THE BITCOIN DECK

V.01 02.22.2022

HISTORY OF MONEY

The invention of money to assign value and transact has occurred thousands of times across thousands of civilizations, all independent of each other.

EXAMPLES

→ Cattle

→ Seashells

→ Rai Stones

→ Aggry Beads

→ Cigarettes in prison

→ Salt

→ Precious Metals

IDEAL PROPERTIES OF MONEY

Beyond → Store of Value / Medium of Exchange / Unit of Account

01
DIVISIBILITY
Subdivide and recombine at scale

02
DURABILITY
Persistence over time (doesn't degrade)

03
RECOGNIZABILITY
Verifiable authenticity and value

04
PORTABILITY
Secure mobility across space and time

05
SCARCITY
Resistant to counterfeiting or supply inflation

06
FUNGIBILITY
All units are the same regardless of time and place

GOLD

"That restaurant is a gold mine"

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→ Everyone knows gold is valuable

→ Beyond value, very few can identify why gold is the best money

Scarcity

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→ Of all the monetary metals, gold is the most scarce

→ Gold exhibits the lowest and most reliable inflation rate

PITFALLS OF GOLD

Gold has been used for 5,000 years, but it lacks three key properties

01

DIVISIBILITY

High value to weight - which is why silver has also been used as money

02

PORTABILITY

Very heavy and high cost to transport

03

RECOGNIZABILITY

Must test the authenticity at the time of each transaction - it lacks convenience

Eventually people realized that gold custody could be centralized

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→ Gold is stored in a secure warehouse

→ The warehouse provides an official certificate of ownership

→ The certificate removes the need to verify authenticity

→ Owners are forced to trust the business running the warehouse

→ This is how gold backed securities were introduced

The gold certification business led to centralized gold custody in fewer hands

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→ Private warehouse businesses → banks **→ central banks**

→ Central banking is the business governments have successfully controlled throughout history

GOVERNMENT MONEY

Historically, governments have mastered the art of centralizing the world's money (gold) and controlling the currency

As soon as money lost its tether to gold, it became purely government money - this is called fiat money

We trust the value because the government says so, which allows them to create and issue money whenever it chooses

Although most governments backed currencies with gold, they eventually moved away from that standard

Fiat money is issued by the state with the full "faith and credit" of the issuing government

This dynamic has made every single market participant 100% reliant on centralized entities to manage the money

TRUST

Today we rely on centrally controlled institutions for rules enforcement, record keeping, adjudication of the system, wealth management, etc.

EXAMPLES

→ **Central Banks**
Govern monetary policy

→ **Commercial Banks**
Custody and manage assets

→ **Payment Processors**
Mediate consumer transactions

Traditional financial systems founded on a trust-based model fail to provide predictable economic assurance.

Ideally, value is exchanged globally and freely. Currently, centralized parties determine the eligibility of participants and control the flow of capital.

Figure 1: The evolution of changes in capital controls since the 1980's
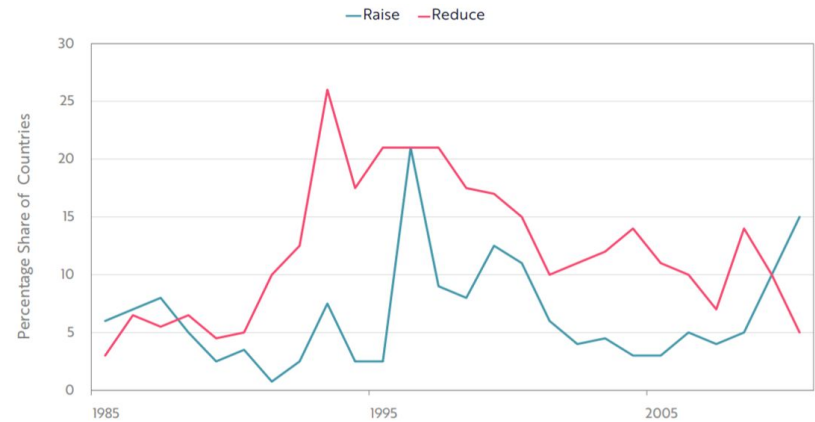
Source: ARK Investment Management, 2020; Data sourced from the European Central Bank, https://www.ecb.europa.eu/pub/ pdf/scpwps/ecbwp1415.pdf

Wealth must be protected and wholly owned.

Centrally controlled wealth is guaranteed only if institutions are willing to protect it.

Subject to weak and unpredictable property rights, citizens must rely on protection inherent in the assets themselves.

Figure 2: Asset protection spectrum

Digital Cash | Physical Cash | Real Estate | Gold

Shallow Protection
Protection is derived from authority

Deep Protection
Protection is derived in the absence of authority

Source: ARK Investment Management, 2020, Coin Metrics
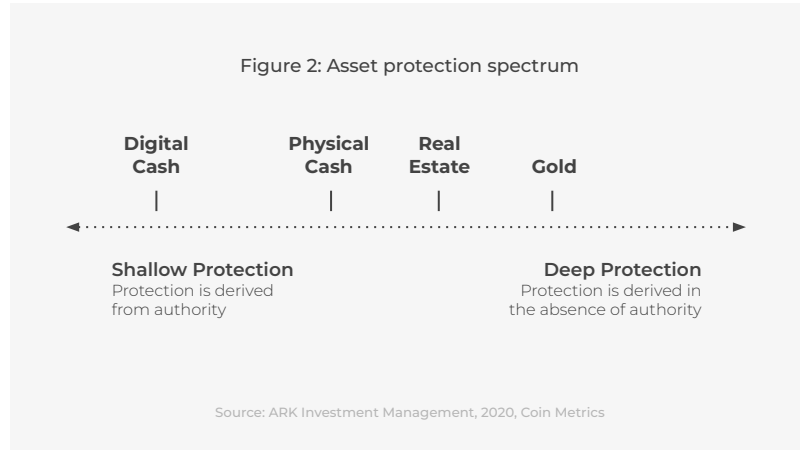
Rules must be enforced reliably and predictably.

Centrally controlled institutions enforce and change rules arbitrarily.

Figure 3: Share of countries whose domestic currency lost more than half of Its purchasing power over a 5-year period
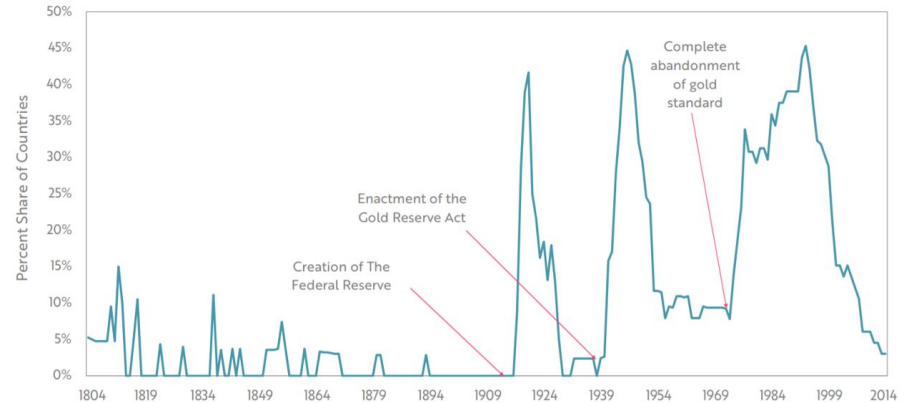
Source: ARK Investment Management, 2020, Data sourced from Carmen and Rogoff: This Time is Different

Integrity of the system must be verifiable.

Centrally controlled institutions lack transparency and auditability.
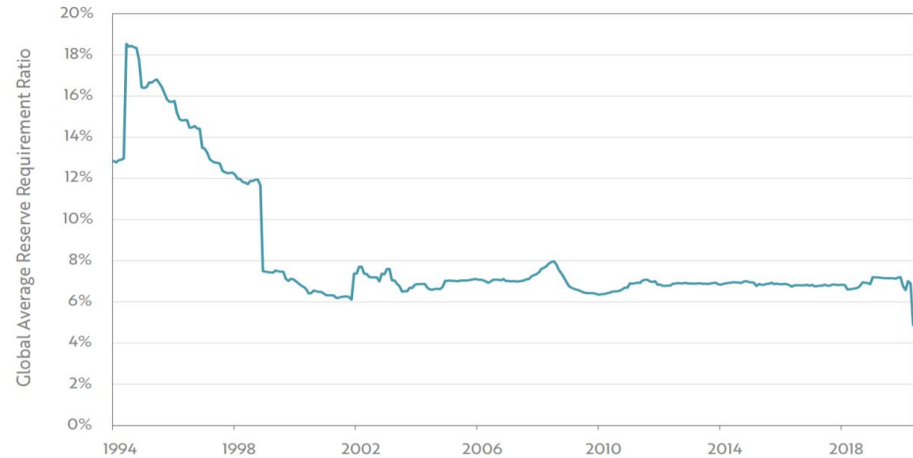

Figure 4: Global average reserve requirement ratio

Source: ARK Investment Management LLC, 2020, CEIC

"To a significant degree, the financial system's weakness today is a function of a trust-based model controlled by centralized institutions. Human bias and error exposes participants to mismanagement, creating an unpredictable environment for economic activity."

→ Yassine Elmandjra, Analyst at ARK Invest

"Commerce on the Internet has come to rely almost exclusively on financial institutions serving as trusted third parties to process electronic payments. While the system works well enough for most transactions, it still suffers from the inherent weaknesses of the trust-based model."

→ Satoshi Nakamoto, Bitcoin creator

INFLATION

What is inflation?

→ Increase in the money supply - "printing money"

Why should you care? Scenario:

→ You live on a remote island with 100 other people

→ There are 10k rare beads used as money circulating around the island, and your own 500 beads

→ One day a ship arrives from a foreign land - from a place that manufactures these rare beads

→ The ship is carrying 100,000 beads

→ People on the ship interact in the island economy with their "counterfeit" beads

→ The value of your 500 beads just dropped significantly

There is an incentive for any single entity to increase the supply of a widely accepted money.

→ Show up with a ship full of beads

→ Discover a new gold mine

→ Print money

Any person with the ability to monopolize the production of money has a mechanism to take value from others using that money as a store of value or medium of exchange.

It's a mechanism for selectively creating wealth concentration by stealing from the poor and giving to the rich.

# Isn't inflation under control?

No, the government currently reports CPI (Consumer Price Index) at 7.5%, but that doesn't reflect true inflation.

Over the years, the government has omitted critical items that reflect true consumption like food and energy.

Inflation has picked up as the US recovers from the pandemic

Consumer price index, change, %, year on year

Core   Headline
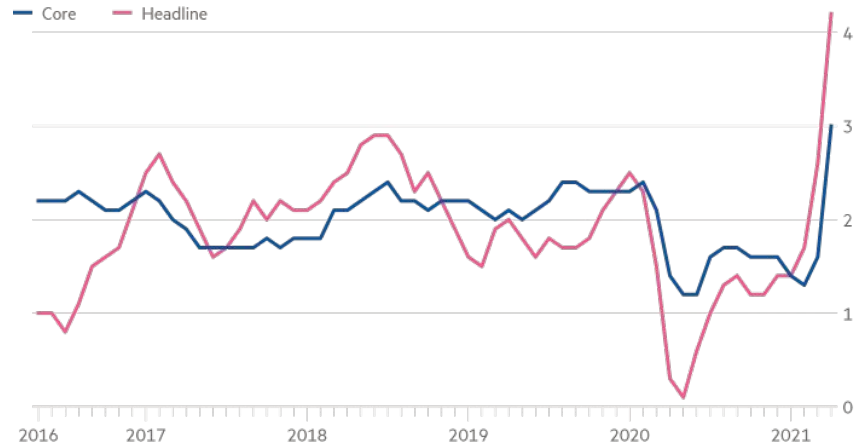
Source: Refinitiv
© FT

True Inflation -v- CPI

The Chapwood Index reflects the true cost of living increase in America. It reports the unadjusted actual cost and price fluctuations of the top 500 items on which Americans spend their after-tax dollars in the 50 largest cities in the nation.

The Chapwood Index and other sources indicate inflation at least **2X the government reported CPI.**

"The data solidly supports what many have suspected for years. The CPI no longer measures the true increase required to maintain a constant standard of living. This is the main reason that more people are falling behind financially, and why more Americans rely on government entitled programs."

→ Ed Butowsky, Chapwood Index Founder

A DOLLAR'S WORTH
PURCHASING POWER OF THE U.S. DOLLAR

Source: Bureau of Labor Statistics · Consumer Price Index, Morris County Library of Historic Prices
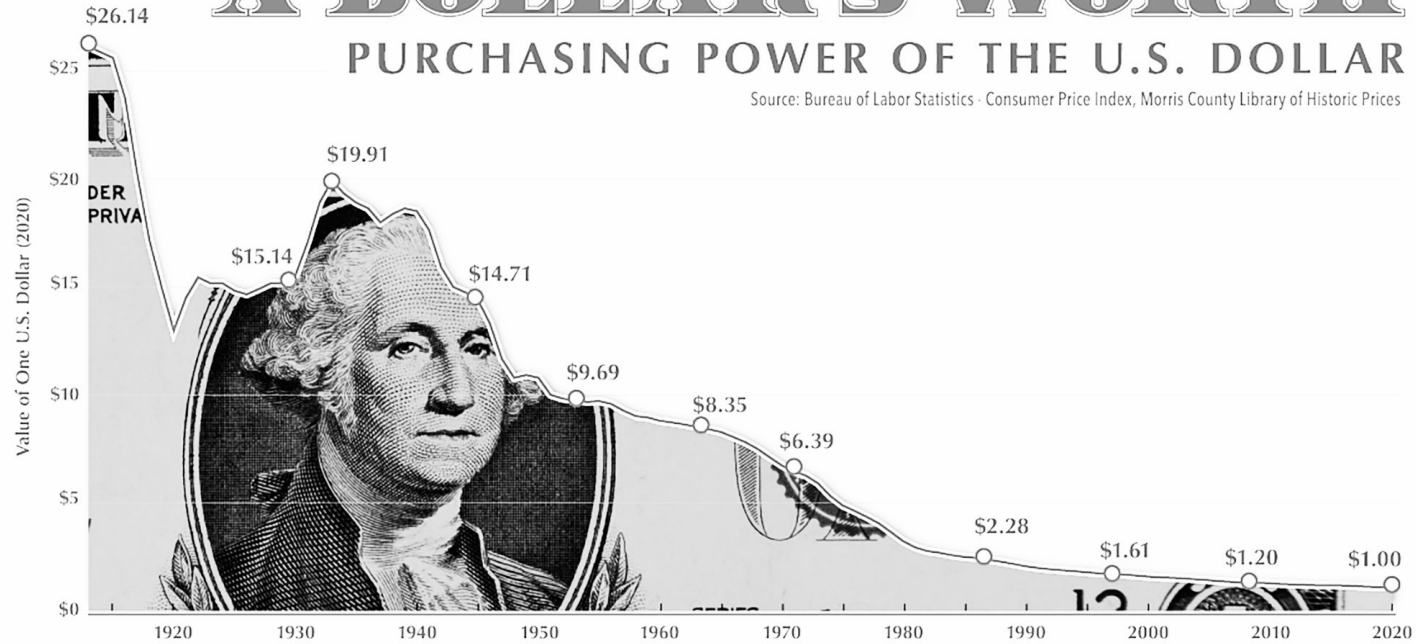
Why do governments do this?

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Short-term interests need to be served a the expense of long-term interests

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Correct poor decision making - which encourages more poor decision making

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Fiat currency gives governments the ability to confiscate wealth from its citizens to service past mistakes

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This has created the massive wealth concentration that exists today and is the root of many societal issues

"The root problem with conventional currency is the trust that's required to make it work. The central bank must be trusted not to debase the currency, but the history of fiat currencies is full of breaches of that trust. Banks must be trusted to hold our money and transfer it electronically, but they lend it in waves of credit bubbles with barely a fraction in reserve."

→ Satoshi Nakamoto, Bitcoin creator

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If fiat currency is headed toward self-destruction, what's the solution?

BITCOIN

What is Bitcoin?

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→ Bitcoin is free and openly available computer code

→ Any individual can choose to download and run the software

→ A computer with an internet connection is all that's needed

→ "Tokens" associated with this software are called Bitcoins

→ "Tokens" transacted between individuals are recorded on a public ledger

→ The network of computers running this software are called the Bitcoin Network

How Does Bitcoin Work?

USERS / OWNERS

You can own Bitcoin by simply installing a Bitcoin wallet on your computer or phone, then purchase BTC.

You can disclose your address to someone who wants to send you Bitcoin, or vice versa - similar to email.

TRANSACTIONS

https://youtu.be/YIVAluSL9SU
0:00 - 2:44

MINING

https://youtu.be/GmOzih6I1zs
0:00 - 0:37

Bitcoin mining is proof of work

Bitcoins are payment to miners
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→ Every 10 minutes, a new block is added to the blockchain, and new Bitcoins are created and issued

→ A complex math problem must be solved for new Bitcoin to be issued

→ The first miner to solve the math problem is rewarded new Bitcoin

→ A block is then added to the chain

Miners require electricity
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→ The energy that miners contribute to the network is translated into network security

→ The more expensive Bitcoin becomes the more difficult it is to manipulate

→ Miners seek the least expensive electricity to increase profitability, which distributes mining across the world's most sustainable options - improving ESG dynamics

BITCOIN PROPERTIES

Why is Bitcoin good money?

01. DIVISIBILITY

Subdivide and recombine at scale

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→ Bitcoin is pure digital information - 1's and 0's

→ Each Bitcoin is divisible into 100,000,000 units, called Satoshis - "sats"

Why is Bitcoin good money?

02. DURABILITY

Persistence over time (doesn't degrade)

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→ Bitcoin is information stored in a an ever expanding distributed fashion

→ There are thousands of computers worldwide running nodes

→ Bitcoin node distribution is geographically diverse

→ Every node running the software has a complete copy of all historical transactions

→ 99% of all Bitcoin nodes could be eliminated, and the network would still function

Why is Bitcoin good money?

03. RECOGNIZABILITY

Verifiable authenticity and value

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→ The Bitcoin Network is an army of computers (nodes) - each verifying the other's work

→ Each computer validates network rules to prevent counterfeiting and inflation

→ Each node ensures transaction and balance accuracy without a trusted third party

→ These principles are universally accepted by hundreds of millions of Bitcoin users

Why is Bitcoin good money?

04. PORTABILITY

Secure mobility across space and time

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→ Bitcoin can be transacted or moved at light speed through layer 2 apps (Lightning Network)

→ Bitcoin can be custodied through private keys, which are infinitely portable and secure

Why is Bitcoin good money?

05. SCARCITY

Resistant to counterfeiting or supply inflation across space and time

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→ Anything physical is just a product of the time required to create it

→ If the entire world mined gold today, the supply would surge and the price would plummet

→ Incentive structure, network rules and distributed consensus ensure only **21M BTC** will ever exist

→ Bitcoin is the only money in history with a **0% inflation rate**

Why is Bitcoin good money?

06. FUNGIBILITY

All units are the same regardless of time and place

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→ Fiat money is fragmented and different around the world

→ Bitcoin is the only money that maintains its status - one Bitcoin is always one Bitcoin

BITCOIN FUNDAMENTALS

Trust

→ Bitcoin removes politics

→ Bitcoin is beyond isolated control

→ It is man-made, but no longer controlled by a man - resistant to any political decision

Fiat monetary policy

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→ Print money slowly over time to increase nominal value of goods, services and assets

→ When there's an economic shock or contraction, create even more currency

→ Issue it selectively to stimulate the economy (Quantitative Easing "QE")

Bitcoin monetary policy

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→ Establish an initial inflation rate

→ Establish a pace at which that inflation rate trends toward 0

→ For every block that is added to the blockchain, issue "x" new coins

→ Every 4 years, cut that issue number in half (this decay function reaches 20M BTC by 2140)

→ Bitcoin's predictable inflation rate declines over time (Quantitative Tightening)

→ When supply approaches 21M, inflation approaches 0%

Bitcoin inflation over time
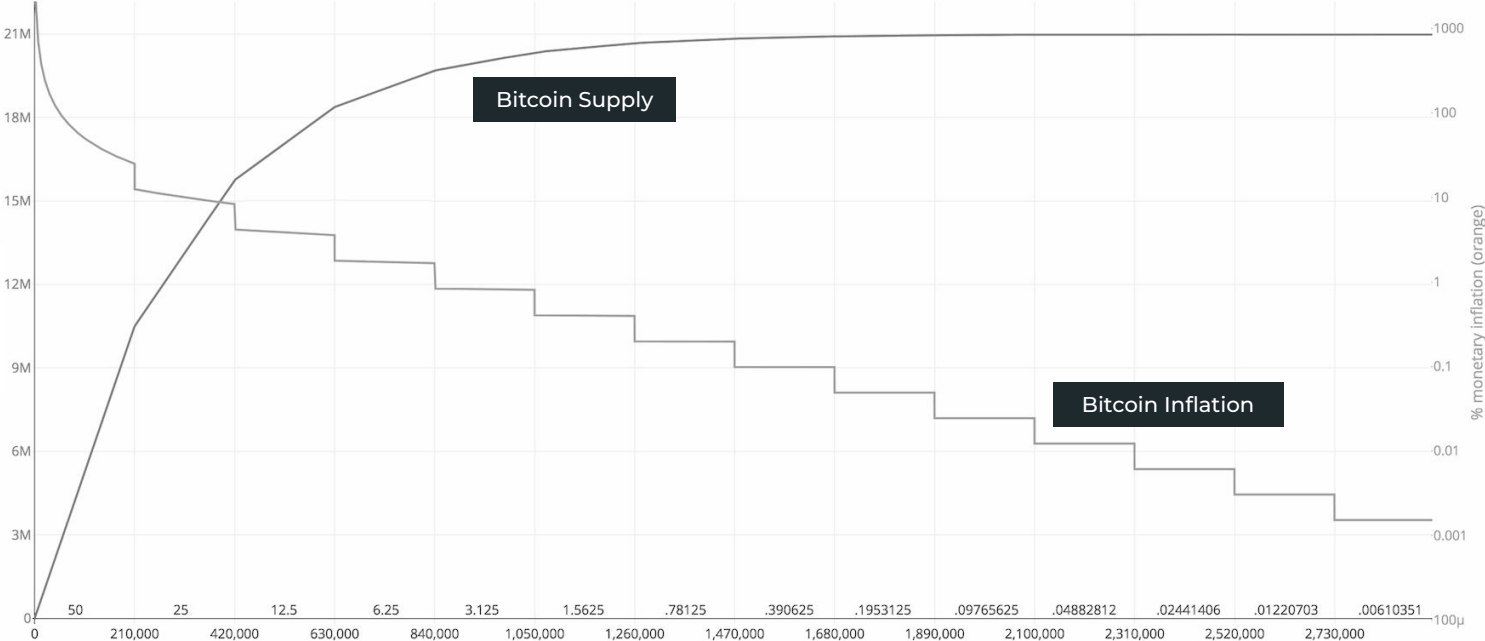
Decentralization

→ No centralized entity is in charge

→ No institution can manipulate it

Figure 5: Financial System

Trust-Based Financial System	Economic Function	Trust-Minimized Financial System
Centralized Payment Processor	Transaction Settlement	The Bitcoin Network
Commercial Bank	Custody and Asset Management	
Central Bank	Monetary Policy	
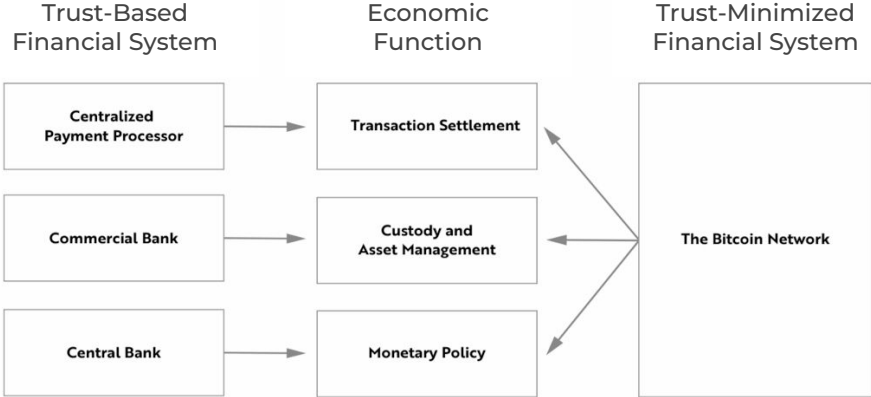
Source: ARK Investment Management LLC, 2020, Coin Metrics

Supply

Every 4 years, the supply of Bitcoin
issued per block decreases 50%

Demand

→ Transactional use

→ Speculation

→ $ debasement hedge

→ Metals and bonds demonetization

→ Real estate and equities demonetization

→ Sovereignty and mobility

→ Corporate and gov. balance sheets

→ Layer 2 & 3 application adoption
(Lightning Network, Cash App, Strike, etc.)

→ ESG momentum

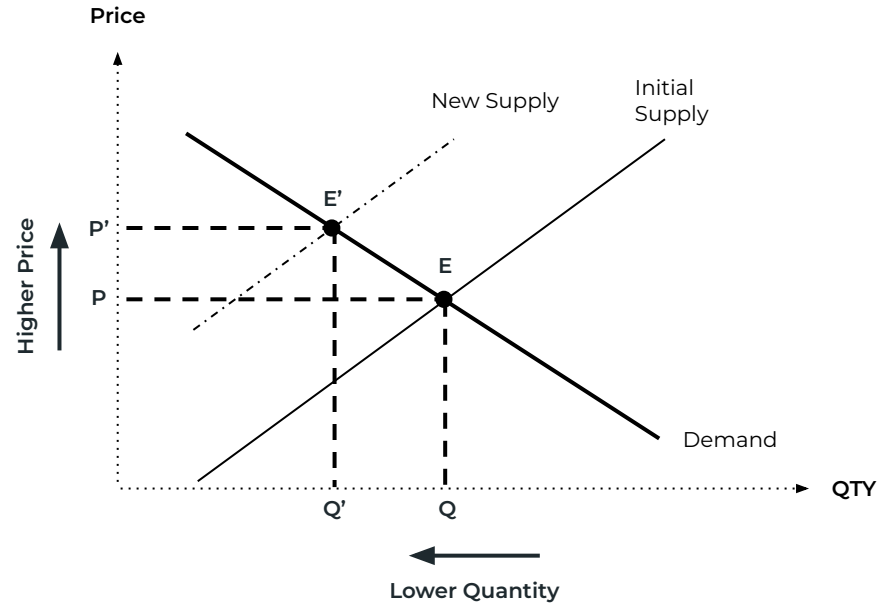*"E" - Counterintuitively, Bitcoin will prevent further global warming by incentivising green energy development, removing energy resource location limitations, and by improving load balance to the existing power grid.*

"S" - Bitcoin improves our social construct by reducing the wealth imbalance caused by currency debasement and encourages a low time preference, which improved decision making and self care.

"G" - Bitcoin truly democratizes governance by removing centralized monetary controls and returns power to the masses. Governance becomes clearer as the rules of the game are fixed and access limitations are removed from the population.

Price

Bitcoin's programmatic nature is reflected in the price chart - demand and scarcity drives price upward

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→ Derivatives (e.g. futures, options, etc.) affect short-term price - but maturity will smooth price volatility and manipulation over time

→ Bitcoin is considered a risk-on asset and correlated to securities markets - as it matures, it will decouple and simultaneously become a risk-off and growth asset

PlanB@100trillionUSD - PlanBTC.com
- Stock-to-Flow Model
- Logarithmic Regression
- BTC price (color = RSI)

Governance

MINERS

USERS

DEVELOPERS

NODES

Miners can decide to
run implementation
created by developers

Nodes can threaten to
exclude transactions
from miners

Users can give
feedback to
developers

Users can
incent merchants
who run nodes

Developers write the software provisioned to nodes

Arrows indicate
power
relationships

A

has power
over

B

Source: Nic Carter, A Cross-Sectional Overview of Cryptoasset Governance and Implications for Investors, https://coinmetrics.io/papers/dissertation.pdf
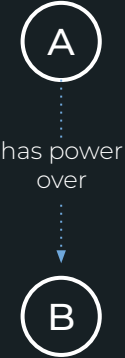
Virtuous cycle

Supply scarcity and demand drivers

Accelerates adoption

Makes the network more secure

Increases mining profitability, which draws in more miners and node operators

Makes the network even more secure

Expands use cases, accelerates demand drivers and adoption

Price accelerates upward

BITCOIN SECURITY & RESILIENCE

"My credit card gets hacked all the time. I get multiple notifications every year informing me that there has been a data breach here and malicious activity there… what makes Bitcoin any different than anything else on the internet?"

Bitcoin's security is antithetical to the trusted, centralized, third party security model.

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→ It is decentralized – battle tested for 13 years and proven as the most powerful computing network in human history

→ The code is visible to everyone worldwide

→ Bitcoin is a perpetual honeypot, with a prize of nearly $1,000,000,000,000 to crack it - nobody has been able to do it!

The Bitcoin software is simple and extremely secure.

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→ Not a lot of features

→ The development community is conservative

→ Bitcoin is not trying to move faster and evolve

→ Bitcoin is optimizing for preserving the basic rules of the protocol and securing the network

→ Through simplicity, there are fewer attack vectors for hackers to exploit

Is there a 51% attack risk posed by centralization?

A 51% attack can be launched if a group of miners control over 50% of the network's mining hashrate - Bitcoin's construct prevents this risk.

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→ Miners and hashrate are geographically diverse to prevent a nation state from controlling a group of miners that represent 51%

→ Bitcoin has survived miner migration between continents (China ban) in search of favorable policies and viable energy resources

→ After the China ban, hashrate immediately recovered, became more diverse, and proved the network's resilience from centralized controls

→ The Bitcoin network is inherently self-healing while growing increasingly more secure

Bitcoin is a protocol, not an application.

Typically, hacks target applications that are riding on top of the internet protocol.

Protocols, once proven, are the foundation on which everything else is built (HTTP, TCPIP, HTML, etc.)

Bitcoin is a protocol because all nodes and miners, of which there are tens of thousands, have chosen to participate with the same version of code - many widely adopted layer two and three applications have chosen to build on the Bitcoin protocol (Lightning Network, Cash App, Strike, etc.).

Technically, Bitcoin can be manipulated.

To manipulate Bitcoin, everyone enforcing the protocol - people running nodes - would have to agree that the manipulation is in their self-interest. Upgrades have occurred with consensus approval.

If one wanted to change the fundamentals of Bitcoin, buy-in is required from the tens of thousands of diverse node operators - node operators participate in Bitcoin because of the rules enforced to secure key fundamentals that support incentive dynamics.

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→ No inflation

→ No counterfeiting

→ 21M supply cap

How does the proof of work mining network ensure secure and final settlement?

Every expenditure by miners represents the security budget of Bitcoin - every block of transactions is allocated an amount of that security budget - it's very difficult to fork the mining network and its associated proof of work validation construct.

If you are sent $100M, you require absolute certainty that the transaction is secure, final and immutable - proof of work enables this certainty - the certainty is validated through thousands of daily transactions.

COMPETITION

Bitcoin is not "crypto" - every other crypto asset (there are thousands) is essentially a company, it's protocol centrally controlled and subject to the discretion of the centralized entity - which reintroduces the issue of trust.

Competition and network effects - Each incremental user on a network increases the value of the network exponentially

The more sides of a network effect, the more difficult it is to disrupt - because you must introduce superior value propositions to different participants simultaneously - Bitcoin's multi-sided network is uniquely insulated from competition.

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→ Buyers

→ Holders

→ Traders

→ Utility Users (Layer 1, 2, 3 Apps - Lightning, Strike, etc.)

→ Miners

→ Developers

What's stopping someone from creating a better Bitcoin?

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Anyone can fork Bitcoin - which means copying the code and modifying it to create another coin.

But how do you fork the community, the network effects, the incentive dynamics, the layer 2 and 3 applications built on the network, and the years of proven viability through a mature proof of work mining industry?

2017 Hard Fork - We already have proof of a failed attempt to fork Bitcoin

The Bitcoin Cash fork was attempted in 2017
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→ Fees on Bitcoin network peaked in 2017 bull run

→ A group of holders forked Bitcoin in an attempt to increase block size, increase transactions per block, and lower fees

2017 Hard Fork - Bitcoin Cash failed to gain traction and has collapsed 98%

The Bitcoin Cash fork failed
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→ The logic was faulty - increasing the size of the blockchain prevented the average person from running a node due to costly computing requirements, which impacts decentralization

→ The community came to the conclusion that existing Bitcoin policies are sound and it continues to prove superiority

REGULATION

The US government has clearly stated that Bitcoin is property and not a security. It is subject to the same regulation as property and passes the Howey Test. All other "cryptos" have been identified as securities and are subject to securities laws - however, none of them have registered with the SEC to ensure their operations are legal.

Gary Gensler - SEC Chair - August 3 2021
https://www.sec.gov/news/public-statement/gensler-aspen-security-forum-2021-08-03

Regulation - Outlaw Bitcoin

PGP "Pretty Good Privacy"

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→ Bitcoin is a lightweight, open-source software client running all over the world

→ In the 90's, the Supreme Court ruled that open-source software is protected under the 1st amendment (freedom of speech)

→ The 1st amendment would have to be overturned to outlaw Bitcoin

Regulation - Shut down the Bitcoin organization

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→ There is no organization running Bitcoin - it is code

→ There is no central Bitcoin authority, no office, no CEO - no single attack vector

→ How would one shut down the internet, everywhere, worldwide, forever?

→ The entirety of Bitcoin is represented on the software running on each individual node on earth

Regulation - Shut down the exchanges

China already tried this and it failed

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→ The attempt resulted in selling restrictions

→ This resulted in price increases

→ Which brought in more participants worldwide

→ Which increased network security

→ One country's attempt to ban simply shifts business elsewhere to favorable regulatory environments - exchange activity simply relocates

Regulation - Shut down the miners

China already tried this and it failed

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→ Miners and their equipment moved - rigs are small, modular and very portable

→ Miners relocated to other countries and continued mining operations

→ After the China ban, which represented ~50% of mining capacity, network hashrate quickly returned to all-time highs

→ The China ban strengthened the network by improving decentralization in favorable regulatory environments - Bitcoin is inherently self healing

Regulation - Seize people's Bitcoin

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→ It is not possible for an entity to seize an individual's Bitcoin if it is held privately (cold storage, personal memory)

→ Bitcoin can and will be seized when it is held on exchanges or centralized custodians (e.g. banks) - this occurred during the Canada Trucker Protests

→ Bitcoin can be seized when holders are careless with private keys (e.g. storing on a regulated centralized cloud resource like Dropbox, Google Drive, etc.)

Regulation - Tax Bitcoin and make it less attractive

The US government, and many around the world, have already ruled in favor of Bitcoin

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→ Bitcoin passes the Howie Test - so it is legal and part of the existing regulatory/tax framework

→ Bitcoin is taxed as property

→ Multiple members of congress are introducing bills that are favorable to Bitcoin and its ecosystem - exchanges, mining, transaction applications, ownership, individual sovereignty, etc.

THE FUTURE

Future Possibilities

The following are occurring today at varying stages of progress:

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→ Bitcoin will improve personal and institutional decision making due to low time preference

→ Bitcoin mining industry dynamics will improve energy challenges and reverse global warming

→ Bitcoin will drive wealth transfer from the "haves" to the "have-nots"

→ Bitcoin will be the preferred store-of-value asset (by demonetizing metals, bonds, securities)

→ Bitcoin's network will enable a financial transformation through extreme efficiencies

→ Bitcoin will serve the world's unbanked and empower them to prosper through free will

→ Bitcoin will limit reach of dictators and institutions that seek to maintain unfair power structures

QUOTES

Quotes

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"Bitcoin is a technological tour de force."

Bill Gates
Founder of Microsoft

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"I do think Bitcoin is the first encrypted money that has the potential to change the world."

Peter Thiel
Co-Founder of PayPal

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"Bitcoin will do to banks what email did to the postal industry."

Rick Falkvinge
Founder of the Swedish pirate party

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"Every informed person needs to know about Bitcoin because it might be one of the world's most important developments."

Leon Luow
Nobel Peace Prize nominee

Quotes

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"Bitcoin is the most important invention in the history of the world since the Internet."

Roger Ver
Bitcoin angel investor

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"Bitcoin, and the ideas behind it, will be a disrupter to the traditional notions of currency. In the end, currency will be better for it."

Edmund Moy
38th Director of the United States Mint

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"I don't think there's anything more important in my lifetime to work on, and I don't think there's anything more enabling for people around the world."

Jack Dorsey
Twitter Founder
Block (Square) CEO

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"Nakamoto's innovation is real."

Gary Gensler
SEC Chairman

"Bitcoin is a bank in cyberspace, run by incorruptible software, offering a global, affordable, simple, and secure savings account to billions of people that don't have the option or desire to run their own hedge fund."

"Once you realize that Bitcoin is digital property, or digital money, or digital energy, it becomes clear that everything else you could possibly own is inferior."

"Bitcoin is the dominant digital monetary network and an opportunity for everyone."

→ Michael Saylor, Microstrategy CEO
First public company to hold Bitcoin as the major portion of a balance sheet

BITCOIN

SOUND MONEY

21 MILLION

ESTABLISHED 2009

DECENTRALIZED

V.01 02.22.2022