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A Future World Monetary Order

A debate on Lawrence H. White's *Better Money: Gold, Fiat, or Bitcoin?*

Edited by
Emile Phaneuf III

Center for Market Education

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Gold or Bitcoin as Alternatives to Fiat Money

Lawrence H. White

Center for Market Education

Lawrence H. White
George Mason University

Gold or Bitcoin as Alternatives to Fiat Money

Gold or Bitcoin as Alternatives to Fiat Money[1]

1. Which would be better as a monetary standard, Bitcoin or gold?

Which of the two would be better, Bitcoin or gold? Historical experience under the classical gold standard shows slow average growth in the supply of monetary gold, but also appropriate variation in the growth rate of the monetary gold stock in response to the current purchasing power of gold. These supply variations acted to stabilize the purchasing power of gold, keeping it close to a flat long-run trend. Gold has a nearly flat long-run supply curve. Bitcoin, by contrast, has a vertical supply curve that makes its purchasing power much more volatile in the face of demand variations. We can expect that should fiat inflations reach the level that prompts spontaneous household switching to better money, a gold standard is more likely than a Bitcoin standard to emerge from the market. In any case, laws and regulations should not prevent the market discovery and spread of better ways to serve money users. That discovery process calls for a level playing field and an open playing field.

Fiat monies are performing poorly. The euro is exhibiting the highest inflation rates in its history, the HICP reaching 10.6% in October 2022, despite a constitution specifying price stability as the European Central Bank's only goal. The US dollar CPI inflation rate reached 9% in June 2022, its highest value in 40 years. The British pound

[1] Prof. While presented his paper at the XVII International Gottfried von Haberler Conference (*Taking Money out of Politics: A Case for Private Money?)* on May 12, 2023 in Vaduz, Principality of Liechtenstein (Europe). It was published at the website of the *European Center of Austrian Economics Foundation* headquartered in Vaduz (Principality of Liechtenstein) (https://ecaef.org/lawrence-h-white-gold-or-bitcoin/). The Center for Market Education would like to thank the European Center of Austrian Economics Foundation for allowing us to republish this material.

CPI inflation rate reached 10.5% in December 2022, also its highest value in 40 years (all rates are year-over-year percentage changes in monthly consumer price indices[2]).

Are these just transitory blips, or will the current high rates of inflation persist as long as double-digit inflation did in the 1970s and early 1980s? Persistent 9-10% inflation imposes a serious tax on holders of money, and in more subtle ways disrupts an economy by making the price system noisier. In developing and middle-income countries, current inflation rates are even worse. Inflation rates are running above 30% in more than a dozen countries, and have recently reached triple digits in five countries. People living in lower-income economies are especially burdened by inflation because they generally speaking hold more cash relative to other wealth and don't have inflation hedges as readily available as do people in higher-income countries.

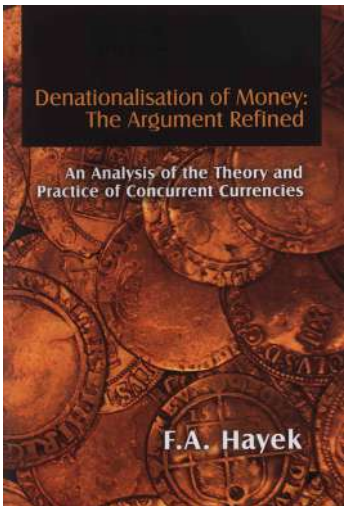
2. What can a society do about high inflation?

How can we control growth in the price level? Today it is generally understood, thanks to generations of economists (Austrian and otherwise) who have studied the matter, that in a fiat money economy we need to control growth in the quantity of money. When a central bank adds more money to the economy, other things equal, it dilutes the purchasing power of existing units of money. This is not to say that other events—shocks to velocity or real income—can't also affect the price level. But those causes tend to be relatively small and temporary, whereas growth in the quantity of money can be very large and be very persistent when the government wants it to be. We need to limit growth in the quantity of fiat money if we want to keep inflation in low single digits.

[2] For the euro, HICP inflation rate – Overall index, https://www.ecb.europa.eu/stats/macroeconomic_and_sectoral/hicp/html/index.en.html; for the US dollar, Consumer Price Index for All Urban Consumers (CPIAUCSL), https://fred.stlouisfed.org/series/CPIAUCSL; for the UK, Consumer Prices Index, https://www.ons.gov.uk/economy/inflationandpriceindices/bulletins/consumerpriceinflation/January2023.

How do we control growth in the quantity of money? Many economists have taken the approach «Let's persuade central bankers to pay more attention to keeping inflation low», as though central bankers are not aware of inflation data, or «Let's advise central bankers to put more weight on keeping inflation low», as though central bankers do not already have preferences. I'm not against giving unsolicited good advice to central bankers, but I don't think that's sufficient. I think we've learned that central bankers have preferences in terms of the immediate-run tradeoff between inflation and unemployment. They are pressured by fiscal authorities to accommodate spending. They value their independence, and so will do what the fiscal authorities want (irony intended). Just as we economists treat firms and consumers, we can presume that a central bank is already optimizing given all of the influences on it. Accordingly, we on the outside need to do more than give advice. We need to impose institutional constraints. We need to limit central banks' discretion to pursue goals other than stability in the purchasing power of money (or in nominal income, which may better balance medium-run stability in purchasing power with stability in real income).

How can we get effective institutional constraints? Two approaches to the question developed during and since the episodes of double-digit inflation in developed economies in the 1970s and 1980s. The first and more common approach considers various "rules" for the creation of fiat money, prescriptions to be imposed on central banks. The classic article Kydland and Prescott (1977) provides a leading example. It discusses how enforceable rules, by contrast to discretion, provide precommitments that enable central banks to achieve a low inflation goal more effectively. This is advice directed to policymakers. When the central bank can't effectively bind itself (because it can always modify any self-imposed rule), policymakers external to central banks, perhaps legislatures, are to impose enforceable constraints on central banks.



Here I take the second approach, which considers how competition among monetary standards can discipline the issuers of money. The classic work in this approach is F. A. Hayek's *The Denationalisation of Money* (1976), published a year before the Kydland and Prescott article.

Hayek reformulated the question of why inflation had gotten so high by asking: «Why has the quality of money been allowed to deteriorate so badly?». He noted that in other goods and services what we rely on to provide us with quality goods is competition among producers. Any dissatisfied consumer can stop buying a low-quality product and switch to a higher-quality product. He concluded that we should similarly let people choose what they consider the best among the world's monies. The earliest version of his recommendation was: Leave people free to use any of the existing fiat monies. Governments should not maintain barriers against people opening bank accounts in foreign currency or even using foreign banknotes. The later "denationalization" version added a further proposal: Let private enterprise compete for the favor of money-users. He predicted that issuing firms would promise to provide stable purchasing power, and if some failed to do so, the public would abandon them in favor of the issuers who were doing a better job.

Competition from other monies would compel a nation's central bank to lower the inflation rate in its money, Hayek argued, because it would lose its customers if it didn't match the low inflation rates of the competing suppliers.

Hayek's imaginative analysis has acquired renewed relevance today in light of real-world new entrants into the market for monetary standards. Bitcoin emerged in 2009. Starting from zero, albeit through ups and down, it has remarkably achieved a market capitalization (total value of units outstanding) that recently stood at over $500 billion (about 20 million coins with a market value above $25,000 each).

The blockchain "distributed ledger" technology introduced by Bitcoin is also being applied to make units of gold transferable in a more convenient way. Tether Gold, consisting of Ethereum tokens backed by ounce for ounce by gold in warehouse vaults, was introduced in 2014. In April 2023 it had $496 million outstanding. The leader in the "digital gold token" segment is Pax Gold, which has over half a billion dollars' worth outstanding ($549 million in April 2023). These tokens are still small in market capitalization compared to Bitcoin, but are growing. They provide a convenient way of holding transaction balances in gold, and paying them to anybody who can accept an Ether token. There are other new firms that enable gold transfers in the form of non-crypto transferable warehouse claims, such as Glint (which enables online transfers) and Coro (phone app transfers).

There are legal obstacles and tax rules in most countries that discriminate against the holding and use of Bitcoin and gold as transaction media. There are certainly obstacles to the creation of brick-and-mortar banks that are based on Bitcoin or digital gold. On a level playing field, against high-inflation fiat monies, both Bitcoin and digital gold are possible competitors as monetary standards.

Which of the two would be better, Bitcoin or gold? We can look to the historical experience with the classical gold standard and see that it produced a slow average growth in the supply of monetary gold. Hugh Rockoff's (1984) data indicate that the stock of gold grew at 2.9% per year on average over the century preceding the First World War. It can be observed in the data that the growth rate of the monetary gold stock varied from decade to decade, roughly in the range of 1% per year to 5% per year. What is less obvious, but no less real, is that it varied in response to the current purchasing power of gold. Such induced supply variations acted to stabilize the purchasing power of gold, returning it to its flat long-run trend.

A thought experiment will illustrate. Suppose that a new country joins the gold standard, making the demand to hold monetary gold grow faster than supply, or alternatively that monetary gold demand grows with productivity improvements that increase in the growth

rate of real output. In either case the purchasing power of an ounce of gold will then begin to rise. The rising purchasing power of gold dampens non-monetary (industrial and jewelry) quantity demanded, and stimulates an additional quantity supplied from gold mines. In the short run it pays to convert jewelry and industrial gold stocks into coin (the monetary stock supply curve slopes upward because the non-monetary stock demand curve slopes downward). In the market for gold flows, it pays to use less for industrial purposes (the flow demand curve slopes downward), and it pays to dig a little deeper into each gold mine (the flow supply curve slopes upward). An increased flow of mined gold to the mint accumulates, shifting the stock supply curve to the right over time. It pays to prospect a little more, leading in the longer run to the opening of new mines, so that the long-run stock supply curve is very elastic. The classical gold standard thus responded both to idiosyncratic demand shocks, like countries switching from silver to gold standards, and to secular growth in money demand, in a way that effectively stabilized the purchasing power of gold. When money demand grew, the gold standard eventually satisfied that demand by increasing the quantity, rather than putting the whole burden of adjustment on the price level.

Monetary gold having a flat or nearly flat long-run stock supply curve means that over long periods – and this is evident in the historical data – the purchasing power of gold keeps returning to a stable trend, a very flat trend. The purchasing power of the US dollar, defined as an unchanging mass of gold, was nearly the same, less than one percent different, between the US re-joining the gold standard in 1879 (the CPI was 9.67) and the classical international gold standard being abandoned in 1914 (the CPI was 9.60). Likewise, the purchasing power of the UK pound was almost exactly the same on the eve of the First World War (1.303 in 1913) as it had on the eve of the Napoleonic Wars (1.304 in 1796)[3].

[3] Data sources: US CPI https://www.measuringworth.com/datasets/uscpi/; UK RPI https://www.measuringworth.com/datasets/ukearncpi/.

Photo by Nick Chong on Unsplash

A gold standard is subject to supply shocks, unexpected discoveries of sources of gold, the largest of which was the California gold discovery of 1848 that led to the gold rush of 1849. But historically such shocks were relatively small, and large future supply shocks are unlikely given that the entire globe has now been explored. Judging by the UK Retail price index, the impact of the California discovery created an inflation in the world price level that ran at an annual compound rate of 1.46% for about 11 years. (The UK RPI turned up only after 1851, reaching a local peak 17% higher in 1862, and thereafter declining.)[4] Over the longer run, as already noted, the purchasing power of gold was very flat.

We do not have historical data for a Bitcoin standard, but we can imagine a world in which Bitcoin is the predominant medium of exchange, so people hold Bitcoin as a transaction medium. That would make demand to hold Bitcoin more stable than it is now, when it is held almost entirely as a speculative asset. But purchasing power would not be constant in response to remaining variations in demand, because the quantity of Bitcoin is absolutely inelastic. It grows at a programmed rate without regard to the value of Bitcoin, without regard to its price in dollars or purchasing power over goods and services. The impact of an increase or decrease in demand falls entire on the price of Bitcoin, not at all on its quantity. This feature makes the purchasing power of one Bitcoin quite volatile. There's no reason for reversion to a steady secular path, the way there is under a gold standard. Purchasing power volatility is built into the design of the Bitcoin system.

[4] Ibid.

Bitcoin has been successful at attracting investors, but not so successful at attracting people who want to use it as a medium of exchange, because of its volatile purchasing power.

The data show that Bitcoin's daily percent change in dollar price is a multiple of that for gold or the euro. Bitcoin's 60-day volatility is likewise a multiple. Contrary to predictions by some Bitcoin promoters, the volatility of Bitcoin has not diminished over its lifetime. Demand swings remain large, and the supply responses to them remain zero. Demand shifts are absorbed only by proportional changes in the price and not by changes in the quantity.

Where does that leave us? Bitcoin standards and gold standards are not going to establish themselves from the bottom up without a breakdown in fiat standards. People are going to continue to use fiat standards as long as they work tolerably well. Recent fiat readings of 10% inflation under fiat standards are indications of not working tolerably well. If we look at the experiences of countries with acutely high inflation, we find that dollarization grows with the height of inflation. There is no exact numerical threshold applicable to every country, but roughly speaking it appears that a majority of the populace switches to using the US dollar, or the euro, when local inflation reaches about 20 percent annually and shows no sign of returning to single digits. You know that a currency is in trouble when the inflation rate begins to be reported in monthly rather than annualized figures.

If inflation rates in the dollar and the euro rise above 20 percent, we will see people in countries with even weaker currency switching not to dollars or euros, but toward alternative media of exchange like gold and Bitcoin. We have already seen this in Venezuela as a result of triple-digit inflation combined with restrictions against US dollar use. Venezuelans have turned to earning and spending Bitcoin, especially in the cities, and to using gold as a medium of payment in the gold-mining regions. News articles have reported on people using flakes of gold to buy groceries, with shop prices posted in grams of gold.

So long as fiat inflation rates remain below that range, established fiat standards have a network advantage. People want to paid in what they can turn around and spend today. There aren't many goods and services available for purchase in gold or in Bitcoin today, outside of countries with triple-digit inflation. To get a spontaneous global switch to a gold or Bitcoin standard I expect that we will have to wait for chronically high inflation in all of the major fiat currencies. Of course, nobody hopes for such an event. Still, it's good to have alternatives on standby. And it's good to allow people as much access to alternatives as they want.

3. If we see a market switch away from fiat monies, would it be to gold or to bitcoin?

I've already noted that gold's purchasing power is less volatile. Gold also has a larger installed base of users. World Gold Council estimates indicate that there is close to $13 trillion dollars of gold held above ground (at a price of $2000 per troy ounce). Nearly half (46%) of that gold is in jewelry, but the dividing line between holding 22K jewelry and holding bullion is a thin one in countries like India. The part of the gold stock held by the public and by central banks in explicitly monetary form, that is, in bullion and coins, is about $4.9 trillion. That's about 9 times the market value of Bitcoin, which is currently about $0.54 trillion.

Bitcoin does have one important advantage, however. Because it is intangible, and can be transferred peer to peer without custodians, Bitcoin payments are harder for governments to restrict or shut down than a system of payments settled by transfers between brick-and-mortar gold-vaulting institutions. We will have to see which advantage will prove more popular. The more restrictive governments are toward gold, the more that favors Bitcoin. Governments can, however, drive Bitcoin underground by outlawing its open use. The

results can be seen in China: not zero use or mining of Bitcoin, but much less, and only underground, blocking its use as a medium of exchange from reaching even the extent possible given its volatility.

There are additional alternatives. There could be a future money somewhat like Hayek imagined, pledging a stable purchasing power. Nowadays it might take the form of a "flatcoin": a cryptocurrency pegged to a price index or quantity-governed to return to a constant purchasing power. Projects are underway. It's not clear that a continuously pegged stablecoin would be viable: It would have to match its inflation-indexed liabilities with inflation-indexed assets, but inflation-indexed bonds often have negative yields. The second alternative, a non-pegged flatcoin, is represented by a project I'm consulting on, called Prasaga. The idea is to program the coin to have a demand-responsive supply, like the classical gold standard had, only with purchasing power mean-reversion in a matter of months rather than years.

The norm of consumer sovereignty calls for better monies from the point of view of money users. We might presume that money users want more stable purchasing power, but the market discovery process needs to operate to show us what features money users actually want. Governments need to allow free entry (on a caveat emptor basis) of monetary projects that involve alternative standards in order to give the entrepreneurial discovery process full scope. Public policies should not inhibit the discovery of better ways to serve money users. That discovery process calls for a level playing field and an open playing field.

As long as fiat money persists because of its network advantage, those of us who want *better money* will need to continue to work on ways to impose rules to appropriately limit the expansion of central bank liabilities. To use the language of constitutional political economy, we will need to constitutionally constrain government issue of money.

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On Larry White's *Better Money*

George Selgin

George Selgin
The Cato Institute

When prospective economics PhDs ask experts how to decide where to study, the standard answers are, first, to choose the most prestigious program that's willing to admit them and, second, to choose as their mentor the most accomplished faculty member who will take them on.

If I ever got that advice, I didn't take it. Instead, I chose as my mentor someone who, instead of being a well-established professor, still lacked his own PhD, and I decided to get my own degree wherever he ended up teaching. NYU hired him, and we turned up there at the same time.

My mentor was Larry White.

I don't regret my risky choice. But why Larry? I chose him after reading parts of his dissertation—later published by Cambridge University Press—on *Free Banking in Britain* (1984). Here was a work at once extremely radical and perfectly sober. It displayed thorough knowledge of its subject-matter and impeccable logic, conveyed through crystal-clear prose. Larry's quietly convincing way of defending a thesis many considered sensational made a deep impression on me. Anyone who could write like that had to be a good teacher. And Larry's willingness to question conventional wisdom suggested that he wouldn't mind having a student who was inclined to do the same.

The qualities that made *Free Banking in Britain* resonate with me reoccur in all Larry's later writings, and never more so than in *Better Money*. Here again his most fundamental thesis runs counter to conventional wisdom: it is, simply, that instead of being dismissed out of hand, potential alternatives to fiat money, gold and bitcoin in particular, deserve to be treated seriously by economists. Actual fiat monetary systems are, after all, far from perfect, and the only way to know whether we can do better is by comparing the merits and drawbacks of fiat standards to other arrangements. *Better Money* considers two alternatives, a Bitcoin standard and a gold standard. Which of the two, it asks, would give us better money, and could either be better than fiat money?

Like his treatment of the Scottish banking system, Larry's attempt to answer these questions is entirely clear-headed: one finds none of the doomsday scenarios here that characterize so many works on gold and Bitcoin. «The approach taken here», Larry (2023, p. 4) writes,

> «is analytical, not alarmist. Inflation has risen, but most countries are not on the verge of a hyperinflationary collapse of their fiat monies. Understanding how a gold standard or a bitcoin standard would work is nonetheless relevant for contingency planning at the very least. The potential alternatives...are little understood outside "goldbug" and "Bitcoiner" communities».

(One might add that they are also poorly understood within those communities.) Because Larry is himself neither a goldbug nor a Bitcoiner, he resists exaggerating either their advantages or the shortcomings of fiat money. *Better Money* is an academic study, not a polemic.

Alas, getting academics themselves to take alternatives to fiat money seriously isn't easy, owing to a fallacy that causes many of them to exaggerate its advantages. The fallacy has to do with the fact that alternatives to fiat money tend to be self-regulating or automatic, whereas fiat standards are, or can be, deliberately manipulated in all sorts of ways. It follows that one can't speak of "the" behavior of the money supply under an ordinary fiat standard. Instead, all sorts of behaviors are materially possible, from the very worst to the very best of which mortal central bankers are capable. The fallacy consists of scholars' tendency, in comparing fiat money to alternatives, to assume that it will be managed *their way*. Because an automatic standard, whether gold or Bitcoin or something else, is unlikely to outperform, in the eyes of any scholar, that scholar's ideally-managed fiat system, fiat takes the laurels—and does so no matter how far real-world fiat systems themselves veer from that same ideal. I call this source of bias favoring fiat systems the "blackboard" fallacy, because it confuses the idealized fiat monetary system of some professor's "blackboard" with versions likely to operate in practice

given the incentives their managers face, including pressure from fiscal authorities to engage in inflationary debt monetization and the "time inconsistency" problem that tempts them to do so even absent such pressure.

The advantages of fiat money over gold and other "natural" commodity standards are often exaggerated for other reasons. One consists of the temptation to exaggerate the likely magnitude of supply shocks to which a gold standard is vulnerable—one that can be resisted easily enough by consulting the actual record. Another is the tendency to exaggerate the resource costs of a gold standard, in part by ignoring how fiat systems have boosted the demand for gold, and its relative price, by giving rise to heightened inflation expectations. In the early chapters of *Better Money* Larry clears the air of these and other mistaken criticisms of the gold standard so as to be able to give readers a clear picture both of its merits and of its genuine shortcomings. He notes, for example, that during the decade following the California gold rush, which included a second gold rush in Australia, the average annual U.K. inflation rate was just 1.3 percent—a figure most of today's central bankers would consider excessively *low*.

While Larry devotes roughly equal attention to gold's historical performance and the theoretical forces that "automatically" regulate its supply, the relative absence of such automatic forces in the case of fiat money cause him to devote more space to empirical evidence in his chapters on it, while drawing on public choice theory and theoretical writings on the potential fiscal "dominance" of monetary policy to account for patterns that evidence displays, including relatively high fiat-money inflation rates.

The last third of Larry's book addresses the relatively unexplored workings of a Bitcoin monetary standard. Because the world has yet to witness an actual Bitcoin standard in operation, the discussion here is necessarily highly speculative. It helps that Bitcoin is another self-regulating standard, where the regulatory mechanism, though technically sophisticated, causes the quantity of Bitcoins to grow at a

perfectly predictable though diminishing rate. That quantity will level off to just shy of 21 million coins a few years from now. Consequently the necessary speculation only concerns how the *demand* for Bitcoin will evolve and fluctuate, and what macroeconomic consequences will follow. An important, related set of questions concerns the role of redeemable Bitcoin substitutes, which may go some way toward accommodating growth in the demand for Bitcoin-based exchange media once the supply of Bitcoins themselves has reached its limit.

The fact that there is (obviously) no industrial or decorative use for Bitcoin also makes speculation concerning the performance of a Bitcoin standard easier. But against that must be set the fact that Bitcoin is the object of a different and more intense sort of speculation, namely, that of investors, many of whom suppose that, because its quantity cannot increase beyond a rapidly approaching limit, it is more likely to appreciate than not. Thus, the fixed supply feature of Bitcoin has inadvertently contributed to the volatility of its relative price, undermining its attractiveness as an exchange media.

Bitcoin's widespread adoption as a medium of exchange would itself tend to stabilize its value. But so far, despite its name, Bitcoin's use for that purpose has been quite limited. Its limited use in ordinary payments is partly due to its short-term price volatility, which exposes anyone who accepts it in exchange to some nontrivial risk of loss. But it's also the case that paying for things with actual Bitcoins isn't very efficient: it costs more, or takes more time, or both, to complete a payment using them than by using many fiat-based alternatives.

The same may be said for gold coins today, with this difference: while gold standards prevailed, banks' paper notes and deposits were also denominated in gold, and these bank-based forms of bank money could themselves be quite efficient. Although there are no gold-standard banks today, were the gold standard revived somewhere, there's every reason to suppose that gold-standard banks would also reappear, provided the government allowed it. And the same bank-based substitutes for cash that make both rapid and inexpensive fiat payments possible today could make equally rapid and inexpensive gold payments possible in the future.

Could banking do for Bitcoin what it does for fiat money, and what it did in the past for gold? There's no reason to suppose it couldn't; and Hal Finney, one of Bitcoin's legendary "cypherpunks" who is widely assumed to have contributed to its development, suppose that it would. For others, however, Bitcoin banking would undermine one of Bitcoin's most important advantages over both digital (including fiat) and commodity monies, namely, that one can transact with it electronically and (hence) remotely, while still avoiding any reliance upon third parties. Perhaps this lack of reliance on third parties would make the higher transaction costs of a bank-less Bitcoin system worth paying.

But going bank-less wouldn't just mean incurring those higher transactions costs of exchange. It might also mean not having any basis for monetary expansion beyond Bitcoin's 21-million-coin limit; and in growing economy, that would almost certainly mean persistent deflation.

Deflation is one of the more divisive topics in economics. Most economists consider all deflation bad. A few free-market types think it is never so. A third group, to which both Larry and I belong, insists that whether deflation is harmful or not depends on whether it results from a decline in spending or an increase in economic productivity. "Good" deflation has prices falling as productivity improves or, what amounts to the same thing, as fast as goods' average unit production costs decline. "Bad" deflation is any deflation beyond that, which can only reflect shrinking demand. Historically, "good" deflation tended to coincide with good times. "Bad" deflation tended instead, and still tends, to go hand-in-hand with recessions or depressions, particularly when it's unexpected.

Most of the deflation that took place under the "classical" gold standard, that is, during the four decades before World War II, was the "good" sort. The deflation of the 1930s was, in contrast, decidedly "bad". Would a bank-less Bitcoin standard be likely to result in deflation and, if so, just how "bad" would that deflation be? The answer to the first question is an almost certain "yes": even modest

economic growth would tend to push prices down in the absence of any corresponding growth in the money stock. The second question is much harder to answer. But it is very hard to deny that the risk of "bad" deflation would be considerably greater under a bank-less Bitcoin standard than it was under the classical gold standard, which benefitted from a steadily growing gold stock, if not from occasional gold supply "shocks".

Larry's summing-up of the question of deflation under a Bitcoin standard exemplifies the low-key nature of his book as a whole. He speculates that, absent bank-issued Bitcoin substitutes or something equivalent, and given recent rates of economic growth, a good guess at a Bitcoin standard annual deflation rate for the United States would be about 2.1 percent. The prevailing real equilibrium interest rate of about 1 percent implies about 1.1 percentage points of what I've called "bad" deflation—enough, Larry (2023, p. 210) says, to «interfere[] with efficient intertemporal allocation». A less temperate writer might have called it enough to cause a recession.

Larry finds it easy to be temperate because he's ultimately not interested in making a case for or against any of the three sorts of monetary standards whose workings he examines. Instead, he ends *Better Money* with a chapter simply urging the powers-that-be to "Let Potential Monies Compete" by removing any artificial barriers to such competition. But *Better Money*'s real contribution isn't policy advice. Its goal is helping others to think clearly about monetary policy options that are usually either dismissed out of hand or regarded as sacrosanct.

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Commentary on Lawrence H. White's book *Better Money: Gold, Fiat, or Bitcoin?*

Emile Phaneuf III

Center for Market Education

Emile Phaneuf III
Center for Market Education
(CME)

Commentary on Lawrence H. White's book *Better Money: Gold, Fiat, or Bitcoin?*

Commentary on Lawrence H. White's book *Better Money: Gold, Fiat, or Bitcoin?*[1]

Introduction

I was pleased to be asked to write some comments on Professor Lawrence White's new book *Better Money: Gold, Fiat, or Bitcoin?* As someone appreciating the Mengerian explanation for the origin of money and the Hayekian concept of competition in currency, I read White's important work with great interest. I also found it to be unsurprisingly masterful in its analysis. I only hope that a lesser seasoned economist such as myself might have a point or two worth making that can add to the conversation. On the whole, I have little disagreement with most of White's analysis, although I do believe that Bitcoin's purchasing power volatility is worth revisiting more carefully. (In fact, on this important matter, we do diverge in our conclusions). I also explore one of the conditions in which White believes that Bitcoin's volatility could be dampened, namely its increased use as a medium of exchange. Finally, I show why Bitcoin is the only realistic candidate to (by "sly roundabout way") introduce something that government cannot stop – as Hayek hoped would become possible.

In *Better Money*, White considers very carefully the trade offs between gold, fiat, and Bitcoin. His analysis rightly highlights important downsides to central banking and the state's monopoly on money (with a focus on fiat), explores some key advantages of gold (especially gold's ability to adapt the monetary stock growth rate «in response to the current purchasing power» – White, 2023b), and

[1] For a couple of paragraphs in the final section of this commentary I borrowed content from two of my own articles (Phaneuf, 2023a and 2023b) formerly published by the American Institute for Economic Research (AIER) (https://www.aier.org/people/emile-phaneuf-iii/). AIER licenses the work under the Creative Commons Attribution 4.0 International License. Glassnode charts created using the platform at glassnode.com using metrics readily available.

puts the spotlight on Bitcoin's «perfectly inelastic supply mechanism that produces purchasing-power volatility» (White, 2023a, p. 195).

White's Hayekian approach to competition allows him to recognize that the currency that users want can only be discovered through a market discovery process. As he states it (White, 2023b), «We might presume that money users want more stable purchasing power, but the market discovery process needs to operate to show us what features money users actually want». As such, legally speaking, governments should «allow free entry... of monetary projects».

There are many areas in which one could focus commentary on *Better Money*, but as perhaps I know Bitcoin better than I do fiat or gold (having studied it carefully for several years now), my commentary will be limited to this sphere. Secondly, while I partially focus on areas of disagreement with White's fantastic new book, it is only to advance the discussion further. Regardless of any disagreement, I find the book exciting and recommend it to anyone seeking to understand what makes a better money.

On a final note, if I am to err in one place or another, I hope that my analysis can still contribute something to the understanding of Bitcoin in particular, and thus, at least some minor degree, also to the broader discussion of better money more generally. Any mistakes are my own.

1. Bitcoin's volatility, revisited

In this section, we will analyze Bitcoin's purchasing power volatility *under a fiat standard*. But as White (2023a, pp. 95-96) himself rightly points out, just as it makes no sense to assume that the purchasing power stability of *monetary gold* can be judged by observing *de-monetized gold* (post-Bretton Woods, for example), we cannot assume that Bitcoin's purchasing power stability during a fiat standard would be representative of how it would perform under a monetary Bitcoin standard[2]. «But because we cannot look to the performance of any historical Bitcoin standard», White writes, we are limited to «theoretical evaluation in light of Bitcoin's supply mechanism and its differences from gold's supply mechanism.»

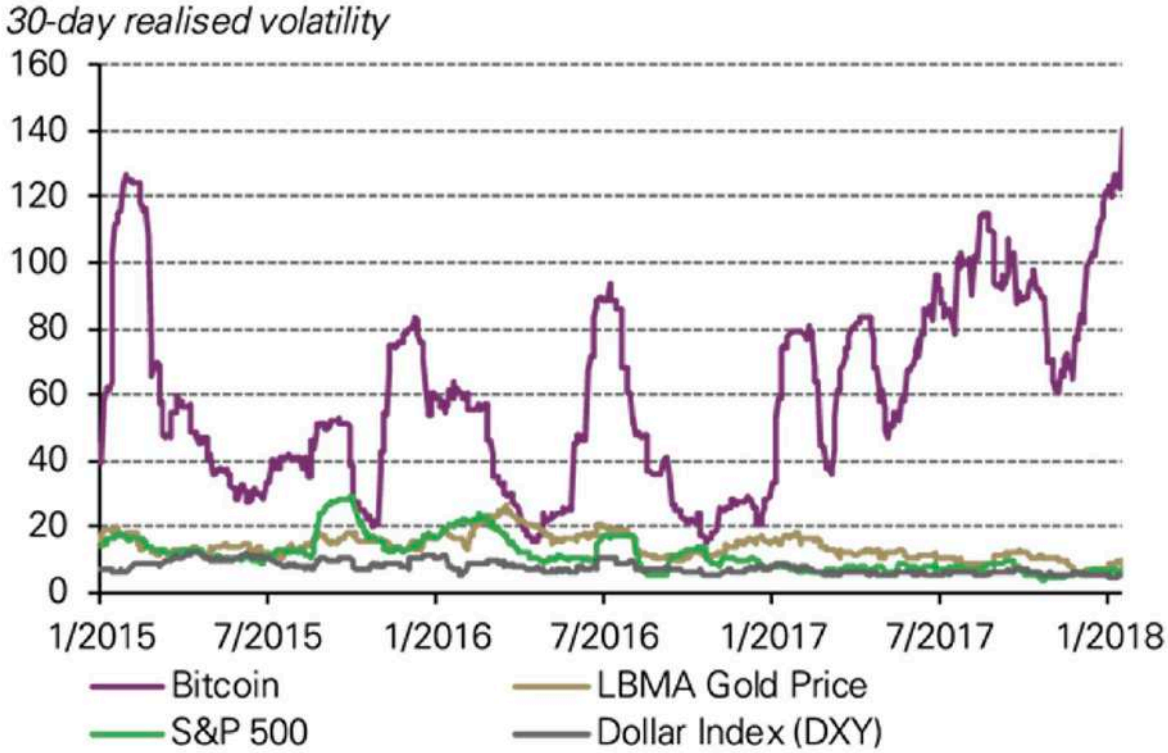
At the outset, I must state that I agree with Professor White that given that Bitcoin's supply is completely unresponsive to changes to demand, this puts all the volatility onto its price. I also readily concede that for more risk averse and less technically-savvy users (or for users with a shorter time horizon), this can be a deal-breaker, especially while governments discourage use of alternative currencies in various ways (taxes, reporting obligations, burdensome and degrading KYC[3] requirements, outright bans, etc.) – especially while fiat currencies are still working tolerably well. However, a few points deserve to be made.

One point worth noting is that one can reasonably come to different conclusions on Bitcoin's price volatility depending on the date range and the metrics used. For example, in 2016 the Brazilian economist Fernando Ulrich (2016) looked at Bitcoin's volatility up until that point using some of the same metrics that White used in *Better Money* and concluded that Bitcoin's volatility had been on a downward trajectory. Of course, much can happen since 2016. By

[2] Joakim Book was right to highlight this point in his own response to *Better Money*, originally published in Bitcoin Magazine
[3] Know Your Customer.

contrast, White looked at Bitcoin's volatility throughout its lifetime for his book published in 2023 and noted that «it is not surprising that (contrary to predictions of a few years ago) no reduction in the volatility of Bitcoin's purchasing power has been seen with growth in its market cap» (White, 2023a, p. 184).

As for Bitcoin's volatility relative to other assets, White writes that «Measures of the volatility of Bitcoin's dollar price show it to be 3.5 to 9 times greater than the volatility of foreign fiat currencies, gold, or even the S&P 500 index (World Gold Council 2018, chart 2)» (White, 2023a, p. 182). Here below is that chart 2, from the World Gold Council[4]:



*As of 19 January 2018

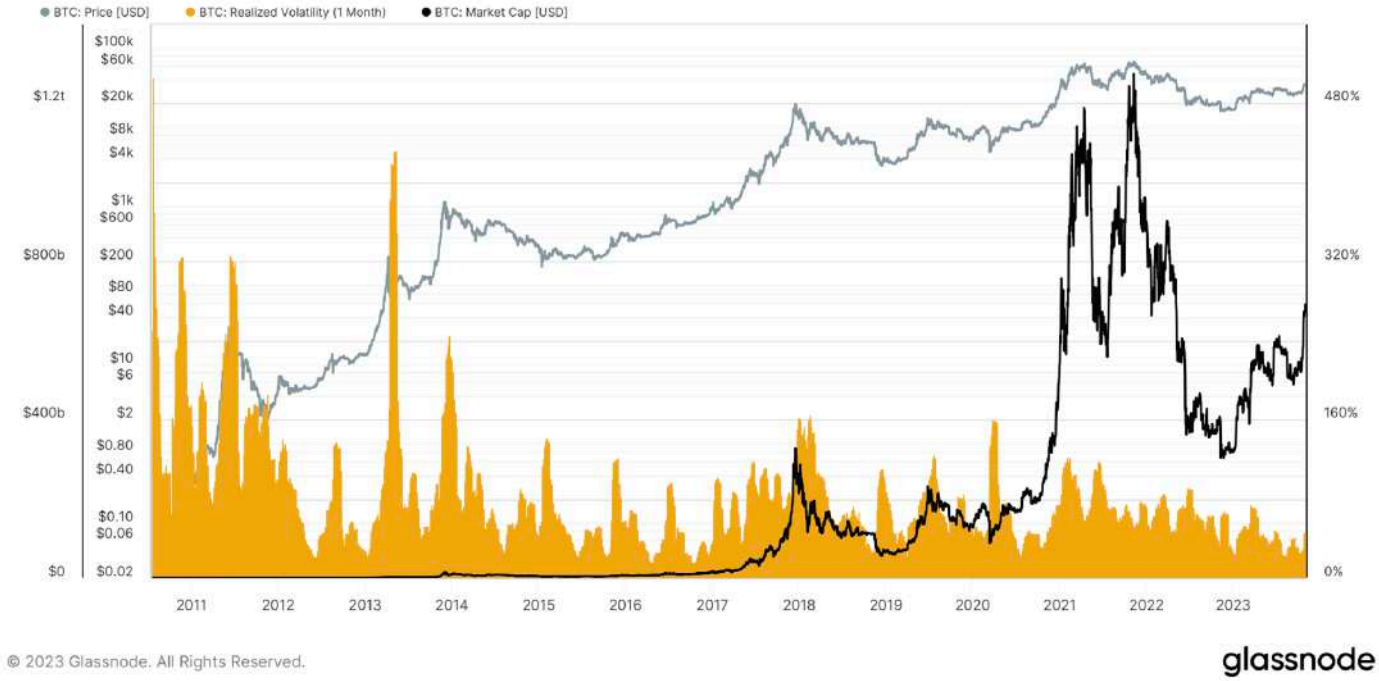
Source: Bloomberg, World Gold Council

Indeed, the chart supports White's point, certainly when compared to the S&P 500 and gold. But, for what it is worth, if we look at a 30-day realized volatility over a longer time horizon, measured in USD (which is the chart Glassnode is able to produce for me), we still see that *Bitcoin's volatility is on the way down, relative to its own past*.

[4] https://www.gold.org/goldhub/research/cryptocurrencies-are-no-substitute-gold.

This is worth mentioning because it refutes White's aforementioned bold claim that purchasing power volatility had not dampened as market cap had grown. On this particular point, I think he is wrong[5]. We *have* seen a reduction in Bitcoin's volatility[6]. It is one thing to show that Bitcoin is more volatile to other assets and to conclude that the relative volatility «makes its widespread use as a medium of exchange very unlikely» (White, 2023a, p. 188); it is another thing to conclude that no reduction in Bitcoin's purchasing power volatility has been seen. That's factually incorrect in an important but exciting way. I say «exciting» because it means that White's (and Hayek's – and my own for that matter) vision of taking money out of the hands of the state may just have a chance *through Bitcoin*. If Bitcoin's volatility is dampening (relative to its own past) in, say, USD terms, it may be on its way. Remember that Bitcoin is a brand new asset class in the grand scheme of things, with only fifteen years of life. If volatility can dampen even a small bit over a medium time horizon, it could do a great deal more over the long-term[7].

BTC volatility + market cap



[5] White being wrong on this one (but still very important) point is forgivable given *Better Money* still has 200+ pages of excellent analysis.
[6] I readily concede here that I am no statistician. I am an educated layman eyeballing charts. I will leave it to real statisticians to decide if my conclusions are correct.
[7] I do suspect that governments will become increasingly more and more hostile to Bitcoin, which can discourage its use as a medium of exchange. This, of course, could slow or reverse the gains in purchasing power volatility reduction.

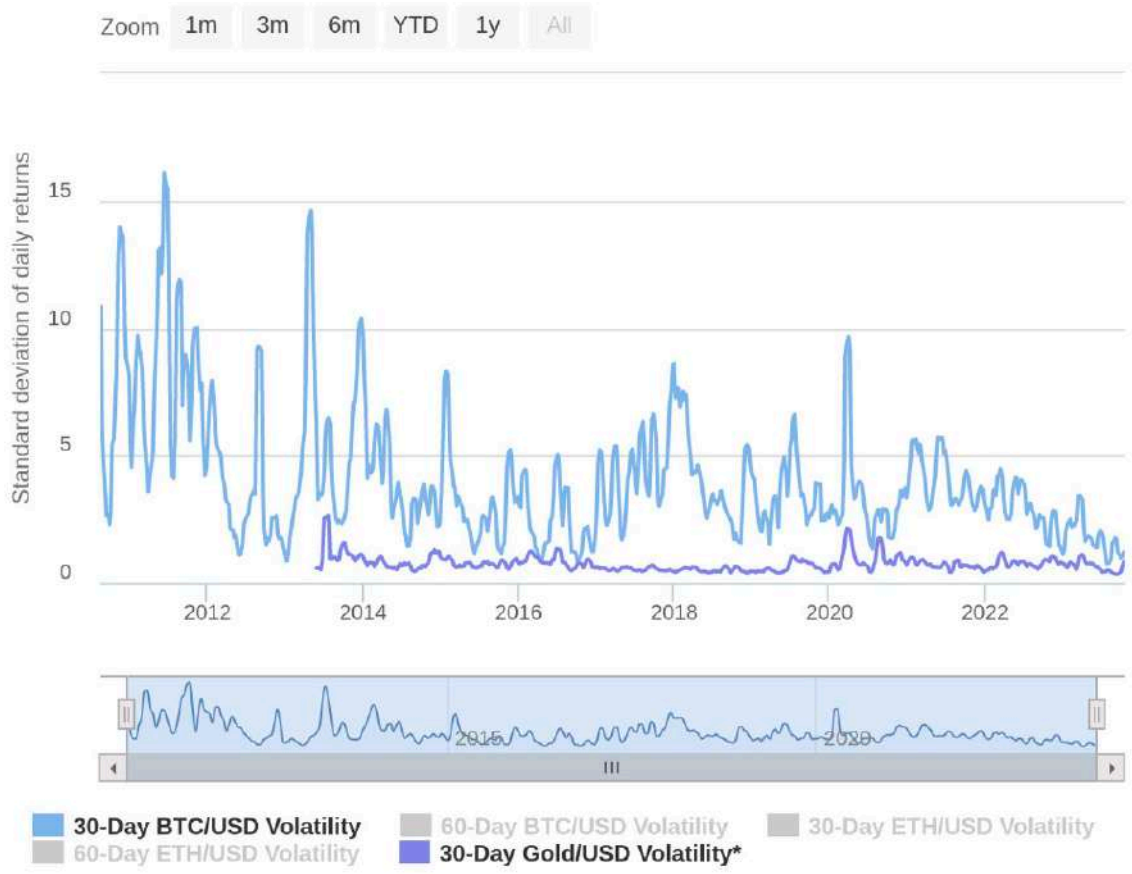
Of course, my chart above does not show gold or equities, but I think it does show that in USD terms, *Bitcoin's price volatility has been dampening* (contrary to White's claim that it has not) – even if you ignore the bumpy beginning of the first year or two of Bitcoin's life (beginning in January 2009). Notice also the unsteady but gradual increase in Bitcoin's market cap given that was the other variable White highlighted that coincided with Bitcoin's volatility over time. It should be noted that the huge spike (black color on the chart) in 2021 came during Bitcoin's bull run, partially propped up by the COVID-era unprecedented levels of economic stimulus that also propped up equities, housing, and commodities that same year.

To summarize my points thus far: Professor White on one hand (rightly) shows that Bitcoin's purchasing power is more volatile than that of gold, the S&P 500, and other fiat currencies. I agree that this makes Bitcoin's rise as a global currency more difficult (especially in countries with tolerable fiat inflation levels). However, he also states (wrongly, I conclude) that «no reduction in the volatility of Bitcoin's purchasing power has been seen with growth in its market cap». As I have shown, as Bitcoin's market cap has increased over time, *we have seen a reduction in its purchasing power volatility, relative to its own past*.

Here below are two more examples I can draw from using sources also referenced in White's book[8].

As we see from the first of the below two images, gold is indeed less volatile than Bitcoin, but there has still been a reduction in the volatility of Bitcoin's purchasing power.

[8] https://buybitcoinworldwide.com/volatility-index/.


Zoom 1m 3m 6m YTD 1y All
Standard deviation of daily returns
15
10
5
0
2012
2014
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2018
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2022
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2020
30-Day BTC/USD Volatility
60-Day BTC/USD Volatility
30-Day ETH/USD Volatility
60-Day ETH/USD Volatility
30-Day Gold/USD Volatility*

Zoom 1m 3m 6m YTD 1y All
Standard deviation of daily returns
20%
15%
10%
5%
0%
$1,000,000
$100,000
$10,000
$1,000
$100
Bitcoin Price
2015
2020
2015
2020
Price
30-Day BTC/USD Volatility
60-Day BTC/USD Volatility
Highcharts.com

2. Bitcoin's increased use as a medium of exchange

I will respond here to an interesting point of White's in regards to the conditions in which he believes could dampen Bitcoin's volatility. To clarify again: I conclude that Bitcoin's purchasing power volatility has been dampening already; he concludes that it has not. Regardless, he does concede that it *could* dampen under one (or both) of the following two circumstances:

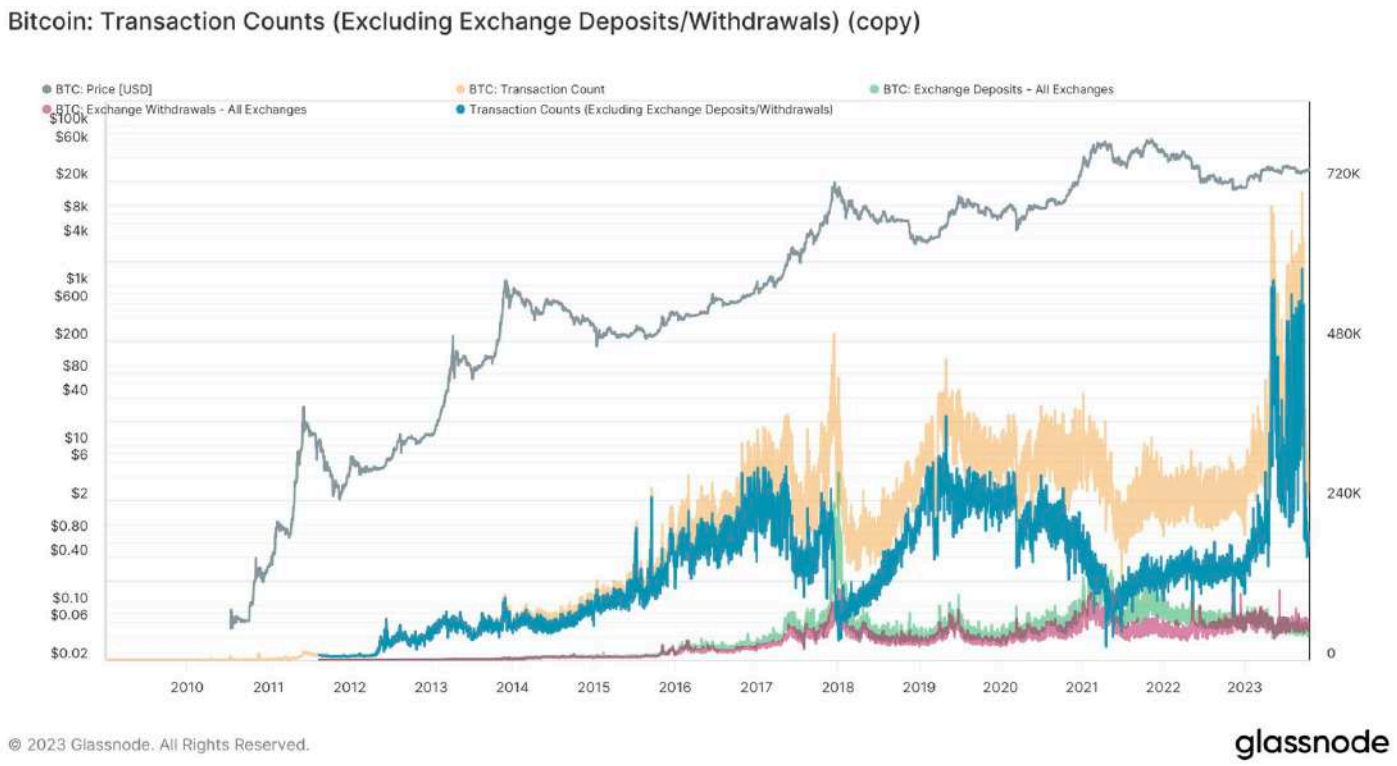
1. if use as a medium of exchange would substantially increase
2. if banking on a Bitcoin standard were to occur

If one concludes that Bitcoin's purchasing power volatility has not decreased over time, they might conclude the following (and as far as I can tell, this is Professor White's argument): *If* Bitcoin's use as a medium of exchange were to increase substantially, then purchasing power volatility would be more likely to dampen, and *if* volatility were to dampen, then people would be even more likely to use Bitcoin further as a medium of exchange (even the more risk-averse users). I readily concede that whether or not Bitcoin's volatility has decreased in the past, White is probably correct on these points. That is, it is reasonable to conclude that increased use as a medium of exchange would dampen volatility further, and thus, would make Bitcoin more accessible to a much wider audience for the same purpose[9].

One way of measuring Bitcoin's use as a medium of exchange is to look at on-chain data of the total BTC transaction count over time, minus transactions known to be used for trading. As it happens, blockchain data and intelligence platform Glassnode follows wallet addresses of cryptocurrency exchanges and is able to provide a picture by subtracting transactions that flow into and out of those exchanges from Bitcoin's total on-chain transaction count. The

[9] When I mention this "wider audience" that may embrace Bitcoin over the long-term, I still expect governments and international financial institutions to fight it, but I also expect other governments with differing interests and political visions to embrace it. For example, El Salvador embracing Bitcoin gives them a bit of leverage in talks with the International Monetary Fund («We don't need you as much as you think we do. We've got a shiny new algorithmically-enforced, rules-based monetary system»).

dark green line in the chart below (while indeed volatile) shows that Bitcoin's use as a medium of exchange – on-chain – continues to increase over time.



There are a couple of caveats we must consider for the above chart: one working against my general point and one in support of it. The first caveat (working against my point) being that beginning in February 2023, a new (and highly contentious) use case for the Bitcoin blockchain began. So-called ordinal inscriptions now allow for images and text to be included onto BTC transactions. These ordinals occupy scarce block space[10], push up transaction (mining) fees, and thereby crowd out legitimate BTC transactions. So intellectual honesty obliges me to mention that part of the spike from the above chart since late-April 2023 (when ordinals experienced their first real spike[11]) is held artificially high for this reason – albeit, while

[10] See here more on this here: https://bitcoinmagazine.com/culture/quantifying-bitcoin-inscriptions-ordinals.
[11] Although to a much lesser degree, these ordinals began in February 2023. See here: https://dune.com/queries/2013645/3334054.

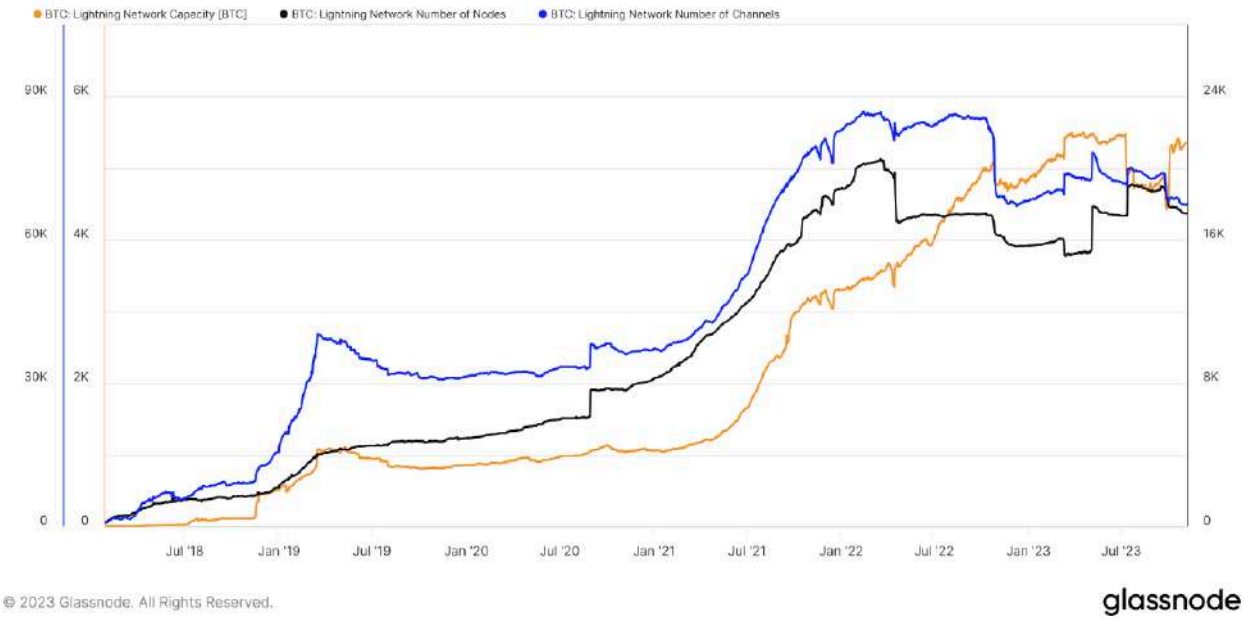
crowding out legitimate transactions, keeping them lower than they would be otherwise. Regardless, even without ordinals, the general trend of on-chain transactions is a bumpy upward trajectory over time[12] (and remember, many BTC transactions happen entirely off the main chain, which we will explore shortly).

The second caveat (working in support of my point) is that many merchants that allow consumers to pay in BTC use major exchanges to process those payments. So, for example, a consumer goes to an online merchant to purchase a t-shirt, and at checkout she opts to pay in BTC. The website now "phones home" using a Coinbase API. The consumer pays with her BTC[13], and the merchant either accepts the BTC itself or has Coinbase auto-convert it to fiat. But either way, the medium of exchange was BTC , and this transaction would show up on the above chart *as a deposit to a centralized exchange* (and therefore keeping the dark green line, our best measure for Bitcoin's use as a medium of exchange on the base layer, artificially low).

As mentioned above, many BTC transactions do not happen on the blockchain (the base layer) at all but instead on "second layer" scaling solutions such as the Lightning Network or "sidechains" such as Liquid[14]. As such, Bitcoin's real growth as a medium of exchange is obfuscated. It is difficult to derive any good estimate of total BTC transactions that take place on Lightning since only the balances of what are sometimes *many* transactions are settled by channel operators, but we can confidently say that use is growing – measured by network capacity (total BTC amount "locked up" for use in the Lightning Network), by total number of Lightning nodes, and by the number of channels.

[12] As of the time of writing, GLASSNODE is still beta testing its inscription transaction count metric, and it is not yet available for customers such as myself.
[13] Or at least one of the media of exchange was BTC. There was, of course, the additional exchange of BTC for USD if the merchant requests Coinbase to auto-convert it.
[14] Note that, oddly enough, the Ethereum blockchain also acts as a "second layer" for Bitcoin, but the application is generally "decentralized finance" (DeFI) trading using so-called ERC-20 tokens such as "Wrapped Bitcoin" (WBTC). As of the time of writing, WBTC is within the top fifteen cryptocurrencies by market cap on CoinMarketCap.com.

BTC Lightning network growth over time



However, despite Bitcoin's use as a medium of exchange being hidden "off chain" on the Lightning network, there is one application of Lightning transactions that *is* measurable. In an attempt to rescue freedom of speech in a world that is increasingly hostile to it, the Nostr protocol was launched in early 2023, which essentially decentralizes social media. (Instead of centralized "servers" owned by Big Tech companies, there is a decentralized set of "relays" spread across the internet).

As part of the Nostr culture, users "zap" each other bitcoins over the Lightning Network – usually in very small values (something that would be prohibitively costly for on-chain transactions). As I write this in October 2023, the Nostr explorer Primal reports that between nearly 600,000 users, well over two million transactions have taken place over the protocol after well under a year of operation[15]. These "zap" transactions are part of what has been called the "value-for-value"[16] pricing model. A Nostr user "zaps" Lightning Bitcoin to other Nostr users as a way to incentivize appreciated content. Although normally Lightning Bitcoin transactions are not so easily discoverable for data collection, so finding a total transaction count across the Lightning network is not possible, "zaps" over Nostr are known (and can be added to a transaction count) because they happen

[15] https://primal.net/explore.
[16] https://en.wikipedia.org/wiki/Pay_what_you_want.

over the Nostr protocol. With funding for Nostr development from Jack Dorsey and prominent users such as Dorsey himself, Edward Snowden, US Senator Cynthia Lummis, Vitalik Buterin (as well as well-known bitcoiners such as Saifedean Ammous, Lyn Alden and Matt Odell), it is reasonable to expect Bitcoin's use as a medium of exchange will continue to grow through this social media use case as well.

3. Why Bitcoin is our best chance at Hayek's "sly roundabout way"

White is careful to point out a couple of key features of Bitcoin that he sees particularly valuable. The first is its distributed ledger (blockchain). He sees value in using blockchains to essentially transfer ownership of (or claims to) tangible assets in the real world[17]. Additionally, he writes of its "internet-native" characteristic

> «Bitcoin does have one important advantage, however. Because it is intangible, and can be transferred peer to peer without custodians, Bitcoin payments are harder for governments to restrict or shut down than a system of payments settled by transfers between brick-and-mortar gold-vaulting institutions» (White, 2023b).

I should mention that I am also fond of this "digital gold token" use case, and I hope it grows. But I cannot help but notice its vulnerability to real world threats by the state: asset seizure, custodian business license revocation, etc. "Digital gold tokens" (or similar real world competing models) simply aren't going to force nation states to fight for their own survival in the way that an internet-native, permissionless, location-agnostic currency can – especially one that (with a little learning) can allow for a fair bit of privacy (and thus, compromise the state's ability to tax effectively).

[17] He mentions, for example, Tether Gold and Pax Gold, which utilize blockchain technology to transfer gold.

Hayek stated in a 1984 interview that:

> «I don't believe we shall ever have good money again before we take the thing out of the hands of government. If we can't take it violently out of the hands of government, [then] all we can do is *by some sly roundabout way introduce something that they can't stop*» (Emphasis mine – Phaneuf (2023a)).

The key to the "sly roundabout way" that Satoshi Nakamoto put together (having borrowed from those before him) is that it is merely *a protocol* – a TCP/IP of money – one that quickly became highly decentralized, meaning that no parties are capable of controlling it for their own benefit. And by being an internet-native digital asset, there is no centralized point of failure in the real world, with tangible, backed assets that can be seized to shut the whole thing down (as happened to at least two asset-backed, privately issued digital currencies before Bitcoin[18]).

What Bitcoin sacrifices in terms of stable purchasing power, it makes up for enormously elsewhere as a superior (algorithmically-enforced) rules-based monetary system, neither subject to human discretion of central planners nor to miners that may wish to create more units than its supply schedule is programmed to create. This is precisely why the masses may inevitably adopt it (whenever their governments are incapable or uninterested in deterring them from doing so), not only as a store of value but also as a medium of exchange.

Additionally, enough of Bitcoin's users don't seem to mind the volatility enough to abandon it, and its widespread use keeps growing: both on-chain and on its so-called second layer. And, in fact, the present crackdown against it – especially in the United States and Europe – as well as the rush to implement CBDCs around the world, each suggest that regulators are worried about just how powerful it is.

[18] I refer here to Gold and Silver Reserve's e-gold and Liberty Reserve's dollars and euros, which were backed by USD and EUR. Both found themselves in legal trouble and were squashed. In the case of Liberty Reserve, the crackdown was rather harsh.

Is Bitcoin's purchasing power more volatile than gold or US dollars or euros? Indeed, for now it is, and it may always remain more volatile than gold, for example, given gold's supply responsiveness to changes in demand. But Bitcoin's volatility, as I have shown, continues to decline as its market cap increases, and its use as a medium of exchange increases by the day.

Whether Bitcoin's volatility will remain a stumbling block in the way of its eventual widespread adoption as a medium of exchange remains to be seen. As Bitcoin is a highly decentralized and antifragile system with no real-world backed assets that can be seized to shut it down, and as it has already reached a fair bit of scale globally, it (to me) appears to be the only realistic candidate to (by "sly roundabout way") introduce something that government cannot stop. At its core, Bitcoin is "Come and take it" defiance money. ΜΟΛΩΝ ΛΑΒΈ[19].

[19] See the historical context of this Greek phrase here: https://en.wikipedia.org/wiki/Molon_labe.
The text usually associated with "Come and take it" under this context is ΜΟΛΩΝ ΛΑΒΕ ("Molon labe"). The Bitcoin "B" (฿) adaptation is my own.

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A review of *Better Money: Gold, Fiat, or Bitcoin?* by Lawrence H. White, Cambridge University Press

Joakim Book

A review of *Better Money: Gold, Fiat, or Bitcoin?* by Lawrence H. White (Cambridge University Press)[1]

Introduction

Of the many economists who opine on bitcoin, few are worth paying attention to; the deranged rumblings of a Roubini, Prasad or Krugman are of no consequence. Lawrence White, of George Mason University, is of a different sort. Professor White has been thinking sensibly about private money and monetary arrangements since before most of us were born. He was on the cypherpunks mailing lists on which the early digital cash schemes were crafted and created.

There is no doubt that *Better Money,* published in spring 2023 by Cambridge, is the cumulation of White's work over five decades, capturing a lifelong investigation into monetary affairs: his books on the history of gold and silver (White, 1999a), on monetary institutions (White 1999b) and how free banking operated in Britain (White, 1984). The book is dense, academic, balanced, and extremely well written. It can teach fiat economists how to analyze hard money standards, make goldbugs understand the virtue of Bitcoin, and introduce Bitcoiners to the monetary properties that really separates bitcoin from fiat and gold. It is a must-read for Bitcoiners keen on understanding how precisely their money differs from others on offer. (It is even more crucial for mainstream economists to read so that they stop saying asinine things about bitcoin.)

[1] *A version of this article was previously published in the print edition Withdrawal Issue of Bitcoin Magazine in 2023. It is republished here by the Center for Market Education with permission. We thank Bitcoin Magazine (and BTC Inc) for allowing us to republish.*

White presents his book as "contingency planning" (p. 4), harking back to Milton Friedman's quip about needing shelf-ready intellectual alternatives for when existing systems crumble. We need to have created and thought clearly about monetary systems into which the wide public can flee *before* their escape thereto is urgently needed.

We're treated to a brisk walk through Chartalism, the origins of money, medieval banking arrangements, coins debased by kings and merchants, and plenty of high-level, practical illustrations of how money's three functions (medium of exchange, store of value, and unit of account) have changed across time. The meat of White's contribution comes in the supply-and-demand analysis he displays for gold as money and repeats with fiat and bitcoin, clearly indicating how the three monetary systems are different. He compiles the academic literature on how the gold standard worked and how well it performed, debunking the many poorly reasoned cases that gold caused the Great Depression, and conjectures into what a bitcoinized world might look like.

The following sentence, perhaps the single most important insight across these 250 pages, is worth stamping on message boards in every economics department and weekly memos to journalists covering the space:

> **«The stability of the purchasing power of monetary Bitcoin under a Bitcoin standard cannot be judged by observing the behavior of the price of pre-monetary Bitcoin under a fiat standard»** (pp. 95).

All professional economists' pontificating about the price volatility of bitcoin making it unsuitable as money is invalidated by this single succinctly phrased sentence by one of their peers. The information you gained from observing bitcoin when it was a fringe and emerging alternative money contender, anno 2009–2023, is not indicative of bitcoin's behavior when it becomes the world's preferred monetary asset.

Professor White doesn't therefore say that the plebs were right all along, that volatility doesn't matter and will go away upon adoption; we can't know that yet. He managed to see this point clearly enough thanks to his many years arguing with the same narrow-minded economists on the viabilities and virtues of gold as base money. In the modern fiat world, gold behaved differently than it did during the classical gold standard—or *would have* today had it not been demonetized. The «swings in the speculative demand for gold as an inflation hedge … reflect, in other words, the instability of fiat currencies» (p. 92).

The same applies for bitcoin.

It then takes White almost the rest of the book before he suggests a way that the plebs might even be right. If and insofar as BTC was *only* valued as a transaction medium (in contrast to a speculative investment vehicle), *then* its purchasing power volatility would likely be lower than it is today. Vindication.

The Purchasing Power of Money Under Gold, Fiat and Bitcoin

In the three-way race between the monetary properties in gold, bitcoin and fiat, our favorite orange system usually occupies a blessed middle ground between fiat and gold—incorporating the best of both worlds, if you will. Fiat doesn't have market-governed supply; there is no marginal cost to its production and no constraints on its creation, which is what contributes to its abuse and instability. On the plus side it doesn't have nonmonetary demand from which shocks can emerge.

Gold has nature-constrained supply, making its issuance subject to shocks of discovery and techniques for its extraction, and its industrial and decorative use on the demand side can mess with its monetary role.

Like fiat, bitcoin has no nonmonetary shock vectors; like gold, it has competitive energy expenditure to constrain its production; and unlike both it has a perfectly predictable supply schedule.

Gold has one enticing property that bitcoin lacks, and which White clings on to: **The price level under gold is mean reverting.** Because gold miners adjust production (or sources of nonmonetary gold, their holding) in accordance with the purchasing power of gold, its supply expands when prices are falling—since the mined gold is more valuable—which brings prices back up again; and it contracts when prices are rising, which brings them back down. The price level under a gold standard becomes self-correcting, causing stable prices over decades and sometimes centuries.

Because bitcoin's supply cannot adjust to changes in its purchasing power, its long-run and short-run purchasing power becomes unanchored—a property it shares with fiat (though in the opposite direction). Its supply is «completely free from surprising exogenous changes» (p. 184).

Under fiat, with credible monetary policy and competent, knowledgeable central bankers committed to a 2% target (a unicorn, I know), we get short-run prices that consumers and businesses can deal with. If what costs $100 today will cost $102 this time next year, I know my wages must rise by 2% to maintain my standard of living; if my bank and I both know that the real value of my mortgage debt will be 2% lower next year and 2% lower still the year after, we can comfortably factor that into our interest rates today. Either party gets shafted only when experienced inflation diverges from what is announced by the central banker. Since real-world central bankers—as opposed to omnipotent and omniscient angels—reliably mess up,

no market participant can have a remotely accurate price-level view for 10, 20 or 50 years into the future; the errors compound, making price level predictability over medium-to-long horizons garbage.

Under a gold standard the opposite is the case. Short-run price predictability is trash, since extraction cannot catch up fast enough with short-run changes in the economy, making gold share the supply inflexibility over the short run that bitcoin always has. In the immediate outlook, prices get unanchored—which is the main property that fiat economists have used to critique a gold standard. They forget gold's superior medium-to-long-run supply reaction, mean-reverting price rises or letting the profit motive turn price declines in reverse. Under gold, the price level over long time periods stays put, enabling long-term planning.

Gold, unlike fiat, lets economic agents plan for the long term. Under ideal fiat, they can instead plan for the short term, at the expense of long-term predictability. With bitcoin, we can't reasonably plan for either—at least until its monetization is complete.

Because unstable monetary demand and unyielding supply makes the bitcoin purchasing price undetermined, White ultimately favors gold. It's up to the reader to judge if his case is compelling, or if that one theoretical drawback overcomes the many well-known problems of gold and fiat standards.

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Comment on Lawrence White: *Better Money: Gold, Fiat, or Bitcoin?*

Peter Šurda

Introduction

The purpose of this comment is to analyse competition between gold and bitcoin mainly considering the arguments brought up by Professor White in his book. My position comes from my thinking as an engineer, however, I will attempt to translate this thinking process into economic terms. For this reason, I will need to make sacrifices with respect to accuracy. However, the benefit will be that I should be better able to get my point across and my explanation should be helpful for a broader audience.

First of all, I agree with the criticism of fiat money presented by Professor White. My disagreement is primarily practical: what should be done about fiat?

1. Why not gold

The foundation of my position is that if somehow a gold standard "happened", it would necessarily develop into a fiat money standard, therefore it is not a good tool to address the problems associated with fiat money. The technical reasons for this are that gold is susceptible to dilution (through fractional reserve banking and government intervention) and censorship (also through banks and governments). These weaknesses can then be successively exploited to replace gold with fiat.

To translate this into economic terms, I'll start with an argument made by Dr Zelmanovitz in Kling, Cachanosky and Zelmanovitz (2023), a discussion also regarding Professor White's book: «The incentives will still be there and it's not difficult to predict that the same thing [i.e. *fiatisation*, ed.] will happen again». Incentives inherent in gold (and to a certain extent inherent in money itself) caused fractional reserve banking to emerge, and subsequently central banking. Gold standard developed into a gold exchange standard, and into fiat money. There are people who benefit from fiat money, and they have

an incentive to *fiatise* a gold standard. Another economic phrase describing this issue is "concentrated benefits and dispersed costs". My question to Professor White is: what changed? Why wouldn't this happen again? I didn't find an answer to this question in the book or any of the related webinars or debates I listened to.

2. Why Bitcoin

As an alternative, the design goals of Bitcoin are to counter dilution and censorship, therefore a Bitcoin standard wouldn't develop into a fiat standard (or at least it is less likely than with gold). In order to achieve this functionality, the Bitcoin network introduced two new types of intermediaries:

- **Miners**, who spend energy on computation, and receive newly created bitcoins and transaction fees;
- **Node operators**, who can validate that the blockchain is protocol-compliant;
- For initiating transfers, intermediaries aren't necessary and can be performed by the users themselves, using **wallets**.

These intermediaries build a consensus in a decentralized manner, purely using a protocol, without any necessity for contractual relationships. Miners are incentivised to compete instead of colluding, and the more computational resources are spent in total, the more costly it is to exert complete control over the outcome. On the other hand, operating a node is cheap, so that it can be done by basically anyone, and many users thus operate their own nodes. As an oversimplification, it could be said that miners prevent censorship (by making censorship expensive), and node operators prevent dilution (by filtering protocol violations).

With respect to other types of intermediaries, traditional intermediaries, like banks or regulators, if they want to exert influence over Bitcoin, they need to target at least one of these three groups. Of course this is possible, but it's very costly to do at a

large scale. The usual economies of scale with respect to influencing intermediaries are weaker in Bitcoin. A traditional intermediary may thus be able to benefit more by participating in Bitcoin instead of trying to exert complete control over it, and thus is incentivised to promote a Bitcoin standard. For example, the status of Bitcoin as legal tender in El Salvador could be interpreted this way.

Furthermore, there exists a movement colloquially referred to as "Bitcoin maximalism", which could be defined as an attempt to maximise the costs an attacker would need to bear to exert complete influence over Bitcoin.

As time goes on, Bitcoin protocol evolves, new functionality becomes available and additional types of intermediaries may emerge. For example, at the time of writing, there are lightning node operators or federated sidechain validators. These operate on layers on top of Bitcoin. They have technically weaker resistances to censorship and dilution, and may affect the incentives of intermediaries, therefore caution is exercised when they are introduced, and their use is optional. They tend to take many years from initial proposals to actually being available to use. An often-repeated criticism of the drivechain proposal, for example, is that it changes the incentives too much and would negatively affect resistance against censorship, see Shinobi (2023).

3. Addressing the book

The foundational argument presented in the book is that the best money is the one with the most stable purchasing power. This is by no means unique to White, it appears to be common among economists, including Austrians, e.g. Hayek (1976). My counterargument is that the best money is the one that best prevents the existence of fiat money. It should have features that prevent its own *fiatisation*.

Therefore, I will leave the question of purchasing power stability open. A Bitcoin standard may or may not have a more stable purchasing power than a gold standard, however from a practical point of view it doesn't matter. I'm not arguing price stability is undesirable, just that there may be more important criteria. Nevertheless, I can still address the question of fractional reserve banking, another economic position Professor White supports. Fractional reserve banking, or to be more exact, the existence of "fiduciary media", is an important, perhaps even a necessary, step in the *fiatisation* process. Therefore, they need to be rejected. Bitcoin rejects them by making money substitutes unnecessary. Without money substitutes there can be no fiduciary media.

4. The path to a Bitcoin standard

In this section I will present an example of a transition to a Bitcoin standard. It isn't necessarily the only, or even the most likely one. It's a very extreme case. I use it for demonstration purposes.

In the current phase, while fiat money still exists, one can sidestep the question of price stability by using fiat credit. A common practical implementation is using a credit card. This allows to spend fiat money without having to hold it. Similarly, tools exist to auto-exchange incoming fiat payments to bitcoins. So you can accept fiat payments without having to hold it either.

What may happen as time goes on?

1. since everything other than Bitcoin is diluted and censored, more and more people hoard bitcoins;
2. eventually, everyone hoards bitcoins and refuses to hold fiat;
3. since the demand for fiat is absent, the price of fiat is zero;
4. if the price is zero, it can't be borrowed, paid with or used for economic calculation;
5. since you have no other option, you'll pay with bitcoin;
6. since you have no other option, you'll use bitcoin for economic calculation;
7. Bitcoin now exhibits all the commonly accepted symptoms of money: a store of value, a medium of exchange, and a unit of account.

5. Conclusion

In summary, Bitcoin is a tool optimised to counter the process of fiatisation, not to provide price stability. Many economists may wonder what kind of a priority is that. To quote Terry Pratchett (2001), it's «THE ONLY ONE THAT WORKS».

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A Future World Monetary Order

Emile Phaneuf III

A Future World Monetary Order[1]

An introduction (and why competition in currency is desirable)

I was asked to write some thoughts for a future world monetary order. I will attempt to do so as briefly as possible. The first thing that must be addressed is that such an order, if the goal is the flourishing of our species (and I concede at the outset that this is my goal), must allow individuals to choose the currencies that work for them. My own view is consistent with that of FA Hayek's *The Denationalisation of Money* (1976, pp. 39-40), well-stated by Hayek himself when he wrote that money as legal tender «is simply a legal device to force people to accept in fulfilment of a contract something they never intended when they made the contract. It becomes, thus, in certain circumstances, a factor that intensifies the uncertainty of dealings». Hayek's proposed solution to reduce the uncertainty of dealings was for the state to allow for «several concurrent, distinct kinds of money are simultaneously in use in the same territory» – including those provided by the market.

For the state to require that one side of all non-barter transactions utilize a money that may not be of their choosing is to subject the transacting parties to uncertainties unnecessarily. Adam Smith (1776, p. 456) was on to something when he wrote that «every individual, it is evident, in his local situation, judges much better than any

[1] In three or four places within this piece, I borrowed content from my own articles previously published on the Dasset blog (https://web.archive.org/web/20221207160530/https://blog.dassetx.com/) (now taken down but still cached by the Wayback Machine) and by the American Institute for Economic Research (AIER) (https://www.aier.org/people/emile-phaneuf-iii/). In the case of the Dasset blog, I have explicit permission to reuse material. In the case of AIER, the work is licensed under the Creative Commons Attribution 4.0 International License.

statesman or lawgiver can do for him». But in taking the viewpoint that competition in currency is desirable, we need not conclude that nation-states (or their respective central banks) necessarily produce inferior products (including currency) in every case. As George Selgin wrote in his book *Good Money* (2008, pp. xvi), «... [It] is not that private enterprises are necessarily better than public ones at supplying the means of exchange, or financial assets of any sort. It is that competition beats monopoly, because the prospect of failure supplies competing firms with a powerful incentive to desist from putting out shoddy merchandise».

Yet we also cannot forget the history of the state's abuse of its monopoly on money. Hayek's call to denationalize money was motivated by a personal quest to find «a politically feasible solution to what is technically the simplest possible problem, namely *to stop inflation*» (emphasis mine – 1976, p. 13). Debasement is an age old problem, and the fiat monetary system is one that enables those that are most closely aligned with the state and its objectives to live at the expense of those who produce. The 19th century French economist Frédéric Bastiat (1998, p. 18) rightly pinpointed this problem as 'legal plunder,' when the law is perverted in «an attempt to enrich everyone at the expense of everyone else». However, given that not every individual is equally connected to the state and its activities, it is not the case that everyone lives at the expense of everyone else to an equal extent. In fact, the fiat monetary system that (since Bretton Woods effectively ended in 1971) finances the state's activities exacerbates income inequality – an ironic fact given the many state activities conducted in the name of reducing it. We see the Cantillon effect in full swing, with those that receive the money first (politicians, bureaucrats, defense contractors, Wall Street) acquiring assets with newly-created currency, and in doing so, bidding up the prices for everyone else, hurting the non-politically connected (especially the poor) the most.

Considerations for a competitive world monetary order

Lawrence H. White (2015, pp. 386) rightly distinguishes two distinct aspects of Hayek's *Denationalisation of Money*: «Hayek's *proposal*—to allow free choice and private competition in currency—from his *prediction* about what type of money would then dominate the field». So while both Hayek and White focus their attention on asset-backed currencies as their own respective prediction for what a winning currency (or money – if its use reaches common acceptance) might look like, the Hayekian concept of competition allows us to also entertain the idea of non-asset backed currencies, such as those that exist in scarce, internet-native digital assets such as Bitcoin.

As a guiding principle, my ideal future world monetary order is one in which the state has nothing to say about which currency might be used by willing participants in exchange. However, some of my thoughts and suggestions below may seem to the reader to be a compromise of this principle. Any such compromises should be viewed as only given the reality that nation-states are likely to violate this guiding principle, and thus, we cannot always have all of what we want in every case. So only *given that* the state violates the principle, it can at least reduce the damage (from my point of view) by doing (or by not doing) X or Y.

Here below are a few of my own thoughts and suggestions – in no particular order – on what a future world monetary order that takes seriously the preferences of each party of a transaction.

1. *The state must never have anything to say about what media of exchange may be used in transactions between individuals or private firms just as long as exchanges are voluntary, conducted with respect to property rights, and without fraud.*

By "with respect to property rights" I mean that, for example, Alice cannot spend the property of Bob without Bob's permission. In terms of fraud, I mean that Bob cannot promise Alice payment of commodity X quality (or quantity) and, upon the date of payment, instead disappoint Alice by delivering less than was promised (unless she agrees to new terms).

Beyond the state violating this principle by means of legal tender laws (as such laws impose an obligation onto the merchant, requiring him to accept the state's own currency of choice), the state also discourages would-be competing currencies in the name of consumer and investor protection. In the United States, the Securities and Exchange Commission (SEC) serves as a prime example. While we need not suggest here that no good can ever come about with the existence of such agencies, we must highlight the dangers. By allowing such agencies to treat some goods as *commodities* and others as *securities* (and none other than the state's own legal tender as *currency*), the state nudges (and sometimes outright bans) its citizens towards one would-be currency or another. Further, such regulatory agencies have long histories of incompetence[2], cronyism (Roberts, 2022), and being mobilized for political ends (Carter, 2023).

[2] For example, see the congressional testimony of Harry Markopolos (a financial fraud investigator and analyst) from 2009 in which he testified that the SEC ignored him for 8.5 years as he and his team repeatedly brought the SEC "red flags and mathematical proof" of Bernie Madoff's Ponzi scheme. Markopolos argued in his testimony that the SEC was "over-lawyered," "lacks the financial expertise," "has too few staff with relevant industry experience and professional credentials to find fraud – even when a multi-billion dollar case is handed to them on a silver platter," and is structured in such a way that SEC offices in different cities act as rivals against one another in "regional turf battles."

I will not be so far-reaching in my analysis to suggest that these obstacles necessarily suggest that such regulatory agencies should be dismantled entirely or that it is not useful (on net) to have legally-recognized terms to distinguish between *commodities* and *securities* (or even *currencies*). However, it is of utmost importance to recognize that such regulatory agencies are a major obstacle (at least in my view) to the Hayekian vision of competition in currency. The goal for a future world monetary order should be one that prioritizes constraining the state from interfering with preferred media of exchange: both directly via outright bans and indirectly by determining what is and is not a currency.

2. *The state must never apply taxes to alternative currencies.*

This usually takes place in the form of capital gains taxes – a tax on realized profits when someone sells or spends (bitcoins, for example). Such capital gains taxes effectively discourage competing currencies and artificially strengthen the monopoly power of the state's own currency. It is exactly this monopoly that we must abandon once and for all if we are to reduce the "uncertainty of dealings" that Hayek addressed in his *Denationalisation of Money*.

3. *We need not advocate confiscatory taxation, but* if *the state is going to meddle in our affairs and fund various activities through taxation, we must come to terms with the fact that the state will also set the currency/currencies in which taxes are to be paid. However, the state should make every effort to accept alternative currencies when there is a demand from taxpayers to do so (even when such currencies may compete against the state's own).*

While the state's choosing one currency over another can in itself generate a certain network effect around a currency, and while we might not approve of the currency (or currencies) the state favors, we must also be realistic in recognizing that it is hardly reasonable to expect the state to accept any medium that a taxpayer may prefer to pay with. So, for example, while a taxpayer may prefer to dispose of unwanted rotten cabbage, blank pieces of paper, etc. as a payment

for taxes, the state can hardly effectively fund its activities with such commodities. While we advocate a freedom to transact, earn or save in any currency (or commodity) that a person may wish, this does not imply an obligation on the part of the state to treat payment in, say, rotten cabbage as a settlement for taxes.

Hayek (1976, p. 40) argued similarly:

> «A government must of course be free to determine in what currency taxes are to be paid and to make contracts in any currency it chooses (in this way it can support a currency it issues or wants to favour), but there is no reason why it should not accept other units of accounting as the basis of the assessment of taxes».

Interestingly, in 2020, crypto financial services company Bitcoin Suisse (2020) announced that it had partnered with the Swiss Canton Zug and that Zug would subsequently allow taxes to be settled in Bitcoin or Ether: up to an amount equivalent to CHF 100,000. This is precisely what Hayek proposed and what I advocate for here.

4. *While the state can allow the use of private currencies, it must not be an active player in them.*

For example, in El Salvador, where Bitcoin and the US dollar serve as dual legal tender, article XIV of the country's 2021 "Bitcoin Law" created a (state-run) entity called the Banco de Desarrollo de El Salvador (BANDESAL) that guarantees «the automatic and instantaneous convertibility of bitcoin to USD»[3]. If we are to move away from a monopoly on money and to embrace competition in currency, a better scenario would involve allowing competing private providers here rather than an established state monopoly on money conversion (or even inadvertently crowding out private players). This would also provide an added layer of privacy and reduce the possibility of financial censorship – allowing consumers to switch from one private provider to another if they do not feel well-served by one or the other.

[3] *See Phaneuf (2021).*

5. *The state must never require any party to accept one currency or another.*

As an example of one country doing it wrongly (from my own point of view), consider Article VII of El Salvador's aforementioned Bitcoin Law. It reads: «Every economic agent must accept bitcoin as payment when offered to him by whoever acquires a good or service». While negative impacts of this imposition is at least partially ameliorated by the state taking on the role of instantly converting BTC to USD for merchants that prefer to not hold Bitcoin as well as (in article XII) allowing exceptions for merchants that «do not have access to the technologies that allow to carry out transactions in bitcoin», from my view, given the inconveniences imposed upon merchants to accommodate the state's requirements and given the state's historical ever-expanding role of meddling in money, it is desirable for the long-term to keep this active role to an absolute minimum.

6. *Financial privacy must be paramount.*

In the digital era, nation-states have become addicted to surveilling their citizens' communications and financial transactions since it is now possible to do so at a very low cost (as digitization leaves easy records of activities, and relatively costly traditional methods of surveilling a specific target via FBI surveillance vans (for example) outside the target's house are often no longer necessary).

These days, nation-states coerce Big Tech companies and commercial banks to do much of the surveillance for them. As for banking, the United States government, through the Bank Secrecy Act (BSA), Foreign Account Tax Compliance Act (FATCA), etc. has essentially destroyed almost any façade of financial privacy (even for US citizens living abroad). More broadly, money laundering and the financing of terrorism are the boogiemen of choice for the G7's Financial Action Task Force (FATF). Within the United States, the PATRIOT Act, which began as part of the Global War on Terror, remains a major threat to a free society more generally, and its scope also encompasses matters of financial privacy[4].

[4] See, for example: https://bitcoinmagazine.com/technical/why-blockchain-surveillance-needs-fincens-patriot-act-ploy.

We propose a different paradigm in which the spirit of the Fourth Amendment to the US Constitution should lead any policy or debate. This Amendment reads:

> «The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no Warrants shall issue, but upon probable cause, supported by Oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized».

This "spirit" of the Fourth Amendment highlights the importance of privacy (including financial privacy), while allowing for *targeted* exceptions when law enforcement is able to obtain a search warrant, issued by a judge.

Given that nation-states are (for now) committed to mass surveillance of their citizens (including financial surveillance), maintaining physical paper cash (including large denomination bills) must be defended tooth and nail, and privacy-enhancing technologies such as privacy-coin cryptocurrencies (Monero, Zcash), so-called "mixers", "coinjoins", and second-layer technologies for Bitcoin (or any other currency) must be treated as welcome, legitimate technical solutions to the problem of state predation of citizens, which is routinely exacerbated by mass financial surveillance in the name of "anti-money laundering" (AML), "countering the financing of terrorism" (CFT), and (more recently) preventing the spread of viruses[5].

7. *Central banks must be abolished once and for all.*

Whole books have been dedicated to this topic, and rightly so. There are many angles at which I could approach it, but I will just name a few.

[5] For example, The Brookings Institution (2020) reported that «Even before the COVID-19 outbreak, the Korean government collected massive amounts of transaction data for investigating tax fraud. Literally every credit card and bank transaction in Korea is recorded on government databases. During the outbreak, this information was repurposed to retroactively track where people went: not just coffee shops and restaurants, but also buses and subways».

First, in the case of the United States, we have a conflict of interest issue in which commercial banks hold stock in their respective Federal Reserve district's Reserve Bank. The Fed defends this on the grounds that returns go back to the US Treasury and that that commercial banks owning stock in district Reserve Banks do not imply that that the Fed is privately owned[6]. The point I wish to emphasize here is that this is hardly an incentive structure that would facilitate competition. It is rarely (if ever) in the interest of incumbent banks to allow new players. To demonstrate this point, I refer the reader to the case of Custodia Bank, which applied for a Fed master account with the proposal that the bank would be full reserve (not fractional), meaning a run on the bank would not bring it down. Regardless, in January 2023, the Fed denied Custodia Bank's application on the grounds that its "novel business model" presented "significant safety and soundness risks"[7]. Just two months later, the US banking system experienced a "Lehman moment" as Silicon Valley Bank (listed by Forbes, 2023, as one of "America's best banks" for five years in a row and as one of its "Financial All-Stars") suffered a bank run and found itself under the receivership of Federal Deposit Insurance Corporation (FDIC).

Central banks, with a top-down view of an economy, struggle to integrate local knowledge into their plans[8]. Among the many examples that could be cited here to make this case is Federal Reserve Vice Chair for Supervision Michael Barr's statement that «The banks we regulate, in contrast [to stablecoins], are well protected from bank runs through a robust array of supervisory requirements»[9]. Barr issued this statement on March 9th, 2023, just as Silicon Valley Bank was experiencing a bank run, which led to its collapse the very next day.

[6] See Who owns the Federal Reserve?
[7] See Federal Reserve Board announces denial of application by Custodia Bank....
Note that this is not an argument on my part against fractional reserve banking as such. I merely emphasize the Fed's incentive to protect incumbents from competition (even when a prospective competitor's business model is both safe and sound). As a consequence, the Fed necessarily injures would-be customers of such aspiring competitors.
[8] See Hayek (1945).
[9] See Supporting Innovation with Guardrails: The Federal Reserve's Approach to Supervision and Regulation of Banks' Crypto-related Activities.

Second, for all the differences of opinion between economists on various matters, the importance of unhampered market prices is one generally agreed upon as price controls create surpluses and shortages[10]. Yet, for whatever reason, this time-tested truism is ignored or forgotten when it comes to central banks tampering with interest rate targets. When it comes to central banks and interest rates, many economists who might otherwise be considered defenders of the price mechanism act as apologists for Politburo-style price fixing, all in the name of promoting maximum employment and stable prices.

Third, the very existence of central banks means a crowding out of real market players, and thereby necessarily injuring the public at large, while enriching players protected by the state apparatus. As Lawrence White notes in his book *Better Money* (2023, pp. 32-35), «[l]egislation, not market forces, created central banks... Their original mission in most cases was to help finance national governments.» White notes that as central banks grew in number and expanded their activities, the result was the monopolization of banknotes, clearing house systems, and the obstruction of the automatic working of the international gold standard. George Selgin (2008, p. 304) notes that «governments started granting currency monopolies to central banks because [they] could be relied on to repay them with credit granted on generous terms, not because competitively supplied [commercial bank-issued] banknotes were inherently unreliable». The late economist Ludwig von Mises (2008, p. 444) took a similar viewpoint to Selgin, arguing that «[t]he governments interfered precisely because they knew that free banking keeps credit expansion within narrow credit limits». In other words, good money has been supplied competently by the private sector in the past. We have much to gain from allowing markets to work within this sphere once again.

[10] Oddly enough, it may have been Frederick Engels (1885) who most passionately defended unhampered market prices in the preface to Karl Marx's book The Poverty of Philosophy when he wrote that price fluctuations have «brought home to the individual commodity producers what things and what quantity of them society requires or does not require». Without these fluctuations, «what guarantee [do] we have that necessary quantity and not more of each product will be produced, that we shall not go hungry in regard to corn and meat while we are choked in beet sugar and drowned in potato spirit, that we shall not lack trousers to cover our nakedness while trouser buttons flood us in millions...».

8. *Central bank digital currencies (CBDCs) must be rejected.*

It goes without saying that if we reject central banks, we necessarily also reject central bank digital currencies in any form: whether wholesale or retail. CBDCs are a relatively new concept launched (or at least accelerated in development) as a reaction to Meta's (Facebook's now parent company) attempt at launching its own currency Libra – rebranded as Diem in 2020.

I have written in more detail on the risks that CBDCs pose for the American Institute for Economic Research (AIER), so I will not attempt to reiterate every detail here[11]. I refer the reader to that essay. However, I will say that the ultimate goal of CBDCs is to (while phasing out paper cash) move ledgers away from commercial banks and eventually have them sit on a single ledger of a central bank. As such, they imply unprecedented levels of centralized power in the hands of central banks and their respective governments. By the public statements of central bankers themselves, we learn of their excitement of the immense social engineering potentiality.

If it is indeed correct that a good governance model is one that is "of the people, by the people, for the people" then Orwellian dragnet financial surveillance must be energetically opposed. However, what *could* exist in such a governance model would be a situation in which politicians (and "public servants" more generally) voluntarily agree to subject themselves to full financial surveillance *of their own activities*. This could exist as a counter-corruption policy in which aspiring public servants understand that as part of the job, they lose their own financial privacy in order to remain fully accountable to constituents. However, given that the surveillance works almost entirely in the opposite direction (allowing state actors to surveil the rest of us and with no equivalent level of surveillance of those state actors' financial activities made available to the public), it seems to reveal that the so-called public "servants" are, in fact, public masters. For what it is worth, I would settle with little surveillance in either direction (as it was historically before the digital era and before the

[11] See Phaneuf (2023).

US's Bank Secrecy Act, for example); the one-directional surveillance model seems, to me, to be quickly running in the direction of tyranny.

Hayek's *The Road to Serfdom* (1944, p. 95) includes a quote worth considering in the context of mass financial surveillance:

> «Economic control is not merely control of a sector of human life which can be separated from the rest; it is the control of the means for all our ends. And whoever has sole control of the means must also determine which ends are to be served, which values are to be rated higher and which lower—in short, what men should believe and strive for».

9. *For further guidance, much can be derived by the Spanish Jesuit Father Juan de Mariana's 1605 work "De Moneta" (meaning "On the Coinage"[sic]), which I summarized back in 2020*[12].

Despite de Mariana applying his monetary analysis to coinage specifically, much of it can be applied to a competitive world monetary order[13]. While my own ideal currency is an algorithmically-enforced rules-based monetary system (such as Bitcoin), if the state will continue to exist and to meddle in monetary policy in various ways, it can at least reduce the size and scope of its damage by considering Juan de Mariana's wise advice to a prince or king on monetary matters. Note that one important factor that de Mariana's advice lacks is that a prince or king could allow *competition in currency* from private providers. For this key insight, we had to wait for Hayek's work from the 1970s.

My own summaries (borrowed from a previously-published article)

[12] See Phaneuf (2023).
[13] For example, Mariana gives us insight into the moral way of thinking about raising funds to defend against foreign invasion as well as issuing currency.

of de Mariana's advice (which I refer to as his "six rules for coinage") from "De Moneta" are as follows:

- **Rule 1** – If a prince would like to impose a new tax (including by means of coin debasement), he must obtain the consent of the people.
- **Rule 2** – If a prince would like to impose a new tax, he must «ask openly» and never cheat his subjects.
- **Rule 3** – If a prince would like to impose a new tax, he must never tax an amount that would leave his subjects «reduced from a state of abundance and prosperity to a state of need».
- **Rule 4** – The king is permitted to make changes to the appearance of the coinage «provided that the value remains inviolate in accordance with the quality of the money and pre-existing law». In other words, changing what is stamped on the coin is fair game for the king; the quality and weight is not. It is neither permissible for the king to suddenly mix a gold coin with brass nor to reduce its weight by «clipping» the coin.
- **Rule 5** – A prince should not, by decree, set the legal value of a coin (what Mariana calls its «extrinsic» value) differently to its market value (what he also calls its «natural» and «intrinsic» value) and warns of negative economic consequences for doing so. But Mariana gives one minor exception that he believes justifies a minor deviation between the legal and market price: a «small amount that can be added to the value of the metal to cover the cost of minting».
- **Rule 6** (a single exception to previous rules) – If necessary, only in a situation of dire life-or-death crisis, such as the need to fight off an enemy attack in war, and only if every plausible alternative has already been considered and is not possible, a prince may consider debasement by either changing the metallic mix or by «nip[ping] off a portion of the weight». But if this is to happen, an immediate return to full pre-war metallic content must take place as soon as the war comes to an end. In this case, Mariana insists that «the bad money that necessity forced upon them be straightaway turned in and retired, and that the proper old coinage be restored in place of that bad one for those who were holding it in good faith».

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centerformarketeducation@gmail.com
No. 53, Jalan SS15/4, 47500 Subang Jaya, Selangor, Malaysia
marketedu.me
CenterMarketEdu
CenterforMarke1
Center For Market Education
@centerformarketeducation2495