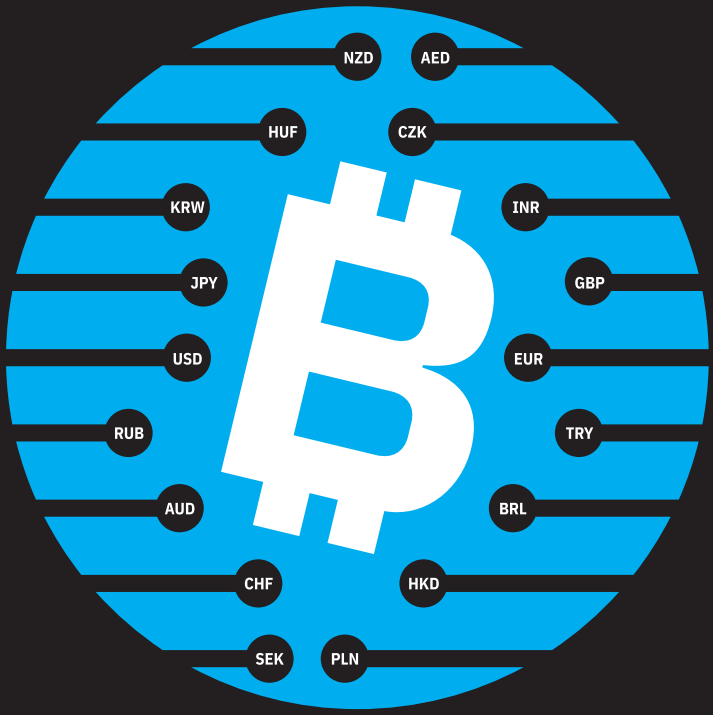

THE BITCOINIZATION OF FINANCE

Financial Architecture for a Sound Money Economy

Author: **WYATT O'ROURKE**
Foreword: **GUY SWANN**

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BRAIINS INSIGHTS:
THE BITCOINIZATION OF FINANCE

Written by
Wyatt O'Rourke

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The Bitcoinization of Finance

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THE BITCOINIZATION OF FINANCE

This book was written by Wyatt O'Rourke, founder and CEO of Basilic LLC. Wyatt specializes in financial advising, investing, and bitcoin. The book covers how bitcoin will intertwine with and revolutionize the entire financial industry due to its unique qualities. It outlines specific ways that investors, lenders, borrowers, traders, and more will benefit from bitcoin improving the way we see finance.

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ACKNOWLEDGEMENTS

This book would not have been possible without the incredible support of the team at Braiins. I am extremely grateful for them embracing me and my ideas. A special thanks to Kristian Csepcsar and Martin Connor for taking a chance on me and my thesis, they have been very encouraging.

To my beautiful wife. Your unwavering support, love, and devotion mean the world to me. I couldn't have done this without you.

To Our Lady of Lourdes Parish and the men there who hold me to a consistently high standard. All glory, honor, and praise be to God the Father. It is by His grace alone that this work was made possible. May it serve His greater glory and the good of His Holy Church. My sole desire is to be His faithful servant, now and always.

To The Space and Denver bitcoin community for inspiring me to seriously get involved in the bitcoin industry. Your support, education, and friendships have been paramount in my bitcoin journey. It is extremely rewarding to be a part of this group and I will always cherish it. A special thanks to Tyler Stevens, Sam Bazarov, and David Weishaus for your help, guidance, and encouragement to pursue writing this book.

FOREWORD

Imagine someone invented a new building material. It's lighter than aluminum, but stronger than steel. It doesn't corrode, doesn't degrade, and has one unique property that no other building material has: it can be made flexible in one direction yet immovably rigid in another — much like how polarized lenses allow light through only from a specific angle.

Naturally, the first impulse would be simple: replace all existing structures made of steel and concrete with this new, superior material. The buildings would be stronger, last longer, and weigh less. It would be a definite improvement.

But that would also be a profound waste.

The true value of this material wouldn't be realized by using it to build the same things in the same way. Its real potential lies in discovering what new kinds of structures we could build — architectures that were never possible with stone, wood, steel, or concrete. Just as the invention of steel redefined our engineering and reshaped our cities, this hypothetical material would open the door to an entirely different approach to building.

Bitcoin is that new material, but for money and finance.

And today, most of what we see and discuss is little more than rebuilding the old world with a new tool. We're recreating the same institutions, the same tools, the same models of traditional finance — just swapping fiat for sats. It's a natural first step, but it misses the point. It fails to grasp what makes this tool revolutionary, and what becomes possible now that we are no longer constrained by the assumptions and failures baked into the financial systems of the past.

Bitcoin is not just digital money. It's programmable, incorruptible capital. It is apolitical, borderless, and finite — immune to the decisions of central banks or the manipulations of policymakers. With primitives like multi-signature custody, global time-locks, and proof-of-reserve, we can design entirely new financial mechanisms — tools that were never possible in the legacy system.

But there is an underbelly in the industry, a quiet revolution, where truly unique services and models are being embraced. Imagine collateral you can see and verify at any time on a public ledger, yet no single entity can touch or move without your cryptographic consent. Imagine being able to participate in a financial system where every party, including you, can cryptographically prove that your money is safe, untouched, and being used exactly as you agreed, without trusting any middleman. Imagine financial instruments that work across jurisdictions but obey none, that don't rely on fragile promises, but on math, open code, and consensus.

Now pair that with the reality we live in today, i.e.an aging global financial system, weighed down by debt, fragility, and political capture. A world where markets respond more to the Fed's statements on interest rate targets and how much money they intend to print, rather than to the production of real goods and services. The institutions we rely on are increasingly unstable, unaccountable, and incapable of serving the people or the purpose for which they were originally built.

Bitcoin offers a different path.

This book is about that path. It is about understanding the tools and models of traditional finance (how they work, why they exist, and where their critical vulnerabilities lie), but more importantly, it is about how those very same mechanisms can be reimagined, rebuilt, and surpassed using bitcoin.Bitcoin can be used not just

to fix what is broken, but to build something entirely new: a financial system aligned to reality, rooted in transparency, secured by mathematics, and governed not by bureaucrats, but by individuals.

I know Wyatt, the author of this book, personally. He's one of the rare few who can see the bigger map of the forest, but also understand the individual roles of the trees. Able to zoom out to see broader trends and principles, and zoom in deeplyon the explicit tools and building blocks and how they will affect the system at large. If you're looking for a detailed exploration of the current system, the cracks running through it, and the new blooms that show us a blueprint for what comes next, you're in the right place.

Bitcoin won't be financialized. Finance is about to be bitcoinized.

Enjoy the journey.

Guy Swann

INTRODUCTION

> **Financialization**–*Financialization is the growing dominance of financial markets, institutions, and transactions in a country's economy.*[1]

In this book you will learn about how the finance industry is a crucial component to hyperbitconization (financialization of bitcoin) and how bitcoin will fundamentally change the finance industry (Bitcoization of Finance).

There have been numerous instances where financiers have pushed over-financialization to extremes, exploiting the fiat system primarily for the benefit of speculators and those with the closest access to the money printer.[2] I certainly don't mean to make light of the fact that our modern lives have been financialized. I don't think this is a good thing. However, I'm going to prove to you that this has much less to do with finance itself, but rather the fiat system infecting finance. Finance can be simply thought of as the business of money. Bitcoin is money, and therefore, business will naturally develop around it-finance.

First and foremost, money is a technology and ledger. It has changed over time and space to adapt to the technological abilities and societal structures of its time. The best forms of money have the following requirements:

- Durable: Lasts over time.
- Portable: Easy to transport.
- Fungible: Identical and interchangeable with any other unit of the same denomination.

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1 Investopedia: Financialization.

2 Fiat systems are centralized, debt-based monetary frameworks that enable unlimited money printing, systemic manipulation, and wealth erosion through inflation.

- Verifiable: Easy to prove it is genuine and accurate.
- Divisible: Can be broken into smaller units.
- Scarce: Supply is limited.
- Established History: Trusted and used over time.
- Censorship Resistance: Can't be blocked or controlled by outside parties.

	Bitcoin	Gold	Fiat
Durable	B	A+	C
Portable	A+	D	B
Fungible	B	A	B
Verifiable	A+	B	B
Divisible	A+	C	B
Scarce	A+	A	F
Established History	D	A+	C
Censorship-resistant	A	C	D

[3]

> **Sound money—***A type of money which acts as a reliable store of value over time where it is difficult to dilute the supply and therefore the value with new units. The soundness of money depends on how well it retains its value and how difficult it is to increase the supply of new units relative to the existing stock.*[4]

Historically, sound money has been tied to commodities like gold, silver, and/or shells. Different human civilizations have adopted

3 Sovereign: The Business Case for Bitcoin

4 Hard Money History: What is Sound Money? [And Why It Is Important To Understand].

different forms of sound money in the past. It is my belief that those societies reached their height when their money was most sound. This tends to correspond to when markets are the most free and there is the least amount of regulation. The society is prospering as a whole because market signals are clear. There is a succinct and functioning feedback loop–capitalists are using markets to organize capital, deploy capital, and create more capital.

Unfortunately, humanity's fatal flaw is when the superior technological civilization centralizes the money. Bureaucrats know this. That is why they have been doing it forever. Repeatedly ruining our civilizations along the way. Wealth and power have a tendency to create a centralizing effect attracting the worst types of people. These people cannot compete in the market, so they compete in "lawfare." Institutions and regulations are designed to alter the once free markets to benefit the backroom Kabal. Incentives become skewed to the point where market participants can no longer make calculated bets with their capital. A rather fake façade is created through market manipulation. There is no sense of a functioning feedback loop; therefore, market participants are forced to gamble with their capital. The mechanisms (free markets, capital organization, capital allocation, technological advancement, freedom, moral cohesion, and societal respect) by which a great civilization has been built are now no longer intact. They have been fully derailed or explicitly destroyed.

This is where we find ourselves today. In a state of economic and moral decay. Now, do not fear friends. We have hope because we have bitcoin. Bitcoin is the apex predator of money. It fulfills all "good money" requirements better than any previous form of money. These qualities are built into bitcoin. Satoshi Nakamoto published the bitcoin whitepaper on October 31st, 2008, and outlined an open-source protocol that is native to the internet and digitally finite. Bitcoin doesn't rely on the whims of any central

planner nor does it derive its value from the economic output of any one country. As a matter of fact, Satoshi Nakamoto inscribed the headline "Chancellor on Brink of Second Bailout for Banks" from The Times newspaper, an explicit warning of the dangers of central planners.

Bitcoin is a neutral monetary asset supported by a decentralized network of nodes, miners, and network participants. Users have the ability to simply verify the legitimacy of the blockchain for themselves. The bitcoin protocol itself is made up of two things: the asset and the network. The asset is a deflationary financial instrument designed to preserve wealth given its digitally finite supply of 21 million coins. The network is a decentralized global payment system that is open and permissionless for all users. *The asset powers the network; the network secures the asset.* Together they form a pioneer species, something that has never been done before, **digital native sound money.**[5]

Bitcoin empowers human beings to wield our gift of individual agency, offering a simple yet profound choice: to opt out of a corrupt fiat system and forge something new. By applying the best tools, products, and strategies from traditional finance (TradFi), we can ignite a lightning-rod catalyst within the ecosystem, deepening bitcoin's capital markets and unlocking opportunities for all. **This maturing asset class, still in its infancy, contains key features for us to break free from the rotten overgrowth of a distorted financial world.**

5 Brandon Quittem: Bitcoin is a Pioneer Species.

A BLUEPRINT FOR FREE MARKETS

I don't think we have even scratched the surface of what true capitalism is capable of facilitating. For a long time the West has posed itself as capitalistic societies. This may have been the case when money was most sound. In the United States, the leader and protector of Western ideals, money was most sound during the late 19th century and early 20th century-certainly, before the unfortunate creation of the Federal Reserve in 1913. Since the creation of the central banks, Western economies have grown more socialist as money has become more centralized. The cancer that is fiat money has certainly been one of the key drivers of creeping socialism. If any one entity, particularly the government, or any of their "public-private partners" can put their finger on the scale to manipulate markets in their favor, that is not a free market.

Money, just like anything, is a market. It is in fact the base market. Every other market is built upon it. When market distortions prevent individual participants from making informed economic decisions-profits and losses on investments become socialized.

Centralizing anything is subject to the will of the centralizers. Centralized money is controlled by–*careful, don't miss it*–central banks. Actually, it's just controlled by one in particular, The Federal Reserve Bank of The United States of America. Now it is important to understand–money is not evil; the worship of money is. Money is simply a unit of account, a measuring stick. It is just a means of economic organization. The most widely accepted money becomes the most influential measuring stick. Well, if money influences everything, then controlling the measuring stick gives you immense power.

Throughout history and even today, there have been evil people within the U.S. government and the Federal Reserve that have leveraged the power of centralized money to alter markets. They

intentionally distort signals opting to achieve their own objectives. Why? Because they can. They control the money. Meaning these corrupt individuals can influence any market they want to. That is destructive, they are destructive.

The U.S. dollar's role as the global reserve currency was formalized at the Bretton Woods Conference, a pivotal event in economic history. However, the system's structure contained inherent weaknesses that made its eventual collapse all but inevitable. It is a striking realization that the framework intended to underpin global financial stability was, from the outset, fundamentally unsustainable.

Harvard Economist Robert Triffin authored the Triffin Dilemma. He theorized that a country issuing the reserve currency must run trade deficits to supply global liquidity, but doing so erodes confidence in its currency over time. In other words, it is hard to grow and maintain the amount of economic activity to support that level of currency supply. While I am certainly no fan of John Maynard Keynes, even he believed it would be "unnatural" for one nation to bear the responsibility of supporting the global monetary system.

The U.S. dollar system has grown into an amorphous blog with little resemblance, if any, of its original intention. *How does it work you may ask?* Convoluted by design. Decades of centralized control have molded the U.S. dollar system into a labyrinth of hidden back doors and loopholes, deliberately embedded to enable corruption.

Every "feature" of the US Dollar either intentionally or unintentionally distorts the market for money. No system with balanced incentives can grow like this. It is unnatural.

We've all heard the adage, "The bigger they are, the harder they fall," a caution about the collapse of oversized systems. Yet, I see

it differently: the bigger they grow, the longer they can keep the music playing. American bureaucrats have devised clever strategies to drum up artificial demand for the dollar, prolonging the system's rhythm. Whether it's the IMF, or the petro-dollar, they will do almost anything to support the dollar-complex.

This unsustainable economic growth, backed by nothing besides the "full faith and credit" of the United States Government has resulted in a powerful system marred with systemic risks. There is no such thing as a perpetual motion machine. The chickens will eventually come home to roost. A system upheld by debt, controlled by a central authority, and dependent on printed money cannot be meaningfully sustained. As Lyn Alden so eloquently puts it, "nothing stops this train."[6]

It is actually a rather nefarious scheme. Participants in global markets, everyday ordinary people, are deprived of the right to receive accurate market signals (data points). When market feedback is distorted or manipulated, people lose the ability to make informed decisions, leading to a profound erosion of their sovereign agency—their intrinsic gift from God. Humans are endowed with free will, a sacred attribute that allows them to navigate the world with intention, purpose, and virtue.

When a lower power intentionally seeks to strip us of this autonomy, it is not just a violation of our human rights, but a deep humiliation. This loss of agency plunges individuals into a state of despair, where rational thought and sound decision-making become nearly impossible. Despair is not just a momentary lapse in judgment; it is a corrosive force that snowballs, leading to increasingly poor decisions that exaggerate suffering. In such a state, humans, who are naturally designed to thrive on clarity

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6 Broken Money: Why Our Financial System is Failing Us and How We Can Make it Better.

and truth, become disoriented and vulnerable. Their resources, both physical and emotional, are drained or outright depleted as they struggle to navigate an environment filled with confusion and misinformation.

This disorientation disrupts the natural order of human existence, as we are not wired to function under such constant and overwhelming uncertainty. The result is a society where despair is rampant, leading to greater chaos. Our current state is a far cry from the flourishing global economy that is possible when individuals are free to act with full agency and clarity.

Bitcoin fixes this. It provides a transparent system where the integrity of market signals are preserved. It is immune to manipulation by any central authority. By removing intermediaries and enabling peer-to-peer transactions, bitcoin restores individuals' sovereign agency. Users are able to act based on accurate and unfiltered information. Maximum transparency creates clarity, empowering people to make informed decisions.

What people are striving for—whether they realize it or not—is a return to truth. Bitcoin represents a bridge back to that: a system where truth is embedded in the protocol, where honesty is rewarded, and where control is decentralized. We are surrounded by fakery—fake news, fake money, fake food, fake status, fake values, and increasingly, fake digital realities. It's no wonder there's a rising hunger for what's real, permanent, and incorruptible. We're living in a society addicted to simulation, abstraction, and manipulation. This is why bitcoin matters so deeply. Not just as a technical or economic breakthrough, but as a cultural and moral restoration. It is real, in a world that is simulated. It is scarce in a world of excess. It is transparent in a world of deception. It is earned in a world of entitlement. Bitcoin doesn't lie, it doesn't inflate itself, it doesn't pretend.

Unlike fiat currency, bitcoin has a fixed supply, which means no one can print more to serve their own interests. This restores fairness to the financial system, eliminating the money-printing exploitation game bureaucrats cannot resist playing. By giving individuals control over their own wealth, bitcoin ensures that the value of their labor is protected. This creates a more resilient and just financial system where humans can thrive, allowing us to return to truth.

True capitalism is about voluntary exchange and competition. If bitcoin were to become the global unit of account, it would lead to real-time price discovery across all markets and eliminate the distortions caused by fiat monetary manipulation. Market participants would directly affect supply, demand, and perceived value rather than central bank intervention, government policies, or credit expansion cycles. Bitcoin removes the ability of central banks to arbitrarily expand the money supply, meaning prices reflect real economic output and consumer preferences, rather than the distortions created by cheap debt. Gone would be the days of quantitative easing, which leads to mispriced assets, boom-and-bust cycles, and speculative excess. We have never had the ability to price goods and services in one incorruptible global currency. Now we do. This would unleash the full potential of capitalism and free markets. I believe the velocity of capital allocation would increase as businesses, individuals, and markets operate in a truly neutral, transparent, and real-time price discovery environment.

THE BITCOINIZATION OF FINANCE

> **Fiat money—***Is a government-issued currency that's not backed by a physical commodity such as gold or silver. It's backed by the government that issues it. The value of fiat money is derived from the relationship between supply and demand and the stability of the issuing government rather than the worth of a commodity backing it.*[7]

Paper Money

As previously mentioned, money is the base market, if it is manipulated, every market on top of it is manipulated. This is the disease of "fiat-ness" and it is pervasive. "Fiat" is now commonly an analogy for the degradation or fakeness of many industries, e.g. "Fiat Food."[8] "Fiat" has corrupted every industry. Finance was particularly susceptible to "fiatness" because it is essentially the business of money.

Setting the stage:
Historically, money and currency have had distinct roles:

- Money is a durable store of value that maintains purchasing power over time
- Currency is the unit of account and medium of exchange used for everyday transactions

Earlier we cited *Broken Money*, describing bitcoin as a technological evolution of money. Lyn relates this back to information traveling at the speed of light via a telegraph, which meant ledgers could be updated at the same speed. Gold is a physical asset and has real-world constraints. When fiat currency was developed as a technological evolution of gold (paper currency could essentially be moved instantly), it worked for a while, but issues quickly followed. Money

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7 Investopedia: Fiat Money: What It Is, How It Works, Example, Pros & Cons.

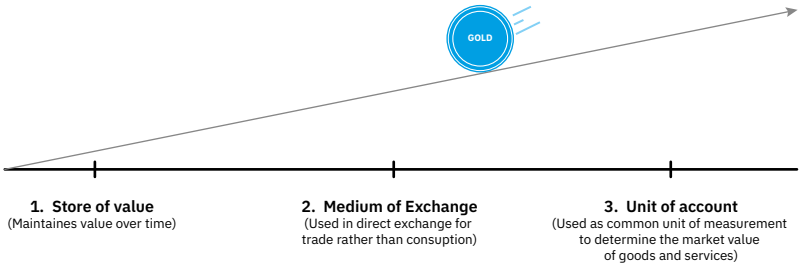
8 Fiat Food by Matthew Lysiak.

was depegged from gold in 1971. That removed any last vestige of sound gold-backed money. Our current system is broken and completely removed from sound money principles, it's all paper.[9]

Even from the beginning, paper and gold were incompatible. There is an inherent technological schism between them. One is scarce and cannot be digitized (gold). The other is abundant and can be digitized (paper). This means all the early fiat currencies backed by gold were doomed to fail–and they are. Admittedly, this analogy isn't a perfect fit, but I think it gets the point across.

What do I mean by this? Well gold actually ends up moving backwards through the currency maturation cycle. It gradually got demoted. Products and services used to be priced in gold (unit of account), then that wasn't practical. However, gold was still used to transact and exchange value (medium of exchange), but that eventually became infeasible. Ultimately, gold is no longer money anymore, it is just an asset (store of value). It has 100% financial value, and 0% monetary value. Fiat money makes hard assets less useful. It abstracts away all of their sound money principles.

Currency Maturation Stages



9 And increasingly, not even paper—most currency today exists as digital ledger entries, abstract numbers on a screen, without any tangible backing beyond institutional trust.

The Sound Money Threat

"When someone shows you who they are, believe them the first time" —Maya Angelou

The Basel Committee on Banking Supervision (BCBS) operates under the Bank of International Settlements (BIS) "the central bank of central banks." The BCBS is a global regulatory body formed to set international banking standards. They publish the Basel reports that encourages the adoption of various frameworks for banks globally. Capital adequacy standards, risk management practices, etc.

Basel I came out in 1988 and classified gold as a Tier 3 Risk-Weighted Asset (RWA) asset which meant it was "riskier" and had lower collateral value. For every $100 of gold, banks could only count $50 toward capital requirements. In reality, its collateral value was often less than 50% due to additional risk-weighting and capital treatment rules.

Reading between the lines:

Humans have used gold as the preeminent store of value for a millennium prior to 2009. It would be directionally correct to say the central banks of central banks, over the last three decades, have punished (they would say disincentivized) banks for holding gold via stricter "capital requirements" and "regulatory constraints." This is the full extent of the BIS's power. That is how much the bank of central banks loves paper money. Sound money is its greatest threat. Basel III has been in a phased rollout from 2013–2025 and it does reclassify gold as a Tier 1 RWA with 85% collateral value. However, I believe my point that they have punished banks holding gold still stands.

Gold Manipulation and the Abuse of Financial Paper

Finance professionals have been sounding the alarm on manipulation in the gold markets for decades. It's a reasonable claim. Gold can be "boxed in." It is susceptible to being manipulated by fiat finance because its sound money principles don't scale in a digital world and it is difficult to custody. There are many reasons why it's particularly difficult to decentralize gold custody. Challenges include;

- **Security Risks**: Requires high-security vaults, 24/7 surveillance, etc.
- **Verification & Authenticity**: Gold bars must be assayed, weighed, and tracked to prevent fraud or counterfeits.
- **Storage Costs**: Secure vaulting and insurance add significant expenses.
- **Logistics & Transportation**: Moving gold safely involves armored transport, customs regulations, and geopolitical risks.
- **Liquidity & Settlement**: Gold must be physically delivered or allocated, making transactions slower.
- **Counterparty Risk**: Custodians must be trusted, as unallocated gold can be rehypothecated or subject to legal claims.

There are two big factors (among others) that make gold markets susceptible to manipulation.

1. It is a *physical* asset that has real-world custody constraints
2. There is extreme concentration in the gold markets.

    a. Participants like J.P. Morgan Chase have dominant roles in both the custody of physical gold and the issuance of financial paper.

So, physical gold within the financial system, humans' preeminent store of value for a millennium prior to 2009, has a relatively small

pool of custodians. Many of those same custodians are also in the businesses of issuing futures contracts against gold. It is estimated that 99.96% of COMEX gold futures contracts are cash-settled.[10] This is the fundamental issue:

The value of a scarce asset (gold) is being manipulated with something unscarce, (paper) because the asset itself isn't actually settling at the end of the trade.

This dynamic also creates a tremendous amount of unnatural leverage within the financial system, making it fragile and prone to volatility. This is the pinnacle of fiatness.

Bitcoin as the Solution

Bitcoin flips the script. It is both:

- A scarce, store-of-value asset (*money*) with an enforced fixed supply
- A self-contained, native digital *currency* that can be transacted without intermediaries.
    - It transmits and settles transactions peer-to-peer without an intermediary.
    - Has a built-in, standardized unit of account.
    - Can be directly exchanged for goods and services.

Unlike gold, bitcoin does not require a secondary currency layer, like paper claims or banknotes, to be useful in commerce. It settles instantly over the internet, making it function both as money and as currency in a way that no previous asset could.[11]

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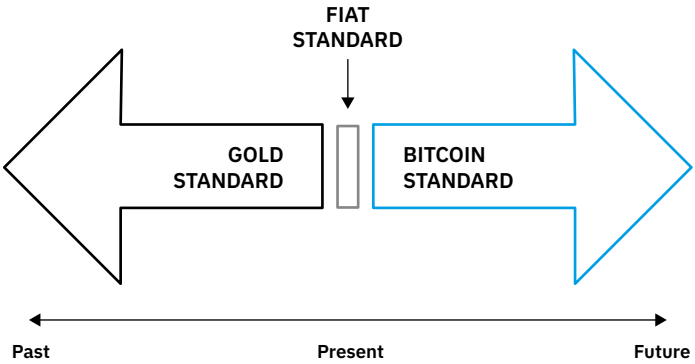
10 BullionStar: What Sets the Gold Price–the Paper or Physical Market?

11 TFTC: Bitcoin is Money and Currency.

This wouldn't be possible, without bitcoin's super feature, **natively allowing all its users to custody the asset themselves**. That means bitcoin custody is decentralized, unlike other sound monies of the past. **Hyperbitcoinization works if bitcoiners can build a financial system where the asset, bitcoin, actually settles and trades in-kind**. If you issue the financial paper, you must custody, settle, and deliver the asset–end of story. Settling for anything less can still make a bitcoinized system subject to manipulation and misaligned incentives. Fortunately for us, bitcoin makes this easy to do. Custody and transmission are innate features. Bitcoin doesn't have the same technological frictions as gold because its sound money principles are built into a digitally native asset. **That is the Bitcoinization of Finance.**



12

It is estimated that ~11.63M bitcoin, or ~55% of supply is held in self-custody by 10–30M individuals.[13] As a self-custody advocate, I predict these numbers will hold, if not increase. Why? Because It's a decentralized, open-source and permissionless protocol with an internet native neutral asset and network. The asset powers the network and the network secures the asset. That has never been

12 Sovereign: The Business Case for Bitcoin.

13 River: What's Driving Bitcoin Adoption in 2025?

done before. It's why people refer to it as a pioneer species. It is our duty as bitcoiners to build financial solutions, products, services, and strategies within the ethos of bitcoin. This is a tremendous opportunity to remove "fiatness" from the finance industry. Much of today's financial engineering resembles a complex treatment applied to an already unwell system—unnatural by design and often exacerbating the underlying issues. Let's fix it.

PROOF OF WORK'S ROLE IN THE REAL ECONOMY

Worthwhile creations–like monuments, architecture, or ideas–all require substantial investments of time, energy, and resources. This effort isn't just a cost; it's a signal of durability and quality, a testament to their lasting value. In America, this philosophy is woven into our ethos: we take pride in crafting things meant to endure. So why isn't this approach–Proof of Work (PoW), where value reflects effort—the universal standard for everything we build?[14]

Well, that answer is both a mix of the quantitative and qualitative. In order to build high-quality creations that last a long time, you need sound money that won't rug you in the meantime.[15] You also need to embrace a moral worldview that encourages low-time preference and optimism. You need the belief that what you are doing has purpose and you will be appropriately rewarded for the risk you take.

The Gilded Age of America (1870–1900) was highlighted by an economic boom and transformation. It was a period of rapid industrialization, expansion, ingenuity, and wealth accumulation. This period was in fact the foundation for (quasi) modern capitalism, technological innovation, and industrial power. Many of the technologies, still pertinent today, were invented during this era. This was the rise of the American empire, where markets were most free and open.

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14 Proof of work (PoW) is the process of expending real-world energy to create something of verifiable value.

15 Rug pulling is a deceptive practice where creators of a project abruptly withdraw funds or disable access, leaving investors stranded and the asset worthless.

Risk-takers such as Rockefeller, Carnegie, and Vanderbilt were appropriately rewarded for their efforts. The American economy was rooted in tangible production, accurate market signals, and real value. The Gilded Age was defined by the massive expansion of railroads, raw material processing, and large-scale capital formation. These ambitious projects demanded immense physical energy, labor, and investment that drove economic growth and transformed society in profound ways.

What follows the rise? You guessed it–the fall. Once the money became unsound, Americans began operating under entirely different economic and moral pretenses.[16] Enter the Zero-Interest-Rate-Phenomenon (ZIRP) Era (2008–2022). ZIRP was initiated in response to the 2008 financial crisis, allowing corporations, governments, and investors to access nearly free money, and encouraging excessive risk-taking. This Federal Reserve-induced sugar rush fueled speculative bubbles, leading to a proliferation of unproductive enterprises that lacked any real proof of work. This is also known as the Cantillon Effect, which states that those closest to the money printer will benefit, while average savers/workers are left behind as their earnings, savings, and time are debased.

During ZIRP, a particular sector thrived disproportionately: venture-backed SaaS (Software as a Service) companies.[17] While I am a self-proclaimed techno-optimist, I want to hone in on this industry as I believe it to be a great case study to fully grasp the ZIRP phenomenon. Growth in this ecosystem was largely driven by cheap money. Chamath Palihapitiya reflected on how the era of

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16 In 1971, President Richard Nixon officially suspended the U.S. dollar's convertibility into gold, ending the Bretton Woods system and removing the last tie between the dollar and a tangible reserve asset. This marked the beginning of a fully fiat monetary era, where money could be created without constraint—ushering in profound economic and cultural shifts.

17 NVCA: Annual Venture Capital Investment Tops $48 Billion in 2014, Reaching Highest Level in Over a Decade, According to the MoneyTree Report.

Zero Interest Rate Policy (ZIRP) influenced perceptions of financial acumen. He noted that many investors and entrepreneurs attributed their successes to their own skills when, in reality, the favorable economic environment played a significant role. This period of easy money led to inflated valuations and a sense of complacency, masking underlying vulnerabilities that became evident as monetary policies tightened. Chamath Palihapitiya argued that the ZIRP era led to inflated valuations and a false sense of accomplishment, as many investors and entrepreneurs mistook the effects of easy money for their own skill.[18] Investors poured billions into high-growth startups, many lacking any viable path to self-sufficiency. Many well-intentioned entrepreneurs were misled into building companies based on vanity metrics, such as headcount and DEI initiatives. This was done so their venture capital (VC) partners could inflate valuations, tout paper gains to investors, raise their next fund and collect management fees. Companies like WeWork and Quibi are stark examples of capital being lit on fire.

Austrian Economist Ludwig von Mises published *Human Action* in 1949, describing how artificially low interest rates lead to boom-and-bust cycles. The autopsy on the ZIRP era, while still ongoing, has been best analyzed by Jeff Booth and Lyn Alden. Lyn, in her book *Broken Money,* describes how the fiat system incentivized "financial engineering" over real economic productivity. She explains how ZIRP fueled asset bubbles rather than investment in energy, manufacturing, or sustainable industries. Jeff Booth, in his book *The Price of Tomorrow*, argues that ZIRP prolonged zombie companies, preventing true innovation and deflationary progress.[19]

As the ZIRP era ends, capital must flow into productive investments rather than speculative bubbles. The return to the Gilded Age is

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18 All-In Podcast: E146: Did the Fed break the VC model? Plus IPOs, M&A, revaluing unicorns & more.

19 Companies that should have failed but survived due to free or cheap money.

based on the larger macroeconomic view that smart capital allocators should recapitalize their balance sheets with scarce, hard assets. Finance writer, Tom Luongo, believes that the underlying strategy of the U.S. Federal government's newly proposed sovereign wealth fund (SWF) is to recapitalize their balance sheet with scarce, hard assets (Tom specifically mentions gold, oil, etc.).[20] He suggests that they are doing this to back the dollar indirectly with assets outside the control of the Federal Reserve. Tom also claims the SWF is a liability to the government and an asset to the people.

It's not the way I would do it, but that's better than nothing. If done well–no guarantee, this is the government–I see Tom's point that this will help recapitalize, broadly, the U.S. balance sheet. As a patriot, that is a good thing for my country. That said, my perspective is ultimately shaped by something higher. I believe there's an even greater opportunity: the recapitalization of everyone's balance sheet. The only way to do that in a decentralized, transparent, and incorruptible way is through bitcoin.

Bitcoin's PoW model forces discipline on capital allocation in a way fiat never could. Like steel and railroads, a bitcoin-based economy will take an intentional, capital-intensive, energy-driven, infrastructure build-out. Unlike SaaS or fiat financial systems, bitcoin has real production costs—it is energy-based and backed by real-world work. Bitcoin mining is industrial-scale work-converting energy into monetary security, economic coordination, and financial sovereignty. Mining connects the physical world of energy production with the digital economy, enabling new investment opportunities. The bitcoin protocol is beautifully designed, with a built-in incentive structure that can create a real economic foundation that is decentralized and resilient. I believe that the future success of modernized economies will depend on whether

20 TFTC: #582: The Great Awakening Has Begun with Tom Luongo.

their investment strategies, monetary/fiscal policies, and moral approach to free markets look more like that of the Gilded Age than the ZIRP era.

THE FINANCIALIZATION OF BITCOIN

Bitcoin is still a nascent asset class. While it has accomplished a lot in a short time, it is still less than two decades old. It is very much still in the first phase of currency maturation: store of value. Bitcoin is a global grassroots movement, meaning the community and network participants will determine the roadmap for bitcoin. Certainly there are still advancements needed in education, layering technology, BIPs, etc. Fortunately for us, there is a time-tested toolkit (traditional finance tools, products, and strategies) that can be easily applied to bitcoin that will drastically accelerate growth, adoption, and usefulness.

In order to build a comprehensive bitcoin financial ecosystem, we must deepen the bitcoin capital markets and make them more robust. I've usually viewed the word "financialization" in a negative context. However, in this case, deeper capital markets are simply a function of capitalism. Two parties can each take a side of a trade, and that trade can then be multiplied into more trades, with market participants determining for themselves which side of the new trade they would like to be on. More market participants equals more competition, which in theory, should naturally drive down the cost of capital, enhance risk management, increase liquidity, introduce diverse hedging strategies, provide more information, and deepen market infrastructure.

DIVERSIFICATION WITHIN BITCOIN

Sometimes, "just buy bitcoin" isn't going to work. While many people/entities/pools of capital may just want to do that (which is good), they could find themselves constrained by investment policies, mission-driven objectives, technical capabilities,

and/or fiduciary responsibilities. Bitcoin serves a role as a strategic portfolio diversifier.

One of my favorite old sayings in finance is "concentration is how you get rich, diversification is how you stay wealthy." Many bitcoiners quibble at the idea of diversification–well how about diversifying *within* bitcoin? There has been a lot of progress on expanding the investable options using bitcoin as the underlying collateral or asset. Spot ETFs, various ETF strategies that provide bitcoin exposure, private credit funds, interest payable in bitcoin, and corporate bonds are some currently existing and expanding options.

It is the development and integration of TradFi products into bitcoin that allows investors to diversify. These developments and their unique value propositions open up all kinds of new opportunities to obtain bitcoin exposure or bitcoin-backed investments. Unlike the speculative, high-leverage environment of past cycles, a broader institutional investor base with a wide toolset can smooth market fluctuations. Ultimately leading to improved price stability.

Bitcoin, the bearer asset, has characteristics that differentiate it from stocks, bonds, and commodities, making it a valuable diversification tool for modern investors. Its growing recognition as a distinct asset class highlights how bitcoin's sovereign, decentralized nature makes it an attractive hedge against traditional financial markets. Though bitcoin experiences short-term co-movements with traditional markets, its broader macroeconomic behavior remains largely independent.[21]

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21 Onramp: Bitcoin's Role as a Diversifier: Addressing Custodial Considerations for Strategic Allocations.

BITCOIN FINANCIAL PRODUCTS

ETFs

An exchange-traded fund (ETF) is an investment vehicle that pools a group of securities or commodities into a fund. As its name indicates, it can be traded like an individual stock on an exchange. ETFs have exploded in popularity and are the cornerstone of many modern-day investment strategies and portfolio construction theories. They have contributed to the rise of "passive" investment and offer a range of benefits to investors such as diversification, cost-effectiveness, liquidity, flexibility, transparency, and tax efficiency. At the end of 2024, U.S.-based ETFs managed over $10.6T in assets, while the global ETF markets expanded to over $15T in assets.[22]

Evolution of the Bitcoin ETF

The quest to introduce bitcoin ETFs began in 2013 when Cameron and Tyler Winklevoss filed a proposal for the Winklevoss Bitcoin Trust.[23] Despite their pioneering efforts, the U.S. Securities and Exchange Commission (SEC) rejected the application in 2017, citing concerns over market manipulation and insufficient regulatory oversight in cryptocurrency markets.

A significant development occurred in October 2021 when the SEC approved the first bitcoin futures ETF, the ProShares Bitcoin Strategy ETF (BITO), which invests in bitcoin futures contracts rather than bitcoin itself. This approval marked a cautious step

22 The Wall Street Journal: A Record Shattering $1Trillion Poured Into ETFs This Year, Financial Times: Global ETF Assets Soar to $15T as Shift From Mutual Funds Gathers Pace.

23 ETF Focus: Bitcoin ETs Are Here! The Full List, Their Outlooks and the Winners & Losers.

forward, allowing indirect exposure to bitcoin through regulated financial products.

The persistent efforts of financial institutions and evolving market dynamics eventually led to a landmark decision on January 11, 2024, when the SEC approved multiple spot bitcoin ETFs. These approvals signified a monumental shift, providing investors with direct exposure to bitcoin through traditional investment channels.

The introduction of spot bitcoin ETFs catalyzed unprecedented growth in the bitcoin investment landscape. Within the first year, these ETFs collectively amassed over $107B in assets under management (AUM).[24] This rapid accumulation of assets underscores the strong demand for bitcoin exposure/investment vehicles and reflects a broader acceptance of bitcoin within mainstream finance.

Bitcoin ETF In-Kind Redemption

There continues to be innovation in the bitcoin ETF space. In January 2025, Nasdaq submitted a proposal to the U.S. Securities and Exchange Commission (SEC) on behalf of BlackRock's iShares Bitcoin Trust (IBIT), seeking approval for in-kind creation and redemption mechanisms for their spot bitcoin ETF.[25] If approved, this means Authorized Participants (APs), a financial institution that facilitates ETF share creation and redemption, can directly exchange the ETF shares for bitcoin. This process offers several benefits like tax (avoiding the sale of assets) and operational efficiency (direct exposure with streamlined creation and redemption process). A decision on this proposal is expected to be made during the first half of 2025. Here is how it would work:

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24 etf.com: Spot Bitcoin ETFs' Groundbreaking First Year: A Look Back.

25 Bitcoin News: NASDAQ Files for In-Kind Redemptions for BlackRock's Bitcoin ETF.

1. A holder of the bitcoin ETF decides to redeem their shares.
2. These shares are sold through an AP.
3. The AP submits a request to the ETF sponsor to redeem ETF shares in exchange for bitcoin instead of cash.
4. The ETF trust transfers an equivalent amount of bitcoin from its reserves directly to the AP.

    a. This transaction occurs on-chain from the ETF's custodial wallet to the AP's designated wallet.

5. The AP now holds bitcoin and can distribute bitcoin to its clients.
6. The ETF trust reduces its bitcoin holdings proportionally to the redemption.

    a. The redeemed ETF shares are removed from circulation, reducing the total ETF assets under management (AUM).

In-kind ETF redemptions could help solve one of the biggest issues in the financialization of bitcoin–paper bitcoin.[26] If APs can redeem the ETF, the ETF manager would **have** to have bitcoin in custody and ready to redeem. This act alone would greatly reduce the concern of rehypothecation. The incentives naturally align that even the threat of APs exchanging their ETF shares for bitcoin would force the issuer to have an equivalent amount of bitcoin on hand. This could reduce the need to sell bitcoin for cash redemptions and may decrease selling pressure, leading to more stable prices. It's important to know that in-kind redemptions are only available to institutional investors given the stringent regulatory standards and sophisticated custodial arrangements associated with in-kind redemptions.

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26 Paper bitcoin refers to claims or financial products (like futures or custodial IOUs) that represent bitcoin exposure without actual ownership or delivery of real bitcoin.

Bitcoin ETF Dynamics

As a bitcoin maximalist, I would be dismayed not to point out the pros and cons that inherently come with an ETF investment. They are a double-edged sword; they help legitimize bitcoin but introduce counterparty risks.

Pros

- **Accessibility and Convenience:** ETFs offer a familiar investment vehicle, allowing investors to gain "easy" exposure to bitcoin. This lowers the barrier to entry for a broader audience.
- **Regulatory Oversight:** Operating within established financial markets, bitcoin ETFs are subject to regulatory standards, providing investors with a layer of protection and oversight absent in unregulated markets.
- **Professional Management:** ETF providers handle the complexities of custody and security, mitigating risks associated with hacking or loss of private keys inherent in direct bitcoin ownership.
- **Remove Unit Bias:** ETFs allow people to buy shares of bitcoin exposure, eliminating unit bias by making it easier to invest in bitcoin without thinking they need to buy a whole coin.[27]

Cons

- **Lack of Direct Ownership:** Investing in bitcoin ETFs means holding shares of a fund rather than owning the underlying asset. This indirect exposure may not align with the preferences of investors seeking the autonomy and utility that come with direct bitcoin ownership.
- **Management Fees:** ETFs charge management fees that can erode investment returns over time. Investors must weigh

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27 Unit bias is the psychological tendency to think that a single unit of something (like one bitcoin) is the "normal" or minimum amount to own. People assume it's too late or not feasible to get in because one bitcoin is "too expensive".

these costs against the benefits of convenience and professional management.

- **Trading Hours Limitations:** Unlike the 24/7 nature of bitcoin, ETFs trade during standard market hours, potentially limiting the ability to react to after-hours market movements.
- **Custody Concentration**: Eight of the eleven bitcoin ETFs currently use Coinbase custody services. This is an extreme concentration where potential regulatory actions, security breaches, or operational failures at Coinbase could impact a significant portion of the bitcoin ETF market.[28]

Expansion of the Bitcoin Within ETFs

The expansion of bitcoin-related investment vehicles, such as managed bitcoin futures, bitcoin mining, and bitcoin-backed convertible bonds ETFs, have significantly broadened financial access to bitcoin.

Bitcoin Bond ETFs

Strive Asset Management has proposed an actively managed ETF with an objective of providing investors with exposure to bitcoin through investments in convertible bonds issued by companies that allocate significant portions of their capital to purchasing bitcoin.[29]

Bitcoin Income Generating ETFs

The NEOS Bitcoin High Income ETF (BTCI) and the Simplify Bitcoin Strategy PLUS Income ETF (MAXI) provide investors with exposure to bitcoin's price movements.[30] The funds are also complemented

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28 Cryptorank: Coinbase Custody Accounts for 90% of All Bitcoin ETFs-Details.

29 SEC Form N-1A: Strive Asset Management Prospectus.

30 NEOS Bitcoin High Income ETF Prospectus, Simplify Bitcoin Strategy PLUS Income ETF Prospectus.

by an income-generating options overlay which involves buying and selling various derivatives.

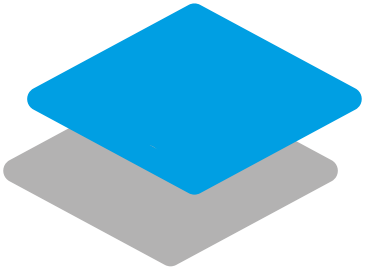
Bitcoin Mining ETFs

The CoinShares Valkyrie Bitcoin Miners ETF (WGMI) and the Global X Blockchain & Bitcoin Strategy ETF (BITS) directly invest in the stock of publicly traded companies that derive a significant portion of their revenue or profits from bitcoin mining operations.[31]

31 CoinShares Valkyrie Bitcoin Miners ETF Prospectus, Global X Blockchain & Bitcoin Strategy ETF Prospectus.

DERIVATIVES IN BITCOIN

Derivatives are financial contracts, set between two or more parties, that derive their value from an underlying asset, a group of assets, or a benchmark. They play a key role in financial markets and serve as an additional layer on top of asset classes giving investors and speculators broader capabilities than just owning the asset itself. Multiple parties can trade derivatives, creating a market on top of a market.



Derivatives can be traded on an exchange or over the counter (OTC). It is important to note that derivatives have no intrinsic value–their value is derived from the underlying asset. Hence, they are subject to supply/demand and market sentiment. These factors can affect the liquidity and price of the derivatives regardless of the price of the underlying asset. Derivatives are oftentimes leveraged instruments, which allow investors/speculators to get greater exposure to the underlying asset without a lot of upfront capital. However, leverage is a two-way street and while it can increase returns, it can also accelerate losses. Derivatives may be used for:

- **Hedging & Risk Management**: Businesses and investors use derivatives to protect against price swings.
- **Market Liquidity & Price Discovery:** Derivatives help establish expected future prices, improving market efficiency.

- **Speculation & Leverage:** Traders use derivatives to amplify exposure to price movements, increasing profit potential but also risk.
- **Synthetic Access:** Derivatives allow investors to gain financial exposure to an asset's price movements without needing to own or physically interact with the underlying asset or infrastructure.
- **Capital Efficiency:** Derivatives allow traders to gain exposure to the underlying asset with a fraction of the capital required to buy the asset outright.

There are 4 types of derivatives that are most commonly used within financial markets.

Derivative Type	Traded On	Used For
Future	Exchanges	Hedging & Speculation
Forwards	OTC	Customized Hedging
Options	Exchanges	Hedging & Speculation
Swaps	OTC & Banks	Interest rate & Currency Risk

FUTURES

A futures contract is an agreement to buy or sell an asset at a future date. In traditional finance, futures are extensively used for commodities like oil, gold, and agricultural products, as well as financial instruments such as stock indices and currencies. They serve two primary purposes: hedging and speculation. Bitcoin futures were first introduced in December 2017, with the Chicago Board Options Exchange (CBOE), followed by the Chicago Mer-

cantile Exchange (CME).[32] These offerings provided a regulated avenue for investors to gain exposure to bitcoin's price movements without holding the asset directly. The existence of bitcoin futures creates an implied money market through the basis trade, where the price difference between spot and futures acts as a synthetic interest rate. This dynamic effectively mirrors lending and borrowing activity, allowing market participants to generate a return without directly participating in credit markets.

Pros

- **Price Discovery:** Futures markets can enhance the accuracy of bitcoin's price by reflecting the collective expectations of market participants.
- **Risk Management:** Investors and businesses can hedge against adverse price movements, stabilizing their financial planning.
- **Increased Liquidity:** The entry of institutional investors through futures can boost market liquidity, potentially reducing volatility.

Cons

- **Paper Bitcoin Concerns:** Futures contracts, especially those that are cash-settled, may lead to a situation where the volume of contracts exceeds the actual supply of bitcoin. This disparity can distort the true price of bitcoin and may suppress its value due to the artificial increase in supply.
- **Increased Volatility:** The leverage inherent in futures trading can amplify price swings, leading to heightened volatility.
- **Market Manipulation:** Large players might influence futures markets to affect spot prices, potentially leading to disoriented trading environments.

32 Federal Reserve Bank of San Francisco: How Futures Trading Changed Bitcoin Prices.

- **Rollover Cost:** In contango markets, rolling futures positions incur a consistent loss by selling lower and buying higher, making them inefficient for long-term exposure.[33]

OPTIONS

An option is the right, but not the obligation, to buy/sell an asset at the strike price by the expiration date of the option. Options are quite possibly the most versatile derivative. They have more use cases than the other derivatives and can be deployed across asset classes–equities, interest rates, currencies, commodities. There are two basic types of options, a call and a put, that can be combined and deployed across 12+ different option strategies. In TradFi, options are utilized for hedging, speculation, and income generation. In January 2020, the CME introduced its bitcoin options further legitimizing the asset class, bitcoin derivatives, and attracting institutional interest.[34]

Pros

- **Risk Management:** Asset holders can utilize options to hedge against adverse price movements, protecting their investments.
- **Strategic Flexibility:** Options enable traders to implement various strategies to profit from different market conditions.
- **Enhanced Market Efficiency:** The availability of options contributes to more comprehensive price discovery and liquidity in markets.

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33 A contango market occurs when futures prices trade above the spot price of the underlying asset, typically reflecting expectations of rising prices or costs associated with holding the asset over time. Rolling a futures position involves closing a contract nearing expiration and opening a new one with a later expiry to maintain continuous exposure to the underlying asset.

34 Crypto.com: History of Crypto Derivatives.

- **Income Generation:** Selling options, such as covered calls, allows investors to earn premium income, enhancing portfolio returns.

Cons

- **Complexity:** Options trading requires a deep understanding of many different factors such as delta, gamma, theta, and vega which can make it challenging to identify exposure.
- **Liquidity Concerns:** In less mature markets, options may suffer from lower liquidity, leading to wider bid-ask spreads and potential execution challenges.
- **Regulatory Uncertainty:** Options have unique tax treatments and regulatory oversight, which vary by jurisdiction and instrument type.

FORWARDS

A forward contract is a customized agreement between two parties to buy/sell an asset at a set price on a future date. Unlike standardized futures contracts that are standardized and traded on exchanges, forwards are over-the-counter (OTC) instruments, allowing for tailored terms to meet the specific needs of both counterparties. They are commonly used for hedging and speculative purposes across various asset classes, including commodities (agreements between producers and consumers), currencies, and interest rates.

Pros

- **Customization:** Forwards allow parties to tailor the contract size, expiration date, and settlement terms. Forwards can be physically settled or cash settled.

- **Price Stability:** Helps market participants manage financial uncertainty and price volatility.
- **No Initial Margin or Daily Settlement:** Forwards do not require margin or daily mark-to-market adjustments, reducing capital requirements.
- **Privacy & Off-Exchange Execution:** Forwards are over-the-counter (OTC) contracts, they allow large players to execute trades privately, avoiding market impact.

Cons

- **Counterparty Risk:** Since forwards are private agreements, there's a risk that one party may default on the contract, especially in the absence of a central clearinghouse or regulatory body.
- **Liquidity Concerns:** The bespoke nature of forwards can lead to lower liquidity compared to standardized futures, potentially making it challenging to exit positions before maturity.
- **Difficult to Price & Mark-to-Market:** No centralized price discovery means forward contracts are harder to value compared to futures.

SWAPS

A swap is a derivative contract through which two parties exchange the cash flows or liabilities from two different financial instruments. Swaps can be used for speculative purposes to profit from market inefficiencies and interest rate differentials. Some swaps, like Credit Default Swaps (CDS), can be structured to provide steady income on pools of capital. However, swaps are primarily used for hedging purposes across asset classes. They are pivotal in TradFi for managing various financial risks. There are three main types of swaps;

- **Interest Rate Swaps:** Exchanging fixed interest rate payments for floating rate payments, aiding in interest rate risk management.
- **Currency Swaps:** Swapping principal and interest payments in different currencies, facilitating foreign exchange risk mitigation.
- **Commodity Swaps:** Exchanging cash flows related to commodity prices, allowing entities to hedge against commodity price fluctuations.

Pros

- **Customizable Agreements:** Swaps are tailored to the specific needs of both counterparties, including contract size, duration, and payment terms.
- **No Upfront Cost:** Unlike options, swaps don't require an initial premium, making them a cost-effective hedging tool.
- **Flexibility in Market Conditions:** Swaps can be used for speculation, arbitrage, or capital structure optimization across various financial assets.
- **Alternative to Traditional Financing:** Companies can secure fixed interest rates or exchange assets without issuing new debt or equity.

Cons

- **Counterparty Risk:** Since swaps are OTC contracts, there's a risk that one party fails to meet their obligations.
- **Lack of Liquidity:** Unlike exchange-traded derivatives, swaps are not standardized, making it difficult to exit a position early.
- **Complexity & Valuation Challenges:** Swaps involve multiple variables (interest rates, currency changes, implied volatility), making them difficult to price.
- **Mark-to-Market Risk:** Institutions using swaps for hedging must adjust their balance sheets as swap values fluctuate, creating potential accounting volatility.

FUTURE OUTLOOK OF DERIVATIVES WITHIN BITCOIN

As bitcoin matures, the derivatives market will evolve to serve its expanding role as both a commodity and a monetary system, pulling demand from both traditional derivatives markets.

Futures will likely become a dominant tool for bitcoin miners seeking to stabilize revenues and improve capital efficiency. As bitcoin adoption grows in corporate finance, it will also challenge financial futures markets by becoming a medium of exchange, increasing demand for hedging against its monetary properties.

Options will remain a key instrument across bitcoin's maturity stages, enabling price risk management, exposure customization, and strategic positioning for institutions and individuals. Additionally, options could extend beyond the asset itself, facilitating synthetic exposure to bitcoin's hashrate, which strengthens security incentives for miners.

Forwards, given their private and customizable nature, align closely with bitcoin's ethos and will become indispensable for miners,

exchanges, and businesses looking to lock in exchange rates or future bitcoin prices. As capital pools deepen and institutional involvement increases, forwards will become a critical financial tool for operational stability.

Swaps will emerge as an essential component of bitcoin finance, allowing companies to hedge interest rate disparities and manage dollar-denominated obligations. As traditional finance derivatives markets are valued in the trillions of dollars, the inevitable bitcoinization of finance will see swaps and other derivatives become standard instruments within the bitcoin economy, fueling the expansion of financial markets denominated in sound money.

DERIVATIVE APPLICATIONS FOR BITCOIN HOLDERS

All four types of derivatives provide tools and strategies for bitcoin companies and individual holders to optimize their position. The specific capabilities and benefits of integrating derivatives into bitcoin include:

- **Hedging Operations:** Bitcoin companies can use derivatives to lock in favorable selling prices, ensuring profitability despite market downturns.
- **Financial Planning & Treasury Management:** Companies holding bitcoin as a treasury asset can hedge against potential devaluation, stabilizing their balance sheets. Derivatives can also be used to make revenues and profit margins more consistent, leading to increased valuations.
- **Access to Capital:** Companies holding large amounts of bitcoin can get access to more favorable financing terms.
- **Market Expansion:** Derivatives add additional value and exposure to the bitcoin asset and network.

- **Speculative Opportunities:** Traders can capitalize on anticipated price movements without the need for custody solutions.
- **Portfolio Diversification:** Institutions can gain exposure to bitcoin's price performance, potentially skirting investment criteria and diversifying their investment portfolios.
- **Arbitrage Strategies:** Exploiting price discrepancies in markets with direct or in-direct bitcoin exposure can yield profits.
- **New Return Profile:** Derivatives can give capital allocators the ability to generate fixed income with bitcoin as the underlying asset.

FINANCIALIZATION OF BITCOIN MINING

Bitcoin mining is a ruthlessly capitalistic industry. It is not only capital intensive and worldwide, but the network regularly adjusts difficulty to the amount of available hashrate online, in addition to chopping supply in half every 4 years. Bitcoin mining is an essential part of the bitcoin ecosystem. It enables bitcoin's PoW consensus mechanism and grounds internet native money in reality. It takes real world energy and machines to hash block headers by incrementing the nonce until a hash is found below the network's target, allowing the miner to broadcast a valid block and earn the reward.

Bitcoin's difficulty adjustment operates as an economic equilibrium layer that governs capital allocation, risk management, and miner profitability. It is the self-correcting force that ensures bitcoin mining remains competitive, efficient, and adaptive across market cycles. At its core, difficulty adjustment functions as a supply-side regulator, responding dynamically to the total hashrate dedicated to the network. When new miners enter, difficulty increases to maintain consistent block times, ensuring that mining rewards don't become too accessible. Conversely, during downturns when miners capitulate, difficulty drops, allowing remaining miners to sustain profitability.

Bitcoin mining is a game of attrition, where efficiency and cost structure determine longevity. Miners must constantly optimize their operations to remain profitable as difficulty rises over time.

The introduction of TradFi instruments will help the bitcoin mining industry hedge against risk and stabilize cash flows. Just as traditional commodity producers use futures, forwards, and options to manage exposure to volatile markets, bitcoin miners can now leverage hashrate derivatives to bring greater predict-

ability to their revenue streams. These instruments are more than a speculative tool, they are the natural evolution of any industry, allowing miners to weather market fluctuations, improve capital efficiency, and further professionalize the mining sector.

Financialization acts as a force multiplier and adds an essential layer of capabilities. All of these layers, including financial products, strategies, and marketplaces add additional information to the ecosystem. By using this information, a bitcoin mining operation can become more resilient. After all, would it not be beneficial for a miner to evaluate the behavior of investors taking positions on future difficulty trends, betting on whether difficulty will rise or fall in response to macroeconomic conditions, energy prices, or ASIC production cycles?

What is Hashrate?

Hashrate refers to the total computational power dedicated to securing the bitcoin network. Measured in hashes per second, this power represents the collective effort of miners guessing a nonce to validate transactions and earn block rewards.[35] Higher hashrate means greater security for the bitcoin network but also increases the difficulty of mining new blocks. Hashrate is not just an operational metric–it's an economic commodity that can be priced, traded, and hedged, just like energy or metals. Analogous to TradFi, bitcoin miners are producers of a commodity i.e. hashrate.[36] Hashrate derivative contracts must account for future difficulty adjustments when pricing hashrate yields. If difficulty is expected to rise, the value of a hashrate future or forward contract should decrease, since miners will earn fewer bitcoin per terahash. Con-

35 FINBOLD: Bitcoin Hashrate Marketplaces are an Alternative Way to Trade Bitcoin.

36 Braiins: Hashrate as a Commodity: The Endgame of Bitcoin Mining Pools.

versely, if difficulty is expected to fall, hashrate becomes more valuable, increasing the price of hashrate derivatives.[37]
Additionally, the transaction fees included in each block—play a critical role in the valuation of hashrate and, by extension, the pricing of hashrate derivatives.[38] If block fees increase (e.g., due to high demand for block space, like during an ordinal minting surge or a market rally), hashprice goes up—and so does the expected payout for hashrate. Buyers benefit from this dynamic because the actual revenue from hashrate exceeds what was initially priced in. Sellers may be short future revenues. Block fees introduce an additional layer of volatility in hashrate derivative markets, since block fees are market-driven, unpredictable, and can create temporary distortion in hashprice.

Financial Dynamics of a Hashrate Future

A hashrate future is a financial contract where two parties agree to buy or sell a specific amount of bitcoin mining computational power at a predetermined price on a future date. The settlement price references the Bitcoin Hashprice Index, which tracks the value of hashrate in the market.[39]

In this specific example, the process begins with the mining services company acting as an Introducing Broker (IB). Operating as a registered Introducing Broker (IB) under the Commodity Futures Trading Commission (CFTC), they facilitate client onboarding by connecting them with Futures Commission Merchants (FCMs) that clear trades on Bitnomial's exchange. An IB essentially acts as a middleman who helps traders set up accounts and access trading

37 FINBOLD: How to Profit From Hashrate Marketplaces-Regardless of Which Way Bitcoin is Moving.
38 Luxor Derivatives: Monthly Lookback Series-January 2025.
39 Luxor Documentation: Derivatives.

platforms but doesn't handle the actual assets or funds. An FCM is like a bank for traders, managing the funds and ensuring that everyone meets their financial obligations in trading. Bitnomial provides the regulated marketplace where hashrate futures are listed and traded, ensuring compliance with U.S. regulatory standards as a CFTC-approved exchange. The exchange operates with a central limit order book, providing transparency by displaying all bids and offers, which allows for efficient price discovery. Contracts are standardized, with each representing one petahash (PH) of mining power and having monthly durations. This standardization simplifies the trading process and enhances liquidity. As a Designated Clearing Organization (DCO), Bitnomial manages the clearing and settlement processes, mitigating counterparty risk by guaranteeing contract performance.[40]

1 Once onboarded, traders (bitcoin mining companies, speculators, institutions, ETC.) gain access to Bitnomial's exchange platform, where they can view live order books and execute trades involving Hashrate Futures contracts.

2 Traders are required to maintain margin accounts with their FCMs, providing collateral to cover potential losses and ensure market integrity.

3 Traders are matched on the exchange, and Bitnomial oversees the clearing process, ensuring that both buyers and sellers fulfil their contractual obligations.

4 A daily process where traders' accounts are adjusted based on the current market value of their positions, reflecting unrealized gains or losses.

5 Upon contract expiration, settlements are conducted in cash. The settlement amount is calculated based on the difference between the contract's agreed-upon price and the final value as determined by Bitcoin Hashprice Index.

40 Bitnomial Documentation.

Cash vs. Physically Settled Contracts

While futures contracts have the ability to be physically settled, in the above example, futures contracts are cash settled, meaning no physical transfer of hashrate occurs. Instead, settlements are made in cash based on the contract's value at expiration. That was a business model decision of the exchange and the mining services provider.

Bitcoin mining service providers currently offer, in the market, physically settled forward contracts.[41] As elaborated earlier, there are some key differences between forward and futures contracts. Chief amongst them, forward contracts are negotiated OTC directly between two parties, and do not mark-to-market. The mining service provider offers the option to take physical delivery of hashrate, meaning the buyer gains access to mining power for a defined period.

How Physical Settlement Works

- A miner enters into a forward contract to sell a certain amount of hashrate for a future period.
- Instead of receiving cash at settlement, the counterparty takes control of the contracted mining power for the agreed-upon duration.
- The buyer can then direct that hashrate to a mining pool of their choice and collect the bitcoin rewards.
- This setup allows institutional investors or energy producers to effectively "own" mining power temporarily without purchasing ASICs.

41 Luxor Derivatives: Trade Hashrate Forward Contracts with Luxor.

Use Cases for Hashrate Derivatives

Hashrate derivatives provide several key benefits for bitcoin miners, investors, and institutions entering the mining space:

Hedging Against Revenue Fluctuations

Mining revenue is highly volatile, extremely competitive, and dependent on:

- Bitcoin price movements
- Block subsidy and transaction fees
- Mining difficulty adjustments
- Energy prices

With hashrate derivatives, miners can hedge against unexpected revenue drops by locking in a predetermined price for their future hashrate output. This provides stability in cash flows, allowing for better long-term planning and sustainable growth.[42]

Risk Management for Mining Operations

Instead of being fully exposed to bitcoin's price volatility, mining companies can use derivatives to hedge their exposure just as oil producers use futures contracts to protect against price swings.

Example:

- A miner could enter a hashrate forward contract to guarantee a price for their hashrate output, reducing uncertainty around future earnings.

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42 Unchained Crypto: How Hashrate Derivatives Can Help Bitcoin Miners Stabilize Revenues.

- If bitcoin's price drops, the contract cushions the miner from losses. If the price rises, they forgo some upside but benefit from stability.

Market & Asset Class Expansion

Beyond direct mining, financial firms and pools of capital can specialize in trading hashrate contracts, creating a new financial market around computational power.

Market participants include:

- **Miners:** Hedging future revenue streams.
- **Investors:** Speculating on bitcoin mining profitability and arbitrage opportunities.
- **Energy Companies:** Monetizing excess energy by selling natural gas or electricity.

Hashrate derivatives give financial institutions direct exposure to hashrate without the need to produce it themselves. Bitcoin mining companies and the bitcoin network benefit from additional liquidity and financial opportunities. Overall, a robust derivatives market helps make the bitcoin mining industry a more accessible asset class.

Derivatives vs. Tokens

As the financialization of bitcoin mining accelerates, two distinct approaches have emerged for gaining exposure to hashrate: tokenized hashrate and hashrate derivatives. While both methods allow participants to engage with mining economics without directly operating ASICs, they differ fundamentally in their alignment with bitcoin's ethos, market structure, and economic incentives.

Hashrate derivatives are voluntary business contracts between two parties. These contracts do not create new assets out of thin air–they are agreements based on real economic activity in bitcoin mining. They remain grounded in actual mining economics providing a direct, efficient, and trust-minimized way to hedge or speculate on mining economics.

Tokenized hashrate, on the other hand, attempts to package mining exposure into a token. Hashrate tokens typically are issued and operate on alternative blockchains or within decentralized finance (DeFi) ecosystems. This means their security, liquidity, and market behavior are detached from bitcoin. Instead of enhancing mining accessibility, tokenized hashrate often obfuscates financial reality, making it harder for investors to evaluate their actual exposure.

ASICS AS COLLATERAL

A bitcoin mining rig is the physical machine that does the computing power critical to the support of the bitcoin network. Inside are application-specific integrated circuits (ASICs) that are purpose-built to rapidly iterate through nonce values (and other block header fields) in search of a valid hash for the next block. You can think of these as computers that do just one thing. We will refer to these computers as ASICs, the industry-standard jargon.

The specialized ASIC hardware used for mining itself has become a pivotal asset. To capitalize on their value, miners and lenders have developed financial arrangements where ASICs serve as collateral for loans. This practice enables miners to expand operations without immediate capital outlay and offers lenders a secured interest in a burgeoning industry. This practice started around 2017 when companies like Riot Blockchain and Hut 8, that previously financed growth with equity, started to gradually ex-

plore debt options. There were certainly challenges to start. ASICs had a short lifespan before becoming technologically obsolete, bitcoin volatility made mining returns unpredictable, and lenders had a limited understanding of the ecosystem. As the industry continued to evolve, key characteristics emerged to make ASICs as collateral more palatable to lenders. As hardware has become more commoditized, rigs are increasingly fungible.[43]

Typical ASIC-Backed Loan Deal Structure

A standard ASIC-backed loan follows a structured process:

1. Loan Agreement & Funding
    a. Miner and lender agree on loan terms, including:[44]
        i. **Loan Amount**: Amount of capital being borrowed.
        ii. **Loan-To-Value (LTV) Ratio:** The percentage of an ASIC's value that a lender is willing to finance. Typically ranges from 50–70%.
        iii. **Interest Rate (Cost of Capital):** The cost of borrowing fluctuates depending on market conditions and the risk profile of the miner.
        iv. **Repayment Schedule:** Structured payments of principal and interest made to the lender based on miner's revenue streams.
        v. **Default Clauses:** In case of non-payment, lenders have the right to seize and liquidate the ASICs.
    b. Once approved, funds are disbursed to the miner, often through direct deposit or an escrow account.

2. ASIC Collateralization

43 Braiins: Debt Capital Markets in Bitcoin Mining Part 1.

44 Braiins: Debt Capital Markets in Bitcoin Mining Part 2.

a. The process of using ASICs as a backstop for the loan.
    i. The value of the ASIC machines are appraised based on market demand, model efficiency, and depreciation rates.
b. The miner posts ASICs as collateral with the lender
    i. Physically transferring the ASICs to a custodial warehouse controlled by the lender.
    ii. Keeping ASICs at the miner's facility but under a UCC-1 lien, meaning the lender has a legal claim on them in case of default.

3. Mining Operations & Loan Servicing
    a. Deployed ASICs mine bitcoin, generating income for loan repayment.
    b. Loan payments are made periodically from the borrower to the lender.
    c. The lender earns interest income from the financing agreement and recoups their principal.

4. Potential Loan Defaults & Liquidation
    a. If the miner fails to make payments, the lender:
        i. Seizes and resells the ASICs to recover funds.
        ii. May require miners to deposit additional collateral if ASIC values decline below the LTV threshold.

5. Loan Repayment & Completion
    a. Upon full repayment, ASICs are released from collateral, and the miner regains full ownership.

Bitcoin Miner S.W.O.T. Analysis

Strengths

- **Capital Access:** Obtain necessary funds without liquidating bitcoin holdings or losing equity.
- **Operational Expansion:** Mining operations can scale to increase hashrate and potential profits.[45]
- **Retained Ownership:** Maintain ownership of ASICs, company equity, and mined bitcoin.
- **Financial Flexibility:** Diversified funding sources reduce reliance on volatile bitcoin sales for capital needs.
- **Access to Cheap Inputs:** Miners with lower electricity costs have a competitive advantage in managing debt obligations.

Weakness

- **Over-Leveraging in a Bull Market:** Many miners borrowed aggressively in 2021 when bitcoin was near $60,000 but faced liquidity crises when prices dropped to $16,000 in 2022.
- **Price Volatility:** Bitcoin's fluctuation makes ASICs even more volatile, as their value comes from their ability to produce bitcoin at a discount.
- **Duration Risk:** Debt payments remain fixed during a period of decreased profitability forcing miners to sell bitcoin at depressed prices or default. Or variable rates subject miners to currency risk if mining revenue shrinks as bitcoin-denominated earnings lose fiat value.
- **Debt Obligation:** Regular repayments are mandatory, regardless of market volatility.
- **Short ASIC Lifecycles:** Equipment can become obsolete rapidly, making it difficult to finance over long-term loan periods.

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45 GSR: The Future of Bitcoin Mining Finance.

Opportunities

- **Positive Bitcoin Price Forecast:** If miners expect bitcoin prices to rise, they may be more willing to take on debt, assuming future profits will cover loan payments.
- **Operational Costs (Energy):** Miners with lower electricity costs have a competitive advantage in managing debt obligations.
- **Return Amplification:** Properly structured debt can enhance returns on equity during favorable market conditions.
- **ASIC Efficiency vs. Debt Burden:** Investing in newer models with lower power consumption can increase profitability, improving debt-servicing ability.

Threats

- **ASIC Depreciation Wiping Out Collateral Value:** ASICs generally lose value in bear markets, meaning miners would have to post additional collateral to stay solvent.
- **Network Difficulty Trends:** If the difficulty is expected to rise significantly, mining rewards may decrease, making it harder to service debt.
- **Market Demand For ASICs Drops:** ASIC prices crash, reducing the collateral value of ASIC-backed loans.
- **Risk of Over-Leverage:** Excessive debt can lead to financial distress, especially during market downturns.
- **Risk of Seizure:** Defaulting on the loan can lead to loss of critical mining equipment.

Lender S.W.O.T. Analysis

Strengths

- **Secured Investment:** ASICs serve as tangible collateral, mitigating default risks.
- **Attractive Returns**: Higher interest rates compared to traditional loans reflect the specialized nature of the industry.[46]
- **Access to Capital Market:** Given the capital-intensive nature of bitcoin mining, there are many publicly traded bitcoin with diversified cap tables. Lenders are not the only source of financing and have the opportunity to evaluate publicly available data to make economic decisions.
- **Deal Structure:** Given the fluidity of this market, lenders have the ability to underwrite favorable loan terms giving them access to greater seniority on the capital stack of bitcoin mining companies.

Weakness

- **Asset Depreciation:** ASICs rapidly lose value due to technological advancements and wear. Lenders had increased responsibility to accurately determine the proper LTV ratio.
- **Market Volatility:** Fluctuations in bitcoin prices can impact miners' profitability and loan repayment capacity.
- **Recovery Challenges:** In default scenarios, liquidating specialized hardware may pose logistical and financial difficulties.

Opportunities

- **Market Evolution:** Anticipation of more sophisticated debt products and strategies within the greater bitcoin industry,

46 Greengage: The Case for Asic-Backed Lending.

gives lenders more data to make informed capital allocation decisions.

- **Institutional Participation:** Increased involvement from traditional financial institutions and pools of capital could lead to more standardized lending practices and a more robust understanding of the industry.
- **Regulatory Developments:** Potential for clearer guidelines that could impact lending structures and availability makes existing and future lenders more comfortable operating in the bitcoin ecosystem.
- **Market Entry:** Opportunity to participate in the bitcoin sector without direct mining involvement.

Threats

- **Loan Default Risk:** A volatile bitcoin market can increase loan defaults, requiring risk-adjusted interest rates.
- **Regulatory Uncertainty:** Governments may introduce laws affecting mining operations, impacting collateral security.
- **Industry Maturity:** Relative to other industries, bitcoin mining is still rather new. Early mining ventures often lacked professionalism, with some operations turning out to be fraudulent.
- **Misunderstanding the Industry:** If lenders don't have a robust understanding of the many variables present within the bitcoin mining ecosystem, they may not be able to accurately assess the creditworthiness of borrowers.

LENDING & COLLATERAL IN BITCOIN

COLLATERAL

Lenders require collateral to have something behind their loans. It adds a security blanket that protects the agreement. Basically, any type of legal agreement will carry some type of guarantee. Anything with value can serve as collateral. Some examples might be a house, a car, a boat, cash, shares of stock, precious metals, art, jewelry–anything that may require a significant amount of money to purchase. If the lender sees you have something valuable, they'll be more trusting that you can repay your loan. They may even offer better terms too. Obviously, the big risk here is that if the loan is defaulted, the collateral goes with it. Generally speaking, the lender would rather have their loan paid back in full, so they'll make several attempts to receive their payments prior to seizing any collateral. It can be quite frustrating to physically collect collateral, especially when a bad debtor knows it's going to be claimed.[47]

Pristine Collateral

Bitcoin is pristine collateral because of its unique internet native characteristics. It has no counterparty risk, settles instantly, is globally accessible, liquid 24/7–365, cheap to store (relative to other assets), and has relatively no maintenance expenses. If collateral ever needs to be called or re-upped, it can be sent nearly instantaneously anywhere in the world with just an internet connection. In other words it's about as good as collateral gets. You can see why lenders, who are open-minded, like bitcoin as collateral. Having

47 Bitcoin The Ultimate Collateral.

pristine anything is a pretty good gig. Owning bitcoin gives you a ton of financial flexibility–there is no second best.

LIQUIDITY

Lending plays a critical role in financial markets by influencing liquidity, capital formation, and capital lock-up, each of which affects the state of our economy. Bitcoin's emergence as pristine collateral adds another dimension to these dynamics, given its unique properties of scarcity, decentralization, and transparency.

- Lending creates liquidity by allowing asset holders to access capital without liquidating their positions. This principle applies broadly across financial markets.
- Capital formation refers to the accumulation of financial and productive assets that enable economic growth.
- When an asset is pledged as collateral, it is effectively removed from circulation (unless it is rehypothecated). Collateralized bitcoin can lead to higher prices and greater price stability.

Sources of Liquidity

A business or individual has bitcoin on its balance sheet–great! But if they want cash, how do they get it? Borrowers need to access liquidity for several reasons, whether it is paying fiat-denominated bills, tax efficiency, procuring assets, or servicing debt–the list goes on. This is a growing market segment. As of August of 2024, it was estimated by HFT Market Intelligence that the bitcoin-backed lending market comprises $8.5B in outstanding bitcoin-backed loans and is expected to grow to $45B by 2030.[48]

48 Osler: Bitcoin-Backed Lending-Opportunities and Considerations for Financial Institutions

Traditional Financial Institutions–TradFi

Companies can pledge their bitcoin as collateral to traditional banks and financial institutions to secure loans. Legacy institutions like Goldman Sachs have allowed borrowers to use bitcoin as collateral for a cash loan.[49] Cantor Fitzgerald announced plans to launch a bitcoin financing business with $2B in initial financing.[50] This practice is only expected to continue growing. In this setup, you should expect all your usual big bank requirements–KYC (Know Your Customer), CPA-audited financial statements, slow disclosures, and 800-page contracts, etc.

While these institutions may be attractive given their deep access to capital, you should anticipate a much more conservative, fiat approach to the asset class. Additionally, TradFi institutions are by far the most heavily regulated. These regulations may lead to a higher legal bill and add complexity to the deal. Borrowers will need to explore how their bitcoin will be custodied (multisig recommended), ensure systems are in place to prevent their bitcoin from being rehypothecated, and obtain the public address for the wallet where their bitcoin collateral is being held.[51] While many of these institutions may leave a sour taste (and rightfully so) in many bitcoiners' mouths, this signifies a massive step forward for bitcoin's maturity and robustness. These institutions have tremendous amounts of capital, large customer bases, and a deep knowledge of financial markets.

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49 CoinDesk: Goldman Sachs Makes Its First Bitcoin-Backed Loan.

50 Cantor: Cantor Fitgerald to Launch Bitcoin Financing Business.

51 Bitcoin multi-signature (multisig) is a security feature that requires multiple private keys to authorize a transaction, reducing the risk of theft or loss by distributing control among multiple parties.

Bitcoin Lending Platforms–Centralized Finance (CeFi)[52]

Businesses and individuals can also pledge their bitcoin as collateral with bitcoin lending platforms and receive dollars in return. While these businesses are still relatively new compared to their TradFi counterparts, their age does not diminish the quality of services they have developed. Companies like Unchained were built specifically to service bitcoin customers. They themselves originate the loan and take bitcoin as collateral. These companies have a robust understanding of the asset, network, and technology. They have made the properties of bitcoin–and the bitcoin ethos–like verifiability, multisig, and zero rehypothecation inherent in their offerings. These companies tend to be more flexible and can process new business quicker than their TradFi competitors. Additionally, many bitcoin lending platforms have innovated on traditional lending mechanics. Some allow the borrower to receive stable coins as liquidity, which can be advantageous for a borrower looking to bypass standard KYC practices or USD rails.

P2P bitcoin lending platforms, like Firefish and Debifi, facilitate direct borrowing and lending between users, leveraging bitcoin as collateral. These platforms are designed to provide non-custodial, secure, and transparent financial services without relying on traditional intermediaries. Firefish ensures that users never give up control of their bitcoin to a third party throughout the loan period. This is achieved through an on-chain multi-signature (multisig) escrow system, which requires multiple signatures to authorize any movement of the collateral, enhancing security and trust.[53] The escrow account leverages Partially Signed Bitcoin Transactions (PSBT) standard, where the borrower pre-signs transactions that limit the way bitcoin can be transferred. The bitcoin can be

52 In this context, CeFi refers to a structured, centralized entity that provides standardized financial services to clients through a formal corporate framework.

53 Firefish Document Hub.

moved back to the borrower upon loan repayment, or to the lender in case of default

Loan Origination and Repayment Process at Firefish

1. **Setting Loan Terms:** Borrowers specify their desired loan amount, interest rate, and loan duration (currently ranging from 3 to 18 months).
2. **Funding Options:** Borrowers can either wait to get matched with an investor based on proposed terms or opt for an "instant" loan with pre-committed liquidity—ideal for quick access to funds, though typically at a higher interest rate.
3. **Locking Bitcoin Collateral:** The borrower transfers the agreed amount of bitcoin into a multisig escrow address. This setup ensures that the collateral remains secure and cannot be accessed unilaterally.
4. **Disbursement of Funds:** After the collateral is secured, the investor transfers the loan amount directly to the borrower's bank account or stablecoin address.
5. **Repayment and Collateral Release:** At the end of the loan term, the borrower repays the principal amount plus the agreed-upon interest. Upon receipt, the bitcoin collateral is released back to the borrower's wallet.

Bitcoin Lending Protocols–Decentralized Finance (DeFi)[54]

The newest way for companies to use their bitcoin as collateral to gain access to liquidity is through DeFi lending protocols. These are protocols that offer people a version of financial services without banks. Loans are issued by decentralized applications and networks, which are powered by code and smart contracts rather than traditional companies. While some organizations may

54 In this context, DeFi refers to a decentralized, protocol-based system that delivers financial services operating without centralized intermediaries.

be involved, these systems are primarily autonomous, offering a more automated and trustless lending service.

Companies like Zest and Fuji have taken advantage of bitcoin's scalability by creating lending protocols on Layer 2 (L2). These protocols use bitcoin's Discrete Log Contracts (DLCs).[55] DLCs, first introduced by Tadge Dryja, co-author of the Lightning Network white paper, are a type of smart contract for bitcoin. Essentially, DLCs allow parties to make conditional agreements, such as bets, but their potential extends far beyond this, enabling a wide range of financial instruments to be created on bitcoin's network.

Borrowers who decide to use a DeFi protocol as a loan mechanism should expect an experience vastly different from getting a loan from a traditional financial institution. These protocols are trustless, the counterparty is often unknown, liquidity can be offered in an array of assets, there are far fewer regulations, no consumer protection, and more advanced technical skills are required. Strict due diligence should be conducted on any projects and side chains so you don't get rugged.

Types of Liquidity

Loans

Before securing a loan, borrowers must understand the collateral management process, loan eligibility criteria, potential loan default consequences, and available refinancing options. Let's review the types of loans businesses or individuals can receive when they use their bitcoin as collateral. The mechanism for these types of loans will vary depending on who, where, and how someone decides to

55 Bitcoin Magazine: The Pros, Cons, and Possibilities for Bitcoin's Discreet Log Contracts.

get liquidity. However, for the sake of this exercise, let's assume the process is more or less the same across liquidity providers:

1. Borrower finds a source of liquidity.
2. Lending company/platform/protocol determines the LTV ratio.
3. Borrower applies/agrees to terms for a loan.
4. Borrower deposits bitcoin into an escrow wallet.
5. The borrower gets their cash upon approval/consensus mechanism and the lender receives bitcoin as collateral.
6. Borrower pays back the loan on a predetermined schedule and method.
7. Lender receives principal and interest payments unlocking collateral at the end of the loan agreement.

Loan options

- **General Loans:** One-time liquidity injection used for a variety of business or individual use cases like expansion, operational costs, and/or to buy assets.
- **Lines of Credit:** Open-ended borrowing agreements usually for day-to-day spending needs.
- **Margin Loans:** These loans are used in financial markets by both businesses and individuals to trade, invest, and/or buy assets. Typically, these loans are used opportunistically depending on market conditions.
- **Bridge Loans:** Businesses need financing to cover gaps in cash flow. These types of loans are usually used in one-off scenarios.

KEY CONSIDERATIONS FOR BORROWERS AND LENDERS

Mutually Applicable Considerations

In the ethos of bitcoin, there are certain business practices that should be upheld by all ethical borrowers and lenders. Bitcoin's de-

centralized, permissionless, and censorship-resistant nature inherently supports and empowers individual sovereignty. These unique traits, natively built into its protocol, are what make bitcoin invaluable. We must not compromise or abandon these essential features.

- **Multisig:** Use platforms/companies/protocols that employ at least a 2–3 multisig escrow account/vault. Make sure you have a firm understanding of the key delegation process and responsibilities.
- **Non-Custodial:** Ensure the bitcoin collateral is held in non-custodial, multisig wallets where neither party has unilateral control.
- **Re-hypothecation:** Do not tolerate platforms/companies/protocols that use your bitcoin to cover their own obligations.
- **Bitcoin Only:** Many companies will feel pressure to access the larger "crypto" market. Any moral and ethical actor will resist this temptation as servicing other tokens leads to unnecessary risks and threats to their bitcoin service offerings.

Borrowers

Borrowers pledge bitcoin as collateral to obtain fiat or stablecoin loans without selling their holdings should carefully consider the following aspects before taking out a loan;

- **LTV:** Weigh individual tolerance, abilities, and lender's offer. High LTV, greater borrowing power, but higher risk and vice versa.
- **Interest Rates:** Borrowers must assess their goals, financial situation, and market competition to determine if the loan is a good deal.

- **Collateral Lock-Up:** Tolerance for bitcoin being inaccessible during loan term. A conservative rule of thumb would be to not collateralize more than 30–40% of your bitcoin.
- **Lender Trustworthiness:** Make sure the lender is an ethical actor that won't renege on their agreement or jeopardize your collateral.
- **Tax Optimization:** Accesses liquidity without incurring capital gains tax and selling your assets.
- **Repayment Capabilities:** Individual's ability to service debt and add collateral if needed to avoid forced liquidation.
- **Transparent Terms & Rates:** Borrowers should understand the full cost of a loan upfront—while DeFi protocols may have variable daily rates, fixed-rate platforms like Firefish offer predictable repayment terms with no surprises.
- **Jurisdictional Legal Practices:** Platform jurisdiction and the laws they abide by matter—regulatory issues, especially with fiat loans, can create unexpected borrower complications.
- **Banking Policies:** Before accepting fiat loan proceeds, borrowers should confirm with their bank to avoid frozen funds or account closures due to anti-bitcoin policies or AML red flags.
- **Liquidation Risks:** If a borrower fails to repay their loan or if the value of their bitcoin collateral drops below a set threshold, the loan may be subject to liquidation. Borrowers should actively monitor the health of their loan, top up collateral when needed, or repay early to avoid forced liquidation.

Lenders

Lenders provide liquidity to borrowers in exchange for interest payments. They should carefully consider the following when originating loans;

- **Credibility & Risk Assessment:** Unlike traditional lending, bitcoin-backed loans prioritize the soundness of the collateral over borrower credit. Lenders should focus on verifying the legitimacy of the borrower's bitcoin and ensuring compliance with KYC/AML standards.
- **LTV:** Low LTV, lower risk of liquidation | High LTV, Higher risk of forced liquidation. Collateralized loans reduce default risk.
- **Interest Rates:** Lenders need to carefully assess their financial situation and assess the appropriateness of fixed or variable terms in combination with the perceived risk of the loan. Lower interest rate, less risky | Higher interest rates, more risky.
- **Profitability:** Earning yield on issued loans generates income and can be a lucrative practice. Institutional lenders may earn additional spreads on their loans depending on their cost of capital.
- **Liquidity Needs:** The lender's capital will be locked up for the duration of the issued loan.
- **Contingency Plans:** Lenders should evaluate potential exit options, such as secondary markets, for liquidity. They should also carefully assess intermediaries and loan processes to ensure collateral remains secured, as failures can drastically alter the loan's risk profile.
- **Liquidation Procedures:** Lenders must choose between managing liquidations themselves for full control or delegating to a third party—trading off ease of execution for added counterparty exposure.
- **Platform Demands and Technical Involvement:** Lenders should evaluate how hands-on they want to be. Platforms like Firefish offer a plug-and-play experience, while others may require key management and transaction signing.

BITCOIN LENDING WILL PROPEL THE BITCOINIZATION OF FINANCE

Bitcoin-backed lending is a crucial mechanism in the financialization of bitcoin, as it establishes bitcoin as a fully functional financial asset. The evolution of bitcoin lending markets will not only unlock liquidity but also refine credit assessment models and enhance market signals.

Credit Assessments & Market Signal

Bitcoin-backed lending introduces market-driven risk assessment into bitcoin's financial ecosystem. Bitcoin's volatility forces lenders to develop new credit risk models that account for on-chain data, price fluctuations, and borrower behavior. This enhances price discovery by establishing a direct link between bitcoin's perceived risk and the cost of borrowing against it. In TradFi, risk-free rates (e.g., U.S. Treasuries) reflect the cost of capital.

Bitcoin-backed loans' interest rates would serve as bitcoin's equivalent—a market-driven risk signal that reflects bitcoin volatility, macroeconomic conditions, lender confidence, and supply/demand for bitcoin-backed loans. Firefish, in partnership with the London Stock Exchange Group (LSEG) has developed the Firefish Bitcoin-Backed LoanRate Fixing. Users of the LSEG Workspace have access to historical data on the evolution of interest rates for bitcoin-backed loans on the Firefish platform. The dataset includes full rate curves across all tenors, supporting user calculations, modeling, and decision-making. This benchmark fixing is designed to help the TradFi community with price discovery, transparency, and risk management. This is another example of how time-tested financial instruments can help deepen the bitcoin capital markets by providing richer data for market participants.

Market Expansion

As bitcoin lending markets expand, both borrowers and lenders will experience significant benefits. Early bitcoin lending markets overpriced risk due to uncertainty correlating in high interest rates and lack of competition. Over time, historical data will allow lenders to quantify volatility risk more effectively, leading to more precise risk-adjusted loan rates. Additionally, as more offerings become available, interest rates for borrowers and risk for lenders should trend downward, a self-reinforcing cycle of financial maturity. Institutions like Unchained prove that bitcoin-backed loans can operate within regulatory frameworks. I estimate more and more companies will embrace the value proposition of bitcoin lending and service a growing market.

Real World Industry Specific Use Cases of Bitcoin Lending

Battery Finance-Blended Collateral Lending

Battery Finance, a subsidiary of Newmarket Capital, has introduced an innovative financing model that combines bitcoin with traditional assets as collateral for loans. This dual-collateral approach aims to provide borrowers with enhanced financing options while offering lenders increased security and potential upside from bitcoin's appreciation. In a typical deal, the loan is secured by both a traditional asset (like real estate) and bitcoin.[56]

Benefits for Borrowers

56 Bitcoin Magazine: Newmarket Capital Launches Battery Finance, Bitcoin-Collateralized Loan Strategy.

- **Enhanced Financing Terms:** By including bitcoin in the collateral mix, borrowers may access more favorable loan terms or increased loan amounts.
- **Asset Diversification:** Incorporating bitcoin allows borrowers to diversify their investment portfolio within the loan structure.
- **Mitigated Volatility Concerns:** The inclusion of stable, income-producing assets alongside bitcoin helps balance the potential volatility associated with the asset.

Benefits for Battery

- **Increased Security:** The dual-collateral approach provides additional layers of security, reducing the lender's exposure to any single asset's performance.
- **Potential for Higher Returns:** Exposure to bitcoin's potential appreciation offers Battery an opportunity for enhanced returns beyond traditional asset-backed lending.

Orange Bridge—Utilize Home Equity

Orange Bridge offers an innovative financial solution allowing homeowners to unlock a portion of their home equity and invest it into bitcoin. Their "Co-Invest" product works as follows:[57]

1. Homeowners access a portion of their home equity through Orange Bridge's program.
2. The unlocked equity is used to purchase bitcoin, facilitating diversification into bitcoin.
3. Orange Bridge assists in securing the acquired bitcoin with a sound custody solution.
4. Repayment occurs at the end of the agreement term, either through proceeds from the sale of the home, refinancing of the home, or by liquidating the bitcoin investment.

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57 Orange Bridge: Diversify Home Equity into Bitcoin.

Benefits for Homeowners

- **No Monthly Payments:** By eliminating monthly debt obligations, homeowners maintain their cash flow and financial flexibility.
- **Portfolio Diversification:** Using funds previously tied up in home equity and investing them in bitcoin offers exposure to a high-performing asset class, potentially enhancing long-term financial growth.
- **Risk Mitigation:** The dual-equity structure balances investment between real estate and bitcoin, aiming to limit downside risk associated with relying on a single asset.

Benefits for Orange Bridge

- **Equity Appreciation:** Instead of charging interest or monthly payments, Orange Bridge shares in the appreciation of the home over time.
- **Bitcoin Price Exposure:** Orange Bridge enables bitcoin-backed real estate investments to gain exposure to bitcoin's price appreciation indirectly.

People's Reserve–Self-Repaying Mortgages

People's Reserve is pioneering financial products that leverage bitcoin to transform traditional debt structures. Their "self-repaying" mortgage allows borrowers to pledge bitcoin as collateral to secure a mortgage, reducing the lender's risk and potentially lowering interest rates.[58] As bitcoin's value appreciates over time, borrowers can use the increased value of their bitcoin holdings to pay down the mortgage principal. Interest rates are adjusted based on bitcoin's performance; rates decrease with bitcoin appreciation and may increase if bitcoin's value declines. Borrowers have options to adjust collateral levels or accept interest rate changes in response to bitcoin's market movements.

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58 People's Reserve Bank Documentation.

Benefits to Borrowers

- **Accelerated Homeownership:** Potential for faster mortgage repayment through bitcoin appreciation.
- **Financial Flexibility:** Retain bitcoin holdings while accessing necessary liquidity for home purchases

Benefit to People's Reserve

- **Enhanced Security:** Bitcoin collateral provides an additional layer of security beyond the property itself. As bitcoin's value rises, the loan-to-value (LTV) ratio improves, providing People's Reserve with less risk on their books.
- **Sticky Offering:** People's Reserve offers many services to clients including direct lending, bitcoin custody solutions, and investment products that their customers may find attractive and become repeat buyers of.

BITCOIN CREDIT PRODUCTS & FIXED INCOME

Fixed income refers to investment securities that provide regular, predetermined payments, typically in the form of interest. The global fixed-income market was estimated at 140.7T dollars in 2023.[59] This makes it one of the largest, most developed, and liquid markets in the world. U.S. Treasuries are debt obligations issued by the U.S. Department of the Treasury and are one of the largest fixed-income vehicles in the market. They are backed by the U.S. government's full faith and credibility.[60] Treasuries are currently the benchmark collateral in the global financial system. The bitcoinization of finance is replacing fiat-based credit models using U.S. Treasury securities as collateral with bitcoin instead.

BITCOIN CREDIT PRODUCTS

Traditional finance institutions, including pension funds, insurance companies, and endowments, often face constraints (regulations, mandates, risk management, etc.) that prevent them from holding bitcoin directly. However, emerging financial instruments—like bitcoin bonds, credit funds, and interest-paying accounts in bitcoin—offer an alternative route for these institutions to gain exposure to the asset class without violating investment restrictions or assuming direct custody risk. These institutions manage some of the largest capital pools in the world. Providing them with the ability to access financial products built with and on top of bitcoin is without a doubt bullish for the industry.

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59 SIFMA: Capital Markets Fact Book.

60 a.k.a. their ability to tax and print money.

Bonds

A bond is a fixed-income financial instrument that represents a loan made by an investor to a borrower (typically a government, corporation, or municipality). The issuer promises to repay the principal at a specified maturity date and makes periodic interest payments (coupons) to the bondholder.

Companies can use their bitcoin as collateral to access liquidity by issuing bonds. This is a particularly intriguing option for companies that are bitcoin-rich and cash-poor. The mechanism for issuing bonds typically aligns with TradFi specialties and institutions. The process looks something like this:

1. The company pledges a specific amount of bitcoin as collateral for the bond.
2. The company issues bonds to investors, guaranteeing that the bitcoin is held in reserve to secure the bond.
3. Investors purchase the bonds, knowing that they are secured by the underlying bitcoin.
4. If the company defaults, bondholders have a claim to the bitcoin collateral, reducing their risk exposure.

While specific regulations vary across jurisdictions, a bond, unlike a loan, is a security. Bitcoin bond issuers must follow the laws and regulations of their local jurisdictions as they pertain

to issuing and selling securities to investors. They will also likely lean on the expertise of traditional financial institutions and their access/reputation to bring their bonds to market.

Types of Bonds

- **Secured Bonds:** A debt instrument backed by specific collateral, such as assets or revenue streams, which can be claimed by bondholders if the issuer defaults.
- **Convertible Bonds:** a type of debt security that gives investors the option to convert their bonds into a predetermined number of shares of the issuing company's stock, typically at a specified price and time.
- **Debenture Bonds:** an unsecured debt instrument backed only by the issuer's creditworthiness and reputation, rather than specific collateral.

Microstrategy's Bond Implementation

In August 2020, MicroStrategy announced bitcoin as its primary treasury reserve asset, citing fiat debasement, inflation risks, and bitcoin's superior store-of-value characteristics. The company initially purchased 21,454 bitcoin for $250M using its corporate cash reserves.[61] Over time, they recognized that simply using cash on hand wasn't enough—so they began leveraging corporate bonds and convertible debt to buy more bitcoin. Microstrategy by far and away has been the largest purchaser of bitcoin amongst public companies.

MicroStrategy strategically issues bonds with minimal interest rates, typically ranging from 0% to 2.25%, as investors are primarily betting on the company's stock price appreciation, which is closely tied to bitcoin's performance. By maintaining low coupon rates, the company significantly reduces its immediate cash interest obligations while simultaneously increasing its exposure to bitcoin. As bitcoin's price rises, MicroStrategy's stock value tends to follow suit, creating an opportunity for bondholders to convert

61 Bitcoin The Ultimate Collateral.

their debt into equity at a premium. This conversion process not only strengthens investor confidence but also gradually lowers MicroStrategy's overall debt burden, making the strategy a highly efficient method of leveraging bitcoin for corporate finance.

MicroStrategy has demonstrated that bitcoin can function as a viable form of corporate collateral, paving the way for broader adoption of bitcoin-backed financial instruments. The company's approach has helped establish institutional legitimacy for bitcoin, as the acceptance of bitcoin-backed bonds signals that major financial institutions and Wall Street recognize its potential as collateral. Additionally, MicroStrategy's strategy serves as a blueprint for other corporations, both public and private, that may seek to issue their own bitcoin-backed bonds or loans. By consistently leveraging debt to acquire more bitcoin, the company has also played a role in deepening bitcoin's integration into capital markets, fostering a cycle of demand that further cements bitcoin's place within traditional financial structures.

MicroStrategy's approach to bitcoin-backed debt and "yield" generation is unique because it does not follow the traditional model of earning yield through lending.[62] Instead, the company's strategy effectively creates yield through financial engineering. This yield is created when bitcoin appreciates faster than the cost of its debt. It represents the percentage change period-to-period of the ratio between the company's bitcoin holdings and its assumed diluted shares outstanding. Here is how it works:

1. The company issues debt at a low interest rate, effectively borrowing from the market

62 Epoch Ventures: The Bitcoin Ecosystem 2024 Annual Report.

    a. This is possible given the cash flows of their software business, first-mover advantage in the bitcoin treasury space, and overall creditworthiness.

2. Microstrategy uses these funds to purchase spot bitcoin. Given the company's large exposure to bitcoin, as the price rises, Microstrategy's stock price also tends to rise.
3. Investors holding convertible bonds may choose to convert their debt into equity, reducing MicroStrategy's outstanding debt obligations.

    a. This process effectively lowers the company's debt burden while increasing its bitcoin per shareholdings, creating an indirect form of yield.

4. Additionally, If bitcoin rises faster than the cost of borrowing, the company effectively generates a yield on its holdings without selling any bitcoin.

    a. This yield is realized through capital appreciation, as bitcoin's price increases over time while the debt remains fixed.

MicroStrategy is expected to sustain its strategy by issuing new bonds as a means of refinancing its existing debt as it matures. This approach allows the company to manage its financial obligations while maintaining its aggressive bitcoin acquisition strategy. Additionally, its success in leveraging bitcoin-backed debt could set the stage for broader adoption of bitcoin-secured corporate bonds, providing a framework for other companies in traditional markets. The company has made excessive efforts to open-source and proliferate their bitcoin treasury/acquisition policies for other companies to implement.[63]

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63 MicroStrategy Bitcoin Initiative: Project Roadmap.

Other Examples of Bitcoin Bonds

People's Republic Bitcoin Bond

A substantial portion of the bond's capital is invested in low-risk traditional assets, such as government securities or high-grade corporate bonds. This allocation ensures that the principal amount remains safeguarded against potential market downturns. The remaining portion of the bond's capital is allocated to bitcoin. This structure allows investors to benefit from bitcoin's potential appreciation without directly holding the asset. If bitcoin's value appreciates, investors receive higher yields. If bitcoin's value declines, the principal remains protected due to its allocation in low-risk assets.

Bitcoin-Backed Sovereign Bonds

El Salvador has plans to issue the world's first bitcoin-backed bond. The bond aims to raise $1B in capital of which 50% will be allocated to bitcoin. The remaining 50% is earmarked for infrastructure development in the country. The bond intends to have a 10–year maturity and an annual interest rate of 6.5%. Investors purchasing the bond will have significant exposure to bitcoin. They would also be the recipients of dividends generated by staggered liquidation of bitcoin holdings. There have been multiple setbacks and the bond has not yet launched. However, the idea and much of the framework remains for the country, or another country, to adopt this strategy.

Andrew Hohns of Newmarket Capital and Battery Finance proposed "BitBonds" to the Bitcoin Policy Institute and U.S. Treasury.[64] BitBonds would integrate bitcoin exposure into U.S. government bonds with the intention of lowering 10–year interest rates, building savings for American families, decreasing the national debt,

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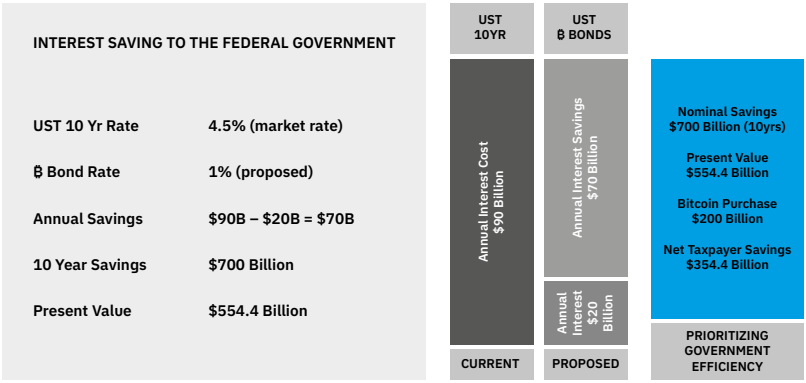
64 Bitcoin Policy Institute: Andrew Hohns: BitBonds – An Idea Whose Time Has Come | Bitcoin for America.

and establishing a revenue-neutral way for the U.S. Government to acquire bitcoin. In his example, the U.S. Treasury would issue $2T of new bonds at 1%, 90% of the proceeds would go towards normal government expenditures and 10% would be used to purchase bitcoin. At maturity, investors receive a 4.5% compound annual return (matching current market rates) on a senior basis, bondholders receive 50% of the bitcoin appreciation, and the U.S. government keeps the other 50%.

Reducing the 10 Year UST Interest Rate



Andrew believes this presents a win-win-win scenario;

- The Government wins through debt reduction, interest savings, and long-term bitcoin appreciation.
- Investors win through a high-upside savings vehicle.
- The bitcoin ecosystem wins by achieving deeper integration with sovereign finance.

While just a proposal, the strategy represents a creative yet fairly simple way for governments to issue debt with bitcoin exposure

Additional Institutional Bonds

Other publicly traded companies like MARA Holdings and Metaplanet have deployed a similar bitcoin acquisition strategy as MicroStrategy. Metaplanet issued ~$40M of debt to fund bitcoin investments, bringing their total holdings to over 2,200 bitcoin. MARA has issued ~$1.3B in convertible debt to purchase bitcoin and help bring their overall bitcoin holdings to over 44,980 coins. Core Scientific also issued convertible debt to finance bitcoin purchases, although specific details about the amount and terms were not disclosed.

Other Credit Products

Credit Funds

Build Asset Management

Build Asset Management is a credit manager creating innovative solutions for public and private markets within private credit funds. The Build Secured Income Fund I (the "Fund") invests its capital in U.S. dollar-denominated commercial loans secured by a borrower's bitcoin. The Fund invests in secured loans made to small and medium-sized businesses that typically fall below the threshold for public debt markets or loan syndication.[65] This fund primarily invests in bitcoin-backed, collateralized business loans originated by Unchained, with a secured structure involving a multi-signature and over-collateralization. Unchained originates loans and sells them to Build, which pools them into the fund, enabling investors to share in the interest income.

65 Build Asset Management: Build Secured Income Fund I.

- Dynamics
  - Loan Terms: Unchained issues loans at interest rates around 14%, secured with a 2/3 multi-signature vault backed by a 40% loan-to-value (LTV) ratio.
- Fund Mechanics
  - Build buys these loans from Unchained, thus providing liquidity to Unchained for further loan originations, while Build manages interest payments to investors in the fund.

Meanwhile Advisors

Launched by Meanwhile Advisors, a subsidiary of Meanwhile Group, the Meanwhile BTC Private Credit Fund LP is designed to provide institutional investors with exposure to bitcoin's growth while offering a conservative bitcoin-denominated yield. The fund is fully denominated in bitcoin. USD contributions are immediately converted to bitcoin, fees are charged in bitcoin, the treasury is held in bitcoin, interest is paid in bitcoin, loans are made in bitcoin, and the funds investments are paid back in bitcoin.[66] This eliminates currency risks and is an encouraging sign of operating within the bitcoin ethos. The fund targets a 5% bitcoin-denominated yield during its term by lending out bitcoin to a diverse range of institutional counterparts that undergo an intense creditworthiness assessment. The principal amount of the loan, plus interest, is then paid back to the fund in bitcoin providing fund investors with a yield on their bitcoin investment.

Before bitcoin matures into a unit of account, the game theory behind lending out bitcoin to generate yield, doesn't quite add up. Your bitcoin, which likely has appreciation, would probably be sold to fund whatever project or purpose the borrower wanted to fulfill. This especially breaks down if you are getting paid back in dollars. Trading something scarce, for something not scarce,

66 Businesswire: Meanwhile Group Unveils First Bitcoin Private Credit Fund.

is a dumb idea. The Meanwhile BTC Private Credit Fund LP fund works because it is fully denominated in bitcoin. The only legitimate way you can earn yield on bitcoin, is if the lender and borrower denominate their deal in bitcoin.

Xapo

The Xapo Byzantine BTC Credit Fund, a collaboration between Xapo Bank and Hilbert Group[67], offers investors access to structured credit deals designed to generate institutional-grade yield on bitcoin holdings. The fund has raised over 3,000 bitcoin and is denominated in bitcoin. While specific details about these structured credit deals have not been publicly disclosed, they are described as sophisticated credit instruments typically inaccessible to individual investors. Structured credit deals generally involve pooling various debt instruments to create securities that offer specific risk and return profiles. In the context of the Xapo Byzantine BTC Credit Fund, these deals are likely tailored to leverage bitcoin holdings to generate yield, though the exact mechanisms remain unspecified.

Interest Payable in Bitcoin

River

River has introduced an innovative product, bitcoin Interest on cash. This allows clients to earn interest on their U.S. dollar deposits, with the interest paid in bitcoin. Clients earn an annual interest rate of 3.8% on their cash deposits. The accrued interest is converted to bitcoin daily and paid out monthly, enabling clients to accumulate bitcoin over time. Cash deposits are insured up to $250,000 through River's banking partner, Lead Bank, a member

67 Hilbert Group: Hilbert Group and Xapo Bank complete launch of Bitcoin Yield Hedge Fund with $175 Million in Initial Investments.

of the FDIC. All bitcoin holdings are maintained in full reserve custody, ensuring that client assets are not lent or leveraged.[68]

Xapo

Xapo Bank offers its members the opportunity to earn interest on their bitcoin deposits. Xapo currently offers a 1% APR on bitcoin deposits (up to five bitcoin). Interest is calculated daily based on the annual rate and credited to your bitcoin savings account each day. Xapo Bank does not lend out your bitcoin deposits. Instead, your bitcoin remains securely stored, and interest is paid without deploying your assets elsewhere. It is important to know that in order to receive interest payable in bitcoin, you must custody your bitcoin with Xapo. Xapo Bank utilizes Multi-Party Computation (MPC) protocols for its bitcoin custody.[69]

Preferred Stock

MicroStrategy is leveraging preferred stock—through vehicles like STRIKE and STRIFE—to tap into the $300 trillion global fixed income market and convert that capital into bitcoin. Preferred stock sits between debt and equity on the capital stack—paying fixed dividends like a bond but with no voting rights or maturity date. The issuances are accretive to Bitcoin-Per-Share and are quicker to deploy than traditional debt instruments. This gives MircoStrategy tremendous flexibility (convertible debt, preferred stock, and/or common equity) to respond to market conditions and stock premiums in the furtherance of their bitcoin acquisition strategies. By structuring preferred equity this way, MicroStrategy accesses a vast pool of capital restricted to yield-generating instruments, offering these investors higher returns than are available in traditional fixed income markets while absorbing

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68 River: Bitcoin Interest.

69 Xapo Bank: The Better Way to Earn Bitcoin.

perceived credit risk that is, in practice, overcollateralized by the company's massive bitcoin treasury.[70] This effectively turns MicroStrategy into a monetary conduit that accelerates the speculative attack on bonds.

Feature	STRIKE	STRIFE
Convertible	Yes (like a bond)	No
Dividend Rate	8% (can be paid in stock)	10% (must be paid in **cash**)
Target Investor Base	Equity + bond crossover buyers	Fixed income investors

71

THE ROLE OF FIXED-INCOME IN INVESTING

As almost every real bitcoiner knows, the 60/40 portfolio is moving into psyop territory.[72] The '40' represents fixed income. Historically, this part of the portfolio was meant to weather the volatility in the equity markets and represent the "safe" investments–typically, some sort of bond. First and foremost, the fixed income section is most commonly constructed with U.S. Debt. There are a couple main reasons for this. Most financial professionals believe the same fairy tale that U.S. Debt is "risk free." U.S. debt is also one of the largest and most liquid assets in the market which comes with a lot of benefits.

There are many brilliant bitcoiners in finance and economics that have sounded the alarm on the U.S. debt ticking time bomb. I highly recommend readers explore the work of Greg Foss, Lawrence

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70 Bitcoin Fundamentals by The Investor's Podcast Network Saylor's Bitcoin Strategy with Preferred Stock w/ Jesse Myers (BTC228).

71 Strategy: Strategy Announces Proposed STRF Perpetual Preferred Stock Offering, Strategy: MicroStrategy Announces Pricing of Strike Preferred Stock Offering (STRK).

72 A psyop (psychological operation) is a strategic effort to influence people's thoughts, emotions, or behaviors—often using misinformation or manipulation.

Lepard, Lyn Alden, and Saifedean Ammous. My very high-level recap of their analysis:

- A bond is a contract in which Party A (the borrower) agrees to repay Party B (the lender) their principal plus interest over time.
- The U.S. government issues bonds (Treasury securities) to finance its operations after tax revenues have been exhausted.
    - These are traditionally viewed as "risk-free" due to the government's historical reliability in repaying its debts and the strength of the U.S. economy (or military).
- U.S. bonds are seen as safe because the government has control over the dollar (world reserve asset) and, until recently (20-some-odd years), enjoyed broad confidence that it would always honor its debts.
    - This perception has contributed to high global demand for U.S. debt, but that is quickly deteriorating.
- The current debt situation raises concerns about sustainability.
    - The U.S. has substantial obligations, and without sufficient productivity growth, increasing debt may lead to a cycle where borrowing to cover interest leads to more debt.
    - This could result in more reliance on money creation (printing), which can drive inflation and further debt burdens.
    - In the words of Lyn Alden, "Nothing stops this train."

So essentially, you are giving money to one of the worst capital allocators in the world (the U.S. Government) and getting paid back with printed money.
It wasn't always this way. The U.S. Dollar used to be a more sound money, we used to have government surplus instead of mathematically certain deficits, the U.S. Federal Government didn't have a money printing addiction, and pre-bitcoin the 60/40 portfolio used to be a quality portfolio management strategy. Those times are gone.

Now the fun part. How does bitcoin fix this?

Bitcoin fixes this indirectly. Understanding investment criteria changes via risk tolerance, age, goals, etc. An individual or institution may still have a need for "fixed income" in the most literal definition–low-risk yield. Now you may be thinking that yield is a bad word in bitcoin land, and you're not wrong, so stay with me. Perpetual motion machine crypto yield is fake and largely where many crypto scams originate. However, that doesn't mean yield in the classic finance sense does not exist in bitcoin, it very literally does, as we just covered in detail. Fortunately for us bitcoiners, there are many other smart, driven, and enterprising bitcoiners that understand this problem and are doing something to address it. These individuals are pioneering new possibilities in bitcoin and finance, specifically when it comes to fixed income.

INTEGRATING BITCOIN INTO PERSONAL FINANCE

It is enjoyable to plan your future for yourself and your family. It frees you to focus on the things that are most important to you. It is always better to prepare than to repair. The real problem people have with macro-economic and market problems, is that they don't have a clear action plan for how to navigate various scenarios when they arise. Complexity does not mean success. While bitcoin does serve as a tool and asset to simplify your finances, there are still nuances to it. In the words of Mitch Moore "holding is not a financial plan." A bitcoin financial plan is not a "do nothing, get results" system. It requires PoW. A financial plan itself is not as valuable, as the continual process of planning is. This chapter will outline the important steps and considerations for creating and maintaining a quality bitcoin financial plan.

Choosing the Right Service Provider

At Basilic Financial, we have adopted a "human-first" approach to financial planning that resonates with bitcoiners. We believe that bitcoin will eventually integrate into mainstream financial planning, shifting focus from asset growth to intentional wealth preservation. Financial planning isn't just a time to dig into the numbers, it's a time to think deeply about your financial future and establish goals to get there.

We aim to help our clients achieve funded contentment–which is the ability for one to underwrite a meaningful and comfortable life, where money and meaning are in balance. Sometimes bitcoiners fall into the trap of making money their idol. This is an irremissible practice and should not be tolerated. Rather we need to view it

as it is, a tool for helping us achieve a life of funded contentment. It's easy to blurt out a goal that sounds nice, but in practice it takes much more consideration. Our goals stem from our core identity, belief systems, and moral worldview. First, one must understand there are two types of happiness:

- Day-to-day pleasure over pain (high-time preference)
- Your life has a source of purpose and meaning (low-time preference)

Individual goals can be identified through a process called the four C's:

- **Connection:** Deep sense of belonging.
- **Control:** Opportunity to tell the story you want to tell.
- **Competence:** Mastery over something important to you.
- **Context:** Living for something beyond ourselves.

Individuals interested in bitcoin are highly recommended to seek out service providers that have a deep understanding of the asset and ethos. Consider the following:

- **High-Touch Service:** Personalized consultations to service your unique needs.
- **Advanced Bitcoin Solutions:** UTXO consolidation, on-chain privacy, spending protocols, key checks/audits, etc.
- **Education:** Resources and capabilities to help individuals grow new concepts.
- **Partner Network:** What other companies in the industry they have relationships with.
- **Bitcoin Ethos:** Individuals are encouraged to work with bitcoin-only providers to avoid misaligned incentives.

- **Pricing:** Individuals are recommended to work with service providers that don't charge AUM on their bitcoin because that is rent-seeking and fiat.
- **Embrace Sound Custody Solutions:** Individuals should work with service providers that utilize or encourage cold storage multisig custody.
- **Fiduciary:** Services providers that are legally required to act in your best interest.
- **Scope of Services**: Partners that can service a diverse range of needs.
- **Industry Involvement:** Are service providers involved with professional organizations like the Bitcoin Financial Advisors Network?[73]
- **Policies & Procedures:** Do service providers have robust solutions to keep you and your information safe?

SAVING & INVESTING IN BITCOIN

Saving

Bitcoin is not just an investment; it's a long-term savings technology that protects purchasing power.[74] Unlike TradFi (stocks, bonds, real estate), bitcoin is a self-sovereign asset that does not require intermediaries. This allows individuals to have unprecedented control over their finances. Bitcoin is hope, bitcoin is for everyone.

Traditional portfolio allocation models do not account for bitcoin's asymmetric return potential. Meaning its upside potential and volatility challenge conventional diversification and risk assumptions. Sizing your bitcoin position is one of the main deci-

73 Bitcoin Financial Advisors Network .

74 Bitcoin Magazine: Bitcoin Financial Planning w/ Pierre Rochard & Morgen Rochard.

sions individuals will have to consider when making an allocation to bitcoin. Typical allocations range from:[75]

- **1–5%** for risk-averse investors.
- **10–20%** for high-net-worth individuals with strong conviction.
- **50%+** for bitcoin-first investors who see bitcoin as the ultimate store of value.

One of the most persistent misconceptions in bitcoin investing is the "bitcoin is too expensive" fallacy, or unit bias, where individuals see the high price per bitcoin and assume they cannot afford to invest. This reflects a fundamental misunderstanding of how bitcoin's divisibility works, leading to poor decision-making regarding accumulation and exposure. Bitcoin is divisible into 100M satoshis (sats) per bitcoin, meaning anyone can buy fractions of a bitcoin. Accumulation in satoshis (instead of thinking in whole bitcoin) is the key mindset shift needed. The real fallacy isn't that bitcoin is "too expensive"—it's that people are pricing themselves out of the future by not accumulating enough sats today.

Investing

Some of the highest value an advisor can add is helping clients manage Investor psychology. Bitcoin is a generational investment opportunity and for certain individuals, that can be a heavy load to carry. One of the best ways to manage investor psychology, which also applies to traditional finance, is to not be obsessed with checking your account balance each day. This is why I advocate working with bitcoin companies that don't gamify trading. Conviction in holding is also correlated with an individual's understanding of the asset, network, and technology.

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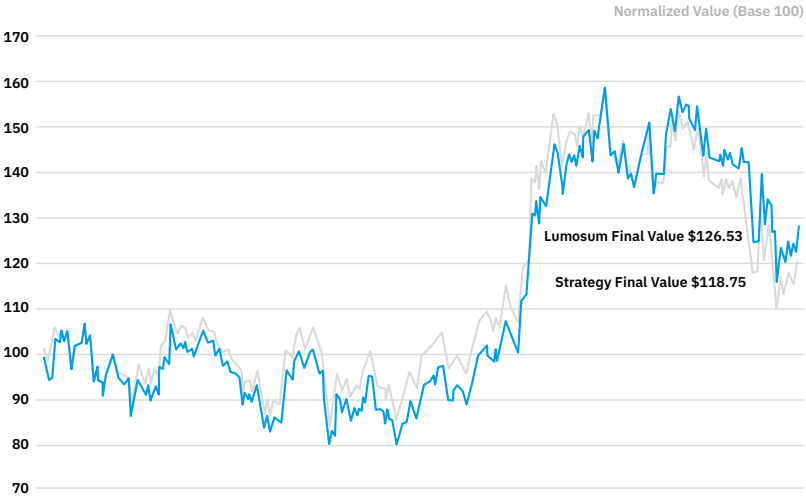
75 Millennial Investing: Bitcoin and Financial Independence w/ Jim Crider.

Research suggests that a properly-timed lump-sum acquisition strategy can be more lucrative than dollar-cost-averaging (DCA) strategies.

Michael Syalor claims that "bitcoin is a masterpiece of monetary engineering."[76] Unlike gold, real estate, or traditional fiat money, bitcoin was intentionally designed to be the most secure, decentralized, and scarce form of money ever created. In that context he also uses another analogy comparing owning bitcoin to prime real estate. "Bitcoin is digital real estate. It's Manhattan in cyberspace." He argues that just as Manhattan real estate became a generational wealth vehicle, bitcoin is the apex property of the digital world.

Performance of strategy compared to BTC



Results for accumulating bitcoin for 365 days from March 20th, 2024 to March 20th, 2025. From the $10,000 in capital to be allocated, no capital was deployed upfront. Buying the

76 Cointelegraph: Bitcoin is a 'Masterpiece of Monetary Engineering' Michael Saylor Tells Austin Davis.

entire position upfront would have resulted in a return of 26.53%. This was better than the strategy return of 18.75%[77].

However, it is important to take into account that investor psychology also plays a huge role in your accumulation strategy. While lump sum buys may pay off in the long run, sometimes investors may get discouraged if they mistime a buy with market movements. DCA strategies help build long-term conviction in your position and tend to result in more resilient holders of the asset. There is an old saying in finance that time in the market is greater than timing the market, and that couldn't be more true when it comes to bitcoin.

Bitcoin has outperformed every asset class over the past decade, with an annualized compound return of over 128% since 2009.[78] In fact, there has not been a 4-year cycle that bitcoin hasn't produced a positive return, regardless of when it was bought in that cycle.[79] Bitcoin's asymmetrical returns can mostly be credited to its fixed supply of 21M coins. Growing demand for a digitally scarce asset means that upside potential is massive while downside risk is limited by decreasing supply and network effects. A traditional 60/40 portfolio is constrained by bond yields and equity multiples, offering low expected real returns (~6.9% annualized).[80] The Bitcoin 24 model has the expected future return of bitcoin ~20% steady state Compound Annual Growth Rate (CAGR) over the next decade, making even a small allocation highly impactful.[81]

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77 Swan: Recurring Buys vs. Lump-Sum Investing

78 CoinMarketCap: Bitcoin Price History.

79 Stephan Livera: Preston Pysh Bitcoins Final Cycle.

80 Vanguard: The Global 60/40 Portfolio-Steady as it Goes.

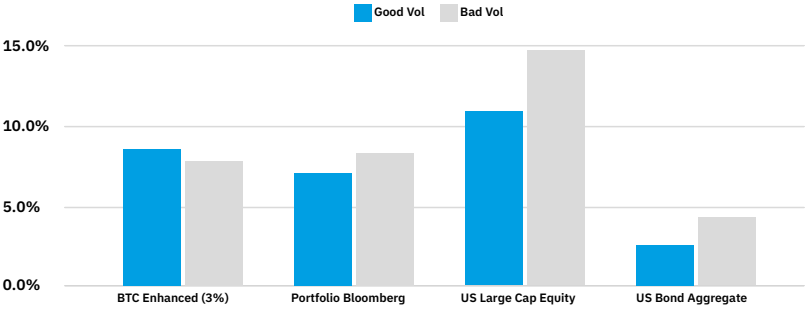
81 MicroStrategy: Bitcion24 Model, Bitcoin Fundamentals by The Investor's Podcast Network: Bitcoin & Your Financial Advisor with Andy Edstrom.

MANAGING VOLATILITY & LIQUIDITY

Volatility

Bitcoin's volatility is a feature, not a bug, as it reflects an emerging asset in price discovery mode. Unlike traditional assets with established valuations, bitcoin is still defining its role in global finance. Its price swings signal growing adoption, increasing liquidity, and a maturing market. Over time, as adoption spreads, volatility is expected to decrease, but in the meantime, it offers strategic entry points for investors and enhances bitcoin's overall resilience as a financial asset. The Onramp team performed a study that showed that bitcoin, while volatile, has more good volatility than bad volatility. Good volatility, or upside deviation measures the deviation or change of only positive returns while bad volatility captures the same for negative returns.

Good Volatility vs. Bad Volatility



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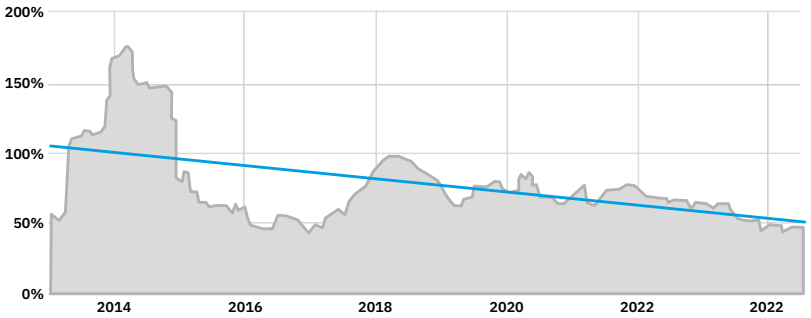
Bitcoin's volatility has been trending lower as price and adoption have risen.

82 Onramp: Registered Investment Advisors (RIAs) & Bitcoin.

Bitcoin Volatility



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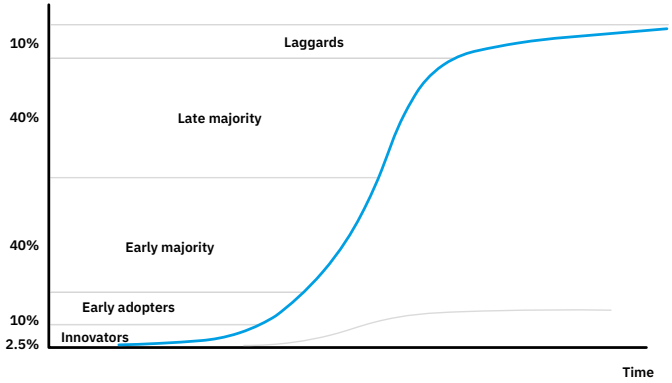
In regards to bitcoin's volatility it is important to understand its long-term adoption trends and cycles. Bitcoin follows an S-curve adoption model, similar to past technological breakthroughs like the internet, mobile phones, and electricity. Historically, disruptive technologies go through five key phases:

Penetration of Target Market



84

83 Onramp: Bitcoin-The Emergent Asset Class Has Arrived.

84 Investura: The Adoption Curve.

- Innovators
- Early Adopters
- Early Majority
- Late Majority
- Laggards

Bitcoin operates in 4-year market cycles based on the halving event, known as an epoch, where the issuance of new bitcoin supply is cut in half. These halvings are built into the bitcoin protocol and play into its beautifully designed incentive structures. Each cycle consists of a:

- **Bull Run:** Large returns & Fear Of Missing Out (FOMO).
- **Correction and Bear Market:** Speculators and paper hands exit.
- **Accumulation & Recovery:** Smart money enters and plebs stack sats.
- **Pre-Halving Run-Up:** Anticipation of reduced new supply.

History has shown (not indicative of future results) that bitcoin usually hits new all-time highs 12–18 months after each halving event. Understanding bitcoin's cycles can give better context to its volatility and how that needs to be managed within the greater context of a financial portfolio.

Liquidity

It is generally recommended financial practice that individuals should maintain cash reserves (3–6 months of expenses) to avoid forced bitcoin sales during downturns. A sale of bitcoin at an inopportune time could drastically impact the future value of an individual's investment, their overall strategy, and could have unforeseen consequences like tax liabilities. Short-term pain

(holding cash), can provide greater long-term benefits in terms of maintaining and growing a bitcoin stack.

"The 4% Rule," derived from the Trinity Study, is a retirement income strategy that suggests retirees can safely withdraw 4% of their total investment portfolio in the first year of retirement and then adjust for inflation each subsequent year.[85] The goal is to ensure that retirees do not outlive their savings over a 30-year retirement period.

While fundamentally sound, this adage is not optimized for bitcoin holders and was based on traditional asset allocations more aligned with 50–75% stocks and 25–50% bonds. These models assume low-volatility and that inflation is inherent in the dollar-denominated assets. Bitcoin naturally serves as a counter to inflation, however, it is still volatile. For early bitcoiners, the 4% rule may be too aggressive as if there are significant drawdowns in the early years of retirement, they may run out of funds sooner than anticipated. Instead they should consider the following;

- A more conservative static withdrawal rate closer to 1.5–2%
- Dynamic withdrawal rate which includes withdrawing less in bear markets and more during bull markets.
- Cash buffer of a predetermined amount of known upcoming expenses.
- Laddered bitcoin sales, which is essentially a reverse DCA in which you sell bitcoin strategically over time in small regular intervals.

It is a common saying in finance that the wealthy never sell their assets, instead they borrow against it. Bitcoiners, as mentioned in the lending chapter, do have an increasing amount of opportunities

85 Wikipedia: Trinity Study.

to use bitcoin as collateral. Borrowing against bitcoin instead of selling provides tax-free liquidity while maintaining long-term appreciation. Bitcoin collateralized loans offer a tremendous amount of flexibility to manage dollar denominated liabilities.

Individuals with significant bitcoin in retirement should only sell when necessary. Selling bitcoin at the wrong time can drastically impact long-term financial security in retirement. Selling is most appropriate in the context of a well-thought out and important goal, like buying a forever home. Additionally, strongly convicted holders could consider denominating and paying expenses in bitcoin. Instead of trading scarce bitcoin, for unscarce dollars, you can exchange bitcoin for products and services that are valuable to you. This facilitates a mindset shift that allows for a better and more consistent understanding of your wealth and value.

SPENDING BITCOIN

When investors shift their mental accounting from dollars to bitcoin, they begin to assess financial decisions through a lens of scarcity and long-term value. In a fiat-denominated world, individuals are incentivized to spend and consume, as inflation erodes purchasing power over time. In contrast, denominating in bitcoin reorients the framework: the individual now sees bitcoin as the base layer of wealth—finite, incorruptible, and designed to appreciate in purchasing power over long time horizons.

This change of denomination reframes spending decisions. Instead of asking "how many dollars does this cost?" The question becomes "is this a good value for x amount of bitcoin?"—a much harder bar to clear. This naturally fosters more intentional spending, promotes frugality, and encourages high-conviction allocation of capital only toward things that meaningfully enhance quality of life.

From a portfolio perspective, this shift discourages reactionary selling based on short-term price fluctuations. Instead, bitcoin becomes a foundational layer in a retirement plan—akin to high-quality real estate or a family business that one doesn't part with lightly. In this way, expenses can be viewed as an exchange of wealth for deeply valuable experiences or goals.

Ultimately, denominating your life in bitcoin encourages a higher standard of stewardship over your wealth. It aligns your financial behaviors with a low-time preference strategy, fosters sustainable wealth, and transforms retirement from "drawing down an account" into living off a generational asset—conserving and compounding its power for decades to come.

TAXES

Bitcoin is taxed as property in the U.S. similar to stocks or real estate. You have a taxable event in bitcoin whenever it is sold, traded, spent, or earned.[86] There are no taxable events for buying, transferring between personal wallets, or gifting bitcoin under $18k (as of 2024). Bitcoin sales are subject to capital gains tax. Long-term capital gains tax (held greater than one year) are taxed in a bracket system between 0–20%. Short-term capital gain tax (held less than one year) is also taxed in a bracket system between 10–37%. Tax-loss harvesting is a tax strategy where investors sell bitcoin at a loss to offset capital gains and reduce taxable income. Unlike stocks, bitcoin is not subject to the "Wash Sale Rule", meaning you can immediately rebuy bitcoin after selling at a loss. Bitcoin holders are encouraged to establish a consistent cost-basis accounting method for their bitcoin.

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86 Bitcoin Magazine: Financial Planning Crash Course-Risk, Taxes, and Retirement with Jessy Gilger.

- FIFO (First-in, First-out)
  - Oldest bitcoin purchased is sold first.
  - Better in a bear market because it increases deductible losses.
- LIFO (Last-in, First-out)
  - Most recently purchased bitcoin is sold first.
  - Better in a bull market because it reduces capital gains (Use long-term vs. short-term).

Companies like Unchained have also made it possible for bitcoiners to get access to tax-qualified accounts, while still holding the bearer asset in a multisig cold storage vault in other types of tax qualified accounts like 401ks, IRAs, etc. Depending on the custodian and plan setup, individuals may have access to bitcoin ETFs, which only offer price exposure as opposed to all the real, unique qualities of bitcoin itself.

IRAs

- Tax-advantaged savings account in the United States that allows individuals to save for retirement.
- Contributions are tax-deductible.
- Taxes are deferred until withdrawal (at retirement age).
- Ideal for those in a high tax bracket now but expecting a lower bracket in retirement.

Donor-Advised Fund (DAF)

- A donor-advised fund is a private charitable account created to manage and distribute donations on behalf of an organization, family, or individual.
- Contributing appreciated bitcoin to a DAF can provide donors with a tax deduction based on the fair market value at the time of donation, without incurring capital gains taxes.

- This structure allows the donated bitcoin to grow tax-free within the fund, potentially increasing the value of future charitable grants.

INHERITANCE

It is my belief that bitcoiners will be the top 1% of political and economic power. Which means we have the opportunity to shape the future with our moral world views and social teachings.[87] Much of the prosperity and stability seen in Western civilization has historically been rooted in high-trust cultures. For wisdom, we can look to the past. The "Noblesse Oblige" (Nobility Obligates) were wealthy families of old Europe and they were honorable models of society.[88] They were called to serve and took responsibility for being care takers of their local communities.

Given the nascency of bitcoin, anyone who holds the asset is a first-generation bitcoiner. Most bitcoiners haven't been born yet. We have an obligation to be good stewards of our wealth. It is our duty to show future generations the right way bitcoin is to be utilized and passed down to successive generations. Again, with great power comes great responsibility.

Bitcoin inheritance planning is a multifaceted process that requires careful consideration of both secure key management and legal title transfer to ensure that digital it is effectively passed on to beneficiaries.[89] Given the finite amount of bitcoin, it is crucially important that inheritance plans are robust and well-thought out

87 TFTC: How to Protect Your Bitcoin From New Policies w/ Matt McClintock.

88 Catholic Money Mastermind: The Noblesse Oblige with Andy Flattery.

89 Onramp: Bitcoin Inheritance Planning-Secure Key Management & Legal Title Transfer Strategies.

so future generations can benefit from the asset accumulation of past generations.

Bitcoin inheritance presents a fundamentally different set of circumstances than traditional financial assets like stocks, bonds, or real estate. Bitcoin does not have a centralized entity that can facilitate transfers upon death or recover lost bitcoin. Instead, ownership is dictated entirely by control over private keys. If not structured properly, bitcoin inheritance can lead to permanent asset loss or theft.
The biggest tension in bitcoin inheritance planning is balancing security with accessibility:

- If bitcoin is too secure (e.g. hidden in complex multisig setups with no clear documentation), heirs may never recover it.
- If bitcoin is too accessible (e.g. stored with a single password or centralized custodian), it risks theft, fraud, or legal complications.

A good estate plan must give your beneficiaries total legal control at all times. This control includes avoiding guardianship while you are alive, preventing unintended beneficiaries from inheriting your estate, and reducing the legal burden on your heirs.[90] The foundation of a good estate plan lies in its ability to protect your loved ones and your assets effectively.

Potential Pitfalls of Bitcoin Inheritance Planning

90 Strong Wealth: Bitcoin Estate Planning Considerations.

Jackson Mikalic, uses two key metaphors—shipwrecks and treasure maps—to describe the dangers of different inheritance planning strategies:[91]

- **Shipwrecks:** Losing bitcoin due to misplaced trust in third parties (lawyer fails to safeguard and/or transition keys properly), centralized custodians (exchange failures), or poorly designed inheritance plans.
- **Treasure Maps:** The risks of self-custody inheritance, where heirs receive bitcoin but lack the necessary knowledge to recover and manage the funds.
  - If heirs do not have the knowledge or access to the private keys, bitcoin could be lost forever.
  - If key information is stored insecurely or heirs are uninformed about proper security, it could be stolen.
  - Heirs unfamiliar with bitcoin may mismanage it or fall victim to a scam.

Objectives of a Successful Inheritance Plan

Bitcoin inheritance planning requires three fundamental components:[92]

1. **Secure Key Management Strategies:** Ensuring heirs can retrieve bitcoin safely.
2. **Legal Title Transfer:** Structuring the inheritance to comply with estate laws.
3. **Professional Guidance & Documentation:** Establishing a well-documented plan with legal and financial professionals.

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91 Onramp: Bitcoin Inheritance-Shipwrecks, Treasure Maps, & Generational Riches.

92 Unchained: What is the Unchained Inheritance Protocol.

Secure Key Management

The foundation of a good inheritance plan is proper bitcoin custody, ensuring the owner maintains access while allowing a designated successor to recover it if needed. Multisignature (multisig) wallets and authorized service providers like Unchained are recommended. Custody models are covered extensively in the following chapter. It is important to note that some estate planning strategies and accounts may only be executed with a 'qualified custodian (just the rules/laws).[93] Individuals looking to pursue these types of strategies should work with a professional and weigh the custody pros & cons given their unique situation.

Legal Title Transfer

Since bitcoin is not inherently linked to traditional financial institutions, legal title transfer must be handled proactively.[94] It is recommended that bitcoin is explicitly mentioned in legal documents and individuals working with a trusted professional must ensure legal compliance. Estate plans must cover both legal ownership transfer and the technical ability to recover bitcoin.

- **Legal title:** Refers to the legal ownership of an asset as dictated by an estate plan.
- **Practical access:** Means that heirs or executors have the necessary knowledge and tools to retrieve bitcoin.

Estate plans must address both legal ownership and key recovery—without the latter, the legal title is meaningless.

Wills & Probate

93 A qualified custodian is a regulated entity authorized to securely hold client assets.

94 Unchained, The Bitcoin Frontier: How to Hold Bitcoin for 1,000 Years with Matt McClintock.

A will is a legal document that outlines how a person's assets should be distributed upon their death. Traditional wills list assets and distribute them via probate, a court-supervised legal process. Probate ensures the will is legitimate, debts/taxes are paid, and that assets are distributed according to the deceased's wishes. This can be a difficult situation for a bitcoin holder as bitcoin's bearer asset nature makes wills insecure. Wills are public records, all assets are inventoried and beneficiaries of the estate are listed. This creates a security risk. In this context that could mean anything from addresses, total holdings, and/or keys being made public.

Additionally, courts cannot directly transfer bitcoin, so the private keys must be securely passed. The probate process can take several months to years, depending on complexity, disputes, and court backlog.

Trusts

A trust structure can securely transfer bitcoin ownership without probate. Generally the trust owns the asset and the original holder creates a control structure.[95]

Irrevocable Trust

Permanently transfers assets out of the grantor's estate, managed by a trustee. It provides strong asset protection, estate tax benefits, and shields assets from creditors. However, they cannot be changed or revoked.

Revocable Trust (Living Trust)

95 Nylen & Partners, LLC: The Bitcoiners "Best 10" Ideas A Guide to Estates, Trusts, and Tax Planning.

Allows the grantor to retain control and modify or dissolve it anytime. This structure offers privacy and flexibility. It does not provide asset protection from creditors or estate tax benefits.

IRA Trust

A trust designed to hold IRA assets and ensure controlled distributions. This protects inherited IRAs from creditors while enabling structured distributions. It also requires strict compliance with IRS rules.

Charitable Remainder Trust

Provides income to the grantor before leaving assets to charity. It offers tax deductions, capital gains tax deferral, and supports philanthropy. They are irrevocable, and generally have high administrative costs.

Intentionally Defective Grantor Trust

An irrevocable trust where the grantor pays income taxes while assets grow tax-free. It reduces estate taxes while maximizing tax-free appreciation. The grantor must pay ongoing taxes and setup is complex.

Grantor Retained Annuity Trust

The grantor transfers assets and receives annuity payments for a set period. It reduces estate taxes with tax-efficient asset transfer. If the grantor dies early, tax benefits are lost.

Dynasty Trust

Long-term irrevocable trust designed to pass wealth across generations tax-free. It avoids estate taxes and offers long-term asset protection. These require careful structuring because the assets remain in trust for generations.

Professional Guidance & Documentation

I cannot emphasize enough the importance of working with a professional who understands bitcoin and its unique characteristics when crafting/documenting an estate plan. This is perhaps the most important step of setting up a bitcoin inheritance plan. Bitcoin is unique in many ways, and the professional you decide to work with should be responsible for carrying out inheritance instructions customized to your particular situation. These professionals are commonly also named as an "executor" tasked with the responsibility of managing and overseeing the distribution of the deceased's assets, ensuring that their wishes are properly executed. Individuals may also want to consider establishing financial power of attorney, medical power of attorney, living will, HIPPA authorization, and medical instructions.

Actioninable Items for Bitcoin Estate Planning

- **Custody Solution:** Decide on a storage method and key distribution.
  - Such as the bitcoin holder, heirs, legal professionals, and bitcoin custody providers.
  - Make sure there are no single points of failure.
- **Education of beneficiaries:** Ensure that heirs or designated individuals possess the necessary knowledge to manage and access bitcoin holdings.
  - How bitcoin works.
  - How to access private keys securely and send a transaction.
  - How to avoid common inheritance mistakes (falling for scams, exposing seed phrases, etc.).
  - How to work with a trusted advisor to manage the transition.
- **Create a legal framework:** Draft a bitcoin-specific estate plan with an attorney.

- **Document clear instructions:** Provide heirs with accessible but secure guidance.
- **Review & update periodically:** Ensure the estate plan evolves with changing regulations, technological advancements, and personal circumstances.
- **Considering tax implications:** Evaluating capital gains, estate taxes, and step-up in basis benefits.[96]
    - As of 2024, the federal estate tax exemption is $13.61 million per individual ($27.22 million for married couples).
    - In 2026, these exemptions are set to decrease by approximately 50%, dropping to around $6 million to $7 million per individual.

96 Strong Wealth: Bitcoin is the Best Asset for Irrevocable Trusts and Generational Wealth Transfer.

BITCOIN CUSTODY

The "Bitcoinization of Finance" thesis is rooted in bitcoin's unique internet native properties, that allow assets to always be custodied and transferred in-kind, reducing or eliminating "paper" manipulation. Sound custody solutions will be the basis of a bitcoinized financial system.

My Hypothesis:

Just as cloud-native computing had a significant advantage over legacy IT systems in the early 2000s, multisig-native companies will hold a substantial edge over traditional third-party custody services in the 2020s and beyond.

SINGLE SIGNATURE (SINGLESIG)

A singlesig wallet requires only one private key to authorize bitcoin transactions. This straightforward setup is prevalent, with over 70% of the total bitcoin supply currently held in this manner.[97] Setting up a single-sig wallet is relatively straightforward, making it accessible for beginners. The critical aspect is securely managing the private key (physical signing device) and memetic backup seed phrase—a series of 12 or 24 words that must be kept confidential and safe. However, the simplicity of single-sig wallets introduces significant risks.

- **Single Point of Failure:** Possession of a single private key means that if it's lost or compromised, access to the associated bitcoin is irretrievably lost.

97 Unchained: Bitcoin Self-Custoy Approaches Compared.

- Theft Vulnerability: If someone gains unauthorized access to the private key, they can transfer the bitcoin without the owner's consent.

To mitigate these risks, users often employ strategies such as:[98]

- **Passphrases**: Utilizing standardized tools like BIP 39 passphrases can add an additional layer of security by combining the seed phrase with a user-defined passphrase. While this enhances protection, it also increases complexity and the risk of loss if the passphrase is forgotten.
- **Seed-Phrase Encryption**: Encrypting the seed phrase to prevent unauthorized access. However, this method introduces challenges in key management and recovery.
- **Private Key Sharding**: Using Shamir's Secret Sharing (SSS) users can set a threshold number m, meaning that at least m out of n shares are required to reconstruct the key.
  - The private key is divided into parts and users can store them separately.
  - This approach aims to reduce the risk of total loss but can complicate recovery processes.
- **Seed Phrase Duplication**: Creating multiple copies of your seed phrase can reduce the risk of total loss but may increase the chance of theft if not stored securely.

98 TFTC: Understanding Bitcoin Custody: Single Sig Vs Multisig Wallets.

Multiple Signature (Multisig)

BIP-11 and BIP-16 made bitcoin's multisig functionality native to the protocol, allowing users to securely implement multisig transactions without relying on off-chain cryptography.[99] Multisig wallets require multiple private keys to authorize a transaction. A common configuration is a 2-of-3 setup, where any two out of three keys are needed to execute a transaction.

I believe multisig will and should be the foundation for all bitcoin custody solutions. In different scenarios, services, and products multisig is crucial for the secure storage and transparency of bitcoin holdings. It allows parties with mutually aligned incentives to always be involved and honest in their economic practices.

Mutlisig structure offers several advantages over single-sig helping users shrink their risk service:

- **Enhanced Security:** By involving multiple, geographically and operationally distinct key holders, the security of the bitcoin holdings is significantly improved. An attacker would need to compromise multiple independent keys simultaneously to access the assets.
- **Reduced Dependency on a Single Person:** Multisig setups distribute control, preventing any single individual (depending on key distribution) from unilaterally accessing or transferring funds.
- **Mitigated Device Dependence:** Since multiple devices hold different keys, the compromise of one device doesn't grant access to the funds.[100]

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99 A BIP (Bitcoin Improvement Proposal) is a standardized document that proposes new features, processes, or changes to the bitcoin protocol for community review and adoption.

100 The Bitcoin Manual: What is the Difference Between a Single Sig and Multisig Wallet.

- **Resilience to Key Loss:** Losing a single key doesn't result in loss of funds, provided the required number of keys for transaction approval remains accessible.
- **Improved Governance:** For organizations, multisig wallets facilitate shared control over assets, ensuring that no single individual can unilaterally authorize transactions. This collective decision-making process enhances internal security protocols.

It also has tradeoffs that users should be aware of:

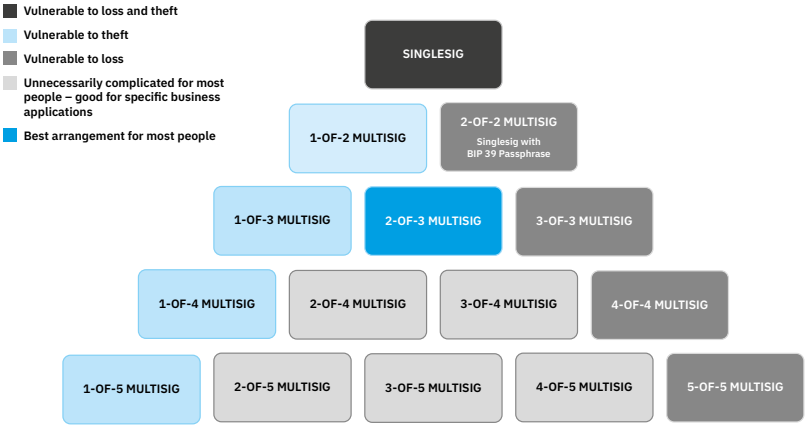
- **Complexity:** Multisig wallets are less convenient for regular transactions and can be more complex to set up, requiring coordination among key holders.
- **Transaction Fees:** They may result in higher transaction fees due to the increased data size associated with multiple signatures.

A crucial component of a multisig wallet is the wallet configuration file, which contains essential information about the wallet's structure. The elements include

- **Address Type:** Specifies the format of the bitcoin addresses used (e.g., P2SH, P2WSH).
- **Quorum:** Defines the total number of keys and the required number of signatures to authorize a transaction (e.g., 2-of-3).
- **Extended Public Keys (xpubs):** Public components of each private key, used to generate wallet addresses.
- **BIP32 Paths:** Derivation paths that outline how addresses are generated from the seed phrases.
- **Master Fingerprints:** Unique identifiers for each seed phrase, aiding in wallet reconstruction if necessary.

This graphic from Unchained helps bitcoin users understand the trade-offs between security, complexity, and recoverability when

choosing a wallet structure and key quorum. For most individuals, institutions, financial products, and bitcoin custody solutions a 2-of-3 multisig is appropriate. 2-of-3 provides the best "bang for your buck" balance between security and complexity. In certain business use cases a 3-of-5 may be an appropriate custody setup.



101

Types of Multisig Configurations

There are three primary approaches to implementing multisig wallets:

1. **Do-It-Yourself Custody (DIY):** Users independently set up and manage multiple keys, offering full control of the key quorum.
2. **Collaborative Custody (CC):** Users partner with an authorized service provider that holds one of the keys, combining self-custody benefits with professional support.

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101 Unchained: What is Multisig?

3. **Multi-Institutional Custody (MIC):** Users utilize an authorized service provider where private keys are distributed across multiple independent institutions.

Do-It-Yourself (DIY)

DIY multisig is a self-custody approach where a bitcoin user independently sets up and manages their own multisig wallet, without relying on an authorized service provider or custodian.[102] Users generate and secure their own private keys across multiple devices ensuring absolute full control over their bitcoin. Users select the number of keys (N) and the number required to sign (M). They then generate their seed phrases and private keys using various hot or cold storage solutions. Users configure a software wallet like Sparrow and associate the private keys with the vault's multisig address. Users then determine a safe and efficient way to store 6 pieces of information (3 signing devices, and 3 seed phrases). DIY multisig is the most self-sovereign and trust-minimized way to store bitcoin, but it requires technical knowledge, careful key management, and discipline. DIY is a perfectly acceptable custodial practice for individual holders, however, it may lack professional industry best practices.

Collaborative Custody (CC)

Collaborative custody is built on multisig, a basic capability of the bitcoin blockchain, and uses open standards such as HD keys and PSBTs to define wallets and transactions. In contrast to proprietary MPC-based methods, wallets protected through collaborative custody can be recovered in a variety of open-source tools operating on a shared standard. In a CC arrangement, with the help of an authorized service provider like Unchained, users can establish

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102 Unchained: DIY Multisig Vs. Collaborative Custody Multisig.

connections with trusted individuals, allowing them to share keys and jointly manage bitcoin vaults.[103]

This setup enhances security by distributing control across multiple parties. To set up a connection, users exchange unique codes within the Unchained platform. Once connected, they can share keys and collaborate on managing multisig vaults. By allowing users to share a single key across multiple vaults, CC streamlines key management, reducing the complexity and potential risks associated with one party handling multiple keys.

Holding keys for other people can be a burden—from fear of physical security breaches to keeping drawers full of seed phrases. CC makes it easy to manage one key which can be shared across many vaults. It also makes signing transactions more convenient and reduces the chance of a mistake. Key holders can initiate a transaction using the Unchained wallet, each independently sign and upload a PSBT file, and then broadcast the transaction to the network.

The Key Network Model

Dhruv Bansal and the team at Unchained have done extensive research on how they believe the CC landscape will evolve and the benefits of CC. Their thesis is that a distributed network of keys disperses control among multiple, independent entities. This approach enhances security by eliminating single points of failure and increasing the system's resilience against attacks or operational failures.[104]

A network-based key management system is inherently more robust. The compromise or loss of a single key does not jeopardize the entire system, as other keys in the network can maintain con-

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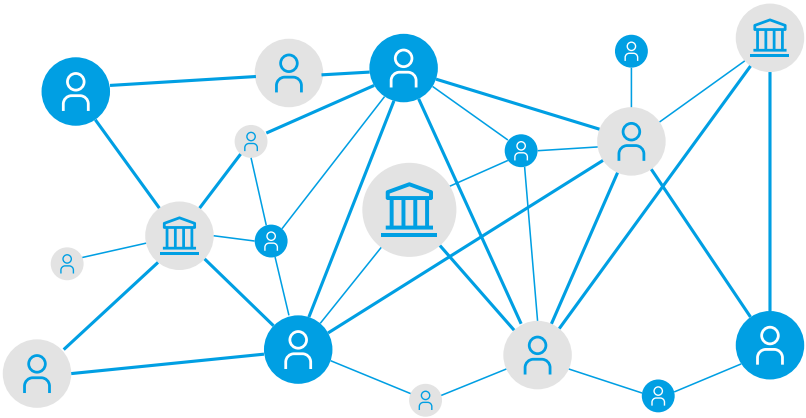
103 Unchained: Connections.

104 Unchained: Bitcoin Needs a Network of Keys. The graphic on page 126 comes from here as well.

trol and security. Such a system allows for dynamic adjustments, including adding or removing key holders without disrupting the overall security infrastructure. This flexibility is crucial for adapting to changing operational requirements or scaling the system. Establishing a network of keys necessitates a framework of trust among participants. Clear protocols and agreements are essential to define the roles, responsibilities, and procedures for key management and transaction authorization.



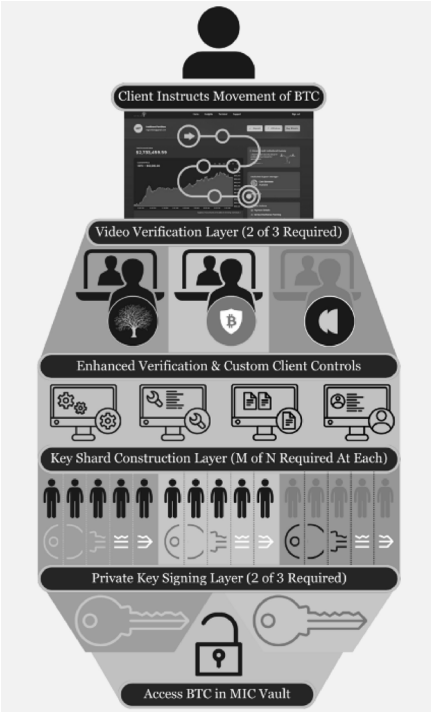
Multi-Institutional Custody (MIC)

MIC's security is rooted in its distributed nature. It introduces a multi-layered quorum system. Three independent institutions each hold one private key. Each key is further divided into cryptographic shards, shared across the institutions. To execute a transaction:

1. A 2-of-3 private key quorum is required across institutions.
2. Each institution must first reconstruct its key from shards before signing.

3. No single institution or individual can approve a transaction unilaterally.

Similar to CC, MIC offers robust security measures that eliminate single points of failure. In the MIC model there are no overlapping dependencies, minimizing collusion risk. Keys and shards are stored in separate locations further reducing the risk of a disaster. MIC enforces multiple verification layers before transactions can be executed. The step-by-step transaction flow includes video verification (performed by each institution), shard reconstruction, quorum based signing, and then finally the transaction being broadcast.



105

105 Onramp: Multi-Institution Custody Explained.

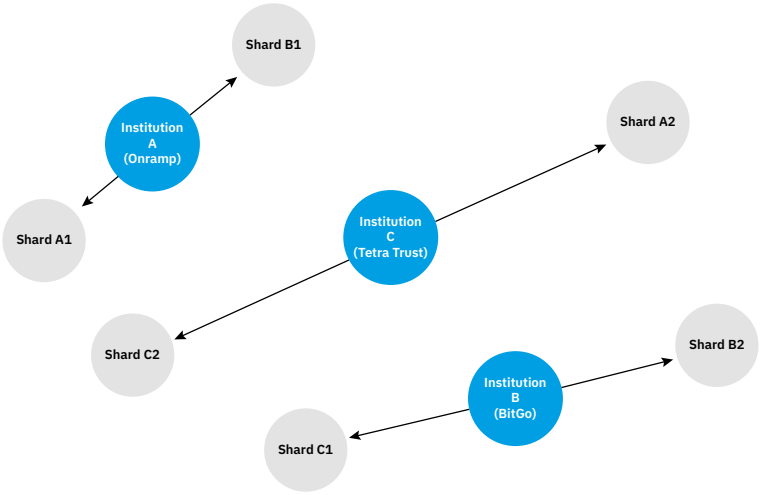
The "Quorum of Quorums" Model

Importantly, Onramp's MIC model does not use traditional seed phrases (12-or 24-word backups).[106] Instead, institutional-grade key generation occurs in air-gapped, high-entropy environments, ensuring maximum randomness and security. Each private key is broken into "m-of-n" shards and distributed across multiple parties. No single person or institution can reconstruct a full key. This prevents unauthorized access, while ensuring redundancy. MIC requires collaboration even at the level of key reconstruction. Here's why:

- **Sharded Key Storage Across Institutions:** Each institution's private key is split into multiple cryptographic shards. These shards are not all stored within the same institution—instead, they are distributed across multiple independent institutions.
- **Mutual Dependence for Reconstruction:** Each institution does NOT hold enough of its own key to reconstruct it alone. It must work with other institutions that hold some of its key shards in order to reconstruct its full key.
- **Key Reconstruction:** If an institution needs to sign a transaction, it must first gather a threshold number of its key shards. It then reconstructs its full key in an air-gapped environment offline.
- **Transaction Signing:** Once the 2-of-3 keys are reconstructed, they can be used to independently sign the transaction. After signing, the full key is discarded, and only the individual shards remain in secure storage.

106 Onramp: Multi-Institution Custody Explained.

Multi-Institution Custody: Shard Distribution & Key Reconstruction



OTHER TYPES OF CUSTODY SOLUTIONS AND TOOLS

Fully Custodial

Custodians alleviate users from the intricate responsibility of managing their own private keys.[107] In a custodial relationship, users delegate the protection of their private keys to the custodian, who utilizes web or mobile applications to authenticate users, authorize transactions, and subsequently move assets on their behalf. Despite their perceived benefits, custodians introduce specific risks that must be diligently managed:

- **External Threats:** Custodians are prime targets for hackers aiming to exploit vulnerabilities in their systems. Additionally,

107 BitGo: Safeguard Your Digital Assets.

unauthorized physical access to custodial facilities can lead to key compromises.
- **Insider Threats:** Malicious employees with access to private keys may misuse their privileges for personal gain. Mistakes by custodial staff can result in key loss or unauthorized transactions.
- **Account Credential Compromise:** Attackers may target users to gain access to custodial accounts, through phishing or social engineering schemes leading to unauthorized asset transfers.
- **Operational Failures:** Weak internal controls can expose custodians to various risks.
- **Regulatory Non-Compliance:** Failure to adhere to legal standards can result in penalties and loss of user trust.

To address these risks, custodians must implement comprehensive security and operational measures:

- **Robust Security Frameworks:** Deploy multi-layered security protocols, including encryption, multi-factor authentication, and regular security audits.
- **Stringent Internal Controls:** Establish clear policies and procedures to prevent unauthorized access and ensure proper key management.
- **Regulatory Adherence:** Maintain compliance with relevant financial regulations to enhance legitimacy and trustworthiness such as SOC 2 and SEC guidelines.
- **Transparency and Accountability:** Provide regular proof-of-reserves reports and undergo independent audits to assure clients of asset security.

The KPMG whitepaper "The Importance of Custodians in Bitcoin Adoption and Ownership" emphasizes that while self-custody aligns with bitcoin's decentralized principles, it presents substantial risks

that many users may find challenging to manage.[108] Custodians play an essential role in facilitating bitcoin adoption by offering secure and compliant solutions for private key management. However, the efficacy of custodial services hinges on their ability to implement robust security measures, adopt the bitcoin ethos, adhere to regulatory standards, and maintain transparent operations to mitigate inherent risks effectively.

Multi-Party Computational Custody (MPC)

MPC custody is a hybrid of both single and multisig—it is a distinct cryptographic approach to key management.[109] Unlike multisig, which relies on multiple distinct private keys to sign transactions, MPC custody splits a single private key into multiple encrypted shares across different parties or devices. These shares collaborate to sign a transaction without ever reconstructing the full private key in one place, making it technically a singlesig wallet, but with distributed control similar to multisig. MPC allows for dynamic adjustment of participants authorized to approve transactions, offering adaptability to changing organizational needs. How MPC works:

- **Key Sharding:** The private key is divided into encrypted shares using MPC proprietary protocols. Each share is stored separately, ensuring that the full key is never reconstructed on a single device.
- **Transaction Initiation:** When a user initiates a transaction, each participant holding a key share contributes to the signing process without exposing their share.
- **Signature Generation:** The wallet combines these partial signatures to create a complete, valid signature for the trans-

108 KPMG: The Importance of Custodians in Bitcoin Adoption and Ownership.

109 Fireblocks: What is MPC (Multi-Party Computation)?

action. This process occurs without any party having access to the full private key at any point.

An MPC setup is by failsafe. It comes with unique risks compared to bitcoin native multisig, singlesig, or traditional custody.[110]

- **Centralization Risk:** Many MPC implementations are offered by centralized service providers, meaning users rely on a third party for key management. Since the key shares are usually controlled by a single provider they could collude to access funds without user consent.
- **Regulatory Seizure:** If an MPC provider is compromised or forced to comply with legal orders, they may be able to reconstruct and seize user assets.
- **Single Points of Failure (Despite Distribution):** Unlike multisig, where each key is independent, MPC requires all key shares to be online and available for computation during signing. Server outages or downtime may render providers unable to sign transactions.
- **No On-Chain Redundancy:** Unlike multisig, which allows for key replacement on-chain, MPC requires the entire private key to be recomputed if a share is lost, making recovery more complex.
- **Proprietary Algorithms & Black Box Risk:** Many MPC solutions use proprietary cryptographic methods, meaning users cannot independently verify how key shares are generated, stored, and combined. Unlike bitcoin's BIP-32 and BIP-39 seed phrase standards, MPC implementations vary widely, making interoperability difficult.
- **Difficult for Users to Audit Security:** Since key shares never exist in full, users must trust that the MPC provider properly enforces security policies.

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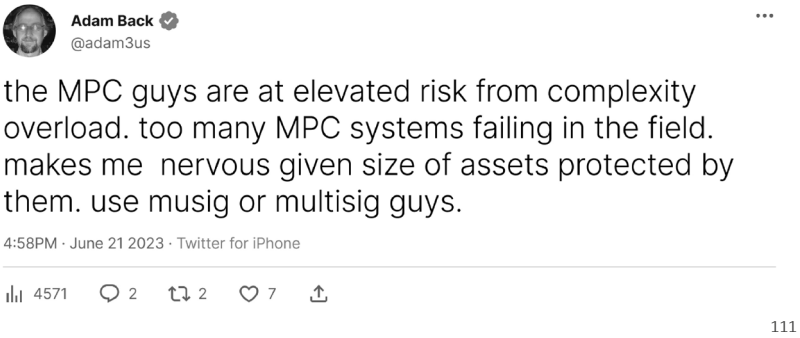
110 The Bitcion Manual: What is Multi-Party Computation (MPC)?

- **MPC Is Not Bitcoin-Native:** Unlike multisig, which is enforced on-chain, MPC is an off-chain cryptographic process. If a user loses access to a key share, they may not have an easy way to replace or regenerate it, unlike multisig, where keys can be rotated.

One of the godfathers of bitcoin itself, Adam Back, succinctly sums up his thoughts on the use and risk of MPC custodial services.



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Key Agents

A key agent is a trusted partner tasked with securing and operating one of the multiple keys within a collaborative custody multisig framework.[112] In this model, no single entity has unilateral access to the assets, thereby shrinking the risk surface area. Key agents offer security and support in a client's custody solution. Engaging key agents within a collaborative custody framework offers several benefits:

- **Enhanced Security**: Distributing keys among multiple agents mitigates the risk of total asset loss due to a single compromised key.

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111 https://x.com/adam3us/status/1682404709284323328

112 Unchained: What is a Bitcoin Key Agent?

- **Operational Flexibility**: Clients can tailor their custody arrangements by selecting key agents that align with their specific security needs and operational preferences.

The Bitcoinization of Finance is predicated on sound custody solutions where every type of user can take custody of their bitcoin. I expect the market for key agents to drastically increase to serve the needs of many different client profiles. Unchained shares this belief with me in their report "Bitcoin Needs a Network of Keys" where they bullishly state that a "market with more key agents provides a more robust custody offering: All other things being equal, more key agents means less bitcoin protected per key agent. If any one key agent were to be compromised, fewer clients would be impacted. And, because the market incentivizes the participation of many, competing, high-quality key agents, clients that are impacted should find it easy to replace their key agent with another."

Types of Key Agents[113]

Enterprise

These are typically larger companies with rigorous key management operations, serving enterprise clients. They often possess certifications such as SOC I & II, ISO, NIST, and Cyber Essentials, ensuring adherence to high-security standards. Examples include Unchained, Coincover, and BitGo. Some enterprise key agents may be classified as qualified custodians, allowing them to serve institutional investors who require regulatory compliance.

113 Unchained: What is a Bitcoin Key Agent?

Small Business Key Agents:
These agents, such as registered investment advisories or law firms, hold keys on behalf of clients without the extensive regulatory requirements of enterprise agents. They offer a balance between professional key management and accessibility for smaller clients. They are best suited for personal savings, small businesses, and those transitioning to self-custody.

Peer-to-Peer (P2P) Key Agents:
In this informal arrangement, individuals, often experienced bitcoin users, assist friends and family in securing their bitcoin through multisignature setups. While lacking formal certifications, this approach fosters community trust and shared responsibility. P2P provides a low-cost entry into bitcoin self-custody while maintaining some level of redundancy.

How Does it Work?

Individuals who use authorized service providers like Unchained have the ability to assign keys when creating a vault. One or more of those keys are eligible to be held by a key agent. Bitcoin transactions only need to be signed with private keys when they are being sent out of the individual's vault. If a key agent is included in the quorum of keys for a particular vault, the process proceeds as follows;

- Individual logs into Unchained's platform and starts a bitcoin transaction by singing it with one of their keys, submitting a request to the key agent.
- The key agent verifies the request through identity checks and security protocols.
- Transaction approval is granted if all criteria are met.
- The key agent signs the transaction with their private key associated with the vault but does not broadcast the transaction.

- Client or another signer completes the process and broadcasts the transaction.

Best Operational Practices

The role of a key agent is multi-faceted. They must hold a private key in a secure environment, provide signatures upon verified client requests, and ensure security compliance without directly controlling clients bitcoin. Their digital asset policies should include the following security measures and compliance frameworks to minimize risk.

- **Redundancy:** Implemented at every stage to ensure continuous protection of cryptographic key pairs.
- **Hardware Security:** Uses purpose-built, single-use devices secured following industry best practices.
- **Physical Security:** Enforces strict access controls at both office and secure signing locations, combining digital identification, restricted access, and continuous monitoring.
- **Cannot Independently Broadcast Transactions:** They only provide partial signatures, requiring additional signers.
- **They Never Maintain a Quorum of Keys:** Meaning they cannot unilaterally move bitcoin.
- **They Never Sign Transactions Alone:** All transactions require additional signers.
- **Comply With All Applicable Regulations:** Including financial and security laws.
- **Identity Verification and Fraud Prevention Protocols:** Maintains discretion to refuse transactions that seem fraudulent or unauthorized.

Customer Considerations

Individuals looking to use the services of key agents should perform extensive due diligence on the business practices, reputation, and terms of the agreement. Not all key agents are created equally and there are no central regulatory standards or bodies that explicitly oversee them. This isn't necessarily a bad thing, but individuals should be educated on what to look for, including;

- **Security protocols:** Clients must follow security policies, like transaction verification.
- **Legal liability:** Many key agents put all legal liability on the client.
- **Indemnification:** Key agents may be indemnified from losses.
- **Processing Time:** Time frame expectations for signature requests may vary.
- **Refusing Transactions:** Key agents may reserve the right to refuse signing a transaction.
- **Emergency Procedures:** Key agent's ability to sign transactions regardless of business disruptions.
- **Termination of Services**: Client's ability to end relationships and facilitate bitcoin movements upon such decisions.
- **Pricing:** Key agents may charge clients in a variety of fashions including AUM, flat fees, and usage.
- **Legal Policies:** Policies and procedures for arbitration and disputes.

Risk Factor	MPC Custody	Multisig	Singlesig
Private Key exposure	Split across multiple parties, but can still be reconstructed	Multiple independent keys, each holding partial control	Single key–total loss if stolen
On-Chain Support	No (Off-chain cryptographic process)	Yes (Bitcoin supports multisig)	Yes (Bitcoin supports singlesig)
Censorship Resistance	Medium (Dependent on the MPC provider)	High (Only rely on key holders)	High (Single key holder in complete control)
Complexity	High (Requires trust in cryptographic security)	Medium (Requires multi-key setup)	Low (Easy setup but risky)
Trust Assumptions	Relies on MPC service provider's honesty & security	No trust required beyond key holders	User must protect the single key but in complete control
Downtime Risk	If an MPC provider is offline, users cannot access Bitcoin	Depends on quorum of key holders being available	No downtime–user has full access
Regulatory Risks	Unclear classification (May be subject to financial regulations)	Strong self-custody model, legally recognized	Strong self-custody model, legally recognized

BITCOIN IN ADVANCED FINANCIAL STRATEGIES

Bitcoin is for everyone. During 2023 and 2024, there was a massive push from corporate finance to adapt the asset. Michael Saylor, Founder and Executive Chairman of MicroStrategy has been the undisputed leader in bringing bitcoin to this industry. I believe he will go down as a 'captain of industry' type figure for the work he has done to revolutionize finance. This chapter will dig into the capabilities, opportunities, and evolution of advanced bitcoin financial strategies.

BITCOIN TREASURY POLICY

Traditional corporate treasury assets (bonds, cash, etc.) and management strategies are increasingly ineffective. They suffer from poor inflation protection, limited appreciation potential, and dependency on central bank policies. Bitcoin, by contrast, provides strong inflation hedging, high appreciation potential, and monetary independence.[114]

Dangers of Inflation

The Consumer Price Index (CPI) is widely trusted by policymakers, businesses, and financial professionals as a measure of inflation. However, CPI has evolved into a heavily misleading and manipulated metric that fails to reflect real economic conditions.[115] Here's how:

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114 Acropolis: Bitcoin Treasury Playbook.

115 Acropolis: The Inflation Illusion.

- **Substitution Bias:** Assumes consumers switch to cheaper alternatives when prices rise.
- **Hedonic Adjustments:** Adjusts inflation downwards based on perceived product quality improvements (e.g. faster processors in phones), even if consumers do not benefit from them.
- **Exclusion of Key Costs:** CPI omits or downplays critical categories like housing, energy, and healthcare.
- **Geometric Weighting:** Reduces the reported inflation rate by lowering the impact of items experiencing higher price increases.

CPI adjustments create an artificial illusion of stability, leading companies to over-rely on fixed-income securities, which don't protect against real inflation. Inflation is not a static number—it's a vector affecting different industries and costs at varying rates. Corporate treasurers and CFOs who rely on CPI as a benchmark are subject to misjudging the true erosion of purchasing power. This jeopardizes a company's ability to effectively allocate resources for operations and long-term planning considerations. Business leaders must:

- Adopt alternative inflation measures (e.g. ShadowStats CPI, Chapwood Index).
- Reevaluate treasury strategies based on actual purchasing power erosion.
- Incorporate real inflation-adjusted hurdle rates into capital allocation decisions.
- Use diversified hedges, to protect treasury assets.

BITCOIN IS THE HURDLE RATE

Treasury instruments often fail to cover the Weighted Average Cost of Capital (WACC), leading to negative real returns. WACC

is a financial metric that represents a company's average cost of financing its assets through both equity and debt. It is a crucial benchmark for businesses to determine whether their investments and projects generate returns greater than their cost of capital. In traditional finance, WACC has served as a hurdle rate–the minimum rate of return that an investment must generate to be considered viable. Companies should only pursue investments that generate a return higher than WACC. The Early Rider team makes a compelling case for bitcoin being the new hurdle rate. Their "Bitcoin is the Hurdle Rate" report stresses the importance of diligent and effective capital allocation to investments/projects that generate a larger rate of return than bitcoin.[116] Identifying such investments/projects is very difficult which further emphasizes the importance of efficient and intentional capital allocation. This aligns incentives and decision making towards sustainability and value creation.

Bitcoin as a Treasury Asset

Bitcoin enhances balance sheet stability by serving as a strategic hedge against inflation with long-term capital appreciation potential. Even a small allocation (~5% of reserves) can provide these features without compromising liquidity. Bitcoin can help bolster balance sheets by extending runway leveraging its appreciation over time, especially its return above inflation. This also helps companies focus on long-term planning rather than relying on short-term funding cycles. The companies that fail to optimize their capital allocation will face competitors with stronger balance sheets due to bitcoin holdings.

116 Early Riders: Bitcoin is the Hurdle Rate.

Additionally, global governments' reliance on financial repression to manage debt creates a favorable macroeconomic environment for bitcoin adoption worldwide. Early adopters are poised to benefit from greater return profiles, financial resilience, and diversification advantages.

Corporate Finance Bitcoin Procurement Strategies

A corporate bitcoin strategy must align with a business' financial goals, cash flow, and risk tolerance. Determining a working capital threshold ensures bitcoin accumulation doesn't disrupt operational reserves. A structured bitcoin accumulation strategy minimizes risk while maximizing long-term value. It is important to remember that "time in bitcoin is greater than timing bitcoin"– long-term exposure matters more than market timing. Companies accumulating large amounts of bitcoin for their treasuries may deploy one the following purchasing strategies:

	Pros	Cons
Lump Sum	Immediate exposure with minimal administrative complexity	Vulnerable to volatility
Dollar-Cost Averaging (DCA)	Reduces price fluctuation risks	Requires ongoing purchasing discipline
Periodic Purchases	Allows businesses with seasonal revenue to accumulate bitcoin flexibly	Have to be agnostic to the time in the cycle
Time-Weighted Average Price	Spreads out purchases over a period to smooth price impact	May accumulate at higher prices and miss drops
Volume-Weighted Average Price	Executes purchases based on trading volume, optimizing liquidity	May execute at suboptimal price levels

They should also consider who they are working with to buy bitcoin. Pricing transparency, trade volume, settlement protocols, and custody should be factored into the decision making process. Using OTC Providers can reduce price slippage and ensure privacy. Lastly, companies need to seriously consider the available custody solutions that work best for them.

Analyzing Bitcoin Finance

Bitcoin fundamentally alters capital dynamics by acting as a store of value, a benchmark for investment returns, and a hedge against fiat debasement. Bitcoin can improve a company's capital stacks by retaining equity and removing the need for credit-based financing.[117] As businesses recognize these advantages, we can expect a shift away from traditional fiat-based treasury management towards bitcoin-centric financial models.

Analysis of these models and the companies that deploy them must also adopt. Proper evaluation includes regular reporting scenario analysis on bitcoins performance, liquidity impact, and role in different economic conditions. Bitcoin investments should be benchmarked against its ability to exceed WACC and its performance as an inflation hedge. Additional key performance indicators (KPIs) include:

- **Return on Bitcoin (RoB):** Measures bitcoin's return relative to initial investment.
- **Bitcoin Yield:** Evaluates growth in bitcoin holdings per share.
- **Volatility-Adjusted Return:** Assesses returns against bitcoin's price volatility.

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117 Early Riders: Bitcoin Will Change Capital Stacks.

- **Bitcoin as a Percentage of Treasury:** Monitors bitcoin's share of total treasury assets.
- **Liquidity Impact:** Tracks bitcoin's role in maintaining cash flow management.
- **ROE (Return on Equity):** Impact of bitcoin on corporate financial performance.

Internal Bitcoin Policy Frameworks

Companies planning to own bitcoin will benefit from the creation of a robust bitcoin treasury policy. Clear roles, responsibilities, and procedures must be clearly defined. To ensure bitcoin acquisition, custody, and governance are done in the best interest of its stakeholders, companies should consider the following key components of their internal frameworks:

- **Board Approval:** For significant transactions.
- **Custody Policy:** How bitcoin will be securely stored and managed.
- **Approved Providers:** For vendors in the ecosystem.
- **Custody Standards:** To define security protocols and signing responsibilities.
- **Treasury Management:** Clear guidelines for acquisition, liquidity, etc.
- **Market analysis:** For adjusting bitcoin holdings and assessing risks.
- **Clear Communication:** Narrative on bitcoin's role.
- **Regulatory Compliance and Reporting:** For transparency and legality.
- **Education:** Technical workshops and training for company personnel

FINANCIALIZATION OF BITCOIN–THE RISKS

Prominent bitcoiners in economics and finance like Lyn Alden and Caitlin Long have raised concerns about the risks of integrating traditional financial structures into bitcoin. Their primary worry is financial paper on top of bitcoin could compromise the asset. These are more than reasonable concerns ***if*** fractional reserve banking practices (paper claims exceed actual bitcoin) are applied to bitcoin. This would essentially mirror the fragility seen in fiat-based financial systems. That is why I am advocating for the Bitcoinization of Finance. Where bitcoin, the underlying asset, actually settles and trades in-kind. There are sound money native features built into bitcoin that easily facilitate this that aren't present in other assets. Nonetheless, we must be aware of the financial paper risks to bitcoin so we can stay vigilant.

Fractional Reserve Banking

If financial institutions create more claims on bitcoin than exist in reality—just as banks issue more deposit claims than they hold in cash reserves—bitcoin's scarcity could be jeopardized. This introduces the systemic risks inherent in the fractional reserve banking system, including liquidity crises and bank runs.

Rehypothecation

Rehypothecation occurs when the lender uses its rights to the collateral to participate in its own transactions. If bitcoin held by custodians is pledged as collateral multiple times, this creates multiple claims on the same underlying bitcoin. In a market downturn, this could cause cascading failures, where lenders find themselves exposed to massive losses as the underlying collat-

eral decreases in value. Unlike the dollar-based system, which has a lender of last resort (the Federal Reserve) to inject liquidity during crises, bitcoin has no such thing.

Duration Risk

Duration risk occurs when a financial institution mismatches the maturities of its assets and liabilities. If an institution funds short-term liabilities (like deposits) with long-term assets (like loans or bonds), it becomes vulnerable to liquidity crises when interest rates change or if depositors withdraw funds en masse. This is especially dangerous in a fractional reserve system, where banks only hold a small portion of their deposit liabilities in cash and invest the rest in long-duration assets. It is applicable to bitcoin if customer assets and liabilities are not fully backed by the corresponding amount of bitcoin.

Fiat Black Hole Exploit (FBHE)

Coined by Braiins' Chief of Product and Strategy, Tomáš Greif, FBHE is a hypothetical but increasingly plausible dynamic. The concern is that the unlimited supply of fiat money is weaponized to absorb large swaths of bitcoin for those who construct the appropriate financial structures to do so. The risk here is not just centralization, but fictionalization. Bitcoin becomes so intertwined with fiat-denominated products that it no longer serves its purpose as a sovereign bearer asset altering how it is perceived and used. If any well-capitalized entity uses fiat's infinite nature to accumulate a significant percentage of the bitcoin supply before the broader market is aware, it could shift the power dynamics of the asset without violating any consensus rules.

REGULATION & INDUSTRY STANDARDS

I personally hold small government values. It is my economic belief that laws protecting justice rooted in a moral order that upholds individual dignity, private ownership, and the principle of subsidiarity, helps everyone. I am advocating that the bitcoin industry, across sectors, proactively **self-regulate** to maintain trust, avoid excessive government intervention, and uphold ethical standards without bureaucratic inefficiency. Industry participants that act within the principles or spirit of bitcoin are incentivized to act as individual nodes aligned in a broader community/society.[118] Each node holds the other accountable, and a consensus standard is maintained. This creates strength and resilience because power and unity is projected from the bottom up as opposed to a top down centrally planned system.

CUSTODY

As previously mentioned, taking custody of your bitcoin is crucial to the Bitcoinization of Finance thesis. Nicolas Dorier emphasizes the importance of maintaining a strict definition of "custody" within the bitcoin ecosystem to preserve user autonomy and prevent regulatory overreach. He asserts "A system is non-custodial if it allows users a 'unilateral exit', meaning they can access and control their funds without needing permission from any third party."[119]

"In all situations, circumstances, and at all times, users must unequivocally have immediate access to their coins no matter what anyone else does."
—Guy Swann

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118 A **bitcoin node** is a computer running the bitcoin protocol that allows an individual to participate directly in the network by validating transactions, enforcing consensus rules, and contributing to the decentralized infrastructure of the system.

119 Nicolas Dorier: Erosion of the Meaning of Custody.

Dorier advocates for a clear and uncompromising definition of custody, emphasizing that preserving the distinction between custodial and non-custodial solutions is crucial for protecting user freedoms and preventing unwarranted regulatory constraints on bitcoin's decentralized nature. Nick goes on to say that "Attacks on language often pave the way for broader confusion or manipulation, so it is crucial to stand your ground and defend clarity."[120]

Guy Swann's commentary on the matter cements the importance of the industry proactively defining custody: "In legal and regulatory environments, it is absolutely crucial that we get the wording right so we always have a strong foundation to argue from. If we can define custody for ourselves, then we can always argue from our position and definition."[121] Guy astutely points out that as derivatives and layer 2's proliferate, it is important to understand the nuances, so we know who has control and under what conditions.

Guy also points out an important distinction between traditional custody and bitcoin custody. "The fiat world can't define custody, because nothing can really be owned, it's all a form of credit." Bitcoin is the first digital thing you can own. We must always remain diligent. It stays this way. If we create artificial constraints otherwise, we have failed.

The Bitcoinization of Finance thesis is predicated on bitcoin's ability to be custodied by any user. A critical component of an honest bitcoinized financial system. Having a strict definition of custody allows us to better advocate for and implement these policies.

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120 Nicolas Dorier: Erosion of the Meaning of Custody.

121 Bitcoin Audible: Read 872–Erosion of the Meaning of Custody.

COMMODITY VS. CURRENCY

There is a growing push in policy circles to define bitcoin strictly as a commodity, excluding its currency function.[122] This is the same way gold has been treated. Sound money is a threat to fiat financial systems and certain power structures will lobby for it to only have financial value and not monetary value.

This approach ignores its economic reality—bitcoin is actively used for payments and competes directly with fiat. The gradual adoption of bitcoin as a savings vehicle is leading to its increased use in transactions, naturally displacing fiat money over time. Since bitcoin is the best store of value, people will naturally want to store more wealth in it over time. As bitcoin holdings grow, the next logical step is to start using it as a currency for daily transactions, because spending fiat means holding an asset that loses value. At this point, the artificial distinction between money and currency collapses.

122 TFTC: #593 Bitcoin is Money and Currency with Parker Lewis.

This is a positive feedback loop that reinforces bitcoin's role as both money and currency. It can be interrupted with regulation that prevents individuals from using the asset/network in its native form. Capitalism itself will be threatened as existing/future companies with economic interest to service those users will be prevented from doing so. We must learn from the past and protect the unique attributes that make bitcoin both a money and currency so they don't get regulated away.

REPEAL OF STAFF ACCOUNTING BULLETIN (SAB) NO 121

On January 23, 2025, the Securities Exchange Commission (SEC) rescinded SAB 121 with the issuance of SAB 122, effectively nullifying the bulletin. SAB 121 created guidance for banks that stated if they wanted to custody bitcoin, they had to treat it as a liability.[123] This meant they needed a correlating asset on their balance sheet, to offset the liability. It also did not allow banks to implement fair-value accounting, forcing them to report losses but not gains. If banks tried to custody bitcoin, their balance sheets would appear riskier and potentially penalizing in the eyes of regulators. SAB 122 repealed the previous accounting principles and enabled banks to custody bitcoin. Simply allowing banks to custody bitcoin as an asset can expose their customers to sound money. Banks are obviously large players across a range of financial services and products. SAB 122 expands the total addressable market and overall capabilities for scaling bitcoin financial services.[124]

123 Joe Consorti: Trump's Repeal of SAB 121 and Executive Order on "Digital Assets" Marks a Turning Point.

124 Ego Death Capital: Too Big to Fail Banks & Bitcoin Custody.

FINANCIAL ACCOUNTING STANDARDS BOARD (FASB) 2023–08

The FASB issued Accounting Standards Update (ASU) 2023–08, introducing significant changes to the accounting treatment of bitcoin.[125] This update requires entities to measure bitcoin at fair value each reporting period, with changes recognized in net income. There are many benefits of fair value accounting:

- **Accurate Financial Reporting:** By measuring bitcoin at fair value, financial statements more accurately reflect the current market value of holdings, providing stakeholders with transparent and timely information.
- **Recognition of Gains and Losses:** The new standard allows for both unrealized gains and losses to be recognized in net income.
- **Enhanced Corporate Adoption:** Aligning the accounting treatment of bitcoin with traditional financial assets reduces complexity and encourages additional market participation.

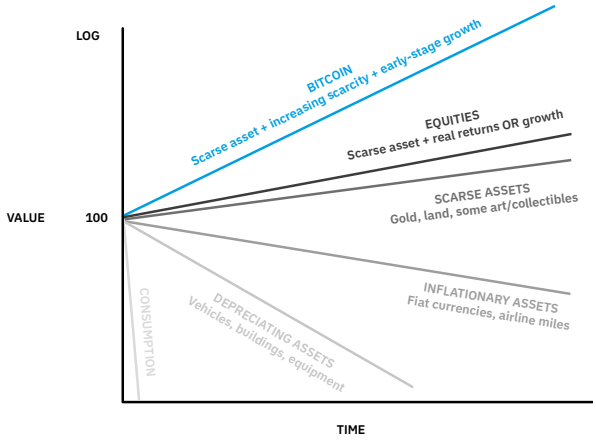
125 FASB Accounting Standards Update: Intangibles–Goodwill and Other–Crypto Assets (Subtopic 350–60).

THE INVESTMENT CASE FOR BITCOIN

Bitcoin is an entirely new asset class. To understand its potential as an investment, we must understand bitcoin's context in the greater macro-economic picture. The current financial system is built on an inflationary fiat system that systematically erodes purchasing power. Meanwhile, bitcoin operates on a fixed-supply model, ensuring that it preserves value over time. They are two fundamentally different foundations.

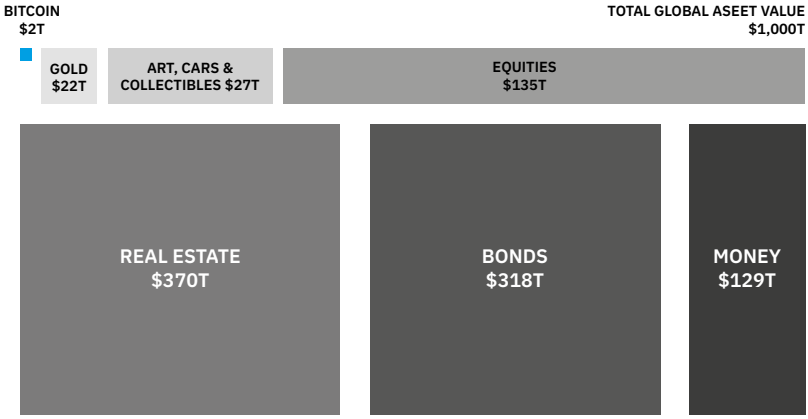
BITCOIN'S FULL POTENTIAL

My personal investment beliefs on bitcoin have been heavily influenced by Jesse Meyer's thought piece titled "Bitcoin's Full Potential Valuation."[126] The article explores bitcoin's prospective valuation by comparing it with other traditional store-of-value assets as opposed to categorizing bitcoin into an industry itself (payments, banking, etc.)



126 One-In-A-Species: Bitcoin's Full Potential Valuation.

Jesse estimates that global assets represent about $900T in value and identifies that as bitcoin's total addressable market in the world's balance sheet.



Bitcoin advocates often mistakenly assume that bitcoin's potential valuation is limitless. While this may hold true in dollar terms—given the infinite potential for currency debasement, it is not a realistic expectation when measured in real terms relative to other assets. This is the key point. Remember, money is a market. Assets are in competition to attract money and the assets with the best value proposition will attract the most money.

Jesse assesses each store-of-value asset current value and compares it to his estimate of what percentage of that value bitcoin could capture once its unique properties are widely understood.

Store-of-Value	Total addressable market ($T)	Bitcoin capture	Bitcoin full potential ($T)
Gold	12	50%	6
Cars, other collectibles	6	5%	0.3
Fine art	18	5%	0.9
Stock Market	115	15%	17
Real Estate	330	15%	50
Bonds	300	30%	90
Money	120	30%	36

He ultimately estimates that bitcoin's full potential is to consume 25% of the world's value. With the $900T global asset value, this puts bitcoin at roughly $225T market cap.

FORECASTING BITCOIN GROWTH

Forecasting is a difficult endeavor, especially in a new asset class like bitcoin. Michael Saylor opensourced the "Bitcoin24" model to help bitcoin users estimate its price appreciation within the greater context of an investment portfolio.[127] This model provides a robust tool with logical considerations investors can take into account when determining their bitcoin investment strategies. Bitcoin24 does not model bitcoin's volatility, as its volatility profile has evolved and will continue to do so in the future. This is a simplified model intended to show possible long-term outcomes of adopting a bitcoin standard.

127 Michael Saylor: Bitcoin24Model.

Key Variables

Compound Annual Growth Rate (CAGR)

The foundational assumption in the Bitcoin24 model is based on bitcoin's past CAGR and its trajectory since inception.

- Bitcoin's CAGR since 2009 has been around 128%.
- The model assumes a slowing rate of return as bitcoin matures.
    - The S-curve adoption model suggests that early growth is exponential, but slows down as market saturation approaches.
- The base case assumes a rate of return starting at 50% in 2025, declining gradually by 2.5% per year until reaching a steady state of 20% by 2037.
    - This aligns with historical bitcoin price patterns following previous halving cycles.
- The assumption that bitcoin will maintain double-digit CAGR for the next two decades is based on the thesis that it will absorb capital from other store-of-value assets.

Inflation and Innovation Growth Rates

The model incorporates inflation and economic innovation growth assumptions to compare bitcoin against traditional assets.These estimates bridge the gap between historic fiat debasement trends and the real-world economy's ability to innovate and absorb inflationary pressures. A key consideration is that the higher the inflation rate, the more attractive bitcoin becomes as an asset for capital preservation.

- The model assumes an average annual inflation rate of 6%, which is higher than the Federal Reserve's 2% target, but reflects reality when considering:
    - M2 money supply expansion (~7–10% per year).

    - Fiat currency devaluation trends.
    - Rising national debt and deficit spending.
- The default innovation growth rate starts at 4%.
    - It assumes technological advancements and economic productivity improvements offset some of the negative effects of inflation.
    - This accounts for GDP growth, automation, AI adoption, and digital transformation, which boost productivity.

Asset Monetization and Demonetization Assumptions

The model evaluates bitcoin's market share capture from traditional assets, such as gold, real estate, equities, bonds, and currencies as highlighted in the above section.

Microeconomic Behavior and Investor Profiles

The model simulates the investment decisions of different types of investors and their portfolio allocations to bitcoin. This breakdown captures real-world investor psychology. Personas include;

- **Normie (0% Bitcoin)** → Invests only in traditional assets.
- **Bitcoin 10%** → Modest bitcoin exposure.
- **Bitcoin Maxi (80%)** → Heavy allocation to bitcoin but no leverage.
- **Double Maxi (100% + debt)** → Uses leveraged debt to buy more bitcoin.
- **Triple Maxi (100% + double debt + tax strategy)** → Optimizes for maximum bitcoin accumulation and relocating to a low-tax jurisdiction.

Corporate and Nation-State Scenarios

The model applies bitcoin accumulation strategies to corporations, institutions, and nation-states in an attempt to accurately represent the growing trend of large scale bitcoin adoption. This section can have a profound impact on an individual investor's thesis given the argument for large demand in bitcoin and a finite supply of bitcoin.

- Corporations
  - Assume treasury reserves are allocated partially or fully to bitcoin.
  - Models the impact of debt-financed bitcoin purchases on corporate balance sheets.
- Indebted Nations
  - Assumes debt-heavy countries use bitcoin as a reserve asset to escape fiat devaluation.
- Wealthy Nations
  - Model countries allocate reserves to bitcoin as a hedge against fiat devaluation.

IN CONCLUSION

The integration of bitcoin into traditional finance is inevitable, but whether that integration strengthens or weakens bitcoin depends on how the ecosystem handles these risks. If bitcoiners allow the proliferation of paper bitcoin and fractional reserve practices, bitcoin could end up facing similar systemic risks as fiat. However, by adhering to bitcoin's core ethos—decentralization, transparency, and self-sovereignty—the asset can remain the hardest money in history, immune to the financial manipulations that have plagued traditional banking systems.

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