Quantitative Easing, MMT, and Inflation/Deflation: A Primer

Quantitative easing (QE) occurs when central banks, such as the U.S. Federal Reserve, create new money to buy government bonds or other securities.

Some people fear that it will cause high inflation or even hyper-inflation and that it is essentially money-printing, while others suggest that it has no impact on inflation because the money that is newly-created or “printed” gets locked away in bank reserves rather than ever making it to Main Street (a term for the broad public), or that the printed money is otherwise offset by deflationary forces of debt and demographics.

Based on history and math, the inflationary side of the argument is eventually correct, but with a lot of nuance along the way.

I’ve received tons of emails and comments in the past few months from people that want research on this topic, to provide a model to think about the deflationary forces of debt and the inflationary forces of unprecedented fiscal and monetary response policies.

One thing I’ve noticed is that the inflation/deflation debate tends to concentrate into the extremes of crippling deflation or hyper-inflation. What about moderate or high inflation as a possible outcome in the
years ahead? And how about some actual numbers to see how we get to different possible outcomes, rather than just claims of deflation forever, or hyper-inflation just around the corner?

This article discusses quantitative easing (QE), Modern Monetary Theory (MMT), and inflation/deflation, and how they link together.

The first part provides several examples of government financing, to walk through differences in money flow in a QE or non-QE environment, to tease out what the impacts are and show how some of that QE money does make it to Main Street (not just locked in reserves), despite some claims to the contrary.

The second part dives into numbers about inflation, to get an idea of how the magnitudes of various policies can affect the broad picture as it relates to inflation and deflation.

It sounds wonkish, but having a framework for how this works in plain English can help investors determine for themselves how to allocate their wealth to different asset classes. All asset prices are priced in dollars or other currency units, but those units, the denominator of measurement, shifts over time, and we need a way to track it and predict it, and in particular what events to look for.

Part 1) Four Examples of Government Financing

A government extracts taxes from the economy it governs, and then spends that money back into the economy in various ways, with of course much debate among politicians and citizens for how much to tax, how much to spend, and where to spend it.

In addition, a government of a country can also borrow more money from the public and redeploy it elsewhere. This allows them to spend more than the amount of money they bring in via taxes in a given year. This is obviously a useful option during wars or other crises. However, most countries use debt as a permanent source of additional financing, and thus their debt as a percentage of GDP keeps growing over time even when things are fine. In other words, they never pay down debt, but rather keep rolling it into a larger and larger base of borrowing.

Leverage is like a glass of wine. A little bit can be a good thing. Too much can be disastrous.

For some examples of good leverage, a startup needs financing to develop their products and scale their business before they have significant cash flows. A blue chip corporation generally uses some continuous low-cost debt as part of their permanent capital structure to reduce their cost of capital compared to a debt-free pure equity business model. A responsible consumer might take out a low-cost mortgage so that they can buy a house earlier than they would if they stuck exclusively to cash, and the house often appreciates over the long run and offsets rent expenditure.

In other words, modest leverage for investment purposes is fine. It lowers the cost of capital compared to pure equity for mature businesses and it allows for more rapid build-out of new businesses. When managed prudently, the risks are modest and the benefits are significant.

Similarly, if a government uses debt to win a necessary war, or fix a crisis, or provide a major infrastructure improvement, that can be a good thing. Even when the government carries a bit of debt consistently, it provides the public with a safe vehicle for savings and collateral (e.g. the Treasury security market), and basically improves the capital structure of government, in a certain way of thinking about it. It can potentially pull forward some scientific breakthroughs or other benefits as well, depending on where the money is spent.

However, if an entity consistently spends more than it earns and racks up debt, it can lead to a lack of financial flexibility going forward, or outright insolvency. If debt becomes too large to service, lenders may demand higher interest rates in exchange for higher repayment risk (credit risk + inflation expectations), and it can cause a death spiral where the debt becomes unserviceable and leads to default or currency devaluation.
Sovereign governments that print their own currencies have more flexibility than any other type of borrower. The economics for monetary sovereigns work very differently compared to other entities such as households, companies, or countries that are not monetary sovereigns (such as the Eurozone nations). For monetary sovereigns, nominal default is not the key risk as it pertains to leverage, because they can always print enough to cover their obligations. Instead, currency devaluation and inflation are the risks for monetary sovereigns. They can default softly by reducing the purchasing power of their debt, and so they tend not to default nominally.

Here are four models of government borrowing, which help us work our way up and see how QE and MMT fit into the picture as it eventually pertains to inflation and deflation.

**Model 1) Domestic Government Borrowing**

This is a basic model for government debt, without QE or any extra things.

In addition to using tax revenue on spending, the government also issues bonds, which domestic individuals and institutions can choose to buy, generally in exchange for interest payments and eventual return of capital when the bond matures. Domestic lenders give the government money, and the government gives them an IOU in the form of a sovereign bond, or a Treasury security in the United States.
The government then deploys the combined tax revenue and net borrowing back into the economy in the form of public spending, such as military activities, public infrastructure, a judicial system, a social safety net, national parks, public services, and so forth. Each country decides what services they want to be public or private or a bit of both. Some uses of capital have a high return on investment for the public, while other uses of capital have poor returns.

Governments tend to roll those debt maturities into the next round of borrowing, rather than ever paying down debt, which can work well as long as debt as a percentage of GDP is relatively stable.

In this model, we “owe the debt to ourselves” in a national matter of speaking. However, debt is still real. The person or institution that lent the money expects it back with interest and with its purchasing power intact. It's not like everyone lent money to the government; some people did and some people didn’t, and in various amounts. So, the flow of capital still needs to be respected. But at least in terms of aggregate funding, it’s from the nation’s citizens and institutions.

When it comes to this government debt, there is no free lunch. The person or institution who lent the money to the government could have lent it elsewhere, or could have used that capital in another way. People describe this as the “crowding out” effect, meaning that if the government borrows too much from its people, it competes with and replaces a lot of investment they could otherwise do.

As some constructive examples, the lenders could have instead spent it on charity, could have started a business, could have lent it to an existing business, or could have put it in the bank and now that bank has a more equity and lending power to other businesses, consumers, and investors.

For some less constructive examples, the would-be lenders could have instead stashed the cash under their mattress, or they could buy their own private island and make the world’s largest zoo on it and then never invite anyone else to see it.

All of those alternative uses of capital have various financial risks and rewards, as well as personal satisfactions. And then from a macroeconomic perspective, if done at a sufficient scale, they can affect the magnitude and type of growth in the country. In other words, a nation generally does better in terms of economic growth if people on average are putting capital in good businesses and charities, rather than under their mattress or into an unusually large quantity of private petting zoos.

The point is, from a high-level view on enhancing national productivity and real wealth and material wellbeing, lending money to the government via Treasury bonds is one particular use of capital, and it has an opportunity cost because it comes at the price of other potential uses of that capital in private markets which could be more or less beneficial, either for one's own self or from a macroeconomic perspective.

An example of a good government spending program that would have been hard to replicate privately is the interstate highway system, put in place under the Eisenhower administration. This was useful enough that it’s fairly easy to argue that it was worth borrowing and getting it built as quickly as possible, to pay down over time, rather than waiting to finance it purely with taxes, because it was strongly beneficial to economic growth during and after completion and gave a big boost to productivity.

Readers probably don’t need an example of wasteful government spending, because everyone has their own list of what they agree or disagree with. Some are more obvious while others are more debatable. Failed wars are historically among the most notable examples of spending that ends up being far from the peak of economic optimization, but there are a variety of domestic spending examples as well.

The main crux of this model is that when the government borrows money from the public via Treasury bonds, the money is extracted from someplace within the domestic economy, and redeployed elsewhere in the economy. Money itself is neither created nor destroyed in this model of government borrowing; just moved around within the economy.

Although we don’t use any sort of gold standard anymore, it helps to think of this example in gold terms for illustrative purposes because that’s how it used to be and why this model exists in the first place.
government can't create gold (a proxy for wealth or hard money); it can just tax or borrow gold from the economy that it governs, and then redeploy that gold back into the economy via various expenditures.

**Model 2) International Government Borrowing**

The previous model was a closed system. In addition to the involuntary extraction of dollars from the domestic economy to spend elsewhere in the domestic economy (taxes), the government extracts additional dollars voluntarily from the domestic economy (selling Treasury securities to those willing to buy) and also spends those borrowed dollars elsewhere in the domestic economy.

If the government borrows too much in that first model, it can crowd out other uses of that capital, and could run out of lenders. And there is a real domestic opportunity cost of that capital; it's just one possible arrangement of domestic capital among the set of all possible options for how that capital could be arranged.

However, a government can extend their reach by borrowing from international lenders. This lets them spend money on the domestic economy without first extracting it from the domestic economy, which is a powerful (and abuse-able) tool.
Most developed countries don’t do this much. However, many emerging countries do regularly make use of this model, because they don’t have much domestic capital to start with, so they borrow money from wealthy foreign sources to start building key infrastructure and other foundations for growth.

Prudent emerging countries end up being very productive with that seed capital and eventually multiply it into positive net worth (let’s say via good infrastructure and a skilled workforce, for starters, which lets them start developing a trade surplus and building wealth), while other countries end up stuck in a debt trap because they don’t use that money very productively, fail to create a trade surplus, and yet still owe the debt to foreign sources. This is particularly risky for emerging markets because they usually borrow in external currencies (such as dollars or euro) that they can’t print, meaning that nominal default risk is significant.

The United States is atypical, because we are a developed country that makes extensive use of international borrowing, due to our historical and current role as the issuer of the primary global reserve currency. However, we borrow from external lenders in our own currency that we control, unlike emerging markets that often borrow in foreign currencies. We run persistent trade deficits with the rest of the world, meaning we consume more than we produce as a nation and therefore send dollars out to the rest of the world each year. Foreigners then reinvest a sizable percentage of those dollars to buy U.S. Treasury securities, meaning they loan those dollars back to the U.S. government in exchange for interest and eventual repayment. From a high level perspective in this existing framework, foreigners send us more products and services than we send them, and we make up the difference by sending them IOUs; promises to pay later. Whenever those IOUs are due, we roll them into later maturities.

Back in the first example, there is a real opportunity cost to government borrowing, because it draws from the same domestic pool of capital that could be used elsewhere. It re-arranges where the nation’s wealth is, for better or worse. It doesn’t add new money to the system.

In this second example though, foreign capital is added to the domestic system in exchange for foreign liabilities, which is why it is powerful and abuse-able. This can feel great while it happens, because it seems like we’re creating something out of nothing. We’re able to build extra infrastructure, or improve our military, or promise our citizens extra retirement benefits compared to what they paid in, or generally consume more than we produce, because we are spending more on our domestic economy than we are extracting from our domestic economy due to borrowing that extra capital from overseas with a promise to pay it back later, or forever roll it into later maturities.

This chart shows the U.S. national debt held by foreign sources as a percentage of U.S. GDP over time:
Back in the 1970’s and 1980’s, the amount of money that the United States government had borrowed from external sources was about 5% of U.S. GDP. The U.S. government borrowing model was still mostly a closed system with just a bit extra foreign capital. By the 1990’s and 2000’s, it increased to 10-15% of GDP. By the 2010’s, it quickly increased to 30-35% of GDP, which is a large amount of foreign borrowing.

Of course, while this can last for decades and feel great, it can’t last forever. Eventually, we run out of foreign lenders that are willing or able to lend to us. And the more we do this, the more we dig ourselves into a negative net international investment position (NIIP), meaning that foreigners own more of our assets than we own of foreign assets.

A country’s NIIP is ideally expressed as a percentage of GDP for proportionate comparison. The NIIP measures how much foreign assets (stocks, bonds, and real estate) are owned by people in a country minus how many domestic assets (stocks, bonds, and real estate) are owned by foreigners. Creditor nations have a positive NIIP, meaning they hold more foreign assets than foreigners own of their country’s assets. Debtor nations have a negative NIIP, meaning they hold fewer foreign assets than foreigners own of their country’s assets.

For example, as of the start of 2020, the United States collectively owns about $29 trillion in foreign assets, while foreigners own about $40 trillion in U.S. assets (including $7 trillion of our government debt), resulting in a NIIP of negative $11 trillion. With the country’s GDP of a little under $22 trillion, the NIIP expressed as a percentage of GDP is worse than -50%. The U.S. BEA keeps track of the NIIP [here](#).

After World War I, the United States became the world’s largest creditor nation. However, decades of persistent trade deficits, particularly in the 1970’s and 1980’s, resulted in the United States shifting towards a debtor nation starting in 1985. By 2008, our NIIP was -10% of GDP. In just the 12 years since then, due to persistent trade deficits and foreigners financing our deficits, we’ve rapidly deteriorated to a NIIP that is worse than -50% of GDP. All those IOUs have added up.

This chart shows the NIIP as a percentage of GDP for 32 nations as of late 2019, according to the IMF:
<table>
<thead>
<tr>
<th>Country</th>
<th>NIIP % of GDP</th>
<th>Country</th>
<th>NIIP % of GDP</th>
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<tbody>
<tr>
<td>Argentina</td>
<td>26%</td>
<td>Norway</td>
<td>221%</td>
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<tr>
<td>Australia</td>
<td>-46%</td>
<td>Phillipines</td>
<td>-10%</td>
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<tr>
<td>Brazil</td>
<td>-32%</td>
<td>Poland</td>
<td>-47%</td>
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<td>Canada</td>
<td>44%</td>
<td>Russia</td>
<td>22%</td>
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<td>Chile</td>
<td>-22%</td>
<td>Singapore</td>
<td>293%</td>
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<td>China</td>
<td>15%</td>
<td>South Africa</td>
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<td>France</td>
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<td>Germany</td>
<td>63%</td>
<td>Spain</td>
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<td>India</td>
<td>-16%</td>
<td>Sweden</td>
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<td>Indonesia</td>
<td>-29%</td>
<td>Switzerland</td>
<td>128%</td>
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<tr>
<td>Israel</td>
<td>42%</td>
<td>Taiwan</td>
<td>212%</td>
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<tr>
<td>Italy</td>
<td>-3%</td>
<td>Thailand</td>
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<td>Japan</td>
<td>67%</td>
<td>Turkey</td>
<td>-47%</td>
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<tr>
<td>Malaysia</td>
<td>-5%</td>
<td>United Kingdom</td>
<td>-18%</td>
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<tr>
<td>Mexico</td>
<td>-53%</td>
<td>United States</td>
<td>-52%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>84%</td>
<td>Vietnam</td>
<td>-20%</td>
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**Data Source: International Monetary Fund**

This second model of government borrowing also works with gold in place of dollars, just like the first model. Money is neither created nor destroyed in this model, although it is brought from external economies into the domestic economy. The government can take dollars or gold from one part of the domestic economy and redeploy those monies elsewhere into the domestic economy (model 1), and they can borrow dollars or gold from external economies with the promise to pay back later and deploy those monies into the domestic economy as well (model 2).

My article on why trade deficits matter dives deeper into the problems of trade deficits and negative net international investment positions.

**Model 3) Quantitative Easing “QE”**

The previous two examples involved extracting existing money (either from the domestic economy only, or from the combined domestic and international economies), and redeploying that money into the domestic economy. It has opportunity costs associated with it; they re-arrange where money is rather than create new money, and/or can end up owing foreign lenders a lot of money.

In a third example, what if the government has basically run out of domestic and foreign lenders for Treasury securities? They’ve already borrowed a ton of money and keep rolling those bonds into new bonds. So what happens when they still want or need to borrow even more, and yet not enough voluntary lenders are available to accumulate Treasuries? When government debt is equal to 100% or even 200% of the country’s entire GDP and still growing, it can be tough to find enough balance sheet space to put all those Treasury securities in exchange for dollars. There are always people willing to trade Treasuries on a short-term basis, but finding large enough balance sheets to accumulate them is another matter entirely.

The government could start a more deflationary cycle of spending less than it borrows, and thus start paying back debt on a net basis, or at least holding debt levels steady for a while. They would likely have to reduce military expenditures, make social programs and other public services less generous including breaking some existing promises, and/or increase taxes, which would all be politically unpopular among voters. And that deflationary deleveraging cycle would likely result in slow or negative economic growth for a while, which often results in lower tax revenues, so it can be a vicious cycle.

That’s not a commonly-chosen path, and it’s very painful to unwind what appeared to be a free lunch for a while, especially when borrowing foreign capital. And it’s even more politically unpalatable when one
generation lived during the era of borrowing, and the next generation lives during the era of payback or balance. That’s a good recipe for inter-generational conflict.

Instead, the more commonly-chosen path when it runs out of lenders at attractive rates is that the government borrows newly-printed money from its own central bank, rather than borrow existing money from the public. When the government runs out of real borrowers of existing capital, they make up new borrowers with new capital. In other words, they initiate debt monetization; a country prints money to buy the Treasury securities that it issues. In recent times they call it quantitative easing, or QE for short. The United States, Japan, United Kingdom, Eurozone, and others have done this.

My favorite source for the definition of QE is the Bank of England, because they are so straightforward about it:

Quantitative easing is a tool that central banks, like us, can use to inject money directly into the economy.

Money is either physical, like banknotes, or digital, like the money in your bank account. Quantitative easing involves us creating digital money. We then use it to buy things like government debt in the form of bonds. You may also hear it called ‘QE’ or ‘asset purchase’ – these are the same thing.

The aim of QE is simple: by creating this ‘new’ money, we aim to boost spending and investment in the economy.

In this model, the central bank creates new digital dollars (or digital pounds, or digital euro, or digital yen, depending on the country in question, but I’m sticking to the U.S. as my default example), and sends them to the government. The government sends the central bank a Treasury security, indicating that they “borrowed” these new digital dollars from the central bank, just like they would if they borrowed it from someone in the existing economy normally. For legal reasons, they don’t interface with each other directly, but instead go through the primary dealer banks.

The difference between this type of borrowing (model 3) and the normal borrowing from the public or international sources (models 1 and 2), is that they “borrowed” from a void of newly-created dollars, rather than extract existing dollars from the economy. This then lets the government inject more money into the economy than they extracted from it, and without extracting money from foreign lenders either. It’s brand new digital money.
This third model of government financing ventures into alchemy; an attempt to create something out of nothing or transform something without value into something with value. And specifically, this third model only works in a fiat monetary system (where money has no intrinsic value and can be created with a printing press or some keyboard inputs), and can't work with a gold standard currency like the previous two models could.

For investors and citizens in general, that should be a red flag. They would do well to pull out and start using what Dr. Carl Sagan once referred to as a "baloney detection kit".

In the course of their training, scientists are equipped with a baloney-detection kit. The kit is brought out as a matter of course whenever new ideas are offered for consideration. If the new idea survives examination by the tools in our kit, we grant it warm, although tentative, acceptance.

-Carl Sagan

The usage of the baloney-detection kit doesn't presuppose that something is baloney; it wonders if it might be, and checks it.

By creating new dollars to fund the government, QE allows the government to spend money on the domestic economy that they never extracted from the domestic economy or even from international
lenders. The government still goes through the process of trading Treasury securities for dollars, but instead of trading Treasury securities for existing dollars from the public, they trade Treasury securities for new dollars from the central bank, created out of thin air. For the central bank, the dollars are their liabilities, and the Treasury securities are their assets.

Back during the 2008 crisis when the Federal Reserve did this at a large scale, they promised that it would be temporary; that a few years after the crisis, the Federal Reserve could sell its new Treasury holdings to the public and erase the newly-created dollars. It was framed as a temporary crisis intervention rather than a new policy of permanent debt monetization. A decade later in 2018 and 2019, it was tried and failed to actually erase these dollars through Quantitative Tightening, and then they started buying more Treasuries, even before the COVID-19 pandemic.

In a 2013 article, the St. Louis Fed featured arguments that QE was not debt monetization because the Fed balance sheet would return to normal. Here was their conclusion:

So, is the Fed monetizing debt-using money creation as a permanent source of financing for government spending? The answer is no, according to the Fed’s stated intent. In a November 2010 speech, St. Louis Fed President James Bullard said: “The (FOMC) has often stated its intention to return the Fed balance sheet to normal, pre-crisis levels over time. Once that occurs, the Treasury will be left with just as much debt held by the public as before the Fed took any of these actions.” When that happens, it will be clear that the Fed has not been using money creation as a permanent source for financing government spending.

None of that happened. A decade later, the Fed’s holdings of Treasury securities and other assets, both in absolute terms and as a percentage of GDP, are far higher now than they were then, and are rising. So, it became clear that it was and is debt monetization.

The Federal Reserve’s total balance sheet and specifically their Treasury security holdings keep rising both in absolute terms and as a percentage of GDP.

Chart Source: St. Louis Fed
It’s now more broadly understood that this void of new dollars will never be paid back and put back out of existence, but instead will be rolled into new maturities. These dollar injections into the economy came out of thin air and are permanent additions to the system.

Carl Sagan’s baloney detection kit is already unfortunately detecting some baloney. The temporary nature of the intervention proved to be incorrect; it was indeed a permanent (decade-long and growing) source of financing government spending via debt monetization. The next question from the kit is whether permanent debt monetization is a problem.

From a legal standpoint, the Treasury does not borrow directly from the Federal Reserve. Instead, they go through intermediaries. The Federal Reserve works with large private banks (primary dealers) who buy the Treasury securities from the Treasury at auction, and then the Federal Reserve buys the Treasury securities from those large private banks or elsewhere on the secondary market. The important point is where those Treasury securities ultimately end up, which in this case is on the Federal Reserve’s balance sheet, bought with newly-created digital dollars. When the Federal Reserve finances government deficits via QE, the primary dealer banks essentially become pass-through entities.

Some analysts suggest that QE isn’t really printing money. It’s just a matter of creating bank reserves that get locked into a “box” of reserves and never put into the economy. The QE money never really gets to Main Street in their view, in other words. And if it doesn’t get to Main Street, it can’t cause consumer price inflation that critics of QE fear.

Although there is some truth to it, the problem with that analysis is that proponents of that view are only looking at one side of the ledger, rather than both sides of the ledger. The other side of the ledger is that the government was able to spend money on the domestic economy via the fiscal spending side that it never extracted from any existing base of money; it instead extracted that funding from a newly-created pile of dollars from the Fed, and those Treasury securities are locked away on the Federal Reserve’s balance sheet from which it drew the new dollars from. The Treasury Department is the mechanism for the Federal Reserve’s QE to get to the public.

Things like Medicare, Social Security, military spending, crisis stimulus checks, and so forth, would likely have to be reduced if the Treasury was limited to only borrowing from real lenders rather than borrowing from newly-created pools of dollars from the Federal Reserve. So, a portion of QE money does make it to Main Street (the portion that goes to buying Treasury securities); albeit in an indirect way based on government fiscal decisions.

In other words, the government and central bank, working together and with primary dealers, simply created new money from a void and spent it, and then put Treasury securities back into that void for record-keeping. It’s not the void that matters; what matters is where the dollars were spent in the real economy. If that QE had not been performed, then the same amount of government spending would have extracted dollars from the economy, or else the government spending would have needed to be reduced if they could not extract the dollars due to saturating the lender base. However, because this void of new dollars was created instead, the government spending was able to happen without extracting it from the existing system.

So yes, part of QE does affect Main Street, either by maintaining existing promises (like the solvency of Medicare), or by being able to send everyone $1,200 checks and extra unemployment benefits during a crisis without having borrowed those dollars from any real lenders. It makes it to Main Street in the sense that Main Street in aggregate continues to receive more government spending than the money they paid in with taxes, and even if there aren’t enough real lenders (balance sheets willing to accumulate Treasuries) at current Treasury rates. However, it doesn’t make it to everyone equally, so some people who receive more government services get a greater share than people who do not receive as many government services.

An Example of Running Out of Real Borrowers

The September 2019 repo rate spike was a tangible example of the difference between borrowing from real lenders, and creating dollars to fund borrowing when real lenders are unavailable. The repo rate is
the overnight lending rate between banks in exchange for safe collateral like Treasury securities. Back in January 2020, before any impacts from COVID-19, I wrote an article called, “The Curious Case of QE” that outlined the events that led up to the spike in that key rate.

In 2019, the U.S. Treasury was running unusually large fiscal deficits of over $1 trillion annualized, meaning government spending vastly exceeded government revenue, and so the supply of new Treasuries was increasing at a rapid rate. However, foreigners had not been buying almost any Treasuries since late 2014 (model 2 stopped working), so this extra net borrowing had to be extracted almost entirely from the U.S. economy (model 1).

For several years that worked, especially because large US banks had so much extra cash from which to buy Treasury securities with, as well as hedge funds, mutual funds, pensions, and other balance sheets. And in early/mid-2019, foreigners briefly started buying Treasuries for several months again as well, which also helped for a while.

But by September 2019, foreigners stopped buying Treasuries again, and became net sellers of them instead. At the same time, most domestic lenders weren’t able to buy more Treasuries either. Corporations weren’t buying. Pensions weren’t buying. Insurance companies weren’t buying. Traders and mutual funds were only buying a little bit. Model 1 of domestic government financing started to run out of lenders.

There were only two real buyers left to fund a $1 trillion annualized rate of net new Treasury issuance: 1) primary dealer banks and 2) hedge funds.

Primary dealer banks buy the Treasury securities directly from auction, but were finding themselves unable to sell enough of them to secondary buyers, so Treasury securities were rapidly accumulating on their own balance sheets, which only have so much room. They were drawing down cash levels and accumulating Treasuries for years.

The second buyer still remaining was leveraged hedge funds running risk parity portfolios or other strategies. They could buy both stocks and Treasuries with leverage, as long as they had plenty of access to the repo market for low-cost borrowing (which itself is supported by primary dealer banks).

Well, in September 2019, primary dealer banks hit liquidity bedrock. Treasury holdings at large U.S. banks had climbed up to a record 21% of assets (red line in the chart below), and their cash levels went down to just 7% of assets (blue line below), which was roughly at post-2008 regulatory lower limits for liquidity/leverage, so they couldn’t keep drawing down cash to buy Treasury securities, or lend more in the repo market to hedge funds to keep buying Treasury securities either.
The result was that there was an acute shortage of dollars in the U.S. financial system compared to the sheer scale of ongoing U.S. Treasury issuance that needed to be bought. The repo rate (overnight lending rate with collateral between financial institutions) suddenly spiked extraordinarily high.

The U.S. government literally ran out of cash dollar lenders for their Treasury securities; both domestic and foreign.
Many people blamed hedge funds, but that was only the proximate cause at best. In reality, the root cause was that the U.S. government ran out of lenders. Foreigners, pensions, insurance companies, retail investors, and finally large banks and hedge funds, simply weren't buying enough Treasuries at that point compared to how many Treasuries the government was issuing, at over $1 trillion annualized. They had no excess dollars from which to lend to the U.S. government at those rates.

The Federal Reserve seemed to have been taken a bit by surprise by the total lack of liquidity in the system, because banks still had some official excess reserves; however, banks need to meet a myriad of liquidity and leverage regulations, so the raw chart of cash as a percentage of assets shows the clearest view in my opinion, and not all “excess” reserves are truly excess when it comes to meeting all liquidity provisions.

There were two possible outcomes of this.

In one alternative world, the repo rate would have remained very elevated, and repo borrowers like hedge funds basically would have had to stop buying Treasuries and even start outright selling them (you can’t borrow at a 7% repo rate to hold 2%-yielding Treasuries on a sustained basis). The interest rates on Treasury securities would have had to rise considerably to attract a totally new pool of buyers (such as foreign pension funds), and even that would have probably been insufficient. With interest rates much higher, that would have put massive downward pressure on equity prices and other risk assets, and would have put immense pressure on the U.S. government budget due to higher interest expense and lower capital gains tax revenue. Treasury solvency would have been a real problem, and spending on some combination of Medicare, Social Security, the military, or other things may have needed to be quickly reduced to avoid defaulting on Treasuries that they continuously roll over into new Treasuries.

In the real world, since the U.S. is a monetary sovereign, the Federal Reserve stepped in with newly-printed dollars out of thin air, and started buying Treasury securities, due to a lack of any more real buyers at those low rates. For the first two weeks starting the day after the repo spike, the Fed lent newly-created dollars to other institutions to buy Treasuries with (basically nationalizing the repo market to reduce the interest rates), but when that quickly proved insufficient, the Federal Reserve began outright buying Treasury bills with newly-created dollars. In other words, the Federal Reserve allowed the U.S. government to keep funding its domestic spending plans at current interest rates, without finding new real lenders for their rising deficits. They just created new dollars to buy Treasury bills and fill the difference between what the government wanted/needed to borrow, and the dollars that real lenders were able to lend.

This chart shows the sudden accumulation of Treasuries by the Federal Reserve during that time, in green, after five years of not buying any (and even trying to reduce their holdings), alongside the updated cash and Treasury security holdings of large U.S. banks as a percentage of their total assets (in blue and red, respectively):
Chart Source: St. Louis Fed

When banks ran out of cash to buy more Treasuries, the Federal Reserve printed up some digital cash and took their place as the primary accumulator of Treasuries. Months before the economic crisis from COVID-19, the Federal Reserve began accumulating Treasuries at basically the same rate they were issued, meaning it was monetizing virtually all net new government debt. That was when the green line in the chart above started to go diagonally upward in late 2019 after the repo spike. Then, in March 2020 it went vertically upward as the COVID-19 crisis hit in full force. And again, for legal reasons, the Federal Reserve buys and accumulates the Treasuries from the banks or elsewhere on the secondary market rather than buying them directly from the Treasury.

One reason that people mistakenly don’t think QE gets to Main Street, is because a lot of QE just goes to maintain existing government spending to Main Street. The government is spending more on the domestic economy (mainly on Medicare, Social Security, and the military) than they are extracting from the economy. So, it’s not like when QE occurs, everyone gets new checks; they just get to keep getting the Social Security, Medicare, military defense, and government services that they are already receiving, which is more than the tax they pay in as a nation. And then in crisis situations, they might also get new checks, like we just saw with the $1,200 sent out to most adults in the country, and the big boost to unemployment benefits.

So yes, a portion of QE money creation does get to Main Street (the portion that is used to buy Treasuries), but it’s primarily embedded in funding existing programs and maintaining deficit spending to fund those programs at low rates, so it doesn’t feel like it gets to Main Street, and the magnitude is not very large compared to what Main Street already has.

We can imagine other hypothetical scenarios for the future where QE money can make it to Main Street more obviously on top of existing entitlement structures, if they choose to do so. The $1,200 checks and extra unemployment benefits that people received in the past couple months were an example of that.

Imagine, for example, that the Treasury (authorized by Congress and the President) decides to spend a trillion dollars to send every American $3,000 in the next round as a stimulus. The Treasury would issue...
Treasury bonds to pay for it, primary dealer banks would buy them at auction, and the Federal Reserve
would create new digital dollars to buy them from the primary dealer banks and accumulate them on their
central bank balance sheet. If we follow the flow from beginning to end, new dollars were created at the
Federal Reserve, sent to primary dealer banks, sent to the Treasury Department, and sent to the public,
which get deposited in their accounts via direct deposit or mailed checks (which directly increases broad
M2 money supply). The Treasury security moves the other direction, from the Treasury Department to
the banks and then ultimately to the Federal Reserve’s balance sheet. This is an example of QE truly
“printing money” and getting that money to the public.

Similar capital flow models apply for corporate bonds, mortgage-backed securities, or other securities. If
they wind up on the central bank balance sheet, bought with newly-created dollars, it effectively means
that money was created from thin air to provide capital funding for a company or the mortgage market,
rather than extracted from elsewhere in the economy. New money entered the system. This set of funding
doesn’t really reach Main Street like it does when QE is used to fund Treasury securities, but it does enter
the financial system as it relates to asset prices.

So, “does QE money make it to Main Street?” is not the main question because it depends specifically on
what securities are bought with QE. When QE is used to buy mortgage-backed securities, corporate
bonds, stocks, or other things, it mainly goes to financial markets rather than Main Street. When QE is
used to buy Treasuries in a normal sense, it makes it to Main Street in the form of supporting existing
government spending (much of it on Social Security, Medicare, and military) that isn’t fully supported by
taxation or real lenders. If QE is used to buy Treasuries for crisis-level helicopter money (checks in the
mail, direct deposits, extra unemployment benefits, negative payroll taxes, or whatever the case may be),
than it gets to Main Street more obviously.

As it relates to QE in general, once you venture into the realm of creating something from nothing, an
astute reader should be using the baloney-detection kit. There of course must be a cost somewhere.

The short answer is that because dollars (or other currency units) are being created at an accelerated rate,
but the available pool of products and services is not necessarily expanding at an accelerated rate, price
inflation can follow, meaning that the purchasing power of each dollar declines over time. However,
where that price inflation shows up, the magnitude in which it shows up, and how long it takes to show
up, is variable, and goes against multiple deflationary forces as discussed later in this article.

Model 4] Modern Monetary Theory “MMT”

Modern Monetary Theory (MMT), which itself is based on an older macroeconomic model known as
Chartalism, takes QE a step further. Major countries don’t currently use this fourth model directly, but
they are discussing it more and more and they already use elements from it via model 3, QE.

So, it’s important for investors to understand it.

In the previously-described third model of QE, even though dollars are being created out of thin air, the
process still goes through the motions of the U.S. government sending Treasury securities to the Federal
Reserve (through an intermediary bank), and the Federal Reserve sending dollars to the U.S. government
(again, through an intermediary bank). They pretend that this is a loan; something that could be paid
back when in practice it tends to get rolled into later maturities forever. These seemingly arbitrary ways
of record-keeping serve as mild checks and balances, because they need coordination between the
government, the central bank, and private bank intermediaries in order to create currency to fund
government spending. This adds a layer of at least partial transparency to the process and multiple
institutions need to participate.

Modern Monetary Theory says, “Wait a second, the first two models are built on an antiquated system
that involved hard money like gold, and the third model still goes through those same antiquated
motions. But we exist in a fiat currency system. The government prints money and writes whatever
numbers it wants on the paper; it doesn’t even need to borrow it from the economy (or even from the
Federal Reserve, for that matter) before it spends it, as it would have to do in something like a gold-based
currency system. The only limitation, apart from the current legal structure, is inflation.”
This is not unlike QE in practice, except that some of the checks and balances are removed. In our system, the Treasury can tax and borrow and spend, while the Federal Reserve can lend but not spend, but if the two work closely together, they can approximate an MMT-like system.

In a pure MMT economic model, the government doesn’t even need to tax or borrow to spend. It can just create and spend money first, and then take some taxes back out to keep the money supply from growing too quickly, because taxes create a demand for that money (by saying that the only thing you can pay taxes with, is that government-issued money). The government could decide to also borrow some money simply to provide a form of nominally risk-free collateral (Treasuries) for investors to own, but in this model, they don’t have to.

If the amount of money put into the economy becomes too great compared to the nation’s productive resources, inflation will happen, because more and more money would be chasing limited goods and services. At that point (or ideally, before that point), the MMT economist suggests that taxes can be increased and/or government spending can be decreased to take money out of the system, which would put downward pressure on inflation.

At the current time within the first three models of operation, the Federal Reserve and other central banks aim to keep inflation and the money supply in check through raising or reducing interest rates. In an MMT model, however, the government instead aims to keep inflation in check by managing its spending.
and taxation (injections and extractions of dollars) so that the money supply doesn’t grow faster than productive resources.

The MMT approach further points out that usually, the economy is not operating at its maximum capacity, and in recessions it operates even further away from its maximum capacity.

In other words, let’s say steel mills usually operate at 90% capacity, and in a given recession their capacity dips down to 50% of capacity, as demand decreases significantly while the existing supply of steel factories and trained steelworkers is unchanged. Well, MMT says that the government can go ahead and do a big infrastructure stimulus andprint money to buy a bunch of steel at that point, and it won’t cause inflation because there is plenty of capacity to produce that steel. It just offsets deflation. It would only cause inflation if the steel mill was already running near 100% capacity and the government was trying to print money to buy more steel anyway.

Steel was the example here, but it applies to everything. Healthcare, education, materials, energy, labor, etc. The MMT model suggests that whenever the country is not operating near full capacity (full employment and high utilization of existing resources), then the government can go ahead and print money to spend on those areas. Then, if the country does get near full capacity of labor and resources and all this new money starts causing price inflation of these goods, the government can raise taxes and/or curtail spending to take some of that money back out of the system. It needs to be more segregated than that, because it’s possible for example to run out of extra engineers or extra copper and start getting inflation in their prices, but still have plenty of extra nurses or extra steel without much inflation there.

It’s also worth pointing out that MMT can be used in either a fiscally left-leaning or fiscally right-leaning political environment. A left-leaning system would use it more on the spending side, getting government more involved in spending decisions. A right-leaning system would use it more on the revenue side, and perform big tax cuts when it’s clear that the economy is operating far from capacity and that inflation is not a near-term concern. Warren Mosler, one of the initial proponents of MMT, has called for full payroll tax holidays for both the employee and employer side during recessions or periods of slow growth, which would be a massive tax cut, especially for the middle class and for employers of all types.

Many critics of MMT just describe it as reckless money-printing, but in order to truly critique a theory, it needs to be well-understood and explained in its best form, and then debated as to why that best form is wrong or questionable. To intentionally weaken an argument made by an opponent and then criticize that weakened argument is a logical fallacy called a “strawman”. The opposite of that is to “steelman” an argument, which means to present the most compelling possible version of your opponent’s viewpoint, and then explain why you disagree with it even in its best form. Only then does a debate really get to the real bedrock of truth and understanding.

So, in this framework, MMT is not just about “money printing”, but about managing the supply of fiat money in the economy via taxes and spending relative to the productive capacity of that economy (labor and resources) to ensure that there is not too much money chasing limited labor and resources, and that there is not extra labor or resources being under-utilized due to lack of spending or high taxes.

Someone that is applying their baloney detection kit to MMT can correctly point out that fiat currency is ultimately a confidence game; it only works if people are willing to hold onto it and expect it to have most of its value next year and the year thereafter. The model that MMT economists use is mathematically correct in theory within a fiat system, but relies heavily on a) politicians and other fiscal authorities actually increasing taxes or cutting spending if inflation picks up and b) that with all of the illusions of fiat money removed and showing what it really is, people will still treat it as a store of value rather than starting to question its worth if the government can just print as much of it as it wants without borrowing any.

That’s my main concern with MMT. It pushes the system closer to the inflationary boundary, which does have advantages, but inflation tends to operate with a lag and can be hard to correct once it starts. The idea that Congress and a sitting President will raise taxes or cut spending in order to tame rising inflation
(or worse, stagflation) comes off as unrealistic, and if inflation remains unaddressed with more and more spending, it can quickly turn into hyperinflation and lead to a disorderly currency reset.

The QE model can create a synthetic version of MMT if the government and Federal Reserve work closely together, which is what is happening now. My previous example of the Treasury sending out helicopter checks to people that are ultimately paid for by issuing Treasuries that the Federal Reserve buys with newly-created dollars (with primary dealer banks as intermediaries), is basically MMT in practice. In other words, what people think of as MMT can essentially be done in the current legal framework.

However, although QE creates new dollars out of thin air, the process still goes through the motions of pretending to respectfully treat money in the same way it was treated in the first two models, meaning something that has to be borrowed from somewhere before spent, and balanced by an asset on the other side (a Treasury security that gets locked away on a central bank balance sheet in place of newly-created dollars, forever to be rolled to the next one when it matures). For a while, those motions along with statements by officials provided many investors reasons to believe that maybe newly-created dollars would be paid back, maybe the Federal Reserve will be able to reduce their balance sheet, and so forth. Those beliefs proved to be unrealistic, but the realization that it was debt monetization is only coming years later for many people after the temporary nature of it proved permanent when quantitative tightening failed in 2019.

MMT, on the other hand, drops a lot of those pretenses of QE and just treats money as something that can be printed whenever unused economic capacity exists. It’s not that fundamentally different than QE; it just cuts to the heart of it and removes some of the steps.

Although it’s not a necessary component of the model, many MMT proponents are also in favor of perpetually low interest rates. The criticism against that, especially from the Austrian economics perspective, is that it makes the cost of money too cheap and leads to high percentages of mal-investment. When interest rates are higher, borrowers and lenders have an incentive to save money, have an incentive to be more selective with their financing and only put it into their most productive ideas, and have an incentive to maintain low debt levels. The “hurdle rate” for investment is pretty high. However, in a 0% interest rate environment, there’s little incentive to save and there’s little incentive to borrow as much as you can to invest in plenty of good ideas, mediocre ideas, and even bad ideas with a low hurdle rate, and to hold a lot of low-cost debt in general in your business, real estate, or other assets to maximize your return on equity and return on invested capital.

As we venture into the next business cycle, where central bank balance sheets around the world will continue to ramp up to fund government deficits at a scale that has not occurred since World War II, it may start to break some of the illusions that the public holds about money, especially as we remain in an environment where bank accounts and Treasuries pay interest rates that are below the Federal Reserve’s stated goal of 2% annual price inflation.

This sort of currency confidence breaks all the time in emerging and frontier markets. I have family and friends in Egypt, for example, that have learned for years not to hold Egyptian pounds for more than a short period of time before spending them on a harder asset, or putting them in an extremely high-yielding bond. A lot of them use accelerated home-buying agreements where they channel seven years of payments into a new condo construction that they own and move into upon completion.

But could it happen in major economies, like the United States in the 1970’s, where we go back to not viewing the currency as a safe place to store wealth? The second part below discusses inflation and deflation.

Part 2: The Inflation/Deflation Debate

There are different definitions of inflation, but for everyday people, what matters is consumer price inflation.

In other words, how much does an apple cost today, compared to what it cost last year, or five years ago?
If an apple gets more expensive, it could be because the apple itself went up in value. For example, if a crop disease destroys 95% of all apple production this year, and apples become in unusually short supply and thus only affordable to apple enthusiasts, the price of apples would increase vs other food items.

Alternatively, it could be because the currency becomes inherently weaker for buying things in general (e.g. we printed a ton of dollars over the years with inflationary monetary policy, so it takes more dollars to buy a bushel of apples today than it took your grandparents to buy the same bushel decades ago, not because of apple scarcity but because of currency devaluation).

If we use a basket of goods, we have a better indication about whether the currency itself is weakening, because we factor out unusual supply limitations of certain goods, such as with apple crop diseases.

Whether monetary and fiscal policies result in significant consumer price inflation or not depends on where the money is spent, the magnitude of that spending, what other inflationary or deflationary forces are occurring to fight with or against it, and whether people have confidence in the soundness of the currency.

And inflation plays a huge role in equity, bond, real estate, and commodity pricing. So having a range of outcomes for inflation in the years ahead is useful for long-term investors.

**Why So Little Inflation In the 2010's?**

Many investors feared that the QE performed from 2008 to 2014 would cause consumer price inflation, but for the most part it did not. Here's the official inflation rate over the long run:

![Inflation Chart](chart_source)

*Chart Source: *St. Louis Fed*

Prior to that point, QE had not really been performed since the 1940's, (the end of the previous debt supercycle), so it was a new variable for most investors to figure out.

People differ on how much they trust the official consumer price inflation estimates. There are many ways that the official numbers can understate actual inflation, especially including a) product substitutions and...
b) a mismatch in ratios for what the average household actually spends its money on in weighted terms. In other words, the basket of goods that the government uses to measure inflation includes substitutions when certain items get too expensive, and may or may not be an accurate representation of the basket of goods that a typical consumer buys to support a decent lifestyle.

However, it’s pretty clear for a broad basket of goods and services, ranging from apples to televisions to car repair services, that inflation has not been very high. The prices for some things like healthcare, consumables, and education have gone way up, but for other things like electronics, software, and commodities, prices have gone way down. And it’s region-dependent; the cost of living in San Francisco has risen faster than living in a suburb in heartland America, for example.

Broad money supply (M2) per capita increased by an annualized rate of about 5.0% from the beginning of 2008 to the beginning of 2020. Official consumer price inflation only increased by an annualized rate of about 1.6% during that timeframe, although it is more or less in various cities. I think there’s a credible argument that the actual cost of living increased faster than that, but probably not quite at the 5% rate of per-capita money supply increase.

So, trillions of new dollars were created on an absolute basis and a per-capita basis, with limited effect on many prices. This is unintuitive to many, but there are several reasons for this:

**Technology is deflationary.** Technology gives us greater and greater access to products and services with less cost. For example, imagine how many expenditures your smart phone replaces. No more paid long distance calls, buying cameras, or buying a CD player with CDs, and it allows for fewer trips to your physical bank (via mobile banking), and probably less expenditure on other sources of entertainment (such as watching free Youtube rather than a paid TV service). It’s a pocket supercomputer filled with countless software tools. My mediocre television bought in 2019 is equivalent to one of the best televisions on the market in 2009, and way better than the best television in 1999, for a fraction of the cost.

**Offshoring is deflationary.** Hiring cheaper labor from less developed parts of the world to build a lot of our products and services is cheaper than paying our own citizens (with higher hourly rates, more expensive healthcare coverage, and more environmental/safety regulations at the workplace) to make those products and services, and helps reduce the cost. This of course has ramifications down the road, especially for the working class whose jobs are more affected, but while it’s happening, it’s a deflationary force.

**Onshoring is deflationary.** Sometimes we don’t send jobs overseas, but instead we bring foreign labor to us. The U.S. agriculture industry, for example, is supported by cheap legal and illegal immigrant workers. In other words, the cost of an apple hand-picked from a legal or illegal immigrant working under the table or even above the table is lower than the cost of an apple hand-picked from someone that has medical insurance and makes $15/hour. Again, this has other ramifications, but it’s deflationary.

**Unprofitable businesses are deflationary.** An era of low interest rates has made capital cheap. The hurdle rate for lending it or investing it is low. So, investors and banks have been willing to provide equity and debt financing to businesses with no plans to be GAAP profitable for a very long time, like Tesla (TSLA), Uber (UBER), and so forth. Even fast-growing Netflix (NFLX) is free cash flow negative year after year and literally issues junk-rated debt to fund new content. As long as the stock price goes up, investors are happy and executives get paid in these unprofitable business models. And as long as companies have not had to make a profit on the products and services, even after a decade or more in operation, the prices of their products tend to be cheaper than they would be in a funding scenario that requires them to make a profit. Bear markets eventually test investor patience for structurally unprofitable businesses, if stock price appreciation is the only source of financial payback.

**Cheap commodity prices are deflationary.** We haven’t had much commodity scarcity over the past decade because we had a large commodity development cycle that peaked in 2012, resulting in oversupply for many commodities that has persisted for nearly a decade. We’ve had an abundance of commodities with modest ongoing input costs to get those commodities thanks to large investments a decade ago.
addition, cheap capital has allowed for growing shale oil production despite many of the companies never generating consistent free cash flow or paying dividends. Investors in those businesses have basically provided cheap oil as a charity, albeit unintentionally. We thank them for their sacrifice.

**Wealth concentration is deflationary.** If you take a trillion dollars and give 100 million middle-class people each ten thousand dollars, they will spend a lot of it, and it will have an inflationary jolt on consumer prices. In other words, the velocity of that money will be high, because it goes to people with a big divide between what they want and need, and what they have. However, if you take a trillion dollars and instead give 100 multi-billionaires each ten billion dollars, their spending patterns are unlikely to change nearly as much, which would not provide a consumer price jolt. The velocity of that money would be low; they already have everything they want, and will likely invest that extra money into financial assets. The difference between what they want and need, and what they have, is nonexistent. They'll stick in the bank, buy bonds, buy stocks, buy another mansion or yacht, and so forth. Financial asset prices are what would see inflation in this scenario (and likely some high-end luxuries like fine art and yachts); not consumer prices for paper towels or apples or Honda cars.

**Lower asset prices are deflationary.** For a middle class person, their home equity and retirement account represents most of their wealth. In fact, with home equity loans or cashing out a 401(k) account during a job change, they can even tap into these assets for consumer spending. In the aftermath of 2008, housing and equity prices collapsed, which wiped out a lot of spending power, and it took years to recover. The initial jolt of money creation from QE was offset by deflating asset prices.

**Debt defaults are deflationary.** When a person or company defaults on a loan/bond and is unable to pay, that loan/bond becomes worthless or severely impaired, and that is someone else's asset. In a credit-based system, most "money" is actually credit, which is a highly-leveraged from of money, so when credit is destroyed, it's basically a destruction of money. Deleveraging is a deflationary event, even if ultimately a healthy one. Household debt as a percentage of GDP reached a peak of 100% in 2009, but gradually fell to about 75% in the following years as people walked away from mortgaged homes that they couldn't afford.

**Aging demographics are deflationary.** For most people, their peak spending years are their middle years, when they are raising a family. As they age into their golden years, many of them downsize their property, and spend less money elsewhere. They do spend more on healthcare, and healthcare prices have risen faster than the broad inflation rate. The United States and most other developed nations have increasingly high median ages and lower fertility rates, which presents a deflationary background force on the economy for many types of products and services outside of healthcare and some other key areas. When a population is older and slower-growing (or even outright shrinking as is the case with Japan), it takes a lot longer for demand to outpace supply whenever there is a supply glut, which pushes down prices.

**Trade surpluses are deflationary.** The United States doesn't have this, but Japan and some European countries do. When a country consistently produces more than it consumes, and thus develops a positive trade balance and particularly a positive current account balance, it means more wealth is flowing into that country each year than is flowing out. This gives a currency a tendency to appreciate in price, which is deflationary. I covered a detailed Japanese example for this in my article, "[How to Win a Currency War](#)".

So, this newly-created money from QE in 2008 to 2014 went up against several deflationary forces. It has been offset by rapidly improving technology, labor offshoring, businesses with no apparent mandate to be profitable, a lack of commodity scarcity, wealth concentration, debt defaults, and aging demographics. In other developed countries, their QE efforts have also been offset by positive trade balances and current account balances.

Before monetary policy is factored in, deflation is the natural order of a productive economy. If we were using a hard money standard like gold, for example, we would expect products to get cheaper over time relative to the value of our golden money, thanks to technological and productivity improvements over time, which make them cheaper relative to the number of labor hours required to produce them. However, monetary authorities in fiat currency frameworks counter that deflationary trend with a
consistent inflationary response, so that most monetary systems experience mild inflation over time. The Federal Reserve targets 2% inflation per year on average.

The magnitude of QE from 2008 to 2014, despite being in the trillions, wasn’t that dramatic in the grand scheme of things. The Federal Reserve’s balance sheet went from $900 billion to $4.5 trillion, meaning about $3.6 trillion in new dollars were created and then either lent to the U.S. government for spending or put into the mortgage market to buy mortgage-backed securities to recapitalize the financial system, effectively out of thin air.

A portion of this $3.6 trillion found its way into the hands of everyday citizens living on Main Street. Some of it supported government spending as discussed in Part 1, including existing entitlement spending and extra stimulus efforts. This was less than $2 trillion. Other portions of it (over $1.7 trillion) just supported the financial system by bailing out the mortgage industry and consequently asset prices.

Total household net worth of the United States dropped from $71.3 trillion in 2007 to $60.3 trillion in 2009, representing a decline of $11 trillion in household wealth, and took until 2012 to get household wealth back to the highs of 2007.

![Chart Source: St. Louis Fed](image)

So, the $3.6 trillion in totally new dollars for QE that came out of the Fed’s void and injecting into the economy was small compared to this total initial base of existing wealth ($71.3 trillion), and small compared to the amount of paper wealth that had recently been lost ($11 trillion). The new money just offset a part of what was otherwise a large deflationary shock.

Even when asset prices ultimately recovered and the deflationary shock side of the equation started to go away, it was a gradual process, and a lot of the benefit of the recovery went to us in the top 10% that own financial assets.
In the 1990’s, the top 10% richest households owned about 60% of the country’s household net worth. By 2006, it had increased to 65%. By the end of 2019, it was over 70%.

Meanwhile, the share of wealth held by the bottom 90% of households decreased from 40% of the country’s household net worth in the 1990’s to 35% in 2006 to less than 30% at the end of 2019.

Overall, the top 1% of households currently own nearly a third of total U.S. wealth. And wealth concentration was occurring before and after QE, due to increased financialization of markets, offshoring, changes in fiscal policy, and other factors. So, this trend was in place prior to QE. QE didn’t cause it, although it didn’t help it either, in the way it was spent during the 2008-2014 period.

Rapid consumer price inflation occurs when a ton of new currency is created, that currency gets to everyday citizens through one channel or another, and they spend it on a finite pool of products and services, and thus bid up the prices more and more. This can start a vicious cycle where money is perceived to be quickly losing its value, so people want to spend it on something durable as soon as they get it, which can further pull forward future demand and exacerbate the shortage of products and services relative to how much new money is in the system and the desire to spend that money on those products and services.

This is not what we saw over the past decade. The everyday household is cash-strapped; they haven’t been flooded with liquidity. They lost home equity and 401(k) values after the 2008/2009 crisis, then were given a bit of a stimulus, their home values and investments slowly recovered, and their wages have been rising at a slow rate, with much of it eaten up by rapidly rising healthcare and education costs. The median American household has very limited cash savings. For Americans receiving Social Security, Medicare, or other government payouts, part of it was funded due to money-printing via QE, but this just maintained their existing payout promises.
Average wages didn’t change much over that period. Wages were growing at a 3.0-3.5% annual rate prior to the recession, and then fell to under 2.0% per year and eventually climbed their way back up to 3.0-3.5% by the end of the business cycle.

![Average Hourly Earnings of All Employees, Total Private](chart)

*Chart Source: St. Louis Fed*

Officially, consumer price inflation went up for certain areas; particularly healthcare, education, and some consumer disposables. Those things are rather essential, generally aren’t outsourced, and technology hasn’t been applied to make them much cheaper (arguably better, but not cheaper). This was partially offset by price deflation in electronics, software, consumer durables, vehicle parts, Walmart products, and so forth that have benefited from outsourcing to cheaper regions of the world and technological improvements that have greatly reduced their prices.

So, the amount of QE in 2008-2014 was small compared to the total household net worth, and small compared to the amount of household net worth that was lost in the years during the time that QE occurred. And even among that small amount of new dollars, only a portion of it got down to Main Street in the form of government spending (and especially to the older side of Main Street rather than the younger side; very little of the money got to the younger side of Main Street), and the rest propped up the mortgage market and helped re-capitalize banks by offsetting debt defaults and was offset by some deflationary trends. It was more inflationary for financial assets than consumer prices.

**Modeling Inflation in the 2020’s**

We’re currently experiencing another huge deflationary shock from the impact of COVID-19 on a highly-leveraged global financial system, as many people have lost incomes and asset prices have fallen, but large fixed debts remain, expecting payment. This is a multi-trillion dollar reduction in U.S. household net worth from peak to trough again, although we don’t know the precise number yet.

Countering that shock is the government and central bank’s QE-funded inflationary response. The U.S. federal government passed a crisis bill to inject $2.2 trillion into the economy, followed by another nearly $500 billion bill more recently, totaling about $2.7 trillion, and we’re only 3 months into this.
Because foreigners and most domestic pools of capital are not able to accumulate $2.7 trillion in Treasury securities, this is being funded by new money creation, aka QE by the Federal Reserve as described earlier in this article. In addition, with a special purpose vehicle between the Treasury and the Federal Reserve, they can make business loans and buy corporate bonds as well. So far, the Federal Reserve has increased its balance sheet by over $2.5 trillion by buying Treasury securities, mortgage-backed securities, and other assets with newly-created dollars. This increase in the balance sheet will likely be $6 trillion or more by the end of the year (up to $10+ trillion for the balance sheet in total from its starting point of about $4 trillion), and more than that in the several years ahead.

Will these ever be unwound from the Fed's balance sheet, or just forever rolled into new maturities like what happened after 2008? Almost certainly the latter. Japan, the European Union, the United States, and other central banks never really unwind their QE.

Current Deflationary Shock

In 2020, deflationary forces are in charge for most product categories. Cars and other durable goods, luxuries, clothing, electronics, commodities, commercial real estate, rents, and capital goods—these are firmly a buyer's market in such a low-demand environment. These things have plenty of supply and few buyers, which means low prices. Sellers of discretionary items need to offer big price discounts to make sales.

Complicating this situation is that we have a supply shock as well, unlike most recessions. Production and supply chains are impacted, and demand or hoarding tendencies have increased for certain categories of goods. This can be inflationary in targeted areas if not corrected. We're starting to see inflation in grocery store prices, because that's the one key area where we are all still spending money at a time when production and supply chains have issues.

So in the near term, we have a broad deflationary trend for discretionary spending categories but potential inflation in essential spending categories.

In addition, there's a giant debt overhang. The United States went into this crisis with total debt (government, corporate, and household) equal to about 350% of GDP or $75 trillion in absolute terms, which is a very deflationary force. We began the 2008 crisis with about a 350% debt/GDP ratio as well.
Chart Source: St. Louis Fed

As businesses and consumers deleverage (either through bankruptcy, debt payoff, or facing stricter credit requirements from banks to get lending), it puts more downward pressure on demand and discretionary prices, because even as money supply increases, overall spending power from credit/leverage decreases.

Even before this crisis, broad money velocity was on the decline. Wealth was concentrated and money was not moving around much. This crisis further amplifies that trend.

Longer-Run Inflation Potential

In the years ahead, the possibility for broad inflation is back on the table. As pandemic lockdowns ease and ongoing government stimulus tries to get the economy back up off the floor, consumer demand can increase while the new money supply remains in the system. The timeline on which this happens depends on how much stimulus and consumer/business support the combo of the Treasury and Federal Reserve prints up and hands out to Main Street, and how fast the virus goes away enough such that restaurants, hotels, airlines, concerts, events, and other gatherings can partially and then completely re-open.

Over the multi-year longer-run, if we see a trend towards bringing a portion of our supply chains back to the United States, that could further raise inflationary pressures because it would start to undo one of the major deflationary outlets (offshoring) that has been in place for decades. For those decades, we’ve optimized efficiency over resiliency (which means lower prices), but in the decades ahead, domestication and resiliency are likely to play a more important role (which means higher prices). In addition, we could likely see a recovery in commodity prices as demand and supply balance themselves out.

However, it’s important to quantify it, not just talk in qualitative terms. If someone speaks of hyperinflation next year or deflation forever, ask them to show you their work.

A Baseline Debt and Inflation Outlook

Here’s a baseline starting point, and readers can change it to accommodate their own assumptions as they wish.
At the end of 2019, total U.S. household net worth was over $118 trillion, U.S. GDP was just under $22 trillion, and U.S. broad money supply was about $15 trillion, as reported by the St. Louis Fed with sources to the relevant agencies that collect those statistics. The Fed’s balance sheet ended 2019 a bit over $4 trillion. That’s our starting baseline, rounded.

Equity prices are down for now in this crisis, and home equity in some regions could be down as well in the years ahead, so some asset-based wealth was lost. Almost $11 trillion in U.S. equity wealth was wiped away from the Wilshire 5000 full-cap U.S. equity market from peak to trough in Q1 of 2020, although as of this writing we’ve partially rebounded from those lows. Foreign equity also lost value. Home values change more slowly; we don’t know the full scope there yet. Cash, Treasury securities, gold, and the safest corporate bonds held up well.

For every 5% of the $118 trillion in U.S. household net worth that was or will be lost in this crisis from peak to trough, that would be $5.9 trillion in wealth wiped away. Unemployment is extremely high and will take an unknown time to recover, so consumer confidence will be shaken for a while.

This lost wealth and income are large deflationary shocks.

Lending will also tight for a while, except for markets where the government decides to intervene. J.P. Morgan Chase, for example, now requires credit scores over 700 and 20% down for a mortgage. Wells Fargo is no longer accepting applications for home equity lines of credit. These types of stricter lending requirements slow down the expansion of credit.

And that expansion of credit is an important point. It’s not just the amount of money and goods/services in the system that governs inflation (rising prices for those limited goods/services). Consumer spending power is in large part fueled by access to and expansion of credit. Banks take deposits and then multiply that money into loans. Consumers get income and then buy more than their income can immediately provide, thanks to mortgages and other debt. If leverage remains static or decreases, it means that base money is not multiplying as much, and consumers are living more their means in terms of spending, and some are deleveraging or defaulting.

Broad money velocity is a measure of GDP divided by the broad money supply. It measures how swiftly those dollars move around the system and get spent and re-spent (which tends to boost inflation), rather than get accumulated and saved (which doesn’t). Broad money velocity has decreased to extreme lows in recent years, down to a little over 1.4x before the COVID-19 crisis, and under 1.4x by the end of Q1 2020:
So, we went into this virus crisis with low money velocity to begin with, and an unknown amount of wealth was destroyed depending on which time period you use and how much home equity net worth ends up being affected. GDP is decreasing while the broad money supply is still growing, so the velocity is sharply declining during the crisis in Q2 2020.

On the other hand, the Fed's balance sheet is expected by many estimates to expand from $4 trillion to $10 trillion this year, and is already up to $6.7 trillion within two months of the crisis and is still growing at a swift rate. If we reach a $10 trillion balance sheet this year compared to the $4 trillion that the Fed came into the year with, that will be $6 trillion in new capital injected into the economy, in the form of fiscal spending that was spent but not extracted (see the QE examples from Part 1 above), and in terms of private bonds being bought with new dollars and stored on the Fed's balance sheet, which re-capitalizes the financial system with new dollars.

Would $6 trillion in new capital lead to massive inflation this year, in the face of such a deflationary shock and wealth destruction? Probably not. This money-printing would counteract some of the deflationary shock of so much debt and lost spending and income, but not necessarily spur a lot of new inflation right away, other than for the possibility of very targeted supply chain disruptions related to food, cleaning supplies, virus protection equipment, and other essentials.

What if the Fed boosts its balance sheet to $15-$20 trillion by the end of next year or the year after, meaning it injects $11-$16 trillion into the system from its starting balance sheet of $4 trillion, particular if a significant portion of that is to finance crisis-level helicopter checks, extended unemployment benefits and other Main Street expenditures by the government? Well now we're talking large numbers, and the possibility for intermediate-term inflation is more on the table. Not hyperinflation, but inflation.

We're already seeing the largest year-over-year percent growth in broad money supply in modern history:
Chart Source: St. Louis Fed

But outside of essentials like groceries and healthcare, that money isn’t moving around yet, with velocity extremely low.

The Years Ahead

It’s the next few years in the future, where we really need to think about broad inflation after so much aggressive policy response and expansion of the money supply. Over 30 million people lost their jobs over the past two months. Many of these can come back sharply whenever restaurants, hotels, airlines, casinos, and other places start to come back online. But several million of them will likely take quite a long time to come back. It took over 6 years for the number of employed people to get back above its previous high after the 2008 financial crisis, as a baseline example.

And we went into this crisis with more wealth concentration and more consumer credit as a percentage of GDP than ever before; the bottom 50% of Americans have very little safeguards against total insolvency. Specifically, the bottom 50% of Americans collectively have only 1.5% of the country’s household net worth, which is down from 4% in the 1990s. Their assets and liabilities are nearly equal, resulting in a very low average net worth, and they are highly dependent on active income streams, and many of those income streams are now shut off. The federal government could very well find itself between a rock and a hard place; support these people financially with QE-funded helicopter money (checks and/or extended unemployment benefits), or face rising prospects of social unrest from people that can’t pay rent and have no job, and thus not much to lose.

So, I somehow doubt that the $1,200 check and extra unemployment benefits will be enough to keep things smooth by the end of the year and through next year and the year thereafter. More checks are likely coming. If so, these would be funded by QE, meaning money that is created out of thin air and makes it to Main Street via the Federal Reserve buying Treasuries that support those payouts. This type of QE would make it to Main Street much more directly and obviously than the smaller portions of prior rounds of QE that only partially made it to people.
Remember, the U.S. government went into this crisis with $1 trillion annual deficits, or deficits equal to 5% per GDP and rising. Normally during market expansions, the government deficit narrows, but this time it was already rising prior to the crisis. This was due to worsening demographics followed by an unfunded tax cut. Medicare and Social Security are becoming more and more top-heavy in terms of the number of people getting benefits vs the number of people paying into the system, as the Baby Boomer generation started to enter peak retirement years. And this is projected to get worse; according to the Census Bureau, the percentage of the U.S. population over the age of 65 will increase from 17% to 21% from 2020 to 2030.

This was an atypical deficit expansion as a percentage of GDP during a period of low unemployment, normally only seen during active wars:

Source: Department of Labor, Office of Management and Budget, Goldman Sachs
Global Investment Research

Chart Source: Goldman Sachs

And as previously described earlier in this article, the government had run out of natural buyers for that debt, both domestic and foreign, and so the Federal Reserve began funding it with new dollars in 2019. So, the combination of the Treasury and the Federal Reserve is injecting a 5% annualized rate of the country’s GDP of new money into the economy in an MMT-like situation right before we found ourselves in this virus crisis.

Going forward, the United States has a structural rising 5% deficit and then some combination of crisis intervention (already projected to be $2.7-$4 trillion or more this year, or 12-18% of GDP) and potential stimulus (infrastructure renewal and continued checks, and so forth going forward in the years ahead) on top of that 5% baseline. After this year with a deficit of 20%+ of GDP, there is a decent probability of several years of fiscal deficits of 10%+ of GDP, and mostly funded by new money from the Federal Reserve. That’s $4+ trillion this year and $2 trillion+ per following year for a while after that in new money injection into the economy.

As a comparison, we can look at how the federal deficit was affected in the 2008 crisis. In 2007, the federal government had an official deficit of a little over 1% of GDP. In 2008, it expanded to over 3% of GDP. The year 2009 was the big one, where the deficit roughly hit 10% of GDP. Then in both 2010 and 2011, the deficit was over 8% of GDP. By 2012, it was still over 6% of GDP, and then by 2013 it was down to 4% of GDP, and eventually bottomed in 2015 and 2016 at below 3% of GDP before starting to rise.
again. The actual increase in debt as a percentage of GDP was higher than official deficits in most years; many items are off of the balance sheet.

And it's not just extra spending. The deficits during 2008-2013 came from both extra spending and a decrease in tax revenue. Specifically, the federal government lost nearly $500 billion or 1/5th of its annual revenue from peak to trough in the recession, and it didn't get back to its 2007 level of tax receipts until 2012. As a result of increased spending and decreased tax receipts, from the start of 2008 to the start of 2013, total federal debt as a percentage of U.S. GDP increased from 64% to 101% as these large federal deficits accumulated into federal debt.

![Federal Debt: Total Public Debt as Percent of Gross Domestic Product](chart.png)

**Chart Source:** St. Louis Fed

By the end of 2019, the U.S. government had inched up to total federal debt at 106% of GDP. That's our starting point for this recession, before the COVID-19 crisis started.

Deficits will likely exceed 20% of GDP in 2020 (a 5% baseline deficit plus perhaps 20% combined crisis spending and tax revenue reduction), so we could be looking at federal debt of around 125-130% of GDP or more by the end of 2020. And then if we have 3 years of 10% deficits in 2021-2023, it pushes the ratio to potentially 140%-160% of GDP, mostly funded by the Federal Reserve with new money. This could represent $10+ trillion in new money injected into the economy.

I consider this a lower-end estimate. If more municipalities and pensions are bailed out by the federal government, if student loans held by the government are forgiven, or if helicopter money to the public stays for a while, or if massive infrastructure stimulus is funded, the projected deficits in this model have a higher potential ceiling.

With all of this money-printing likely to occur over the next several years, the possibility for consumer price inflation becomes a matter of money velocity and confidence in the dollar. Putting $10+ trillion in new capital into a country with $1.18 trillion in total starting household net worth and $1.4 trillion in starting money supply can be inflationary, depending on what share of that money ends up in consumer
hands, how far nominal asset prices fall, how much of that money goes to deleveraging, the degree to
which lending multiples the effect of that new money, and so forth.

The biggest variable in the near-term and intermediate-term to monitor for broad consumer price
inflation in my view (outside of targeted areas of supply chain disruptions) is the total amount of QE-
funded money that makes it to Main Street, meaning to the public, as well as their ability to come out of
quarantine and spend it. And then for the longer-run, the on-shoring of supply chains and big
infrastructure projects amid a period of deglobalization, if it happens, is something to watch as it pertains
to more structural inflation.

These are trends I’ll be monitoring in the quarters and years ahead. Outside of food, healthcare, and other
essentials which have inflationary catalysts at the moment, the trend is likely to be disinflationary for
many discretionary goods and services until a large amount of helicopter-like money ends up on Main
Street in the form of more checks, negative payroll taxes, considerably extended unemployment benefits,
or other stimulus policies. And the probability of those types of policies occurring over the next few years
is likely higher than many people think due to how few assets the bottom 50% of the population has and
how reliant they are on active income streams.

At that point, the possibility for broadly higher consumer price inflation is on the table and the four-
decade period of disinflation from the 1980’s to the 2020’s will have ended.

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