Digital Assets: ESG – Why Not GSE?

An insightful, thought-provoking, and balanced paper for sophisticated investors exploring digital assets and ESG investing to make informed financial decisions.

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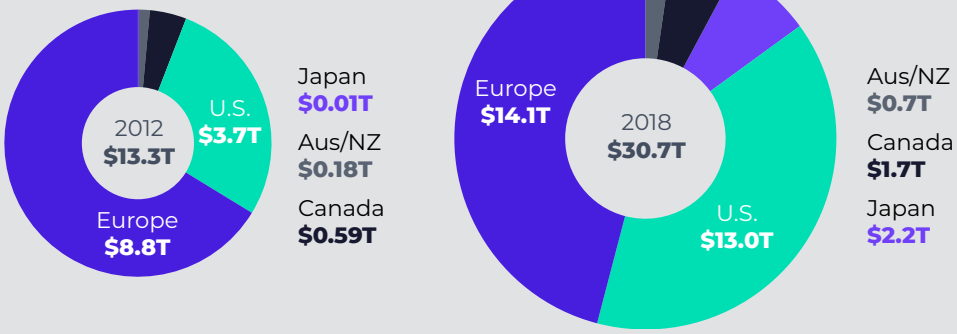
Thoughtful conversation is much more productive than rhetorical debate. The overwhelming amount of passion and dollars surrounding sustainable investing, coupled with the widely divergent nature of partisan camps motivated us to pause, ponder, and probe. What is the cause of this attention and how does it relate to the digital asset ecosystem? In pursuit of Arca's goal to provide insightful, thought-provoking, and balanced resources for serious investors, we have composed an exploration of ESG (Environment, Social, Governance). Our aim is to encourage readers to approach this topic with an open mind, and if interested, dig deeper to get the necessary information needed to make investment decisions and meet broader financial goals.

Motivation

Sustainable investing in the United States continues to expand at a torrid pace. The total U.S. domiciled assets under management (AUM) using sustainable investing strategies grew by 42% from $12 trillion at the start of 2018 to $17 trillion at the start of 2020.[1] This represents 33% of the $51 trillion in total U.S. assets under professional management.

Global Growth In Sustainable Investments[2]

Europe is well ahead of the sustainable investing curve with the U.S. closing the gap. Specific legislation is fundamentally shaping the industry.

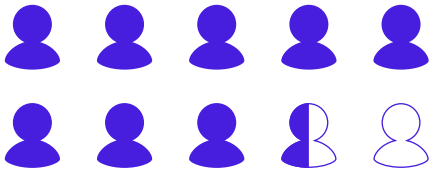


Reasons For The Increase In Societal Impact Investing

1. Consequential physical effects, i.e. experiencing 70 degree weather in Boston in February.
2. An assortment of media platforms that increase the airtime of social issues.
3. The growing opinion of the value-driven Millennial generation.

The rise of responsible and impact investing has challenged the wealth and asset management business. A recent wealth management study of 2,000 individuals holding investment accounts shows that 85% of participants think responsible investments will profit or not distract from gains.[3] This thought process has contributed to ESG becoming an increasingly important directive for asset managers, with some focusing more on style over substance. The power of ESG investing as a narrative has caused marketing savvy investment managers to characterize more investments as "ESG-friendly" in order to entice issue-conscious investors, a practice known as Greenwashing.[4]

While the explosion of interest and dollars in ESG is a relatively new phenomenon, the concept itself is not, it dates to the 1960s with the awareness of tobacco product health concerns and corporations' involvement in the South African apartheid regime.[5] However, current technology has facilitated the creation of rich data sets for investment managers to incorporate ESG considerations into their decision making and portfolio allocations. The classification and ranking of ESG investment products are underway. RavenPack, for example, is one of many firms that allow investors to measure ESG qualities more quantitatively.[6] Yet, without formal standards and guidance, there continues to be a lot of noise and the burden falls on the investor to weed out the over-stated marketing claims from the valid opportunities.



85% of participants think responsible investments will profit or not distract from gains.

ESG Investing Milestones[7][8]

1960s
ESG impact investing originated as socially responsible investing with the awareness of tobacco health concerns and corporations' involvement in the South African apartheid regime.

1971
ICCR (Interfaith Center of Corporate Responsibility) was founded to oppose apartheid in South Africa.

1984
The Forum of Sustainable and Responsible Investments was founded to advance sustainable investing across all asset classes.

1988
U.S led 134 companies in terminating business with South Africa to protest its apartheid regime.

1992
World Business Council for Sustainable Development was founded to accelerate the transition to a sustainable world.

1995
International Corporate Governance Network was founded to promote effective standards of corporate governance and investor stewardship.

1999
U.N. created the Global Compact for companies to align strategy and operations with human rights, labor, environment, and anti-corruption principles.

2006
U.N. launched PRI (Principles for Responsible Investments) to promote ESG factors in investment decision-making.

2011
Sustainable Accounting Standards was established to develop standards for companies to disclose material financial sustainability information.

2014
Ceres and INCR (Investor Network of Climate Risk) launched the Clean Trillion campaign to boost global investment in clean energy to $1 trillion annually.

2015
The Paris Agreement was adopted by 196 parties to limit global warming.

2019
U.N. launched PRB (Principles for Responsible Banking) to provide a framework for a sustainable banking system into the future.

Why Digital Assets?

Digital assets, a modern and high-profile asset class, is the newest financial investment opportunity to be appraised for its ESG footprint, with particular scrutiny focused on Bitcoin's energy consumption by mainstream media and dissenters of digital assets.

Bitcoin, a decentralized digital cryptocurrency, was born in the turbulent environment of the great financial crisis of 2008. It was designed to solve the problems derived from the abuse, and ensuing mistrust, of centralized authorities within the financial system, particularly central banks and their control over fiat currencies. The main objective of the Bitcoin blockchain, a peer-to-peer payment network that operates on a cryptographic protocol, was to resolve governance challenges related to corruption and distribution of power. The centralized framework of the traditional markets is the lowest hanging fruit for the application of blockchain technology. Satoshi, the creator of Bitcoin, and like-minded individuals questioned the basic conception of financial order and enlightened the world with an alternative method to improve our conventional foundation.

The Basics

Blockchain
A system to track transactions made in Bitcoin, or another digital asset, that are maintained on a peer-to-peer or decentralized and distributed network.

Digital Assets
A non-tangible asset that is created, traded, and stored in a digital format on a blockchain (also known as tokens).

DeFi (Decentralized Finance)
A new way to execute financial transactions and remove intermediaries through decentralized applications that run on top of blockchain networks.

Smart Contracts
Self-executing digital agreements that are stored on blockchains.

Fast forward to 2021, the digital asset and blockchain ecosystem has expanded to include thousands of different digital assets and hundreds of blockchain protocols. Due to the prevalent ESG conversation and increasing focus on sustainable investing, an examination of the current narrative and how digital assets are, and should be, assessed will empower investors to make educated investment decisions.

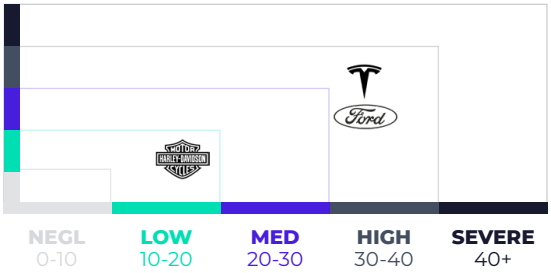
The ESG Narrative Surrounding Digital Assets

Why is the environmental element of ESG the primary focus for digital assets? Perhaps it is because it's the first letter of the coined term 'ESG', or maybe similar altruistic subjects, such as climate change, have favorably opened the dialogue. Either way, evaluations should be specific to the subject. Bitcoin's energy consumption has dominated the environmental impact discussion for all digital assets, yet thousands of digital assets exist, each with a unique value proposition requiring its own sustainability impact assessment. We wouldn't lump the entire asset class of equities into ESG friend or foe - Ford stock would be appraised separately from Tesla and BlackRock.

ESG Sustainability Impact Assessment[9][10]

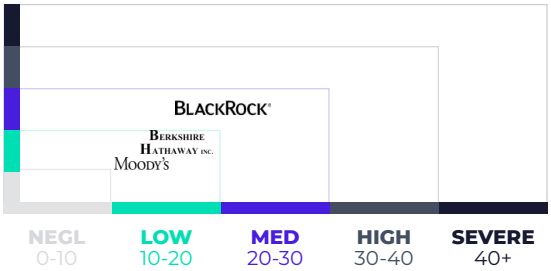
INDUSTRY GROUP: AUTOMOBILE

COMPANY	RISK RATING	RANKING
TESLA	High Risk	31.3
FORD	High Risk	31.2
HARLEY DAVIDSON	Low Risk	16.4



INDUSTRY GROUP: DIVERSIFIED FINANCIALS

COMPANY	RISK RATING	RANKING
BLACKROCK	Medium Risk	21.1
BERKSHIRE	Low Risk	17.2
MOODY'S CORP.	Low Risk	11.6



Similarly, each token and protocol need to be weighed according to its native attributes and outputs. A blockchain's primary function is to create a decentralized and distributed network, and it should be evaluated on its ability to accurately execute on its mission.

Due to the over-heated rhetoric around ESG, we believe it is critical to focus the dialogue on the factors that specifically apply to digital assets, with a calm and sober demeanor. Unlike what the media indicates, there are nuances to these arguments; black and white statements are not instructive in developing a comprehensive viewpoint.

Bitcoin, the original blockchain and first digital asset created utilizing blockchain technology, was created to address governance; environmental and social impacts are secondary to its primary purpose. Everything has varying degrees of environmental and social impact. Just as airplanes solve for efficient travel, with unintended environmental and social impacts, blockchains solve for efficient governance with unintended sustainability impacts. These conversations are not just fun buzzwords we read in the headlines, the marketing effects of ESG are driving GIANT allocations of capital.

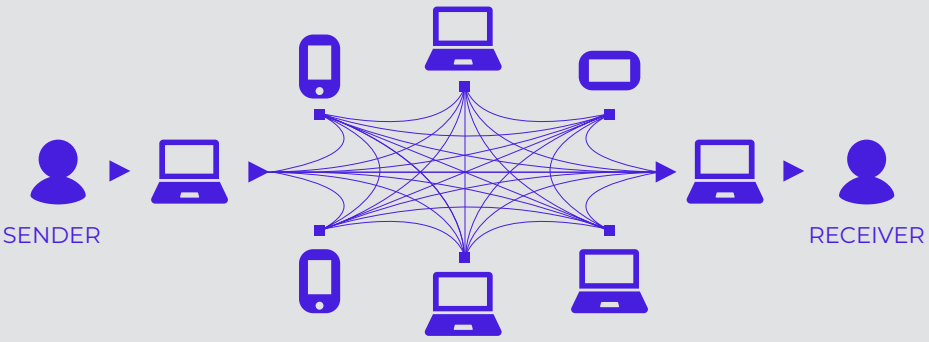
Collectively, humans accept elements of daily life because it is ingrained into our routines. Connotations, and later behaviors, are thus derived from these unquestioned understandings. Lets's take a moment to examine and comprehend the potential advantages of different governance structures and bodies, the taxonomy of digital assets, and ask ourselves why all assets deserve to be evaluated separately. We suggest focusing on the principles that drive blockchain and digital assets' origination first - governance.

Traditional, Centralized Financial System[11]

CENTRALIZED ADVANTAGES

- Clear chain of command
- Focused vision
- Consistent output
- Follows rules and regulations
- Promotes unity of economic system

Decentralized Financial System[12]



DECENTRALIZED ADVANTAGES

- No central point of failure
- Full control of data
- Less prone to censorship
- Limited risk of excessive power
- Respects ethical and cultural diversities

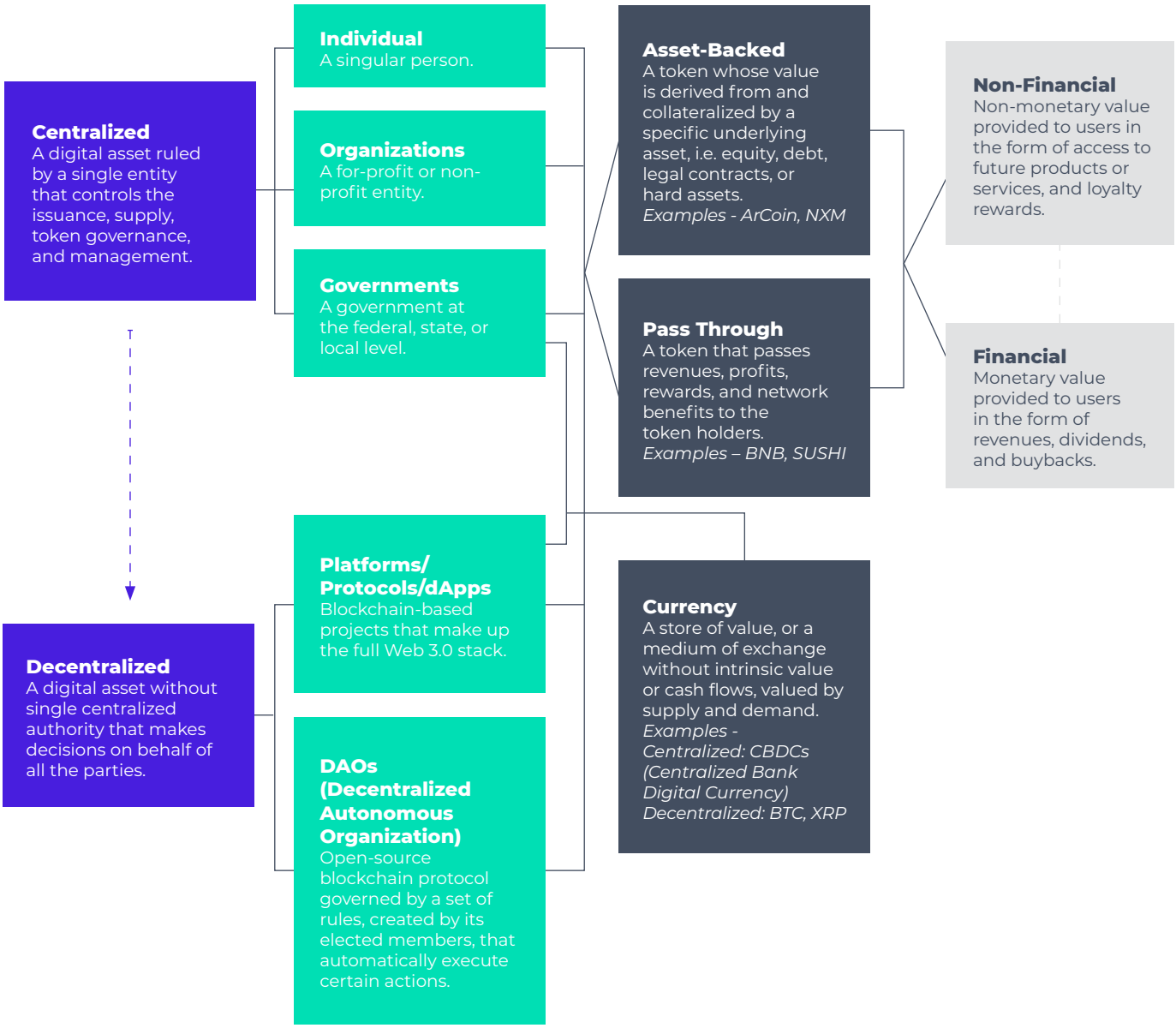
Digital Assets Taxonomy[13]

Governance Structures
The power to influence core protocol decision making; including, product roadmap, hiring, and governance updates.

Governing Bodies
An entity that is offering a tradeable asset via a blockchain-based token.

Digital Asset Types
Token categories that describe its unique value proposition.

Value Accretion
The gradual and incremental growth of assets and earnings due to business expansion.



85% of U.S. investors want the ability to tailor their investments to their values. This rises to **90%** among millennials.

86% of U.S. investors believe that companies with strong ESG practices may be more profitable.

What Does ESG Mean To Investors?[14]

Changing ESG To GSE

We are reversing the digital asset ESG conversation to focus on Governance. Awareness of the catalysts behind the current ESG discourse helps us rethink the logical way to more accurately frame the dialogue, and switch the narrative to **GSE**.

Governance
Fair And Just Business Influence

Social
Democratizing Access And Promoting Inclusivity

Environmental
Sustainable Energy Consumption

G

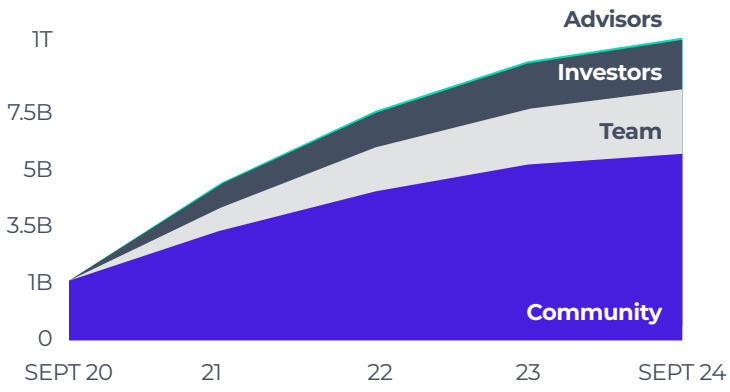
Governance

Governance refers to a company's leadership and includes board diversity, reasonable payment thresholds and caps, and shareholder responsiveness.

The designed intent of blockchain technology is to administer a decentralized and distributed governance structure. Organizations can issue digital assets that administer decentralized management attributes using blockchains, such as, an infinite number of board of director members with equal votes based on the number of tokens owned. Additionally, digital assets can be earned by completing tasks or displaying desired behaviors, rather than purchased, creating greater inclusivity and economic diversity. However, not all issuers of digital assets are decentralized, a common misconception within the ecosystem.

Uniswap, a leading crypto exchange, is an example of a centralized company that converted to a decentralized structure. The company issued its inaugural token, UNI, complimentary to customers of its platform, rather than selling to retail investors.[15] UNI is a governance token, meaning those who hold the token have control over company decisions, creating a mutually beneficial governance framework for users, investors, and liquidity providers. Moreover, UNI tokens are now held by more than 50,000 wallets, instantly making it one of the most decentralized tokens in the entire marketplace. This might be one of the most groundbreaking token launches ever created, epitomizing the digital assets ethos that customers and investors can and should be the same people.

UNI 4 Year Release Schedule[16]



The nature of a decentralized and distributed, community-based foundation enables broad and diverse influence in the underlying project. While owners of decentralized tokens may have no explicit legal rights, the token's community has a real-time, ongoing voice over the protocol's technical direction and cash flow distribution. Contrarily, traditional asset shareholders are granted statutory rights, which are unlikely to be exercised and do not protect small, individual interests over those of larger stakeholders. Most equity investors have no substantive vote or effective impact over the company's strategic direction; while larger equity holders make the decisions regarding dividends paid, economic decorum and all other determinants regarding capital, employees, and customers.

Arguably, even more important than cash flow leverage is the power to determine the direction of scarce development resources of widely used digital infrastructures. Our friends at Delphi Digital explain the value of public goods governance without cash flow yields.

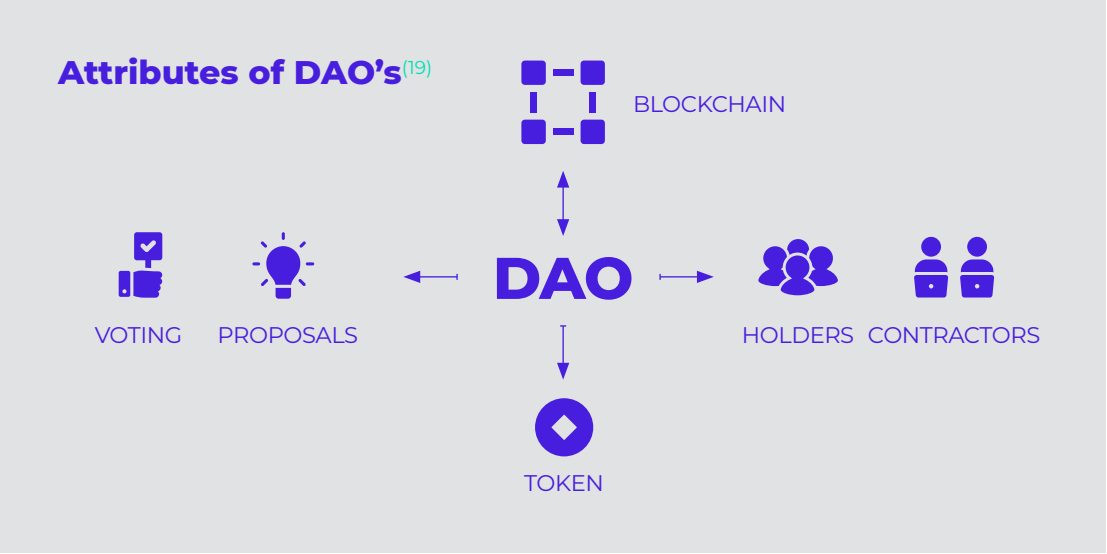
"For example, even if Metamask never generated a dollar of fees, it's intuitively obvious that their decision of which chain to support next would be a valuable thing to be able to exert influence on. Many argue this is why tech giants donate so much money to open-source: to influence the platforms used by those developers."[17]

However, the designed intent does not always flow through to the practical. As with all technological adoption, there is a transitory period, where gaps between old and new structures expose vulnerabilities. It is difficult to navigate the brackish waters as centralized methods are deeply embedded into our behavior and decentralized methods are unfamiliar and alien. For example, "not your keys, not your coins," is a rule of thumb in the digital asset ecosystem that refers to self-custody and ownership control, but a foreign notion to the traditional financial system that designates an authority to safeguard assets.[18] The ownership tradeoff is responsibility, power, and trust; however, some tradeoffs are more costly than imagined and the real risks are not understood. Consider the case of QuadrigaCX, once Canada's largest centralized cryptocurrency exchange that suddenly ceased operations and declared bankruptcy. Investors lost over $135 million worth of digital assets with the alleged death of its CEO/Founder, the only individual who had access to the private keys associated with the accounts. These investors thought their decentralized assets were safe at a centralized exchange – exemplifying the single point of failure deficiency.

Investors can end up holding an empty bag if they aren't able to evaluate their centralized world inflicted blind spots. Currently, a crypto exchange is not regulated like a securities exchange; thus, money held on that platform is not protected. The assumption of value safety is a drawback during the transitory period from a centralized to decentralized framework. In the QuadrigaCX example, platform users obviously did not receive the benefits of appropriate governance.

An example of a fully decentralized governance structure are DAOs (Decentralized Autonomous Organizations), a collection of individuals organized around a set of rules or beliefs. Built on a public blockchain, DAOs typically integrate around a token that provides the holder with governance rights over the entity. Think of a DAO like the government of a town, city, or country, with a constitution of rules determining the mission of the government and the rights of people residing within it. While we have only seen DAOs in their earliest iterations so far, the current landscape represents a glimpse into a new form of management that may coordinate resources more efficiently and fairly than ever before.

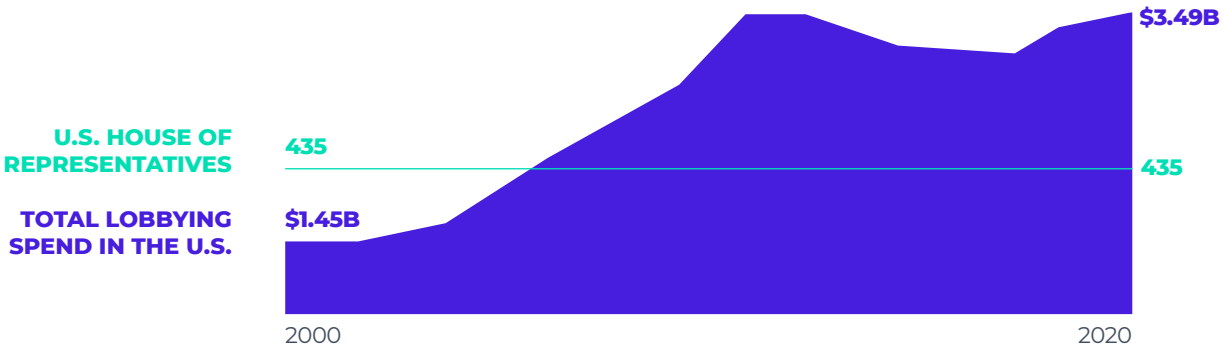
DAOs leverage the anonymity made possible by blockchain technology to solve for exploitation of voting bias. In traditional corporations, board members are paid by the organization they oversee, creating an inherent conflict of interest, and often their vote is cast among the presence of their board member peers. DAOs also address the top-down structure, which dismisses contributions from anyone besides top management. Rules are established using smart contracts and the DAO carries them out without the need for centralized management. Consequently, DAOs are only as good as the hand that codes them.



Throughout history, different models of governance have been explored with the one commonality being centralization. The issue has always been relying on the people in control to do good and not pull the levers of power for their own benefit. Bitcoin is the first example of turning this model on its head using mathematics and an immutable ledger. If one person or group of people wanted to corrupt or change a transaction in the Bitcoin network, they'd have to obtain more computing power than all the governments in the world combined to manipulate it.(20)

That being said, dollars still talk. Coinbase spent $230,000 to lobby Congress in 2020, Ripple hired two lobbying firms in the beginning of 2021, and this year Grayscale allocated $1 million to Coin Center, a non-profit focused on cryptocurrency policy issues.[21][22][23] In 2020, the total lobbying spend in the U.S. alone was $3.49 billion. Interestingly enough, the number of U.S. House Representatives seats have stayed fixed since the beginning of the century, yet the amount of money raised to acquire these seats has gone up by 240% in the past 20 years.[24] Whether an organization is governed centrally or not, outside factors of legal manipulation and influence by money are still extensive.

Lobbyist Spend Compared To U.S. House of Representatives[24][25]



94%

Members of congress with jurisdiction over privacy and antitrust issues received money from Big Tech.

$3.2 Million[26]

Contributed by Big Tech and lobbyists to lawmakers tasked with regulating them in 2020 alone.

Governance is a complex issue with many considerations. On the one hand, blockchain aspires to make governing structures more democratic, equal, and decentralized. But the phased implementation process and our inherent gravitation to centralization will result in some of the same issues that plague our current governance frameworks.

Social

Social factors include areas such as diversity, human rights, consumer protection, and financial inclusion.

The rise of decentralized finance (DeFi) appears to be a fantastic example of a technology aligning and enabling the goals of socially responsible investing.[27] This is achieved through the simple and mechanical nature of how one participates in DeFi. The only criteria to be a user of a DeFi protocol is assets in your wallet. There are no background checks, nor human bias dictating eligibility. Using DeFi, everyone can get a loan, buy insurance, or invest simply by showing up at the table with assets. How do you discriminate against someone if you don't know who they are? The developers, liquidity providers, and token holders can represent a truly global, diversified group of people, knocking down geographic, racial, socioeconomic, and gender barriers, *if* these people are brought to the table.

DeFi has the potential to be the engine of inclusivity because of blockchains' ability to shield user identity, but it doesn't mean that it's being implemented. Even with DeFi, we're seeing the same representation in digital assets as we are across the technology and financial services sectors. Currently, these sectors are areas of the U.S. economy that are characterized by disproportionately high levels of men and Caucasians. The digital asset ecosystem is mimicking this representation with 74% of crypto holders being men, and 71% white, according to Gemini's "The State of U.S. Crypto Report."[28]

Beyond DeFi, many digital assets attempt to drive a more equitable division of wealth and a more inclusive investing playing field than most other financial asset classes. Pass-through token models, where financial gains flow directly to the users of a platform or protocol rather than to shareholders, are central to this fair and equal distribution of wealth. Amazon's Prime membership is a great example of how, had it been tokenized, could have further incentivized users and strengthened the brand with pass-through benefits.[29]

Social Considerations

Can it be accessed and used easily by all people?

Is it a suitable investment for all investor profiles?

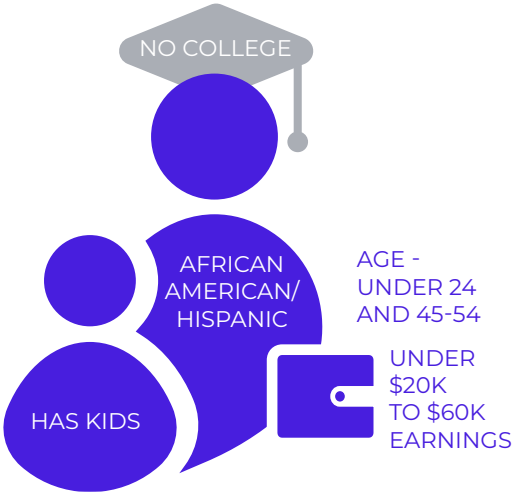
Are consumer protections implemented and enforced?

The real-world example of McDonalds (MCD) may help clarify the concept. It currently has a $172 billion equity market cap, owned by shareholders who are an entirely different socioeconomic demographic than their customers and employees.[30] McDonald's would certainly be more socially responsible if the people who drove their success were also made successful as a result. This is possible with thoughtfully designed tokens. In a different world, MCD stock could be replaced with a MCD token, whereby token holders would receive benefits and discounts for dining at McDonalds while also seeing a portion of top line revenue distribution in the form of dividends or buybacks.

McDonald's Leading Diner Demographics[31]

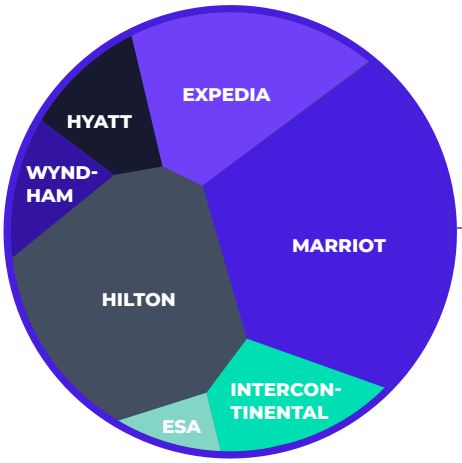
$172 Billion

Equity market cap



To understand how badly this is needed, look no further than the recent Airbnb (ABNB) and DoorDash (DASH) IPOs. In both cases, a handful of wealthy investors made hundreds of billions of dollars from ABNB and DASH IPOs on the backs of regular people who own houses, vacation, cook, ride bikes, and eat food. Those who made these services successful did not gain in the same manner as those that provided the capital. Digital assets, meanwhile, turn product users into quasi-equity owners, thereby aligning social activity with economic incentives. Those who take early risks to use unproven platforms are financially incentivized to help their favorite companies and applications grow, and can become strong, vocal evangelists.

Airbnb Market Cap $117.6 Billion[32]



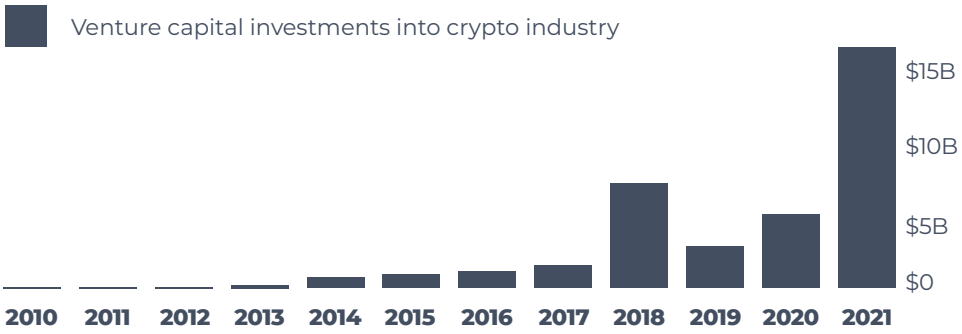
COMPANY	MARKET CAP	REVENUE
EXPEDIA	$20.0B	$12.1B
EXTENDED STAY AMERICA (ESA)	$2.7B	$2.1B
HILTON	$31.0B	$9.5B
HYATT	$7.5B	$5.0B
INTERCONTINENTAL	$9.3B	$4.6B
MARRIOTT	$42.0B	$21.0B
WYNDHAM	$5.8B	$2.1B

DoorDash Market Cap $57.6 Billion[32]

COMPANY	MARKET CAP	REVENUE
DOMINOS	$14.9B	$3.6B
GRUBHUB	$6.7B	$1.3B
JACK IN THE BOX (JTB)	$2.3B	$1.0B
WENDY'S	$4.8B	$1.7B
YUM BRANDS	$31.8B	$5.6B

The vision is exemplary; however, in our current state of limbo between centralized and decentralized the stakeholders making the money are still the founders and venture capitalists. Coinbase has raised over $500 million and is now valued at $86 billion, Bakkt has raised $482.5 million and is valued at $2.1 billion, and Circle has raised over $700 million and is valued at $4 billion. The massive amount of capital and valuations in digital assets are clear. What may not be as evident is the social representation of the individuals reaping all the benefits.[33][34][35]

Gold Rush: Venture Capital Has Piled Into Crypto Companies In 2021[36]



2021 Crypto Billionaires List[37]

Sam Bankman-Fried
FTX Exchange
Net worth: $8.7B

Brian Armstrong
Coinbase
Net worth: $6.5B

Tyler Winklevoss
Gemini Exchange
Net worth: $3B

Cameron Winklevoss
Gemini Exchange
Net worth: $3B

Chris Larsen
Ripple Labs
Net worth: $3.5B

ChangPeng Zhao (CZ)
Binance
Net worth: $1.9B

Michael Saylor
MicroStrategy
Net worth: $2.3B

Jed McCaleb
Ripple
Net worth: $2B

Fred Ersham
Coinbase
Net worth: $1.9B

Barry Silbert
Digital Currency Group
Net worth: $1.6B

Matthew Rosvak
Bloq
Net worth: $1.5B

Tim Draper
Draper Fisher Jurvetson
Net worth: $1.5B

Environmental

Environmental factors include how a company mitigates its greenhouse gas emissions, the sustainability of products created, the efficiency of natural resources used, and its recycling methodology.

Bitcoin, the first digital asset created utilizing blockchain technology, is the most popular, contributing to half the market cap of all digital assets at times, and the easiest to understand as a cryptocurrency with a correlation to modern gold. Contrary to the black and white narrative being pushed in mainstream media and by many opponents of digital assets, Bitcoin may not be all bad when it comes to environmental concerns. Misconceptions tend to arise from linear extrapolations from current statistics, information asymmetry on how the Bitcoin network operates, and the assumption that Bitcoin 'steals' energy from another potential user.

Let's separate the objective from the subjective; objectively, Bitcoin uses a lot of energy. According to Digiconomist, the Bitcoin network uses 38.96 Mt of CO_2, 82.03 TWh of electricity, and produces 10.75 kt of e-waste on an annualized basis.[38] If the network were a country, it would be the 38th largest user of energy in the world. These are all facts with some room for error due to assumptions and variance. In a vacuum, these numbers seem like a slam dunk for environmental pundits - Bitcoin is an energy hog. One transaction on the Bitcoin network is roughly equivalent to 784,000 transactions on Visa, which handles well over 100 billion transactions per year.[39] In some way, shape, or form we have all heard these arguments and how this makes Bitcoin bad for the environment.

There is admittedly a lot to unpack here, and no way to completely illustrate the various reasons that these data points don't necessarily lead to environmental harm in the conclusive manner suggested. Instead, let's introduce a more constructive discussion on what Bitcoin is, and its potential unrealized effects.

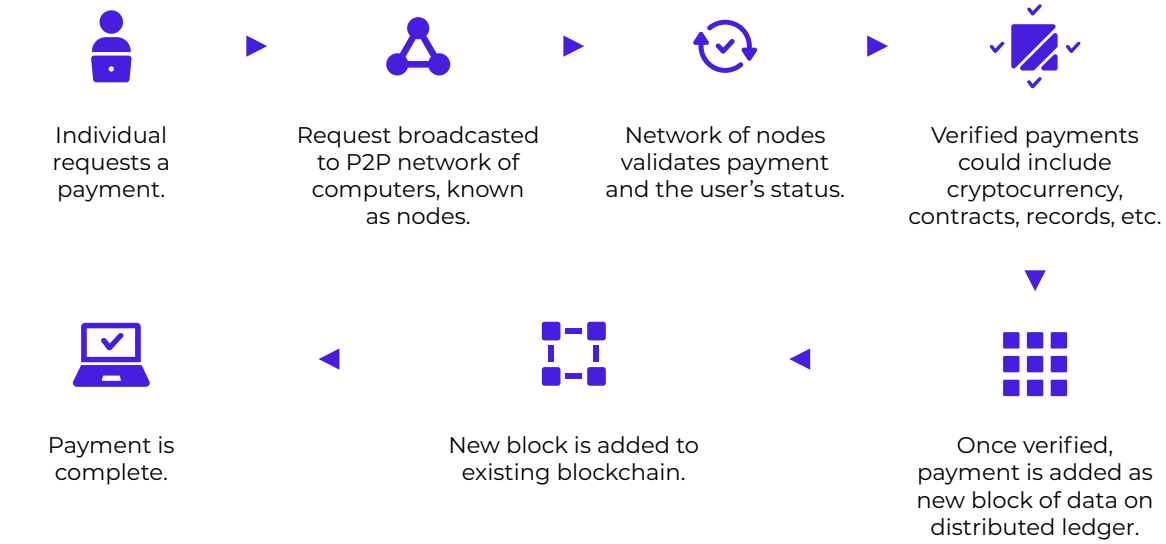
Bitcoin's Role in the Financial System

Bitcoin is a final settlement network for money, packaged in a social contract that dictates the parameters of the network without the need for management by a nation-state. A succinct comparison describes Bitcoin as the base layer of the payments system, akin to Fedwire, CHIPS, SWIFT and others that are the global payments settlement layer. The second layer systems, i.e. Visa and PayPal, are aggregators that process millions of transactions a day, but theoretically could be netted and settled in one transaction on the Bitcoin network. While the prevailing mainstream theory is that Bitcoin is trying to replace day-to-day transactions, such as buying coffee, that is not the value proposition. Bitcoin is best suited as sound money, which is fundamentally different from state issued fiat currencies. If we look at Bitcoin this way, we believe we can accurately compare the energy consumption of the network and determine the tradeoffs between energy waste and conversion.

"A credit network is a small layer in the broader payments, clearing, and settlement monetary stack. And ultimately those networks depend on the U.S. dollar. Since Bitcoin composes an entire self-contained monetary and payments system, you should probably be comparing that to the whole dollar system and the extra knowledge that entails."

Nic Carter, Castle Island Ventures Founding Partner[40]

How Bitcoin Works[41]



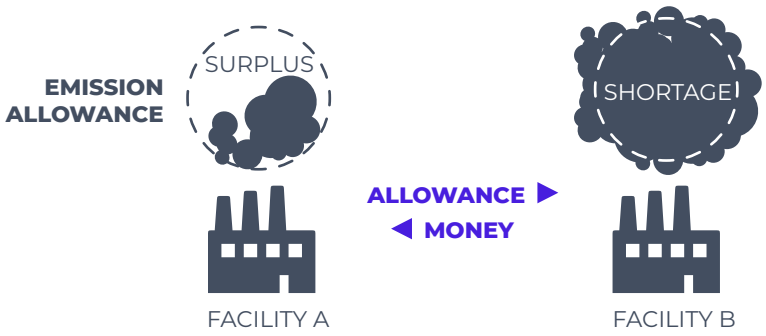
The advantages of a free market are increased efficiency, productivity, and innovation.

Some argue that Bitcoin itself wastes **zero** energy since energy is a free market; a system based on supply and demand without government intervention. The advantages of a free market are increased efficiency, productivity, and innovation. Theoretically, it makes sense that opportunists would convert a free asset into one with value. Essentially, that is what Bitcoin miners are doing; utilizing surplus energy (paying more than the next potential user) to mine Bitcoin and create value.

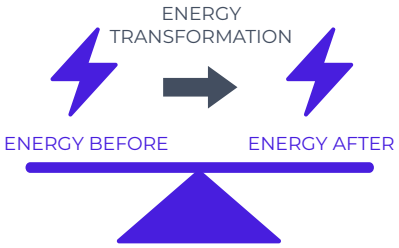
Bitcoin creates a means to convert renewable energy into a fungible, transferable asset.[42] In 2016, 6% of U.S. energy alone was lost in transit; the second law of thermodynamics holds that every moment energy is not being actively used, it is dissipating through entropy.[43] It is for this reason that every city has a power grid, and that local power outages are not immediately remedied with energy transference. Grids often oscillate between peak capacity and off-peak demand, and with the absence of micro-grids experience load-loss factors when the production of energy exceeds the demand for energy.

Bitcoin's ability to convert excess energy into a transferable, fungible unit of value accomplishes a similar real-world outcome to the intended outcome of carbon credits. A carbon credit is a manufactured unit of environmental emission created under the United Nations Framework Convention on Climate Change (UNFCCC) treaty of 1992.[44] Effectively created to drive change, it is a system to limit countries and companies from emitting too much greenhouse gas. Carbon credits are economic contracts that can be traded freely. The important distinction between Bitcoin, a fungible asset and carbon credits, also a fungible asset, is that Bitcoin's value is derived from 'work' or energy output, whereas carbon credits are arbitrarily assigned. As there is no real attachment to anything tangible with carbon credits, their history has been plagued by ineffectiveness and criminal fraud, reportedly in excess of 5 billion euros.[45] Carbon credits are a well-intended solution that is suffering from a poor execution plan - does this mean the effort should be abandoned? Just because the wrinkles have not been ironed out, it does not mean the idea was bad, or that we should stop searching for answers.

Carbon Credits Emissions Trading



The First Law Of Thermodynamics



So, where does this leave Bitcoin? As a technology, it is barely a decade old. The full effects of a sound monetary system that has no borders and no central authority controlling it has yet to be fully ascertained; more time is needed to understand the net cost/benefit. The focus should be directed more towards the sustainability of a full-scale renewable energy network. A great case study for the potential mutualistic relationship between the Bitcoin network and renewable energy can be found in the Sichuan province in China, which is the second largest regional contributor to hashpower in the world. With an abundance of local hydroelectric power, the province runs into two choices: let the energy go to waste or convert it into resources.[46] With the ever-present First Law of Thermodynamics at play, an asset like Bitcoin offers productive ways to harness otherwise lost energy. It's hard to see how this can be construed as environmentally harmful.

When thinking about a project as grand as the replacement of money and the number of resources it would take, it is important to look at all potential outcomes and the probabilities of each scenario. At worst, the Bitcoin experiment fails, and the energy allocated towards the network will be pointed elsewhere, or a complete waste. In a middle-of-the road outcome, Bitcoin proliferates as a form of nationless money and continues to consume energy where there is either a demand deficiency or favorable energy pricing, which usually come in tandem when the supply issuance subsidy decreases. At its full implementation, it supplants the traditional financial framework of currencies, i.e. U.S. dollar and the incredibly resource intensive apparatus to support it, and obviates the need for precious metals as a store of value. It appears to be a project that deserves more time and further maturation of the broader digital asset ecosystem before we jump to conclusions.

Ultimately, when evaluating digital assets' environmental impact, the underlying technology is the object for review. In pursuit of our objective to weigh digital assets' environmental impact separately, here are some of the positive and negative effects of the two dominating consensus mechanisms for most digital assets.

Proof of Work 'PoW'

A decentralized consensus mechanism that requires members of a network to expend effort to solve mathematical problems.

Example - Bitcoin network

Advantages
1. More secure network
2. Battle tested

Disadvantages
1. Consumes more energy
2. Longer transaction processing time

Proof of Stake 'PoS'

A decentralized consensus algorithm that enables people to mine or validate block transactions according to how many tokens they hold.

Example - Ethereum network

Advantages
1. Requires less energy to maintain
2. Faster

Disadvantages
1. More room for collusion
2. Centralized node operations

Conclusion

The growth in ESG investing in the equity world has shown that investor pressure can influence company decisions even without having any legal rights. BlackRock, the world's largest asset manager, released an open letter warning companies that it would "be increasingly disposed to vote against boards moving too slowly on sustainability."[47] In BlackRock's words, social purpose "is the engine of long-term profitability." Essentially, companies are being held accountable simply by the threat of losing access to strong investor bases. They want management teams to protect more than just shareholders, they want them to protect all stakeholders, which includes their employees, environment, city, and social surroundings. Perhaps, unbeknownst to BlackRock, they are describing what arguably already exists in the digital assets market.

The digital asset ecosystem is pursuing aspirations for forward-looking opportunities. Our society tends to get stuck in recency bias, a cognitive bias that favors recent events over long-term ones. Currently, investors are concerned with environmental impacts, and on the surface, Bitcoin appears to be a threat. However, when approaching from a higher elevation, and considering where this technology is in its development, critics may see the larger motivation and rationale, and have a greater appreciation for what this resource spend may bring.

Redirecting the dialogue to focus on the elements that apply to digital assets is key. We encourage continued conversation and collaboration to determine the best framework for assessing the qualities of the thousands of digital assets across the board, not just Bitcoin. This discourse is on a continuum, just one point on a line stretching infinitely into both the past and the future. Nothing must be formally decided today, tomorrow, or ever. Nobody knows how blockchain, or any technology for that matter, will evolve. Our world and everything in it are constantly changing, and the most beneficial outcome from this discussion is the promotion of a more open-minded outlook on digital assets and their potential impact on our world.

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