

The Basis for a Deep Financial Crisis; A Compilation of Major Forms of Monetary Stimulus in the US Since 1980. Christopher S. Bates, CIO Brampton Gillow Advisors, September 2021.

Introduction

The United States has been caught red-handed in pursuing a systematic program of using performance-enhancing substances to help The Team.

No, I'm not talking about Olympic athletes and anabolic steroids. I'm talking about a decades-long multi-pronged offensive by the US government to help consumers, investors, the economy and ultimately the GDP weather all manner of headwinds through various forms of monetary stimulus. Boosting GDP has had the knock-on effect of inflating capital asset prices. The multitude of sources of this stimulus and their combined effect is so vast and far-reaching it's difficult to catalog all in one place. I will nevertheless attempt to gather as much information as possible on the most important ones and try to put it in perspective. There will be charts of course – what self-respecting chat about economics and markets wouldn't have, and there will be conclusions and value judgements. I will explore an emerging mode of economic thought that argues the US Federal deficit can be any number. I will argue that this long-term trend of government assistance is at the same time imbedded in our culture and unsustainable. I will explore the idea that the net effect of stimulus thus far could theoretically be calculated, but I will also submit that the more important point is what happens to excessive valuations when the tailwind disappears. Ultimately though we are all able to draw our own conclusions and make our own predictions about the residual effect of the influences covered within.

While focusing on means of stimulating the economy, it is understood that wealth can be, and always has been created by people doing work. We make things, we perform services, and then we trade it all back and forth. This will remain so. The question always for capital markets is, how much future work has been discounted back to the present?

Based on the information presented here, I suggest the broader Government, and specifically the Federal Reserve, has introduced more instability than stability into the system by overcooking stimulus. We exist in a "pendulum economy" where excessive liquidity and valuations must be followed by crises. All the fire alarms have been pulled and the hydrants are almost dry during this upswing.

In the appendix at the end of the paper I've attempted to summarize in tabular form the effects discussed below.

What are the sources of monetary stimulus?

Before I jump into a list, let me clarify the length of time under consideration. For this discussion, I'm looking at the period starting in 1980 up to the present. Let's call it 4 decades. Most people will immediately associate the early 1980s with peak interest rates and the beginning of the Regan administration. The high weekly close for the 10-year Treasury was in fact October 2, 1981, at 15.68%. After that, interest rates have fallen almost continuously concurrently with falling corporate and individual tax burdens at the margin. With the understanding that a study of the fall in rates from the peak is cherry-picking, we can look at averages

over longer periods as well. Nevertheless, I make the argument that the period since 1980 is an identifiable era worth considering between bookends.

Here is a list of the various mechanisms by which the economy has been helped along since 1980:

- Falling interest rates
- Falling tax burdens
- Direct payments(bailouts) to financial and industrial companies
- Absorption of failed companies
- Direct payments to consumers
- Asset purchases by the Federal Reserve Bank
- Increases in the money supply
- Mortgage/Renters Moratoriums and Relief

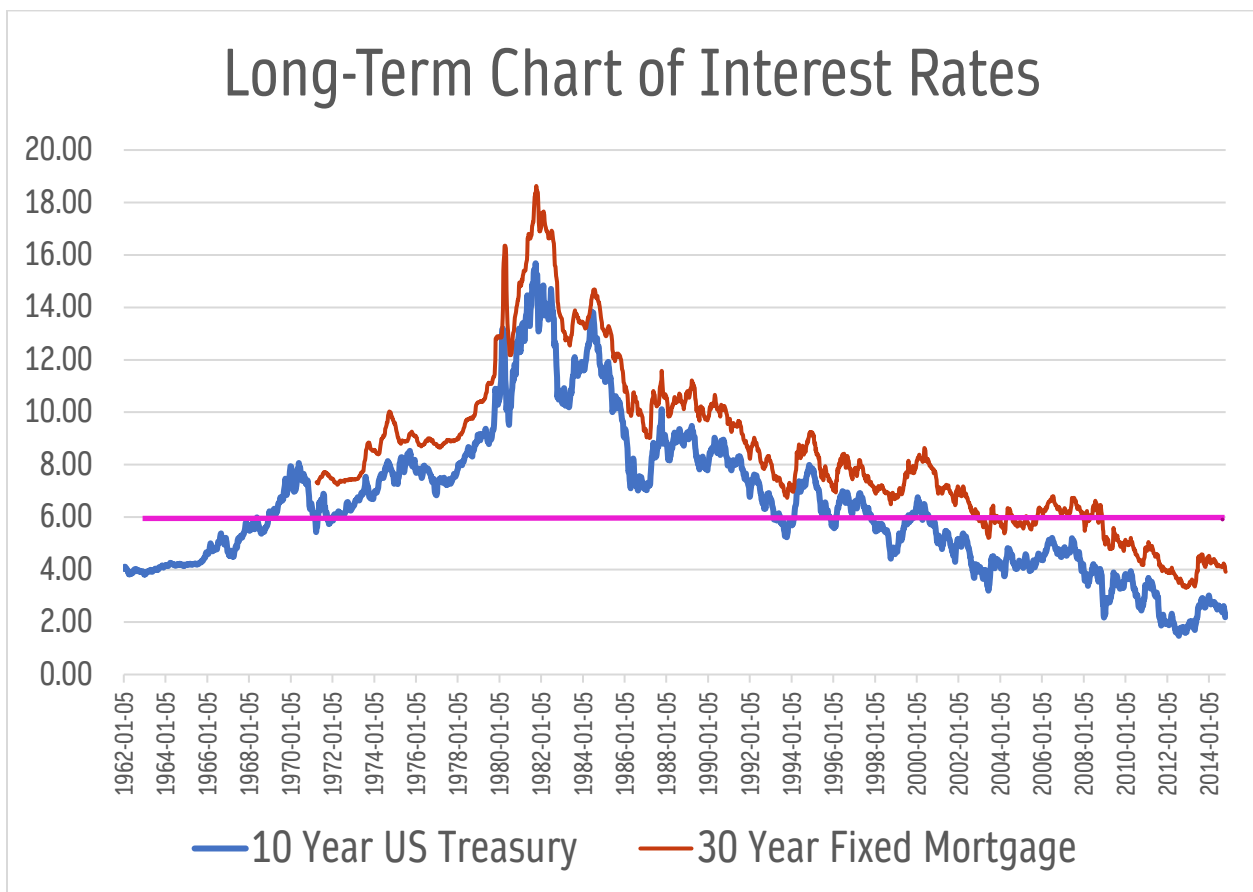


Chart 1. – Source: Federal Reserve — = Average of 10-year Tsy since 1962

Interest rates and Aliens

Imagine yourself arriving here on Earth, perhaps in the middle of Manhattan, from another planet in the Universe. On your planet there is a currency, and you are able to lend and borrow this currency (which

happens to be tied to the price of magnesium). Being well-educated you're familiar with rudimentary economics and how interest rates are related to the demand for currency. A friendly citizen of Manhattan sees you and randomly shows you the chart above and asks you of your opinion of whether the local economy had done well or poorly over the past 40 Earth years. You might say, "I feel like you're trying to trick me, but I'd say not very well. Your most important interest rate is approaching zero."

The Manhattanite then produces this chart:

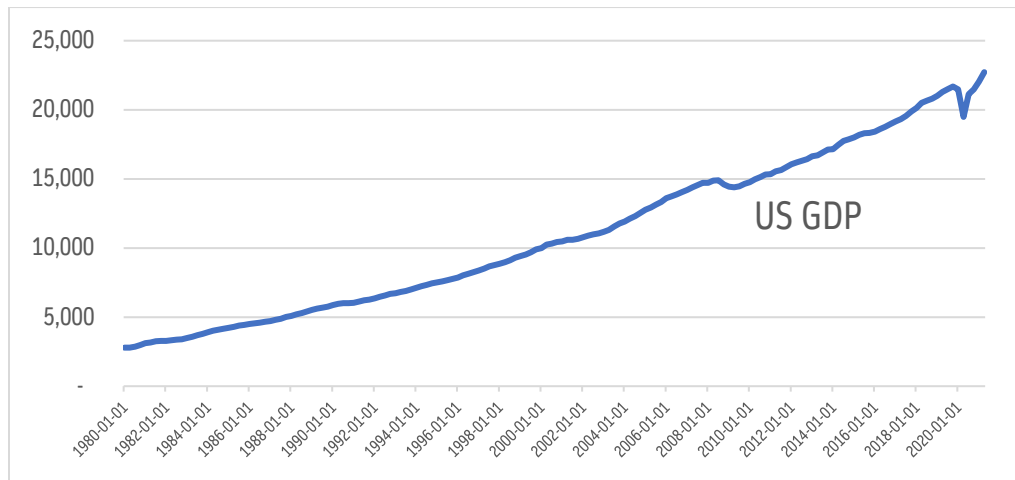


Chart 2. – Source: Federal Reserve

You look at it for a minute and say, "Well, except for a couple of weird blips, that's very, very good. A gain from 2,700 to 22,700 currency units of GDP on our planet is a lot, a very large number. That's over 8X. Congratulations are in order, but what's the deal with interest rates."

So, the New Yorker laughs of course and says, "That's not 22,700, those are billions. Our GDP is 23 trillion. Every year. And if you think that's a large number, wait till you see a chart of how much money our government owes other people..."

So, what is the deal with interest rates? The larger question is, can our government control or influence interest rates anyway? If the Fed can influence rates, is it across the whole term structure? I think if there was any debate before the past two recession cycles, there isn't now. The Fed has exhibited a tremendous, noticeable influence on rates by buying fixed income securities because, simply put, this is how the market works. We know the Fed has significant control over very short-term rates and there is evidence the Fed has some control over long-term rates through the implied forces of gradualism – the market knows(feels) that the Fed is forward-looking and will adjust the term structure through incremental changes in policy over time in response to changes in outlook. This concept is discussed in a paper published by the Federal Reserve Bank of San Francisco in their "Economic Letters" section dated May 20, 2005.¹

I bring the subject of the degree to which the Fed can control interest rates to the table because we know rates are as low as they've ever been, and the wider effect of very low interest rates is well known. There must be some intention at play, and this is borne out by every communication from Fed meetings. We do

¹ Oscar Jorda, *Can Monetary Policy Influence Long-term Interest Rates?* (FRBSF Economic Letter, 2005).

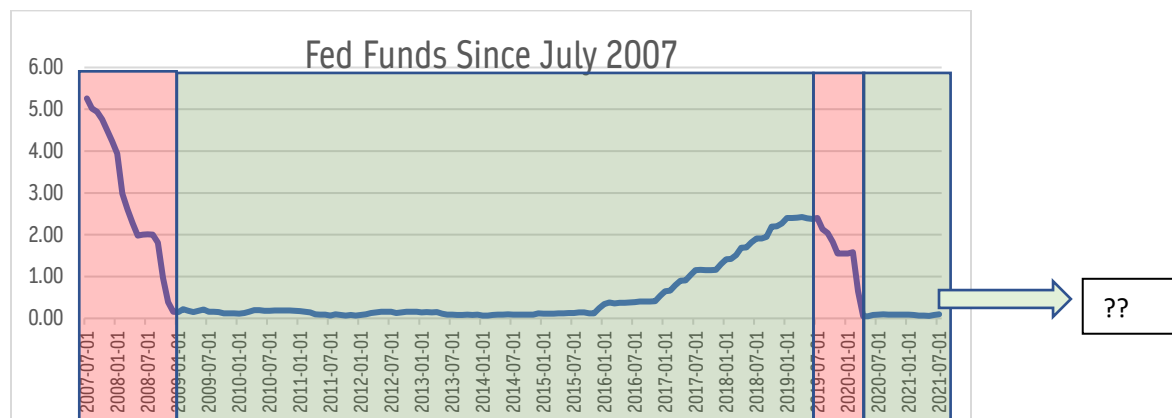
hear about demographic changes as a contributing factor to low rates. The older folks of an aging population are savers, not spenders, so this slows down the velocity of money. There could be many other factors why interest rates are low, and N. Gregory Mankiw, an economics professor at Harvard, listed some in an article in the New York Times from December 6, 2020.²

To some extent the Fed's hands are tied in relation to interest rates because of globalization. We only have a certain degree of autonomy, somewhat like a larger European Union. We can't raise rates here in the US up to or past the rate of inflation regardless of how strong the economy is because it would create imbalances in currency markets and global trade. In fact, because of the pandemic, the Fed is keeping rates well below the rate of inflation. On that basis, nobody would find fault if the Fed had already begun nudging rates upward.

It barely needs to be added, there is a huge incentive to keep rates low now and forever with the size of the deficit. Interest payments might overwhelm the budget given a substantial backup in rates. One might think the Fed would be better off raising rates a bit more now to squelch the possibility of much higher inflation later, but that's not the course of action.

I believe there is also another factor at work called the "ratchet effect". According to anybody that owns any capital investment with borrowed money, or wants to make a capital investment, lower interest rates are better than higher. Many more market participants are helped by lower rates than are hurt by them because fixed-income retirees is a small segment of the population. Politicians know this and will always push for lower rates than might otherwise be warranted. In a 2018 interview on CNBC, former Fed Chief Greenspan said, "The best thing that you can do if you're in the Fed is put earmuffs on and just don't listen. I was at the Fed for 18 ½ years. I got innumerable notes, pledges, request, et cetera to lower rates. I do not recall a single instance where somebody in the political realm said we need to raise rates, they're too low."³

I would say Greenspan was being very optimistic in implying that neither he nor any other member of the Fed would ever suffer from any cognitive bias. Frankly, though, we can give them the benefit of the doubt and stipulate the Fed is free from a systemic bias towards lower rates. This doesn't change my opinion that the broader economic and political system has entrenched itself in the mantra of ever- lower rates and that the Fed is just existing within the system. Just look specifically at a chart of the Fed Funds rate since 2007.



² N. Gregory Mankiw, *The Puzzle of Low Interest Rates* (The New York Times, December 4, 2020).

³ Jeff Cox, *Greenspan to the Fed: 'Put earmuffs on,' Trump's criticism is nothing new...* (CNBC 10/18/2018)

Chart 3. – Source: Federal Reserve

Drops in Fed Funds are nearly instantaneous in response to crises, but the claw-back takes years. By late 2018, a full 10 years after the financial crisis, Fed Funds had only gotten back to 2.50%, half of what it had been before 2008. And even then, because markets went into a free-fall in late 2018, the Fed buckled and decided they had to start lowering rates again. Rates had already fallen quite a bit before the COVID crisis hit. Again, an immediate drop to near zero (or below zero if you consider the “shadow rate” as explained later). Now, the current Fed chief Jay Powell has already said short-term rates will stay near zero for many years. It’s hard to imagine what kind of growth or inflation would cause the Fed to substantially change its mind now. This asymmetry produces a bias towards lower rates. As time goes on, each next crisis will occur before the last one is cured so-to-speak.

The debate surrounding why interest rates are so low and whether the Fed is to blame is very complex and interesting. There is no debate, however, as to the benefit to capital assets like real estate and equities. Simple math reveals certain truths: if a prospective homeowner has \$3,000 to spend on a mortgage today, they can borrow about \$730,000 at 3% (or lower) for 30 years. At 10%, \$3,000 will buy you \$383,000 for the same period, a little more than half as much as at 3%. Mortgage rates were over 10% for about 12 years, as recently as 11/1990. For a while way over 10%. The borrower today can wrangle much more money out of the local bank, so they have more to spend, which pushes up home prices. Simple economics.

The same concept, which is so easy to demonstrate with mortgages and home prices, applies everywhere in the economy. Businesses can expand more easily, and corporate profits become more valuable, so stock prices go up. When rates are at zero, stock valuations can go to the moon. The stock of growing companies with no profits does best because there’s no p/e constraint on the valuation at all. The mantra becomes, “Why would you want to own a bond”, the opposite of 1981 when the mantra was, “Why would you want to own a stock”.

Let us now introduce a chart of household net worth:

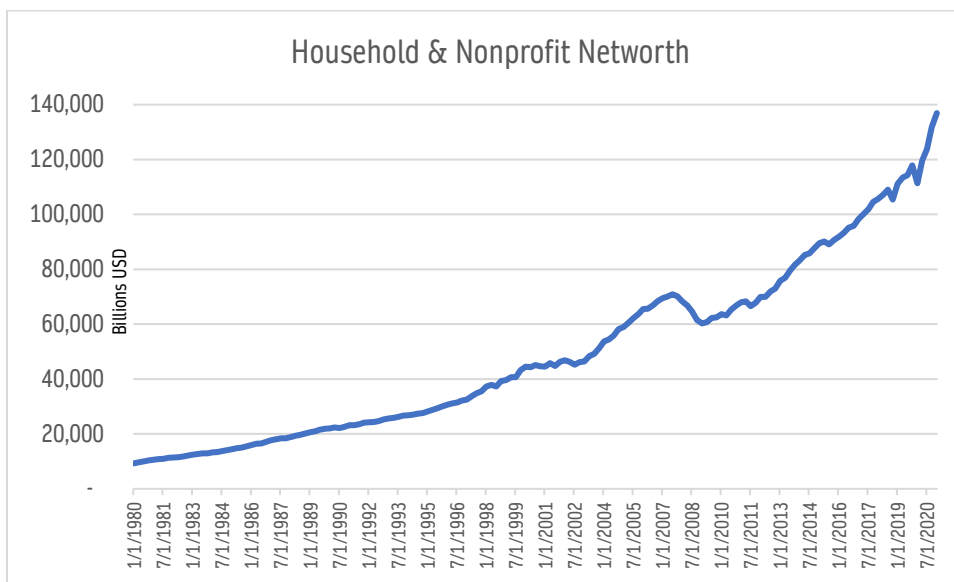


Chart 4. – Source: Federal Reserve

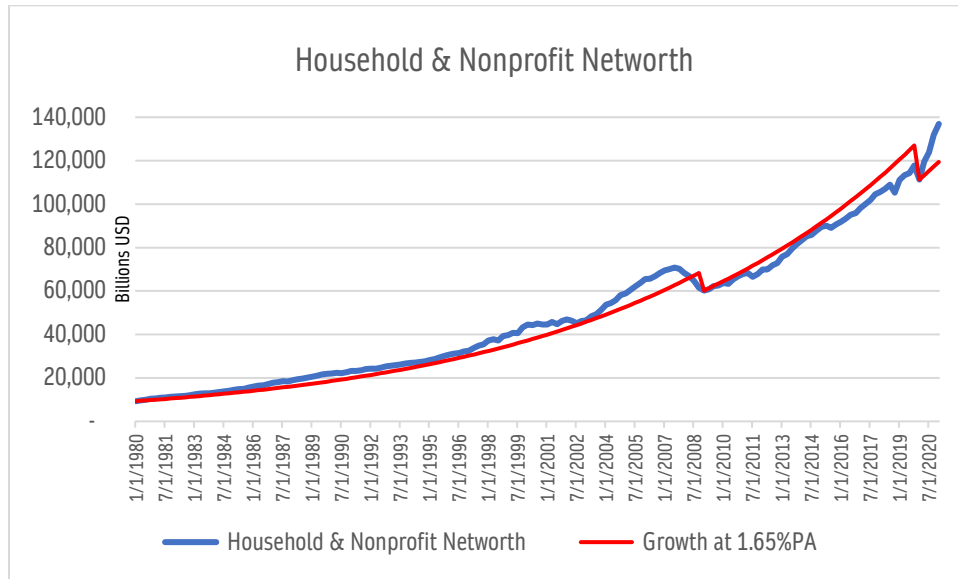


Chart 5. – Source: Federal Reserve

In the second chart I've inserted a trendline for growth at 1.65% per annum, resetting it back to actual at the bottom of the recessions in 2009 and 2020. Not dissimilar to the chart for US GDP although the spike after the COVID recession is even more pronounced and the growth since 1980 is 14X. It also highlights how massive the growth has been since the COVID bottom. The Household number is just one component of total US wealth. I don't have a chart for it, but including other components of US wealth brings the net worth of the US to about **359 trillion** in mid-2021, up from about **225 trillion** in 2013.⁴

Would the chart of household wealth look like this if rates had never changed during the intervening 40 years? A lot different for sure, but that's not fair because I'm not making the argument that rates should never stray from the average. I am, however, making the argument that over the next 40 years the 10-year Treasury can't go down another 1400 basis points. Or even the 500 basis points from the long-term average. There is little more ammunition to give on that front. Short term rates **can** theoretically stay near zero forever, however, and that is better than going up. So, then the question becomes how much economic activity benefits from rates that are falling, and not just low? Is there a psychological component to falling rates as well?

There is another well-known bias called "loss aversion" that affects human behavior, and to the degree that a governmental entity can exhibit loss aversion as well, I have no doubt this is in play. The prospect of losing a million dollars is worse in magnitude than the magnitude of joy in earning it. What about the prospect of losing 359 trillion dollars? The federal government has adopted the position that it will do anything necessary to make sure the GDP never declines meaningfully. The "full employment" and "stable prices" mantra is just a framework for rationalization.

⁴ Z.1 Financial Accounts of the United States Report, 2013 & 2021, Federal Reserve, and my calculations.

Interest rates might be the most influential driver of economic conditions but let's explore the other means the government has at its disposal to make sure GDP keeps growing.

Falling Tax Burdens on the Wealthy and Corporations

In 2017 substantial changes were made to the US tax code. One of more prominent changes was the statutory corporate rate from 35% to 21%. Here is a chart of corporate and individual top marginal tax rates since 1968:

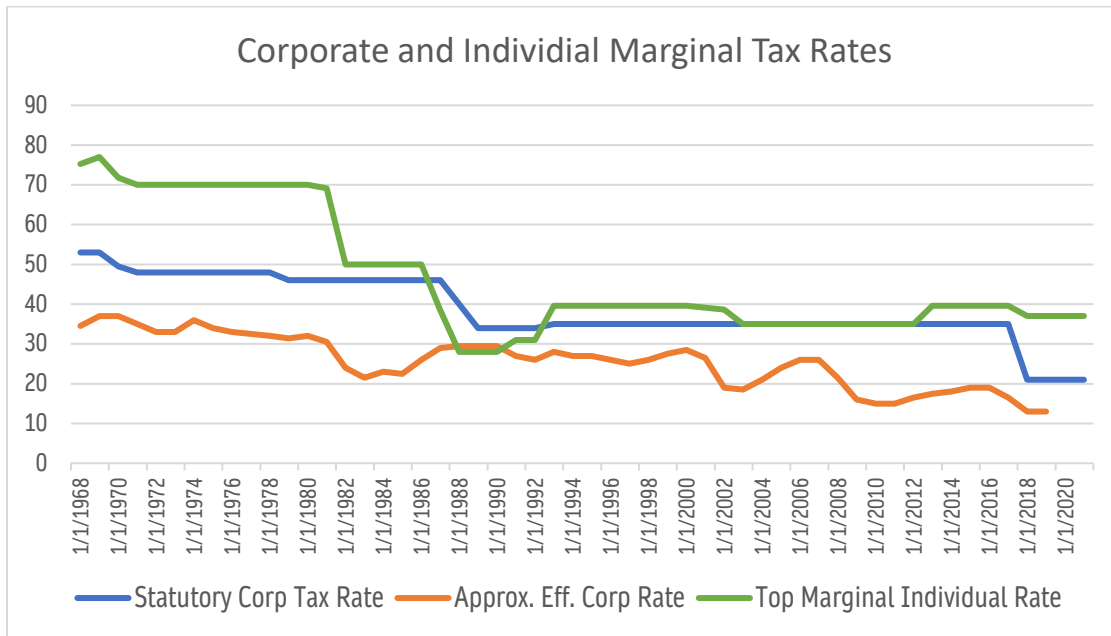


Chart 6. – Source: Federal Reserve, World Tax Database

It might be a little shocking for anyone not already aware, just how high the top marginal tax rates were for individuals until 1980. Yes, most of the decline in the top marginal rate after that happened before 1990. The current rate of 37% feels high enough, but at 77%, there wasn't much left. Even for an investor with a bond portfolio averaging a yield of, say, 12%, the after-tax yield only from federal taxes would be 2.76%, not that much better than today. Quite an incentive to invest in tax-free or tax-sheltered instruments (and not work).

To be fair, the majority of the population doesn't pay the top marginal rate and has to work for a living. Total tax revenues as a percentage of GDP have remained fairly stable, but not against the total Federal debt:

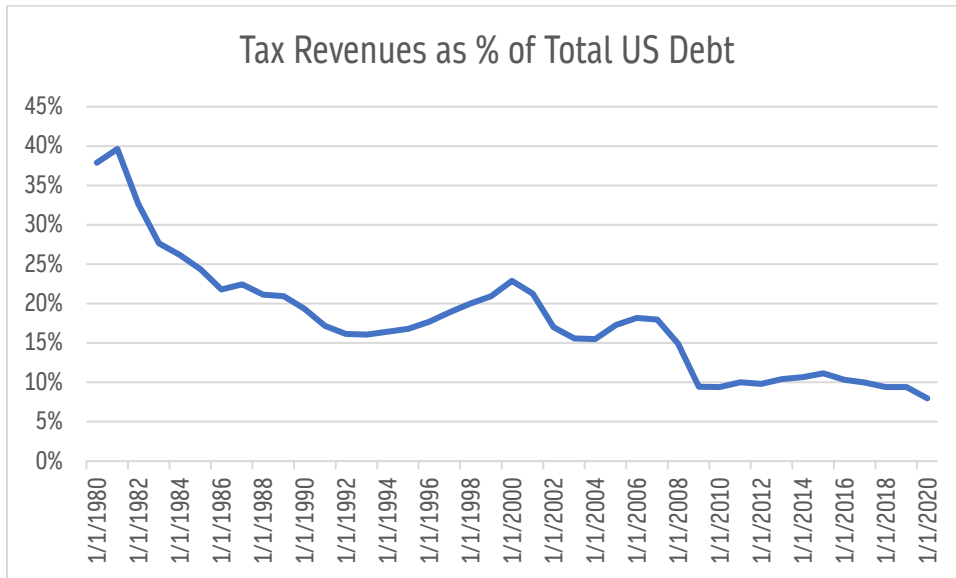


Chart 7. – Source: Federal Reserve

From a high of 40% in 1981, annual tax revenues stand at a paltry 8% of the Federal debt. Yes, interest payments are lower because of low rates but that ignores the fact that the debt, in theory, might eventually need to be paid back from some source of revenue. Eventually investors might start to think, “Who cares if these bonds are earning a negative real rate of return of -2% when the whole 100% is at some risk?”

Corporate tax cuts were the most controversial part of the 2017 tax changes. One main argument for the cut was that other countries had a lower corporate tax rate than the US. To me this sounds like calling your bank and asking if you can lower your car payment because your neighbor across the street has a lower payment than you. “Yes, but he bought a Ford, and you bought a Lamborghini,” your banker might reply. Regardless of the arguments for or against, it had the effect of allowing corporations to keep more of their money which of course will bump stock prices. And it will continue to support stock prices every single year, it’s not a one-time thing. The attendant trickle-down-effect postulation is a way for wealthy taxpayers to feel better about keeping ten dollars for every one dollar less advantaged people receive from changes in policy. (My factor of 10X is hypothetical, only for illustration. The actual benefit of tax changes like that is probably much higher.)

I don’t have good data on the effect of lowering the top marginal rates on the highest earners. Lower tax rates for individuals will put more money in pockets but it will also propel investment and risk taking. This will boost GDP and has the potential to raise tax revenues in later years. An evident weakness to this argument is that tax revenues have only gone up about 500% since 1980 when household net worth has gone up 1400%. This is because incomes haven’t risen as fast as the wealth effect, and we don’t have a wealth tax (other than property tax) in the US.

Tax rates are different than interest rates in that they are set exclusively by policy, not markets. It seems a “perfect” tax rate shouldn’t be too hard to determine through economic analysis. This isn’t the case in practice though because of the same biases as discussed earlier and conflicting ideologies. The proof of the last point is that we tend to change them often. I’m sure US tax code will be changed many, many times in

the future. The question on the minds of investors is, will politicians ever be able to raise tax rates to stabilize the budget if a growing GDP doesn't do it?

I would frame a short summary of the tax issue in this way: in the short- to medium-term lower and lower tax rates will add to GDP, but it's somewhat less clear that lower tax rates will always directly lead to excessive asset price valuations. During low inflation periods, consumers may opt to keep extra money not taxed in cash and do the opposite during periods of high perceived inflation by investing in securities that benefit from higher inflation. If tax rates went down because the government started running much more efficiently and spent less money governing, lower taxes receipts wouldn't be any problem at all.

Bailouts, or the *United State of America Private Bank*

ProPublica has prepared an extensive and on-going list of bailout recipients in response to the 2008 Financial Crisis. I recommend looking at it, but here is the summary: 987 recipients received \$635 billion. Much of the money has been returned, indeed, and at this point there is a net profit to the government of about \$110 billion according to ProPublica.⁵ The overriding issue here then is not how much was added to the debt but rather the degree to which we, as Americans, are willing to temporarily de facto nationalize a large segment of the private economy to survive. The answer is, to any degree necessary. Does it mean future generations of bankers and investors might book too much risk knowing the government is there to pick up the pieces when it sours? Of course, and when do bankers and investors undertake too much risk? At the same time all the other bankers and investors do.

I agree this is a somewhat cynical appraisal. There were real changes to credit lending standards after 2009 that continue to this day. Banks are well-capitalized and profits will only be helped when interest rates do finally rise.

The unanswerable question is, where would we be without the bailouts? A much different place surely. It's difficult to argue, however, that the government should never provide assistance to institutions only to avoid the safety net syndrome.

In some cases, among the 987 recipients, shareholders did lose everything, but in most cases the institution as it existed in 2007 remained intact and equity holders that rode out the crisis survived intact and are now much better off. This is not a free economy.

When all else fails, Helicopter Money

There is something fundamental that is happening in our socio-economic scene here in America, and perhaps in the entire developed world. Consider these two pictures, which depict images probably familiar to the reader:

⁵ Paul Kiel and Dan Nguyen, *Bailout Tracker* (ProPublica April 15, 2009, and updated August 30, 2021).



On the left, a food line from the Depression Era. On the right, a food line from COVID Era. In the one on the right, there are millions and millions of dollars in value of cars. What I see is a modern economy that has provided lots of relatively expensive things via low interest rates and easy credit to a large number of people who have no safety net. Put another way, it's getting more and more expensive for the government to keep people up with the status quo in case of emergency. **I believe there is a compounding effect in play that stipulates more and more relief/stimulus will be necessary just to stay in place as the programs pile up over time.** If the US government debt has grown by 18 trillion since 2007 to keep the economy growing at the current rate, then it will have to increase by, say, 3X or another 60 trillion over the next generation to keep the economy growing at the same rate. This is probably conservative. In 20 years the total debt could be closing in on \$150 trillion barring other unforeseen circumstances or dramatic changes in policy. The debt has been compounding at 8.8% since 1980, and applying that same growth for 20 more years equals \$142 trillion. What comes after a trillion? Maybe not in my lifetime, but one quadrillion.

How will it happen? By continuing to give people money in a manner that really kicked into high gear in 2020 during the pandemic. The COVID crisis may or may not be different than other crises, I'm not going to try to rank them, but I will say that the government is over-compensating regardless. What is the total for COVID relief as of this writing in the fall of 2021? About \$4.6 trillion just since March of 2020 and more is budgeted.

But the flow of stimulus actually started at least as far back as June 2001 with EGTRRA. EGTRRA was a Bush era package of tax cuts aimed at helping consumers across all strata. It was targeted at \$1.35 trillion, and according to the CBO did in fact reduce tax revenues by about \$1.2 trillion over 10 years. Next in 2003 came the JGTRRA. This relief, in conjunction with aggressive interest rate reductions and lax lending practices in the early 2000's (Tech Wreck) led to the housing bubble. In February 2008 the Economic Stimulus Act of 2008 was enacted by President Bush when the economy started to look shaky. The target amount for this Act was \$152 billion. (Looks trite now). What's interesting is that this Act arose during a Republican administration in response to indicators that there was a threat of recession, not even the actual recession that started later in the year. This gift also mainly took the form of tax rebates. Next up sequentially was the American Recovery and Reinvestment Act of 2009(February). The ARRA was far-reaching and I would refer the reader to the many sources online as to where the \$831 billion for this Act went. So about one trillion within that year. Then there was TARP, and ATRA and more recently the CARES Act. I believe it's not too hard to argue the financial crisis of 2008-2009 was deeper and broader than the COVID recession. The catalyst of the Great Recession was a fundamentally economic one that affected a wider cross section of the

American economy. In hindsight, it appears the governmental responses to the earlier crisis and the more recent one have little consistency in magnitude. The implication is that the more recent one is too large. For further analysis see:⁶

Wait, there's more; Federal Reserve Asset Purchases

When the Fed walks into the open market and buys securities, usually fixed income, they are increasing the money supply and exerting upward pressure on prices (and downward pressure on rates). It's easy to keep track of this via the Federal Reserve's website:

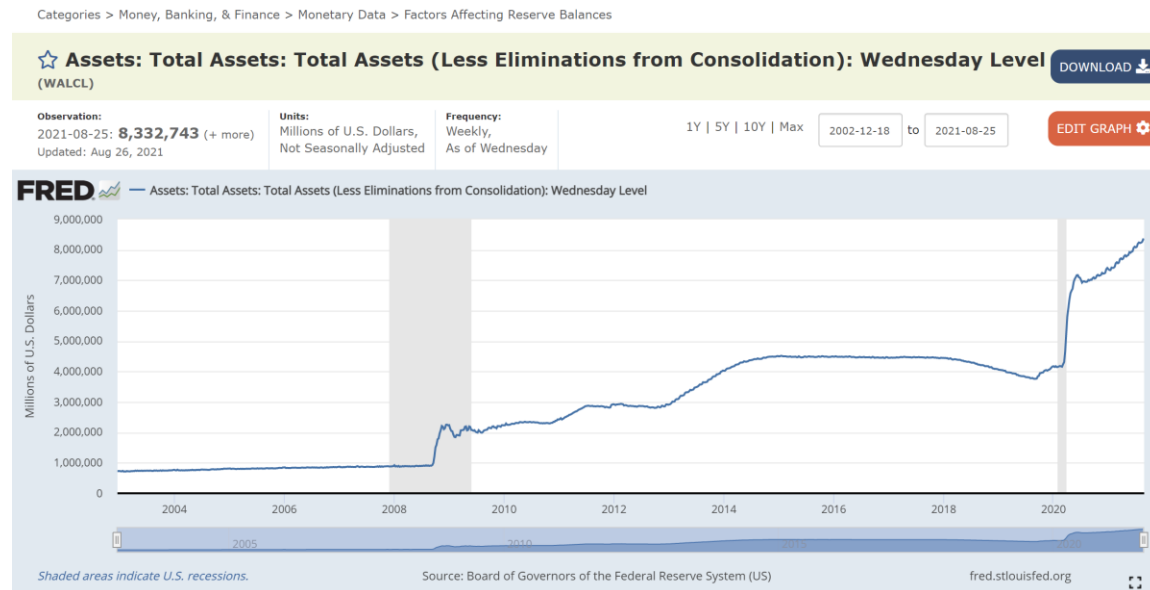


Chart 8. – Source: Federal Reserve

Easy enough to track the growth in the Fed's balance sheet caused by buying securities worth trillions. In fact, just a little over 7 trillion since 2008. This is done to..., wait for it, ...help the economy. Since the Fed started easing rates via this method in 2008, remarkably little stimulus was bled from the market by selling securities previously bought. It was done, though, starting in early 2018 continuing until September 2019. Soon after, the pandemic hit and the Fed started another massive round of bond buying that continues to this writing.

“Quantitative Easing” is a mechanism by which the benefit of deeply negative rates can be enjoyed without actually setting interest rates there. The greater money supply gives rise to a “shadow rate” as explained by Wu and Xia (2016).⁷ See chart next page.

⁶ Kathy Ruffing and Joel Friedman, *Economic Downturn and Legacy of Bush Policies Continue to Drive Large Deficits* (Center on Budget and Policy Priorities, February 28, 2013).

⁷ Jing Cynthia Wu and Fan Dora Xia, *Measuring the Macroeconomic Impact of Monetary Policy at the Zero Lower Bound* (Journal of Money, Credit and Banking, March 14, 2016).

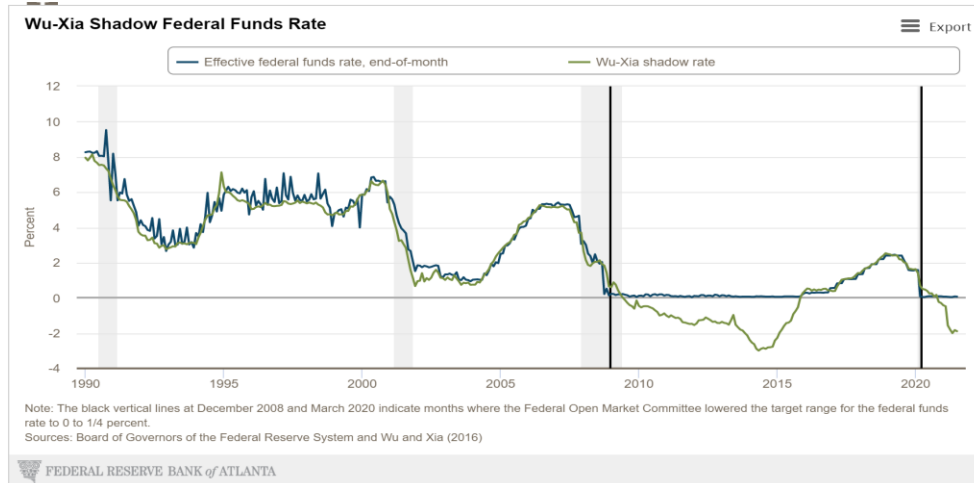


Chart 9. – Source: as stated on chart

According to this methodology, the shadow FF rate got as low as -3% in 2014, and now stands at -2%. Undoubtedly this rate will go at least a bit lower, even barring any other near-term shocks from COVID or elsewhere.

Unsurprisingly, the Fed has now created another highwater mark from which it can only gingerly recede without upsetting the markets. Everyone waits with baited breath as to when the next “taper” will begin. I will be interested to see if the markets will allow the Fed to taper as they see fit or if pandemonium will follow despite the Fed’s best attempts to “telegraph” the taper in advance. If the M2 velocity of money never rises, money supply can’t be withdrawn without causing GDP to decline.

Finally, Mortgage and Renter Moratoriums

I haven’t found hard data to accurately enumerate totals relating to moratoriums and forbearance on renters and mortgage payers. One study estimated a cost to landlords in LA County of about \$3 billion, so if we scale that up to cover the whole US it would be about \$100 billion.⁸ The affects of these acts of relief are different than the others I have discussed. Landlords and financial institutions are bearing the direct burden of moratoriums due to COVID. It was mandated by the government though, and there will be a secondary cost the government will bear. The government will absorb some of the cost as it indirectly assists investors through tax abatement and other means. This action *might* be unique to COVID and not repeat itself in the future, but I think there’s a real danger that once any relief program is invented and implemented, it will be more quickly triggered in the future. (See: everything else).

I’m not making a value judgement one way or another on moratoriums. The cost to society for millions to lose their homes is very high as we saw in 2009. It is true, though, the number of homeowners who lost their homes to foreclosure in the Great Recession was greater than the number of payers now enjoying a moratorium by a factor of more than 5-to-1.

⁸ Gary Painter, *The Eviction Moratorium Won’t Save Renters—or Landlords* (Politico, August 10, 2021)

I'm leaving this effect out of my chart of total cumulative assistance on purpose because it's so hard to calculate any real numbers.

Beyond the more obvious and direct methods of stimulus discussed above, in reality, all deficit spending is stimulus. We can combine everything the government spends money on but doesn't have revenue to cover. It's all accounted for in the total debt and adds to GDP.

According to a Certain Mode of Thought, None of this Matters!

I'm being a little loose with my depiction of Modern Monetary Theory. The central tenet of MMT prescribes that the US can create any amount of money it needs to ensure full employment in response to any crisis. It doesn't address the other methods discussed above to goose the economy. MMT as adopted by Stephanie Kelton and her followers is controversial and I would invite the reader to investigate the concepts further because our government seems to be adopting them.^{9,10} I won't undertake a point-by-point rebuttal to MMT here as it's beyond the scope of this paper. I will, however, endeavor to point out that to say deficits incurred by sovereign countries can be used to provide for full employment without side effects sounds a little too good to be true. An overriding force in play has to be a powerful bias towards believing that something so pleasurable, i.e., giving freshly printed money to people or to institutions that promote job-creation is also the best course of action. Is it possible that the best solution to long-term stability and credit-worthiness of the US is also the one that makes everybody happy? Yes, it's possible but highly unlikely.

Ms. Kelton answered questions on the "Odd Lots" podcast sponsored by Bloomberg dated March 18, 2021. When asked how she's so sure that her line of thinking is correct, her answer was that gross indebtedness hasn't backfired yet, so why should it ever? To me this is like the person who jumps out of an airplane without a parachute and on the way down says, "This is no problem, this is no problem, this is no problem...". Well, you get the idea.

I think the MMT'ers would say ballooning deficits are just for temporary fixes and not necessarily meant to be permanent. I just think it's much, much harder for the government to get back money previously doled out once it's in private possession.

Summary and Conclusions

For the summary I would like to concentrate on asset prices. I think there's no doubt the sum total of all the tailwinds outlined in this paper have contributed substantially to the current level of capital asset values. I haven't seen anything in the literature that would suggest otherwise for any one of the components discussed, and taken together the evidence is very strong. Since asset prices are determined at the margin, it's useful to remember that a relatively small amount of buying pressure can force prices up when it's (mostly) all in the same direction. It's worth remembering also that there can be both a cash savings glut and high asset prices concurrently when the world is awash in so much liquidity. As I illustrated, high asset prices are a simple function of math as the inverse of interest rates. As long as inflation stays low, or the Fed ignores it, rates will stay low and stocks will be the favored investment. Caveat being, stocks at any price can

⁹ Stephanie Kelton, *The Deficit Myth* (PublicAffairs, NY, 2020)

¹⁰ Dylan Matthews, *Modern Monetary Theory, explained* (Vox, April 16, 2019)

always be rationalized through earnings multiples and earnings expectations could be derailed by changes in interest rates.

The crux is, how much more can the modes of stimulus contribute? There are some alternatives going forward. One is **no additional** stimulus. Meaning interest rates stop going down, relief checks stop going to citizens, the Fed stops buying bonds, and tax rates don't change and people are forced to start paying mortgages and rents again. I'll submit that even this scenario is extremely dangerous for the markets despite describing the way the economy has been known to survive quite well in the past.

The second scenario is scarier, that being, if **interest rates spike**. The consensus is that this is unlikely in the near future, and I would have to agree. I will say, though, that the consensus is usually for little- to no change in levels whatever the item being forecasted. **History is determined by things that are unpredictable.** Interest rates are not immune, just consider the alternatives. What are the chances they never change, or only by a very small amount? Almost zero. The possibilities of dramatic spikes in rates, or tumbles, both have high probabilities of happening in the future. Especially considering negative rates, both real and shadow, are always possible. I'll venture that when a substantial rise in rates happens, it might be for a reason not anticipated now. Maybe not even inflation. I'll also venture that it will be vicious and swift, not like the 0.25 rate hikes the Fed would prefer. If the Fed is unable to keep rates down, or willing to let them rise, asset prices will take an exaggerated hit. I'll predict the horizon for a spike in rates in the US that causes a severe financial crisis is highly likely within the window of **5 to 15 years**.

A third scenario is one where the government is able to manage any crisis thrown at it through **perfect application of the latest monetary theories**, and then when everything is all ok, bleed off all the excesses without anyone noticing. Sounds absurd just writing it and I give this scenario very little hope.

In all likelihood, for the foreseeable future, the Fed will continue buying bonds, and continue to keep rates lower than they should be relative to inflation. Lawmakers will continue to spend money they don't have and hold tax rates lower than they should be, even if at a higher level from here.

The true end-game, I believe, is at the intersection of wealth accumulation and climate change. **There's a very high probability in my opinion that the point at which the broader markets can't take anymore US debt, and the true cost of climate change becomes evident, will coincide.** This is the greatest financial risk. It may not be the next financial crisis but it's lurking in a shadow down the line.

The implications for investors going forward are many, but for the time-being I recommend a substantial exposure to equities and growth equities, depending of course, on personal financial situation. Our pro-growth, pro-stimulus and pro-corporate culture in the US is too deeply established to recede anytime soon. However, it makes great sense to peel away profits on a regular basis into defensive assets that will withstand the inevitable shocks.

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Appendix I

The following table is a numerical summary of the effects and programs included in the paper above. I'm grouping "excessive capital asset valuations" (sections 1,5) together with direct cash payments (sections 3,4) and all other deficit spending (section 6) under the idea of broad economic benefit. My estimates are meant to be a generalization as a representation of the magnitude of the effects involved. It's impossible to be precise given the number of variables.

Economic Stimulus Item		Estimates of Economic Benefit as of 9/2021		Footnotes
1)	Falling/Low Interest Rates	Real estate	20,000,000,000,000	1.
		Corporate Stock	27,260,000,000,000	2.
		Other Addition to GDP	12,632,000,000,000	3.

2)	Falling Tax Rates	<i>Included in Deficit 6) below</i>		

3)	Direct Payments to Corporations	After 2008	635,000,000,000	4.

4)	Direct Payments and other Programs to Consumers, Tax Payers, Corporations	EGGTRA 2001	1,200,000,000,000	5.
		JGGTRA 2003	<i>Included in Deficit 6) below</i>	
		ESA 2008	152,000,000,000	
		ARRA 2009	831,000,000,000	6.
		TARP 2009	<i>Included in Deficit 6) below</i>	
		ATRA 2012	<i>Included in Deficit 6) below</i>	
		CARES Act and Supplements 2020-2021	4,600,000,000,000	7.
		State/Local Relief	unknown	
		Administration of COVID Relief	725,000,000,000	7.

5)	Asset Purchases by Federal Reserve		7,800,000,000,000	8.

6)	Increase in Total Federal Deficit since 1980 not included above. (Infl. Adj.)		16,347,000,000,000	9.
		Total	92,182,000,000,000	

Footnotes:

1. Conservatively factoring one-third of current value of US real estate attributable to current interest rate structure. Zillow estimates current US residential home value at approx. 40t. Estimating commercial RE to be about 50% of residential the total is 60t or 20t at 33%.
2. 58% of current value. Projecting an interest rate reset to historical averages would reduce current US corporate stock P/E from 35 to 15.
3. Relying on paper written by Samuel Reynard, QE Equivalence to Interest Rate Policy: Implications for Exit (Swiss National Bank, 2015-Draft). 400bps decline in CB rates results in 1.75% addition to GDP. I've applied this metric to the US GDP each year since 1980 against an average FF rate of 4.67%.
4. Data from ProPublica, see reference in body of paper.
5. CBO
6. CBO, 2017
7. covidmoneytracker.org, Committee for a Responsible Federal Budget.
8. Federal Reserve.
9. Inflation adjusted rise in deficit since 1980 is 23.8t. I've subtracted out items from section 4.