
ORIGINAL RESEARCH ARTICLES

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Hard Money and Time Preference: a Bitcoin perspective³

Abstract: Money is what allows individuals to face uncertainty, by controlling and debasing money, governments shift individuals' time preference to somewhere closer to the present. This currency inflation disincentivizes savings and has societal consequences that go beyond the economics realm. By giving back to individuals the possibility of saving, Bitcoin emulates what gold did for centuries, the gold standard, and provides a much-needed solution to the interference of governments in the money market. Adopting a Bitcoin standard will provide for much higher levels of social development because it will incentivize and facilitate savings, without the need of investing to maintain purchasing power, while at the same time also facilitating the exercise of economic calculation.

Keywords: time preference, fiat money, savings, investing, Bitcoin, economic calculation.

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Dinero duro y preferencia temporal: una perspectiva de Bitcoin

Resumen: el dinero es lo que permite que los individuos enfrenten la incertidumbre, y al controlar y degradar el dinero, los gobiernos del mundo desplazan la preferencia temporal de los individuos hacia un lugar más cercano al presente. Esta inflación monetaria desincentiva el ahorro con consecuencias sociales que van mucho más allá de lo económico. Al devolverles a las personas la posibilidad de ahorrar, Bitcoin emula lo que hizo el oro, el patrón oro, durante varios siglos y brinda una solución muy necesaria a la interferencia de los gobiernos en el mercado monetario. El patrón Bitcoin permitirá niveles mucho más altos de desarrollo social, porque incentivará y facilitará el ahorro, así como el ejercicio del cálculo económico.

Palabras clave: preferencia temporal, ahorro, Bitcoin, dinero fiduciario, cálculo económico.

“Dinheiro duro” e preferência temporal: uma perspectiva do Bitcoin

Resumo: O dinheiro é o que permite aos indivíduos enfrentarem a incerteza, ao controlar e desvalorizar o dinheiro, os governos do mundo todo aumentam a preferência temporal dos indivíduos, trazendo-a mais próximo do presente. Tal inflação monetária desincentiva a poupança com consequências sociais que vão muito além da economia. Ao devolver aos indivíduos a possibilidade de poupar, o Bitcoin emula o que o ouro, o padrão ouro, fez por muitos séculos e oferece uma solução necessária contra a interferência dos governos no mercado monetário. O padrão Bitcoin permitirá níveis muito mais elevados de desenvolvimento social, pois incentivará e facilitará a poupança, separando-a dos investimentos, bem como facilitará o exercício do cálculo econômico.

Palavras-chave: preferência temporal, dinheiro, poupança, Bitcoin, moeda fiduciária, cálculo econômico

Introduction: on Time preference

This paper discusses the link between time preference and money and hard money. Specifically, it explores Bitcoin as an example and what it can teach us about this link.

To start, the scarcity of time forces men to choose between alternatives at all points in life. It means that that every decision has an opportunity cost. Even in the case that there is no restraint on the number of other resources available, an individual's choice of how to spend their time necessarily results in the elimination of all other possible choices for which he could have used that same time.

Economizing time is a unique form of economizing because time passes and cannot be stopped, nor reversed, nor acquired in the market. When he is born, man's life clock begins ticking. It continues ticking relentlessly and only stops when he dies. There is no knowing when that clock will stop and there's no restarting it after it stops. Men gets one uninterrupted shot at life, and they never know when it will end.

This means that time is not a normal market commodity like all the others. One cannot just choose the quantity that they would like to have of time. There is no market choice be-

tween different quantities of time, or different periods of time, as Mises (1998, cap. 18) put it, appear in different perspective according to whether these periods are nearer or more remote from the instant of valuation made by the individual.

The nearer from the present, the more valuable it will appear to an individual (MISES, 1998; ROTHBARD, 2009, esp. cap. 1, 5 and 6). The present is certain as it is already here, but the future is uncertain as it may never come. The future can only come through successfully securing survival in the present, which makes the needs of the present always more pressing and important than the needs of the future (HOWDEN; KAMPE, 2016).

The present is where all senses and experiences are felt. It is where humans experience life, its pleasures and its pains. Future pains and pleasures are hypothetical, but those of the present are real and visceral. Hunger felt in the present is far more pressing than anticipated hunger in the future, which makes food more valuable in the present than in the future (HERBENER, 2011).

Danger in the present is far more pressing than future danger and tools that secure safety today are thus more valuable than tools that secure safety in the future. Given a choice between obtaining a good in the present or in the future, man chooses the present. The higher valuation of present goods is a permanent fixture of human action.

Time preference is the degree of preference of present goods over future goods. It is always positive because humans always prefer present over future goods, but its magnitude varies from person to person and for each person across their life. Time preference is subjective. A high time preference indicates heavy discounting of the future in favor of the present - and present orientation - while a low time preference implies a lower discounting of the future and more future orientation (ROTHBARD, 2009, p. 379–389).

Numerous social and institutional factors can affect an individual's time preference. Perhaps most important among them is the security of property which would provide man a very effective way of providing for his future. Acquiring durable goods is arguably the initiation of the process of the decline of time preference for humanity (HOPPE, 1999; 2006).

A man who commands a valuable good that can be used in the future, reduces the uncertainty that surrounds his future and becomes less likely to discount this uncertainty in his present actions.

As societies accept the concept and adopt the practice of property rights, a widespread *decline* in time preference follows because individuals begin to increasingly value their increasingly secure future. As a property owner's certainty of their command of a good increase into the future, they are more likely to maintain the good in good shape and more likely use the resource with not only the present, but also with the future in mind.

If we use this reasoning to focus specifically on one type of property, money, which is arguably extremely important for time preference. Providing for the future suffers from the problem of coincidence of wants usually discussed in the context of trade (MENGER, 2009). The future is unknowable and uncertain (LACHMANN, 1976; PACKARD; CLARK, 2020; SHACKLE, 1958). It is not possible to know exactly what *your demand* will be in the future. It is even harder to determine today, *someone else's specific demand* at a future point in time.

In a similar way to how it solves the problem of coincidence of wants in trade, money solves the problem of future provision.

By saving the most liquid or the most saleable good, the generalized medium of exchange, the savers will be able to exchange their savings for goods that they will want in the future. Therefore, money allows savers to perform exchange at the time of their choosing. Money is then held precisely because it works as a defense, a hedge, against the uncertainty of the future.

In a future that is perfectly predictable, individuals could arrange all their future financial inflows to go directly to the providers of the good they would need at the time they need them. Holding money would be unnecessary because uncertainty would disappear (ROTHBARD, 2009, cap. 8). In the real world, however, where the future is uncertain and unpredictable, money is the best tool for providing for the future. This happens because money's liquidity allows it to be converted to whatever goods are available and are desired by the saver in any point in time, the present or the future.

The Roles of Money, Saving, and Investing

Money can be understood as the economic good likely to have the highest future marginal utility. This happens because money proper can be most easily converted into whatever other good has the highest marginal utility for the individual saver in the future. As human society develops money as a good, humans find a very convenient and powerful tool for transferring value from the present into the future (AMMOUS, 2021; MENGER, 2009). This transferring process allows societies to lower their time preference and engage in more savings, leading to more future provision (GARRISON, 2000). As humans use money to conduct trade, the technology used for money improves and becomes more efficient at carrying out its task as a medium of exchange. This happens in two ways, money becomes more efficient in facilitating present transactions and at the same time, it also permits the existence of inter-time transactions, ones that start in the present, but will only end at a relatively distant point in the future. Money is a technology, and the preponderance of users leads to a preponderance of choices competing against each other (AMMOUS, 2021). In money, better ideas and technologies win out and drive out the inferior ones (HAYEK, 1990).

A monetary medium which is easy to produce in excessive quantities in response to demand increases will likely experience substantial increases in its supply and, as a consequence, will also experience a reduction in the economic value that it is capable of storing over the long-term (ROTHBARD, 2005). On the other hand, the monetary medias that are difficult to produce – that are difficult to increase in quantities - in response to demand increases, are likely to witness their supply expand to a limited extent, and so they will be much better at preserving purchasing power (HÜLSMANN, 2008).

Those who store their wealth in the harder monies witness their wealth preserved and even appreciate because of the improvements in technology that occur as time passes. While those who store their savings in easy money, even considering the improvements in technology, generally witness their own wealth, their capacity to access goods, dissipate with

the passage of time. In some cases, people that save in “easy monneis” may learn this lesson before it is too late, moving their wealth to the harder money, or they may not.

Examples of easy monneis and what it does to peoples’ savings can be found in places that face significant inflation. In those cases, part of the population, usually the most educated members of that society, migrate from their national money to some other form of money that is better capable of preserving the previously acquiring purchasing power. There are many examples of this monetary phenomenon across time, but some recent ones occurred in Argentina (CACHANOSKY, 2018; KAMIN, ERICSSON, 2003), Venezuela (ACEVEDO, CIROCCO, D’ANDREA, 2018; SU, KHAN, TAO, UMAR, 2020) and Zimbabwe (CHAGONDA, 2011; PILOSSOF, 2009), see also Cifuentes (2019).

In any case, the result will be the same. Most of the available wealth will accrue to the hardest money, and it will be held in the hardest money. This process, which has been discussed in greater detail in *The Bitcoin Standard* (AMMOUS, 2018), explains the demonetization of seashells, glass beads, iron, copper, and other primitive monies in favor of harder and harder forms of money that eventually lead to the adoption of gold and silver all over the world.

This is the same process that explains the demonetization of silver in the 19th century and the precipitous decline in its value when compared to gold – the undisputed winner of the global market for money at the end of the 19th century (AMMOUS, 2018). As most individuals in the planet converged to the one commodity which had the reliably lowest annual supply growth rate, gold, secure savings that were able to provide to the individuals into the future became ubiquitous. This encouraged people all over the world to save for their future. In economic terms, the adoption of gold lowered the individuals’ average time preference. They started using the harder money to save more, and by making plenty of savings available for capital investment and technological innovation, societies increased labor productivity and thereby increased overall prosperity (HOPPE, 1999; HÜLSMANN, 2008).

As humanity progresses into using monetary media that are harder to produce, our ability to provide for our future increases. The technology that money represents allows for increased efficiency in transacting with our future selves, thereby, the uncertainty of the future declines. Further, the security of a widely accepted form of money as a medium of saving has allowed countless people to escape the ravages of war and disaster with wealth they could more-or-less easily transport anywhere they went.

As the uncertainty of the future declines, and the expected wealth that individuals are able to transfer to themselves in the future – represented by their savings in hard money - increases, the discounting of the future decreases. The relevant economic consequence for the discussion here is that time preference declines. Thus, time preference can be understood as the driver of saving and investment, or as Hoppe calls it, time preference initiates the process of civilization (HOPPE, 1999).

Once an individual can lower his/her time preference to engage in activities that do not offer immediate rewards, s/he is choosing to sacrifice present resources, including time, in exchange for future possibilities of consumption. Once the individuals decides to forego consumption of present goods to save for the future, they are further lowering their time

preference, initiating the process of saving. Conceptually and chronologically, saving can only be understood as a precedent of investment and its necessary prerequisite (MISES, 1990).

Regardless of its type, any capital good can be not only used to production, but also consumed or exchanged for goods that can be consumed in the present. Before one can invest capital, one must first defer its own consumption by saving part of what s/he has previously produced. No matter how short the period between earning wealth and investing it, that period is a period of saving.

This is the logic of both grandmas and part of modern money managers worldwide. Reduce your expenditures to be able to save. You need some cash balance to protect you from a rainy day, an accident. Once you have reached that safe amount, you should start investing the excess savings you have in productive businesses that would ideally bring profits and, as a consequence, even more savings.

The lowering of time preference is what drives individuals to accumulate cash balances, e.g., to save, and ultimately to invest. The lower the time preference, the less the individuals will consume, and the more resources they will spare for savings and investing. Each person keeps in cash a balance they would like to have with certainty and takes risk – faces uncertainty (ROTHBARD, 2009) - with investment in search of return.

Under a hard money standard, such as gold, the hard money itself would be held as saving. This happens because the hard money's relative scarcity and the overall technological development, makes the savings appreciate slightly in purchasing power at every unit of time. In other words, because of technological development and the relatively low increase in the supply of the commodity that serves as money, the same amount of money in time one buys more stuff than it would buy in time zero. Gold is, in this sense, deflationary. Even considering its usually slight increases in supply, *it gains purchasing power* as time passes.

In the modern easy money economy, cash, understood as government issued money, is trash. This is known by every investment manager. People instead hold the equivalent of what would be their savings in government bonds or what is considered to be low-risk investment stocks. At the same tie, the part of their portfolio that would go to investment is placed in riskier financial instruments.

The more time preference declines, the more individuals are likely to defer consumption, the more cash they have on hand, the more they are willing to lend. The abundance of loanable funds allows for the financing of an increasing number of productive enterprises, with this movement comes the rise the income and living standards. The increase in income in turn allows for more capital accumulation in a virtuous cycle of improving material well-being for not only the initial money lenders, but for all the individuals participating in the market. This can be understood as the process of civilization.

As individuals lower their time preference, invest and accumulate more capital, their productivity increases and, as a result, they are incentivized to lower their time preference further. In the history of interest rates, Homer and Sylla (1996) show a 5,000-year process of decline in interest rates intertwined with significant increases during periods of war, diseases and catastrophes.

The move toward harder types of money, with better “salability”⁴ across time (MENGER, 1892), can be viewed as a contributor to the epical decline in time preference by allowing humans to have access to a better saving technology. With a better money in which to save, the future becomes less uncertain for the individuals and thus makes them discount the future less. The result is that more savings and thus more capital available at lower interest rates to be invested in further developing the structure of production.

For as long as individuals are able to accumulate capital and reasonably expect it to remain theirs after they invest in it, this process is likely to continue generating a higher stock of capital and a lower interest rate. This process, however, can be interrupted and reversed through various factors. Natural disasters destroy property and capital, lower living standards and endanger survival, leading to a higher discounting of the future and a need to consume more of the available resources in the present, reducing capital accumulation and raising time preference (STORR, HAEFFELE-BALCH, GRUBE, 2016).

Violations of property rights are perhaps the most important social and institutional factor affecting time preference. Theft, vandalism and other forms of crime have a similar effect that natural disaster, in that they reduce the stock of capital and goods available to an individual, pushing them to consume a larger fraction of their resources in the present because of the increasing uncertainty about the future.

The growth in crime rates further leads to the expenditure of increasing resources on protection from crime, taking resources away from other productive enterprises. The more prevalent crime is, the more resources need to be dedicated to protection. These resources, by definition, do not create wealth, they help to protect wealth that previously existed. Their societal impact would be much higher if they could be used in different, more productive endeavors. Far more significant than individual crime, as Hoppe (2001) says, is institutional or organized crime in the form of predatory government policies.

Whereas it is possible to purchase protection from random individual criminals that act outside of the government, government violations of property rights are systemic, recurring and inescapable. Because they are overwhelmingly considered legitimate, it is much more difficult to defend oneself against government violations of property rights than it is to defend oneself from crime committed by non-governmental entities. In this sense, the devaluation of governmental currency is one major violation of individual’s property rights that is highly destructive of a future time-preference orientation. Debasing the money stops the process of lowering of the time preference of the individuals in that society.

Having money that holds value, that maintains its salability, across time, allows men to delay consumption in exchange for something that can hold value well and can be exchanged easily in the future. Money that holds its purchasing power naturally increases the expected future value of defraying consumption and, so, the better the money is at holding onto its value into the future, the more reliably individuals can use this money to provide for their future selves, and the less uncertainty they will have about their future selves.

⁴In some translations the concept has been worded “saleability” (MENGER, 2007).

Historically, salt, cattle, glass beads, limestones, seashells, iron, copper and silver have all been used as money in various times and places. By the end of the 19th century, the entire globe was practically on a gold standard. The use of an easier monetary medium would lead to its overproduction and thus a decline in its value and the dissipation of its monetary premium.

With the gold standard of the late 19th century, most of the world had access to a form of money that could hold its value well into the future, while it was also increasingly easy to transfer across space. In this setting, saving for the future became increasingly reliable for more and more of the world's population. With the ability to saving hard money, everyone was constantly enticed to save, lower their time preference and reap future rewards.

Savers in such setting see the benefits of hard money around them every day. They appear in falling prices and in the increased wealth of savers. Economic reality is constantly teaching everyone the high opportunity costs of spending in the present in terms of future happiness.

However, the 20th century's shift to an easier monetary medium has reversed this millennium old process of progressively adopting better technology in money and consequently progressively lowering the average time preference. Rather than a world in which almost everyone had access to a store of value whose supply could only be increased at around 2% per year, which was gold, the 20th century brought a hodgepodge of government-provided currencies growing, in the best examples, at 6% or 7% per year (AMMOUS, 2021, cap. 4). In many cases, in different places and times, the growth of the currency achieved double-digit percentage growth every year. Occasionally it reached triple-digit numbers a year. This happened in the early 1900 in Germany, in the 980's and 1990's in Brazil and Argentina, and earlier in the 2000's in Zimbabwe and Venezuela. The average growth of all national currencies broad supply during the period between 1960 and 2020 is 30% per year (AMMOUS, 2021, cap 4).

On average, there has been a 14% annual increase in the market supply of all government-controlled fiat currencies in the last century or so. This can be viewed as the average money supply increase experienced by the average citizen of these nations of the late 20th and early 21st century (AMMOUS, 2021, cap. 4). Society moved from a world in which everybody had access to a money whose supply increased at 2% a year to a world in which everybody's money is increasing at an average of about 14% a year.

Societal and Economic Consequences of Easy Money

Rather than expecting money to appreciate and thus have a reliable way to retain purchasing power into the future, fiat money returned 20th century humans to a far more primitive time when retaining purchasing power into the future was far less certain. Because of this characteristic, the individuals should expect that the value of what they saved, its purchasing power, their wealth, would at best be reduced as time passed, at worse it would be totally obliterated. The future is hazier with easy money, and the inability to provide for the future makes it even more uncertain.

Because of the increased uncertainty, people will apply higher discounting of the future. With easy money, time preference becomes higher, people focus shift to the present.

Fiat money effectively taxes future provision of the present savings, leading to a higher discounting of the future and an increase in basic present-oriented behavior. Why delay present consumption when you are unsure what will happen to your property, your money, our savings tomorrow?

The extreme of this process can be seen when observing the effects of hyperinflation. Looking at modern economies of Lebanon, Zimbabwe or Venezuela through their recent hyperinflationary episodes provides a good case study as do the dozens of examples of hyperinflation in the 20th century (REIHART; SAVASTANO, 2003).

In each of these hyperinflationary scenarios, as the value of the government issued money was destroyed, along with it went concern for the future. Attention turns instead to the very short-term quest for survival. Saving becomes unthinkable and people seek to spend whatever money they have as soon as they secure it. People begin to discount all things which have value for the long run and capital is used for immediate consumption. In hyperinflationary economies fruit bearing trees are chopped down for firewood to be used in the winter.

Businesses are liquidated to finance the owner's personal expenditure, and the proverbial seed coin is eaten. Human and physical capital leave the country to where savers can afford to maintain and operate them productively. With the future so heavily discounted, there is less incentive to be civil, prudent or law-abiding, and more incentive to be reckless, criminal or dangerous. Crime and violence become exceedingly common as everyone feels robbed and seeks to take it out on whoever has anything (ACEVEDO et al., 2018).

Families break down under financial strain. While more extreme in the cases of hyperinflation, these trends are nonetheless ever-present in milder forms under the yoke of the slow fiat inflationary bleed.

The most immediate effect of the decline in the ability of money to maintain its value over time is an increase in consumption and a reduction in savings. Deferring consumption and delaying gratification requires one to give up immediate pleasure for future reward. The less reliable the medium of exchange, the lower the expected value of the future reward for this same medium, the more expensive the present sacrifice becomes, and the less likely people are to defer consumption.

Grocery stores in countries that are witnessing hyperinflation see peaks of demand right after people are paid. Everybody runs to the store as fast as possible to try and spend all the money they have, even in goods that one does not intend to use directly. People do so because they know that a few days into the future, that same amount of money is going to be worth less, the purchasing power of the currency will be reduced, so the faster one can get rid of the money in exchange for something that actually holds value, the better.

The same phenomenon happens in all countries, all over the world, at all times, but at lower rates so it becomes harder to notice. The culture of conspicuous consumption that pervades our planet today cannot be understood except through the distorted incentives fiat money creates around consumption. With money that constantly loses value, deferring present consumption and saving would likely have a negative expected value.

In the current fiat money arrangement, finding the right investment is difficult. It requires active portfolio management and supervision, and it entails riskier “bets”. ‘Saving’ became an activity for professionals. The path of least resistance, the path permeating the entire culture of fiat society is to consume all the income, living paycheck to paycheck or even on credit. On the other hand, when money is hard and can appreciate, individuals are likely to be very discerning about what they spend it on as the opportunity costs appreciates over time. In a hard money environment saving does not depend upon complex financial instruments or active management.

Why buy a shoddy table shirt or home when you can wait a little while and watch your savings appreciate to allow you to buy a better one? On a fiat currency world, with cash burning a hole in their pockets, consumers are less picky about the quality of what they buy because money not spent now will continuously lose purchasing power. The shoddy table, home, or shirt becomes a reasonable proposition when the alternative is to hold money that depreciates over time even more, permitting you, with some luck, to acquire an even lower quality product in the future.

One great visual expression of the problem of time preference is in art. They say a picture is worth a thousand words, so here’s 2,000 words on the effect of fiat money on civilization. Art under a gold standard, a favorite example, contrast the Sistine Chapel, which Michelangelo painted in four years - a poem that Michelangelo wrote about how awful and horrible and difficult it was for him accomplish this task, hanging for four years from the ceiling and painting every little meticulous detail has been published in the Bitcoin Standard (AMMOUS, 2018, p. 100). This is the kind of art that was funded on hard money. There were artists and patrons who had the time preference to want to create things that survived for many generations, even for centuries. For this reason, today, hundreds of years later, we are still talking about the Sistine Chapel.

By contrast we have some other things in modern art, which were not, contrary to popular belief, painted by my five-year-old daughter, or by any other infant, for that matter. Modern paintings are painted by supposedly professional artist, but many of them could have been painted by pretty much any five-year-old. These children could recreate most of the so-called modern art in painting in 15 minutes if they are just given some paint and canvas. This is art on easy money. Easy money artists do not have the ability to spend the time and to think about producing something that is of such high quality as the Sistine Chapel, modern art is not made to endure. And I believe that this same phenomenon is something that you see across all artistic discipline and the uncertainty of fiat also extends to all property.

With government emboldened by its ability to create money from thin air, it grows increasingly omnipotent over all citizens property. The power over money gives governments the ability to degree individual’s properties as it pleases. This ability can also be used to confiscate individuals’ properties altogether in the most extreme cases. In *The Great Fiction*, Hoppe (2021) likens fiat property to a sword of Damocles hanging over the head of all property owners who can have their property confiscated at any point in time, increasing their future uncertainty and reducing their provision for the future.

Another way to understand the destructive impact of inflation on capital accumulation is that the threat of inflation encourages savers to invest in anything they expect will offer a better return than holding cash. When cash holds its value and appreciates, an acceptable investment will return a positive nominal return, which will also be a positive real return.

Potential investors can be discerning, holding onto their cash while they wait to find the best opportunity. But when money is losing its value, savers have a strong impetus to avoid the devaluation of savings by investing. And so, these individuals become frantic in the tentative to preserve their wealth and thus become much less discriminating. More than that, investments that offer a positive nominal return could nonetheless yield a negative real return. Business activities that destroy economic value and consume capital appear economical when measured against the debasing monetary unit and can continue to subsist, find investors, and destroy capital because they're better than holding onto cash that is being destroyed at a faster pace.

The destruction of wealth and savings does not magically create more productive opportunities in society, as Keynesian fantasies want individuals to believe. It simply reallocates the wealth into destructive and failed business endeavors. Related to the general rise in time preference and heavy discounting of the future is the rise of interpersonal conflict between individuals and the degradation of the manners and morals that make human society possible.

Trade, social cooperation and the ability of humans to live in close contact with one another in permanent settlements are dependent upon them learning to control their basic hostile animal instincts and responses and substitute them with reason and long-term orientation.

Religion, civic and social norms all encourage people to moderate their immediate impulses in exchange for the long-term benefits of living in a society and cooperating with others. When these long-term benefits seem far away, the incentive to sacrifice for them becomes weaker. When individuals witness their wealth dissipate, they rightly feel robbed, and they question the utility of living in a society and respecting its mores.

Rather than a way to ensure more prosperity for all, society appears as a mechanism for an elite few to rob the majority. Under inflationary environments, crime rates soar and more conflict emerges (ROSENFELD, 2014). Some of those who feel robbed by the wealthy elite of society will find it relatively easier to justify aggressing against other's property.

Diminished hope for the future weakens the incentive to be civil and respectful of clients, employers and acquaintances. As the ability to provide for the future is compromised, the desire to account for it declines. The less certain the future appears, the more likely people will be to engage in reckless behavior that could pay rewards in the short term while the possible endangerment is only present in the long, and very uncertain, term. The long-term downside risk of these activities, some of which can be as bad as mutilation, imprisonment or even death, are discounted more heavily compared to the immediate reward of securing life's basic necessities or simply responding to animal-like instincts.

Bitcoin and how it “Fixes it”?

The emergence of Bitcoin represents a fascinating opportunity to understand the role of money on time preference as well as to reverse the global trend of rising time preference caused by fiat money. Bitcoin is peer-to-peer software for operating a payment network with its own native currency (NAKAMOTO, 2009).

Bitcoin’s two most important features are that its native currency has a strictly fixed supply that is completely irresponsive to demand, making it thus the hardest money ever invented. And that it allows for cross-border payments without needing any political authority to supervise the transactions.

These two properties arguably give Bitcoin the best saleability across time and space. Its scarcity means that its supply cannot be diluted unexpectedly by anyone. This ensures it is likely to hold onto its value into the future. And it has automated the processing of payments, which means it can travel worldwide without having a single authority able to censor it or confiscate it.

Bitcoin’s monetary policy is set and unchangeable. There is a total supply of Bitcoin across time, as of mid-2022, it currently stands at around 19 million Bitcoins. That’s the total number of Bitcoins that are in circulation today. It started at zero in 2009 and it’s been increasing at a decreasing rate since then.

Currently, the annual rate of increase in the supply of Bitcoin is somewhere between 1.8 to 2% per year. This will be the same for the next three years. After this period, this increase in supply will drop by half. It will be around 1% for four more years and then it will drop by another half, to 0.5%, the four years after that. This will continue to drop by half, roughly every four years, until it goes to 0 which means that the supply of Bitcoin will stop increasing. It will settle at a total supply of 21 million Bitcoins.

There has never been a monetary asset like this. An asset that has its supply completely independent of demand. The operation of Bitcoin is completely orthogonal to the demand because of something called the “difficulty adjustment”. Its supply cannot be affected by its demand. Contrary to other moneys that are or have been in use, there is no mechanism for anybody to make more Bitcoin. On top of this, Bitcoin also has no single point of failure. It has no single piece of critical infrastructure, hardware or software. It has no single critical individual or organization that is solely responsible for its operation. It is a software protocol open to anyone anywhere who has a device that can receive around one or two megabytes of data every 10 minutes. And there are tens of billions of these devices worldwide. All Bitcoin does is that, approximately every 10 minutes, it produces a new record of ownership reflecting around 3,000 transactions, those transactions recorded in the Bitcoin blockchain reflect the reallocation of existing or newly created coins among the different public addresses.

This process has never failed and has never produced a fraudulent transaction. Bitcoin is purely voluntary monetary phenomena that does not require regulation enforcement or a judicial system to function. It fits into the Austrian School definition of sound money (NORTH, 2015) because it is chosen on the market and its value cannot be dictated by any authority.

More than this, of all the moneys chosen on the market or imposed by government, Bitcoin is the only one whose supply is fixed and cannot expand in response to increasing demand.

Analysts and experts have made many spectacular claims about what Bitcoin and digital currencies can do but most of that is meaningless hype. Bitcoin is basic, and it simply allows you to hold and transfer ownership of currency units.

It is a very boring game for those that want to think about Bitcoin. It is a game where you just collect units and you can move them around, that is basically it. That is all that the Bitcoin system does. In practice, the most prevalent use case for Bitcoin has been its use as a store of value or as a saving account. Millions of people worldwide have used Bitcoin as a savings account, and they have profited from this immensely. Bitcoin's price, because of the limit on its supply, has appreciated a compound annual growth rate of 215% per year in its first 10 full years of trading.

Over a four-year timeframe, the Bitcoin price has never been down and it has been up under fivefold for only one day. In its history of over 3,000 days, there was only one day in which Bitcoin was worth less than five times higher than what it was worth four years ago. And it was only up under tenfold for only 100 days. Generally, holding onto Bitcoin for more than four years implies a return of more than tenfold.

Over the past five years – from 2017-2021, the average return on holding Bitcoin for four years was around 22-fold. Bitcoin as money is thus very different from government's money. Bitcoin, on average just goes up in purchasing power. And it works wonderfully as a long-time oriented saving account. This is becoming increasingly popular around the world where people use Bitcoin for what it is called dollar-cost averaging, where the individual buys a specific quantity of Bitcoin recurrently, regardless of the price of Bitcoin against its local currency.

To illustrate, here is what would have happened with an individual that bought \$10 of Bitcoin every week between 2017 and 2021, \$10 a Bitcoin every week means \$2,600 bought of Bitcoin, which is a relatively small sum for a developed country. Over that time, the initial \$2,600 would have turned into a purchasing power of \$30,500.

Pretty much everybody in the developed world has \$10 to spare a week. A lot of people have \$10 that they spend and waste on all kinds of meaningless nonsense. Not a lot of people have \$30,000 in cash lying around that they could use for anything. Bitcoin offers any individual with a connection to the internet the possibility to get this amount of cash and purchasing power over time, to reach this amount of saving with small amounts of recurring purchases. This type of approach is becoming increasingly popular as more and more people begin to take advantage of it not only in developed regions, but also in underdeveloped areas of the globe.

Bitcoin and the approach that it implies offers us very interesting insight into the importance of money to time preference. Democracy, inflation, government predation, wars, the Keynesian managerial state and the majority of modern factors causing a rise in time preference are still there and are usually getting worse. But for a small growing minority of people around the world, Bitcoin represents an escape path from at least monetary inflation.

Unlike the majority of the humans in the past century, Bitcoiners today are able to actually save for the future and expect with relatively low uncertainty to have their savings available in the future and to have their purchasing power increase.

If money is important for time preference, we would expect to see these people, Bitcoiners, to differentiate themselves from their peers that continue to rely on fiat money. My personal experience from years in the Bitcoin space provides several compelling pieces of evidence to support this claim. Recently, I ran a poll for my followers on Twitter who have held Bitcoin for more than a year, asking them of the percentages of their income they saved or invested before getting into Bitcoin and what percentage they save or invest today after at least one year of holding onto Bitcoin, the results are amazing: 48% of people used to save less than 10% of their income before Bitcoin. After Bitcoin, only 11% of people saved less than 10% of their income. The ratio of people saving 10 to 25% stayed the same.

The number of people saving from 25 to 50% went up from 12% to 23%, almost double. And the number of people saving over 50% of their income has gone up from 15% to 40%; this is a huge increase. 40% of people who have held onto Bitcoin for more than a year, obviously this sample is not representative of the general population, these are people who follow me on Twitter so they have come across these ideas, they have likely come across the concept of saving and seeing this connection, but still, this is a very stark change.

The average savings rate before Bitcoin was probably around 10%. After Bitcoin it would be somewhere around perhaps 20-30% as the average saving rate.

Consequences and Conclusions

In 2018, *The Bitcoin Standard*, an academic book which had a whole chapter on time preference and money, was published. I did not expect discussion of time preference to be popular with people who have no background in Austrian economics, surprisingly, it was. Three years later, the book has become the best-selling book on Bitcoin, and it's been translated to over 25 languages worldwide.

I have been told personally by thousands of people how it helped them explain the changes in their life after moving to Bitcoin. The very common story I heard from Bitcoiners is, I used to spend all my money on all kinds of stupid things, when I learned about Bitcoin, I cut down on my expenses drastically and started saving everything in Bitcoin.

Along with that came a market change in future orientation across all manners of personal behavior for these people. Some of these people decided to start a family, some got over depression and found meaning to life, some quit dead-end careers and took up challenging and engaging work and many quit bad habits.

One of the most common stories is of people quitting alcohol and drugs. My personal favorite was when somebody told me that they introduced their drug dealer to Bitcoin, they started saving in Bitcoin, made a lot of money on Bitcoin, decided that holding Bitcoin was a better use of their time than dealing drugs, forcing the person who introduced him to Bitcoin to quit drugs because he no longer had a drug dealer. And similar stories seem to be quite

common. A quick Twitter search on “Bitcoin and drugs” will turn up many stories of people who quit drugs to do Bitcoin instead. Specifically, in its early days, Bitcoin was used for buying drugs online. A lot of people got into Bitcoin because they wanted to have access to the drugs online. But as the common saying goes, “come for the drugs, stay for the hard money.”

These people find a much better ‘drug’ when they realize that you can just make your future better instead of just getting high today. There are many examples, *I quit meth because now Bitcoin is going up, I can’t stop smiling and I don’t want my teeth ruined, Bitcoin is my anti-drug*. And these are extremely common stories and I think they are quite telling.

The story of savings is thus a common one. Before Bitcoin, most people alive today simply had no conception of saving and delayed gratification. Almost anyone has access to gold.

People all over have recollections of stories of individuals who have saved and worked hard and had their wealth destroyed by inflation. The threat of inflation demotivates people. The uncertainty of saving in fiat heavily discounts the future payoff, also reducing the incentive to invest. For the people living in the fiat standard, the opportunity cost of spending today is relatively low tomorrow because of the absence of a reliable mechanism for transferring wealth from today to tomorrow.

A common story in the developed world is that people spent all the money they earned and when they have major expenses, they got into debt to pay. They continue to work and pay off the debts indefinitely. To the extent that people in the developed countries invest, they do so through their work retirement funds. Those who do invest by themselves are mostly those who spent considerable amounts of time studying the markets and modifying their portfolio. The complexity of doing it makes that kind of approach basically a very specialized job.

The notion of saving passively, while earning money from a regular job, is very rare, and in fact almost absent in the fiat economy. The advent of Bitcoin makes it common and straightforward. People from all over the world are now obsessed with stacking SATs, where SAT refers to the Satoshi, which is the smallest unit of Bitcoin, 1 one hundred millionth of a Bitcoin. 100 million Satoshis make one Bitcoin and Bitcoin can potentially be divided even further.

Millions of people worldwide now work their day jobs, spend as little as they can and stack as much SATs as possible. Once someone is introduced to the magic of Bitcoin’s, to its rapidly increasing purchasing power, and because of its limited supply, it is inevitable that they start calculating how much wealth they could have had if they had spent on Bitcoin the money that they spent on other things, particularly on frivolous spending.

Bitcoin then is the free market solution to the problem of rising time preference that was introduced by government controlling the supply of money that led the world to the fiat money standard. Bitcoin is the technological solution that allows anyone to rejoin the process of lowering time preference, saving, investing, capital accumulation and civilization.

Bitcoin requires no political permission. It obviates politics and monetary policy; it is unstoppable and it is hugely rewarding for anyone who adopts it. As it is expected to lose its value over time, easy money is not a reliable way of providing for the future, which thereby increases the uncertainty of the future, encouraging heavier discounting of the future.

In other words, it encourages higher time preference, as observed in the 20th century under the fiat standard.

Because it can be expected to hold onto its value, its purchasing power, into the future, hard money increases the potential payoff from savings and delaying gratification. It reduces the uncertainty of the future and encourages more saving and more future-oriented behavior as was the case under the gold standard and as we are fortunate to see in the nascent Bitcoin standard.

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