

# Government of the People, by the Blockchain, for the Crypto?

## The Implausibility of Democratizing Cryptocurrency Governance

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### Abstract

The 2024 US presidential election has accelerated the pace at which cryptocurrency has become a mainstream feature of politics and the economy. Advocates suggest that the technology offers promise to democratize and decentralize finance, but these claims have not received serious scrutiny. This paper critically examines the democratic potential of cryptocurrency governance by analyzing the governance mechanisms of the two most prominent cryptocurrencies, Bitcoin and Ethereum. While they operate on different models, Proof of Work (PoW) and Proof of Stake (PoS) respectively, both reveal significant democratic deficits. Bitcoin, dominated by a small group of miners, and Ethereum, controlled by a handful of staking institutions and large holders, exhibit governance structures that are highly centralized and far from democratic. After considering theories of democratic governance and applying them to monetary and corporate institutions, we argue that democratizing cryptocurrency would require fundamental changes to its privatized and technocratic nature. Given that these are constitutive features of cryptocurrencies, we challenge the claim that these systems have the potential to become meaningfully decentralized or democratic.

**Keywords:** all-affected principle, cryptocurrency, democracy, decentralization, finance.

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### Introduction

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Cryptocurrency and the blockchain technology it is built on are rapidly becoming both major issues and forces in politics. Cryptocurrencies have faced a string of scandals, including those associated with Binance, HyperFund, the Terra blockchain, FTX, and the conviction of its celebrity founder, Sam Bankman-Fried. Yet, in the 2024 presidential election, pro-crypto voters emerged as a voting bloc and the industry spent over \$130 million on electing cryptocurrency friendly candidates.<sup>1</sup> Eric Trump promised his father would be the “Most Pro-Crypto President in history”;<sup>2</sup> and the price of cryptocurrencies and related businesses soared. Bitcoin values surpassed \$100,000 in December, 2024 and reached all time high (ATH) of \$125,000 around October 6, 2025.<sup>3</sup>

Among cryptocurrency supporters, some advocated greater regulation including Bankman-Fried, who had published “an industry norms manual,” in which he laid out a framework for regulating the cryptocurrency industry.<sup>4</sup> A second group opposes regulation, viewing the collapse of HyperFund and FTX “as a validation of things they believed in all along: centralized anything is by default suspect”.<sup>5</sup> For these decentralization advocates, the very existence of a cryptocurrency exchange undermines the promise of blockchain technology, which they variously view as democratizing, decentralizing, and populist.<sup>6</sup>

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<sup>1</sup> David Yaffe-Bellany, “Binance Founder Sentenced to 4 Months in Prison,” *New York Times* (April 30, 2024), <https://www.nytimes.com/2024/04/30/technology/binance-founder-changpeng-zhao-sentenced.html> (accessed November 14, 2025); Dan Mangan, “DOJ and SEC Unveil Charges in \$1.9 Billion HyperFund Cryptocurrency Fraud,” *CNBC* (January 29, 2024), <https://www.cnbc.com/2024/01/29/doj-and-sec-unveil-charges-in-1point9-billion-cryptocurrency-fraud-scheme.html> (accessed November 14, 2025) (HyperFund); Allison Stanger, “Are Cryptocurrencies and Decentralized Finance Democratic?” in *Introduction to Digital Humanism: A Textbook*, eds. Hannes Werthner et al. (Cham: Springer Nature Switzerland, 2024), 511-522, [https://doi.org/10.1007/978-3-031-45304-5\\_32](https://doi.org/10.1007/978-3-031-45304-5_32) (the Terra blockchain); Andrew Ross Sorkin et al., “Guilty on All Counts, Bankman-Fried Completes a Fall From Grace,” *New York Times* (November 3, 2023), <https://www.nytimes.com/2023/11/03/business/dealbook/bankman-fried-guilty-verdict.html> (accessed November 14, 2025) (Sam Bankman-Fried—“SBF”); David Yaffe-Bellany, “The Crypto Industry Spent Over \$130 Million on the Election. It Paid Off,” *New York Times* (November 6, 2024), <https://www.nytimes.com/2024/11/06/technology/crypto-industry-spend-ing-election.html> (accessed November 14, 2025).

<sup>2</sup> Ismaeel Naar et al., “Eric Trump Promises the ‘Most Pro-Crypto President’ in History,” *New York Times* (December 10, 2024), <https://www.nytimes.com/2024/12/10/us/politics/eric-trump-cryptocurrency-conference.html> (accessed November 14, 2025).

<sup>3</sup> João da Silva, “Bitcoin Jumps to New Record High of More than \$106,000,” *BBC* (December 16, 2024), <https://www.bbc.com/news/articles/c5ywp010xxro> (accessed November 14, 2025); Alexander Reed, “Bitcoin All Time High,” *99Bitcoins*, <https://99bitcoins.com/cryptocurrency/bitcoin/historical-price/all-time-high/> (accessed October 26, 2025).

<sup>4</sup> Daniel Kuhn, “Is SBF Right about DeFi Regulation?” *CoinDesk* (October 25, 2022), <https://www.nasdaq.com/articles/is-sbf-right-about-defi-regulation> (accessed November 14, 2025).

<sup>5</sup> Joanna Ossinger, “Ethereum Co-Founder Vitalik Buterin Says FTX Saga Offers Lessons for Crypto,” *Bloomberg* (November 20, 2022), <https://www.bloomberg.com/news/articles/2022-11-20/ethereum-co-founder-buterin-ftx-sam-bankman-fried-offer-lessons-for-crypto> (accessed November 14, 2025).

Although Trump’s support for cryptocurrency appears at least partly motivated by personal profit, in the wake of the 2024 US election cryptocurrency supporters that oppose regulation appear ascendent, increasing the urgency for better understandings of the implications of the technology.<sup>7</sup>

Here we draw on normative theories of democracy to assess the claims of both cryptocurrency advocates and skeptics. We ask how would cryptocurrencies be governed if they were democratic and decentralized? While this is a general investigation into the democratic potential of cryptocurrency across the globe, many of our empirics and examples are focused on the United States as the country which has generally been the most important for cryptocurrency creation, mining, and trading, as well as for finance more generally. Drawing on data available from news coverage and through publicly available statements from cryptocurrency leaders and organizations, we conduct a preliminary analysis that raises serious doubts about the existence of and possibility for a democratically governed cryptocurrency. In so doing, we lay the groundwork for theory building and further empirical study of cryptocurrencies and other blockchain technologies through a political science lens.

## **Democratic Governance and Cryptocurrency**

Cryptocurrency, its impact on politics, and claims about its potential benefits are sufficiently wide ranging and common to be worth interrogation. Cryptocurrency advocates have long asserted that “blockchains shift some control over daily interactions with technology away from central elites, redistributing it among users. In doing so, they make systems more transparent and, perhaps, more democratic.”<sup>8</sup> They “argue that cryptocurrencies are democratizing the financial world,” serving the unbanked and underbanked as well as opening access to investment opportunities for traditionally marginalized countries and groups.<sup>9</sup> Blockchain-based solutions are proposed for a wide variety of social, political, and economic problems; companies, states, and Inter-Governmental

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<sup>6</sup> A cryptocurrency exchange is a business that enables its customers to trade cryptocurrencies for each other or traditional state-backed money; a blockchain is a ledger that should theoretically keep a decentralized, public, and secure record of anything, most commonly the digital tokens we call cryptocurrency.

<sup>7</sup> Eric Lipton, David Yaffe-Bellany, and Ben Protess, “Secret Deals, Foreign Investments, Presidential Policy Changes: The Rise of Trump’s Crypto Firm,” *New York Times* (April 29, 2025), <https://www.nytimes.com/2025/04/29/us/politics/trump-crypto-world-liberty-financial.html> (accessed November 14, 2025).

<sup>8</sup> Philip Boucher, *How Blockchain Technology Could Change Our Lives: In Depth Analysis* (LU: European Parliament. Directorate General for Parliamentary Research Services, 2017).

<sup>9</sup> World Economic Forum, “Cryptocurrencies Are Democratizing the Financial World. Here’s How,” *World Economic Forum* (January 22, 2021), <https://www.weforum.org/agenda/2021/01/cryptocurrencies-are-democratising-the-financial-world-heres-how/> (accessed November 14, 2025).

Organizations are experimenting with these approaches. For example, the Asia Development Bank in conjunction with KPMG (a consultancy) is developing a project to use the blockchain “to manage the leasing and registration of indigenous Fijian lands”.<sup>10</sup> From North Korea to India, cryptocurrency can be used to fund both victims and opponents of regimes that leverage finance to repress the opposition.<sup>11</sup> Supporters and some academics have also argued blockchain technology will make voting more secure in democracies.<sup>12</sup>

Yet many still find the assertions of cryptocurrency supporters theoretically and empirically unconvincing.<sup>13</sup> The claim that blockchains can be used to make voting more secure is one of the few which has received serious academic scrutiny. Analyzing and systematizing previous research, Park et al. show that not only do the risks inherent in online voting “...persist in blockchain-based voting systems, but blockchains may introduce ‘additional’ problems for voting systems”.<sup>14</sup> Others have found constitutional issues with blockchain-based voting.<sup>15</sup> Here we broaden their critical assessment by examining the governance of blockchain’s principal use, cryptocurrencies. Gaps between the promise and practice of cryptocurrency governance are of theoretical interest, but also of importance for the technology’s implications for global climate, markets, and politics. In addition to increasingly impacting elections through donations, they are used to subvert governments in avoiding taxes, facilitating payment for human and drug trafficking, perpetrating scams, laundering money, financing terrorism,<sup>16</sup> and enabling political corruption.<sup>17</sup>

The impact of cryptocurrency on climate change is both large and of

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<sup>10</sup> Olivier Jutel, “Blockchain Imperialism in the Pacific,” *Big Data & Society* 8, no. 1 (2021), <https://doi.org/10.1177/2053951720985249>.

<sup>11</sup> Alex Gladstein, “How to Dictator-Proof Your Money,” *Journal of Democracy* (April, 2024), <https://www.journalofdemocracy.org/online-exclusive/how-to-dictator-proof-your-money/> (accessed November 14, 2025).

<sup>12</sup> Amrita Dhillon et al., “Long Read: How Blockchain Can Make Electronic Voting More Secure,” *USAPP* (September 25, 2020), <https://blogs.lse.ac.uk/usappblog/2020/09/25/long-read-how-blockchain-can-make-electronic-voting-more-secure> (accessed November 14, 2025).

<sup>13</sup> See, for example, Ethan Fridmanski, *Crypto-Capital: The Political Economy of Cryptocurrencies* (PhD diss., University of Notre Dame, 2021), <https://doi.org/10.7274/02870v86418>; Stefan Eich, “Old Utopias, New Tax Havens: The Politics of Bitcoin in Historical Perspective,” in *Regulating Blockchain: Techno-Social and Legal Challenges*, eds. Philipp Hacker et al. (Oxford: Oxford University Press, 2019), <https://doi.org/10.1093/oso/9780198842187.003.0005>.

<sup>14</sup> Sunoo Park et al., “Going from Bad to Worse: From Internet Voting to Blockchain Voting,” *Journal of Cybersecurity* 7, no. 1 (2021): tyaa025, <https://doi.org/10.1093/cybersec/tyaa025>.

<sup>15</sup> Yoan Hermstrüwer, “The Limits of Blockchain Democracy: A Transatlantic Perspective on Blockchain Voting Systems,” *TTLF Working Paper*, no. 49 (Stanford-Vienna Transatlantic Technology Law Forum, Stanford, CA, 2020), [https://law.stanford.edu/wp-content/uploads/2020/01/hermstruewer\\_wp49.pdf](https://law.stanford.edu/wp-content/uploads/2020/01/hermstruewer_wp49.pdf) (accessed November 14, 2025).

<sup>16</sup> Shacheng Wang and Xixi Zhu, “Evaluation of Potential Cryptocurrency Development Ability in Terrorist Financing,” *Policing: A Journal of Policy and Practice* 15, no. 4 (2021): 2329-2340, <https://doi.org/10.1093/police/paab059>.

<sup>17</sup> Amy Q. Nguyen, “The Mysteries of NFT Taxation and the Problem of Crypto Asset Tax

particular importance for understanding different models of cryptocurrency governance. A single transaction using Bitcoin, the world's most valuable cryptocurrency, uses energy sufficient to power a German household for weeks.<sup>18</sup> Bressler estimates “that adding 4,434 metric tons of carbon dioxide in 2020—equivalent to the lifetime emissions of 3.5 average Americans—causes one excess death globally in expectation between 2020-2100”.<sup>19</sup> Using this standard, Bitcoin was “responsible for an estimated 18,818 unnecessary future deaths per annum as of October 2021”.<sup>20</sup> Bitcoin's chief competitor, Ethereum, has shifted away from the Proof of Work (PoW) technology used by Bitcoin and thereby reduced its energy usage from the equivalent of Switzerland's to less than that of the Eiffel Tower.<sup>21</sup>

Theories of democratic governance provide a basis for evaluating the democratic implications of these different governance models and the processes through which they were adopted. We focus our analysis on a principle of democratic governance known as the all-affected principle (AAP), which holds that “everyone who is affected by a decision should be able to influence that decision”.<sup>22</sup> As a normative principle of democracy that offers an alternative to the frameworks based on territorially bounded nation-states, AAP

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Evasion,” *SMU Science and Technology Law Review* 25, no. 2 (2022): 323-351, <https://scholar.smu.edu/scitech/vol25/iss2/8> (accessed November 14, 2025) (subvert government and avoid tax); U.S. Government Accountability Office, “As Virtual Currency Use in Human and Drug Trafficking Increases, So Do the Challenges for Federal Law Enforcement,” *GAO WatchBlog* (February 24, 2022), <https://www.gao.gov/blog/virtual-currency-use-human-and-drug-traffic-king-increases-so-do-challenges-federal-law-enforcement> (accessed November 14, 2025) (facilitating payment for human and drug trafficking); David Krause, “Meme Coins and the Trump Effect: Deregulation, Speculation, and the Future of Political Cryptocurrencies,” *SSRN* (March 3, 2025), <https://doi.org/10.2139/ssrn.5162499> (accessed November 14, 2025) (enable political corruption).

<sup>18</sup> Johannes Sedlmeir et al., “Ein Blick auf aktuelle Entwicklungen bei Blockchains und deren Auswirkungen auf den Energieverbrauch” [Recent Developments in Blockchain Technology and Their Impact on Energy Consumption], *Informatik Spektrum* 43, no. 6 (2020): 391-404, <https://doi.org/10.1007/s00287-020-01321-z>.

<sup>19</sup> R. Daniel Bressler, “The Mortality Cost of Carbon,” *Nature Communications* 12, no. 1 (2021): 4467-4467, <https://www.nature.com/articles/s41467-021-24487-w> (accessed November 14, 2025).

<sup>20</sup> Jon Truby et al., “Blockchain, Climate Damage, and Death: Policy Interventions to Reduce the Carbon Emissions, Mortality, and Net-Zero Implications of Non-Fungible Tokens and Bitcoin,” *Energy Research & Social Science* 88 (2022): 102499, <https://doi.org/10.1016/j.erss.2022.102499> (accessed November 14, 2025).

<sup>21</sup> Ruth Newman, “New Tool Estimates Environmental Impact of Blockchain Networks,” *Cambridge Judge Business School* (April 26, 2023), <https://www.jbs.cam.ac.uk/2023/blockchain-sustainability-ethereum/> (accessed November 14, 2025).

<sup>22</sup> Archon Fung and Sean W. D. Gray, “The All-Affected Principle: A Pathway to Democracy for the Twenty-First Century?” in *Empowering Affected Interests: Democratic Inclusion in a Globalized World*, eds. Archon Fung and Sean W. D. Gray (Cambridge: Cambridge University Press, 2024), 1-18, <https://doi.org/10.1017/9781009453981.001>. See also: Robert E. Goodin, “Enfranchising All Affected Interests, and Its Alternatives,” *Philosophy & Public Affairs* 35, no. 1 (2007): 40-68, <https://doi.org/10.1111/j.1088-4963.2007.00098.x>.

is a fitting criteria to apply to cryptocurrency governance. Cryptocurrencies are themselves transnational and implicate numerous policy problems with global reach (e.g. climate change, financial markets).<sup>23</sup> AAP also aligns with cryptocurrency governance structures by raising the possibility of distributing influence in proportion to affectedness (e.g. according to processing power or staking amount), rather than according to “one person one vote”. Although this principle establishes a regulative ideal that real world democratic governance structures likely cannot fully live up to, it provides a standard against which to assess their democratic character and deficits.

In assessing the democratic and decentralized character of cryptocurrencies and blockchains, we examine Ethereum’s shift from PoW to an increasingly prominent cryptocurrency technology, Proof of Stake (PoS) which accords decision-making power to cryptocurrency owners in proportion to the amount of the currency they own and stake. While PoS is heralded as a more democratic consensus mechanism, we show that Ethereum is not only elite and resource dominated but controlled by a handful of individuals and companies.

Below, we begin by providing a brief history of blockchain and cryptocurrency, especially Bitcoin and Ethereum. We explain the PoW and PoS consensus mechanisms as well as Ethereum’s shift from the former to the latter. We show how current governance mechanisms for cryptocurrencies are neither democratic nor decentralized as proponents claim. Finally, we consider the democratic potential of cryptocurrencies and conclude that governing them more democratically would require a fundamental reconceptualization of their design and purpose.

## **Blockchain, Cryptocurrency, Bitcoin, and Proof of Work**

In 2008, a programmer or group of programmers using the pseudonym Satoshi Nakamoto wrote the code for Bitcoin. The system used peer-to-peer architecture that allowed it to operate without a central administrator. Miners apply computing power to solve complex math problems that verify transactions in the currency, leading to the name ‘proof-of-work’. Consensus is obtained on the Bitcoin network through “voting among the miners approximately every 10 min... to consolidate the validated transactions into a block”.<sup>24</sup> In a PoW system the winning miner (generally one of those that applied the most computing power) chooses the transactions to include in the block and each member of the network confirms and validates each block mined.

Not only are Bitcoins tracked and recorded by all participants, but changes

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<sup>23</sup> For application of AAP to the problem of climate change see: Melissa Lane, “The All-Affected Principle and Climate Change,” in *Empowering Affected Interests: Democratic Inclusion in a Globalized World*, eds. Archon Fung and Sean W. D. Gray (Cambridge: Cambridge University Press, 2024), 211-228, <https://doi.org/10.1017/9781009453981.016>.

<sup>24</sup> Zi Hau Chin, Timothy Tzen Vun Yap, and Ian Kim Teck Tan, “Genetic-Algorithm-Inspired Difficulty Adjustment for Proof-of-Work Blockchains,” *Symmetry* 14, no. 3 (2022): 609, <https://doi.org/10.3390/sym14030609>.

“to the Bitcoin software, which would run on the computer of every user, would also be decided by means of this democratic model. Any user could make a change to the open-source Bitcoin software, but the changes would generally be effective only when a majority of the computers on the network adopted the altered version of the software”.<sup>25</sup> This change can result in the creation of a parallel currency (a hard fork) as some users continue with the old code and others upgrade. This has created over 100 Bitcoin forks (independent cryptocurrencies), many of which no longer exist and none of which proved nearly as successful as Bitcoin.<sup>26</sup>

Metaphorically, the validation of each Bitcoin transaction is like a plebiscite verifying the decisions, laws, and constitution of a government every ten minutes.<sup>27</sup> It is roughly as though every registered voter had an editable copy of their country’s laws and constitution and if enough voters (as measured by processing power rather than one person one vote) made the same change, then likely the entire population of voters would follow suit, and it would immediately be enacted. Alternatively, a dedicated minority of voters could agree to make or resist changes and thereby create a hard fork and their own polity.

As the first cryptocurrency, Bitcoin has been wildly successful. In 2010, the first physical Bitcoin purchase, two pizzas, was made at the value of less than one cent per Bitcoin.<sup>28</sup> Since late 2019, the price of an individual Bitcoin has fluctuated between about US\$7,000 and US\$110,000.<sup>29</sup> As of May 2024, it had a market capitalization of over two trillion dollars, similar in size to Alphabet (Google) or Amazon.<sup>30</sup> Yet, design limitations restrict its potential. Only 21-million coins can ever be created.<sup>31</sup> To control the creation of new

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<sup>25</sup> Ibid, 30.

<sup>26</sup> Walter Bazán-Palomino, “How Are Bitcoin Forks Related to Bitcoin?” *Finance Research Letters* 40 (2021): 101723, <https://doi.org/10.1016/j.frl.2020.101723>; Thomas Conlon et al., “Bitcoin Forks: What Drives the Branches?” *Research in International Business and Finance* 70 (2024): 102261, <https://doi.org/10.1016/j.ribaf.2024.102261>; Walter Bazán-Palomino, “Bitcoin and Its Offspring: A Volatility Risk Approach,” in *Advanced Studies of Financial Technologies and Cryptocurrency Markets*, eds. Lukáš Pichl et al. (Singapore: Springer, 2020), 233-256, [https://doi.org/10.1007/978-981-15-4498-9\\_13](https://doi.org/10.1007/978-981-15-4498-9_13).

<sup>27</sup> For more on the applicability of constitutional processes to blockchain governance, see: Eric Alston, “Constitutions and Blockchains: Competitive Governance of Fundamental Rule Sets,” *Journal of Law, Technology, & the Internet* 11, no. 1 (2020): 131; Eric Alston et al., “Blockchain Networks as Constitutional and Competitive Polycentric Orders,” *SSRN* (2021), <https://doi.org/10.2139/ssrn.3887701>.

<sup>28</sup> Eric Mack, “The Bitcoin Pizza Purchase That’s Worth \$7 Million Today,” *Forbes* (December 23, 2013), <https://www.forbes.com/sites/ericmack/2013/12/23/the-bitcoin-pizza-purchase-thats-worth-7-million-today/> (accessed November 14, 2025).

<sup>29</sup> John Edwards, “Bitcoin’s Price History,” *Investopedia* (October 15, 2025), <https://www.investopedia.com/articles/forex/121815/bitcoins-price-history.asp> (accessed November 14, 2025).

<sup>30</sup> Forbes, “Cryptocurrency Prices, Market Cap and Charts,” *Forbes*, <https://www.forbes.com/digital-assets/crypto-prices/> (accessed May 22, 2025).

coins as the number of calculations per second increases, the difficulty of PoW transactions is consistently adjusted upwards. This, in combination with limits on block size, creates a bottleneck in Bitcoin's processing of transactions, leading to delays and high transaction fees. Because of these bottlenecks, many Bitcoin transactions currently take place through faster "layer 2" payment protocols (such as lightning network or liquid network) and third parties (including cryptocurrency exchanges like Coinbase).<sup>32</sup> While these limitations are largely self-imposed, they create Bitcoin's tremendous environmental toll, limit its usefulness as a currency, and ensure that much of its operation happens outside of its blockchain.

## **Proof of Stake, Ethereum, and the Merge**

The success, limitations, and externalities of Bitcoin have led to a host of competitors.<sup>33</sup> Having identified the major drawbacks of PoW, newer cryptocurrencies generally use a PoS consensus mechanism, in which the validation of transactions and the new coins that reward that validation are based on how much of the currency a user already owns. PoW and PoS are two ways of making the blockchain secure and verifiable without a centralized guarantor. In a PoW model, the complexity of the calculations means that a potential attacker would need to control a significant amount of the processing power in the network. Similarly, a PoS model usually limits validators to those with substantial holdings in the currency. In both cases, not only is this a high bar for potential malicious actors to meet, but it would make them institutional players with an incentive in the overall health of the currency and therefore less likely to damage it through the hijacking of transactions. PoS allows for similar decentralization as a PoW system without some of the downsides, most notably the tremendous energy and environmental costs; estimates suggest that Ethereum's switch to PoS reduced its energy use by 99.99 percent.<sup>34</sup>

Launched in 2015, Ethereum is a blockchain platform on which many services operate including smart contracts, non-fungible tokens (NFTs), and a variety of cryptocurrencies, including its native currency (named Ether but generally called Ethereum). Together Bitcoin and Ethereum make up around 70 percent of the total market capitalization of all cryptocurrencies, not counting several other prominent cryptocurrencies that also use

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<sup>31</sup> Nathaniel Popper, *Digital Gold: The Untold Story of Bitcoin* (London: Allen Lane, 2015).

<sup>32</sup> Pedro Franco, *Understanding Bitcoin: Cryptography, Engineering and Economics* (Chichester, UK: John Wiley & Sons, 2014); Ankit Gangwal, Haripriya Ravali Gangavalli, and Apoorva Thirupathi, "A Survey of Layer-Two Blockchain Protocols," *Journal of Network and Computer Applications* 209 (2023): 103539, <https://doi.org/10.1016/j.jnca.2022.103539>.

<sup>33</sup> Martin Garriga et al., "Blockchain and Cryptocurrencies: A Classification and Comparison of Architecture Drivers," *Concurrency and Computation: Practice and Experience* 33, no. 8 (2021): e5992, <https://doi.org/10.1002/cpe.5992>.

<sup>34</sup> Newman, "New Tool Estimates Environmental Impact of Blockchain Networks."

Ethereum's blockchain.<sup>35</sup>

Like Bitcoin, Ethereum started with a PoW system and its operation emitted as much carbon as a medium-sized country. In 2022, Ethereum shifted to PoS (“the Merge”) marking a meaningful step in fighting climate change, comparable to a country like Spain going carbon neutral.<sup>36</sup> Despite the clear environmental benefits of the Merge, the switch put in jeopardy billions of US dollars of value with nothing to back it but the faith of its stakers. This required the support of Ethereum miners who invested large sums in specialized mining machines that effectively became worthless overnight. Some Ethereum miners attempted to resist the Merge;<sup>37</sup> but their efforts resulted in a largely worthless and inactive fork.<sup>38</sup>

Belying an understanding of cryptocurrency as democratic and decentralized, the Merge was largely elite-driven, top down, and centralized. Ethereum was created by Vitalik Buterin with some backing from conservative billionaire Peter Thiel's fellowship.<sup>39</sup> Even before Ethereum was launched, Buterin teased the shift to proof of stake, citing security advantages in addition to environmental considerations.<sup>40</sup> Since then, Buterin and other founders of the technology have worked towards the Merge, as has the Swiss-based Ethereum foundation, set up to support Ethereum with Buterin as one of its three board members.<sup>41</sup> Additionally, early developers built a “difficulty bomb” into Ethereum's code in 2015, which would be triggered after users updated to the new PoS system as part of the Merge, making mining with the old code difficult to the point of unprofitability. Economic factors also facilitated the Merge. Many believed markets would reward the greening of Ethereum, especially in comparison to Bitcoin. Many of the largest mining

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<sup>35</sup> CoinMarketCap, “Cryptocurrency Prices, Charts and Market Capitalizations,” *CoinMarketCap*, <https://coinmarketcap.com/> (accessed August 16, 2024).

<sup>36</sup> Isabella Gschossmann et al., “Mining the Environment—Is Climate Risk Priced into Crypto-Assets?” *Macroprudential Bulletin*, no. 18 (2022), [https://www.ecb.europa.eu/pub/financial-stability/macprudential-bulletin/html/ecb.mpbu202207\\_3~d9614ea8e6.en.html](https://www.ecb.europa.eu/pub/financial-stability/macprudential-bulletin/html/ecb.mpbu202207_3~d9614ea8e6.en.html) (accessed November 14, 2025).

<sup>37</sup> Bessie Liu, “Ethereum Fork May Be Doomed To ‘Fail,’ but Chandler Guo Is All In. Again,” *Blockworks* (August 16, 2022), <https://blockworks.co/news/ethereum-fork-may-be-doomed-to-fail-but-chandler-guo-is-all-in-again> (accessed November 14, 2025).

<sup>38</sup> Terence Zimwara, “Ethereum Hard Fork Coin ETHW Down More Than 95% Since The Merge,” *Bitcoin.com News* (September 13, 2023), <https://news.bitcoin.com/ethereum-hard-fork-coin-ethw-down-more-than-95-since-the-merge/> (accessed November 14, 2025).

<sup>39</sup> J. Z. Garrod, “The Real World of the Decentralized Autonomous Society,” *tripleC: Communication, Capitalism & Critique* 14, no. 1 (2016): 62-77, <https://doi.org/10.31269/triplec.v14i1.692>.

<sup>40</sup> Taylor Locke, “Ethereum Creator Vitalik and His Father, Dima Buterin, on This ‘Morally Clarifying Moment’ and Why There’s More to Crypto than Money,” *Yahoo! Finance* (June 19, 2022), <https://www.yahoo.com/now/ethereum-creator-vitalik-father-dima-165601747.html> (accessed November 14, 2025).

<sup>41</sup> Real Vision, “What Is the Ethereum Foundation?” *Real Vision* (July 7, 2022), <https://www.realvision.com/blog/what-is-the-ethereum-foundation> (accessed November 14, 2025).

pools believed they had the capacity and reputation to switch to stake pooling, which they hoped would prove more profitable as it greatly reduced the cost in processors and energy.<sup>42</sup> Although buy-in was required from the Ethereum community, the shift from PoW to PoS was led by elites who leveraged their moral authority, financial resources, and media access, in a manner reminiscent of political party leaders influencing rank-and-file members.

## **Governance Mechanisms and Organization after The Merge**

The rise of blockchain technology and the impact of its most prominent use thus far (cryptocurrencies), raises questions about the governance of cryptocurrency. This section provides what, to our knowledge, is the first detailed empirical analysis of cryptocurrency governance through a comparison of Bitcoin (PoW) and Ethereum (PoS). According to the AAP, the democratic character of these cryptocurrencies depends on the extent to which people with affected interests are able to influence decision-making. Determining what counts as affected, or affected enough to merit influence, is one important conceptual question when applying the AAP.<sup>43</sup> In this section we define affected interests relatively narrowly to mean those who own Bitcoin or Ethereum. Although we explore more expansive conceptions of affected interests later in the paper, here we show that Bitcoin and Ethereum governance in current practice accords influence to a very small proportion of even this most narrowly defined set of affected interests.

Around 220 million people own some amount of Bitcoin, but fewer than ten-thousand individuals hold at least 25 percent of all Bitcoin in circulation. This percentage is likely a vast underestimate as many of the largest Bitcoin wallets may be owned by the same person, but the opacity of the system makes an exact estimate impossible.<sup>44</sup> Actual power over the currency is far more concentrated than ownership. The top mining pools (centralized organizations of miners) have almost all the influence, not only because they control the most processing power, but because in such a winner-take-most system miners usually emulate their most successful peers. This has led to substantial consolidation; the largest four mining pools comfortably control the majority of Bitcoin mining capacity.<sup>45</sup> As these mining pools are run by privately held corporations, Bitcoin is now effectively under the control of just four private

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<sup>42</sup> Prashant Jha, "Ethereum Merge Prompts Miners and Mining Pools to Make a Choice," *Cointelegraph* (August 19, 2022), <https://cointelegraph.com/news/ethereum-merge-prompts-miners-and-mining-pools-to-make-a-choice> (accessed November 14, 2025).

<sup>43</sup> Fung and Gray, "The All-Affected Principle," 5.

<sup>44</sup> Igor Makarov and Antoinette Schoar, "Blockchain Analysis of the Bitcoin Market," *NBER Working Paper*, no. w29396 (2021): 29, <https://doi.org/10.3386/w29396>.

<sup>45</sup> Kadan Stadelmann, "Big Miners Pose a Growing Existential Threat to Bitcoin," *Cointelegraph* (May 16, 2024), <https://cointelegraph.com/news/big-bitcoin-miners-growing-threat-bitcoin> (accessed November 14, 2025).

companies. To return to our plebiscite analogy, the votes are still held every ten minutes, but the majority of votes are now cast by just four private companies.

The consolidation of Bitcoin mining in the hands of just four companies undermines the essential ethos of the cryptocurrency but has also had practical effects. To prevent fraud, corruption, money laundering, and terrorist financing, mining pools now require miners to go through Know Your Customer protocols like those of financial institutions.<sup>46</sup> This is probably to stave off potential government action and avoid money laundering charges. Additionally, some mining pools have been credibly accused of censoring (declining to validate) transactions from addresses sanctioned by the US Office of Foreign Assets Control (OFAC). According to the founding ideology of Bitcoin, these types of restrictions and government regulation were supposed to be impossible but have become a reality as the control of the cryptocurrency has consolidated. Ultimately, many Bitcoin proponents see the centralization of Bitcoin as something that needs to be combatted and as an existential threat to the currency;<sup>47</sup> but there is no clear movement in this direction.

Theoretically, in a PoS system the power to make new blocks or change the blockchain could be more decentralized than with PoW; post-Merge Ethereum surpassed a million validators in May 2024.<sup>48</sup> The reality, however, is that a large number of validators does not necessarily equate to decentralization;<sup>49</sup> and post-Merge Ethereum is highly centralized. According to coinbase.com, 28 percent of Ethereum was staked in December 2024, roughly equivalent to just 28 percent of adult citizens being registered to vote, even though they are incentivized to do so by interest payments. Of this minority, only a small percentage are directly participating in the network. Ethereum.org describes solo staking as the “gold standard for staking. It provides full participation rewards, improves the decentralization of the network, and never requires trusting anyone else with your funds”.<sup>50</sup> While solo staking represents the democratic and decentralized ideal, the reality is that only a small percentage of Ethereum is controlled by solo stakers. Due to the anonymity of the technology an exact percentage is not calculable with precision but can be estimated at somewhere between 5 percent and 18 percent.<sup>51</sup>

Even among the minority of Ethereum holders that stake their holding,

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<sup>46</sup> Ibid; Makarov and Schoar, “Blockchain Analysis of the Bitcoin Market.”

<sup>47</sup> Stadelmann, “Big Miners Pose a Growing Existential Threat to Bitcoin.”

<sup>48</sup> Ibrahim Ajibade, “Ethereum Hits 1 Million Active Node Validators, Will ETH Price React?” *FX Empire* (May 13, 2024), <https://www.fxempire.com/forecasts/article/ethereum-hits-1-million-active-node-validators-will-eth-price-react-1430029> (accessed November 14, 2025).

<sup>49</sup> GLCstaked, “Ethereum - How Many Solo Stakers?” *Mirror* (October 10, 2023), <https://mirror.xyz/glcstaked.eth/CzCNFznCveDIKnIvaSU5-MzUtn9gW0K1gPe5FVrQME> (accessed November 14, 2025).

<sup>50</sup> Ethereum.org, “Ethereum Staking: How Does It Work?” *Ethereum.org* (October 8, 2025), <https://ethereum.org/en/staking/> (accessed May 22, 2025).

<sup>51</sup> Ajibade, “Ethereum Hits 1 Million Active Node Validators, Will ETH Price React?”; hildobby, “Ethereum ETH Staking (Lido, Coinbase, Kraken, Binance, RocketPool, Frax...)” *Dune* (May 6, 2024), <https://dune.com/hildobby/eth2-staking> (accessed November 14, 2025).

the technical requirements, necessary skills, and substantial staking minimums (over \$100,000 as of December 2024 for Ethereum) mean that, rather than solo staking, most Ethereum currency holders who do stake entrust their money to a staking institution. These staking institutions validate transactions and receive a share of transaction fees proportional to the size of their holdings, some of which they keep and the rest they pass on to the owners that have entrusted Ethereum to them. The vast majority of staked, and therefore voting, Ethereum is controlled by one of four types of staking institutions: cryptocurrency exchanges, staking pools, liquid stakers, and liquid restakers.<sup>52</sup>

Just five of these staking institutions control a majority of voting Ethereum. The privately held non-custodial staking provider Figment, in combination with publicly traded Coinbase and privately held Binance (both cryptocurrency exchanges) currently control over 19 percent of voting Ethereum, but do not make even a pretext of allowing their stakers to vote or participate in the governance of the staking institution, much less impact how their Ethereum votes. Ether.fi is a fast-growing liquid restaker that currently controls about 5 percent of staked Ethereum.<sup>53</sup> Ether.fi makes a clear claim to care about governance and participation, urging users to “start by claiming your token and joining Discourse to engage in the discussion” on a platform called Agora (a reference to ancient Greek democracy).<sup>54</sup> Yet despite controlling over 6 billion US dollars of Ethereum, Agora states that “Delegation and voting are coming soon”.<sup>55</sup> To date, there do appear to have been votes on eight proposals on ether.fi, with the highest participation rate just under 1.5 percent. In one case, a majority of votes was cast by a single coin holder. Moreover, interest seems to be waning as the number of votes cast per proposal has dropped from a few thousand to a few hundred.<sup>56</sup>

By far the biggest staking institution in Ethereum is the liquid staker Lido, which ran about 28 percent of validators in August 2024. Lido bills itself as a Decentralized Autonomous Organization (DAO), in which token holders participate in management and decision-making. In 2022, for example, Lido held a vote over whether to limit its dominance of Ethereum. The result was notable; an overwhelming 99.81 percent of tokens voted against limiting Lido’s total stake in Ethereum and against the wishes of Ethereum founder Vitalik Buterin and Ethereum foundation researcher Danny Ryan.<sup>57</sup> Further, with less than 10 percent of Lido tokens voting, just three wallets (presumably three individuals) controlled the majority of votes cast. Looking across Lido

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<sup>52</sup> hildobby, “Ethereum ETH Staking.”

<sup>53</sup> Ibid.

<sup>54</sup> Voter on Agora, <https://vote.ether.fi/delegates> (accessed November 14, 2025).

<sup>55</sup> Ibid.

<sup>56</sup> Aleksander Gilbert, “Lido Voters Reject Limiting Growth In Key Move For Eth2,” *The Defiant* (June 28, 2022), <https://thedefiant.io/lido-rejects-self-limiting> (accessed November 14, 2025).

<sup>57</sup> Ibid.

voting more generally, most votes similarly involve participation rates below 10 percent and therefore are easily dominated by just two or three token holders. Even if one accepts the principle of one coin one vote, this represents a pronounced democratic deficit: the equivalent of approximately 0.05 percent of votes dominating an institution that controls 28.6 percent of overall votes.<sup>58</sup>

Yet, even if Lido were more decentralized and democratic or if ether.fi developed the discursive democracy they are suggesting, it might make no difference. Lido and ether.fi are each run by privately-owned companies based in the Cayman Islands.<sup>59</sup> It is not clear if either are under any obligation to use the Ethereum stake entrusted to them in a way consistent with the governance mechanism discussed above. Whereas a charismatic founder and his associates once appeared to set policy for Ethereum (as in the cases of The DAO attack and the Merge), after the Merge, a tiny group of privately held (except for Coinbase) corporations now control Ethereum.

Another important influence over both PoW and PoS cryptocurrencies comes from the small cadre of coders who amount to a technocratic elite. They not only write the code but are generally the ones who understand it and are therefore able to shape the discourse around proposed changes. Kavanagh and Ennis argue that this group constitutes a new and even more powerful form of Weberian bureaucracy that they term blockocracy.<sup>60</sup>

From rhetoric about the independence of solo stakers, Discourse, Agora, and Lido's voting, it is clear that a significant portion of the cryptocurrency community embraces at least the language and appearance of caring about democracy, governance, and decentralization. As we have clearly demonstrated, however, the empirical reality of contemporary Bitcoin and Ethereum is the exact opposite of these aspirations. In the language of the AAP principle, even when limited in scope to cryptocurrency owners only, the overwhelming majority of people with affected interests lack any meaningful influence over

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<sup>58</sup> Mitchell Goldberg and Fabian Schär, "Metaverse Governance: An Empirical Analysis of Voting within Decentralized Autonomous Organizations," *Journal of Business Research* 160 (2023): 113764, <https://doi.org/10.1016/j.jbusres.2023.113764>.

<sup>59</sup> CB Insights, "Lido - Products, Competitors, Financials, Employees, Headquarters Locations," <https://www.cbinsights.com/company/lido-finance> (accessed May 22, 2025); Lido DAO, "Lido DAO Terms of Use," <https://lido.fi/terms-of-use> (accessed May 22, 2025); Sovereign Wealth Fund Institute, "Lido Finance (Lido) - Collateralized Loan Obligation, Cayman Islands SWFI," <https://www.swfinstitute.org/profile/62226b8125d245f9114d7b7d> (accessed May 22, 2025); PitchBook, "Ether.Fi 2025 Company Profile: Valuation, Funding & Investors PitchBook," <https://pitchbook.com/profiles/company/520903-54> (accessed May 22, 2025); Cayman Finance, "Ether.Fi Secures \$23M in Funding Led by Bullish Capital and CoinFund," *Cayman Finance*, <https://caymanfinance.ky/2024/03/04/ether-fi-secures-23m-in-funding-led-by-bullish-capital-and-coinfund/> (accessed March 4, 2024).

<sup>60</sup> Donncha Kavanagh and Paul John Ennis, "Cryptocurrencies and the Emergence of Blockocracy," *The Information Society* 36, no. 5 (2020): 290-300, <https://doi.org/10.1080/01972243.2020.1795958>; See also: Primavera De Filippi and Benjamin Loveluck, "The Invisible Politics of Bitcoin: Governance Crisis of a Decentralised Infrastructure," *Internet Policy Review* 5, no. 3 (2016), <https://doi.org/10.14763/2016.3.427>.

the way both cryptocurrencies are governed. Far from being decentralized and democratic, Bitcoin and Ethereum are both under the control of a few private companies and large-value token holders.

## **The Democratic Potential of Cryptocurrency Governance**

Having established the concentrated, technocratic, and plutocratic nature of cryptocurrency governance in both PoW and PoS systems, as well as low levels of participation, we now return to the democratic promise of cryptocurrencies in the view of their proponents. Are such aspirations realizable and, if so, how might cryptocurrencies be democratized? Or are claims about the decentralization and democratization of cryptocurrencies an aspiration grounded in misguided enthusiasm or intentional misdirection? To answer these questions, we must consider what kind of entities cryptocurrencies are to assess what kinds of governance models are most applicable to them as standards against which to evaluate their democratic potential.

### *Cryptocurrencies as Currencies*

Most obviously, cryptocurrencies can be thought of as currencies; they are used as a medium of exchange and a form of payment. In 2017, blockchain data provider CoinMetrics estimated that 33 percent of Bitcoin transactions were used to purchase goods and services.<sup>61</sup> A growing number of retailers and payment platforms accept cryptocurrencies as payment and some cryptocurrency enthusiasts have predicted they will replace fiat currency as soon as 2035.<sup>62</sup> El Salvador and the Central African Republic have adopted Bitcoin as legal tender, though uptake has not been widespread, and El Salvador has had to scale back the plan to secure a loan from the IMF.<sup>63</sup> Further, the Reserve Bank of Australia, the US Federal Reserve, and Sweden's Riksbank have published data in more recent years showing that only 1-2 percent of

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<sup>61</sup> Cole Petersen, "33% of Bitcoin Payments Used to Purchase Goods, Economic Value in Question," *NewsBTC* (July 27, 2018), <https://www.newsbtc.com/news/ai-and-tech/only-33-of-bitcoin-payments-used-to-purchase-goods-economic-value-in-question/> (accessed November 14, 2025).

<sup>62</sup> Carla Mozée, "More than Half of Experts in a Recent Crypto Survey Said Bitcoin Will Replace Fiat Currency by 2050," *Business Insider* (July 18, 2021), <https://markets.businessinsider.com/news/cryptocurrencies/bitcoin-vs-fiat-global-finance-2050-crypto-experts-finder-2021-7> (accessed November 14, 2025).

<sup>63</sup> Fernando E. Alvarez, David Argente, and Diana Van Patten, "Are Cryptocurrencies Currencies? Bitcoin as Legal Tender in El Salvador," *NBER Working Paper*, no. w29968, <https://doi.org/10.3386/w29968>; João da Silva, "El Salvador Strikes \$1.4bn IMF Deal after Scaling Back Bitcoin Policies," *BBC* (December 19, 2024), <https://www.bbc.com/news/articles/c20e313xllwo> (accessed November 14, 2025).

people in Australia, the US, and Sweden actually use cryptocurrency to make purchases.<sup>64</sup>

If we are to consider cryptocurrencies as forms of money, we can turn to the existing literature about the democratic potential of money to guide our inquiry. Stefan Eich argues that money “is not just a neutral convenience of commerce but a public good as well as, at least aspirationally, a political institution of self-rule”.<sup>65</sup> This reality has been obscured by a decades long consensus regarding central bank independence as a “virtually uncontested institutional norm” which serves to insulate the governance of money from its distributive consequences in a way that clearly violates the AAP.<sup>66</sup> Under this set of norms, monetary policy is characterized as a technocratic rule-driven practice that is appropriately beyond the reach of elected officials and democratic publics. The 2008 financial crisis (followed by the COVID-19 pandemic) revealed the extent to which central bankers make political decisions that have major distributive consequences without mechanisms for political accountability.<sup>67</sup> This legitimacy problem has been one of the rationales offered for cryptocurrency—a form of denationalized privatized money beyond the reach of the state and banking system. This promise revives and extends a political project that can be traced back to at least the 1970s, when Friedrich Hayek advocated for denationalized private money entrusted to “the hyper-coordinative processes of the auto-regulating market”.<sup>68</sup> When we consider cryptocurrencies as currencies then, it becomes clear that while they are neither democratized nor decentralized, they differ from fiat currencies primarily because they are privatized.<sup>69</sup> This is true both in the sense that they were not the creation of a state or central bank, but also in the sense that they enjoy relatively minimal regulation or oversight by states, though currently the trajectory for this is uncertain and will vary substantially in

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<sup>64</sup> John Hawkins, “Almost No One Uses Bitcoin as Currency, New Data Proves. It’s Actually More like Gambling,” *The Conversation* (June 22, 2023), <http://theconversation.com/almost-no-one-uses-bitcoin-as-currency-new-data-proves-its-actually-more-like-gambling-207909> (accessed November 14, 2025).

<sup>65</sup> Stefan Eich, *The Currency of Politics: The Political Theory of Money from Aristotle to Keynes* (Princeton, NJ: Princeton University Press, 2022), 214.

<sup>66</sup> Erik Jones and Matthias Matthijs, “Rethinking Central-Bank Independence,” *Journal of Democracy* 30, no. 2 (2019): 128, <https://doi.org/10.1353/jod.2019.0030>.

<sup>67</sup> Adam Tooze, “The Death of the Central Bank Myth,” *Foreign Policy* (May 13, 2020), <https://foreignpolicy.com/2020/05/13/european-central-bank-myth-monetary-policy-german-court-ruling/> (accessed November 14, 2025).

<sup>68</sup> JG Swanson, *Subjects of Money: Political Practices of Self-Making in Capitalist Modernity* (PhD diss., Cornell University, 2022), 158.

<sup>69</sup> For evidence that participants in blockchain communities are less trusting of government and more supportive of privatization than the general public, see: Melusine Boon-Falleur and Talia Laizeau, “Trustless Libertarians? Attitudes about Trust, Politics, Science and the Environment in the Blockchain Community,” (2021): 1-24, <https://doi.org/10.31234/osf.io/ka7st>.

different jurisdictions.<sup>70</sup>

While cryptocurrencies are held up as a solution to the democratic legitimacy problems of the contemporary global financial system, political theorists who interrogate the governance of money typically embrace the opposite impulse by calling for heightened state involvement and public accountability in state-backed money. Some proposals advocate for a two-tiered system that toggles between central bank independence in “normal times” and heightened democratic accountability and oversight of monetary policy in or following exceptional or crisis times.<sup>71</sup> Others advocate moving money’s routine governance towards increased public accountability by democratizing the internal governance of central banks through forms of “open democracy” and/or representative (election or sortition based) deliberative councils.<sup>72</sup> Such an approach expands the affected interests that are granted influence over decision-making and would require “redefining independence as not against democracy but rather against the executive and financial markets”.<sup>73</sup> Beyond the democratization of money’s governance, several proposals focus on democratizing access to credit, including the creation of central bank digital currencies and a restructuring of central banks’ mission and purpose (see, for example, The People’s Ledger).<sup>74</sup> This suggests that efforts to democratize both access to and the governance of money will not be realized via private denationalized cryptocurrencies but instead via a re-politicization of money where its governance is subject to greater public accountability.

### ***Cryptocurrencies as Corporations***

Considering how little they are used for transactions, there are good reasons to reject cryptocurrencies’ self-presentation as currencies and instead recognize them as speculative assets.<sup>75</sup> Their volatility, a major factor undermining their use as currency, makes them attractive speculative assets. From this vantage, while cryptocurrencies are not technically corporations, they share with

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<sup>70</sup> Huw Jones, “Crypto Sector Gets Its First Set of Global Rules from Watchdog,” *Reuters* (May 23, 2023), <https://www.reuters.com/business/watchdog-proposes-first-set-global-rules-crypto-sector-2023-05-23> (accessed November 14, 2025); Peter Stone, “Critics Slam Deregulation of Crypto as Trump Family Expands Its Footprint in Industry,” *The Guardian* (April 14, 2025), <https://www.theguardian.com/us-news/2025/apr/14/critics-slam-deregulation-of-crypto-as-trump-family-expands-its-footprint-in-industry> (accessed November 14, 2025).

<sup>71</sup> Jones and Matthijs, “Rethinking Central-Bank Independence.”

<sup>72</sup> Eich, *The Currency of Politics*, 218.

<sup>73</sup> *Ibid.*

<sup>74</sup> Saule T. Omarova, “The People’s Ledger: How to Democratize Money and Finance the Economy,” *Vanderbilt Law Review* 74, no. 5 (2021): 1231-1300; John Crawford, “Radicalism and Democracy in Monetary System Reform Response,” *Vanderbilt Law Review En Banc* 75 (2022): 55-86, <https://scholarship.law.vanderbilt.edu/vlreb/vol75/iss1/3/> (accessed November 14, 2025).

<sup>75</sup> Eich, “Old Utopias, New Tax Havens,” 115.

corporations the primary purpose of profit maximization for their investors. While corporations seek to maximize profits for their shareholders, and such profits are generally collected in proportion to the number of shares owned, cryptocurrencies aim to generate profit for investors in two ways. First, cryptocurrencies provide rewards for validation, the distribution of which varies. Second, they reward investors through appreciation of the currency in proportion to the amount owned. Furthermore, some cryptocurrencies, like Helium, were created by corporations (Helium Inc., now known as Nova Labs Inc.) and much of the cryptocurrency ecosystem relies on corporations (i.e., currency exchanges like Coinbase) to function.<sup>76</sup>

What might it look like to consider cryptocurrencies through the lens of corporate governance? To start with a narrow application of the AAP, we consider shareholders as those with affected interests significant enough to merit influence. When compared to the structures of shareholder democracy, cryptocurrencies appear no more (and probably less) transparent for several reasons. First, the tiers of empowered membership in cryptocurrencies are less formalized and transparent than the relationship between shareholders and a board in corporate governance structures. Unlike the “one share one vote” governance structure of public corporations, simply owning cryptocurrency does not necessarily empower a member to participate in decisions. Investing in cryptocurrency via a coin exchange is like holding non-voting shares in a corporation because it offers the potential to earn profit without empowerment. Beyond this, various cryptocurrencies establish the qualifications for empowered participation differently, with most setting the threshold well beyond simple ownership and often introducing varying tiers of empowerment. PoW has two kinds of differently empowered members: miners and those operating nodes on the blockchain. While the formal empowerment mechanisms between miners and regular node operators are not terribly different (both participate in validation), the size of the rewards paid to miners and their role in the generation of new units of currency give them outsized influence on how PoW currencies are governed.

PoS also has two kinds of differently empowered members: staking institution operators and solo stakers on one hand, and owners that stake with a staking institution or do not stake on the other. In one sense, PoS makes the relationship between investment and influence more direct by empowering validators in proportion to the amount of currency they stake (rather than the amount of computer processing power they invest in mining). In another sense, it adds a representative layer by requiring that owners delegate their power to staking institutions. Proxy voting is a common practice in corporate governance (where shareholders select someone else, often a member of the

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<sup>76</sup> Hannah Miller, “Crypto Wireless Company Helium Hits Unicorn Status,” *Bloomberg* (March 30, 2022), <https://www.bloomberg.com/news/articles/2022-03-30/crypto-wireless-company-hits-unicorn-status-raises-200-million> (accessed November 14, 2025).

management team, to vote on their behalf), but shareholders do retain the ability to vote directly if they wish. Additionally, the formal structure and rules of shareholder proxy voting allow shareholders signing over their votes to be relatively confident of how their shares will be used. In contrast, in PoS cryptocurrencies staking institutions establish a kind of “forced” proxy voting in the sense that staking institution participants, who do not have the resources or expertise to solo stake, must delegate their votes to staking institutions if they wish to participate or earn interest. Yet, there are no structures or rules that ensure that a staking institution will use a staker’s crypto to vote in accordance with their wishes. Further, stakers may be locked-in for set periods, making it difficult to move to another staking institution that they believe better represents them. While they may earn monetary rewards, stakers forfeit their power, leaving staking institutions in control.

In addition to these tiered forms of empowered membership, another distinction from shareholder democracy is that cryptocurrencies do not have an annual meeting as a focal point for deliberation and voting about governance questions. Instead, deliberation is carried out in multiple informal spheres and is always ongoing. Voting itself does not take place as a communicative act where members submit ballots or voice their votes. Voting in cryptocurrency governance is instead enacted. Even those that interact directly as PoS solo stakers or PoW validators can only “vote with their feet” by keeping their assets on the blockchain, updating the software, or joining a fork (i.e. a parallel crypto currency on a different blockchain). Finally, an overarching difference is that many of the mechanisms of corporate governance (especially for public corporations) are required or regulated by governments and exchanges; to our knowledge there is no regulation that specifically addresses the governance of cryptocurrencies or staking institutions.

In all these respects, the distinctions between cryptocurrency governance structures and the norms of corporate shareholder democracy suggest fewer empowered affected interests and therefore greater democratic deficits for cryptocurrencies. Yet reforming cryptocurrencies to be structured more like shareholder democracy would be challenging given that qualities like tiered empowered membership are part of the basic cryptocurrency architecture. Moving PoW cryptocurrencies towards a “one share, one vote” structure is implausible as it would eliminate the distinction between miners and owners that is central to the PoW structure. Moving PoS cryptocurrencies towards a “one share, one vote” structure is theoretically possible by lowering staking minimums to the smallest possible unit of currency. As no PoS cryptocurrency we are aware of has pursued such a structure it is difficult to fully assess the possibilities and problems inherent in such an approach. However, one obvious hurdle is the technical complexity of moving from hundreds of thousands of validators to hundreds of millions. Another issue is the reliability of these validators. By requiring validators to have a significant investment in the cryptocurrency, the goal is to ensure that those running the validator

are incentivized to guarantee it is always online and validating and that they will not do anything to endanger the value of the currency. Some technical fixes for these issues might be possible, for example, leaving day-to-day validation in the hands of larger validators but moving important policy votes to the smallest possible unit of currency. The fact that no cryptocurrency has tried this, however, shows that the technocratic values involved in adhering to a PoS system with large stake minimums take priority over the values of decentralization and democratization. While democratic entities generally face some technocratic barriers to empowered participation (which may be partially addressed through civic education efforts), these appear more entrenched and insurmountable in the context of cryptocurrencies.

Beyond shareholder democracy, some observers contend that democratization of the corporation requires an expansion of “the franchise” to include workers via structures like unionization, Employee Stock Ownership Plans (ESOP), co-determination, bicameral firms, or worker cooperatives.<sup>77</sup> From the perspective of the AAP, these proposals enlarge the scope of affected interests that should have influence. Altering cryptocurrency governance structures to empower those who invest their labor in its production in equal measure to (or to a greater extent than) those who invest their capital, would not have the same decentralizing effects it does in the context of a typical corporation. This is because those investing labor in cryptocurrencies are a relatively small group who are, in most cases, owners (capital investors) as well (e.g. miners in PoW systems and those writing the code of the blockchain and operating nodes in either PoW or PoS systems), and already exercise disproportionate control over governance. While there are numerous “cryptocurrency-adjacent” workers employed by corporations and non-profits that service the cryptocurrency industry who might be empowered through these kinds of structures;<sup>78</sup> a worker empowerment model of corporate democracy cannot readily be applied to cryptocurrency governance directly.

Democratization of the corporation is also sometimes argued to entail empowerment of other stakeholders like customers, suppliers, and local communities.<sup>79</sup> In the case of PoW the affected interests of communities

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<sup>77</sup> Tom Malleon, “The Corporation, Democracy, and the Idea of the Bicameral Firm,” *Politics & Society* 51, no. 2 (2023): 167-187, <https://doi.org/10.1177/00323292231163690>; Ian B. Lee, “Citizenship and the Corporation,” *Law & Social Inquiry* 34, no. 1 (2009): 129-168, <https://doi.org/10.1111/j.1747-4469.2009.01141.x>; David L. Ratner, “The Government of Business Corporations: Critical Reflections on the Rule of ‘One Share, One Vote’,” *Cornell Law Review* 56, no. 1 (1970): 1-56; Elizabeth Anderson, *Private Government: How Employers Rule Our Lives (and Why We Don't Talk about It)* (Princeton, NJ: Princeton University Press, 2017); H el ene Landemore and Isabelle Ferreras, “In Defense of Workplace Democracy: Towards a Justification of the Firm–State Analogy,” *Political Theory* 44, no. 1 (2016): 53-81, <https://doi.org/10.1177/0090591715600035>.

<sup>78</sup> Robert Iafolla, “Crypto Mine Unionizing Campaign Reaches Federal Labor Board,” *Bloomberg Law* (June 10, 2023), <https://news.bloomberglaw.com/daily-labor-report/crypto-mine-unionizing-campaign-reaches-federal-labor-board> (accessed November 14, 2025).

can be quite apparent. Cryptocurrency mining has large measurable impacts on local economies through its effect on local and national energy markets. Cryptocurrency mining in Upstate New York costs households and businesses approximately \$300 million in the form of higher energy costs. In China, the electrical use of mining crowded out other businesses and was associated with a statistically significant drop in local GDP of 8.2 percent.<sup>80</sup> In short, PoW cryptocurrencies have negative externalities on their local communities. PoW cryptocurrencies seeking to democratize would need to find ways to empower these local communities within their governance structures. A more direct step would be to transition, as Ethereum has, from a PoW to a PoS system to eliminate these harms.

Beyond localized impacts on energy markets, PoW cryptocurrencies are having significant global environmental impacts. While far less acute, the same is true for PoS cryptocurrencies whose impacts on global markets are also widely felt by many who do not own cryptocurrency. In both cases affected communities are global in scope and therefore very hard to directly empower in practical terms. One way to address this is for states and transnational governance institutions to regulate cryptocurrency in ways that seek to protect the public interest. In the case of regulation by states, however, a race to the bottom may ensue, just as we see with efforts to regulate transnational corporations. In other words, cryptocurrencies and their related businesses would likely flock to the states with the least or most favorable regulations. We already see evidence of this with many large crypto-related companies based in the Cayman Islands and other tax havens.

In the case of transnational governance institutions, where the capacity to enforce regulation remains uneven, norm diffusion may be the most likely way to influence cryptocurrencies to consider the wider public interest. Ron and Singer argue that when viewed through the lens of transnational democracy, the influence of corporate shareholders over corporate governance norms may be more significant than their influence over the governance of any single corporation. They write about a “shareholder civil society and public sphere” that “exerts influence over corporate boards and executives” in the same way that the transnational civil society and public sphere influences states and international governance bodies.<sup>81</sup> The same may be true for cryptocurrency

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<sup>79</sup> Jeffrey S. Harrison et al., eds., *The Cambridge Handbook of Stakeholder Theory* (Cambridge: Cambridge University Press, 2019), <https://doi.org/10.1017/9781108123495>; Marc Fleurbaey, “Workplace Democracy, the Bicameral Firm, and Stakeholder Theory,” *Politics & Society* 51, no. 2 (2023): 243-257, <https://doi.org/10.1177/00323292231163700>; Marc Fleurbaey and Grégory Ponthière, “The Stakeholder Corporation and Social Welfare,” *Journal of Political Economy* 131, no. 9 (2023): 2556-2594, <https://doi.org/10.1086/724318>.

<sup>80</sup> Matteo Benetton, Giovanni Compiani, and Adair Morse, “When Cryptomining Comes to Town: High Electricity Use Spillovers to the Local Economy,” *Center for Economic Policy Research* (August 12, 2023), <https://cepr.org/voxeu/columns/when-cryptomining-comes-town-high-electricity-use-spillovers-local-economy> (accessed November 14, 2025).

investors who often own multiple cryptocurrencies and are therefore affected by and seek influence over not just the governance decisions of an individual currency, but also the norms of cryptocurrency civil society more broadly. Global civil society might also organize via social movements to pressure cryptocurrencies to operate in the public interest. While such efforts may have some potential to subject cryptocurrencies to increased forms of public accountability, as with corporations, there are significant challenges to realizing a meaningful level of democratization.

## Conclusion

It is apparent from our analysis that cryptocurrency fails to live up to its promise of being decentralized, much less democratic. Despite being held by hundreds of millions of people, Bitcoin is now controlled by just four private companies. Ethereum likewise is held by tens of millions but dominated by one public and four private companies. Where voting exists, voting rates are worse than those of public corporations or democratic states. Moreover, cryptocurrencies largely lack the democratic institutions and processes that we expect to find in a public corporation or democratically governed currency. They fall far short of empowering affected interests even when those are defined most narrowly and appear constitutively incapable of empowering a more expansive definition of affected interests.

Despite, or perhaps because of, the shortcomings of cryptocurrency governance we have highlighted here it is important that those interested in democracy continue to interrogate the governance of cryptocurrency and the blockchain technology on which it is based. Cryptocurrency is not disappearing; its impact on economies and climate change as well as its use for tax evasion and other illegal activities, which often thwart the laws and policies of democratic states, are all reasons to continue examining how it is governed. Moreover, it is becoming more central in discussions of politics and policy as demonstrated by its role in the 2024 US presidential election and its centrality to the Trump administration's priorities.

Our analysis suggests that democratizing cryptocurrency would require fundamentally altering one or more of its constitutive elements, whether that be its privatized structure and/or its technocratic and plutocratic features. For these reasons, not only must claims about the current decentralized and democratic character of cryptocurrencies be refuted, but assertions about their potential to become more decentralized and democratic should also be challenged.

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<sup>81</sup> Abraham Singer and Amit Ron, "Models of Shareholder Democracy: A Transnational Approach," *Global Constitutionalism* 7, no. 3 (2018): 422-446, doi:10.1017/S2045381718000126.

