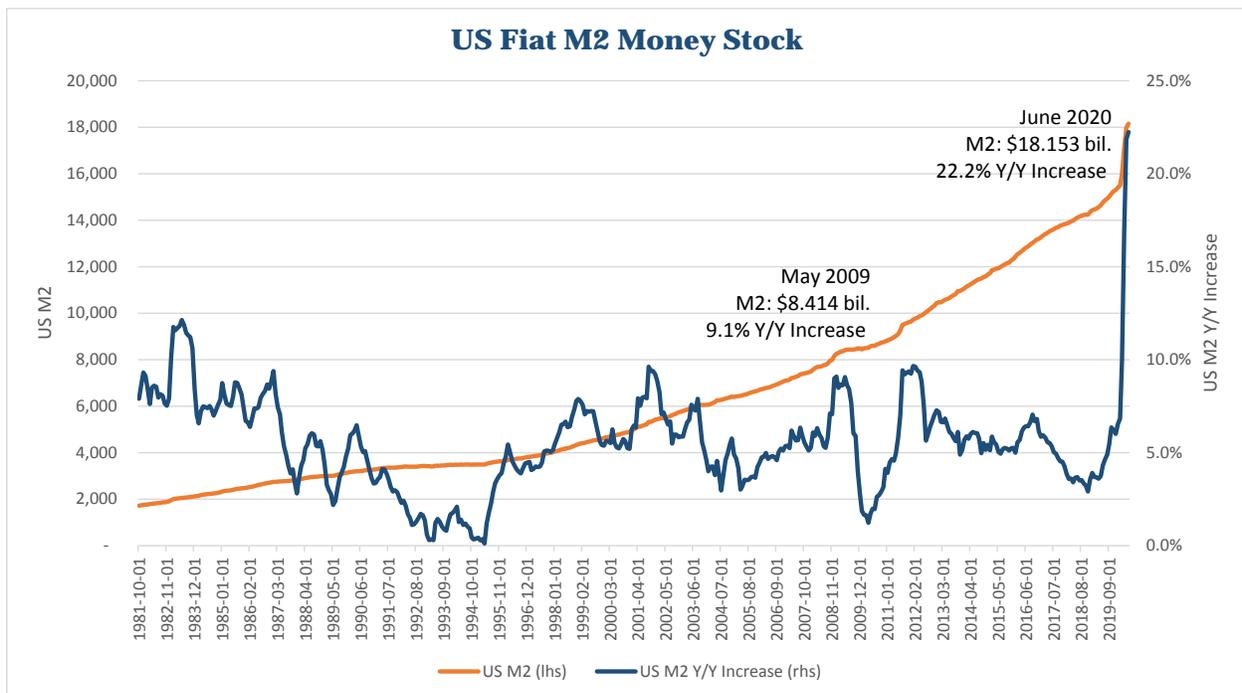


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*(Published in June 2020)*

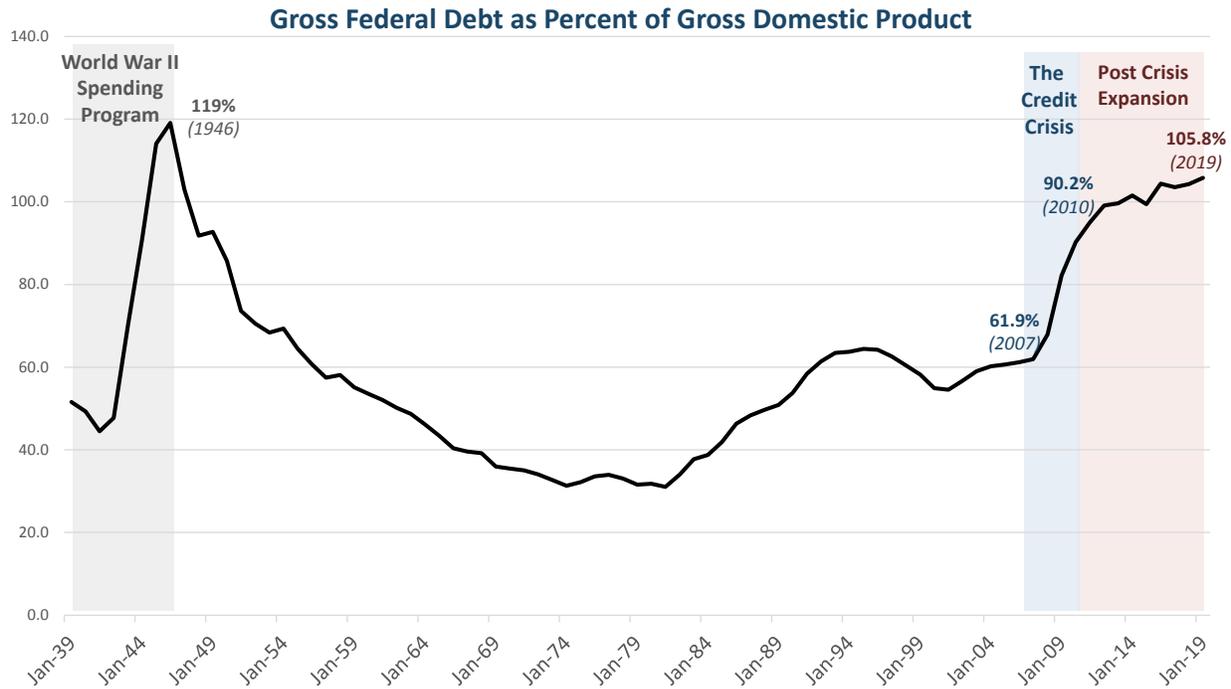
**Bitcoin Supply Curve Over Time**

Bitcoin was the best-performing asset in 2019 and year-to-date 2020: its 5-year return as of this writing is over 4,000%. This should not come entirely as a surprise. While Bitcoin has been referred to as “digital money”, “digital gold”, and “money over IP (Internet Protocol)”, it perhaps deserves even more urgent consideration from not only investors, but also consumers (as a payment method) and central banks, because of the incredible fiscal and monetary response by countries around the world to the COVID-19 epidemic. In the United States, the M2 Money Supply has spiked by an astounding degree, as the charts below indicate:



*(Source: St. Louis Fed, M2 Money Stock, Billions of Dollars, Monthly, Seasonally Adjusted)*

Even the enormous monetary response to the 2008-2009 financial crisis appears as just a bump relative to the hockey-stick-like response to the current crisis. Year-to-date alone, the M2 has increased by 19%, and it has risen by over 1% per week recently. In dollar terms, the money supply rose by \$2.6 trillion between the end of February and the beginning of June, and this is only a portion of the \$1.8 trillion in the CARES Act stimulus plan. Relative to GDP of \$21.535 trillion, that’s over 12%. Relative to year-end Federal debt of \$23.2 trillion, that’s over 11%. Since the year-end Federal debt-to-GDP ratio was 106%, the up-to-date figure will obviously be a great deal higher.



(Source: St. Louis Fed, Gross Federal Debt as Percent of Gross Domestic Product, Percent of GDP, Annual, Not Seasonally Adjusted)

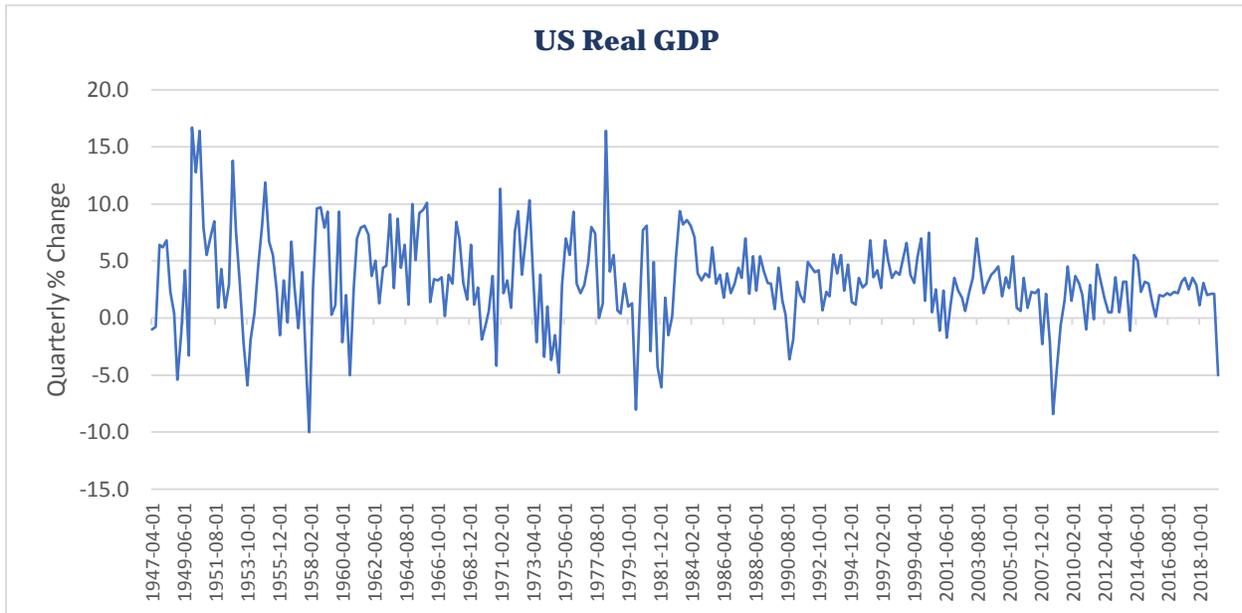
This can be considered a measure of inflation, if not immediately, then down the road. In the past year, M2 has spiked 22%, so it is possible that a much higher amount of dollars will shortly be chasing a lower-than-normal (as a result of COVID-related closures) amount of goods and services. Hence, inflation could return on a scale not experienced in two generations.

We believe that this historically new phase would be, for all practical purposes, permanent. The debt and money creation are of an *unprecedented* scale, and will mark the beginning of an indefinite period of inflation and money debasement. It takes ever-increasing debt creation to generate the same percentage gain in GDP, and if the objective is continued GDP growth, then the debt creation cannot stop. This is partly a fiscal necessity because a large part of economic growth comes from capital gains, as does the total amount of taxes collected. Every year, approximately \$1.0 trillion of capital gains are taxed at approximately 20%, which indicates that investors get \$800 billion in after-tax gains (which is like an economic stimulus), and the government gets tax revenue of \$200 billion per year. The capital gains tax revenue is equivalent to the total amount of corporate taxes collected each year. This provides a significant incentive to keep the economy, and the stock market, rising.

That is partly the reason interest rates have been on a downward trajectory for almost 40 years, since lower interest rates help boost both the economy and the stock market. Also, with the US National Debt at \$25.3 trillion, total debt of all types in the U.S. at \$77.3 trillion, and \$147.6 trillion in total US unfunded liabilities<sup>1</sup>, there is simply no way rates can be allowed to rise. At these

<sup>1</sup> [USdebtclock.org](http://USdebtclock.org)

historically extreme debt levels, just a one percentage point increase across the board on \$77.3 trillion of debt would mean an incremental \$773 billion in interest expense, which would represent an additional 3.6% of US GDP going to debt service instead of consumption. A 2% or 3% increase in interest rates could be catastrophic.



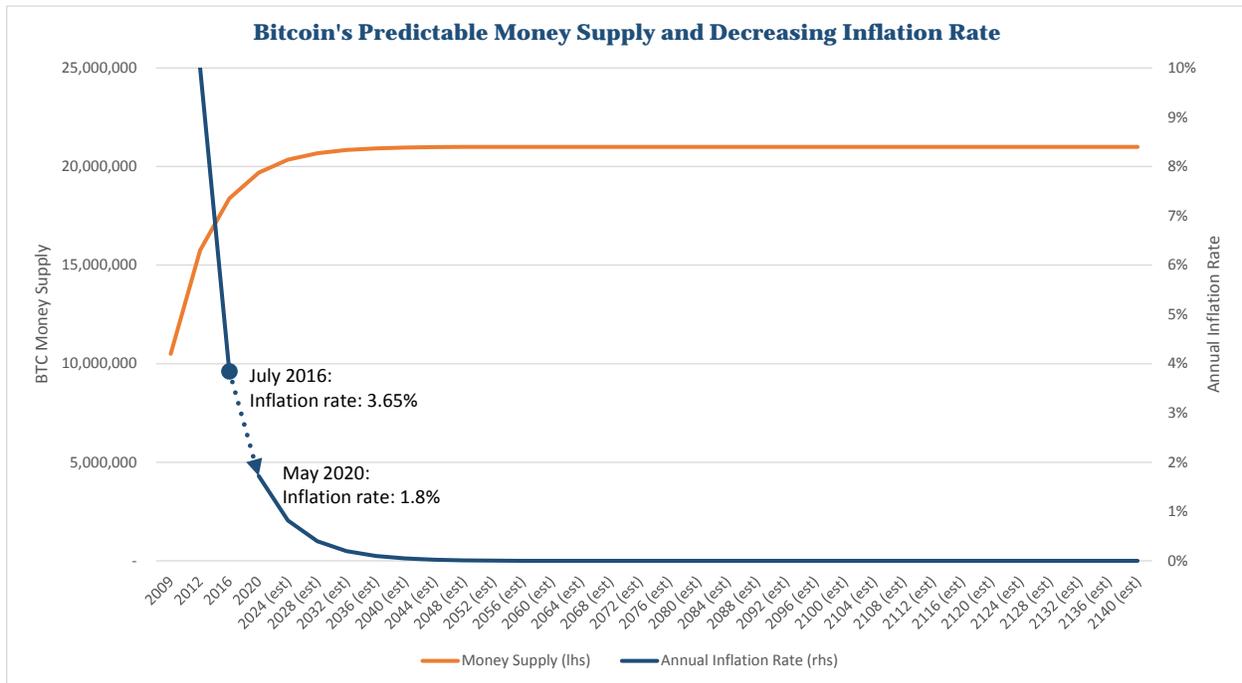
(Source: St. Louis Fed, Real Gross Domestic Product, Percent Change from Preceding Period, Quarterly, Seasonally Adjusted Annual Rate)

As a result, with near-zero or perhaps even negative interest rates, the common bond/equity asset allocation models could be rendered obsolete, and the decades of statistics underpinning those models could be discontinued. Given such interest rates, there is no scenario in which bonds do not lose value – either in real terms, since even the current rate of inflation already well exceeds bond yields; or in the event of an interest rate spike, which could cause stock-market-like declines in bond prices. The bond asset class will be riskier than equities, which at least incorporate the expectation of value and dividend increases through the operation and expansion of their underlying businesses.

Consequently, one of the most important elements in asset management in the coming decades will be identifying assets and businesses that can either be direct beneficiaries of inflation or, absent that, can nevertheless thrive in such an environment. It appears likely that one such beneficiary is Bitcoin. It is perhaps the only asset class that hasn't gotten a government bailout, and is truly freely traded 24 hours per day, 7 days per week, and is not manipulated by central bank-induced buying. In that latter sense, as well as others, it is observably independent of government intervention. In the end, we believe that Bitcoin could succeed because it fulfills the needs of the complex system of systemic risks, not necessarily because it is a cryptocurrency, but because it has no CEO, no marketing budget, and no central authority that can decide on its fate.

The bitcoin supply curve is unlike that of any other commodity, whether hard, soft, or financial, because the curve generally does not increase supply in response to changes in demand. In practice,

it is possible to do so by adding a large amount of mining equipment and, via this additional processing power, have a block cycle time of less than 10 minutes. But while this action increases production at the moment, so to speak, it obviously comes at the expense of future production, since the long-term supply of bitcoin is fixed. Moreover, it is possible for the supply to decline in the sense that bitcoin holders have lost—and continue to lose—private keys; those coins still exist but are de facto inaccessible.



Compared to the 22% one-year increase in the M2 money supply, in May 2020, bitcoin went through a so-called “halving”, which reduced its annual inflation rate from 3.65% to 1.8%. More importantly, unlike the increase in the supply of dollars, which could be anything, Bitcoin’s inflation rate is programmed into the Bitcoin Core software; it is set in stone that, upon a halving every four years, its inflation rate is cut in half each time. In fact, the inflation rate in Bitcoin for the next 120 years is known, and it is a cumulative 14.2%, or an average 0.1% per year. We know this because there will only ever be 21 million Bitcoin outstanding, with the last coin expected to be mined in 2140, and there are currently 18.4 million coins already mined, so only 2.6 million coins remain to be mined over the next 120 years.

Thus, Bitcoin is becoming increasingly scarce at a time when the US dollar, as well as Euro, Yen, Yuan and all the other worldwide fiat currencies, are flooding the market. Bitcoin is also more scarce than gold in terms of gold that is already mined. More important than that, should the price of gold rise rapidly, new mines and new deposits within existing mines would then be economical, with the full expectation of a substantial increase in supply thereafter—a dynamic that applies to almost all commodities worldwide; but not to Bitcoin. Bitcoin also has advantages over gold, not only regarding portability, but also as to its use in transactions, which are immediate and border-free, since clearance does not require a specific custodian.



Another way of thinking about it is that the recent halving represents a ‘quantitative hardening’ for Bitcoin, relative to the quantitative easing that the fiat currency world is experiencing. The analogy has been made to the world-wide oil industry, as if half of all the oil wells were shut overnight. The result would be an improvement in the stock-to-flow ratio. Another way of thinking about it is that the Bitcoin price is affected by the supply, which, until the recent halving, amounted to about \$18 million of newly mined Bitcoin per day (144 blocks per day, or one every 10 minutes, with 12.5 Bitcoins per block, at a price of around \$10,000). Thus, assuming Bitcoin miners sold their daily rewards, it required net fundamental daily demand of \$18 million to keep the Bitcoin price steady. Bitcoin’s price has actually advanced rapidly over the past 1 ½ years, so it appears that demand has outstripped supply. Now, however, since the halving that occurred on May 11<sup>th</sup>, there is only \$9 million worth of Bitcoin being mined every day (144 blocks per day or one every 10 minutes, with 6.25 Bitcoins per block, at a price of around \$10,000). Therefore, assuming that demand can stay at the same level of \$18 million per day (just counting net fundamental demand and not algorithmic/day trading), then the price should increase.

Since it now has existed for 11.5 years, Bitcoin is the most successful and longest-living cryptocurrency, and with every year that it survives, the longer it is expected that it will continue to survive, as specified by the so-called Lindy Effect<sup>2</sup>. It is anti-fragile, to use another term. Bitcoin has been declared dead hundreds of times; yet, it is not just still alive, it is thriving. This in and of itself attracts more users—people who realize that it’s thriving despite that they’ve heard it was dead—and that contributes to an expanding network of users. Most recently, famous investor Paul Tudor Jones announced in early May that he has a 1%-2% position in Bitcoin<sup>3</sup>.

Since the supply of bitcoin cannot change with fluctuations in demand, the price is extremely volatile, which is to be expected given this condition. Holders of this currency should appropriately size the position with this volatility in mind. It is important to remember, in this connection, that when there is demand for any other commodity or currency, whether for wheat, gold, soybeans, or oil, etc., if the price rises enough, substantial new supply can be created. In the financial markets, an almost infinite supply of any item can be made available with alacrity if it is in high demand.

Bitcoin is a commodity for which that cannot happen, and with every 10 minutes that pass, there is less supply that can ever be created. Therefore, if bitcoin ever becomes sufficiently accepted, one should expect an absolutely enormous rate of return in a very brief period of time. The idea that someone can observe bitcoin gradually moving higher and then buy some might prove to be an incorrect analysis; by then, it would be too late.

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<sup>2</sup> *The Lindy effect is a theory that the future life expectancy of some non-perishable things like a technology or an idea is proportional to their current age, so that every additional period of survival implies a longer remaining life expectancy.*

<sup>3</sup> <https://www.scribd.com/document/460382154/May-2020-BVI-Letter-Macro-Outlook#download>



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