able to identify, in real time, just how tight monetary policy in Japan was:

“politicians have turned their attention to the possibility of more monetary-policy support from the BOJ. As the central bank resisted, government ministers piled on criticism, with Financial Services Minister Shizuka Kamei calling central bankers ‘asleep at the switch’.”⁷¹

- We also note similar statements from then Fed Chairman, Ben Bernanke, back in August 2009, when the Fed was overly concerned with inflation and prematurely talking about unwinding the Fed balance sheet, etc. Again, as is the case with the current Fed maintaining IOER at 0.1% instead of 0%, these seemingly small statements have *enormous* effects on (tightening) the markets expectation as to future monetary policy. Of course, the market was correct in 2009 and we predict the market will be correct again going forward in the 2020s. Bernanke in 2009:

“And secondly, at some point, when the economy begins to recover, we want to make sure that we don't overstimulate the economy into an inflation. And so, for both of those reasons were going to have to unwind essentially all of the programs that we've put out”⁷²

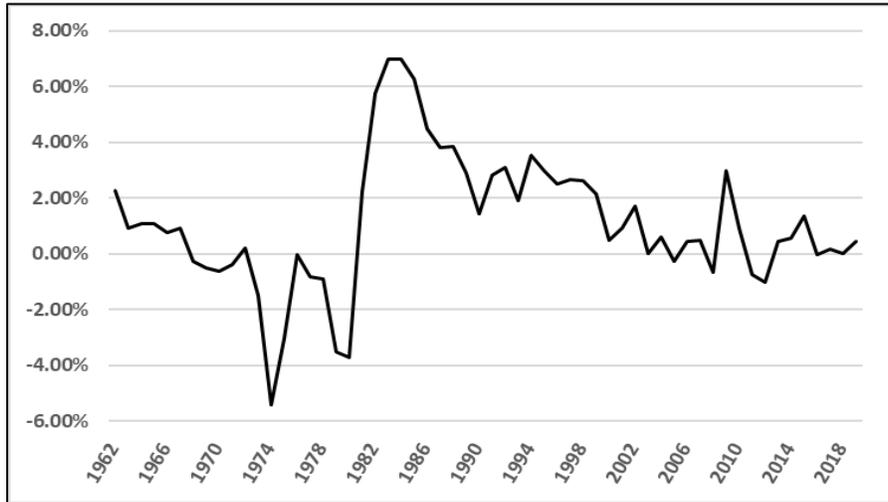
Later in the same town hall Bernanke continues:

“The Fed supports the Treasury's strong dollar policy. We think the dollar should be strong, and the best way we think to get a strong dollar, is to have a strong economy. When the economy is strong, then there's a lot of good investment opportunities...foreigners want to invest here. And that causes the dollar to rise.”⁷³

While we are all for a strong economy, a strong dollar, especially against other currencies which also have tight monetary policy, is not the right answer.

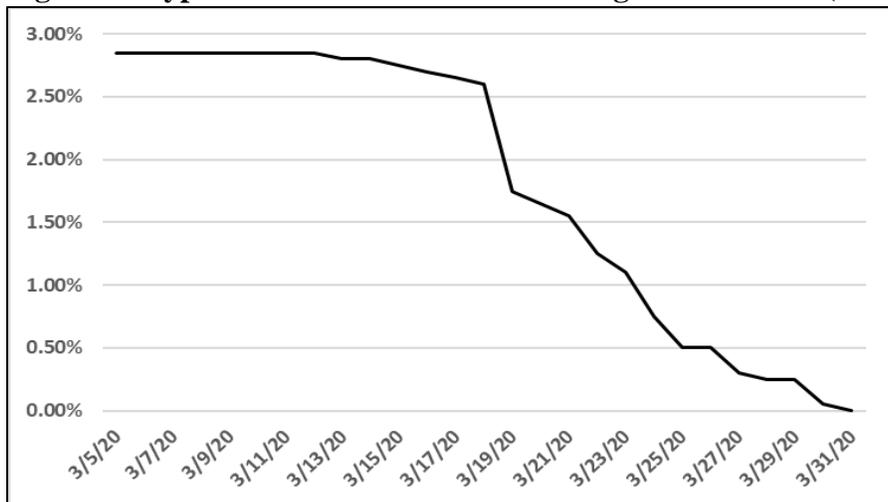
- In looking at changes in the 10-year Treasury yield, it can be helpful to control for various factors. One common factor is to control for inflation and look at the real Treasury yield. In addition, we think controlling for working age population growth is also important (all else equal, we'd expect higher Treasury yields in an economy with fast population growth). In the below graph we control for both inflation and population growth. We can see that this explains some, but not all, of the changes in Treasury yields we've seen over the past 50+ years. CPI and population numbers are backward looking, but in the future we could create a graph using 5-year *forward* inflation expectations as well as *future* population projects. Both forward inflation and forward population growth are forecasted to drop or remain low, so today's abnormally low nominal Treasury yields are partially explained by these low inflation and low population growth expectations.

Figure 2: 10-year Treasury Yield – Inflation – Working Age Population Growth (1962 - 2019)⁷⁴



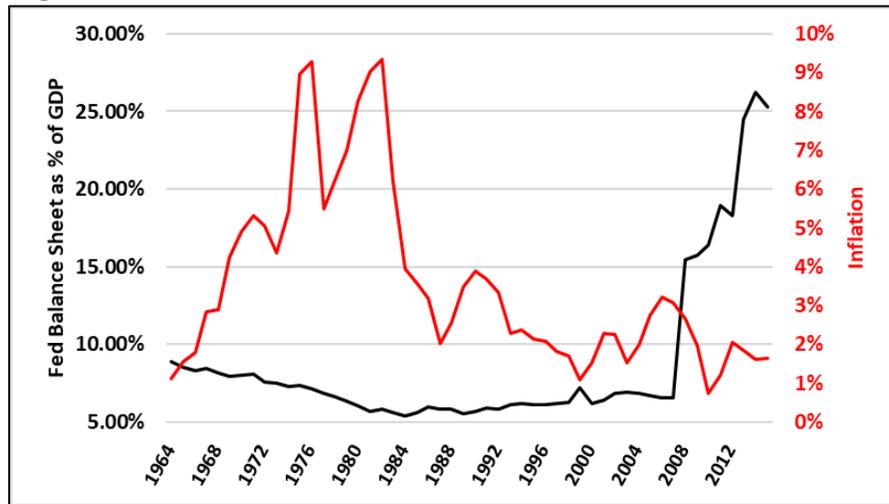
- We’ve also noted many pundits automatically assuming that the yield on government bonds automatically correlates to default risk. This is sometimes true, but many times these pundits fail to consider the scenario where a government has (too high) NGDP/inflation but also a low default risk. The best way to separate out the causes is to look at both NGDP growth as well as [Credit Default Swaps \(CDS\)](#) for a given government.⁷⁵ A prime example of this was the high bond yields in Greece back in 2011. There was a high risk of default but low predicted NGDP growth in the EU. The opposite example would likely be the U.S. in the 1980s, when default risk was low, but NGDP growth was (too) high.
- We earlier noted that current [Hypermind.com](#) predicts that 2020 NGDP will be 0%. In the below graph we note just how quickly these expectations have fallen in the last few weeks

Figure 3: Hypermind Predictions for NGDP growth in 2020 (March 2020)⁷⁶



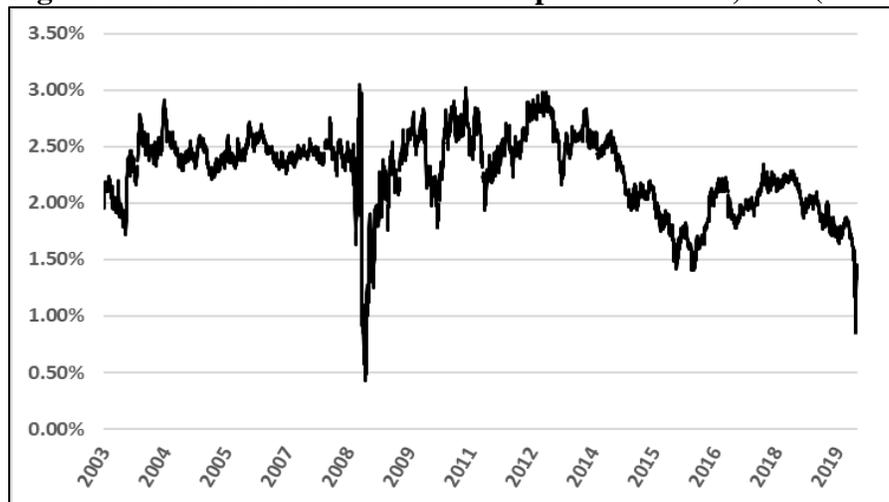
- Of late we've also seen many pundits claim that an increase in the monetary base will lead to inflation. We've also seen many claim that inflation will result, but only after massive purchases by the Fed (much bigger than today). We'd disagree with both ideas. Inflation is almost entirely the result of expectations. Looking at daily changes in the size of a central bank balance sheet will tell you very little. In fact, in times of high inflation, where expectations are set in, the size a central bank balance sheet is actually *small* in relation to G.D.P. (See 1980 in U.S. graph below). Conversely, many times, a large central bank balance sheet as a percentage of G.D.P. will mean that monetary policy is tight (a central bank claims it wants higher inflation and tries to bluff the market by increasing the balance sheet. But if expectations don't change, then even massive purchases (the U.S. since 2008) will fail to stoke growth. Expectations are paramount.)

Figure 4: Size of Fed Balance Sheet vs. Inflation (1964 - 2015)⁷⁷



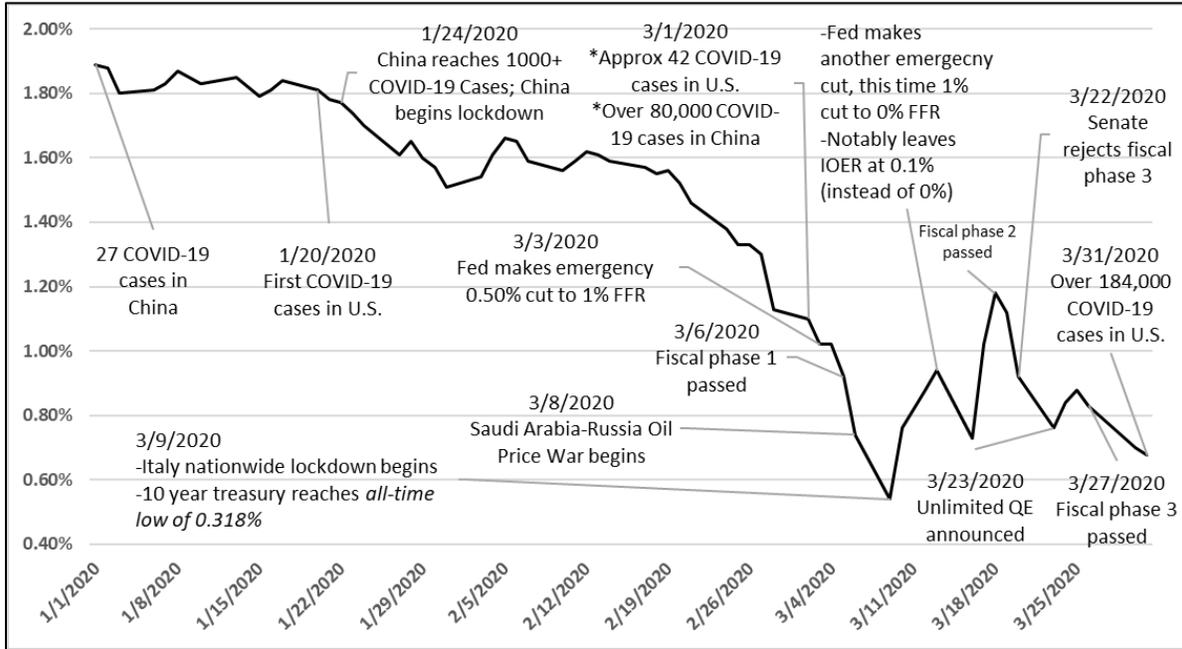
We don't see the U.S. having significantly higher inflation going forward, despite the increase in the Fed's balance sheet. The Fed is trying to bluff its way toward inflation, and the market is not having it (see 5 year forward inflation expectations below). Also note the massive drop in inflation expectations in 2020, despite massive moves from the Fed (two emergency rate cuts to 0%, unlimited QE, etc.). Monetary policy is still entirely too tight.

Figure 5: 5-Year Forward Inflation Expectation Rate, U.S. (2003 - 2020)⁷⁸



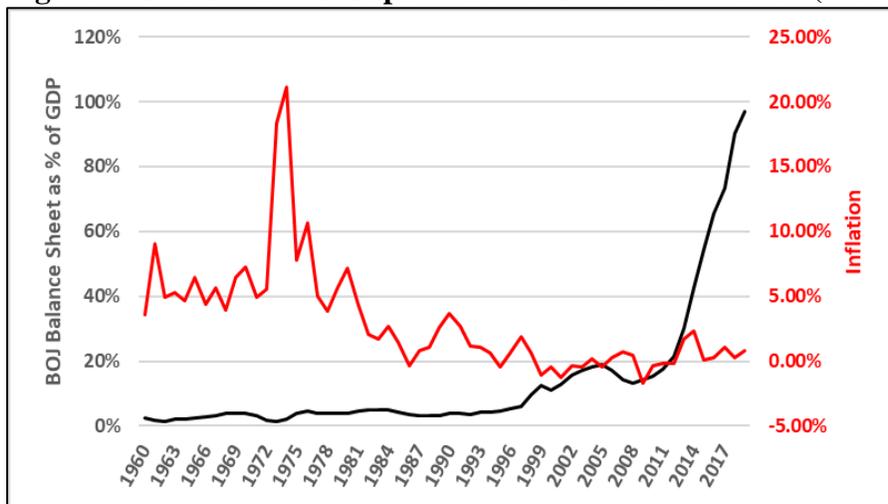
To illustrate this point even further, we look at recent 10-year Treasury yields with various Fed actions, etc. imposed on the graph. Keep in mind that true easy monetary policy should result in *higher* bond yields. Instead we see the recent Fed's so called "bazooka's" (unlimited QE, emergency rate cuts, etc.) were in fact leading to the *tightening* of monetary policy. These actions, while positive, are not nearly quick enough given the even quicker deterioration in the economy. Much more needs to be done to ease monetary policy

Figure 6: 10-year Treasury with Recent Events (January 2020 – March 2020)



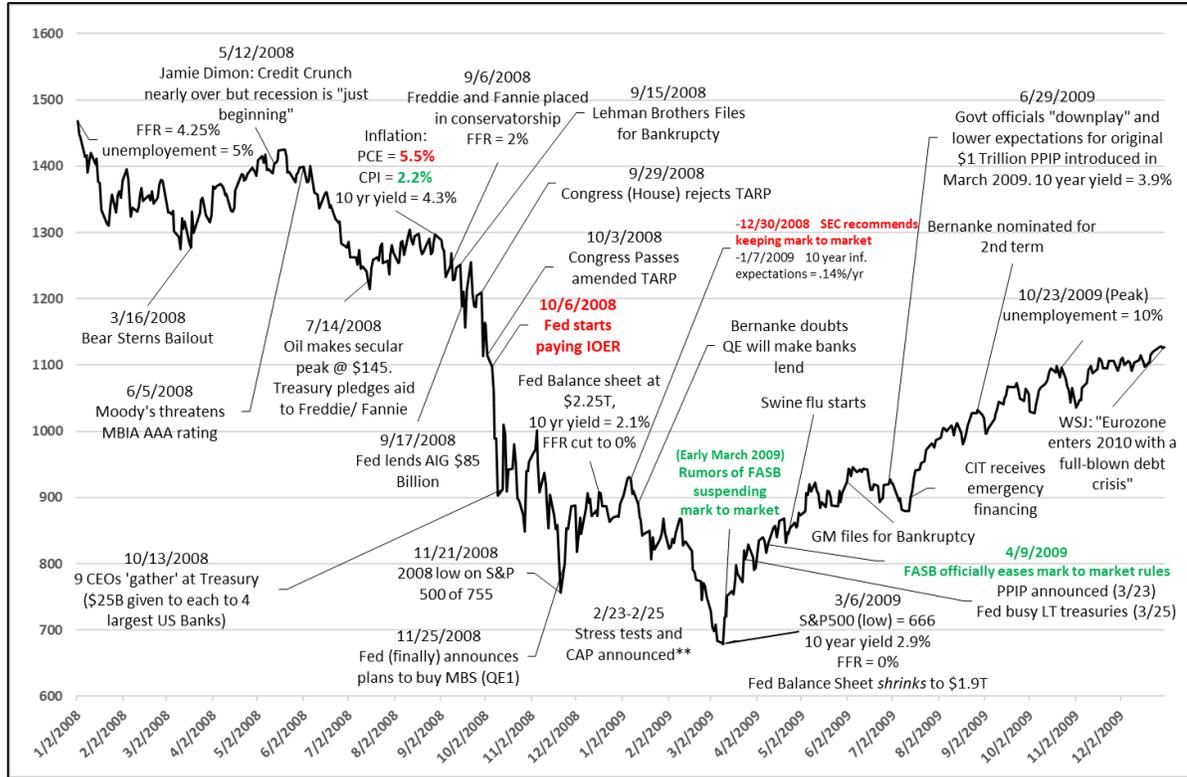
If we look at Japan, we see a similar pattern that we saw in the U.S. back in Figure 4. There is almost no correlation between a central bank's balance sheet size (as percentage of G.D.P.) and the inflation rate. If anything, it appears as though there is a negative correlation.

Figure 7: Size of Bank of Japan Balance Sheet vs. Inflation (1960 - 2019)⁷⁹



- On the previous page, we listed the 10-year Treasury yield and superimposed various events on this graph. As we mentioned earlier, we have begun reading old Wall Street Journals from 2008-2009. In the graph below, we list the S&P 500 price trend during the 2008 Great Financial Crisis and list some important events as well. We admit it is a busy graph and likely will get a “chart crime” nomination, however we hope at least some will find it useful. In particular, we note the discrepancy between PCE and CPI inflation in the summer of 2008 (which confused the Fed and led to worry too much about high inflation). We also note the large drop in stock prices *after* IOER was announced (this despite TARP passing 3 days prior – this should illustrate the importance of IOER relative to, even exceptionally large, injections of reserves). Finally, we note the importance of mark to market rules.

Figure 8: S&P 500 Price vs. Daily News Events (2008 - 2009)⁸⁰



For the “” in the February 2009 note, please see “**” section in footnote #80

Footnotes and Sources

¹ Assumes a 1% annual management fee. Not included in these calculations is an approximately \$200 charge per account per year for fixed costs (minimum account fees, trading commissions, etc.). Split Rock Capital Management runs various separately managed accounts. While the strategy is the same, due to differing start dates, etc, the various accounts can have differing holdings and therefore differing performance numbers. While over the long term we expect these differences to even out, over the short run that can vary meaningfully. That said, on inception date, we started an initial portfolio (our *only* account at the time) which we have always, and will continue to use, as our tracking portfolio. To maintain consistency, and remove any selection bias, all historical performance numbers are from solely this account, regardless if the other accounts outperform or underperform this main tracking account in the past or going forward. Above performance numbers are from our original portfolio account. This was the only account setup as of our 12/15/2015 inception date, and the only account that has been continually open since inception.

² Includes dividends. Please note that these “S&P 500” numbers use [SP500TR](#). The performance numbers may vary slightly from the official S&P 500 performance numbers listed elsewhere on a year to year basis. However, over time, the differences should cancel out. For example, our SP500TR numbers for 2016 was 21.87% which was slightly above the official [21.83% for the S&P 500](#). However, in 2018 the differences largely evened out, with our SP500TR reporting a return of -4.41% while the official S&P 500 return was -4.38%. The differences in annual returns are largely canceled out over the entire 2-year time frame, and we expect differences between the two performance metrics to be even less of longer periods of time.

Also please note: Split Rock Capital Management runs various separately managed accounts. While the strategy is the same, due to differing start dates, etc., the various accounts can have differing holdings and therefore differing performance numbers. While over the long term we expect these differences to even out, over the short run that can vary meaningfully. That said, on inception date, we started an initial portfolio (our *only* account at the time) which we have always, and will continue to use, as our tracking portfolio. To maintain consistency, and remove any selection bias, all historical performance numbers are from solely this account, regardless if the other accounts outperform or underperform this main tracking account in the past or going forward.

³ Assumes a 1% annual management fee. Not included in these calculations is an approximately \$200 charge per account per year for fixed costs (account fees, trading commissions, etc.). Split Rock Capital Management runs various separate accounts. While the strategy is the same, due to differing start dates, etc., the various accounts can have differing holdings and therefore differing performance numbers. While over the long term we expect these differences to even out, over the short run that can vary meaningfully. That said, on inception date, we started an initial portfolio (our *only* account at the time) which we have, and will continue to use, as our tracking portfolio. To maintain consistency, and remove any selection bias, all historical performance numbers are from solely this account, regardless if the other accounts outperform or underperform this main tracking account. Above performance numbers are from our original portfolio account. This was the only account setup as of our 12/15/2015 inception date, and the only account that has been continually open since inception.

⁴ Assumes a 1% annual management fee. Not included in these calculations is an approximately \$200 charge per account per year for fixed costs (account fees, trading commissions, etc.). Split Rock Capital Management runs various separate accounts. While the strategy is the same, due to differing start dates, etc., the various accounts can have differing holdings and therefore differing performance numbers. While over the long term we expect these differences to even out, over the short run that can vary meaningfully. That said, on inception date, we started an initial portfolio (our *only* account at the time) which we have, and will continue to use, as our tracking portfolio. To maintain consistency, and remove any selection bias, all historical performance numbers are from solely this account, regardless if the other accounts outperform or underperform this main tracking account. Above performance numbers are from our original portfolio account. This was the only account setup as of our 12/15/2015 inception date, and the only account that has been continually open since inception.”

⁵ Partial year only; from inception date of 12/15/2015 to 12/31/2015.

⁶ You wouldn’t want a firm that has seen no drop in revenue (say a firm like zoom), qualify for loans just because they happened to keep up their payroll numbers. Loans/grants should be for firms that both: keep up payroll numbers and experience significant economic hardships because of the virus/lockdown

⁷ Selgin makes a similar point: “ I don't disagree (at having Fed make loans to private companies, etc). But if risk is entailed I think the Treasury should back-up the lending.” Source:

<https://twitter.com/GeorgeSelgin/status/1241818841946173440> ; <http://archive.is/KhFg0>

⁸ See document: “[Automatic BOOST to Communities Act](#)”. We also point out that the platinum coin idea only works because of a legal loophole. For example, one could not issues unlimited amounts of paper currency or coins. It only works with platinum coins (but that's far from saying it *should* be done): “The issuance of paper currency is subject to various accounting and quantity restrictions that platinum coinage is not”. Source:

https://en.wikipedia.org/wiki/Trillion-dollar_coin ; <http://archive.is/YnNy9>

⁹ Regarding the Phase 3 bill and its lending process: “The banks have been deputized to originate the loans—full guarantees, hold harmless and no put back risk, full fee payment will have them cranking out these loans as fast as possible. The App process is streamlined because the personal guarantees are gone. The rate limiting step is closure of bank locations. The application is a one pager with a dropbox link: <https://t.co/hbO262DFDv?amp=1> ” Source:

<https://twitter.com/jamesacoxiii/status/1243535801557962755> ; <http://archive.is/bxlmf>

¹⁰ Regarding nominal wage rigidity, George Selgin notes: “Finally, although it should go without saying, things have changed since 1921, including the extent of price and wage stickiness. Indeed, they'd already changed substantially by the end of the 1930s—an era that witnessed numerous initiatives aimed at discouraging or prohibiting downward changes to prices and wage rates. These initiatives began with Hoover's "high wages" campaign, by which he sought to convince businessmen to stick to paying high wage rates on the dubious grounds that doing so would allow workers to spend more. They continued with the various price- and wage-control programs of FDR's first New Deal, and also with the 1935 Wagner Act. Finally, they culminated, in 1938, in the nation's first minimum wage law. As those last two measures mentioned illustrate, some of those depression-era measures remain in place to this day; and as a vast empirical literature suggests, they together with a host of other factors—whether legislative, contractual, or psychological—continue to limit the extent of downward nominal price and (especially) wage adjustment that occur in response to spending downturns in modern economies. Murphy has himself written eloquently of the destructive effects of minimum wage increases; and he presumably understands that the same lawmakers responsible for such increases have never so much as considered reducing the minimum wage in response to an economic downturn”

Source: Alt-M blog post: “[Robert Murphy on Market Monetarism](#)” ; <http://archive.is/y67dJ>

¹¹ Here are some highlights from Scott Sumner and his recent Macro Musings podcast on 3/2/2020: “If you go back to 2006 to 2008, we had a long decline in housing construction, where housing construction fell in half over 27 months. And there was almost no effect on the unemployment rate. It just edged up a little bit, between early 2006 and early 2008. And then, it spilled over into DEMAND. What was originally just a problem in the housing industry, started to effect aggregate demand as a whole because the Fed didn't cut rates fast enough in 2008. And then the unemployment rate skyrocketed.” || (17:30) “Similarly, I believe the effect of the corona virus on aggregate demand this time around would be much greater than the supply side effects. So, we're taught that negative supply shocks are inflationary. But the markets are acting as if this shock will be deflationary. In other words, the markets believe the spillover effects on aggregate demand going down will be worse than the initial supply of the supply side. And then if the Fed doesn't respond properly; If they don't cut rates fast enough, then monetary policy gets unintentionally tighter. One side effect of tighter money is that the dollar appreciates in the foreign exchange markets. This also happened in the second half of 2008 during the financial crisis in the US. The dollar appreciated strongly. And for countries where their currency is linked to the dollar or borrowed a lot in dollars, this can be a very big burden. So, it can impart spillover effects in the global economy. And you'll notice if the Fed adopts an unexpectedly expansionary monetary policy, it not only helps the US stock market, but also helps many foreign markets because of these interrelationships between the dollar and the broader global economy” || (29:50) “The other thing we have to think about: Are we going to tell central banks to do whatever it takes to hit the target. So in a technical sense, central banks can always create any amount of inflation up to the hyperinflation you've seen in Zimbabwe or Venezuela. They never run out of the ability to print money. The problem central banks run into is essentially political. So there maybe political constraints on what central banks are allowed to do. That might be constraints on how many assets they can buy, that is how much QE they can do. But If you allow the central bank unlimited ability to create money, then they can definitely hit their target. Would we rather give central banks the tools and instructions to do whatever it takes to hit the inflation target. Or would we rather give that over to fiscal policy. And I think for a wide variety of reasons, monetary policy is more effective. More likely to be successful than fiscal policy. It's also way less costly, because monetary policy does not add to our national debt. It does not put a big tax burden on future generations. So for all sorts of reason, I favor monetary over fiscal stimulus, but I do understand the intellectual current is running in the other direction. I think people will be very disappointed if they

rely on fiscal policy to help us in the next recession. Just as it was ineffective in the 2009 recession” || (49:08) “Were in the longest expansion in American history and I think that’s not an accident. I think the Fed learned from some past mistakes and especially in 2019: under their old regime, they would not have cut interest rates 3 times because unemployment was falling below 4%. So their Phillips curve models were telling them ‘we’re going to overheat’. But the fed started looking at markets and started seeing that markets were actually warning them that policy was too tight. So, they cut rates 3 times and the trade war did not lead to a recession. Obviously, you and I have been pushing for more of a role in market forecasts in fed policy and less reliance on Phillips curve models. You can argue that the Fed is paying more attention to markets and that the reason we didn’t have the sort of normal recession we would have when a shock like the trade war hit...because they paid attention to markets and were very nimble in reversing course from their interest rate increases. So, I’m optimistic that they are learning things, although short term I’m pessimistic about the corona virus situation” || “cutting interest rates alone is not enough to solve the problem as we saw in previous recessions. It’s really more about the long run strategy: making up for previous short falls creates much more bullish expectations than you get from interest rate cuts alone...even though they probably should reduce interest rates to reflect the slowdown in the global economy and the greater uncertainty” || (53:17) “Go to congress and ask for a bill that would say that in an emergency, when rates fall to zero, they can buy a wider range of assets. That would also be helpful. It would reassure markets)” Source: <https://overcast.fm/+PVA-QAcNQ>

*in addition: “In my view, the Fed should aim for on-track nominal spending one, two and three years out, not in April and May of this year. If virus fears cause many businesses to shut down, and/or if retail spending is temporarily depressed (as seems likely to me), the Fed probably could not and should not try to prevent that, as long as expectations for 2021 NGDP remain on track. Here the Christmas analogy holds.” Again, we are probably a bit more pro fiscal policy than Sumner here, especially given the severity of the virus. Source:

<https://www.econlib.org/not-all-ngdp-fluctuations-are-bad/> ; <http://archive.is/zfdJG>

*Lars also makes some good points: “Hence, both the Fed and the ECB are primarily conducting monetary policy by trying to control the short-term money market rates. Effectively, what the Fed and the ECB is trying to ‘shadow’ the natural interest rate to keep monetary conditions neutral. The natural interest rate is not constant. It moves for all kind of reasons – for example risk appetite, demographics and structural growth trends. This also means that the natural interest rate should be expected to be moving in response to supply shocks. Hence, we should expect the real natural interest to move down when the economy is hit by a negative supply shock.” Source:

<https://marketmonetarist.com/2020/02/26/the-scary-risk-that-central-banks-will-turn-the-corona-shock-into-a-global-recession/> ; <http://archive.is/wGVnd>

¹² George Selgin notes: “Although it’s true the central banks can operate with no or even negative capital, as conventionally defined, that’s so only because they can always cover their losses by creating base money.” || “The Fed does have the option of making a call on member banks for any part of the 3 percent of their own capital that they are required to keep on reserve. Note, however, that even when it still had the power to do so, the Fed failed to set aside additional capital to cover itself from risks stemming from its large-scale purchases of long-term securities. Were the Fed not able to carry unrealized losses on its balance sheet for an extended period of time, such losses would already have exhausted its capital. In December 2018, for example, the Fed reported unrealized losses of \$66 billion—a value equal to 170 percent of its capital at the time—leaving it with marked-to-market net worth of minus \$27 billion (Pollock 2019). In the Fed’s case, operating losses do not lead at once to any corresponding reduction in the Fed’s capital surplus, but are instead capitalized as a “deferred asset”—a sort of Treasury IOU—that the Fed resolves by suspending remittances to the Treasury until it has made up its loss. The Fed’s capital can nevertheless be depleted if for any reason its retained earnings fall short of its operating expenses.” Source: Kindle locations 802 and 876 in “[The Menace of Fiscal QE](#)”

¹³ More of the thread is viewable here: <https://twitter.com/SplitRockMgmt/status/1182038879072870401> (both threads archived here: <http://archive.is/o4UFJ> ; <http://archive.is/F4dVb>)

¹⁴ Archived Source: <http://archive.is/KF4PW>

¹⁵ One such misconception is the idea of the [Cantillon Effect](#) which is largely irrelevant in the case of Q.E. as Sumner points out: “In all four cases the impact on the purchasing power of various groups in society is virtually identical. Bonds are purchased at market prices. It simply doesn’t matter how the money is injected, if we assume a pure monetary policy with no change in fiscal policy. Of course a “helicopter drop” is also a fiscal expansion, and hence would produce slightly different results. I don’t know if this is what the Austrians actually believe, but Richman seems to be assuming that OMOs are gifts of purchasing power from the Fed to the recipients. That is not

true, the newly injected cash is sold at market prices, in exchange for Treasury debt.” Source:

<https://www.themoneyillusion.com/it-makes-very-little-difference-how-new-money-is-injected/>

Or here: “To summarize, it makes my brain hurt to try to understand how anyone could think it matters who gets the Fed injections first, assuming the new money is sold at fair market prices. Needless to say I can’t rule out the theoretical possibility that G-S gets some sort of sweetheart deal and earns above fair market commissions on OMOs in Treasury bonds. If so then that’s a scandal that needs to be investigated. But it would hardly be the basis for a serious theory of the macroeconomic effects of monetary policy. It would be like claiming the Federal government doesn’t really control the monetary base because the North Koreans produce some \$100 bills as well. True, but nearly irrelevant.” Source: <https://www.themoneyillusion.com/it-really-really-really-doesnt-matter-who-gets-the-money-first-part-2/>

Stated another way, imagine the Fed publicly offered us new printed dollars for our iPhone. Lets, assume the Fed is paying market prices for used iPhones; the same amount that we could get from selling on eBay. Because there is marginally more dollars floating around and because the Fed made the purchase announcement public, all prices of all iPhones (including ours and the other phones on eBay) would go up some fraction of a penny (the same % amt as the newly added money as a percent of the total money supply). If the Fed publicly offered to buy 1 million iPhone, prices on both eBay and private iPhone would go up a bit more. But the important point is that both the iPhones the Fed bought as well as other iPhones sold between third parties on eBay, etc. would rise to the same price. It is not true that the Fed bought iPhones would be at a higher price than the other third party iPhones. The market is smart and all iPhone prices would rise. In the same way, bond sellers who sell their bonds to the Fed don’t get any better price than other third party sellers. That’s not to say that prices of bonds won’t change, but simply that the prices for all bonds will be the same, regardless of whether the seller sells to the Fed or sells to a private third party. There is no Cantillon Effect at play here.

¹⁶ See podcast: “[George Selgin Monetary Policy & Fiscal Policy During COVID](#)”

¹⁷ See George Selgin’s comments: <https://twitter.com/GeorgeSelgin/status/1240623496599920642> ; <http://archive.is/KEXU7>

¹⁸ “In January 2016, the Bank of Japan followed European central banks and lowered its interest rates below zero, after several years of keeping them at the lower end of the positive range.[13] The existing balances will keep on yielding a rate of 0.1 percent; the reserves that banks are required to keep at the BOJ will have a rate of zero percent, and a rate of minus 0.1 percent will be applied to any other (excess) reserves.” || “The European Central Bank and central banks of other European countries, such as Sweden, Switzerland, and Denmark, have paid negative interest on excess reserves—in effect taxing banks for exceeding their reserve requirements—as an expansionary monetary policy measure” Source: https://en.wikipedia.org/wiki/Negative_interest_on_excess_reserves

¹⁹ All calculations in this paragraph are through 7/16/2009.

²⁰ It’s not clear to us that higher NGDP growth would be better in the long term. Something around 3-5% NGDP growth seems to be ideal, but more important than the growth rate, is the **consistency of the growth rate.** 3% NGDP growth, that never varies from trend line, is likely ideal in our mind.

Of course, practically implementing higher NGDP targets can be politically difficult (as we showed in past letters where the U.S. has pressured to Japan against a much needed easing of the Yen”. In 2009, China had concerns about Fed easing and worried that China’s large Treasury holdings would be partially inflationed away: “He contends that “Chinese officials” were “miffed” last week when Fed chairman Ben Bernanke announced that it would buy up \$300 billion in longer-dated securities “which, China’s leaders fear, could trigger inflation, thereby further decreasing the value of China’s portfolio.” Source: <https://www.atlanticcouncil.org/blogs/new-atlanticist/china-we-need-new-world-currency/> ; <http://archive.is/UXZ0n>

²¹ “Even after the BOJ bowed to political pressure and cut rates in 1999, its unease with the situation had it rushing to raise rates again as soon as possible. Too soon in fact; just six months after raising rates in 2000, the BOJ had to ease again. (This flip-flop had a top political official publicly calling the BOJ governor of the time a “numbskull.”) Source: December 2008 WSJ article: “[Bank of Japan to Do the Unthinkable – Again](#)”

More recently, Japan continues to keep money tight: “The forward guidance sounds a bit more hawkish than the market expected,” said Hiromichi Shirakawa, chief Japan economist at Credit Suisse Group and a former BOJ official. “I see this as a message that the BOJ isn’t looking at further easing and policy normalization isn’t off the table.” Source: <https://www.bloomberg.com/news/articles/2019-04-25/boj-extends-forward-guidance-maintains-key-policy-settings> ;

*From 2009, Japan continues to do nothing while its currency appreciates: ” Investors lifted the yen to a two-month high against the dollar Friday after Japan's finance minister said he isn't planning to stop the yen's recent rise.” ||

“We have yet to figure out what is driving the yen higher,” Mr. Yosano said at a news conference. “We aren’t at all thinking about intervening in the foreign-exchange markets at this point. Analysts said Japan’s apparent reluctance to act in the currency market comes as no surprise. During January, Tokyo let the currency rise to 87.10 yen per dollar, a level last seen in July 1995, without a fight. But it is rare for Japanese officials to make remarks suggesting they have been caught off-guard, especially when the economy is in trouble, because that could give speculators an excuse to buy the yen, analysts said. ” || “ The Japanese currency rose to 93.91 yen against the dollar -- a level unseen since March 19 -- immediately after traders learned about Mr. Yosano’s remarks Friday morning” || “Japan hasn’t intervened in the currency markets since March 2004, when it ended a 15-month campaign in which Tokyo sold 35 trillion yen to prevent the yen from strengthening too much and snuffing out the country’s then-nascent recovery” Source: May 2009 WSJ article: “Intervention Comments Allow Yen to Surge Higher”

²² <http://archive.is/g3OfO>

²³ See Macro musing podcast: (38:30 to 45:00) [Evan Koenig on the Fed’s Review Period, Monetary Regimes, and Yield Curves](#)

²⁴ “Roche contends that economists put too much emphasis on the base. But he overlooks the fact that the base provides a nominal anchor, a numeraire, without which it’s impossible to model the price level or NGDP. And that would still be true even if the base were just 0.00001% of GDP, which it might be in a future all electronic money regime.” Source: <https://www.themoneyillusion.com/cash-is-getting-more-important-as-bank-deposits-become-less-important/> ; <http://archive.is/yfkxt>

²⁵ Source: <https://twitter.com/GeorgeSelgin/status/1161808762136645632> ; <http://archive.is/TEAxi>

²⁶ Equity would only include paid off portion of any real estate owned (“real property value”), etc. See header titled “What Does Equity Tell You?”: <https://www.investopedia.com/terms/e/equity.asp> ; <http://archive.ph/Qud9S>

Any funds raised via sale of common stock are referred to as Contributed Capital or Share Capital: <https://corporatefinanceinstitute.com/resources/knowledge/accounting/stockholders-equity-guide/> ; <http://archive.is/DZHWN>

²⁷ Source: https://www.investopedia.com/terms/1/3_6_3_rule.asp

²⁸ Source: <http://monetaryfreedom-billwoolsey.blogspot.com/2010/03/reserves-and-capital-confused.html> ; <http://archive.is/XYatZ>

²⁹ While not covered in Mr. Woolsey’s blog, we could even imagine a hypothetical bank with a 0% capital ratio and 10% (or even 100% reserve ratio). This would probably be a fully electronic bank with no costs (impossible, but again this is just a thought experiment)? It would process transactions and make loans. It would accept the same \$2 trillion in deposits and loan out \$1.9 trillion (for a 5% reserve ratio but still 0% capital ratio as we had no original equity). It could keep all the \$2 trillion, making no loans, which would result in a 100% reserve ratio (and still 0% capital ratio)

³⁰ *As the bank makes income off its interest differential (interest charged – interest paid) it makes income which will add to equity. Although usually we know that the capital adequacy ratio usually stays relatively constant (ratios stays constant when the bank either makes more loans, returns excess income to shareholders in form of dividends, etc.)

*For a more realistic look at commercial bank balance sheets with more details on assets and liabilities see: <https://corporatefinanceinstitute.com/resources/knowledge/accounting/financial-statements-for-banks/> ; <http://archive.is/idd8t#selection-647.0-647.18>

*A good basic video on this from the Khan Academy: “Bank balance sheets and fractional reserve banking” <https://www.youtube.com/watch?v=bZEAkO9OSco>

*George Selgin: “Between 1997 and 2005, for instance, U.S. depository institutions’ reserves ranged, with rare exceptions, between 11 and 14 percent of their demand deposits (see figure below). Put another way, for every dollar of base money “raw material” they acquired, U.S. commercial banks were able to “manufacture” (that is, to create and administer) just under 10 dollars of demand deposits. That figure, the inverse of the banking system reserve ratio, is what’s known as the reserve-deposit “multiplier.” || “What certainly has happened since the crisis is, not that the reserve-deposit and base-money multipliers have died, but that their determinants have changed enough to cause them to plummet. U.S. bank reserves, for example, have (as seen in the next picture) gone from being equal to a bit more than a tenth of demand deposits to being about twice the value of such deposits! The base-money (M2) multiplier, shown further below, has, at the same time, fallen to below half its pre-crisis level, from about 8 to 3.5 or so (not long ago it was less than 3).” <https://www.alt-m.org/2016/07/12/monetary-policy-primer-part-6-reserve-deposit-multiplier/>

³¹ See: https://en.wikipedia.org/wiki/Basel_III

³² “Basel I, that is, the 1988 Basel Accord, is primarily focused on credit risk and appropriate risk-weighting of assets. Assets of banks were classified and grouped in five categories according to credit risk, carrying risk weights of 0% (for example cash, bullion, home country debt like Treasuries), 20% (securitisations such as mortgage-backed securities (MBS) with the highest AAA rating), 50% (municipal revenue bonds, residential mortgages), 100% (for example, most corporate debt), and some assets given No rating. Banks with an international presence are required to hold capital equal to 8% of their risk-weighted assets (RWA).” || “A new set of rules known as Basel II was later developed with the intent to supersede the Basel I accords. However they were criticized by some for allowing banks to take on additional types of risk, which was considered part of the cause of the US subprime financial crisis that started in 2008” || “Basel III was developed in response to the financial crisis; it does not supersede either Basel I or II [clarification needed], but focuses on different issues primarily related to the risk of a bank run”. Source: https://en.wikipedia.org/wiki/Basel_I ; <http://archive.is/uPw3t>

³³ In order to keep this example easy, we are assigning a 0% weighting to all our equity, which may include buildings, equipment, etc. In reality, this may not be the case, but our false assumption here doesn't affect the high-level takeaways from our example.

³⁴ This follows a similar example here:

https://en.wikipedia.org/wiki/Capital_adequacy_ratio#Risk_weighting_example ; <http://archive.is/TDYE3>

³⁵ We note that FDIC cover any bank customers money in the event that a bank cannot pay its depositors but only up to a limit (currently at \$250,000, but was \$100,000 prior to 2010. We note case below, that if a customer has *more* than the FDIC insured limit in a bank, and the bank gets into trouble, that the depositor may take a haircut on the amounts above \$100,000/\$250,000. In this case the depositor received only about 70% of the amount above the FDIC insured limit at the time (\$100,000) Wall Street Journal articles from April and May 2009: [Eight Years After Bank's Seizure, a Depositor Waits](#) ; [The FDIC Has Limits on What It Can Do](#)

*Furthermore, the point in time fund size of the FDIC is usually quite small compared to total deposits. Of course this isn't necessarily bad because FDIC comes with implied help from other parts of government, should a crisis occur. As of September 2009, “The FDIC had just \$10.4 billion in its deposit-insurance fund at the end of June to protect more than \$6.2 trillion in U.S. deposits”. Source: September 2009 Wall Street Journal [“FDIC Considers Prepaid Bank Fees”](#)

³⁶ Source: https://en.wikipedia.org/wiki/Capital_requirement

³⁷ Perry Mehrling on the money view: (13:13) “These words: ‘Monetary liquidity, funding liquidity and market liquidity’, I want to align them with accounting structure. That when you are a deficit agent, and you need liquidity, you need to fill that spending gap: ‘monetary liquidity’ refers to filling that spending gap by using your reserves of money. Dishoarding. ‘Funding liquidity’, means filling that liquidity gap by using your credit line. By using your ability to borrow. And ‘market liquidity’ means filling that gap by using your available financial assets. Selling them or maybe using them as collateral for borrowing or something like that. Since World War 2, we’ve moved from a system that was largely focused on monetary liquidity, where people met their payments by using their money balances. And we developed our monetary theory around the idea that that’s the only way to do it. Then the system changed, and people started meeting their liquidity needs with ‘funding liquidity’. And then people start meeting their needs with ‘market liquidity’. And now all three are available. But the theory hasn’t caught up to this fact about the world. Standard economics talks about money supply meeting money demand and as if everything is about ‘monetary liquidity’ and it misses these other substitutes” || (27:50) “When I do the payment, which is another time, maybe much later, and there’s this mediation of MasterCard in the middle that basically gives each of us the cash flow that we need. It helps us match up our cash in flows with our cash outflows, by using credit. Allowing us to relax the daily settlement constraint. If we had to pay with everything in cash, and receive everything in cash, it would be much harder to organize this thing. That’s why we like credit cards. I can buy the food even though I don’t have any money. We can deal with the money part much later on when its more convenient for both of us (buyer and seller). The settlement constraint is still there. It is postponed, but its still there. And it costs more the more it is postponed. So that discipline is something I feel and create in my life. And if I don’t pay attention to it, it will catch up to me, and my balance will get bigger and bigger. And then they will cut off my credit. Settlement mechanics” || (36:50) “In the money view, emphasizing the settlement constraint, we are paying attention to the timing of cash payments. Its not about leverage, but instead about when the debt is due. I have a mortgage for my house, but it’s a 30 year mortgage. It may look like I’m incredible leveraged. That mortgage is multiples of my annual income, but I’m only required spend only a portion of my annual income paying this mortgage. I’m actually a hedge agent in the mortgage market. “ || (48:00) “The imbalance between cash inflow and cash outflows, *today*, impacts the overnight interest rate, *today*, and that ripples through the entire world and through the risk structure of

interest rates. This is the mechanism level of imbalance in the macro economy is signaled to everyone. Not just my imbalance but is the macro economy in general in balance. Are cash flows and cash commitments in balance. And if not, are these messages that we are sending that we need to correct something?" || (55:24) "This hierarchy is a pyramid. There's a little bit of the best money at the top, and a ton of credit down at the bottom. And its fluctuating over time. Getting wider at the bottom (that's a period of elasticity). And then in periods of crisis or recession, it shrinks back down again. These dealers who are standing between the layers of the hierarchy are under stress when there's a contraction. There's elasticity and there's contraction. They'll straddling between layers of this hierarchy. And when hierarchy gets steeper, they're straddling farther and farther, that's when you start seeing these intermediaries running into trouble. Banking crisis, etc. It becomes harder and harder for banks to maintain par. And maybe they need a bailout from the central bank or something like that. So this is an image I want you to have in your mind. I'm a central bank, and it becomes harder and harder to do this, and maybe I just stop. And if I stop, then the ability to sell something at the lower level of the pyramid for something at the higher level of the pyramid, stops. It's the dealers that make it possible for use to sell credit for money at a good price." || (1:20:55) "You realize that even when you have freely moving asset prices, the central bank *still* has leverage over the economy. It's very clear that it has leverage during a crisis...its making markets when no one else is making markets. A central bank has leverage even in normal times too. The central bank has leverage because it's own liabilities are the final means of settlement. That's why it can manipulated the overnight interest rate: because it can manipulate the survival constraint. It can also manipulate the availability of credit to dealers and so therefore the dealer's willingness to make markets and move asset prices remains. The central bank has leverage, even if there are no frictions. It's not supply meeting demand. Its supply meeting dealers and then dealers meeting demand. The dealers are standing in between. And by influencing the dealers balance sheet, you can influence the economy as a whole." || (1:24:40) "This is not a story about the money multiplier or banks making more loans and effecting the real economy. This is immediate and is every day. As the overnight rate is fluctuating, it gets transmitted into the whole pattern of rates". Source: Youtube video: "[Perry Mehrling w SGH. Wykład „Money view fundamentals”](#)"

*We find many of Perry's Ideas useful. It seems that Perry focuses much on money AND banking. Scott Sumner himself admits to be much more focused on money and not banking.

³⁸ "Solvency refers to an enterprise's capacity to meet its long-term financial commitments. Liquidity refers to an enterprise's ability to pay short-term obligations; the term also refers to a company's capability to sell assets quickly to raise cash. A solvent company is one that owns more than it owes; in other words, it has a positive net worth and a manageable debt load. On the other hand, a company with adequate liquidity may have enough cash available to pay its bills, but it may be heading for financial disaster down the road." Source:

<https://www.investopedia.com/articles/investing/100313/financial-analysis-solvency-vs-liquidity-ratios.asp> ; <http://archive.is/G4HLi>

³⁹ Of course banks, with such high leverage ratios can quickly get in trouble if there is even a slight error in how they model/value their assets. If use our bank, with say \$1.9 million in mortgages

⁴⁰ "Canada, the UK, New Zealand, Australia, Sweden and Hong Kong have no reserve requirements. This does not mean that banks can—even in theory—create money without limit. On the contrary, banks are constrained by capital requirements, which are arguably more important than reserve requirements even in countries that have reserve requirements. It also does not mean that a commercial bank's overnight reserves can become negative, in these countries." || "The Bank of England, which is the central bank for the entire United Kingdom, previously held to a voluntary reserve ratio system, with no minimum reserve requirement set. In theory this meant that commercial banks could retain zero reserves. The average cash reserve ratio across the entire United Kingdom banking system, though, was higher during that period, at about 0.15% as of 1999. From 1971 to 1980, the commercial banks all agreed to a reserve ratio of 1.5%. In 1981 this requirement was abolished" || "Canada abolished its reserve requirement in 1992" Source:

https://en.wikipedia.org/wiki/Reserve_requirement#Countries_and_districts_without_reserve_requirements ; <http://archive.is/sbMUC>

"Until January 2012, banks had to hold a minimum of 2% of certain liabilities, mainly customers' deposits, at their national central bank. Since then, this ratio has been lowered to 1%. The total reserve requirements for euro area banks stand at around 113 billion euro (beginning of 2016)." Source: https://www.ecb.europa.eu/explainers/tell-me/html/minimum_reserve_req.en.html (Official ECB website!) ; <http://archive.is/NVqSs>

⁴¹ That said, Federal Reserve Deposits can be converted in cash

⁴² Source: "George Selgin | American Institute for Economic Research" (published 8/2/2018) 1:00:03 to 1:04:03: https://www.youtube.com/watch?v=c6F_5772t70

⁴³ On average, a branch seems to have about \$20,000 in physical cash on hand. Given Bank of America and JP Morgan have about 5,000 branches in the U.S., that results in \$100 million in physical bills.

Also see some popular misunderstandings with terms like Federal Reserve Deposits vs. Bank Deposits, etc.:
https://en.wikipedia.org/wiki/Federal_Reserve_Deposits#Conflation_with_popular_economic_terms ;
<http://archive.is/nlQyO>

⁴⁴ Vítor Constâncio, Vice-President of the European Central Bank (ECB), in a speech given in December 2011, argued, “In reality, the sequence works more in the opposite direction with banks taking first their credit decisions and then looking for the necessary funding and reserves of central bank money.” Source:

<https://www.investopedia.com/articles/investing/022416/why-banks-dont-need-your-money-make-loans.asp> ;
<http://archive.is/Eechi>

⁴⁵ Matt Waters on loans and deposits happening at the same time: “It's tough to wrap one's mind around banks *as a whole* having loans and deposits go up together. But it's like if a new college graduate enters the workforce. Both total income and spending go up. But the college graduate is not spending money only on their services. They spend money on new consumption and investment. Everybody else, in aggregate, spends an equal amount on the new grad's labor.” Source: <https://twitter.com/mattwwaters/status/1217256453406384128> ; <http://archive.is/ILGnn>

⁴⁶ In reality, retained earnings are a great way to gradual increase equity. Again, our example saw extreme changes in all these ratios simply to make a point. In the real world these changes are much smaller and take place in smaller increments over long periods of time, making retained earnings a likely better option than new share issuance. Other options to raise capital include selling property, selling non core businesses, increased paid in capital, retained earnings, new share issuance, debt-to-equity swaps, etc.

*Also see chart on May 2009 WSJ article: “[Banks' Capital Push in Home Stretch](#)”

** PNC said it currently doesn't plan to convert preferred shares issued under the Treasury Department's Capital Purchase Program into common stock, a move that would increase common-equity ratios” Source: May 2009 WSJ article: “[PNC Raises \\$600 Million After Stress Test](#)”

***Bank of America Corp. BAC has raised \$13.5 billion through common-stock sales, with more than half of the total coming on Tuesday, as it taps rising investor appetite for financial stocks. The total issuance of 1.25 billion shares by BofA is part of a previously announced plan to create a \$33.9 billion buffer to meet the U.S. government's stress-test requirements and fortify the bank against future losses as its loans and other assets are hit by the recession. Combined with the bank's recent \$7.3 billion sale of a stake in China Construction Bank, BofA has generated an infusion of \$20.77 billion, putting it more than halfway to the U.S.-set goal and easing concerns that BofA would have to take more government capital or be nationalized. The Charlotte, N.C., bank sold a block of 825 million shares for \$10 apiece on Tuesday” Source: “[Bank of America Sells \\$13.5 Billion of Stock](#)”

***Debt capital is also referred to as debt financing. Funding by means of debt capital happens when a company borrows money and agrees to pay it back to the lender at a later date” || “Equity capital (as opposed to debt capital) is generated not by borrowing, but by selling shares of company stock. If taking on more debt is not financially viable, a company can raise capital by selling additional shares. These can be either common shares or preferred shares. The primary benefit of raising equity capital is that, unlike debt capital, the company is not required to repay shareholder investment. The disadvantage to equity capital is that each shareholder owns a small piece of the company, so ownership becomes diluted ” Sources: <https://www.investopedia.com/ask/answers/032515/what-are-different-ways-corporations-can-raise-capital.asp> ; <http://archive.is/q3jdl> ; <https://smallbusiness.chron.com/increase-shareholder-equity-67375.html> ; <http://archive.is/DHI9F>

“Citi has accepted more than \$50 billion in TARP aid. As a result of the recent "stress tests," bank regulators this month told Citi to raise an additional \$5.5 billion in common equity. The bank has said it will cover the shortfall by expanding its previously planned conversion of preferred shares into common stock. Citi also has been selling noncore businesses.” Source: WSJ article “[Citi Bond Sale Shows Strength](#)”

⁴⁷ George Selgin also makes these other points against paying IOR/the Fed's ‘Floor’ system:

***“So remember that this all gets started because the Fed incidentally creating new reserves (in 2008) and it doesn't want that to loosen monetary policy unintentionally. That because they were still worrying about oil price driven inflation. By late November 2008, that is a month and half or so after instituting this new policy (IOER), the economy is looking really bad. And they're (the Fed) all saying, ‘you know, maybe we need a little stimulus after all’. So they decide that now they're going to expand the Fed's balance sheet and create reserves on purpose. And that is what quantitative easing will be: an intentional expansion of the balance sheet designed to increase bank reserves and provide for loosening of policy. Well, they didn't put it that way, of course, because they couldn't loosen policy under the floor system just by expanding the balance sheet. But they come up with new theories of

how this increase in balances would, somehow, matter. So the problem of course is, as you've all realized I think, is that they still have a setup in place that is designed to sequester any new reserves created so that they don't get used by banks to expand lending and ultimately expand deposits in the system. So they have the same mechanism in place that was once meant to prevent emergency expansion from stimulating the economy. And they're going to keep it in place now that they want intentional expansion to stimulate the economy. You know if insanity is doing the same thing and expecting a different result, then one has to wonder whether Fed officials at this time were in their right minds. And what happens is that now, despite really dramatic growth in the quantity of reserves, excess reserves just pile up (almost) in lockstep with the growth in the balance sheet. That is, the reserves get to the banks and stay there...nothing else happens with them (reserves)."

*"Another consequence is, remember that separation of the size of the Fed's balance sheet from the monetary policy stance. In the old days (pre-floor system), the Fed has pressure put on it by the Treasury to not monetize this or monetize that. Or similar pressure from other interest groups (such as "buy our bonds" or "lend to us"). The Fed could always say: 'Look, we can't support these fiscal programs because we'll expand our balance sheet and miss our inflation target'. The balance sheet is no longer a determinant of the inflation rate. Think about what that means from a public choice or political economy point of view. It becomes a loose parameter football, to be tossed around by special interests. What is the determinant of the size of the Fed's balance sheet? Under this policy (floor system/IOER), who decides what that should be? What are the crucial indicators? If you can't think of the answer, you can bet the special interest groups are saying 'we're going to be the indicators. Or the Treasury is going to say 'we'll indicate it'. So this has very bad consequences. It turns the floor system into what I call a 'secret fiscal weapon' that we could do without." Source: "George Selgin | American Institute for Economic Research" (published 8/2/2018) 53:20 to 54:44: https://www.youtube.com/watch?v=c6F_5772t70

*"When banks make loans, they really are lending away reserves. It's not that the borrowers want reserves, as they do on the Fed Funds Market. The borrower really wants a house. The borrower wants a car. The borrower wants a car or machine. But, when I make the loan, the long run result of that transaction is that the deposit is credited to the borrowers account. They go back down, perhaps to zero. And reserves, on the other side of my balance sheet go down by the amount of the loan. And I end up in equilibrium without the reserves. And this is really important, because I'd argued earlier that, normally when banks have more reserves collectively than they need, they will build up total deposits to the point where they have no excess reserves. But to do that, the reason that happens is because every bank is disposing of its reserves through this process of lending as I just described. Other banks that then find themselves with excess reserves (you're talking about a fresh increment of reserves into a system that already had what it wanted), they'll pass the reserves on like a hot potato by lending them. This process will go on until total deposits in the system do increase by a multiple of the new injection of reserves. Somebody ends up holding the hot potato.....What makes me (as a bank) want to make the loan is that the excess reserves are a hot potato that is costing me in potential interest. So I want to pass the hot potato on. I do so by making a loan, to you or anyone else. If we are conscious of the long run consequences of this, then that is going to get rid of these pesky reserves from my balance sheet. Its going to give me a loan that earns nice interest instead of those 0% interest earning reserves. So the long run operation is getting rid of unwanted excess reserves that earn no interest and replacing them with loans that does earn interest. This sense of the non interest paying reserves, not being an ultimately desired asset by the bank that makes us call them a hot potato. Its not that banks don't like deposits, but they don't really like excess reserves when they earn no interest.....This is, in a sense, how private commercial banks are true intermediaries. They don't create money out of thin air, in a way that a central bank can do it. Commercial banks have to have resources to lend....A central bank creates reserves. It can create all it wants (of reserves). It doesn't run out (of reserves). Its creating the ultimate reserve medium itself. No commercial bank is in a position to create settlement media that pay other banks what it owes them. That's a crucial difference (between central banks and commercial banks)" Source: "George Selgin | American Institute for Economic Research" (published 8/2/2018) 1:00:03 to 1:04:03: https://www.youtube.com/watch?v=c6F_5772t70

*"(the floor system/IOER) is a very cozy deal for the banks that find holding reserves attractive. Which is really a subset of banks...these huge New York banks and those foreign banks. For other banks, it's not giving them any great favors. In fact, on the whole, what this set of programs has done is to compress the yield curve, and it's now in danger of inverting it, and most banks have real trouble earning money when long term rates are below short-term rates. So its actual murder on most banks. But obviously some banks (the large banks) are finding it just easy money to sit on those reserves. But I think if we think of the banking system as a whole, it's very bad." Source: "George Selgin | American Institute for Economic Research" (published 8/2/2018) 1:09:53 to 1:10:49: https://www.youtube.com/watch?v=c6F_5772t70

*“Among other things, I explain in my book, as I’ve also done to some extent here at Alt-M, that that decision contributed to the U.S. economy’s deep downturn in late 2008, that it undermined banks’ incentives to monitor each other’s safety, and that it has made it more tempting for politicians to treat the Fed as a giant piggy-bank to draw upon for their pet trillion-dollar projects.” Source: <https://www.alt-m.org/2019/05/16/the-feds-shifting-goalposts/> ;

⁴⁸ George Selgin compares the payment of IOER to a car that is flooring the gas pedal but in neutral at the same time. The car goes no where despite “flooring it”. Similarly, you can inject as much reserves as you want, but you won’t any stimulus if you continually pay higher and higher interest rates on excess reserves. George Selgin:

“The fans of this system (the floor system – which pays Interest on Excess Reserves (IOER)) say: ‘look we have a wonderful setup where now we can make banks as *liquid* as we want, and it doesn’t interfere with our monetary policy stance (which is solely a function of where we put the interest rate on excess reserves). We have two controls that, in the past, were linked (so you couldn’t manipulate them independently). Now we can divorce the *stance* of monetary policy (now set by the IOER) from the *liquidity* policy (which is a function of the size our balance sheet’. That’s the argument (from Fed officials).

Now I (George Selgin) am going to make an analogy: Suppose I have an automobile, and I have the following complaint. There are two controls in the automobile:

- 1) a steering wheel (which determines the direction) and
- 2) a gas pedal (which determines the speed)

And the problem is that certain combinations of hitting the gas and turning the steering wheel just aren’t practical possible with the usual transmission mechanism that is in place. But we can fix that. How can we fix it? The answer is: put it in neutral. You put the car in neutral, and now you can independently set the steering in any direction you want. You can turn the wheels as hard as you want: right or left. You can step on the gas as hard as you want. But there is a problem with this new wonderful system with two completely independent control variables. The problem is: You don’t go anywhere! We are going to see how monetary policy now (after IOER), no longer goes anywhere.”

Source: Source: “George Selgin | American Institute for Economic Research” (published 8/2/2018) 29:54 to 31:55: https://www.youtube.com/watch?v=c6F_5772t70

⁴⁹ Source: “George Selgin | American Institute for Economic Research” (published 8/2/2018) 35:40 to 39:03: https://www.youtube.com/watch?v=c6F_5772t70

⁵⁰ See relevant thread: <https://twitter.com/GeorgeSelgin/status/1229172985673781248> ; <http://archive.is/cmX4L>

⁵¹ We should also note that the Fed largely decides whether to conduct open market operations based on the Fed Funds Rate which is a rate that banks lend to themselves. If the rate is too high, the Fed will step in and sell treasuries (removing reserves)

⁵² That said, before even reducing IOER, we favor George Selgin’s approach: “I actually don’t favor lowering the IOER rate as a first step toward genuine policy normalization. Instead, I would have the Fed reduce its balance sheet first, and more aggressively, until it is as low as it can be whilst still consistent with an inactive fed funds market. At that point only would I have the Fed marginally lower the IOER rate, while further reducing its balance sheet enough to maintain an unchanged overall policy stance.” Source: <https://www.alt-m.org/2018/04/30/anniversary-of-a-fed-blunder/#comment-3879731919> ; <http://archive.is/mwCAr>

⁵³ “Banks can determine the amount of excess reserves they want to hold, even in aggregate. Believe me, if the interest rate on excess reserves fell from 0.25% to negative 4%, all those ERs would quickly spill out into RRs and cash. We don’t see that because the Fed doesn’t want that to occur. Indeed that’s exactly why they started paying interest on reserves—there were afraid of high inflation.” Source: <https://www.themoneyillusion.com/back-to-aggregate-demand-which-has-been-the-1-problem-all-along/#comment-35230> ; <http://archive.is/XILdX>

“One common argument is that swapping cash for zero interest T-bills is useless, because they are perfect substitutes. I don’t view them as perfect substitutes at all. When I get in the car to go shopping at Walmart I don’t think “Hmmm, should I take cash or T-bills.” At this point people will say “Yes, but zero interest bank reserves and T-bills are near perfect substitutes. And all the recent base injections are going into excess reserves.” Yes, but there is no zero lower bound on interest paid on reserves (and yes I’m including vault cash in “reserves.”) | “I agree that policy expectations are a key, but find it more useful to think in terms of changes in the expected path of the supply and demand for base money. Simply put, I believe that current and expected future increases in base supply relative demand cause expected future NGDP to increase. This is because even if we are at the zero bound, and cash and T-bills are perfect substitutes, we are not expected to be there forever.” Source:

<https://www.themoneyillusion.com/why-i-dont-believe-in-liquidity-traps/> ; <http://archive.is/c0ViL>

“Regarding T-bills, it is not enough for their price to be fairly stable to be counted as a medium of account, it must be absolutely fixed, and yet a free market price. Lots of products have fairly stable prices. If T-bills did actually have a constant price, then they could be considered a sort of currency. But for that to occur the quantity of each denomination would have to be demand determined, just like any other form of currency. Because T-bill yields are generally different from zero, I think it is better to treat them as money substitutes, which can have important effects on money demand when rates are close to zero (or when the Fed pays IOR.) I’m not sure anything of importance hangs on this question. Both our views would allow for a large increase in T-bills to be inflationary. In your view it increases the money supply, in mine it decreases the demand for base money. It just seems cleaner to me to define the medium of account as that asset whose price is always one by convention. OGT, Thanks. But I’d add that there are times where M0 tracks economic performance better than M2 or M3. The first year of the Great Depression was one such time, I seem to recall that late 2007 and early 2008 was another.” || “When people say T-bills are close substitutes for cash at low rates, my response is “fine, let T-bills be one factor that influences the demand for M0.” T-bills are not media of account, as their price is not equal to one. The fact that on rare occasions the price may be close to one doesn’t help, the same is true for items sold in “Dollar” stores. Suppose the price of Hershey candy bars had been \$1 for the past two years’ would you argue they had become a medium of account? Money is not money because it facilitates transactions. Money is money because it is the medium of account.” Source:

<https://www.themoneyillusion.com/andy-harless-on-monetary-policy/#comment-47672> ; <http://archive.is/f1G5m>

⁵⁴ For more, see Matt Waters points here: <https://twitter.com/SplitRockMgmt/status/1217182323235610625>

⁵⁵ While the Fed can’t directly force the general public to lend, it can influence it to a *major* degree. Many credit worthy private citizens will not take out a loan charging 6% interest if NGDP growth is 4%. However, if the Fed targets 15% NGDP growth, then those same credit worthy private citizens will take out that same 6% loan. The Fed influenced the private citizens desire to take out a loan. See more:

<https://twitter.com/SplitRockMgmt/status/1217187948141207558> ; <http://archive.is/9SSFp>

<https://twitter.com/SplitRockMgmt/status/1217192560810250240> ; <http://archive.is/7uPzF>

*Also see Matt Waters: “The deposit side also changes. While banks do not lend out new reserves, new deposits (only when there are non-bank sellers) do, IMO, get spent. While it’s correct that banks do not “lend out reserves,” if there is higher velocity of deposits, then that additional spending (from deposits) creates better income records for credit-worthiness (for banks, when creating new loans/money)” Source:

<https://twitter.com/mattwaters/status/1229162804982272001> ; <http://archive.is/JrpmB>

⁵⁶ For more evidence against the pushing on a string theory, see this great post by Scott Sumner: “This is because even if we are at the zero bound, and cash and T-bills are perfect substitutes, we are not expected to be there forever.” || “I don’t view them as perfect substitutes at all. When I get in the car to go shopping at Walmart I don’t think “Hmmm, should I take cash or T-bills.” || “I can’t take anyone serious who actually believes in a complete liquidity trap—i.e. that no amount of monetary base injections would be inflationary. Taken literally, that would imply the Fed could buy up all of Planet Earth without creating any inflation. Among serious economists the debate is over magnitudes.” <https://www.themoneyillusion.com/why-i-dont-believe-in-liquidity-traps/> ;

<http://archive.is/c0ViL>

⁵⁷ If expectations are managed correctly, then only a small amount of reserves are required. Afterall, during high inflation of the 1980s, the Fed’s balance sheet was only 5% of GDP. During the low inflation of present, the Fed’s balance sheet is around 25% of GDP. Its counterintuitive but shows how important Fed expectations are. The Fed must credibly promise to act irresponsibly in order for it to act responsibly. Some have claimed that, despite the Fed only owning about

⁵⁸ Again, this applies in the long term. Short term changes in the amount of reserves are less important than the long run path of reserves. IOER, bank regulations, etc. can also change the quantity effect of reserves in the short term

⁵⁹ Source: “George Selgin | American Institute for Economic Research” 1:00:03 to 1:04:03:

https://www.youtube.com/watch?v=c6F_5772t70

⁶⁰ As Warren Buffett said, if he was Fed chair, he may have done some things as Fed chair, despite legal concerns or questions on the legality of such actions. In a CNBC interview about the 2008 financial crisis, he posed the question in regards to such legal concerns: “I mean are they going to come down... Is the Supreme Court going to send down some guy to arrest me as president of the Federal Reserve? I mean I would feel it’s an act I should do in the interest of the country” Source: “Warren Buffett on the 2008 Financial Crisis”

https://www.youtube.com/watch?time_continue=417&v=MQcPC31KRqA&feature=emb_logo

“There may be some cases where central banks are limited by laws regulating the sorts of assets they are allowed to purchase, but I know of no real world cases where that was a determining factor. Indeed I know of no case where a

central bank that wished to boost inflation and/or NGDP was unable to do so. Nor do I think we need ever worry about that scenario actually occurring.” Source: <https://www.themoneyillusion.com/why-i-dont-believe-in-liquidity-traps/> ; <http://archive.is/c0ViL>

⁶¹ Further evidence of the BOJ tightening policy from back in March 2009: “Mr. Shirakawa suggested after the meeting that (the bond buying) program is unlikely to be expanded further”

*The ECB also tightened during this time: “Mr. Trichet suggested that comparing policy rates is misguided. ‘It is not a race’ he said” Source: <https://twitter.com/SplitRockMgmt/status/1207730245236858882> ; <http://archive.is/7b6vj>

*From the September 2009 Wall Street Journal showing that Japan was not completely clear, sometimes implying that the yen could *strengthen*: “I That image, fostered by Mr. Fujii himself by his insistence that governments ought not to drive down their currencies to support their export industries, has emboldened yen buyers. They pushed the dollar to an eight-month low of 88.23 yen on Monday, threatening to worsen Japan's economic slump by making its exports more expensive abroad.’ There is a possibility that we would take proper steps to protect our national interests if there are abnormal movements [in the yen's rates],’ Mr. Fujii said at a news conference. Reiterating comments he made Monday, Mr. Fujii emphasized he has “never said” he endorses a strong yen, drawing a distinction between such a stance and his view that competitive currency devaluations ‘could ruin the world.’” Source: September 2009 Wall Street Journal “[Japan's Finance Minister Hardens Talk Against Yen Strength](#)”

⁶² While the discount window has not been used much of late, it certainly is used in times of crisis. From June 2009 Wall Street Journal: “[A total of 566 depository institutions borrowed from the Fed's discount window in the four weeks ended May 27, with the majority of borrowing done by large banks with assets of more than \\$50 billion. Borrowers pledged \\$965 billion in collateral as of May 27 against \\$448 billion in loans.](#)” Source: “[Fed Makes \\$2.7 Billion, Offers Details on Loans](#)”

⁶³ The components of the monetary base (“MB”) are “1) currency held by the nonbank public and in circulation throughout the economy, 2) vault cash held by commercial banks and currency out of circulation, and 3) Federal Reserve deposits that commercial banks keep with Federal Reserve Banks.” || “Note that vault cash is not part of the official M1 money supply because it is held by banks (not the nonbank public) and thus it is not in circulation.” We also note that, as of 12/31/2018, the by denomination breakdown of “currency held by the nonbank public” is approximately: \$1.3435 trillion in \$100 bills, \$89.2 billion in \$50 bills, \$188.5 Billion in \$20 bills, \$20.5 billion in \$10 bills, \$15.3 billion in \$5 bills, \$2.5 billion in \$2 bills, and \$12.4 billion in \$1 bills for a total of approximately \$1.672 trillion in physical currency in circulation. Vault cash is approximately \$80 billion. Federal Reserve Deposits totaled approximately \$1.607 trillion. Adding these three components together gives us an approximate monetary base of \$3.4 trillion. Sources: <https://fred.stlouisfed.org/series/TLVAULT> ; https://www.federalreserve.gov/paymentsystems/coin_currircvalue.htm ; https://www.amosweb.com/cgi-bin/awb_nav.pl?s=wpd&c=dsp&k=monetary+base ; https://www.federalreserve.gov/monetarypolicy/bst_recenttrends.htm ; <https://fred.stlouisfed.org/series/BOGMBASE> ; <http://archive.is/HX09A> ; <http://archive.is/IsFMj> ; <http://archive.is/L8Fcm> ; <http://archive.is/zjZZG>

*In addition to breakind down the monetary base under the gold standard in the following article, Sumner argues for removing banks monopoly on access to Federal Reserve Deposits and go to a pure “cash and coin” monetary base: “I understand that many free market economists are skeptical of allowing central banks to offer deposits to the public. So am I. Indeed I’m probably about the only person in the world who has advocated totally abolishing accounts at the Fed, even for banks, and going back to the cash and coin monetary base of 1912. That system seemed to work fine (at least in Canada, where they didn’t have an insane set of banking regulations.)” || “I think it’s misleading to suggest these accounts are sort of like a bank account at Bank of America. If I have \$10,000 in bills in a shoebox under my bed, is that sort of like an account at BOA? Clearly not. A commercial bank account is a loan of money from me to a commercial bank. A box of cash under my bed is not really a loan of money to the government in the conventional sense of the term” hat-|| “Where is the risk in the public having deposits at the central bank? I don’t get regulated for having a shoebox of cash under my bed, why would moving that money into an account at the Fed cause the government to begin regulating me like a bank? Again, I’m not saying that offering Fed accounts to the public is a good idea. Rather I’m waiting for free market economists to give me a plausible explanation as to why these deposits are not a good idea for the public, but are a good idea for commercial banks. What makes banks so special that they deserve this subsidy?” Source: https://www.themoneyillusion.com/should-the-feds-public-option-be-only-for-banks/?utm_source=dlvr.it&utm_medium=twitter ; <http://archive.is/keKA9>

*We argue that under a gold standard, there remains the possibility that all parties could demand physical gold at once. If there any any sort of money (M2) etc built on top of gold (anything less than 100% reserve banking) then the system can run into problems. However, under the system of today, it remains possible that all M2 money could be converted into physical cash

⁶⁴ To illustrate the importance of looking at the long run path of MB and not temporary, point in time changes or figures, we list a few extreme examples. Sumner mentions in the below links how you could have a long run path of MB reaching a very tiny 0.00001% of GDP: “In fact, both cash held by the public and bank reserves are a larger share of GDP than in 1929. For reserves, that’s partly because of the crisis. But currency as a share of GDP was higher in 2007 than 1929, so it’s not just about liquidity traps. As the role of cash has increased, bank deposits have become steadily less important with both DDs and TDs shrinking as a share of GDP.” || “But he overlooks the fact that the base provides a nominal anchor, a numeraire, without which it’s impossible to model the price level or NGDP. And that would still be true even if the base were just 0.00001% of GDP, which it might be in a future all electronic money regime.” || “Even with zero reserves, cash would be important. So the monetary base would still be large. Right now we need more reserves because regulatory changes have led to an increased demand for reserves. But yes, the absolute amount of reserves are not the question, it’s equating supply and demand at the target level of NGDP. If they can do so, then even a tiny amount of reserves is adequate” Source: <https://www.themoneyillusion.com/cash-is-getting-more-important-as-bank-deposits-become-less-important/> ; <https://www.themoneyillusion.com/what-drives-the-unemployment-rate/#comment-5192190> ; <http://archive.is/yfkxt> ; <http://archive.is/8PFLB>

In addition, Matthias Görgens has some good thoughts in the comment section of the links above.

⁶⁵ This is a post which we largely agree with, which dives more into this concept of the monetary base being the ultimate constraint: https://old.reddit.com/r/badeconomics/comments/f2275i/central_bankers_are_not_mmters/ ; <http://archive.is/7HJc3>

⁶⁶ Regarding insolvency vs liquidity, it is certainly possible for an institution to become insolvent at least temporarily (ie negative equity). Many of these asset pricing models are necessarily inexact. In theory, an entity could have negative equity at a point in time, however if it was still making money, then retained earnings etc might be enough to eventually push equity back to a positive level. That said, the amount of time a company spends with negative equity, the terms it can get on loans, etc. during such times, etc. clearly is very important and at the very least, substantially increases the risk of bankruptcy

⁶⁷ Perry Mehrling gives a good example: “I’m showing you here an example of a purchase of a house. There are three stages: 1) I am going to purchase the house, and I’m going to my bank and taking out a loan (a mortgage loan) from that bank. And I’m showing here the alchemy of banking. The bank says “I owe you \$1 million for a 1-bedroom apartment. This is New York after all.” So that is the deposit account of the bank, the loan is an asset for the bank and a liability for me. The alchemy of finance is what gets this whole thing started. 2) Now I make a payment, by transferring my deposit account to you...you own this house. You sell this house. You lose the house as an asset but gain on the asset side a deposit account. And that deposit account is a liability of your bank, which is not the same as my bank. So, there’s a transfer of that deposit from my bank to your bank. How does that happen? One way it could happen is by a transfer of reserves, but in order to make the example interesting, I’m saying, in this example, that the bank doesn’t have enough reserves. This is a very big mortgage! And so, the bank borrows the reserves from your bank. The federal funds market is a wholesale money market, in which my bank can borrow Fed Funds from your bank, and that’s how this payment gets made. Not by a transfer of money (reserves). This is all credit all the way down. There is an expansion of balance sheets of my bank, that at the end of the day, that expansion is still there. There’s an expansion of the balance sheet of your bank as well. There are interbank balances, where my bank is borrowing from your bank, in order to make the payment. So, there are two payments here. One is a *retail* payment: I make a payment to you, and you transfer the house to me. And then behind the scenes (which you and I never see in our live, but if we were bankers we would): my bank has to pay you. How does that happen? That happens by my bank borrowing from your bank, in order so that, if later on it gets reserves, it can pay this back. It’s credit all the way down. I’m not showing any transfer of reserves yet.” || “This is the first stage. It shows elasticity and showing that the way in the expansion of bank balance sheets makes it possible for me to buy a house, even though I don’t have any money. The money to buy the house, is being created at the moment of the transaction. And how is funding this transaction? Who am I borrowing from? I’m borrowing from my bank, but they’re borrowing too. At the end of the day, they are borrowing from your bank. And who is your bank borrowing from? They’re borrowing from you. So, the person who sold the house, is the person lending me the money to buy the house. Isn’t that mind blowing? This is the alchemy of banking in practice”

*Later in the lecture he shows how the above quote addresses “elasticity”. But the “discipline” feature concerns it self with the fact that the seller of the house is unlikely to keep all \$1 million in deposits at his/her bank. Instead they use it somewhere else in the economy.

*we’d also note that the “credit all the way down” quote above from Mr. Mehrling feature doesn’t mean there is no nominal anchor to the economy. Its credit all the way down when looking at this transaction at this one point in time, but the ultimate, long-term nominal anchor to the economy is still ultimately the monetary base

Source: 56:25 to 1:01:42 [“Perry Mehrling w SGH. Wykład Why is money difficult”](#)

⁶⁸ “In our world, the Treasury repo market plays a special role as the main interface between the money market and the Fed. (I speak here of the way things worked before the crisis.) The Fed enters that market typically as a lender, offering short-term loans of high-powered money (deposits at the Fed) in return for Treasury bill collateral. On a daily basis, the Fed might “tighten money” by allowing outstanding repo loans to mature without replacement, or it might “loosen money” by offering new and larger loans. The immediate counterparties to these loans are the “primary dealers,” so called for their commitment to bid for Treasury securities whenever the Treasury wishes to borrow.” Source: p. 24 in [“The New Lombard Street: How the Fed Became the Dealer of Last Resort”](#) by Perry Mehrling.

*“By contrast to Bagehot’s time, under modern conditions the Fed’s discount window has fallen into disuse. When individual banks need money to meet their commitments at the daily clearing, they usually raise it from other banks in the wholesale money market. And when the banking system as a whole needs money, that money is usually raised by selling security holdings into liquid markets. Both channels are backstopped ultimately by the Fed’s commitment to stabilize the federal funds rate around a chosen target, and by its intervention to make good on that commitment by lending in the Treasury repo market. Put starkly, under modern conditions the Fed is always lending freely, but only to primary security dealers, only against Treasury security collateral, and only at the Treasury repo rate that corresponds to the target federal funds rate.” || “In the crisis, this system broke down. As asset valuations came into question, haircuts for secured borrowing rose sharply, even for Treasuries but especially for non-Treasury securities, and the result was forced deleveraging and disordered markets.⁷ The problem was that, in private credit markets, collateral is marked to market, not to fundamental value“ Source: p. 26 in [“The New Lombard Street: How the Fed Became the Dealer of Last Resort”](#) by Perry Mehrling.

** What was not Bagehot (during 2008 crisis) was the *level* of interest rates, which fell almost to zero. This was possible only because the Fed, unlike the nineteenth-century Bank of England, faces no reserve constraint in terms of gold. The whole world treats dollar deposits at the Fed not only as good as dollar currency, but also as the ultimate world reserve in a time of crisis. That means that the Fed, unlike the Bank of England, can create both more domestic dollars to meet an internal drain and more international dollars to meet an external drain. The Fed has no need to safeguard its holding of world reserves by keeping the federal funds rate high, since world reserves are its own liability.” Source: p. 29 in [“The New Lombard Street: How the Fed Became the Dealer of Last Resort”](#) by Perry Mehrling.

**These three money market instruments—federal funds, Eurodollars, and repo—are all close substitutes in the sense that they can be used to do much the same thing, but not everyone has equal access to them, so their interest rates can and do vary. Typically, the repo rate is less than the federal funds rate, and the federal funds rate is less than the Eurodollar rate, but the spreads are very small, just a few basis points.” || “If you don’t have acceptable collateral for repo borrowing and you don’t have access to the federal funds market, then you have no choice but to bid up the LIBOR rate until someone is willing to lend to you. That is what happened repeatedly as the crisis unfolded” Source: p. 96 in [“The New Lombard Street: How the Fed Became the Dealer of Last Resort”](#) by Perry Mehrling.

*Of course many folks (including us) agree that the Fed can put a floor on any given panic. Much less appreciated is the ceiling the Fed creates as well. Private banks can create money to an extent, but of course, these private banks are ultimately checked by the *ceiling* the fed establishes when it signals future monetary policy etc (tightening if growth rises above it which limits private bank money creation, etc.). Fed is still ultimately in charge and establishes a floor as well as a ceiling to nominal growth rates.

** Most significant, in an explicit effort to restart the securitization apparatus, in March 2009 the Fed opened the Term Asset-Backed Securities Loan Facility (TALF) to support the AAA tranches of new securitized lending.¹⁵ The idea was to start with consumer loans (such as credit card receivables and auto loans) and then to move on to mortgage-backed securities,” || “Because the Fed’s charter gives it lending authority, not insurance authority, the facility was structured as a loan. In fact, however, by lending ninety cents on the dollar on a nonrecourse basis at a rate of 100 basis points over LIBOR, the Fed was doing essentially what Lehman and AIG used to do, but with less

leverage and charging a higher price. Thus did the Fed expand its dealer of last resort intervention from the money market to the capital market” Source: p. 133 in [“The New Lombard Street: How the Fed Became the Dealer of Last Resort”](#) by Perry Mehrling.

*Regarding IOER, George Selgin also notes the regulatory changes needed to insure banks are not hoarding reserves: “A smoothly functioning corridor system also requires that excess reserves, instead of being locked up in a handful of large banks, flow freely to wherever they’re most needed. To allow this, the Fed and other regulatory agencies will need to relax some current liquidity regulations, particularly the guidance they offer larger banks for implementing “living will” liquidity requirements: those requirements, as presently implemented, are the chief impediments to interbank reserve flows today (Baer, Court, and Nelson 2018). Although banks are nominally allowed to satisfy their liquidity requirements using not just excess reserves but other HQLAs, bank supervisors fear that, in a crisis, even such high-quality assets may prove difficult to liquidate. Consequently, they’ve encouraged large banks to favor reserves over other HQLAs in meeting certain liquidity requirements (Quarles 2019; Andolfatto and Ihrig 2019a). To put supervisors’ concerns to rest, the Fed should establish a fixed-rate full-allotment standing repo facility (SRF), as recommended by David Andolfatto and Jane Ihrig” Source: Kindle locations 1149 in [“The Menace of Fiscal QE”](#)

⁶⁹ This is a helpful Youtube video titled: [“What is a repo? - MoneyWeek investment tutorials”](#)

*in addition, we found this analogy helpful: “Repo’ is a lot like a Pawn Shop. You need \$100 in cash, to pay bills. You bring \$100 worth of stuff, they warehouse it, and let you leave with the cash. Soon after, you return with \$102, and get your stuff back. So it is pretty different from money printing. And it certainly isn’t a \$100 gift.” In a sense, in theory unlimited amounts of money can be created this way via the pawn shop. However this amount of money that *could* be created is ultimately checked by the interest rate: not much money will be created if one is forced to pay \$180 instead of \$102 at time of repayment Source: <https://twitter.com/Truthcoin/status/1240440694570975233> ; <http://archive.is/dWOnE>

* “Repurchase agreements can take place between a variety of parties. The Federal Reserve enters into repurchase agreements to regulate the money supply and bank reserves. A repurchase agreement (repo) is a form of short-term borrowing for dealers in government securities. In the case of a repo, a dealer sells government securities to investors, usually on an overnight basis, and buys them back the following day at a slightly higher price” Source: <https://www.investopedia.com/terms/r/repurchaseagreement.asp> ; <http://archive.is/u4BqJ>

**Reverse Repo Rate Properties: Reverse repo rate is the rate that a country’s central bank borrows funds from commercial banks within that country. Central banks use the reverse repo rate as a monetary policy instrument to control fluctuations in the money supply. When the reverse repo rate goes up, the money supply tightens. The rate hike encourages commercial banks to hold their deposits with the Fed rather than borrow from the central bank and increase the money supply.” Source: <https://smallbusiness.chron.com/bank-rate-vs-reverse-repo-rate-72960.html> ; <http://archive.is/zfftv>

⁷⁰ Source: August 2009 Wall Street Journal [“Japan Party Talks Down Borrowing”](#)

⁷¹ Source: December 2009 Wall Street Journal [“Bank of Japan Tries New Deflation Buster”](#)

⁷² Full comment: “Question: You reacted to a perfect storm going into the crisis, but the judgement will be how you come out of it. As you talk of these special new programs, are they going to be part of the normal course of business for the Fed going forward?

Bernanke: No, they won’t. We have some programs that we’ve had for a while, which as you would know, are short term lending programs to banks when they need liquidity for short term periods. And that’s been around since the beginning of the Fed. And that would continue. But all the other programs, the special programs we put together to help in the commercial paper market, to help in the consumer market, to help in the mortgage market, all those will eventually be unwound and be taken away as the normal market processes begin to function again. We need to do that because we want to make sure that first: markets go back to normal, that credit is allocated through the market process. And secondly, at some point, when the economy begins to recover, we want to make sure that we don’t overstimulate the economy into an inflation. And so, for both of those reasons were going to have to unwind essentially all of the programs that we’ve put out.” Source: Youtube video: [“NEWSHOUR | Bernanke, On The Record, Part 1 | PBS”](#)

⁷³ Source: 7:00 in Youtube video: [“NEWSHOUR | Bernanke, On The Record, Part 2 | PBS”](#)

Bernanke (at 8:00): “given the softness of the global economy, except possibly with some fluctuations in energy prices, we expect that in the next couple of years that inflation will be quite low”

⁷⁴ Source: <https://fred.stlouisfed.org/graph/?g=q4KA#0> ; also see discussion here: <https://twitter.com/SplitRockMgmt/status/1224473595184893952>

⁷⁵ Archived link for current CDS prices as of 3/31/2020: <http://archive.is/D0dNX>

⁷⁶ Source: <https://predict.hypermind.com/dash/dash/dash.html?list=NGDP>

⁷⁷ Sources: Figure 2 at <https://www.stlouisfed.org/publications/regional-economist/january-2014/the-rise-and-eventual-fall-in-the-feds-balance-sheet> ; <https://fred.stlouisfed.org/series/CPIAUCSL>

⁷⁸ Source: <https://fred.stlouisfed.org/series/T5YIFR>

⁷⁹ Source: <https://fred.stlouisfed.org/series/DDDI06JPA156NWDB>

⁸⁰ Source: Various Wall Street Journal articles from 2008 to 2009.

-Regarding the market to Market: “Indeed, as First Trust’s Brian Wesbury pointed out that very day, it was FASB’s March 9, 2009 hint that it was backing away from mark-to-market accounting that turned the stock market.” Source: <https://www.fa-mag.com/news/ten-years-on--the-definitive-account-of-the-subprime-mortgage-crisis-43712.html> ; <http://archive.is/a2cwZ>

-Indeed, Congress began pressuring FASB from March 12 Financial Times: “Congress will force regulators to relax the much-criticised mark-to-market accounting rule if they fail to take action themselves, Barney Frank, the chairman of the House financial services committee, on Thursday warned. Mr Frank told representatives of the Financial Accounting Standards Board and the Securities and Exchange Commission that they had to act quickly to revise the rule. “We do have to have you move now,” said Mr Frank. “You are the FASB. In this one you can’t be the slow-B” Source: “[Congress warns on mark-to-market rule](#)” ; <http://archive.is/jMV1q>

- Of course even weeks before, rumors had started about the suspension of mark to market. From the 2/6/2009 Business insider: “Now there are reports that the SEC is planning to give banks "flexibility" on mark-to-market accounting rules. It may even suspend mark to market rules”. Source: “[Suspending Mark To Market Accounting: The Tale Of Two Cows](#)” ; <http://archive.is/LcRnQ>

- “On December 30, 2008, the SEC issued its report under Sec. 133 and decided not to suspend mark-to-market accounting. On March 16, 2009, FASB proposed allowing companies to use more leeway in valuing their assets under "mark-to-market" accounting. On April 2, 2009, after a 15-day public comment period and a contentious testimony before the U.S. House Financial Services subcommittee, FASB eased the mark-to-market rules through the release of three FASB Staff Positions (FSPs). Financial institutions are still required by the rules to mark transactions to market prices but more so in a steady market and less so when the market is inactive. To proponents of the rules, this eliminates the unnecessary "positive feedback loop" that can result in a weakened economy. On April 9, 2009, FASB issued an official update to FAS 157 that eases the mark-to-market rules when the market is unsteady or inactive. Early adopters were allowed to apply the ruling as of March 15, 2009, and the rest as of June 15, 2009. It was anticipated that these changes could significantly increase banks' statements of earnings and allow them to defer reporting losses. The changes, however, affected accounting standards applicable to a broad range of derivatives, not just banks holding mortgage-backed securities.” Source: https://en.wikipedia.org/wiki/Mark-to-market_accounting#Effect_on_subprime_crisis_and_Emergency_Economic_Stabilization_Act_of_2008 ; <http://archive.is/ovlZl>

- “Instead, the system was given time to heal. That’s what should have happened in 2008. Instead, FASB stubbornly stuck to its guns over MTM accounting. Finally, in mid-March 2009, with stocks at new lows, Congress started to twist arms on the issue, a rare and unheralded moment of bipartisan action. FASB was forced to loosen up its rules and allow cash flow to be used when markets were illiquid. Just this small change did the trick. Banks were finally able to raise new capital, \$100 billion or so, and the stock market surged.” Source: <https://www.forbes.com/2009/07/27/suspend-mark-to-market-fasb-cpa-opinions-columnists-wesbury-stein.html#685634e3c348> ; <http://archive.is/VJ2xU>

-“In the event the Fed used both a hook and a crook. The crook consisted of its decision to "sterilize" those emergency loans, yanking-back as many reserves as its emergency loans created by emptying its portfolio of Treasury securities worth as much as the loans it made. That strategy lasted until Lehman’s demise, after which the volume of Fed lending exploded, while its Treasury holdings dwindled. So on October 6th out came the hook, consisting of the Fed’s offer to start paying interest on bank reserves. By paying banks more to hoard reserves than they could make by lending them, the Fed could effectively sequester those reserves, preventing them from contributing to increased lending, spending, and prices. By then, however, the Fed’s Maginot Line had already been breached. With market interest rates in free fall, the Fed’s 2 percent rate target was mere wishful thinking. Consequently, on the same day that it announced its plan to pay interest on bank reserves, the Fed at last relented by cutting its rate target to 1.5 percent. But no sooner had it done so than reality made a mockery of the new target as well. Eventually the Fed settled on an interest-rate target "range," with the interest rate paid on bank reserves as its upper bound, and a lower bound of zero. The new target range had at least one undeniable advantage: the Fed

couldn't miss it. But despite that innovation it wasn't until sometime in November 2008, as the unemployment rate approached 7 percent, that the FOMC determined that monetary stimulus was, after all, just what the economy needed. Sources: <https://www.alt-m.org/2018/04/30/anniversary-of-a-fed-blunder/#comment-3879731919> ; <http://archive.is/mwCAr> ; <https://www.federalreserve.gov/monetarypolicy/20081006a.htm> ; <http://archive.is/zTiN>

** For this CAP events:

-“the Supervisory Capital Assessment Program (SCAP, or stress test). Introduced in February 2009, the “stress test” required the largest U.S. bank holding companies to undergo simultaneous, forward-looking exams designed to determine if they would have adequate capital to sustain lending to the economy in the event of an unexpectedly severe recession. If banks deemed inadequately capitalized could not fill their gap privately, they would qualify for public funds through the Capital Assistance Plan (CAP) announced the same day as the stress test.” Source: SSRN paper: “[The Information Value of the Stress Test and Bank Opacity](#)”

-“Of the four events we studied, the one with the biggest absolute impact on abnormal stock returns was the clarification around February 23-25, when details of the capital assistance plan were released and Federal Reserve Chairman Bernanke indicated that the stress-tested banks would not be nationalized. Precisely which of those sub-events was the driver of stock market returns is difficult to resolve, but the decline in credit default swap spreads around that event suggest that part of the reaction was due to investors learning that the SCAP banks were not to be nationalized.” Source: SSRN Paper, page 21: “[The Information Value of the Stress Test and Bank Opacity](#)”

-“CAP was clarified (February 23 and 25) and Chairman Bernanke’s indication (on February 24, 2009) that SCAP banks would not be nationalized or let to fail.” Source: “[FAQs on The Capital Assistance Program \(CAP\)](#)”

- on 2/11/2009, Geithner gave a glimpse of PPIP but it disappointed investors and was vague. See graph at bottom of article: June 2009 WSJ article: “[Wary Banks Hobble Toxic-Asset Plan](#)”

- Also from 2/11/2009 WSJ: “Shares of banks, which had been recovering on expectations that the government would be taking their troubled investments off their hands, fell hard. Bank of America tumbled 19% and Citigroup declined 15%. Regional banks fell even more, with KeyCorp down 27%.” Source: February 2009 WSJ: “[Blue Chips Slide 381.99; Rescue Talk Falls Flat](#)”

- “The government clarified details on the SCAP and CAP each day between February 23 and 25. On February 23, the government reiterated that it would supply capital under the CAP via mandatorily convertible preferred shares, and that banks would be able to exchange Troubled Asset Relief Program injections into mandatorily convertible preferred shares. The government clarified that this was not a new capital standard for banks and revealed that the presumption of CAP was for banks to —remain in private hands” || “The market may have inferred from Chairman Bernanke’s remarks that government did not intend to fail or nationalize any of the banks that were subject to the stress test. Finally, on February 25, the Treasury published an eight-page CAP term sheet, a four-page CAP white paper, and four pages of answers to frequently asked CAP questions. The term sheet revealed that the mandatory convertible preferred (MCP) shares provided through the program would be converted into common equity only as needed to keep banks well capitalized and could be retired if financial conditions improved before the conversion became mandatory. The term sheet revealed the price at which MCP would convert to common equity, thus indicating the dilutive effect on existing common equity holders. We call the February 23-25 event the clarification, but note that —the clarification was actually multiple events, each with a potentially separate impact.” Source: Pages 9-10 “[Federal Reserve Bank of New York Staff Reports The Information Value of the Stress Test and Bank Opacity](#)”

-“Conversion Price: Conversion price is 90% of the average closing price for the common stock for the 20 trading day period ending February 9, 2009, subject to customary anti-dilution adjustments. If applicable, the conversion price shall be reduced by 15% of the original conversion price on each six-month anniversary of the issue date of the Convertible Preferred if the consent of the QFI stockholders described below has not been received, subject to a maximum reduction of 45% of the original conversion price.” Source: Page 3 “[Cap Term Sheet](#)”

-“CAP Contingent Common Capital The capital provided to eligible banking organizations under this program will be in the form of a preferred security that is convertible into common equity. Market participants pay particular attention to common equity as a measure of health in stressed environments, and

regulators have long believed that common equity should be the dominant component of a banking organization's highest quality forms of capital. The convertible preferred security provided through the CAP will serve as a source of contingent common capital for the firm, convertible into common equity when and if needed to retain the confidence of investors or to meet supervisory expectations regarding the amount and composition of capital. The CAP instrument will be designed to give banks the incentive to redeem or replace the government-provided capital with private capital when feasible. Finally, with supervisory approval, banking organizations will be allowed to exchange their existing TARP preferred stock for the new preferred instrument. The CAP is open immediately. Eligibility will be consistent with the criteria and deliberative process established for identifying Qualifying Financial Institutions (QFIs) in the TARP Capital Purchase Program (CPP)." Source: pages 2-3: "[CAP White Paper](#)"

-"Each QFI may issue an amount of Preferred equal to not less than 1% of its risk-weighted assets and not more than the lesser of (i) \$25 billion and (ii) 3% of its risk-weighted assets.

Security: Preferred, liquidation preference \$1,000 per share. (Depending upon the QFI's available authorized preferred shares, the UST may agree to purchase Preferred with a higher liquidation preference per share, in which case the UST may require the QFI to appoint a depository to hold the Preferred and issue depository receipts.)" Source: Pages 1-2 : "[TARP Capital Purchase Program Preferred Securities](#)" (published 11-13-08)

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