Tapering QE, Fed Balance Sheet, Interest Rates, Oh My!

March 11, 2022

Introduction

The Federal Reserve (The Fed) is talking about Tapering Quantitative Easing (QE) and raising the Fed Funds Rate (FFR). The QE tool helped bail out the highly levered and bankrupt US financial system during the 2008 Financial Crisis. The Fed has used it several times since then. The Fed has also stated its intentions to raise interest rates to fight the highest inflation in 40 years. Where are we now? How did we get here? What are the possible policies and outcomes next?

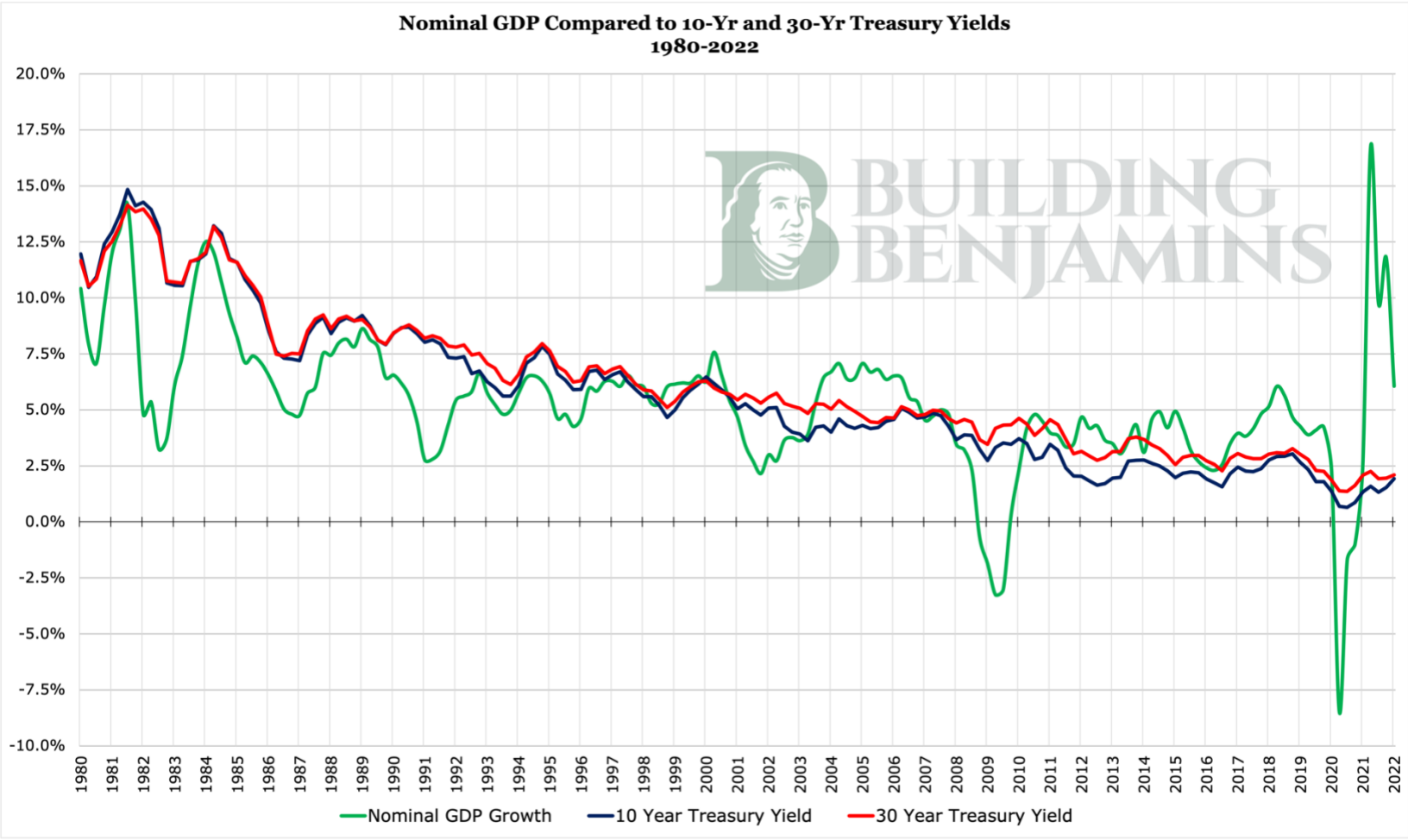
Where are we today?

The Federal Reserve is set to begin tapering and shrinking the balance sheet thereafter this year. On Mar 2, the Fed announced a token 0.25% rate increase in March – half of earlier expectations and a little disappointing. While interest rates are still at rock bottom levels, inflation runs rampant at over 7%. To tackle inflation in the past and calm it in the future, the Federal Reserve has raised rates to prevent excess borrowing, therefore significantly reducing the money multiplier effect, lowering inflation; the negative side effect being a slowing economy. This time, though, they seem excessively slow to act. The Fed has estimated that rates would need to rise to 2.5% to even begin to get inflation under control, yet rate increases are projected to crawl along at a snail's pace of 0.25% 4 to 7 times a year and take until 2024.

While unemployment has been significantly reduced – below what is considered full employment -- labor force participation is at a near all-time low. While this has uncertain effects, it has already pushed wages up far quicker than many employers can keep up with.

Yields have been completely decoupled from indicators. Traditionally, the 10-year treasury tracks nominal GDP growth as shown on the graph below. In 1981, when inflation and nominal GDP were high, GDP growth and yields on Treasuries were both around 14%. However, it seems this time that the

intense GDP growth and inflation levels have not yet budged yields because of QE. What is important to note for equity investors is that higher yields on long Treasuries generally result in lower Price/Earnings (P/E) ratios for stocks resulting in a correction or bear market.



Graph source: St. Louis Fed

The Fed presently owns almost 25% of all outstanding Treasuries and has an engorged balance sheet of nearly $9 trillion. The original Quantitative Easing programs were novel and highly effective – but those fixed programs quickly gave way to the "Hotel California"[1] of open-ended balance sheet stacking,

[1] The famous Eagles song – "You can check out any time you like, but you can never leave." The Federal Reserve has consistently been unable to reduce the size of its balance sheet and return to a hands-off approach to the markets, without causing mass shocks.

which has led to an unsurmountable amount of assets for the Fed to offload especially in the face of market turmoil surrounding the Russian invasion of Ukraine. As a result, higher rates and tapering might have to wait again even as inflation surges through the global economy.

How we got Here

During the 2008 Financial Crisis, the Fed found that the standard toolbox had negligible impact on a market in freefall with a wave of unemployment mixed with a drop in consumer confidence and highly levered financial institutions that looked like dominos ready to fall into bankruptcy. Moreover, rates were at the "effective lower bound," meaning the Fed could no longer effectively enact monetary policy as rates had already been set at 0%. It had even begun to pay out interest on excess reserves to encourage banks to switch to cash to avoid liquidity and solvency problems. It also introduced several emergency lending facilities for financial institutions to provide additional liquidity to prevent a downright collapse of the financial system.

To offset this growth of the balance sheet, the Fed sold off some of its Treasury holdings in September of 2008 (in a short-lived policy called "sterilization"). However, it may have been too little too late or just downright inevitable: the 2008 Financial Crisis became dramatically worse in late September of 2008 – rendering it no longer possible for the Fed to offset these loans by selling its holding of Treasuries. As a result, its balance sheet had grown to approximately $2 trillion in temporary liquidity facilities, along with Maiden Lane LLC's assets (shell company in charge of the liquidation and resale of Bear Sterns and AIG's most toxic assets).

With a looming economic crisis, the Fed borrowed a policy from the Bank of Japan, a policy of "quantitative easing." The idea of QE is that if the Fed drives up the price of bonds, yields and interest rates fall, and investors will move their money to equity and other forms of private investment so that cash is injected into the economy. An additional effect is that it provides commercial banks with an increase in reserves as their bonds can be easily converted into cash, preventing bank runs and reducing interest burden on consumers.

In November of 2008, the Federal Reserve began its policy of QE1, announcing its intent to purchase $600 billion in government-sponsored MBS (Mortgage Backed Securities). By January of 2009, the Fed had successfully averted a *total* economic collapse – but if it ceased lending and wound down its balance sheet, the stimulus it provided to the economy would have been

effectively removed, and that would have driven the economy from recession into depression.

This policy was extended for a year in March of 2009 and began to include $300 billion in Treasuries, $175 billion in Agency debt, and more MBS up to $1.25 trillion.

By March 2010 – when most of these programs had concluded – the Fed had amassed approximately $1.25 trillion in MBS (about one fourth of the outstanding at the time), $175 billion in Agency debt, and $300 billion in Treasuries.

Now that the recession was over, the Fed turned its eyes to economic growth, which had been anemic, to put it lightly. The Fed believed that further stimulus was needed to pursue stable prices and maximum employment – its two stated goals.

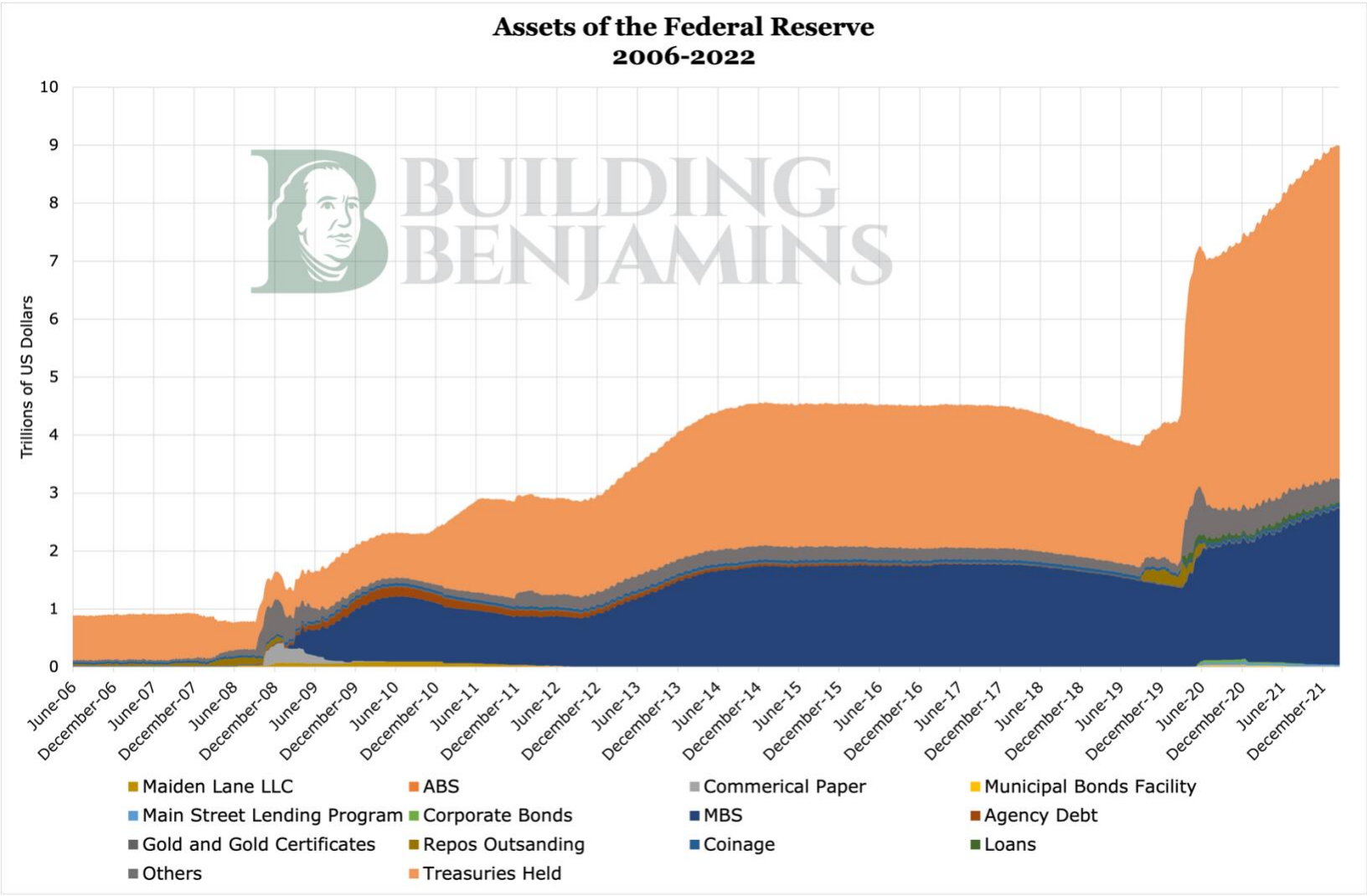
In November of 2010, QE2 was introduced which would replace the maturing bonds on the Fed's books (about $100 billion a year) – and add an additional $600 billion of Treasuries at about $75 billion a month.

The Fed had several major fears regarding ceasing QE after just one round. During the 1980s, tight monetary policy following the recession of the late 70s created a "double-dip" effect, in which the economy exited a recession and then reentered one during normalization.

In addition, the Fed feared a liquidity trap, in which aggregate spending remains low despite avid stimulus in the economy, usually caused by both business and consumers paying off debt and saving rather than spending money, which can cause significant and rapid deflation or demand shocks making monetary policy completely ineffective and tanking the economy once again (This is what happened to Japan in the 1990s). With inflation hovering around 1% and GDP growth not even hitting 2%, this liquidity trap was the primary fear of the Fed (if anything, QE2 causing some inflation may be considered good for the economy).

QE2 was also regarded as successful and began to successfully help pull the economy out of a recession and prevent a double-dip, formally ending the program in June of 2011, bulging the balance sheet to $2.6 trillion.

By September of 2012, it was clear that the economy was in a moderate growth state, but unemployment and private investment was still sluggish at best. While some feared inflation with further programs, the Fed projected its inflation rate would remain under its 2% target.



Graph source: St. Louis Fed, Board of Governors of the Federal Reserve System H.4.1

A new "QE3" – or open-ended QE – was introduced in September of 2012 to begin purchasing $40 billion in Treasuries and $40 billion in other assets a month until conditions improved. They estimated this would take place for a longer time or indefinitely, noting in their release that the Fed Funds Rate (FFR) was likely to remain low until at least mid-2015. Once unemployment began to move on a decisive downward trend, Chair Ben Bernanke said in a congressional hearing on May 22, 2013, that the Fed would begin winding down asset purchases from $85 billion to $65 billion and begin to conclude the program *if* unemployment continued to drop. Additionally, he stated that if inflation remained at roughly 2% and unemployment hit 6.5%, the Fed would raise rates. This announcement caused markets to throw a "taper

tantrum." Investors panicked and sold bonds that they owned in an attempt to get out before the Fed ceased buying and rates moved higher. Bonds of all types sold off, and The Fed paused its tapering activities until December of 2013, when purchases were tapered from $85 billion to $75 billion.

QE3 became a toxic circle of crowding-out non-Fed entities and being stuck with trillions in assets. Moreover, whenever it began to wind down the program markets reacted. Richard Fischer, Former Federal Reserve Bank of Dallas president, called this the "Hotel California" monetary policy; without a set end date for QE, investors became addicted to the Fed's money in the markets, with artificially inflated equity prices. So now the Fed was stuck with trillions on its balance sheet it could not get rid of lest they tank the market with the mere notion of a policy change. “You can check out any time you like, but you can never leave,” -The Eagles.

In October of 2014, the Fed finally ceased buying assets. At this point, the balance sheet was roughly $4.5 trillion. With rates beginning to increase, the Fed sought to decrease its balance sheet, which it managed to reduce to approximately $3.7 trillion by the end of 2019 and had FFR sitting at just under 2.5%, and targeting increases, likely up to 5% or higher, as it had been before the 2008 crisis.

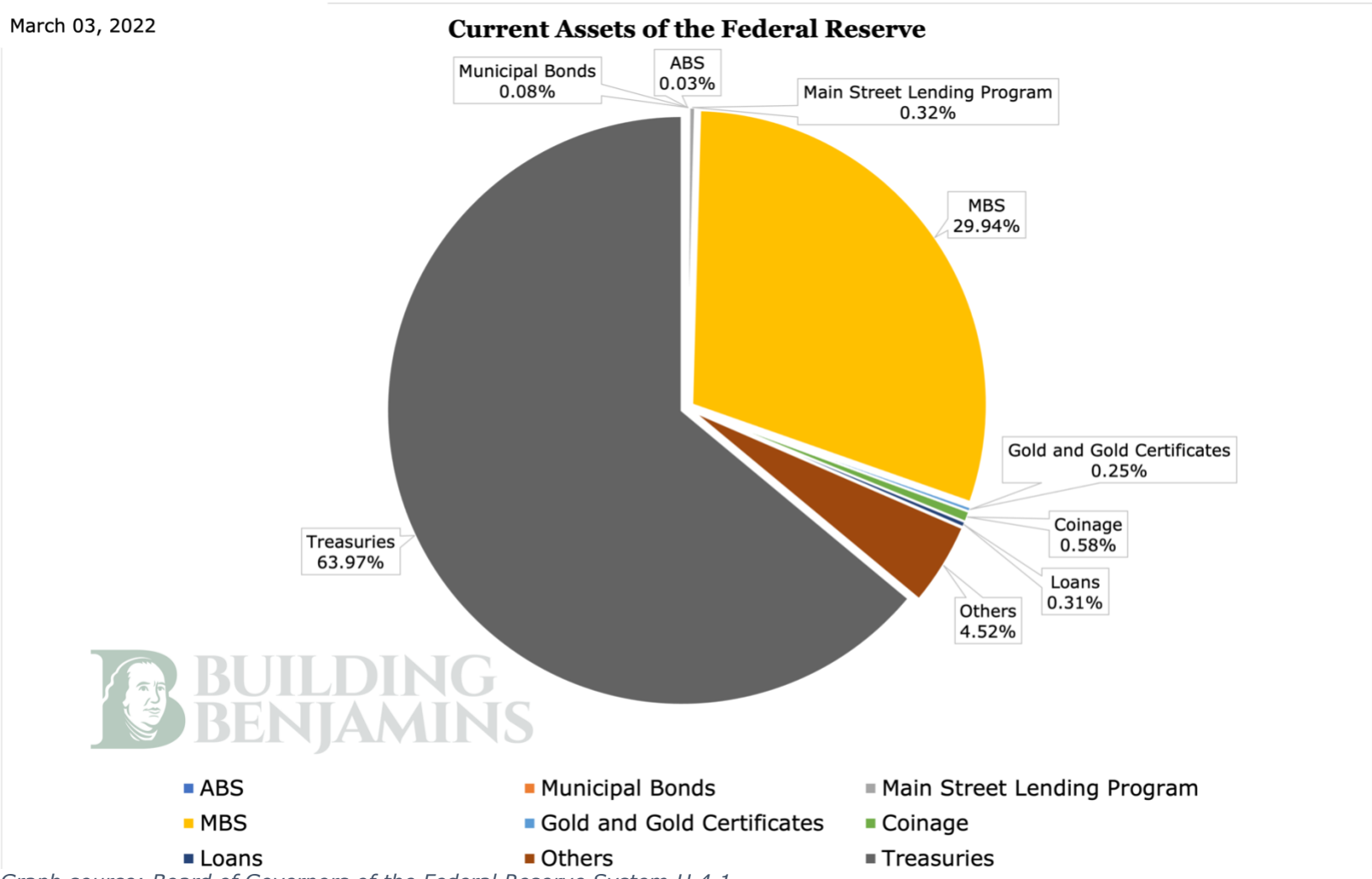
COVID creates another crisis. On Jan 4, 2020, the WHO announced pneumonia of unknown origin spreading through China. By Jan 22, the CDC had begun preparations for a pandemic and implemented testing procedures at certain airports and declared the now-called COVID-19 a public health emergency. Despite all this, the S&P 500 closed at a record high on Feb 19. However, it would not last long as the first COVID crash would happen on Feb 28, causing the Fed to announce that it was prepared to use its toolbox to aid economic downturn. However, the space the Fed had to move within its standard toolset was tiny – rates were already low, its balance sheet was bloated, and the markets were in a downright panic.

By Mar 3, the Fed had dropped FFR to 1.25%. By Mar 15, the Fed announced it was dropping rates to target 0%, eliminating reserve requirements, and encouraging borrowing through the discount window to drop consumer credit rates and cushion the possible fall in consumer spending. Additionally, it would purchase $700 billion in assets – $500 billion in Treasuries and $200 billion in MBS. Once it became clear that COVID-19 was not localized and temporary, the Fed was simply unable to restore market stability. Even elevated levels of Open Market Operations (OMO) and discount window borrowing simply did not cut it this time, and they were

forced to buy *everything*. You have heard of the shotgun approach? The Fed would even buy junk (below investment grade) bonds.

On Mar 23, it announced that it will be re-introducing open-ended purchases of assets of "any amount" to "support market functions" – setting purchases at $80 billion per month in Treasuries and $40 billion per month in MBS. In addition, it would be introducing a new policy of purchasing both newly issued and already outstanding high-grade corporate debt to aid businesses needing liquidity. It also further expanded what it would be buying to include AAA-rated asset-backed securities, commercial paper, municipal bonds, and certificates of deposit.

The balance sheet had amassed $5 trillion in bonds and $3 trillion in MBS. Now in 2022, the Fed owns roughly a quarter of all Treasury bonds outstanding, and the total balance sheet is $8.91 Trillion.



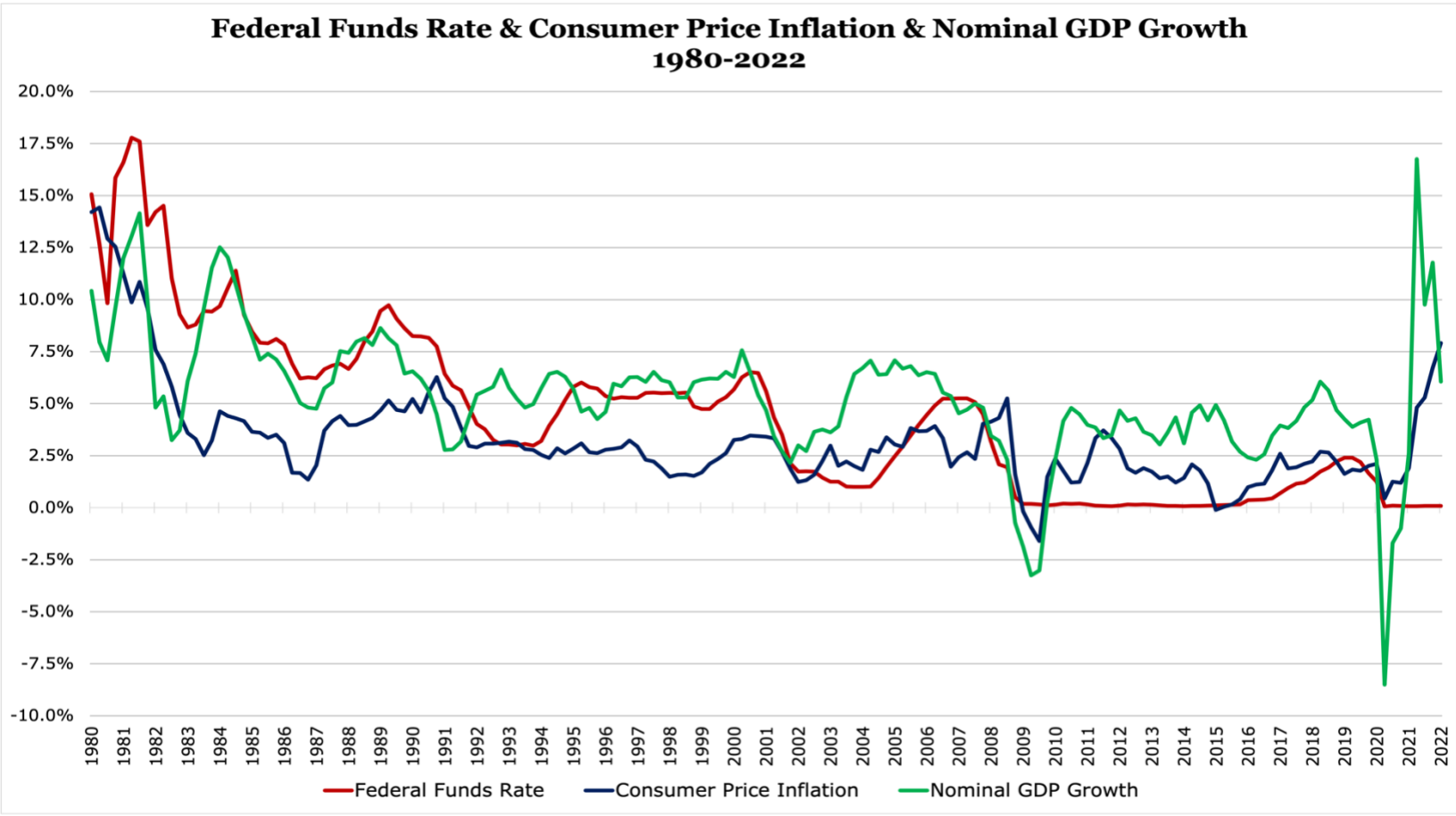
Graph source: Board of Governors of the Federal Reserve System H.4.1

What are the options going forward?

The first (ongoing) measure in fixing this bloated balance sheet is through tapering. Powell has telegraphed often and early (to avoid a taper tantrum II), frequently reminding investors the Fed will be drawing back purchases. In November 2021, with inflation looming on the horizon, the fed began to taper by $10 billion per month in Treasuries and $5 billion in MBS per month. In December, this rate was doubled as it became apparent inflation was out of control. However, the Fed has obfuscated, purposefully or not, what exactly they are going to do to get from here to a low-inflation normalized economy with a significantly reduced balance sheet. In addition, the Russian invasion of Ukraine has created another level of uncertainty that will result in higher global inflation, a European recession, and a possible US recession.

Potentiality 1: Volcker II

Tapering will certainly not be enough; it is unlikely to begin winding down its balance sheet until 2024. Again, the reasoning is sound -- tapering too quickly could lead to economic stagnation or rapid deflation – however – ending it too late could see record-high inflation.



Graph source: St. Louis Fed, Atlanta Fed, Bureau of Economic Analysis

This is precisely the dilemma president Jimmy Carter faced when elected in 1976. Massive inflation was crippling the American economy. Paul Volcker was named Fed chair and was told to fix inflation by any means necessary. Volcker took radical measures – bringing the FFR interest rates to 20% by June of 1981. This led to two recessions, bank failures, high unemployment, and effectively torpedoed Carter's chance at reelection. But in only a few short years, he broke the inflation spiral, and it slowed from 15% down to 3% -- they were painful years – but inflation was tamed, and the groundwork for the massive economic expansion from the early 1980s to 2008 was laid.

This "electric shock therapy" that Volcker pioneered is unlikely today as everyone is too levered, especially the Federal Government, to withstand high interest rates. Also, nobody is willing to spend the political capital as even the Republicans have lost any sense of fiscal discipline. The Fed has

stolen the leading role in the economy over the last decade and a half, addicting markets to low rates and QE. The Fed has bailed out bankrupt banks and financed massive deficit spending, allowing moral hazard to infect the largest financial institutions in the country. Low rates have propped up an artificially high housing market eliminating affordability for new buyers. With all that being said, this Volcker approach would be devastating to the economy and would likely put us back into a recession, if not worse. It would likely reduce the gains made on unemployment and wages and induce a bear market in stocks as the economy went into recession and interest rates increased.

Based on the Fed's 2022 stress-tests implemented by Dodd-Frank, it is likely that some of the largest banks in the world would fail with crashing real estate, high unemployment, collapsing asset prices, widening corporate yield spreads, and volatility. While a Volcker-like hike of rates to extremes may not cause this, current events mixed with uncertainty could very well damage more than it would fix.

Potentiality 2: Speed Up Rates and Selling off

This is a smaller and more likely scenario than the previous scenario: the Fed changes course and begins faster, but fewer, 50 basis point hikes– chair of the St. Louis Fed has suggested this. Then, with rates sitting at 1-1.5% by Q4, the Fed can begin to unwind the balance sheet far earlier than anticipated, which will likely have the effect of both calming equity markets – and prevent a potential credit crunch in debt markets by raising yields on Treasuries and reducing corporate spreads.

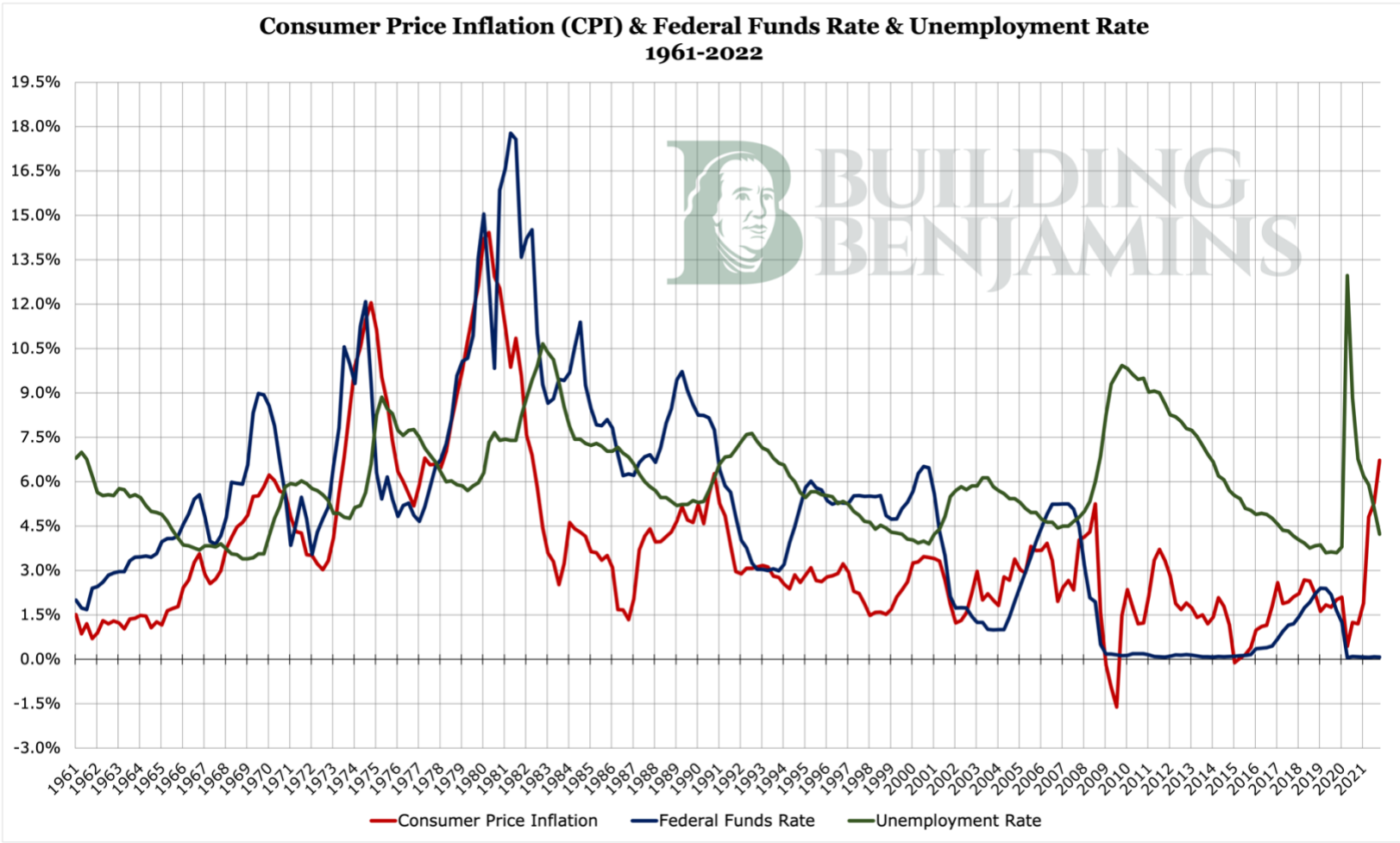
Potentiality 3: Reducing the Money Supply to Reduce Inflation Faster

The option of selling off the balance sheet to control the money supply is certainly novel, but the Fed has the tools to do it through other means. For example, raising reserve requirements (currently set at 0%) and continuing on the interest rate increase path could be an effective way to induce a soft landing on inflation – especially if rate hikes are frequent, albeit small.

However, with credit spreads widening, many banks are seeing environments in which there are the beginnings of yield-seeking behavior. With assets being pushed down by inflation and current events, it may induce a crunch as banks do not want to lend at current rates, as the Fed is only projected to raise rates by 25 basis points 7 times this year (ending the year at ~1.75%). This would be further exacerbated by keeping the balance sheet at its current size.

Potentiality 4: The Trend Continues

What if the Fed does not do anything else?



Graph source: St. Louis Fed

If it turns out that the Fed is correct and inflation is only transitory, being mostly COVID-19 induced, then they are right to not be overly aggressive with tightening policy. The Fed estimates that we are near or at the peak of inflation on most goods, and that the 5-year inflationary trend is at approximately 2%. Should investors also come to a similar conclusion, it is unlikely we will see adverse effects like a credit crunch or further volatility in markets – allowing the Fed to continue its intentions before it begins winding down assets from its balance sheet in 2024. Russia's invasion makes this transitory inflation story with a happy conclusion unlikely.

Potentiality 5: Quantitative Easing at the Hotel California

The global fallout from the Russian invasion of Ukraine gives the Fed cover to postpone both tapering and raising FFR to a high enough level to stem inflation. In an interlinked global economy, supply disruptions coming out of the war and the sanctions will create not only higher inflation, but also lower economic activity.

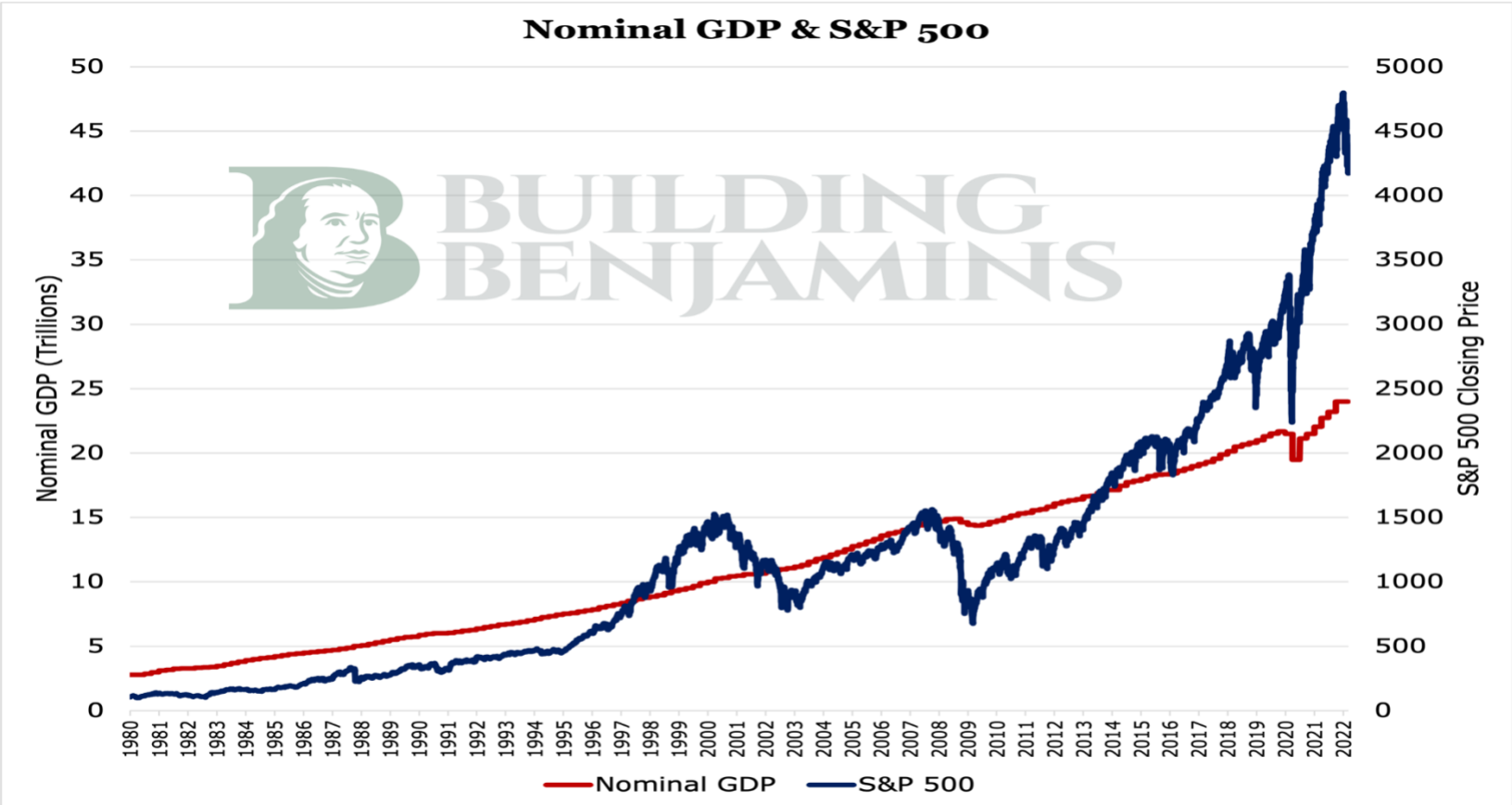
The risk of inflation and recession at the same time has dramatically increased. (As a side note, everybody wants the fame of being Fed Chairman, but the job is like a hot potato as no one wants to be Fed chair when the hard decisions need to be made. Greenspan, Bernanke, Yellen and now Powell. My guess is Powell will not make the hard decision and will not shrink the balance sheet before he is gone.)

Given the magnitude of the US federal debt which just passed $30 trillion, Unfunded Social Security Liability of $21.8 trillion, and Unfunded Medicare Liability at $33.9 trillion, the Fed is the only entity that can finance these liabilities. With the US GDP at $24 trillion, we are reaching a point of the debt becoming unserviceable especially as the debt and liabilities are growing at a faster rate than economic activity.

The Fed led us into the "Hotel California" in 2008, Fisher's statement that we can never leave is proving prophetic. If we cannot leave, what can the Fed do? Print baby print – Quantitative Easing for infinity, forever low FFR, Modern Monetary Theory (MMT) fully implemented. More stimulus checks, universal basic income, and nirvana in our lifetime. "Money for Nothing."[2]

What could go wrong with all this? Inflation reaching levels that make the 1970s look like stability. A permanent state of economic stagflation and chaos with the potential of a hyperinflationary depression. Massive financial market volatility. The US Dollar loses its precious reserve currency status. Social unrest as the US population realizes that their dollars buy fewer goods and services than they ever imagined. Are you ready?

[2] The Dire Straits song, written by Mark Knopfler after overhearing two people in an appliance store complaining about the easy life of rockstar excess.



Graph source: St. Louis Fed, Wall Street Journal

Glossary:

Gross Domestic Product (GDP): the total value of goods and services produced and provided by a country during the fiscal year.

Modern Monetary Theory (MMT): a macroeconomic theory in which the theoretical bounds of the money supply are infinite. Because the government controls and has a monopoly on the issuance of currency they simply do not need to worry about debt and cannot go bankrupt as they can always print more money and use taxes to reduce the money supply. While the theory is certainly more nuanced than "the government doesn't have to pay for stuff," heterodox economics tends to be even more esoteric than standard-school economics.

Corporate Credit Spread: the yield difference between corporate bonds and an equivalent maturity government bond. The wider the spread, the riskier lending is considered to be.

CREDIT CRUNCH: a phenomenon independent of interest rates, banks no longer feel comfortable lending under current conditions. The supply of credit dries up as even though interest rates may be low – banks do not want to lend as they feel the yields offered on issuing credit do not outweigh potential risks.

RESERVE REQUIREMENT: Banks over a certain level of deposits (larger than local) must essentially warehouse a certain amount of consumer deposits with the Fed. This is a monetary policy tool and depending on the percentage of deposits that must be kept, it can raise or reduce the money supply in the economy, a critical tool for fighting inflation and modifying interest rates. **It is important to note that** even if the reserve requirement is 0%, the reserve requirement only refers to money required to be kept on-hand at the Fed. The FDIC still will want banks to keep 8-10% of customer deposits independently of the Fed. Less than 8% is considered undercapitalized; the FDIC may audit the bank without warning to ensure they abide by their fiduciary duty to keep client deposits safe.

INTEREST ON EXCESS RESERVES (IOER)/INTEREST ON RESERVE BALANCES (IORB): IOER and IORB is essentially the opposite of Reserve Requirement: if banks are not warehousing enough cash the Fed can give banks interest on the excess reserves (or any reserves held) held at the Fed, this has the effect of preventing banks from lending below the level set by IOER. This is useful as it provides another avenue for the Fed to manipulate the FFR. Theoretically, IORB with a 0% reserve requirement may also reduce the money supply.

FEDERAL FUNDS RATE (FFR) AND DISCOUNT WINDOW: The discount window is the rate at which banks can borrow money from the Fed. Generally speaking, this will be set at exactly 1% higher than the Federal Funds Rate (FFR). The FFR is essentially the interest rate banks charge one another to loan money overnight – either to meet obligations with the Fed or customers. This is manipulated in a variety of ways, but the fastest way is open market operations.

OPEN MARKET OPERATIONS (OMO): Open Market Operations is the standard day-to-day operations of the Fed and has become the strong arm of monetary policy implementation. If the Fed wants interest rates higher, it will remove money from the economy by selling an announced number of Treasuries. If it wants to add money to the economy and reduce rates, it will buy them.

QUANTITATIVE EASING: Quantitative easing is a special policy, usually only enacted in times of crisis (like 2008, or during 2020) in which the Fed will use Open Market Operations to purchase securities from investors on a very wide scale, sometimes without a specific goal (like QE3 or the 2020 relief package), in order to inject money into the economy on a much wider scale. This has the downside risk of creating inflation and crowding out investors from Treasury markets.

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