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Bitcoin is Speech: Notes Toward Developing the Conceptual Contours of Its Protection Under the First Amendment

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Bitcoin is Speech: Notes Toward Developing the Conceptual Contours of Its Protection Under the First Amendment

JUSTIN S. WALES & RICHARD J. OVELMEN*

Bitcoin permits users to engage in direct expressive activity with one another without the need for centralized intermediaries. It does so by utilizing an open and community-managed global database called a blockchain. While much of the literature about Bitcoin has focused on its use as a form of digital payment, this Article suggests an expanded understanding by demonstrating its use as a protocol network, not unlike the internet, that can be used to extend the possible range of human expression. After developing an appreciation of the technology, this Article recommends a framework for applying the First Amendment to Bitcoin and similar technologies and explores how the Amendment's guarantees of associational and expressional freedoms may impact restrictions on access to the Bitcoin network.

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INTRODUCTION

The nature of a revolution in thought can be that, in its early stages, even its participants may be unaware of it.

And when awareness comes, they still may be unable to know or foresee where its changes lead.¹

¹ Packingham v. North Carolina, 137 S. Ct. 1730, 1736 (2017)

In October 2008, an unknown person or group of people going by the name of “Satoshi Nakamoto” published a nine-page paper titled “Bitcoin: A Peer-to-Peer Electronic Cash System”² to a small mailing list of cryptographers.³ The document is technical, focusing on the architecture of what is now called a “blockchain,”⁴ the publicly maintained ledger that records every bitcoin transaction, and its “proof-of-work” consensus mechanism that empowers the community of network participants to authenticate transactions made on the network directly.⁵ Although much of the attention on Bitcoin⁶ has focused on its use as a currency, Satoshi’s creation is revolutionary not only because it is an efficient form of “digital money,” but also because it is the first global *network* that lets participants engage in electronic relationships without centralized intermediaries to authenticate the integrity of the communication.⁷

On January 3, 2009, Bitcoin’s genesis block was created.⁸ In it, Satoshi embedded an immutable message for any to see: “The Times 03/Jan/2009 Chancellor on brink of second bailout for banks.”⁹ As

² See generally SATOSHI NAKAMOTO, BITCOIN: A PEER-TO-PEER ELECTRONIC CASH SYSTEM (2008), <https://bitcoin.org/bitcoin.pdf>.

³ NATHANIEL POPPER, DIGITAL GOLD: BITCOIN AND THE INSIDE STORY OF THE MISFITS AND MILLIONAIRES TRYING TO REINVENT MONEY 20–21 (reprt. ed. 2016).

⁴ *Id.* at 21.

⁵ NAKAMOTO, *supra* note 2, at 1; see also POPPER, *supra* note 3, at 20–21.

⁶ Bitcoin with a capital “B” is used to describe the Bitcoin network, while bitcoin with a lowercase “b” is used to describe its native virtual currency. *Some Bitcoin Words You Might Hear*, BITCOIN, <https://bitcoin.org/en/vocabulary#address> (last visited Sept. 26, 2019) [hereinafter *Bitcoin Vocabulary*]. We promise that will make more sense as you read through this paper.

⁷ See ARVIND NARAYANAN ET AL., BITCOIN AND CRYPTOCURRENCY TECHNOLOGIES: A COMPREHENSIVE INTRODUCTION 19–20, 27–32 (2016).

⁸ *The True Meaning Behind Bitcoin Captured in the Genesis Block by Satoshi Nakamoto*, GENESIS BLOCK NEWSPAPER, <https://www.thetimes03jan2009.com/> (last visited Oct. 21, 2019) [hereinafter GENESIS BLOCK NEWSPAPER].

⁹ *Transaction* 4a5e1e4baab89f3a32518a88c31bc87f618f76673e2cc77ab2127b7afdeda33b, BLOCKCHAIN, https://www.blockchain.com/btc/tx/4a5e1e4baab89f3a32518a88c31bc87f618f76673e2cc77ab2127b7afdeda33b?show_adv=true (last visited Oct. 25, 2019) (encoding the message “The Times 03/Jan/2009 Chancellor on brink of second bailout for banks”); see GENESIS BLOCK NEWSPAPER, *supra* note 8. The

the genesis block's preamble makes clear, from its very start, Bitcoin was envisioned by its creator as more than a commercial tool.¹⁰ To Satoshi Nakamoto, Bitcoin was an expressive platform built in response to a global financial crisis that sought to eliminate what he described as an “inherent weakness” fundamental not only to our global financial system but also all institutions that require a central authority to maintain their integrity: trust.¹¹

A decade removed from Bitcoin's launch, it is easy to ignore or overlook its origins and potential as a communicative platform. Since its inception, very little attention has been given to its broader expressive uses, some of which are detailed in this Article.¹² This failure has likely resulted from a misunderstanding about the nature and use of Bitcoin's technology,¹³ as well as the fact that it has, to some extent, been overshadowed by a highly volatile secondary

message is a reference to a headline that appeared in that morning's edition of London-based newspaper *The Times*. *Id.* The article details the status of the British government's bailout of banks in the wake of the 2008 world financial crisis. Francis Elliott, *Chancellor Alistair Darling on Brink of Second Bailout for Banks*, THE TIMES (Jan. 3, 2009, 12:00 AM), <https://www.thetimes.co.uk/article/chancellor-alistair-darling-on-brink-of-second-bailout-for-banks-n9l382mn62h>.

¹⁰ NAKAMOTO, *supra* note 2, at 1.

¹¹ *See id.*

¹² *See* discussion *infra* Section I.G.

¹³ The name “Bitcoin” adds to the confusion. As explained in this Article, Bitcoin is a protocol and communication network that allows individuals to share data and value directly with one another without having to rely on centralized intermediaries such as banks or payment processors. *See* 1 ANDREAS M. ANTONOPOULOS, THE INTERNET OF MONEY 25–26 (4th prt. 2017) [hereinafter THE INTERNET OF MONEY]. In this regard, bitcoin is an abstraction of money that has an equivalent fiat value merely because an independent secondary market has demanded it. *See* Josiah Wilmoth, *Bitcoin Liquidity: A Guide for Institutional Firms*, STRATEGIC COIN, <https://strategiccoin.com/bitcoin-liquidity-a-guide-for-institutional-firms/> (last visited Oct. 5, 2019). In truth, there are no *coins* in bitcoin and use of the term *bitcoin* has the effect of taking “the most abstract form of money we have ever created” and presenting it to the public in a manner that forces comparisons with tangible currencies. THE INTERNET OF MONEY, *supra*, at 81. The instinct to treat bitcoin like any other form of currency presents one of the central problems with how regulation of the technology has developed. *See infra* Part IV.

market for bitcoin and other cryptocurrencies.¹⁴ This powerful diversion has developed around a broader industry that consists of thousands of virtual assets, some of which have little in common with bitcoin and were created solely as a means of raising capital by selling tokens via a crowdfunding mechanism called an Initial Coin Offering (“ICO”).¹⁵ As a result, U.S. regulators tasked with protecting consumers and investors from fraud or stopping bad actors from using virtual currencies for crime have generally treated all virtual currencies as a monolith.¹⁶ This treatment has led to broad and sometimes contradictory regulations on virtual currencies that are potentially problematic when applied to Bitcoin or similar technologies that possess characteristics of both a financial instrument and an expressive and associational platform.¹⁷

¹⁴ See Greta Guest, *Cryptocurrencies: High Volatility and Returns*, PHYS.ORG (Nov. 21, 2018), <https://phys.org/news/2018-11-cryptocurrencies-high-volatility.html>.

¹⁵ See *Initial Coin Offering (ICO)*, INVESTOPEDIA, <https://www.investopedia.com/terms/i/initial-coin-offering-ico.asp> (last updated Dec. 20, 2018). Several other variants of a token offering, some embracing the potential securities implications by labeling themselves Security Token Offerings, have since been developed. See Athena Blockchain, *How Tokenized Private Placements of Securities and the Development of Markets will Create Trading Liquidity and Enhance Demand*, MEDIUM (Jan. 3, 2019), <https://medium.com/@Athenablockchain/how-tokenized-private-placements-of-securities-and-the-development-of-markets-will-create-trading-a3603d30449c>.

¹⁶ See Matthew E. Kohen & Justin S. Wales, *State Regulations on Virtual Currency and Blockchain Technologies*, CARLTON FIELDS (Apr. 19, 2019), <https://www.carltonfields.com/insights/publications/2018/state-regulations-on-virtual-currency-and-blockchain-technologies> (analyzing each state’s approach to the regulation of virtual currencies, which shows that only Wyoming has enacted regulations treating virtual currencies differently based on their distribution model and function).

¹⁷ Although this Article focuses exclusively on Bitcoin, the arguments and issues raised within it may also be applicable to other virtual currency networks that share Bitcoin’s fundamental properties, such as being open source, neutral, public, censorship resistant, and borderless. See generally Andreas M. Antonopoulos, *The Five Pillars of Open Blockchains*, YOUTUBE (May 11, 2019), <https://www.youtube.com/watch?v=qlAhXo-d-64>. An example of a decentralized network that, like Bitcoin, is considered by many to possess these characteristics and which can also be used for a wide range of expressive and associational uses is the Ethereum network, which utilizes a virtual currency called “ether” that is used as “gas” to run decentralized applications. See Christian Seberino, *Ethereum*

This Article suggests an expanded understanding of Bitcoin beyond its use as “digital money” by demonstrating its potential as a protocol network that is being used by people around the world to extend the possible range of human expression. After developing an appreciation of the technology, we will recommend a framework for applying the First Amendment to Bitcoin and explore how the Amendment’s guarantees of associational and expressional freedoms may impact restrictions on access to the Bitcoin network.

Part I provides an overview of Bitcoin’s technology, including an analysis of how its unique system design can be used by a global community as a censorship-resistant platform for free expression and so much more. Part II sets out an analytic framework for addressing the applicability of the First Amendment to technologies like Bitcoin and surveys several prominent theories of First Amendment interpretation. Part III explains how Bitcoin implicates the First Amendment by tracing several lines of cases that recognize expressive and associational rights to new media and technologies. Finally, Part IV outlines the application of First Amendment principles to U.S. regulatory agencies’ treatment of the purchase and use of bitcoin.

I. BITCOIN’S TECHNICAL AND POLITICAL FRAMEWORK

The chief purpose of this Article is to initiate the development of a First Amendment framework to be applied to Bitcoin. Central to this goal is the presupposition that Bitcoin is an ideological technology that was created specifically to allow its users to associate

Classic Technical Reference (BETA), ETHEREUM CLASSIC, https://ethereum-classic-guide.readthedocs.io/en/latest/docs/world_computer/accounts.html#ether-gas (last visited Oct. 5, 2019); ETHEREUM CLASSIC, <https://ethereumclassic.org/> (last visited Oct. 5, 2019). It is not our suggestion that every virtual currency should be provided the same degree of constitutional protection or analysis as Bitcoin. For example, centrally maintained virtual currencies that limit the public’s ability to participate in its underlying governance may require a different constitutional analysis and may be more easily and broadly regulated as a financial instrument. See, e.g., Libra Ass’n Members, *An Introduction to Libra*, LIBRA, <https://libra.org/en-US/white-paper/> (last visited Oct. 5, 2019). While there are many examples of centrally managed virtual currencies, Facebook’s upcoming *Libra* project and JP Morgan’s proposed coin are two of the most anticipated. See generally *id.*; J.P. Morgan Creates Digital Coin for Payments, J.P. MORGAN (Feb. 14, 2019), <https://www.jpmorgan.com/global/news/digital-coin-payments>.

with a broad global network of individuals who share common values through a communication network that rejects the need to depend on centralized intermediaries.¹⁸ Accordingly, an understanding of the technology and electronic monetary policies that underlie Bitcoin is required.¹⁹

A. *Defining Bitcoin*

*[Bitcoin is] everything you don't understand about money, combined with everything you don't understand about computers.*²⁰

While Bitcoin is most often described as “digital money,” advocate Andreas Antonopoulos explains that “it’s so much more than that. Saying bitcoin is digital money is like saying the internet is a fancy telephone. It’s like saying that the internet is all about email. Money is just the first application.”²¹

Bitcoin is more accurately understood as a standard or a protocol like TCP/IP,²² email, or the internet that permits individuals from all around the world to communicate directly with one another without the need of an intermediary to validate the communication.²³ For

¹⁸ See THE INTERNET OF MONEY, *supra* note 13, at 26–27.

¹⁹ There are countless resources available that provide highly nuanced explanations about the technology that makes Bitcoin function and tomes detailing the underlying economic theory that its supporters suggest gives it its value. See, e.g., ANDREAS M. ANTONOPOULOS, *MASTERING BITCOIN: PROGRAMMING THE OPEN BLOCKCHAIN* (Tim McGovern ed., 2d ed. 2017) [hereinafter *MASTERING BITCOIN*]; HANNA HALABURDA & MIKLOS SARVARY, *BEYOND BITCOIN: THE ECONOMICS OF DIGITAL CURRENCIES* (2016); SAIFEDEAN AMMOUS, *THE BITCOIN STANDARD: THE DECENTRALIZED ALTERNATIVE TO CENTRAL BANKING* (2018).

²⁰ *LastWeekTonight, Cryptocurrencies: Last Week Tonight with John Oliver (HBO)* YOUTUBE (March 12, 2018), <https://www.youtube.com/watch?v=g6iDZspbRMg> (John Oliver discussing cryptocurrencies at 0:54–1:00).

²¹ THE INTERNET OF MONEY, *supra* note 13, at 1.

²² TCP/IP, or Transmission Control Protocol/Internet Protocol “is a suite of communication protocols used to interconnect network devices on the internet.” Margaret Rouse, *TCP/IP (Transmission Control Protocol/Internet Protocol)*, TECHTARGET, <https://searchnetworking.techtarget.com/definition/TCP-IP> (last updated July 2019). It, like email and Bitcoin, permit individuals to communicate directly with one another without utilizing an intermediary. See THE INTERNET OF MONEY, *supra* note 13, at 2.

²³ THE INTERNET OF MONEY, *supra* note 13, at 2–3.

Bitcoin, the means is the end.²⁴ The Bitcoin protocol is sustained through a globally managed, open source software,²⁵ which allows those who run it to maintain and validate a public ledger that records every bitcoin transaction, as well as all of the financial and non-financial data included within every bitcoin transaction that has ever or will ever occur.²⁶

The term “Bitcoin” (capital “B”) refers to both the network that enables participants to send and receive the bitcoin (lowercase “b”) virtual currency, as well as the native bitcoin currency that is sent through the network.²⁷ No one “owns” the Bitcoin network, it is not a formal organization, and it has no board of directors or central governance structure.²⁸ Rather, it is a communal piece of software that empowers and rewards individuals that contribute to maintaining its integrity and allows anyone running the software to propose

²⁴ See *id.* at 95–106.

²⁵ *What Is Open Source?*, OPENSOURCE.COM, <https://opensource.com/resources/what-open-source> (last visited Oct. 6, 2019).

Open source software is software with source code that anyone can inspect, modify, and enhance. “Source code” is the part of software that most computer users don’t ever see; it’s the code computer programmers can manipulate to change how a piece of software—a “program” or “application”—works. Programmers who have access to a computer program’s source code can improve that program by adding features to it or fixing parts that don’t always work correctly.

Id.

²⁶ As explained in more detail below, and fundamental to understanding Bitcoin’s expressive potential, a bitcoin transaction can be written to include “arbitrary,” or non-financial, data, which can include messages, documents, or images that, once the underlying bitcoin transaction is validated, become permanently added to Bitcoin’s blockchain. See Andrew Sward et al., *Data Insertion in Bitcoin’s Blockchain*, 3 LEDGER 1, 1–2 (2018); Roman Matzutt et al., *A Quantitative Analysis of the Impact of Arbitrary Blockchain Content on Bitcoin*, in 10957 LECTURE NOTES COMPUTER SCI. 420, 420–21 (2018).

²⁷ *Bitcoin Vocabulary*, *supra* note 6.

²⁸ Timothy B. Lee, *Who Is in Charge of Bitcoin?*, VOX, <https://www.vox.com/2015/11/3/18053552/who-is-in-charge-of-bitcoin> (last updated Nov. 3, 2015, 10:03 PM). While the independent “Bitcoin Foundation” has acted as the de facto center of Bitcoin governance, it appears to be offline at the time of publication. See *Bitcoin Foundation News*, COINTELEGRAPH, <https://cointelegraph.com/tags/bitcoin-foundation> (last visited Oct. 25, 2019); BITCOIN FOUNDATION, <https://bitcoinfoundation.org/> (last visited Oct. 25, 2019).

amendments to the protocol, which become implemented upon a consensus of the community of “nodes,”²⁹ or computers connected to the Bitcoin network.³⁰ These nodes play a vital role in Bitcoin’s decentralized structure because, unlike centralized payment processors or banks that are singularly charged with maintaining the integrity of the currency or customer account, Bitcoin distributes the responsibility to its entire network.³¹ Bitcoin’s software is freely available and permits anyone connected to independently verify the integrity of its public ledger by running a “full node,”³² which retains a complete record of every transaction ever made on the network.³³

B. *The Blockchain*

Bitcoin enables frictionless peer-to-peer transactions through the use of a “blockchain,” a public ledger that permanently records each transaction.³⁴ As transactions are made and subsequently vali-

²⁹ MASTERING BITCOIN, *supra* note 19, at 25.

Any system, such as a server, desktop application, or wallet, that participates in the bitcoin network by “speaking” the bitcoin protocol is called a *bitcoin node* . . . Any bitcoin node that receives a valid transaction it has not seen before will immediately forward it to all other nodes to which it is connected . . . Thus, the transaction rapidly propagates out across the peer-to-peer network, reaching a large percentage of the nodes within a few seconds.

Id.

³⁰ The most popular, but by no means only, software implementation of Bitcoin nodes is called Bitcoin Core. *See Bitcoin Core Integration/Staging Tree*, GITHUB, <https://github.com/bitcoin/bitcoin> (last visited Oct. 6, 2019) (“Bitcoin is an experimental digital currency that enables instant payments to anyone, anywhere in the world. Bitcoin uses peer-to-peer technology to operate with no central authority: managing transactions and issuing money are carried out collectively by the network. Bitcoin Core is the name of open source software which enables the use of this currency.”).

³¹ NARAYANAN ET AL., *supra* note 7, at 28–30.

³² *See Running a Full Node*, BITCOIN CORE, <https://bitcoin.org/en/full-node#what-is-a-full-node> (last visited Oct. 6, 2019).

³³ *See* Rakesh Sharma, *Running a Full Bitcoin Node for Investors*, INVESTOPEDIA, <https://www.investopedia.com/news/running-full-bitcoin-node-investors/> (last updated June 25, 2019); *see also*, NARAYANAN ET AL., *supra* note 7, at 66–75.

³⁴ NARAYANAN ET AL., *supra* note 7, at 66–67.

dated by a global community of individuals independently maintaining the network's integrity, they are timestamped and recorded into a "block" of data that is cryptographically linked (or "chained") to the previous block.³⁵

By creating a cryptographic relationship between new and previous bitcoin transactions, Satoshi solved the "double spend" problem that has traditionally made peer-to-peer electronic transactions risky for the recipient.³⁶ Unlike fiat currencies, such as the U.S. dollar, or commodities like gold, there is no physical manifestation of a bitcoin.³⁷ Before Bitcoin, secure peer-to-peer electronic transactions of virtual assets were practically impossible because digital information—such as code indicating ownership of a digital asset—is relatively easy to reproduce.³⁸ Accordingly, transacting in virtual currencies posed a risk because one could potentially send an unlimited number of digital copies of a virtual asset to an infinite number of recipients without immediate detection.³⁹ Private payment processors such as Visa and PayPal resolve this issue by acting as intermediaries that assume the risk for the recipient, but their role adds cost and friction to each transaction, creates a centralized point of attack for actors wishing to disrupt the system, and gives the payment processor significant power over the types of transactions it is or is not willing to approve.⁴⁰

³⁵ *Id.* at 64–66.

³⁶ *See id.* at 22–25; *see also* Team InnerQuest Online, *How Does a Blockchain Prevent Double-Spending of Bitcoins?*, MEDIUM (Aug. 25, 2018), <https://medium.com/innerquest-online/how-does-a-blockchain-prevent-double-spending-of-bitcoins-fa0ecf9849f7>.

³⁷ *See* THE INTERNET OF MONEY, *supra* note 13, at 12–15.

³⁸ *See* Collin Thompson, *How Does the Blockchain Work? (Part 1)*, MEDIUM (Oct. 2, 2016), <https://medium.com/blockchain-review/how-does-the-blockchain-work-for-dummies-explained-simply-9f94d386e093>.

³⁹ *See* Harsh Agrawal, *What is Double Spending & How Does Bitcoin Handle It?*, COINSUTRA, <https://coinsutra.com/bitcoin-double-spending/> (last updated Aug. 12, 2019).

⁴⁰ For example, in 2010, numerous payment processors and banks including Bank of America, Visa, MasterCard, PayPal, and Western Union initiated a blockade on all donations to WikiLeaks. *See* Jon Matonis, *WikiLeaks Bypasses Financial Blockade with Bitcoin*, FORBES (Aug. 20, 2012, 9:47 AM), <https://www.forbes.com/sites/jonmatonis/2012/08/20/wikileaks-bypasses-financial-blockade-with-bitcoin/#55182c827202>. In response, its creator, Julian Assange, relied on bitcoin to raise funds, asking his global followers to send

C. *How Bitcoin Transactions Are Validated*

Bitcoin solves the double spend problem and eliminates the need for a centralized intermediary through its “proof-of-work” consensus mechanism, which tasks a large and ever-expanding number of individuals to validate transactions on the network.⁴¹ These validators, known as “miners,” expend computing power to solve complex cryptographic hash functions.⁴² Once deciphered, miners confirm mathematically that a transaction is valid and not a double spend.⁴³ They do so by tracing the provenance of every bitcoin to make sure that the sender has enough in his or her digital wallet (think a pseudonymous bank account) to cover that transaction.⁴⁴ All of the miners on the network race against each other to be the first to solve a block of transactions, and the first to successfully do so is rewarded

bitcoin donations directly to WikiLeaks’s digital wallet. See Nermin Hajdarbegovic, *Assange: Bitcoin and WikiLeaks Helped Keep Each Other Alive*, COINDESK (Sept. 16, 2014, 8:44 AM), <https://www.coindesk.com/assange-bitcoin-wikileaks-helped-keep-alive>.

⁴¹ See MASTERING BITCOIN, *supra* note 19, at 229; see also NARAYANAN ET AL., *supra* note 7, at 34–38.

⁴² A cryptographic hash is a mathematical function that creates an output value that is a deterministic function of a stated input value. *What Are Hash Functions*, LEARN CRYPTOGRAPHY, <https://learncryptography.com/hash-functions/what-are-hash-functions> (last visited Oct. 6, 2019). In simpler terms, whenever X is inputted into Bitcoin’s SHA-256 Cryptographic Hash Algorithm, it will always result in output Y. See *id.* Miners use computing power to find the Y output for the current block of bitcoin transactional data, whose input includes the entirety of all data written onto the blockchain to that point. See MASTERING BITCOIN, *supra* note 19, at 25–28. By discovering this output, the miner mathematically verifies the validity of the transactions that make up the newest block as well as all prior transactions up to that point, and, as a reward for their effort, miners are awarded with newly mined bitcoin. See *id.*

⁴³ See Tim Fisher, *Cryptographic Hash Function: Use a Cryptographic Hash Function to Verify the Authenticity of Data*, LIFEWIRE, <https://www.lifewire.com/cryptographic-hash-function-2625832> (last updated Aug. 11, 2019); see also NARAYANAN ET AL., *supra* note 7, at 104–06.

⁴⁴ NARAYANAN ET AL., *supra* note 7, at 104. A Bitcoin address is an alphanumeric sequence that is unique to a wallet. *Bitcoin Vocabulary*, *supra* note 6. They are usually free and available through numerous platforms. See Margaret Rouse, *Bitcoin Address*, TECHTARGET, <https://whatis.techtargget.com/definition/Bitcoin-address> (last updated July 2018); see generally NARAYANAN ET AL., *supra* note 7, at 76–79.

by the network with newly minted bitcoins—hence the term “miners.”⁴⁵

D. *Sending Bitcoin*

Briefly setting aside the issues of legality and regulatory restrictions, bitcoin can be obtained either through the mining process described above or through a variety of media including digital exchanges, Bitcoin ATMs, or individuals wishing to either sell bitcoin to purchasers or in exchange for goods or services.⁴⁶ It is often said

⁴⁵ A consensus of nodes, discussed in *supra* notes 29–33, determines whether a block has been sufficiently mined. See MASTERING BITCOIN, *supra* note 19, at 176–77, 79; NARAYANAN ET AL., *supra* note 7, at 28–30; see also *Consensus Protocols*, LISK, <https://lisk.io/academy/blockchain-basics/how-does-blockchain-work/consensus-protocols> (last visited Oct. 6, 2019). New bitcoins are created each time a miner solves, and thus validates, a new block of transactions. See *Controlled Supply*, BITCOIN WIKI, https://en.bitcoin.it/wiki/Controlled_supply (last visited Oct. 6, 2019). “The number of bitcoins generated per block is set to decrease geometrically, with a 50% reduction every 210,000 blocks, or approximately four years.” *Id.* Initially, each solved block would create fifty bitcoin. See *id.* Since 2016, successful miners have earned 12.50 bitcoin per block, with that number estimated to halve at block 630,000, which will likely occur in May 2020. See *Bitcoin Block Reward Halving Countdown*, BITCOINBLOCKHALF, <https://www.bitcoinblockhalf.com/> (last visited Oct. 6, 2019). The result of this declining production structure is that the total number of bitcoins can never exceed twenty-one million bitcoin. *Id.*

⁴⁶ Domestically, one of the most popular ways to obtain bitcoin is through Coinbase.com, which allows individuals to purchase bitcoin, and several other virtual currencies, directly. Todd Haselton, *How to Buy Bitcoin, Which Has Rocketed in Value in Recent Months*, CNBC (June 27, 2019, 9:06 AM), <https://www.cnbc.com/2019/06/27/how-to-buy-bitcoin.html>. Coinbase is a centralized, privately owned company that allows its customers to maintain their virtual assets in its custody. See *Coinbase*, CRAFT, <https://craft.co/coinbase> (last visited Oct. 6, 2019); see also *What is Coinbase?*, COINBASE, <https://www.coinbase.com/buy-bitcoin> (last visited Oct. 6, 2019). Alternatively, there exist numerous exchanges of varying repute across the world that permit users to purchase or exchange bitcoin with and for other virtual currencies. See, e.g., *Top Cryptocurrency Exchanges List*, COIN.MARKET, <https://coin.market/exchanges-info.php?what=> (last visited Oct. 6, 2019).

Bitcoin ATMs can be found all over the world and typically allow a user to insert fiat currency that instantaneously generates a computer readable code. See *How to Buy Bitcoins at a Bitcoin ATM*, COIN ATM RADAR (Oct. 31, 2014), <https://coin-atmradar.com/blog/how-to-buy-bitcoins-with-bitcoin-atm/>. Once this code is scanned using the camera function on one’s mobile digital wallet, the process of

that a user “hodls” bitcoin in a digital wallet that is secured by a unique private key.⁴⁷ However, the notion that one can take custody of bitcoin is misleading because it is a purely digital asset that exists only as a reflection on Bitcoin’s community-managed public ledger.⁴⁸ A more accurate description is that a digital wallet is software that keeps track of the holder’s bitcoin and maintains a pri-

recording the transaction on Bitcoin’s blockchain begins. *See id.* As of this Article’s publication, there are approximately 3,800 Bitcoin ATMs across the United States. *See Bitcoin ATMs in United States*, COIN ATM RADAR, <https://coinatmradar.com/country/226/bitcoin-atm-united-states/> (last visited Oct. 6, 2019).

One can also find individuals willing to sell bitcoin directly through platforms like LocalBitcoins.com, a website that connects buyers and sellers. *See Buy and Sell Bitcoins Near You*, LOCALBITCOINS.COM, <https://localbitcoins.com/> (last visited Oct. 6, 2019). As explained in this Article, however, an advisory opinion issued by the Financial Crimes Enforcement Network (“FinCEN”) stating that those who sell virtual currencies are subject to federal registration requirements, has created regulatory confusion regarding the legality of selling bitcoin or other virtual currencies directly. U.S. DEP’T OF TREAS., FIN. CRIMES ENF’T NETWORK, FIN-2019-G001, APPLICATION OF FINCEN’S REGULATIONS TO CERTAIN BUSINESS MODELS INVOLVING CONVERTIBLE VIRTUAL CURRENCIES 27 (2019), <https://www.fincen.gov/sites/default/files/2019-05/FinCEN%20Guidance%20CVC%20FINAL%20508.pdf> [hereinafter FINCEN GUIDANCE 2019]; Brian Barrett, *Application of FinCen’s Regulations to Certain Business Models Involving Convertible Virtual Currencies*, JD SUPRA (May 21, 2019), <https://www.jdsupra.com/legalnews/application-of-fincen-s-regulations-to-25490/>. This confusion has only been exacerbated by a lack of uniform treatment amongst states. *See* Kohen & Wales, *supra* note 16 (analyzing the different state approaches to the regulation of virtual currencies).

⁴⁷ *See* *HODL*, INVESTOPEDIA, <https://www.investopedia.com/terms/h/hodl.asp> (last updated June 25, 2019). “HODL is a term derived from a misspelling of ‘hold’ that refers to buy-and-hold strategies in the context of bitcoin and other cryptocurrencies.” *Id.* HODL has become an acronym for the phrase “hold on for dear life.” *Id.*

⁴⁸ *See* Moe Adham, *Crypto Custody Explained*, FORBES (Dec. 18, 2018, 9:00 AM), <https://www.forbes.com/sites/forbesfinancecouncil/2018/12/18/crypto-custody-explained/#446fa551379f>. *See also* NARAYANAN ET AL., *supra* note 7, at 76–77. The legal implications of having “custody” of digital assets is a confounding topic that has been woefully underexplored. *See, e.g.*, Andrew M. Hinkes, *Throw Away the Key, or the Key Holder? Coercive Contempt for Lost or Forgotten Cryptocurrency Private Keys, or Obstinate Holders*, 16 NW. J. TECH. & INTELL. PROP. 225 (2019) (examining some of the problems that arise in a completely digital economy).

vate key that grants its holder control over the bitcoin that the network recognizes the that holder owns.⁴⁹ When one wishes to “send” bitcoin to a digital address,⁵⁰ he or she affixes a digital signature to the transaction that, once confirmed valid by the network, starts the process of adding the transaction to the blockchain.⁵¹ When a transaction is made and subsequently authenticated by a consensus of participants on the network, a record of that transaction is etched permanently onto Bitcoin’s public ledger.⁵²

E. *Bitcoin’s Monetary Policy and Use as a Currency*

While Bitcoin’s technical achievements are rooted in projects dating back decades (before Satoshi’s scholarship) that attempted to solve the double spend problem, in many ways, Bitcoin is a unique response to what Satoshi viewed as a fundamental problem with state-backed currencies.⁵³ As Satoshi posted on the website of the P2P Foundation, which is an organization dedicated to peer-to-peer technology, “[t]he root problem with conventional currency is all the trust that’s required to make it work . . . [t]he central bank must be trusted not to debase the currency, but the history of fiat currencies is full of breaches of that trust.”⁵⁴

Satoshi’s concern with currency debasement was exasperated by the government-sponsored bank bailouts that were signed into law by President George W. Bush in early October 2008, only weeks

⁴⁹ See NARAYANAN ET AL., *supra* note 7, at 76–77.

⁵⁰ Because bitcoin is a purely digital asset, there actually is no way to “send” a bitcoin. See NARAYANAN ET AL., *supra* note 7, at 52 (explaining that Bitcoin is based on a transactional, as opposed to an account-based, model). Rather, one merely signals to the network that they wish to reflect on the ledger that a transaction occurred, which is deemed validated based on a consensus of the network. See *id.* at 28–32. At no point, however, is the bitcoin “in transit” or in the custodial control of an intermediary or the bitcoin network itself. See *id.* at 53–55.

⁵¹ *Id.* at 29–30.

⁵² *Id.* at 22; see also *Blockchain Explained*, INVESTOPEDIA, <https://www.investopedia.com/terms/b/blockchain.asp> (last updated June 25, 2019).

⁵³ See NAKAMOTO, *supra* note 2, at 8 (“We have proposed a system for electronic transactions without relying on trust.”); see also NARAYANAN ET AL., *supra* note 7, at xix – xxvii.

⁵⁴ Satoshi Nakamoto, *Bitcoin Open Source Implementation of P2P Currency*, P2P FOUNDATION: FORUM (Feb. 11, 2009), <https://p2pfoundation.ning.com/forum/topics/bitcoin-open-source> [hereinafter *Bitcoin Open Source Implementation*].

before the publication of the Bitcoin whitepaper.⁵⁵ While fears of currency debasement had long concerned many in the United States after the abandonment of the gold standard permitted central banks to print money without restraint, the 2008 bailout brought the concern of fiat devaluation to the mainstream when the U.S. Federal Reserve attempted to stimulate the economy through the creation of new dollars.⁵⁶

Satoshi felt history confirmed that central banks, subject to the whims of political leaders, were not structured to control unbridled spending and envisioned a technical solution to the problem.⁵⁷ *New York Times* author Nathaniel Popper explained this in his book, *Digital Gold*, which details the early history of Bitcoin:

This apparently small detail in the system carried potentially great political significance in a world worried about unlimited printing of money. What's more, the restraints on Bitcoin creation helped deal with one of the big issues that had bedeviled earlier digital moneys—the matter of how to convince users that the money would be worth something in the future. With a hard cap on the number of Bitcoins, users could reasonably believe that Bitcoins would become harder to get over time and thus would go up in value.⁵⁸

⁵⁵ See POPPER, *supra* note 3, at 30–31 (discussing Satoshi's February 2009 post and other early communications); see also Maria Bustillos, *The Bitcoin Boom*, NEW YORKER (Apr. 1, 2013), <https://www.newyorker.com/tech/annals-of-technology/the-bitcoin-boom> (“Nakamoto was very clearly motivated . . . by the fallout from the 2008 financial crisis.”).

⁵⁶ See POPPER, *supra* note 3, at 31–32.

⁵⁷ See *id.* at 32 (“While the Federal Reserve had no formal limits on how much new money it could create, Satoshi's Bitcoin software had rules to ensure that new Bitcoins would be released only every ten minutes or so and that the process of creating new coins would stop after 21 million were out in the world.”); Joshua Davis, *The Crypto-Currency: Bitcoin and its Mysterious Inventor*, NEW YORKER (Oct. 3, 2011), <https://www.newyorker.com/magazine/2011/10/10/the-crypto-currency> (“[Nakamoto] wanted to create a currency that was impervious to unpredictable monetary policies as well as to the predations of bankers and politicians.”).

⁵⁸ POPPER, *supra* note 3, at 32–33.

From its very creation, Bitcoin was designed to solve what Satoshi viewed as a political problem with the global economy.⁵⁹ By solving the double spend problem, restricting bitcoin's inflationary risks programmatically through a hard-coded monetary policy, and creating an open source software that encourages anyone throughout the world to maintain and validate transactions on a public ledger, Satoshi created a financial network that he believed could function better than the current system.⁶⁰ Moreover, he created an associational platform to connect those that agree with his ideology that central governments should not be in control of global monetary supplies and that encourages direct participation and support of his grand experiment.⁶¹

⁵⁹ *Bitcoin Open Source Implementation*, *supra* note 54; see POPPER, *supra* note 3, at 30–32.

⁶⁰ See *Bitcoin Open Source Implementation*, *supra* note 54.

⁶¹ See THE INTERNET OF MONEY, *supra* note 13, at 1–3. One of the more interesting associational aspects of open, public blockchains like Bitcoin is the ability of a minority of network participants to “hard fork” a blockchain into two competing networks. Aaron Hankin, *What You Need to Know About the Bitcoin Cash ‘Hard Fork’*, MARKETWATCH (Nov. 15, 2018, 8:00 AM), <https://www.marketwatch.com/story/what-you-need-to-know-about-the-bitcoin-cash-hard-fork-2018-11-13>. Bitcoin has itself been hard forked a number of times over community disagreements regarding the ideal data size of each block of transactions, among other reasons. See *id.*; see also Nathan Reiff, *A History of Bitcoin Hard Forks*, INVESTOPEDIA, <https://www.investopedia.com/tech/history-bitcoin-hard-forks/> (last updated June 25, 2019). For example, in August 2017, Bitcoin hard forked and the competing “Bitcoin Cash” (sometimes known as “B-Cash”) blockchain was created. *What is Bitcoin Cash?*, COINTELEGRAPH, <https://cointelegraph.com/bitcoin-cash-for-beginners/what-is-bitcoin-cash> (last visited Oct. 7, 2019). The Bitcoin Cash blockchain was itself hard forked into yet another competing network called “Bitcoin SV”. SFOX Edge, *What is Bitcoin SV?*, MEDIUM (Dec. 21, 2018), <https://blog.sfox.com/what-is-bitcoin-sv-dfda089205d3>; see also *Bitcoin SV: Implementing the Original Bitcoin Protocol*, BITCOIN SV, <https://bitcoinsv.io/> (last visited Oct. 7, 2019). Similarly, the Ethereum network hard forked into a competing network called “Ethereum Classic” following a controversial decision to refund ether stolen following a hack of a decentralized investment vehicle called “The DAO.” Valeria Beasrow, *Discovering Atlantis: Ethereum Classic Hard Fork and What Will Change*, COINTELEGRAPH (June 28, 2019), <https://cointelegraph.com/news/discovering-atlantis-ethereum-classic-hard-fork-and-what-will-change>. In each of these cases, the forked network and associated currency has continued in parallel to the “legacy chain” and has maintained a minority of community support. Aziz, *Guide to Forks: Everything You Need to Know About Forks, Hard Fork and Soft Fork*, MASTER THE CRYPTO,

F. *Bitcoin as an Expression of Value*

Satoshi addressed his concerns about the inadequacy of state-issued currencies by eliminating what he viewed as their inherent weakness: the central authorities charged with preserving their value.⁶² He did this by creating “the first network-centric, protocol-based form of money . . . [that] exists without reference to an institutional or platform context.”⁶³ Satoshi dramatically lowered the costs of production of bitcoin’s currency relative to central currencies by distributing the responsibility of maintaining bitcoin’s integrity to a world-wide community.⁶⁴ Distributing this responsibility caused bitcoin’s representation of value to not be constrained in the same manner as other currencies because Satoshi created a form of money in which the *message*, that is, the expression of value, was not tethered to the *medium* of fiat currencies.⁶⁵ For the first time, this breakthrough allows users to “express the entire range of transactional expression—from the tiny to the enormous”⁶⁶

<https://masterthecrypto.com/guide-to-forks-hard-fork-soft-fork/> (last visited Oct. 7, 2019). The community’s ability to govern itself and even form competing factions following a community disagreement demonstrates the political and associational characteristics of open and decentralized blockchains and necessarily must be considered when analyzing efforts to regulate such technologies. *See id.*

⁶² *Bitcoin Open Source Implementation*, *supra* note 54; *see* POPPER, *supra* note 3, at 32–33.

⁶³ *See* THE INTERNET OF MONEY, *supra* note 13, at 15.

⁶⁴ *See id.* at 102–04.

⁶⁵ *See id.*

⁶⁶ *Id.* at 103. Because Bitcoin is a protocol, it allows users to undertake financial communications not otherwise possible with traditional currencies. *See, e.g.*, Joseph Young, *\$194 Million Was Moved Using Bitcoin with \$0.1 Fee, True Potential of Crypto*, CCN (Oct. 16, 2018), <https://www.ccn.com/194-million-was-moved-using-bitcoin-with-0-1-fee-true-potential-of-crypto/>. For example, in October 2018 somebody directly sent the equivalent of \$194 million of bitcoin peer-to-peer to a digital address atomically for only 10 cents in network fees, a transaction that would cost exponentially more and take exponentially longer via traditional payment channels. *See id.*

On the other side of the spectrum, one could also use a second-layer Bitcoin protocol like the Lightning Network to send, and potentially *stream*, micro-payments of as little as 1/236 of a penny at effectively no transaction costs, a breakthrough that could drastically alter how we understand, and utilize, what is most often considered negligible value. *See The Bitcoin Lightning Network*, LIGHTNING NETWORK, <https://lightning.network/lightning-network-summary.pdf> (last visited Oct. 7, 2019).

Since time immemorial, humans have attributed value to *things* in order to allow members of society to express sentiments of value easily.⁶⁷ That is because, at its root, money is a language that we use to represent value to one another.⁶⁸ Society has always used abstractions to represent value, whether it be salt, shells, feathers, gold, coins, green pieces of cotton paper, or representations of ownership on a globally curated ledger.⁶⁹ As Andreas Antonopoulos notes, “[b]itcoin is just the latest iteration of abstraction.”⁷⁰

A question that often arises when discussing bitcoin as a currency is the origin of its value. The answer, of course, is the assumption that it will be accepted at some point in the future.⁷¹ At this moment, there are places of business all around the world that gladly accept bitcoin in exchange for goods or services,⁷² as well as a

In January 2019, a Twitter user known only as “Hodlonaut” who is represented by an avatar of a cat in a space suit, began a “trust chain” in which bitcoin micro transactions were sent via the Lightning Network by users all over the world. hodlonaut (@hodlonaut), TWITTER (Jan. 19, 2019, 11:14 AM), <https://twitter.com/hodlonaut/status/1086703428791865345>; see Alyssa Hertig, *Bitcoin’s ‘Lightning Torch’ Explained: What It Is and Why It Matters*, COINDESK (Feb. 5, 2019, 4:25 AM), <https://www.coindesk.com/bitcoins-lightning-torch-has-blazed-through-37-countries-so-far>; *The Torch*, TAKETHETORCH.ONLINE, <https://www.takethetorch.online/Torch> (last visited Oct. 7, 2019) [hereinafter TORCH]; see also Peter Wind, *Bitcoin Community Rallies Around “Hodlonaut” Following Legal Threats from Craig Wright*, COINCODEX, <https://coincodex.com/article/3410/bitcoin-community-rallies-around-hodlonaut-following-legal-threats-from-craig-wright/> (last visited Oct. 7, 2019). Participants made use of the Bitcoin network’s borderless, peer-to-peer capabilities to send essentially non-financial transactions of the virtual currency around the world as a demonstration of Bitcoin’s expressive and global associational possibilities. Hertig, *supra*. Nearly 300 users participated in the experiment and sent transactions in close to 40 to more than 40 countries. See *id.*; TORCH, *supra*.

⁶⁷ See THE INTERNET OF MONEY, *supra* note 13, at 11–13.

⁶⁸ See *id.* at 66.

⁶⁹ *Id.* at 11–19.

⁷⁰ *Id.* at 80.

⁷¹ See *id.* at 78–80; see also Sophie Bearman, *As Bitcoin’s Price Plunges, Skeptics Say the Cryptocurrency Has No Value. Here’s One Argument for Why They’re Wrong*, CNBC (Jan. 16, 2018, 9:13 AM), <https://www.cnbc.com/2018/01/16/skeptics-say-bitcoin-has-no-value-heres-why-theyre-wrong.html>.

⁷² See, e.g., *Who Accepts Bitcoin as Payment*, 99BITCOINS, <https://99bitcoins.com/bitcoin/who-accepts/> (last updated June 10, 2019). Our law firm is among these businesses.

highly liquid secondary market eager to exchange bitcoin for equivalent currencies.⁷³ Therefore, bitcoin, as a currency, is valuable because many people in the world have imbued it with value.⁷⁴

G. *Non-Financial Applications of Bitcoin*

Bitcoin, as explained by Andreas Antonopoulos, allows users to do more than merely send “digital money” to one another: “[c]urrency is just the first app—just the first application that you can build on a distributed consensus system. Other applications include distributed fair voting, stock ownership, asset registration, notarization, and many other applications we’ve never thought of before.”⁷⁵

1. BITCOIN AS A PUBLICATION TOOL

As exemplified by Satoshi himself through his “Times of London” message embedded into Bitcoin’s genesis block,⁷⁶ Bitcoin permits users to include non-financial data (called “arbitrary data”) that, once the associated (often nominal) transaction is validated, becomes immutably published onto Bitcoin’s blockchain and accessible to anyone around the world.⁷⁷ In this sense, Bitcoin’s ledger is a global publication tool that permits anyone to publish a wide range of content directly and permanently without fear of censorship.⁷⁸ Today, the Bitcoin blockchain is filled with political and artistic messages in the form of text, images, and MP3 files, published by actors from around the globe that are immune from the threat of governmental or corporate censorship.⁷⁹ As noted by Andrew Sward

⁷³ See Wilmoth, *supra* note 13.

⁷⁴ See THE INTERNET OF MONEY, *supra* note 13, at 80; John P. Kelleher, *Why do Bitcoins Have Value?*, INVESTOPEDIA, <https://www.investopedia.com/ask/answers/100314/why-do-bitcoins-have-value.asp> (last updated June 25, 2019).

⁷⁵ THE INTERNET OF MONEY, *supra* note 13, at 2.

⁷⁶ See *supra* notes 8–9 and accompanying text.

⁷⁷ See Sward et al., *supra* note 26, at 1.

⁷⁸ See, e.g., Maxim Chesnokov, *CryptoGraffiti: Permanently Preserve Images on the Blockchain*, BITCOIN.COM (June 19, 2016), <https://news.bitcoin.com/cryptograffiti-images-blockchain/>; see also Sward et al., *supra* note 26, at 1.

⁷⁹ See MARCIA HOFMANN, ELEC. FRONTIER FOUND., COMMENTS TO THE NEW YORK STATE DEPARTMENT OF FINANCIAL SERVICES ON BITLICENSE: THE PROPOSED VIRTUAL CURRENCY REGULATORY FRAMEWORK, 14–16 (2014),

et al. in *Data Insertion in Bitcoin's Blockchain*,⁸⁰ some of the many examples of expressive content published onto Bitcoin's blockchain include the following:

A JPEG image of Nelson Mandela found at block 273,536 along with a pair of inspirational quotes by the former South African leader:

<https://www.eff.org/files/2014/10/21/bitlicense-comments-eff-ia-reddit-hofmann-cover.pdf> (citing examples of political, religious, artistic, and commercial messages published to the Bitcoin blockchain, including a memorial to Nelson Mandela, bible verses, a tribute to cryptographer and privacy advocate Len Sassaman, artwork, and art depicting former Federal Reserve chairman Ben Bernanke); *see also* Nikhilesh De, *TD Ameritrade Put an Actual Ad on the Bitcoin Blockchain*, COINDESK (Apr. 24, 2018, 5:45 PM), <https://www.coindesk.com/td-ameritrade-put-actual-ad-bitcoin-blockchain> (discussing how TD Ameritrade imprinted a commercial advertisement on the blockchain); Kai Sedgwick, *A Brief History of Hidden Messages in the Bitcoin Blockchain*, BITCOIN.COM (May 9, 2018), <https://news.bitcoin.com/a-brief-history-of-hidden-messages-in-the-bitcoin-blockchain/>.

The inability to censor non-financial data, of course, raises concerns regarding the possibility of unlawful or harmful materials being immutably published onto Bitcoin's blockchain. *See, e.g.*, Matzutt et al., *supra* note 26, at 420–21, 425, 433. Indeed, in a paper titled “A Quantitative Analysis of the Impact of Arbitrary Blockchain Content on Bitcoin,” a group of German researchers document several instances of unlawful material, including privacy data published in violation of European law, politically sensitive and classified documents, content that violates intellectual property rights, and even links to child pornography on Bitcoin's blockchain. *Id.* at 425–27. The existence of these materials raises potentially difficult challenges for regulators and law enforcement officers. *See, e.g.*, Leigh Cuen, *Child Porn on Bitcoin? Why This Doesn't Mean What You Might Think*, COINDESK (Mar. 27, 2018, 12:00 AM), <https://www.coindesk.com/child-porn-bitcoin-blockchain-what-it-means> [hereinafter *Child Porn on Bitcoin?*]. While such topics will certainly be the subject of future scholarship, they are beyond the scope of this Article.

⁸⁰ *See generally* Sward et al., *supra* note 26.



Nelson Mandela (1918-2013)

"I am fundamentally an optimist. Whether that comes from nature or nurture, I cannot say. Part of being optimistic is keeping one's head pointed toward the sun, one's feet moving forward. There were many dark moments when my faith in humanity was sorely tested, but I would not and could not give myself up to despair. That way lays defeat and death."

"I learned that courage was not the absence of fear, but the triumph over it. The brave man is not he who does not feel afraid, but he who conquers that fear."

81

A JPEG image of Mr. Burns ironically holding up a sign that reads "Don't Forget You're Here Forever," published using a Data Drop w/ Sig Method on April 5, 2017:



82

⁸¹ Sward et al., *supra* note 26, at 4; HOFMANN, *supra* note 79, at 14–15.

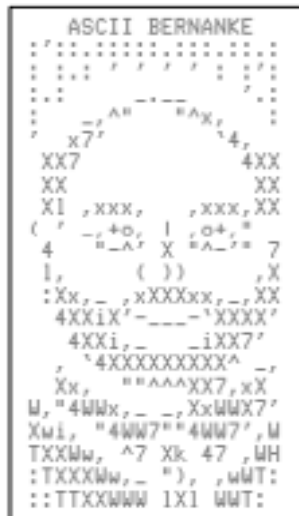
⁸² Sward et al., *supra* note 26, at 7. The picture of Mr. Burns was likely published in violation of Disney's copyright on Simpsons characters.

Religious prayers immutably stored into Bitcoin’s blockchain:

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Benedictus Sanguis eius pretiosissimus.
Benedictus Iesus in sanctissimo altaris Sacramento.
Ave Maria, gratia plena, Dominus tecum. Benedicta tu in mulieribus, ...
...and life everlasting, through the merits of Jesus Christ, my Lord and Red
eemer.
O Heart of Jesus, burning with love for us, inflame our hearts with love for
Thee.
Jesus, meek and humble of heart, make my heart like unto thine!
```

83

An ASCII plain text art memorial for privacy advocate Len Sassaman and a depiction of former Federal Reserve chairman Ben Bernanke:



84

An MP3 of Spock saying “Live long and prosper,” spread across multiple transactions inside of block number 345,858.⁸⁵

⁸³ HOFMANN, *supra* note 79, at 15.
⁸⁴ *Id.* at 16.
⁸⁵ Sward et al., *supra* note 26, at 16 n.30.

There will likely be a significant learning curve before Bitcoin becomes a mass publication tool because it is still an emerging technology; however, it may resemble the future of publishing.⁸⁶ As innovation around the technology grows and expressive transaction become more accessible to create and encode, the importance of Bitcoin as a publication tool could become as ideologically, politically, and culturally significant as any social media platform—or even the internet itself.

2. BITCOIN AS AN AUTHENTICATION TOOL

The Bitcoin network is a useful tool for timestamping data and demonstrating proof of existence because every transaction made

⁸⁶ There is a significant debate in the Bitcoin community about whether storing arbitrary data unrelated to bitcoin payments is appropriate since the additional data adds to the blockchain's total size and could negatively impact the speed and efficiency of engaging in transactions. See Sward et al., *supra* note 26, at 1. See generally Thomas Claburn, *Bitcoin's Blockchain: Potentially a Hazardous Waste Dump of Child Abuse, Malware, Etc*, REGISTER (Mar. 19, 2018, 8:11 PM), https://www.theregister.co.uk/2018/03/19/ability_to_dump_illegal_content_in_bitcoins_blockchain_puts_participants_in_peril/. As Andreas Antonopoulos explained, "The use of bitcoin's blockchain to store data unrelated to bitcoin payments is a controversial subject. Many developers consider such use abusive and want to discourage it. Others view it as a demonstration of the powerful capabilities of blockchain technology and want to encourage such experimentation." MASTERING BITCOIN, *supra* note 19, at 131.

There are also practical limitations inherent to the design of Bitcoin's blockchain, such as the relatively small capacity of data able to be stored on each block, that make Bitcoin a not-as-of-yet ideal platform for storing arbitrary data. See Sward et al., *supra* note 26, at 3. Indeed, there are blockchain networks other than Bitcoin that have been designed specifically to store non-financial data. See, e.g., *Decentralized Cloud Storage*, STORJ, <https://storj.io/> (last visited Oct. 7, 2019). For example, Storj, is a distinct blockchain designed specifically to store non-financial data. See Pete Rizzo, *Blockchain Startup Storj Targets Enterprise Cloud with \$3 Million Raise*, COINDESK (Feb. 23, 2017, 9:59 AM), <https://www.coindesk.com/blockchain-startup-storj-targets-enterprise-cloud-3-million-raise>. Even if Bitcoin is not the most efficient platform for this type of expressive activity, there is no way to prevent those with bitcoin from publishing non-financial data to Bitcoin's blockchain because the output of expressive transactions is indistinguishable from financial transactions. See Sward et al., *supra* note 26, at 17 n.36.

with bitcoin is timestamped and cryptographically linked to an earlier transaction.⁸⁷ Simply create a hash output of the data you wish to timestamp and send a negligible amount of bitcoin in a transaction to the hash address of the document itself.⁸⁸ While doing so “burns,” or takes out of circulation the infinitesimal amount of bitcoin sent to the document, the non-commercial transaction results in an immutable record that a document was in existence and published at a specific time.⁸⁹

Use of the Bitcoin network as a tool for non-financial authentication is still in its nascency. However, one can easily imagine how documents timestamped on a public blockchain could supplant our current authentication system of using third-party notaries. As an example of how Bitcoin could be used to prove a document’s authenticity, a small amount of bitcoin was sent to a hash of this Article on November 7, 2019. With that, an immutable record now exists, which demonstrates conclusively the publication date of the document that is cryptographically linked to a private key that I can demonstrate is mine.⁹⁰ This process may very well resemble how

⁸⁷ See NARAYANAN ET AL., *supra* note 7, at 213–17. One of the more prominent projects to take advantage of the Bitcoin blockchain for non-financial uses is a proposed decentralized identity tool in development by Microsoft. See Leigh Cuen, *Microsoft Launches Decentralized Identity Tool on Bitcoin Blockchain*, COINDESK (May 13, 2019, 9:00 AM), <https://www.coindesk.com/microsoft-launches-decentralized-identity-tool-on-bitcoin-blockchain>; see also *RSK Smart Contract Network*, RSK, <https://www.rsk.co/> (last visited Oct. 7, 2019) (protocol proposed to utilize Bitcoin’s blockchain to build smart contract applications).

⁸⁸ See NARAYANAN ET AL., *supra* note 7, 216–17.

⁸⁹ See *id.* at 216. There are other methods, and still more developing, that allow a timestamp to be created on Bitcoin’s blockchain that would not result in a fractional amount of bitcoin being permanently taken out of circulation. See, e.g., *id.* at 216–17. Moreover, there are service providers and technology companies that utilize Bitcoin’s robust network to provide authentication services. Kate, *11 Blockchain API Providers Enabling Developers to Build Next-Gen Apps*, MEDICI (Apr. 28, 2016), <https://gomedici.com/11-blockchain-api-providers-that-are-allowing-developers-to-build-next-generation-applications>. Tierion.com, for example, utilizes Bitcoin’s network to provide, among other things, non-financial document authentication services. See *id.*; TIERION, <https://tierion.com/> (last visited Oct. 8, 2019).

⁹⁰ A hash of this Article (hash f9d6cd51db5a24c83ed402808c271a5cfd11d3cda160a58ca83e728d8f745d20) was written into Bitcoin Block 602757. The document itself is not accessible on the Bitcoin ledger, rather there is just a record

businesses, government offices, or courts will authenticate evidence or prove a chain of custody in the future.

3. BITCOIN AS SMART PROPERTY

Another unique characteristic of the bitcoin virtual currency is it is not *technically* a fungible asset like fiat dollars because the Bitcoin network traces the provenance of each bitcoin back to its genesis upon each validation.⁹¹ This feature allows individuals to assign unique characteristics to specific bitcoins that are recognized within a subset of the community (the resulting coins are sometimes called “colored coins”) and that can be used to represent ownership or rights to things such as stock in a company, physical property, or domain names.⁹² As an illustration, consider this example provided in *Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction*:

[A] potential use is that colored coins might represent a claim to some real-world property. For example, a colored coin could be associated with a house or a car. Maybe you have a sophisticated car that actually tracks a specific colored coin on the block chain and automatically starts and drives for anybody who owns that colored coin. Then you could sell your car, or at least transfer control of it, simply by making a single transaction on the blockchain . . . [T]he dream of colored coins and smart property is that any real-world property could be represented in the world of Bitcoin and transferred or traded as easily as bitcoins themselves.⁹³

It should be noted that the ability to track each transaction to the genesis of that particular bitcoin is fundamentally different than, say, the inclusion of a serial number found on the face of a fiat note. As previously explained, unlike with the printed serial number, it is impossible to effectuate an on-chain bitcoin transaction of any

of its existence that can be demonstrated pseudonymously. For a discussion on publishing non-financial data to a blockchain *see* discussion *infra* Section I.G.i.

⁹¹ *See* NARAYANAN ET AL., *supra* note 7, at 219.

⁹² *See id.* at 219–24.

⁹³ *Id.* at 223.

amount without network participants reviewing and validating the providence of the bitcoin being sent.⁹⁴ This feature allows users of bitcoin as a secure and programmable data point that could potentially represent countless other indicia of relationships such as irrefutable evidence of membership, providence, existence, or ownership of assets, both physical and digital.⁹⁵

4. BITCOIN AS A PLATFORM

The ability to use bitcoin in expressive and associational contexts is vast and expanding as development around the technology continues.⁹⁶ However, as we approach a discussion about regulating bitcoin, it is important to note that one's ability to fully participate in (and thus exploit) Bitcoin as a platform for the expressive activities described above requires that the aspiring user is able to obtain bitcoin lawfully. As discussed *infra*, U.S. regulations by federal and state officials that place restrictions or registration requirements on those wishing to purchase or sell bitcoin may be problematic under the First Amendment's expressive and associational guarantees.

II. NOTES TOWARD AN ANALYTIC STRUCTURE OF THE FIRST AMENDMENT AS APPLIED TO BITCOIN

For many fundamental reasons, Bitcoin should be viewed not merely as a digital form of money, but as a global network for expressive and associational activity that enjoys the broad protection of the First Amendment. In this Section, we will begin the scholarly conversation necessary to set out an analytic framework for a First Amendment analysis of expressive activity conducted through decentralized global communities like the Bitcoin network. First, we will provide an overview of several deep-structure models of the First Amendment. Next, we will consider more specific First Amendment principles and doctrines used in deciding concrete cases and controversies. Finally, we will address how these and other values influence or restrict First Amendment protections as applied to new media and technologies.

⁹⁴ See discussion *supra* Section I.G.2.

⁹⁵ See *id.* at 219–24.

⁹⁶ See *id.* at 224–40 (providing examples of how Bitcoin can be used to create fairer lottery systems, low-cost voucher or secure event ticketing platforms, and transparent predictive markets and data feeds, among other applications).

A. *First Amendment Interpretive Models*

Situating Bitcoin within the scope and context of the First Amendment poses many conundrums because the former is a new and innovative medium of expression, and the latter is an Amendment bristling with a conflicting array of legal theories, interpretive models, narrow doctrines, intermediate standards, and broad rules of decision.⁹⁷ This Section will attempt to sort out some of the more important basic models and specific implementing doctrines encompassed in a contemporary understanding of the First Amendment.

1. FIRST AMENDMENT ORIGINALISM

As in other areas of constitutional interpretation,⁹⁸ a large and powerful community of interpreters believe the First Amendment should be construed in adherence to the original meaning of its text⁹⁹ as the language was first publicly understood at the time of ratification.¹⁰⁰ This view as an overarching theory has been subjected to a

⁹⁷ See generally FREEDOM OF EXPRESSION IN THE SUPREME COURT: THE DEFINING CASES (Terry Eastland ed., 2000) (collecting and analyzing many of the leading decisions of the Supreme Court interpreting the First Amendment from 1919 to 1998).

⁹⁸ There is a vast literature regarding constitutional adjudication that extends far beyond the scope of this paper. For example, in *Constitutional Personae*, Cass Sunstein provides a taxonomy based on the scope of precedential impact for classification of judicial decision-makers. CASS R. SUNSTEIN, CONSTITUTIONAL PERSONAE: HEROES, SOLDIERS, MINIMALISTS, AND MUTES 1–5 (2015). Judicial “Heroes” favor broad, transformative decisions; “Soldiers” dutifully follow the text and precedent; “Minimalists” decide cases on the narrowest of grounds; and “Mutes” avoid making any decision at all on difficult questions. See *id.* at 2; see also J. HARVIE WILKINSON, III, COSMIC CONSTITUTIONAL THEORY: WHY AMERICANS ARE LOSING THEIR INALIENABLE RIGHT TO SELF-GOVERNANCE 3–10 (2012) (similarly outlining each of the most popular, seemingly disparate theories of constitutional interpretation while arguing that they are all equally subject to judicial abuse).

⁹⁹ The text of the First Amendment, in relevant part, reads as follows: “Congress shall make no law . . . abridging the freedom of speech[.]” U.S. CONST. amend. I.

¹⁰⁰ See, e.g., ANTONIN SCALIA, A MATTER OF INTERPRETATION: FEDERAL COURTS AND THE LAW 13 (Amy Gutmann ed., 2018) (“[M]any believe that [the Constitution] is in effect a charter for judges to develop an evolving common law freedom of speech, of privacy rights, and the like. I think that is wrong—in-deed . . . I think it frustrates the whole purpose of a written constitution.”); see

number of major objections.¹⁰¹ One crucial argument thought to be in favor of the originalist approach is that it constrains judges from

also ROBERT H. BORK, *THE TEMPTING OF AMERICA* 1–14 (Free Press 1997) (arguing for an interpretation of the Constitution according to the “original understanding” of the Framers and the people for whom it was written); JACK M. BALKIN, *LIVING ORIGINALISM* 1–34 (2011) (outlining a modified version of originalist constitutional theory by arguing that modern conceptions of civil rights and liberties, as well as many of the protections offered by the modern state are fully consistent with the Constitution’s original meaning). In a famous essay, Justice Scalia advocated reliance on what the reasonable man at the time of the ratification, rather than the Framers as individuals, would have understood the language of the text to mean, the public meaning of the Constitution. Antonin Scalia, *Originalism: The Lesser Evil*, 57 U. CIN. L. REV. 849, 861–62 (1989). He further qualified his originalism by stating that if the text was not sufficiently “rule-like” it need not be followed. Similarly, he believed that if the court’s precedent had substantially departed from the text for a sufficient period of time, or, irrespective of anything else following the text, it should not be followed. Scalia’s revision resulted from three powerful criticisms of his former originalism. First, that attempting to discover the subjective intent of a myriad of drafters and ratifiers is impossible. *Id.* at 856–57. Second, relying on the original intent of the framers was contrary to the actual historical view of the ratifiers. *Id.* at 854. And finally, that people living today should not be governed by long dead ancestors. *See id.* at 855–856. Scalia’s new originalism based on a common understanding of the language of the text does not solve the problem to the extent the text uses highly abstract, essentially contested concepts in the Constitution, like “Freedom of the Press.”

¹⁰¹ *See, e.g.*, LEONARD W. LEVY, *ORIGINAL INTENT AND THE FRAMERS’ CONSTITUTION* 388–98 (Ivan R. Dee 2000). Levy concludes that there is no evidence for grounding the law in original intent:

Two hundred years of expanding the meaning of democracy and of becoming a heterogenous nation of nations in which the citizens have the remarkable duty and the right to keep the government from falling into error, must have tremendous constitutional impact. History can only be a guide, not a controlling force. How the Supreme Court uses history, origins, and evolution as well as original intent depends on those who serve on the Court, because in the end, we must face up to the fact stated by Chief Justice Earl Warren on his retirement in 1969. Speaking of the Court, he declared, “We serve only the public interest as we see it, guided only by the Constitution and our own consciences.” That, not the original intent of the Framers, is our reality.

Id. at 398. Other theorists, like Akhil Reed Amar and Bruce Ackerman, analyze and interpret a broad range of historical, political, and social evidence, including

straying from the *will of the people* as expressed in the text of the Constitution.¹⁰² Thus, judicial power is precluded from becoming antidemocratic because it must confine itself to those areas where the original understanding of the Constitution is ascertainable.¹⁰³ However, this argument becomes less compelling the more historical analysis is brought to bear. First, the ratifiers were anything but a democratically representative community, and neither was the Republican form of government they established.¹⁰⁴ For example, one major compromise between the Framers from the Northern and Southern states was preservation of the institution of slavery.¹⁰⁵ Therefore, black people, who were a substantial percentage of the population at the time of ratification,¹⁰⁶ remained property in the

large-scale reform movements, to develop a structural interpretation of the Constitution. See, e.g., AKHIL REED AMAR, *AMERICA'S UNWRITTEN CONSTITUTION: THE PRECEDENTS AND PRINCIPLES WE LIVE BY* ix–xiii (2012) (arguing that much of the most important and accepted constitutional law is *not* found in the text of the Constitution); AKHIL REED AMAR, *AMERICA'S CONSTITUTION: A BIOGRAPHY* xi–xii (2005) (providing a painstaking historical analysis of the functional meaning of the text of the Constitution); 1 BRUCE ACKERMAN, *WE THE PEOPLE: FOUNDATIONS* 268 (reprt. ed., 1993) (discussing mobilized deliberation, whereby amendments to and changes in interpretation of the Constitution are often the result of social revolutions and reforms and do not follow the formal amendment process).

¹⁰² See SUNSTEIN, *supra* note 98, at 13; WILKINSON, III, *supra* note 98, at 39–42.

¹⁰³ See WILKINSON, III, *supra* note 98, at 41; see also Will Baude, *Reasons for Being an Originalist*, WASH. POST (Feb. 12, 2014, 12:00 PM), <https://www.washingtonpost.com/news/volokh-conspiracy/wp/2014/02/12/reasons-for-being-an-originalist/> (“Originalism is good, the argument goes, because it constrains judges. OR, originalism is good because it advances a certain form of democratic decisionmaking. OR, originalism is good because, at least under our Constitution, it is faithful to a supermajoritarian process that is systematically likely to produce good results.”) (emphasis in original).

¹⁰⁴ See ROBERT A. DAHL, *HOW DEMOCRATIC IS THE AMERICAN CONSTITUTION?* 7–20 (2d ed. 2003); SANFORD LEVINSON, *OUR UNDEMOCRATIC CONSTITUTION: WHERE THE CONSTITUTION GOES WRONG (AND HOW WE THE PEOPLE CAN CORRECT IT)* 18–19, 168–69 (2006). These books focus on the anti-democratic features of United States governmental structures, such as the Electoral College, the Senate, and lifetime appointment for Supreme Court judges. The text, here, addresses the demographics of the ratifiers.

¹⁰⁵ See *id.* at 12–13.

¹⁰⁶ See Jenny Bourne, *Slavery in the United States*, EH.NET, <https://eh.net/encyclopedia/slavery-in-the-united-states/> (last visited Oct. 9, 2019).

Southern states and were largely excluded from the democratic process.¹⁰⁷ White women and those men not owning land or significant property were also excluded for undemocratic reasons—gender discrimination and the desire for plutocratic control.¹⁰⁸ Even the residue—consisting of rich white men—was further winnowed down to only a handful of whom were ratifiers.¹⁰⁹ To suggest that *we the people* ratified the Constitution is a myth, not a historical fact.

It is likely that even the tiny and homogeneous community of ratifiers that were present at the Constitutional Convention did not reach a consensus on what the words in important clauses meant or on their validity.¹¹⁰ This is scarcely surprising since phrases like

¹⁰⁷ See DAHL, *supra* note 104, at 16.

¹⁰⁸ See *id.* (explaining that the framers failed to guarantee a woman’s right to vote, and allowed the states to set limitations on a woman’s right to participate in the democratic process for nearly 150 years); Matthew C. Simpson, *The Founding Fathers’ Power Grab*, NEW REPUBLIC (Sept. 29, 2016), <https://newrepublic.com/article/137310/founding-fathers-power-grab> (discussing the argument that “the Constitution is undemocratic because it was designed to protect wealthy merchants and landowners from the redistributive tendencies of popular government”).

¹⁰⁹ As evidence of how few people had a say in ratification, compare the minute number of ratification votes with the total population of several major states:

State	Vote in Favor of Ratification	Total Population
Pennsylvania	46-23	434,000
Massachusetts	187-168	475,000
Maryland	63-11	320,000
Virginia	89-79	821,000
New York	30-27	340,000

PAULINE MAIER, RATIFICATION: THE PEOPLE DEBATE THE CONSTITUTION 120, 207, 245, 305, 396 (2010); *State-by-State Ratification Table*, TEACHING AM. HIST., <https://teachingamericanhistory.org/resources/ratification/overview/> (last visited Oct. 9, 2019).

¹¹⁰ See William Anderson, *The Intention of the Framers: A Note on Constitutional Interpretation*, 49 AM. POL. SCI. REV. 340, 342 (1955):

The original intentions of the members, whatever they were, did not remain steadfast throughout the Convention. As the discussion developed, new topics were taken up, new ideas and arguments were presented, and the interrelations of various problems of government were brought out. Decisions were made one day and changed or rescinded the next . . . Can we be sure that even at the end, when agreement was voted on certain verbal formulations, there was full concurrence also in intentions?

Id. at 342.

“freedom of speech” were not then common expressions whose meanings were firmly established in daily discourse.¹¹¹ Indeed, these were relatively novel concepts that were still being developed at the time of the Constitutional Convention.¹¹² Phrases like “freedom of speech” or “freedom of the press” are abstract, essentially contested concepts,¹¹³ with significant disagreement over their core, as well as marginal, meanings.¹¹⁴ Moreover, the hunt for what the accepted linguistic understanding was more than two hundred years ago is itself either fruitless or endlessly controversial.¹¹⁵ Justices

There is substantial reason to doubt that attempting to discover the meaning of specific clauses of the Constitution by examining their historical linguistic meaning is a viable method of interpretation. For example, at least since Charles Black’s *Structure and Relationship in Constitutional Law*, it has been thought that the Constitution should be interpreted, at least in part, from a structural standpoint, that is, by examining the *function* clauses play in the text taken as a whole. CHARLES L. BLACK, JR., *STRUCTURE AND RELATIONSHIP IN CONSTITUTIONAL LAW* 3–13 (2000).

Additionally, the meaning of the text of the Constitution, like all texts, is established by an interpretive community, and there are numerous and different interpretations which can conflict and change over time. See STANLEY FISH, *DOING WHAT COMES NATURALLY: CHANGE, RHETORIC, AND THE PRACTICE OF THEORY IN LITERARY AND LEGAL STUDIES* 141 (1990). The basis of any interpretation of the Constitution’s text depends on many factors recognized, to some extent, by members of the interpretative community. See *id.* Those can depend on differing views of what the purpose of the text really is, political orientation, social values, professional considerations, and ideological viewpoints. See *id.* at 130–31. The interpretations of the First Amendment applied to Bitcoin in this paper are well recognized within the interpretive community and express differing views of how the First Amendment functions in the structure of the government created by the text taken as a whole. See discussion *infra* Section II.B.

¹¹¹ See David S. Bogen, *The Origins of Freedom of Speech and Press*, 42 MD. L. REV. 429, 430–31, 446, 463 (1983) (demonstrating that the words “freedom of speech” and “freedom of the press” were the product of six strands of thought developed over time with possibly different meanings to each ratifier).

¹¹² See *id.* at 430–31; Thomas I. Emerson, *Colonial Intentions and Current Realities of the First Amendment*, 125 U. PA. L. REV. 737, 738 (1977) (“The era in which the Declaration of Independence and the Constitution were framed was actually a period of transition.”).

¹¹³ See W. B. Gallie, *Essentially Contested Concepts*, 56 PROC. ARISTOTELIAN SOC’Y 167, 169 (1956) (expounding on a philosophical enquiry used to determine the meaning of concepts with no widely agreed upon application).

¹¹⁴ See Maxwell Brandwen, *The Battle of the First Amendment: A Study in Judicial Interpretation*, 40 N.C. L. REV. 273, 273–75 (1962).

¹¹⁵ See *id.* at 280–81, 283.

purporting to look at the same historical material reach diametrically opposite conclusions.¹¹⁶ The notion that there was, or even is now, an agreed upon collective meaning of the First Amendment is a fiction.¹¹⁷ Nonetheless, courts continue to analyze the original meaning of constitutional clauses, even if it is, as Justice Scalia put it, in a “faint-hearted” way.¹¹⁸

There may be some benefit to persisting with an originalist analysis. Professor Jack Balkin advocates a revised form of originalism that distinguishes between original concepts embedded in the constitutional text and particular applications or conceptions of these abstractions.¹¹⁹ An originalist approach may recognize that the text of the Constitution establishes a broad concept of freedom of speech.¹²⁰ This broad concept allows later generations or courts to develop specific applications not anticipated by the ratifiers in light of evolving values, technologies, and social needs.¹²¹ Akhil Reed Amar believes a careful study of the historical record suggests that the First Amendment was, at least in part, a structural provision designed to protect majorities (and to some degree minorities) from the federal government.¹²² Amar’s interpretation resembles the “checking value” theory discussed below.¹²³

¹¹⁶ Compare *District of Columbia v. Heller*, 554 U.S. 570, 605–36 (Scalia, J.) (analyzing the early history of the Second Amendment and determining that the Amendment applies outside the context of militia service) *with id.* at 666–79 (Stevens, J., dissenting) (analyzing the early history of the Second Amendment and determining that the Amendment applies *only* within the context of militia service).

¹¹⁷ See, e.g., Paul Brest, *The Misconceived Quest for the Original Understanding*, 60 B.U. L. REV. 204, 205, 214, 217–18 (1980) (expounding on multiple approaches to constitutional interpretation); see also Brandwen, *supra* note 114, at 273–75, 280–81.

¹¹⁸ See Antonin Scalia, *Originalism: The Lesser Evil*, 57 U. CIN. L. REV. 849, 862–64 (1989).

¹¹⁹ See BALKIN, *supra* note 101, at 3.

¹²⁰ See *id.* at 14 (identifying “freedom of speech” as an abstract principle that should be interpreted using history and subsidiary principles to explain it).

¹²¹ See *id.* at 3–4.

¹²² AKHIL REED AMAR, *THE BILL OF RIGHTS: CREATION AND RECONSTRUCTION* 20–21 (2000) [hereinafter *THE BILL OF RIGHTS*].

¹²³ See *infra* note 143 and accompanying text. Amar’s approach may be considered a structural originalist approach, in which he relies on a close reading of the historical record to ascertain the function of clauses in text of the Constitution

Perhaps surprisingly, some originalist interpretations of the First Amendment may afford Bitcoin protection. For example, Balkin's theory of "living originalism" is based on the need to develop new applications and conceptions of the First Amendment as society and technology evolve.¹²⁴ Balkin's theory interprets the Constitution by examining the purpose of the amendments as understood by the founders not limited by the technological or social realities of the period.¹²⁵ Just as the First Amendment has been applied to other modes of communication that developed long after its ratification, such as film, radio, television, the internet, and social media,¹²⁶ Balkin's theory can easily accommodate applying protection to Bitcoin as a communicative platform.¹²⁷ Indeed, in *Packingham v. North Carolina*, the Supreme Court recently provided an illustrative view of the First Amendment as an expansive doctrine designed by the founders to encompass avenues of expression not yet invented.¹²⁸

When one considers the potentially far-reaching applications of decentralized global networks like Bitcoin, including their ability to effectuate a wide variety of commercial and non-commercial forms of expression that were previously not technologically possible,¹²⁹ the First Amendment emerges as an obvious protective barrier. Because the text of the First Amendment is so abstract and elliptical,¹³⁰ courts and scholars have developed important simplifying models as well as more specific principles and doctrines (discussed below) to

taken as a whole. *See, e.g.*, THE BILL OF RIGHTS, *supra* note 122, at 47–49 (employing this approach to argue that the central function of the Second Amendment was primarily to address the ratifiers' fear of being victimized by a centralized standing army of the newly formed federal government); *see also* Brest, *supra* note 117, at 217–18.

¹²⁴ *See* BALKIN, *supra* note 100, at 3, 19–20.

¹²⁵ *Id.* at 1–34.

¹²⁶ *See, e.g.*, *Packingham v. North Carolina*, 137 S. Ct. 1730, 1735–38 (2017) (holding state law that prohibited sex offenders from participating in social media communication violated the First Amendment); *Reno v. Am. Civil Liberties Union*, 521 U.S. 844, 849, 885 (1997) (holding internet is entitled to the full protections of the First Amendment).

¹²⁷ *See* BALKIN, *supra* note 100, at 13–14, 19–20.

¹²⁸ *Packingham*, 137 S. Ct. at 1735–36.

¹²⁹ *See* discussion *supra* Sections I.E.–G.

¹³⁰ *See, e.g.*, BALKIN, *supra* note 100, at 14 (identifying "freedom of speech" as an abstract principle that should be interpreted using history and subsidiary principles).

determine whether a particular expressive activity is covered and what level of scrutiny or specialized doctrines should be applied.¹³¹

2. THE MARKETPLACE OF IDEAS THEORY

One broad theory used to interpret the First Amendment is the “marketplace of ideas”¹³² metaphor associated most strongly with Justice Oliver Wendell Holmes and the poet John Milton.¹³³ This powerful conception posits that viewpoints should freely compete in the marketplace of ideas without government interference.¹³⁴ In this way, better ideas will be discovered, or at least false and unwise ideas discarded.¹³⁵ But critics have raised some fundamental objections. Professor Jerome Barron, for example, has argued that some governmental intervention in the marketplace of ideas is required to prevent powerful entities from controlling public discourse.¹³⁶ This

¹³¹ See *infra* Sections II.A.2–5, B.

¹³² Benjamin S. DuVal, Jr., *Free Communication of Ideas and the Quest for Truth: Toward a Teleological Approach to First Amendment Adjudication*, 41 GEO. WASH. L. REV. 161, 188–89 (1972).

¹³³ Justice Holmes discussed the “free trade in ideas” in *Abrams v. United States*, 250 U.S. 616, 630 (1919). In his famous work *Areopagitica*, John Milton encouraged readers to “[l]et [truth] and falsehood grapple, who ever knew the truth to be worse, in a free and open encounter?” JOHN MILTON, *Areopagitica*, in *AEROPAGITICA AND OTHER WRITINGS* 98, 137 (William Poole ed., Penguin Group 2014) (1644). John Stuart Mill also offered a version of the marketplace of ideas in *On Liberty*. JOHN STUART MILL, *On Liberty*, in *ON LIBERTY AND THE SUBJUGATION OF WOMEN* 60–63 (Alan Ryan ed., Penguin Group 2006) (1859).

¹³⁴ See, e.g., *Abrams v. United States*, 250 U.S. 616, 630 (1919) (Holmes, J., dissenting) (“[W]hen men have realized that time has upset many fighting faiths, they may come to believe even more than they believe the very foundations of their own conduct that the ultimate good desired is better reached by free trade in ideas—that the best test of truth is the power of the thought to get itself accepted in the competition of the market, and that truth is the only ground upon which their wishes safely can be carried out.”); JOHN MILTON, *AREOPAGITICA AND OTHER WRITINGS* 110–11, 127, 131–37 (William Poole ed., Penguin Classics 2014); DuVal, *supra* note 132, at 188–89.

¹³⁵ See DuVal, *supra* note 132, at 188–89.

¹³⁶ Jerome A. Barron, *Access to the Press—A New First Amendment Right*, 80 HARV. L. REV. 1641, 1649, 1651–52, 1655, 1676 (1967). Barron has perhaps the unique distinction of arguing his own theory at the U.S. Supreme Court and having it rejected. See *Miami Herald Publ’g. Co. v. Tornillo*, 418 U.S. 241, 251, 258 (1974) (holding that Florida’s “right of reply” statute, which granted political candidates a right to equal space to answer criticism and attacks on his record by a newspaper, violated the First Amendment).

objection would seem to carry less weight in the age of social media, twitter, the internet in general, and other mediums that allow anyone to publish their views. But the new question is whether this plethora of voices is drowning out essential expression.¹³⁷ The marketplace theory, discussed below, has great vitality in the Supreme Court today, particularly in the case law striking down campaign financing laws.¹³⁸

As explained above, Bitcoin, when properly understood, is a powerful medium of communication that allows its users to express ideas both financial and non-financial in ways previously not possible.¹³⁹ Its content is public and immutable. Whether considering its communication of value for goods and services, or the non-financial messages it carries, Bitcoin arguably is and will continue to be an important international forum and association for ideas. Indeed, this is true both at a micro level, as applied to individual ideologies discussed or initiated through the Bitcoin blockchain,¹⁴⁰ as well as at a macro level, as an expression of the philosophy underpinning Bitcoin's creation that central intermediaries should not stand in the way of peer-to-peer communications.¹⁴¹ As such, it is already performing an essential role in the marketplace of ideas and could reasonably be protected by the First Amendment for that reason.

¹³⁷ See generally Lili Levi, *Social Media and the Press*, 90 N.C. L. REV. 1531, 1548–49, 1551–53 (2012); Nicole Martin, *How Social Media Has Changed How We Consume News*, FORBES (Nov. 30, 2018, 4:26 PM), <https://www.forbes.com/sites/nicolemartin/2018/11/30/how-social-media-has-changed-how-we-consume-news/#42a4fbc93c3c>; Jay David Bolter, *Social Media Are Ruining Political Discourse*, ATLANTIC (May 19, 2019), <https://www.theatlantic.com/technology/archive/2019/05/why-social-media-ruining-political-discourse/589108/>.

¹³⁸ See, e.g., *Citizens United v. Fed. Election Comm'n*, 558 U.S. 310, 335, 371, 468–69 (2010) (“The First Amendment protects political speech; and disclosure permits citizens and shareholders to react to the speech of corporate entities in a proper way. This transparency enables the electorate to make informed decisions and give proper weight to different speakers and messages.”).

¹³⁹ See discussion *supra* Sections I.E.–G.

¹⁴⁰ See, e.g., *supra* notes 44–45, 53–60 and accompanying text (discussing internal debates regarding governance and structure of Bitcoin's blockchain as demonstrated through contested “hard forks” of the network, as well as discussing political expression published to Bitcoin's blockchain).

¹⁴¹ See, e.g., *supra* notes 34–39 and accompanying text.

3. THE CHECKING VALUE THEORY

A vital First Amendment interpretation is Vincent Blasi's "checking value" theory.¹⁴² Blasi convincingly establishes that a central purpose of the First Amendment is to provide a check on the government, making it essentially a Fourth Branch in the constitutional scheme of checks and balances.¹⁴³ The idea is that, through the Petition Clause, the Press Clause, and the Free Speech Clause, as well as their derivative protections of demonstrations and marches, newsgathering, anonymous speech, and the right of access to judicial proceedings and records, the First Amendment acts to restrain government excesses.¹⁴⁴ While too narrow to be a full-blown theory of the First Amendment, it plays an important role in many cases.¹⁴⁵

Bitcoin should enjoy the protection afforded by the checking value theory of the First Amendment because the central ideological purpose of the network is to provide a check on the abuse of governments engineered by the folly or greed of central banks.¹⁴⁶ Indeed, Bitcoin is a network purposefully created to provide a check on the requirement of trust in governments and their financial intermediaries.¹⁴⁷ This checking value protects the Bitcoin network from government reprisal for its rejection of state-sponsored currency manipulation, bank failures, and fraud committed through the sale of financial instruments such as worthless mortgage paper marketed as high-grade bonds.¹⁴⁸ This First Amendment theory should provide

¹⁴² Vincent Blasi, *The Checking Value in First Amendment Theory*, 1977 AM. B. FOUND. RES. J. 521, 527–28, 649.

¹⁴³ *Id.* at 527.

¹⁴⁴ *Id.* at 523, 525.

¹⁴⁵ See, e.g., *Ward v. Rock Against Racism*, 491 U.S. 781, 791 (1989) ("Our cases make clear, however, that even in a public forum the government may impose reasonable restrictions on the time, place, or manner of protected speech, provided the restrictions are justified without reference to the content of the regulated speech, that they are narrowly tailored to serve a significant governmental interest, and that they leave open ample alternative channels for communication of the information.") (internal citations and quotation marks omitted).

¹⁴⁶ *Bitcoin Open Source Implementation*, *supra* note 54; see POPPER, *supra* note 3, at 20–24, 30–32.

¹⁴⁷ *Bitcoin Open Source Implementation*, *supra* note 54.

¹⁴⁸ For discussions of structural problems in finance, see generally MICHAEL LEWIS, *THE BIG SHORT: INSIDE THE DOOMSDAY MACHINE* (W. W. Norton & Company reprinted ed. 2011); ANDREW ROSS SORKIN, *TOO BIG TO FAIL: THE INSIDE*

Bitcoin with robust protection as a platform founded in the rejection of such evils.

4. THE POLITICAL SPEECH THEORY

Alexander Meiklejohn and Robert Bork posit a self-governance theory that argues only political speech, or speech directly related to democratic political processes, is afforded protection under the First Amendment.¹⁴⁹ Logically, this theory leaves vast unprotected bodies of expression, including both non-fiction and fiction books, film, performing art, painting, music, and sports. Essentially all of these are forms of expression that make life worth living.

There are many good reasons why the Supreme Court has routinely rejected this narrow view.¹⁵⁰ For example, Harper Lee's *To Kill A Mocking Bird* is a novel, but also a powerful political statement about courage in the face of racism.¹⁵¹ Similarly, Stanley Kubrick's films are entertainment, but *A Clockwork Orange* is an

STORY OF HOW WALL STREET AND WASHINGTON FOUGHT TO SAVE THE FINANCIAL SYSTEM—AND THEMSELVES (Penguin Books 2010).

¹⁴⁹ ALEXANDER MEIKLEJOHN, FREE SPEECH AND ITS RELATION TO SELF-GOVERNMENT 22–26 (1948); Robert H. Bork, *Neutral Principles and Some First Amendment Problems*, 47 IND. L.J. 1, 20 (1971) (arguing that constitutional protection should be afforded only to speech that is explicitly political).

¹⁵⁰ See, e.g., *United States v. Stevens*, 559 U.S. 460, 468, 470, 472, 481–82 (2010) (“The First Amendment’s guarantee of free speech does not extend only to categories of speech that survive an ad hoc balancing of relative social costs and benefits. The First Amendment itself reflects a judgment by the American people that the benefits of its restrictions on the Government outweigh the costs.”); *Central Hudson Gas & Elec. Corp. v. Pub. Serv. Comm’n of N.Y.*, 447 U.S. 557, 560–62 (1980) (holding that commercial speech is protected under the First Amendment); *Miller v. California*, 413 U.S. 15, 26, 29 (1973) (finding pornography may be protected under the First Amendment so long as it has “serious literary, artistic, political, or scientific value”).

¹⁵¹ Teresa Godwin Phelps, *The Margins of Maycomb: A Rereading of To Kill a Mockingbird*, 45 ALA L. REV. 511, 511–15, 526–29 (1994).

important meditation on behavioral conditioning in modern society,¹⁵² and *Dr. Strangelove* presents a biting indictment of U.S. nuclear weapons policy.¹⁵³ Jordan Peele's 2017 film *Get Out* is at once a gripping horror movie as well as an artist's satirical reflection on the relationship between African Americans and liberal America.¹⁵⁴ The fundamental flaw of the political speech theory's approach, then, is that it fails to inquire into the kinds of expression that shape the values of voters. And, while voting is an important function in our lives, it surely is not more important than love, art, procreation, religion, family, or other values.¹⁵⁵

Bitcoin is political speech. Although it can function as a virtual currency that enables commercial payment, it is also an overtly political association that allows its participants to communicate in ways previously unimaginable and to express their rejection of trust in central economies. It is an ideological rejection of faith in government and reliance on centralized authorities.¹⁵⁶ Thus, even under the political speech theory's narrow interpretation of the First Amendment as protecting only political speech, Bitcoin would very arguably still enjoy protection.

5. THE LIBERTY AND AUTONOMY THEORY

Another theory, which is most closely associated with Thomas Emerson, Martin Redish, Thomas Scanlon, and C. Edwin Baker, contends that the purpose of the First Amendment is to allow people

¹⁵² Anthony Burgess, *The Clockwork Condition: The Author Comments on His Most Famous Book, in 1973.*, NEW YORKER (May 28, 2012), <https://www.newyorker.com/magazine/2012/06/04/the-clockwork-condition>.

¹⁵³ Rebecca C. Lubot, "A Dr. Strangelove Situation": *Nuclear Anxiety, Presidential Fallibility, and the Twenty-Fifth Amendment*, 86 *FORDHAM L. REV.* 1175, 1176 (2017).

¹⁵⁴ Cara Buckley, 'I'd Never Seen My Fears as an African-American Man On-screen,' N.Y. TIMES (Dec. 6, 2017), <https://www.nytimes.com/2017/12/06/movies/jordan-peeel-get-out-african-american-biracial.html>.

¹⁵⁵ See Alexander Meiklejohn, *The First Amendment Is an Absolute*, 1961 *SUP. CT. REV.* 245, 256–57. Meiklejohn subsequently realized many non-political works have great political significance and expanded the scope of works he considered protected, explaining that "there are many forms of thought and expression within the range of human communications from which the voter derives the knowledge, intelligence, sensitivity to human values: the capacity for sane and objective judgment which, so far as possible, a ballot should express." *Id.*

¹⁵⁶ See *Bitcoin Open Source Implementation*, *supra* note 54.

to achieve liberty and autonomy. Under this theory, the government may not limit the flow of truthful information or the opportunity to attain it.¹⁵⁷ Perhaps the most relevant doctrine for today's Supreme Court First Amendment precedent, it stands as a bulwark against governmental paternalism and viewpoint discrimination.¹⁵⁸

Bitcoin is a quintessential exercise of liberty and autonomy.¹⁵⁹ The information contained in its ledger has been democratically determined by a worldwide network of participants to be truthful information, without the requirement of an imprimatur of government or high finance.¹⁶⁰ That the government may favor another form of expression, or indeed currency, or may fear that the populace would be best protected without unrestricted access to the information contained in the blockchain or the ability to add information to it, is contrary to the liberty and autonomy theory of the First Amendment.¹⁶¹ The public has developed (through open-source software) and supported (through participation) Bitcoin as an expressive

¹⁵⁷ C. EDWIN BAKER, HUMAN LIBERTY AND FREEDOM OF SPEECH 3–5 (1989); THOMAS I. EMERSON, TOWARD A GENERAL THEORY OF THE FIRST AMENDMENT, at viii, 3, 5–6 (1966); Martin H. Redish, *The Value of Free Speech*, 130 U. PA. L. REV. 591, 593–94, 626–27 (1982); Thomas Scanlon, *A Theory of Freedom of Expression*, 1 PHIL. & PUB. AFF. 204, 208, 213–14, 221–24 (1972).

¹⁵⁸ For example, in *Sorrell v. IMS Health Inc.*, 564 U.S. 552, 563–67, 578–79 (2011), the Court invalidated a Vermont law that prohibited data miners from collecting prescription records from pharmaceutical companies for their use in targeting physicians who were not prescribing branded drugs rather than generics. The State's medical reimbursement costs would be greater if doctors decided to use branded drugs instead of inexpensive generic versions. *Id.* The Court found this restriction on the communication of truthful information to be impermissibly paternalistic and viewpoint discrimination. *Id.* Similarly, in *Linmark Assocs., Inc. v. Township of Willingboro*, 431 U.S. 85, 93, 95, 97 (1977), the Court invalidated a municipal prohibition on placing "For Sale" signs in homeowners' yards that was enacted to deter white flight by keeping information about homes available for purchase from the community. Again, the Court considered the restriction impermissibly paternalistic and viewpoint discriminatory. *Id.*

¹⁵⁹ See, e.g., NARAYANAN ET AL., *supra* note 7, at 19–20 (describing the concept of decentralized identity management).

¹⁶⁰ *Id.* at 19–20, 51.

¹⁶¹ See, e.g., EMERSON, *supra* note 157, at 4 ("The right to freedom of expression . . . derives from the widely accepted premise of Western thought that the proper end of man is the realization of his character and potentialities as a human being."); Redish, *supra* note 157, at 594–95, 621–27 (arguing that all forms of expression that further the self-realization value are deserving of First Amendment protection).

means of protecting itself against government and corporate censorship and paternalism.¹⁶² Accordingly, under a liberty and autonomy theory of the First Amendment, the Bitcoin association, which has banded together in the form of digital self-governance, is protected.

B. *Specific First Amendment Doctrines and Principles*

While the Court has employed many specific principles and particularized doctrines which encompass various approaches and accommodate factual patterns that differ in scope and applicability, there is no single, coherent, organized theory of the Free Speech Clause of the First Amendment.¹⁶³ For example, the Supreme Court has in the past created categories of expression that it has characterized as unprotected by the First Amendment, including obscenity,¹⁶⁴

¹⁶² See, e.g., Alex Gladstein, *Why Bitcoin Matters for Freedom*, TIME (Dec. 28, 2018), <https://time.com/5486673/bitcoin-venezuela-authoritarian/>.

¹⁶³ See, e.g., Martin H. Redish, *Commercial Speech, First Amendment Intuitionism and the Twilight Zone of Viewpoint Discrimination*, 41 LOY. L.A. L. REV. 67, 68–69 (2007) (analyzing criticisms of commercial speech protection under the First Amendment).

¹⁶⁴ The Supreme Court has created a limited category of unprotected expression with respect to obscene materials on the grounds that the original meaning of freedom of speech did not encompass obscene expression, that such expression contributes nothing to public discourse, and that the prohibition reflects long-held societal values. *Roth v. United States*, 354 U.S. 476, 481–85 (1957). The specific regulatory scope is limited to works “which depict or describe sexual conduct” and in which the obscene conduct is “specifically defined by the applicable state law.” *Miller v. California*, 413 U.S. 15, 24 (1973). *Miller* also requires regulations to “be limited to works, which, taken as whole, appeal to the prurient interest in sex, which portray sexual conduct in a patently offensive way, and which, taken as a whole, do not have serious literary, artistic, scientific, or political value.” *Id.* However, obscenity must be distinguished from pornography, or the graphic depiction of sexual activity, which is protected. See *Sable Commc’ns of Cal., Inc. v. FCC*, 492 U.S. 115, 126 (1989).

child pornography,¹⁶⁵ government speech,¹⁶⁶ fighting words,¹⁶⁷ and false and defamatory speech made with actual malice.¹⁶⁸ However,

¹⁶⁵ Neither depictions of minors engaged in sexual activity nor offers to provide or accept such materials are protected by the First Amendment. *See* *New York v. Ferber*, 458 U.S. 747, 757–64 (1982) (holding, in part, that the test for child pornography is separate from the obscenity standard enunciated in *Miller*). Obscenity and child pornography restrictions on speech similarly apply to distributed networks, like Bitcoin, when such materials are transmitted through the network. *See Child Porn on Bitcoin?*, *supra* note 79. Interestingly, there have been instances in which links to unlawful imagery have been published onto Bitcoin’s immutable ledger, raising the issue of whether such publications mean that various stakeholders (such as miners or node operators who help to maintain a distributed ledger) are in violation of the law. *See id.* As of this writing, and to our knowledge, the question has not been ventilated by the courts and, therefore, it will likely be a subject of future scholarship and debate.

¹⁶⁶ The government speech doctrine provides that when the government disseminates its own messages the First Amendment does not apply. *See, e.g., Pleasant Grove City v. Summum*, 555 U.S. 460, 464, 468 (2009) (holding that the placement of a statue of the Ten Commandments in a public park was government speech and, therefore, not subject to scrutiny under the Free Speech Clause); *Walker v. Texas Div., Sons of Confederate Veterans, Inc.*, 135 S. Ct. 2239, 2245–46 (2015) (holding that specialty license plates constituted government speech and did not trigger First Amendment rules designed to protect the marketplace of ideas).

¹⁶⁷ Fighting words are another category of unprotected speech. *Chaplinsky v. New Hampshire*, 315 U.S. 568, 571–72 (1942) (holding arrest of a Jehovah Witness for insulting a police officer was permissible under fighting words doctrine). Subsequent case law has narrowed and limited this doctrine to the degree it would have virtually no bite to it. *See, e.g., R.A.V. v. City of St. Paul*, 505 U.S. 377, 391, 393–94, 396 (1992) (holding that city ordinance prohibiting bias-motivated disorderly conduct was facially invalid under the First Amendment); *Snyder v. Phelps*, 562 U.S. 443, 454–55, 458 (2011) (holding virulently anti-gay, and otherwise insulting, speech directed at mourners from outside a funeral is protected when the speech is characterized as a matter of public concern and performed in a public place).

¹⁶⁸ *See, e.g., N.Y. Times Co. v. Sullivan*, 376 U.S. 254, 279–80 (1964) (requiring a public official to prove a false statement was made with “actual malice” to recover damages for defamation). Precedent established by *N.Y. Times v. Sullivan* affords great protection even to false speech. *See id.* To the degree defamatory content is transmitted through Bitcoin, the doctrine may arguably apply. A corollary question is whether the immunity provisions of the Communications Decency Act provides immunity to messages published through decentralized networks. *See Child Porn on Bitcoin?*, *supra* note 79.

in recent years, the Court has stated it is loath to continue with such a categorical approach.¹⁶⁹

The Court has also fashioned specific doctrines for adjudicating First Amendment claims. These include the overbreadth doctrine,¹⁷⁰

¹⁶⁹ See *United States v. Alvarez*, 567 U.S. 709, 719 (2012) (declining to recognize false statements about the award of military medals as a new category of unprotected speech even though the Court viewed the speech as constituting stolen valor from war heroes).

¹⁷⁰ The overbreadth doctrine invalidates laws on their face that prohibit substantial protected expression along with unprotected expression. See *United States v. Stevens*, 559 U.S. 460, 473–75, 478–80, 482 (2010). The Court’s application of the overbreadth doctrine can cause invalidation of a law where a litigant’s assertion of free speech rights would otherwise be unprotected. See, e.g., *id.* (holding producer of animal snuff films protected by overbreadth doctrine from statute that too broadly prohibited depictions of animal cruelty); *Bd. of Airport Comm’rs of L.A. v. Jews for Jesus, Inc.*, 482 U.S. 569, 574, 576–77 (1987) (holding resolution banning all First Amendment activity at airport impermissibly broad). The overbreadth doctrine may have application to regulations that restrict too much otherwise protected expression on the Bitcoin Network. See *Child Porn on Bitcoin?*, *supra* note 79.

prior restraint doctrine,¹⁷¹ anonymous speech principle,¹⁷² commercial speech doctrine,¹⁷³ symbolic speech doctrine,¹⁷⁴ public forum

¹⁷¹ The prior restraint doctrine imposes a virtually impossible burden on government seeking to enjoin speech prior to its publication or dissemination. *See* *Near v. Minnesota*, 283 U.S. 697, 714, 718, 722–23 (1931) (enjoining law that would prevent newspaper from publishing obscene materials); *N.Y. Times Co. v. United States*, 403 U.S. 713, 714 (1971) (refusing to enjoin publication of Pentagon Papers as a prior restraint). For an application of the doctrine to Bitcoin, *see* discussion *infra* Part V.

¹⁷² *See* *Nat'l Ass'n for the Advancement of Colored People v. Ala. ex rel. Patterson*, 357 U.S. 449, 466 (1958) (“We hold that the immunity from state scrutiny of membership lists which the Association claims on behalf of its members is here so related to the right of the members to pursue their lawful private interests privately and to associate freely with others in so doing as to come within the protection of the Fourteenth Amendment.”); *Talley v. California*, 362 U.S. 60, 64–65 (1960) (“There can be no doubt that such an identification requirement would tend to restrict freedom to distribute information and thereby freedom of expression.”); *McIntyre v. Ohio Election Comm’n*, 514 U.S. 334, 357 (1995) (“Anonymity is a shield from the tyranny of the majority.”).

¹⁷³ The commercial speech doctrine distinguishes political speech from expression that proposes or relates to commercial or business transactions. *Centr. Hudson Gas & Elec. Corp., v. Public Service Comm’n.*, 447 U.S. 557, 562–63 (1980). The Court established a four-part test to govern the commercial speech doctrine. *Id.* at 566–71. The first two prongs question whether the speech is misleading or relates to unlawful activity and whether the asserted government interest is substantial. *Id.* at 566. If the expression meets these threshold requirements, the government must show the restriction directly advances the governmental interest asserted and is reasonably tailored to that purpose. *Id.* The test has been criticized and is seemingly eroding, but the commercial speech doctrine may still have global ramifications for Bitcoin or other technologies that have broad commercial and non-commercial applications. *See, e.g.,* Jacob J. Strain, *Finding a Place for Embedded Advertising Without Eroding the First Amendment: An Analysis of the Blurring Line between Verisimilar Programming and Commercial Speech*, 24 *BYU J. PUB. L.* 167, 190–92 (2009) (discussing application of the commercial speech doctrine to “hybrid speech”).

¹⁷⁴ *See, e.g.,* *United States v. O’Brien*, 391 U.S. 367, 376–77, 382 (1968) (burning a draft card is not protected as symbolic speech under the incidental restriction test); *Tinker v. Des Moines Indep. Community Sch. Distr.*, 393 U.S. 503, 513–14 (1969) (students wearing black arm bands to protest Vietnam War engaged in protected symbolic expression).

doctrine,¹⁷⁵ content-neutral/content-based and viewpoint discrimination principles,¹⁷⁶ and the strict and intermediate scrutiny levels,¹⁷⁷ among others. This First Amendment toolbox is quite full, and as a result, First Amendment adjudication may be regarded as perhaps “over-determined” when applying all of these doctrines to decide concrete cases and controversies. In the analysis that follows, we will discuss only a handful of the principles and doctrines that are most relevant to certain government regulations of bitcoin.

C. *Other Values and How They Limit the First Amendment*

The central theories and specific doctrines interpreting the First Amendment discussed above do not define an absolute right; consequently, finding limits and reconciling expressive rights with other values requires line drawing.¹⁷⁸ Generally, we may speak freely under the protection of the First Amendment, but that is not true in every case or circumstance.¹⁷⁹ For example, if a speaker makes a false, defamatory statement about a public official knowing it to be false, and if the official can prove that with clear and convincing evidence, he may sue and recover any actual damages that he suffered as a result of the publication of this statement about him to

¹⁷⁵ See, e.g., *Perry Educ. Ass’n v. Perry Local Educator’s Ass’n*, 460 U.S. 37, 45, 55 (1983) (upholding the constitutionality of a provision within a collective bargaining agreement on the basis that not all speech is equally situated on government property).

¹⁷⁶ In *Reed v. Town of Gilbert*, the Supreme Court attempted to clarify the distinctions between content-neutral, content-based, and viewpoint discrimination in regulations affecting speech. *Reed v. Town of Gilbert*, 135 S. Ct. 2218, 2227, 2230 (2015). Content-based discrimination, including viewpoint discrimination as a form of content-based discrimination, is required to meet the strict scrutiny standard discussed below. *Id.* at 2230–31.

¹⁷⁷ Where strict scrutiny applies, a restriction on speech must serve a compelling interest and be the least intrusive means of doing so. See, e.g., *United States v. Stevens*, 559 U.S. 460, 467 (2010). Courts apply intermediate scrutiny where application of strict scrutiny is not warranted, but the adverse effect of a statute on free speech should not receive “near-automatic approval.” *United States v. Alvarez*, 567 U.S. 709, 731 (2012) (Breyer, J., concurring).

¹⁷⁸ See, e.g., *Commercial Speech*, *supra* note 101, at 591–92, 624–25.

¹⁷⁹ See *supra* notes 164–68 and accompanying text.

third parties.¹⁸⁰ Why is that? Why isn't there absolute immunity? There are several underlying reasons. First, personal reputation is something we value along with freedom of speech.¹⁸¹ Second, a knowing defamatory falsehood is not considered very valuable in the marketplace of ideas.¹⁸² Third, defamation is a category of expression that was not protected at the time the First Amendment was ratified.¹⁸³ The important point is that many factors apply in limiting the First Amendment to serve other values. The libel example illustrates that a test for drawing a line between the First Amendment and another value is necessary but difficult to develop.¹⁸⁴

Privacy issues can also create a category of unprotected speech. The First Amendment does not protect speech that ventilates embarrassing facts of private figures in a "false light"¹⁸⁵ or intrudes on one's seclusion in a manner that meets the *Sullivan* "actual malice" test and is highly offensive to a reasonable person.¹⁸⁶ Standards like these are arguably better than the ad hoc balancing approach in which the courts nakedly weigh one interest against the other as if they were things that really have measurable "weight."¹⁸⁷ In such instances, a court actually seems to be deciding based on what it

¹⁸⁰ See *N.Y. Times Co. v. Sullivan*, 376 U.S. 254, 264–65, 279–80 (1964) (reversing state libel verdict for public official because it was not published with "actual malice").

¹⁸¹ Robert C. Post, *The Social Foundations of Defamation Law: Reputation and the Constitution*, 74 CAL. L. REV. 691, 691–92 (1986) ("The common law of slander and libel is designed to effectuate society's 'pervasive and strong interest in preventing and redressing attacks upon reputation.'").

¹⁸² See *Sullivan*, 376 U.S. at 300 (Goldberg, J., concurring).

¹⁸³ See *id.* at 273–74.

¹⁸⁴ See Post, *supra* note 181, at 691–92.

¹⁸⁵ See, e.g., Nathan E. Ray, Note, *Let There Be False Light: Resisting the Growing Trend Against an Important Tort*, 84 MINN. L. REV. 713, 713–15 (2000) ("False light invasion of privacy involves exposing an otherwise private individual to unwanted and false publicity.").

¹⁸⁶ See, e.g., *Time, Inc. v. Hill*, 385 U.S. 374, 388–91, 397 (1967) (finding reversible error in context of false-light privacy case for failure to "instruct the jury that a verdict of liability could be predicated only on a finding of knowing or reckless falsity in the publication of the Life article").

¹⁸⁷ See *Branzburg v. Hayes*, 408 U.S. 665, 705–09 (1972), for an example of the Court implementing an ad hoc balancing test to hold that a reporter was required to give testimony to a grand jury. See also Paul Marcus, *The Reporter's Privilege: An Analysis of the Common Law, Branzburg v. Hayes, and Recent Statutory Developments*, 25 ARIZ. L. REV. 815, 859 (1983).

subjectively believes is more important: the harm caused by restricting the expressive right or the injury to the other value produced by the expression. Certain tests have been developed to avoid this blatant battle of intuitions, or at least render them less obvious and apparently more constrained. For example, speech activity may be restricted by time, place, and manner, so long as it is content-neutral and non-discriminatory.¹⁸⁸ These limitations allow for a First Amendment right to be exercised in a regulated manner so that other values are also served.

Less gentle restrictions come when “heavier” other values are threatened or the speech activity is in a category deemed to be of lesser importance. For example, speech proposing a commercial transaction may be regulated under an intermediate scrutiny standard: the speech must relate to lawful activity, but if the government still wishes to restrict it, the restriction must directly advance substantial government interests and be reasonably tailored to do so.¹⁸⁹ If fully protected speech, like political expression, is the target of regulation, the law must serve a compelling government interest and be the least restrictive means of doing so to be upheld.¹⁹⁰ It is difficult to draw a clear—or even convoluted—line from the text of the First Amendment through any of the various First Amendment theories to the scrutiny tests used to interpret the Amendment in actual cases. It has also become progressively harder to distinguish between a “substantial government interest”¹⁹¹ and a “compelling”¹⁹²

¹⁸⁸ See, e.g., *Ward v. Rock Against Racism*, 491 U.S. 781, 798–99 (1989) (holding a regulation of the time, place, or manner of protected speech must be narrowly tailored to serve the government’s legitimate content-neutral interests but does not need to be the least restrictive or the least-intrusive means of doing so); see also *supra* notes 164–68 and accompanying text.

¹⁸⁹ *Central Hudson Gas & Elec. Corp., v. Public Service Comm’n.*, 447 U.S. 557, 566 (1980) (setting forth separate constitutional standard for regulations impacting commercial speech).

¹⁹⁰ VICTORIA L. KILLION, CONG. RESEARCH SERV., IF11072, THE FIRST AMENDMENT: CATEGORIES OF SPEECH (2019), <https://crsreports.congress.gov/product/pdf/IF/IF11072>.

¹⁹¹ E.g., *Clark v. Cmty. for Creative Non-Violence*, 468 U.S. 288, 289 (1984).

¹⁹² E.g., *Widmar v. Vincent*, 454 U.S. 263, 270 (1981).

one, or a “reasonably tailored”¹⁹³ fit from the “least intrusive”¹⁹⁴ means.

Equally concerning is the progressive difficulty in deciding which expression is deserving the protection of strict scrutiny, and which only warrants an intermediate review. For example, is the collection of data regarding prescription drug marketing practices analyzed in *Sorrell v. IMS Health, Inc.* protected by intermediate scrutiny or that is fully protected?¹⁹⁵ On one hand, a prescription is just an order for the purchase of a drug, but on the other, healthcare is critical to us all. Was invalidating the ban on advertising prescription drug prices in *Virginia State Board of Pharmacy v. Virginia Citizens Consumer Council* protection of commercial transactions or speech about necessary health information?¹⁹⁶ Because the *Sorrell* Court had difficulty deciding what the speech was, it looked to narrower rules of decision to resolve the case.¹⁹⁷ It concluded that the statute was impermissibly paternalistic in preventing doctors from gaining truthful information just because it might cause them to decide to use branded drugs, a viewpoint the government did not like.¹⁹⁸ The Court also found the Vermont law to be viewpoint discrimination, a particularly virulent form of content-based regulation.¹⁹⁹

¹⁹³ *E.g.*, *Ruggiero v. Fed. Commc’n Commission*, 317 F.3d 239, 245 (D.C. Cir. 2003); *see Edenfield v. Fane*, 507 U.S. 761, 761 (1993) (“Florida’s rule need only be tailored in a reasonable manner to serve a substantial state interest in order to survive First Amendment scrutiny.”).

¹⁹⁴ *E.g.*, *Ward v. Rock Against Racism*, 491 U.S. 781, 789 (1989).

¹⁹⁵ *See Sorrell v. IMS Health Inc.*, 564 U.S. 552, 557 (2011) (employing “heightened” scrutiny to strike down state law restrictions on the practice of pharmaceutical data collection).

¹⁹⁶ *See Va. State Pharmacy Bd. v. Va. Citizens Consumer Council*, 425 U.S. 748, 770–73 (1976) (invalidating state prohibition on advertising prescription drug prices as violating the protection of commercial speech under the First Amendment).

¹⁹⁷ *See Sorrell*, 564 U.S. at 570 (“There is thus a strong argument that prescriber-identifying information is speech for First Amendment purposes.”).

¹⁹⁸ *See id.* at 576–79 (“Here, however, Vermont has not shown that its law has a neutral justification.”).

¹⁹⁹ *See id.* at 565 (“‘In its practical operation,’ Vermont’s law ‘goes even beyond mere content discrimination, to actual viewpoint discrimination.’”) (quoting *R.A.V. v. St. Paul*, 505 U.S. 377, 391 (1992)).

These various doctrinal developments produced one of the most spectacular First Amendment decisions in many years, *Citizens United v. FEC*.²⁰⁰ In this case, hundreds of state and federal laws were effectively invalidated.²⁰¹ Contrary to years of judicial precedent and statutes throughout the country,²⁰² the Court held that *all* associations, including not-for-profit and for-profit corporate entities, are fully protected “persons” under the First Amendment, and that the money they spend on expressive activity cannot be restricted even in political campaigns.²⁰³ In decisions both before and after *Citizens United*, the Supreme Court also held that expressions on the internet and social media are fully protected.²⁰⁴

It is with this backdrop that we now may begin consideration of how the First Amendment may be applied to Bitcoin. Because Bitcoin is a tool for expression and association, it is arguably entitled to First Amendment protection. Various interpretations provide lines that must be drawn between that protection and other values. One does not need to speculate or imagine what other values may be brought to bear. Government regulation in various forms is already occurring and will be discussed below.²⁰⁵

Values competing against the right to free speech include, *inter alia*, prevention of money laundering, protection from fraud, stopping funding of terrorism, sequestering assets, ensuring compliance with taxing authorities, and preserving the soundness of regulated

²⁰⁰ See generally *Citizens United v. Fed. Election Comm’n*, 558 U.S. 310 (2010).

²⁰¹ See *id.* at 372 (concluding that restrictions on corporate independent expenditures pursuant to 2 U.S.C. §441b are unconstitutional).

²⁰² See *id.* at 343–48 (describing the history of statutes and precedent government regulation of corporate political speech).

²⁰³ See *id.* at 342–43, 363–66 (explaining that the speech of associations should not be treated differently under the First Amendment than that of “natural persons”, and overruling precedent in two cases that limit corporate expenditures and political speech).

²⁰⁴ See, e.g., *Reno v. Am. Civil Liberties Union*, 521 U.S. 844, 868 (1997) (holding the internet is entitled to the full protections of the First Amendment); *Packingham v. North Carolina*, 137 S. Ct. 1730, 1737–38 (2017) (holding that state law prohibiting sex offenders from participating in social media communication violated the First Amendment).

²⁰⁵ See generally *Kohen & Wales*, *supra* note 16 (outlining virtual currency regulations for each state).

financial intermediaries and central banks. The level of scrutiny applied to regulations reportedly pursuing these other values should be the compelling interest, least restrictive means test, which is enunciated by the Court in many cases.²⁰⁶ The reason this test is most appropriate is because Bitcoin involves powerful non-commercial expression, including the ability to publish a wide array of content and information immutably onto a global database,²⁰⁷ as well as constituting an ideologically driven network that allows its members to exercise their repute of trust in government.²⁰⁸ The network also enables its participants to exercise a form of expression—that is, the ability to communicate value—in ways not otherwise capable absent its unique technological architecture.²⁰⁹ While this general test should be applicable, other First Amendment rules of decision may undoubtedly apply to particular forms of regulation, such as time, place, and manner restrictions, and, as we shall discuss *infra* Part V, the prior restraint doctrine.

III. BITCOIN IMPLICATES THE FIRST AMENDMENT

A. *Bitcoin as Speech*

As explained in Part I, the ability to “send” or “receive” bitcoin is a misnomer because bitcoin exists only as a reflection of a community’s understanding of information within a public ledger. Accordingly, as a purchaser of bitcoin, one is arguably purchasing access to the underlying code required to participate in the global bitcoin communications network as valued independently by a worldwide market.²¹⁰ Contextualizing the purchase or sale of

²⁰⁶ See, e.g., *Citizens United*, 558 U.S. at 340 (“Laws that burden political speech are ‘subject to strict scrutiny,’ which requires the Government to prove that the restriction ‘furthers a compelling interest and is narrowly tailored to achieve that interest.’”) (quoting *Federal Election Comm’n v. Wisconsin Right to Life, Inc.*, 551 U.S. 449, 464 (2007)); *Reed v. Town of Gilbert*, 135 S. Ct. 2218, 2231 (2015) (applying strict scrutiny to content-based restrictions on speech).

²⁰⁷ See, e.g., Sward et al., *supra* note 26, at 1.

²⁰⁸ See, e.g., POPPER, *supra* note 3, at 22.

²⁰⁹ See, e.g., NARAYANAN ET AL., *supra* note 7, at 284–85 (discussing the pros and cons of Bitcoin as “smart property”); THE INTERNET OF MONEY, *supra* note 13, at 23–24.

²¹⁰ See NARAYANAN ET AL., *supra* note 7, at 76–79.

bitcoin more accurately as the purchase or sale of the right to participate in the Bitcoin network, it becomes apparent that broad registration requirements on the ability to buy or sell bitcoin are potentially overbroad and at odds with several First Amendment theories.

The recognition that computer code is itself expressive under the First Amendment has been generally accepted since the 1990s.²¹¹ The first case to analyze the expressive qualities of computer code was *Bernstein v. United States Department of State*. Mr. Bernstein, a Ph.D. candidate at the University of California at Berkley, sought declaratory and injunctive relief from California's Northern District to publish and share source code created as part of his graduate thesis, which, if executed, could be used to encrypt data.²¹² Bernstein submitted a request to the Department of State to determine whether the items he wished to publish were subject to control by the Arms Export Control Act ("AECA") and the International Traffic in Arms Regulations ("ITAR").²¹³ The Department of State ruled that Bernstein's code was a "defense article" and therefore designated to the United States Munitions List.²¹⁴ Because Bernstein's code was designated to the United States Munitions List, he was required to obtain a license from the Government before the code could be exported.²¹⁵

Bernstein asserted facial and as applied constitutional challenges to the Department of State's enforcement of the AECA and the ITAR as infringement upon freedom of speech.²¹⁶ In its briefing, the Government did not contest that the "academic writing explaining plaintiff's scientific work in the field of cryptography [was] speech of the most protected kind,"²¹⁷ but argued that the code was itself

²¹¹ See, e.g., *Universal City Studios, Inc. v. Corley*, 273 F.3d 429, 449 (2d Cir. 2001); *Junger v. Daley*, 209 F.3d 481, 485 (6th Cir. 2000); *321 Studios v. Metro Goldwyn Mayer Studios, Inc.*, 307 F. Supp. 2d 1085, 1099–1100 (N.D. Cal. 2004); *United States v. Elcom Ltd.*, 203 F. Supp. 2d 1111, 1126–27 (N.D. Cal. 2002); *Bernstein v. U.S. Dep't of State*, 922 F. Supp. 1426, 1436 (N.D. Cal. 1996); see also Mark C. Bennett, *Was I Speaking to You?: Purely Functional Source Code as Noncovered Speech*, 92 N.Y.U. L. REV. 1494, 1499 n.23 (2017).

²¹² *Bernstein*, 922 F. Supp. at 1428–30.

²¹³ *Id.* at 1428.

²¹⁴ *Id.* at 1429–30.

²¹⁵ *Id.* at 1430.

²¹⁶ *Id.* at 1428, 1430–31.

²¹⁷ *Id.* at 1434.

functional and therefore should be viewed as “conduct” and not “speech.”²¹⁸ In making its argument, the Government relied predominately on the Supreme Court’s flag desecration cases *Texas v. Johnson*²¹⁹ and *Spence v. Washington*²²⁰ for the proposition that conduct must be “sufficiently imbued with the elements of communication” to fall within the protections of the First Amendment.²²¹ The Government’s argument turned on whether Mr. Bernstein’s code was sufficiently communicative even though it was written in computer code and not a more widely understood and easily communicative language.²²²

The *Bernstein* court rejected the Government’s argument, holding that because “Bernstein’s encryption system [was] written, albeit in computer language rather than in English . . . there [was] little about this functional writing to suggest it is more like conduct than speech.”²²³ Instead, the court took the position that source code, whether functional or not, is *always* speech protected by the First Amendment, holding that “the functionality of a language does not make it any less like speech.”²²⁴ The court found that the communicative nature of the speech comes from the fact that it “‘communicates’ to and directs the [computer] itself” in the same way musical notations, technical manuals, recipes, or mathematical equations are communicative even though the general population may not be fluent in the language in which they are written and the speech requires some amount of execution to be fully appreciated.²²⁵

²¹⁸ *Id.*

²¹⁹ 491 U.S. 397 (1989).

²²⁰ 418 U.S. 405 (1974).

²²¹ *Bernstein*, 922 F. Supp. at 1434 (citing *Johnson*, 491 U.S. at 404).

²²² *Id.*

²²³ *Id.* at 1434–35.

²²⁴ *Id.* at 1435–36.

²²⁵ *Id.* at 1435 (citing *Ward v. Rock Against Racism*, 491 U.S. 781, 790 (1989) (finding that music is protected under First Amendment)). The court also cited *United States v. Progressive, Inc.*, 467 F. Supp. 990 (W.D. Wisc. 1979), in which the Government was granted an injunction to prevent the publication of an article titled “The H-Bomb Secret; How We Got It, Why We’re Telling It.” *Bernstein*, 922 F. Supp. at 1435. In *Progressive*, the court found that the article’s publication would likely violate the Atomic Energy Act. *Progressive, Inc.*, 467 F. Supp. at 999–1000. Although the court acknowledged that the article was “speech” under the First Amendment, the article was nonetheless capable of restriction considering the National Security issues implicated by its publication. *Id.* The *Bernstein*

Since *Bernstein*,²²⁶ every appellate court to address the issue has held that computer code is sufficiently expressive to enjoy First Amendment protections.²²⁷ However, the bounds of First Amendment protection have been narrowed by at least some courts facing the issue of the distribution of code that could be used to violate the

court did not engage in an analysis regarding whether the security concerns over the publication of the encryption source code justified prior restraint, but because the H-Bomb article dealt specifically with the publication of government secrets, and not merely the creation of a novel encryption program, it is understandable why the two prior restraints were treated differently in each case. *See New York Times Co. v. United States*, 403 U.S. 713, 730–32 (1971) (White, J., concurring) (explaining that the government must demonstrate sufficient evidence of grave and irreparable danger to justify a prior restraint on speech).

²²⁶ The Ninth Circuit affirmed the Northern District of California’s decision, holding that “encryption software, in its source code form and as employed by those in the field of cryptography, must be viewed as expressive for First Amendment purposes.” *Bernstein v. U.S. Dep’t of Justice*, 176 F.3d 1132, 1141, 1147 (9th Cir. 1999). That opinion was subsequently withdrawn and an *en banc* review of the case was ordered. *Bernstein v. U.S. Dep’t of Justice*, 192 F.3d 1308, 1309 (9th Cir. 1999). As the case awaited additional proceedings, the export regulations challenged by Bernstein were amended such that Bernstein was no longer under direct threat of prosecution for his activities. *Bernstein v. U.S. Dep’t of Commerce*, No. C 95-0582 MHP, 2004 WL 838163, at *1, *2 (N.D. Cal. Apr. 19, 2004). In light of these amendments, the Northern District held that Bernstein lacked standing to challenge the regulation because he was “no longer subject to prosecution based on the export restrictions at issue.” *Id.* Notably, the Ninth Circuit never conducted its *en banc* rehearing and the Northern District’s analysis regarding the expressive character of source code under the First Amendment remains intact. *See Bernstein v. U.S. Dep’t of State*, 922 F. Supp. 1426, 1434–36 (N.D. Cal. 1996).

²²⁷ *See Universal City Studios, Inc. v. Corley*, 273 F.3d 429, 449 (2d Cir. 2001); *Junger v. Daley*, 209 F.3d 481, 485 (6th Cir. 2000). Additionally, U.S. copyrights may also be granted for computer code which is not based on common programming techniques found in public domain and involves expressive choices by the developer in its design, even where the underlying code is “functional.” *See, e.g., Oracle Am., Inc. v. Google, Inc.*, 750 F.3d 1339, 1368 (Fed. Cir. 2014) (holding that 17 U.S.C.A. § 102 may be read to permit copyrighting of expressions contained within computer programming); *Harbor Software, Inc. v. Applied Sys., Inc.*, 925 F. Supp. 1042, 1047–52 (S.D.N.Y. 1996) (finding that certain elements of a computer program are protectable expression where the programmer has made expressive choices not dictated by efficiency or taken from the public domain).

law or another's rights.²²⁸ These courts have viewed this issue as computational speech so as to justify regulations that would likely not pass pure First Amendment scrutiny in other contexts. This is perhaps best illustrated in *Universal City Studios, Inc. v. Corley*, in which the Second Circuit affirmed an injunction that prohibited several websites from making software available that could allow individuals to decrypt, and therefore make copies of, DVDs.²²⁹

In *Corley*, the court acknowledged that computer code is speech for First Amendment purposes, but it disagreed that such speech is "no different" from "pure speech."²³⁰ Therefore, computer code could be regulated according to a different constitutional standard.²³¹ The court acknowledged that source code itself is communicative and therefore protected by the First Amendment,²³² but that the application of the code, and its ability to be read or executed programmatically, could justify a different constitutional standard:

Unlike a blueprint or a recipe, which cannot yield any functional result without human comprehension of

²²⁸ See, e.g., *321 Studios v. Metro Goldwyn Mayer Studios, Inc.*, 307 F. Supp. 2d 1085, 1098 (N.D. Cal. 2004) ("[T]he First Amendment does not protect commercial speech that involves illegal activity . . .").

²²⁹ *Corley*, 273 F.3d at 453, 459–60.

²³⁰ *Id.* at 451.

²³¹ *Id.* at 451–52.

²³² As the court explained:

Instructions such as computer code, which are intended to be executable by a computer, will often convey information capable of comprehension and assessment by a human being. A programmer reading a program learns information about instructing a computer, and might use this information to improve personal programming skills and perhaps the craft of programming. Moreover, programmers communicating ideas to one another almost inevitably communicate in code, much as musicians use notes. Limiting First Amendment protection of programmers to descriptions of computer code (but not the code itself) would impede discourse among computer scholars, just as limiting protection for musicians to descriptions of musical scores (but not sequences of notes) would impede their exchange of ideas and expression. Instructions that communicate information comprehensible to a human qualify as speech whether the instructions are designed for execution by a computer or a human (or both).

Id. at 448.

its content, human decision-making, and human action, computer code can instantly cause a computer to accomplish tasks and instantly render the results of those tasks available throughout the world via the Internet. The only human action required to achieve these results can be as limited and instantaneous as a single click of a mouse. These realities of what code is and what its normal functions are require a First Amendment analysis that treats code as combining nonspeech and speech elements, *i.e.*, functional and expressive elements.²³³

Similarly, in *Junger v. Daley*,²³⁴ the Sixth Circuit concluded that the First Amendment protects encryption source code, but the functionality of the code “should be considered when analyzing the governmental interest in regulating the exchange of this form of speech.”²³⁵

The analysis of whether code is functional becomes especially difficult in light of the Supreme Court’s recent jurisprudence and seeming expansion of what constitutes a “content-based” restriction on speech.²³⁶ For example, whether a bitcoin transaction is “functional” or “non-functional” likely depends on the sender’s method and purpose for executing a bitcoin transaction and whether the transaction ultimately results in some occurrence, whether externally or through use of a smart-contract platform, of some act beyond merely asking the network to validate that a transaction occurred.

The distinction between functional and non-functional becomes even more difficult to apply given the increasing amount of code-driven interaction we experience in our day-to-day lives. For exam-

²³³ *Id.* at 451.

²³⁴ 209 F.3d 481 (6th Cir. 2000).

²³⁵ *Id.* at 485.

²³⁶ *See, e.g., Sorrell v. IMS Health, Inc.*, 564 U.S. 552, 570–71, 580 (2011) (holding that a Vermont statute that restricted the sale and use of patient data to pharmaceutical advertisers was a content-based restriction on speech in violation of the First Amendment); *Reed v. Town of Gilbert*, 135 S. Ct. 2218, 2224 (2015) (holding that a municipal sign ordinance, which placed stricter limitations on religious signs than other types of signs, was a content-based restriction on speech).

ple, the regulation at issue in *Junger* prohibited distribution of encryption software through electronic avenues without a license, but created an exception to its export restriction when the encryption software was distributed in printed form.²³⁷ The rationale behind this distinction, and an inherent assumption underlying both the *Junger* and *Corley* decisions, is that while code in and of itself is expressive, it becomes something less protected and potentially non-communicative when communicated *through* a computer.²³⁸ This rationale becomes progressively fragile given the availability of technologies such as Optical Character Recognition mechanisms, which enable one to quickly convert printed, and thus fully protected source code, into its digital, and potentially less protected, form.²³⁹

The difficulties in determining whether a bitcoin transaction produces functional or non-functional code can be illustrated when one considers the Quick Response (“QR”) codes automatically generated through digital wallet software.²⁴⁰ A QR code, like the one below, allows the user to either send or request bitcoin automatically once it is scanned by a digital wallet.²⁴¹

²³⁷ *Junger*, 209 F.3d at 483.

²³⁸ *See id.* at 483–84; *Universal City Studios, Inc. v. Corley*, 273 F.3d 429, 446–48, 451–52 (2d Cir. 2001).

²³⁹ *See* sourav soni, *Optical Character Recognition—Recognizing Text to Labels on an Android Platform*, CODEBURST (Feb. 27, 2018), <https://codeburst.io/optical-character-recognition-recognizing-text-to-labels-on-an-android-platform-4c20bdc9175> (“Optical Character Recognition (OCR) detects text in an image and extracts the recognized words into a machine-readable character stream.”).

²⁴⁰ *See* NARAYANAN ET AL., *supra* note 7, at 76–79 (explaining that bitcoins can be sent or received using a QR code, which is a matrix barcode that can be read by a camera); *see also* THE INTERNET OF MONEY, *supra* note 13, at 89–90 (describing the completion of a bitcoin transaction using a digital wallet).

²⁴¹ Scanning this QR code will request a payment of \$10.00 in bitcoin. I encourage you to try it out. *Block 000000000000000000019046cf62aa17f6e526636c71c09161c8e730b64d755ae*, BTC.COM, btc.com/000000000000000000019046cf62aa17f6e526636c71c09161c8e730b64d755ae (last visited Oct. 25, 2019).



The QR Code is therefore non-functional and would likely be protected as pure expression that can be freely distributed or sold under the First Amendment. But if the same transaction were made digitally through a digital wallet or generated automatically as part of a smart contract, it would potentially be functional and, therefore, subject to a lesser degree of protection.²⁴²

The Fifth Circuit most recently analyzed the expressive elements of code in *Defense Distributed v. United States Department of State*, refusing to enjoin a regulation restricting the publication of files that enable the public to print guns or gun parts using a 3D printer.²⁴³ In so holding, the court left open the question, which will certainly be a battleground of both First and Second Amendment jurisprudence for years to come, of whether an executable file, in this case one that could be used to print a physical object, is still speech subject to broad protection.²⁴⁴ To base expressive protections on the execution of a piece of software arguably misunderstands the nature of code and the ability to manipulate it to make it appear superficially less like content.

²⁴² See *Corley*, 273 F.3d at 445–46; *Junger*, 209 F.3d at 483; *Def. Distributed v. United States Dep’t of State*, 838 F.3d 451, 459–61 (5th Cir. 2016) (“This case presents a number of novel legal questions, including whether the 3D printing and/or CNC milling files at issue here may constitute protected speech under the First Amendment, [and] the level scrutiny applicable to the statutory a regulatory scheme here . . .”).

²⁴³ See *Def. Distributed*, 838 F.3d at 460.

²⁴⁴ *Id.* at 461.

The Second Circuit has said that the functionality analysis is really “a proxy for effects of harm,”²⁴⁵ which in the context of that case appears to mean resulting in harm to third-party rights.²⁴⁶ Whether a Bitcoin transaction is “functional” under this standard in some ways comes down to whether you understand that Bitcoin is a forum, like the internet itself,²⁴⁷ that allows individuals to propose and share information (about both financial transactions and expressive information) to a community with the expectation that it will be accepted so long as it is quantitatively valid.²⁴⁸

B. *Bitcoin as an Associational Platform*

Bitcoin is a global association, network, and forum made up of individuals that have rejected the trust relationship with governments and their central banks, and through their technological capacity have taken it upon themselves to maintain the validity of a global public ledger that records transactional and other information.²⁴⁹ Accordingly, it is reasonable to assume that various forms of participation in the Bitcoin network carry with them at least some associational protections under the First Amendment.

The Supreme Court has long recognized that the right to associate is central to a vast array of human affairs.²⁵⁰ In 1958, for example, the Court held in *NAACP v. Alabama ex rel. Patterson* that the government could not compel private associations such as the National Association for the Advancement of Colored People

²⁴⁵ See *Corley*, 273 F.3d at 451 (quoting a passage from the district court opinion, which was authored by Judge Kaplan).

²⁴⁶ See *id.* at 434 (addressing First Amendment issues concerning computer code encryption).

²⁴⁷ See *MASTERING BITCOIN*, *supra* note 19, at 103 (suggesting that Bitcoin allows for “the entire range of transactional expression—from the tiny to the enormous, from consumer to consumer, from government to government”); Chesnokov, *supra* note 78; HOFMANN, *supra* note 79, at 14–16.

²⁴⁸ See *Bitcoin Open Source Implementation*, *supra* note 54, at 2–3; *THE INTERNET OF MONEY*, *supra* note 13, at 114–15.

²⁴⁹ See *Bitcoin Open Source Implementation*, *supra* note 54, at 1–4; *THE INTERNET OF MONEY*, *supra* note 13, at 109.

²⁵⁰ See *Roberts v. United States Jaycees*, 468 U.S. 609, 622 (1984) (“An individual’s freedom to speak, to worship, and to petition the government for the redress of grievances could not be vigorously protected from interference by the State unless a correlative freedom to engage in group effort toward those ends were not also guaranteed.”).

(“NAACP”) to disclose their membership lists.²⁵¹ In a unanimous opinion, Justice Harlan recognized that “[i]t is beyond debate that freedom to engage in association for the advancement of beliefs and ideas is an inseparable aspect of the ‘liberty’ assured by the Due Process Clause of the Fourteenth Amendment, which embraces freedom of speech.”²⁵² Accordingly, the Court held, that “state action which may have the effect of curtailing the freedom to associate is subject to the closest scrutiny.”²⁵³ The Court would later elaborate in its 1984 *Roberts v. United States Jaycees* decision that the First Amendment protects not only intimate associations that are fundamental to personal liberty, but also expressive associations, which the Court deemed “an indispensable means of preserving other individual liberties” including the rights of “speech, assembly, petition for redress of grievances, and the exercise of religion.”²⁵⁴

As the *Roberts* Court recognized, “the nature and degree of constitutional protection afforded freedom of association may vary depending on the extent to which one or the other aspect of the constitutionally protected liberty is at stake in a given case.”²⁵⁵ It held that a government cannot infringe on the right to associate for expressive purposes without demonstrating that a regulation was “adopted to serve compelling state interests, unrelated to the suppression of ideas, that cannot be achieved through means significantly less restrictive of associational freedoms.”²⁵⁶

In the transformative decision *Citizens United v. FEC*, the Court recognized corporations as associations that are “persons” under the First Amendment, and that the First Amendment protects their expenditure of money, even in political elections.²⁵⁷ There exists little doubt that, as contemplated by Satoshi Nakamoto, Bitcoin was created as an expressive association for individuals to contribute to a

²⁵¹ *Nat’l Ass’n for the Advancement of Colored People v. Ala. ex rel. Patterson*, 357 U.S. 449, 466 (1958).

²⁵² *Id.* at 460.

²⁵³ *Id.* at 460–61.

²⁵⁴ *See Roberts*, 468 U.S. at 610, 618.

²⁵⁵ *Id.* at 618.

²⁵⁶ *Id.* at 623.

²⁵⁷ *See Citizens United v. Fed. Election Comm’n*, 558 U.S. 310, 339–43 (2010) (stating that § 441(b)’s “prohibition on corporate independent expenditures is an outright ban on speech . . . and political speech must prevail against laws that would suppress it”).

network that could be maintained without a centralized authority's oversight and control.²⁵⁸ It happened to be that the initial, and perhaps most effective, use of the Bitcoin network was to maintain the integrity of its financial public ledger, but as explained above, the overarching goal of Bitcoin was to advocate for a decentralized economic system by building a network large enough to be secure on a global scale.²⁵⁹ The Bitcoin network's remarkable breadth and the security achieved through its global community of authenticators may very well form the infrastructure for much of the world's future financial and non-financial institutions in the same way that the internet itself has become a ubiquitous technology through which nearly all financial, social, and expressive communications now flow.²⁶⁰

The Supreme Court's recent *Packingham v. North Carolina* decision is perhaps the clearest illustration of how the First Amendment can be utilized to prohibit overbroad regulations impacting one's right to communicate through the Bitcoin network.²⁶¹ In *Packingham*, the Supreme Court struck down a North Carolina statute which restricted sex offenders from using any "commercial social networking Web site where the sex offender knows that the site permits minor children to become members or to create or maintain

²⁵⁸ See *Bitcoin Open Source Implementation*, *supra* note 54, at 1; see also discussion *supra* note 61 regarding how the community of Bitcoin participants can self-govern and even democratically form competing associational networks by "hard forking" Bitcoin's blockchain when there is a community disagreement.

²⁵⁹ See *MASTERING BITCOIN*, *supra* note 19, at 181; *Bitcoin Open Source Implementation*, *supra* note 54, at 1–3. As more miners participate in the Bitcoin network, the hash rate, or the power the Bitcoin network continuously consumes to function, has increased. See *MASTERING BITCOIN*, *supra* note 19, at 209–10. This has the impact of making it more expensive, to the point of practical impossibility, for an individual to overtake the network and validate fraudulent transactions. See *id.* at 209–17.

²⁶⁰ See discussion *supra* note 87 regarding a proposal by Microsoft to build an identity management tool that utilizes Bitcoin's decentralized architecture, as well as the Rootstock (RSK) protocol that proposes to leverage Bitcoin's robust public network as the infrastructure for a limitless platform for smart contract applications.

²⁶¹ See *Packingham v. North Carolina*, 137 S. Ct. 1730, 1737 (2017) (holding that prohibiting sex offenders from using social media websites prevents them "from engaging in the legitimate exercise of First Amendment rights").

personal Web pages.”²⁶² Petitioner was charged and convicted with a felony after he posted a celebratory status on Facebook after having a ticket dismissed in traffic court.²⁶³ He challenged his conviction on First Amendment grounds, arguing that North Carolina’s statute “arbitrarily burden[ed] all registered sex offenders by preventing a wide range of communication and expressive activity unrelated to achieving its purported goal” of protecting children. The Supreme Court agreed, holding that while it was clearly in the State’s interest to protect children from sex offenders, the rule was not narrowly tailored to serve that interest.²⁶⁴

The *Packingham* decision is important not because it struck down the North Carolina statute, which was very obviously overbroad, but because it recognized the internet, and “social media in particular,” as a “vast democratic forum” and because it acknowledged that the nature, use, and expressive reach of the internet are still developing and not completely known.²⁶⁵ In charting the growing influence of the internet and social networks on expression and association, the Court recognized that it “must exercise extreme caution before suggesting that the First Amendment provides scant protection for access to vast networks in that medium.”²⁶⁶

The Court recognized that “[s]ocial media offers ‘relatively unlimited, low-cost capacity for communication of all kinds[,]’ as well as a platform where users can share religious and political content, photos, and “engage in a wide array of protected First Amendment activity on topics ‘as diverse as human thought.’”²⁶⁷ This technological and communicative innovation, which has and will continue to develop, is not dissimilar to the American experiment itself, which was at its core an innovation in self-governance, autonomy, and expressive and associational possibilities.²⁶⁸ Indeed, quoting Benjamin

²⁶² *Id.* at 1733 (quoting N.C. Gen. Stat. Ann. §§ 14–202.5(a), (e) (2015)).

²⁶³ *Id.* at 1734.

²⁶⁴ *See id.* at 1736–37 (“[T]he provision cannot stand . . . [A] law must be ‘narrowly tailored to serve a significant governmental interest.’”) (quoting *McCullen v. Coakley*, 573 U.S. 464, 477 (2014)).

²⁶⁵ *See id.* at 1735–36.

²⁶⁶ *See id.* at 1736; *see also* *Reno v. Am. Civil Liberties Union*, 521 U.S. 844, 868 (1997).

²⁶⁷ *Packingham*, 137 S. Ct at 1735–36 (quoting *Reno*, 521 U.S. at 870).

²⁶⁸ *See Founding Principles and Virtues*, BILL RTS. INST., <https://billofrightsintstitute.org/founding-documents/founding-principles/> (last

Rush's view of democracy, the Court adopted the view that it should embrace the many changes created by the internet, and not stand in the way of unforeseen progress:

The nature of a revolution in thought can be that, in its early stages, even its participants may be unaware of it. And when awareness comes, they still may be unable to know or foresee where its changes lead. So too here. While we now may be coming to the realization that the Cyber Age is a revolution of historic proportions, we cannot appreciate yet its full dimensions and vast potential to alter how we think, express ourselves, and define who we want to be. The forces and directions of the Internet are so new, so protean, and so far reaching that courts must be conscious that what they say today might be obsolete tomorrow.²⁶⁹

Despite the Court's pronouncements in *Packingham*, the protection afforded under the First Amendment to technologies like Bitcoin that possess characteristics of both an associational and expressive platform as well as those of a financial instrument becomes difficult, especially where the distribution and transfer of financial instruments are regulated under both state and federal law. In *Giboney v. Empire Storage & Ice Co.*, for example, the Court held that a peaceful union protest was properly enjoined where the purpose of the protest was to unlawfully restrain trade in violation of the law.²⁷⁰ The opinion recognized that expressive behavior does not by itself immunize unlawful behavior,²⁷¹ but the Court notably did

visited Oct. 20, 2019); James D. Best, *What Were the Founding Principles?*, WHAT WOULD FOUNDERS THINK?, <http://www.whatwouldthefoundersthink.com/what-were-the-founding-principles> (last visited Oct. 20, 2019).

²⁶⁹ *Packingham*, 137 S. Ct. at 1736 (internal citations omitted).

²⁷⁰ *Giboney v. Empire Storage & Ice Co.*, 336 U.S. 490, 491–92, 501 (1949).

²⁷¹ *See id.* at 495–96 (finding it difficult to understand how a labor union's "trade restraint combinations" could be immune from laws due to "the guaranties of freedom of speech and press stemming from the Fourteenth and First Amendments"). In *Central Hudson Gas & Elec. Corp. v. Pub. Serv. Comm'n*, 447 U.S. 557, 566 (1980), the Court similarly held that although commercial speech is protected by the First Amendment, unlawful or misleading speech is not protected even though it is otherwise protectable "expression."

not suggest that one can enjoin all forms of peaceful protest merely because one may be able to violate the laws through picketing activity.²⁷² Indeed, such a restriction would surely be deemed constitutionally infirm under the Court's overbreadth jurisprudence.²⁷³ As discussed below, the tendency of state and federal regulators to place broad restrictions on the sale, transfer, or use of Bitcoin may be constitutionally problematic and, like *Giboney* suggests, require regulators to consider individual motivations for obtaining or using cryptocurrencies before barring all such uses.²⁷⁴

IV. U.S. EFFORTS TO REGULATE BITCOIN

The central question posed by this Article is whether the sale or use of bitcoin should be regulated as a currency or financial instrument, or whether the actual and potential expressive and associational uses of the Bitcoin network discussed above require a different analysis under the First Amendment. An argument sometimes made in favor of regulating bitcoin as a purely financial instrument is that its non-financial uses, including as a censorship-resistant publication platform, are incidental and should not impact how it is viewed by regulators any more than the ability to draw a picture on the face of a dollar bill changes how governments regulate fiat currencies.²⁷⁵ This position is problematic because, while it may be true that the most prominent use of bitcoin at this moment may be as a

²⁷² See *Giboney*, 336 U.S. at 498, 501.

²⁷³ See, e.g., *United States v. Stevens*, 559 U.S. 460, 473, 482 (2010) (holding that a producer of animal snuff films was protected by the overbreadth doctrine from a statute that too broadly prohibited depictions of animal cruelty); *Bd. of Airport Commissioners v. Jews for Jesus, Inc.*, 482 U.S. 569, 569 (1987) (holding resolution banning all First Amendment activity at airport impermissibly broad). The overbreadth doctrine is often deployed by courts and may have application to regulations that restrict too much otherwise protected expression on the Bitcoin Network.

²⁷⁴ See *infra* Part IV.

²⁷⁵ See, e.g., Andrew Balthazor, *Bitcoin Will Find No First Amendment Refuge*, FIU L. REV. BLOG (Feb. 26, 2019), <https://law.fiu.edu/2019/02/26/bitcoin-will-find-no-first-amendment-refuge/> (“That one could write a political message on a dollar bill and ‘publish’ at the corner store when buying some milk does not transform all dollar bills into protected speech or all paper currency into a ‘publishing platform.’”).

digital payment system,²⁷⁶ it fails to consider the growing uses and expression made possible by the Bitcoin network described above.²⁷⁷ Indeed, as we have seen with the internet itself, our utilization of open protocols varies and changes over time in ways that one cannot predict.

Despite the broader expressive uses made possible with Bitcoin or other cryptocurrencies that utilize similarly open community-managed associational networks, there has been almost no effort by regulators to even contemplate the growing expressive canon of uses these virtual assets allow,²⁷⁸ or to draw distinctions among different types of cryptocurrencies that may lack Bitcoin's expressive and associational characteristics.²⁷⁹ This is potentially due to fatigue by regulators charged with policing the thousands of different "cryptocurrencies" that have emerged in the last decade.²⁸⁰ Indeed, the term "cryptocurrency" has become a catchall for nearly every virtual asset in which a secondary market exists.²⁸¹ While some of these assets share Bitcoin's underlying philosophy regarding the dangers of

²⁷⁶ See Ben Chapman, *Bitcoin: What Is It, Where Can You Use It and Is It Worth Investing?*, INDEPENDENT (Jan. 5, 2018, 11:15 AM), <https://www.independent.co.uk/news/business/news/bitcoin-what-is-cryptocurrency-where-use-investment-dark-web-illegal-explained-value-exchange-rate-a8082491.html> (referring only to the currency function of Bitcoin).

²⁷⁷ See *supra* Section I.G.

²⁷⁸ See, e.g., Donald F. Kettl, *How Do We Regulate Bitcoin and Other Cryptocurrencies?*, GOVERNING (Aug. 2018), <https://www.governing.com/columns/washington-watch/gov-bitcoin-regulations-states.html> (evidencing the fact that, when thinking about how to regulate Bitcoin optimally, regulators only think of it as some sort of financial entity).

²⁷⁹ See, e.g., FINCEN GUIDANCE 2019, *supra* note 46, at 7 (failing to distinguish between any types of cryptocurrency, and, in fact, stating that distinctions such as "digital currency," "cryptocurrency," "cryptoasset," and "digital asset" have no "dispositive[ly]" different "regulatory treatment under the BSA").

²⁸⁰ As of March 2018, there were 1,658 cryptocurrencies. Matthew Frankel, *How Many Cryptocurrencies Are There?*, MOTLEY FOOL (Mar. 16, 2018, 6:21 AM), <https://www.fool.com/investing/2018/03/16/how-many-cryptocurrencies-are-there.aspx>.

²⁸¹ See, e.g., U.S. Sec. & Exch. Comm'n, *Statement on Digital Asset Securities Issuance and Trading*, SEC.GOV (Nov. 16, 2018), <https://www.sec.gov/news/public-statement/digital-asset-securities-issuance-and-trading>; Jay Clayton, U.S. Sec. & Exch. Comm'n, *Statement on Cryptocurrencies and Initial Coin Offerings*, SEC.GOV (Dec. 11, 2017), <https://www.sec.gov/news/public-statement/statement-clayton-2017-12-11>.

a centralized monetary policy and utilize a copy or variant of Satoshi's blockchain,²⁸² many share little in common with Bitcoin and were created so that they could be sold to investors in order to raise capital for a profit-making enterprise.²⁸³

Given the amount of money poured into virtual currencies (more than \$5.6 billion in initial coin offerings in 2017 alone)²⁸⁴ and the increasing prevalence of individuals utilizing virtual currencies for unlawful activity,²⁸⁵ state and federal regulators have attempted to create a framework applicable to virtual currencies.²⁸⁶ However, within the United States there has been little consistency regarding how to best regulate virtual currencies and almost no attempt to discriminate between how different categories of virtual currencies are treated.²⁸⁷

²⁸² See Jake Frankenfield, *Cryptocurrency*, INVESTOPEDIA, <https://www.investopedia.com/terms/c/cryptocurrency.asp> (last updated Feb. 12, 2019) (explaining that some cryptocurrencies are clones of Bitcoin); Paul Vigna, *Which Digital Currency Will Be the Next Bitcoin?*, WALL ST. J., <https://www.wsj.com/articles/which-digital-currency-will-be-the-next-bitcoin-1513679400> (last updated Dec. 19, 2017, 4:13 PM) (calling altcoins alternative versions of Bitcoin).

²⁸³ See, e.g., Ameer Rosic, *What Is an Initial Coin Offering? Raising Millions in Seconds*, BLOCKGEEKS, <https://blockgeeks.com/guides/initial-coin-offering/> (last updated Feb. 21, 2019) (“Since 2013 ICOs are often used to fund the development of new cryptocurrencies. The pre-created token can be easily sold and traded on all cryptocurrency exchanges if there is demand for them.”).

²⁸⁴ Oscar Williams-Grut, *Only 48% of ICOs Were Successful Last Year — But Startups Still Managed to Raise \$5.6 Billion*, BUSINESS INSIDER (Jan. 31, 2018, 1:44 AM), <https://www.businessinsider.com/how-much-raised-icos-2017-to-kendata-2017-2018-1>.

²⁸⁵ See Dean Takahashi, *Cryptocurrency Thefts, Scams, and Fraud Top \$1.2 Billion in Q1 2019*, VENTUREBEAT (Apr. 30, 2019, 10:09 PM), <https://venturebeat.com/2019/04/30/cryptocurrency-thefts-scams-and-fraud-top-1-2-billion-in-q1/>; Rupert Jones, *Cryptocurrency Scams Triple in a Year — at £27m Total Cost to Victims*, GUARDIAN (May 20, 2019, 7:01 PM), <https://www.theguardian.com/business/2019/may/21/cryptocurrency-scams-triple-in-a-year-at-27m-total-cost-to-victims>.

²⁸⁶ See, e.g., FLA. STA. § 896.101 (2017); FINCEN GUIDANCE 2019, *supra* note 46, at 7; see Kohen & Wales, *supra* note 16.

²⁸⁷ See generally *id.* (offering a comprehensive review of every virtual currency or blockchain specific regulation issued by the states). Of the fifty states, only Wyoming has enacted regulations which treat virtual currencies differently based on their distribution model and function. *Id.* Specifically, H.B. 70, known as the “Utility Token Bill,” exempts “Utility Tokens” from the state’s securities laws provided the issued token has a number of characteristics, including a use

Much of the guidance or new regulations enacted at the state and federal levels have been efforts to update existing statutes (such as unclaimed property or money laundering regulations) in order to expressly contemplate virtual currencies,²⁸⁸ or are otherwise related to the sale of virtual currencies as a method of raising capital and the analysis of whether such sales trigger regulations related to the sale of securities.²⁸⁹ The type of regulations which most immediately impact one's ability to participate and take advantage of the Bitcoin network, however, relate to whether bitcoin is "money" under state and federal rules that require "Money Transmitters"²⁹⁰ to pre-register and obtain personal information from buyers prior to purchasing

that is "for a consumptive purpose" and was not initially sold as a "financial investment." *Id.*

²⁸⁸ See, e.g., FLA. STA. § 896.101; see also Kohen & Wales, *supra* note 16.

²⁸⁹ The U.S. Securities and Exchange Commission has been very active and has issued a substantial amount of guidance, as well as a number of enforcement actions with respect to whether the sale of a token is a security under *SEC v. W.J. Howey Co.*, 328 U.S. 293, 301 (1946), which is the defining Supreme Court case that provides "The Howey Test" to determine whether a transaction is a security. See, e.g., Press Release, U.S. Sec. & Exch. Comm'n, SEC Bars Perpetrator of Initial Coin Offering Fraud (Aug. 14, 2018), <https://www.sec.gov/news/press-release/2018-152>; Press Release, U.S. Sec. & Exch. Comm'n, Company Halts ICO After SEC Raises Registration Concerns (Dec. 11, 2017), <https://www.sec.gov/news/press-release/2017-227>; Press Release, U.S. Sec. & Exch. Comm'n, SEC Issues Investigative Report Concluding DAO Tokens, a Digital Asset, Were Securities (July 25, 2017), <https://www.sec.gov/news/press-release/2017-131>.

²⁹⁰ See 31 C.F.R. § 1010.100(ff)(5)(i). Per FinCEN's regulations, a "money transmitter" is defined as:

(5) Money transmitter—(i) In general.

(A) A person that provides money transmission services. The term "money transmission services" means the acceptance of currency, funds, or other value that substitutes for currency from one person and the transmission of currency, funds, or other value that substitutes for currency to another location or person by any means. "Any means" includes, but is not limited to, through a financial agency or institution; a Federal Reserve Bank or other facility of one or more Federal Reserve Banks, the Board of Governors of the Federal Reserve System, or both; an electronic funds transfer network; or an informal value transfer system; or

(B) Any other person engaged in the transfer of funds.

Id.

Bitcoin with either fiat dollars or another virtual currency.²⁹¹ As explained below, the effect of treating those who sell Bitcoin as money servicers is to effectively make it impossible for U.S. residents who wish to participate in the Bitcoin network by executing transactions or publishing messages or other data without first providing their names and other identifying information to the government.

Since 2013, the Financial Crimes Enforcement Network (“FinCEN”) has taken the position that those who sell or exchange even small amounts of Bitcoin for fiat or other virtual currencies are operating a money services business (“MSB”) and therefore must comply with provisions of the Bank Secrecy Act requiring the business to register with the government and keep records which identify its customers.²⁹² FinCEN’s regulations related to money services businesses differentiate between currency “users,” “exchangers,” and “administrators,” with the term “currency” defined broadly as “the coin and paper money of the United States or any other country that [i] is designated as legal tender and that [ii] circulates and [iii] is

It is important to note that the federal regulations also provide exceptions to this rule, resulting in a person being excluded from the definition of “money transmitter.” § 1010.100(ff)(5)(ii). However, these limitations do not necessarily exclude those participating in the Bitcoin network. *Id.*

²⁹¹ See Nikhilesh De, *FinCEN Says Some Dapps Are Subject to US Money Transmitter Rules*, COINDESK (May 9, 2019, 5:30 PM), <https://www.coindesk.com/fincen-says-some-dapps-are-subject-to-u-s-money-transmitter-rules> (“Individuals, platforms and companies that do not fall under a federal exemption are required to register with FinCEN as a money services business (MSB), develop anti-money laundering programs and report currency transactions, as well as any suspicious activity.”). SEC Chairman Jay Clayton testified before the House Appropriations Committee that “cryptoassets” which acted as “a pure medium of exchange,” including Bitcoin, were likely not securities as contemplated by federal securities regulations. Neeraj Agrawal, *SEC Chairman Clayton: Bitcoin Is Not A Security.*, COIN CENTER (Apr. 27, 2018), <https://coin-center.org/link/sec-chairman-clayton-bitcoin-is-not-a-security>.

²⁹² See U.S. DEP’T OF TREAS., FIN. CRIMES ENF’T NETWORK, FIN-2013-G001, APPLICATION OF FINCEN’S REGULATIONS TO PERSONS ADMINISTERING, EXCHANGING, OR USING VIRTUAL CURRENCIES (2013), <https://www.fincen.gov/sites/default/files/shared/FIN-2013-G001.pdf> [hereinafter FINCEN GUIDANCE 2013]; 31 C.F.R. § 101.312.

customarily used and accepted as a medium of exchange in the country of issuance.”²⁹³ In a guidance letter dated March 18, 2013, FinCEN determined that because “virtual” currencies can be “medium[s] of exchange . . . in some environments” and have a market-driven equivalent value in real currencies, the agency would consider all convertible virtual currencies as “currency” for the purpose of determining whether registration is required.²⁹⁴ In May 2019, FinCEN published additional guidance that reiterated its broad view that those who sell “convertible virtual currencies” (“CVCs”) such as bitcoin are potentially money servicers subject to the full scope of registration and oversight requirements.²⁹⁵

Under applicable regulations, money servicers are required to register if they act as “administrators” or “exchangers,” but not if they are “users” of virtual currencies.²⁹⁶ While the “administrator” category is particularly relevant to whether proprietary token issuers, including those who issue tokens via a crowd-funding mechanism, must register as an MSB,²⁹⁷ there is little doubt that there are no “administrators” within the Bitcoin ecosystem.²⁹⁸ An “exchanger” of virtual currency, however, is required to register as an MSB if he “(1) accepts and transmits a convertible virtual currency or (2) buys or sells convertible virtual currency” in a “money transmitter” capacity, defined as “a person that provides money transmission services” such as “accept[ing] currency, funds or other value that substitutes for currency from one person *and* the transmission

²⁹³ FINCEN GUIDANCE 2013, *supra* note 293, at 1 (citing 31 C.F.R. § 1010.100(m)).

²⁹⁴ FINCEN GUIDANCE 2013, *supra* note 293, at 1, 3 (“The definition of a money transmitter does not differentiate between real currencies and convertible virtual currencies.”).

²⁹⁵ See FINCEN GUIDANCE 2019, *supra* note 46, at 7.

²⁹⁶ FINCEN GUIDANCE 2013, *supra* note 293, at 2–3; FINCEN GUIDANCE 2019, *supra* note 46, at 13.

²⁹⁷ See FINCEN GUIDANCE 2019, *supra* note 46, at 13 (“[A]n administrator is a person engaged as a business in issuing (putting into circulation) a virtual currency, and who has the authority to redeem (to withdraw from circulation) such virtual currency.”).

²⁹⁸ See generally NAKAMOTO, *supra* note 2, at 6–8 (advocating for a peer-to-peer system that has abandoned the traditionally trusted third-party system).

of currency, funds, or other value that substitutes for currency to another location or person by any means.”²⁹⁹

FinCEN has assisted with a number of criminal enforcement actions against individuals who have sold Bitcoin for either fiat or other virtual currency without registering as an MSB and agreeing to keep records of every Bitcoin purchaser.³⁰⁰ The agency creates an exception for those that wish to sell Bitcoins obtained through the Bitcoin mining process,³⁰¹ but because it has become increasingly

²⁹⁹ U.S. DEP’T OF TREAS., FIN. CRIMES ENF’T NETWORK, FIN-2014-R001, APPLICATION OF FINCEN’S REGULATIONS TO VIRTUAL CURRENCY MINING OPERATIONS (2014), <https://www.fincen.gov/sites/default/files/shared/FIN-2014-R001.pdf> [hereinafter FINCEN GUIDANCE 2014].

³⁰⁰ See, e.g., *United States v. Lord*, No. CR 15-00240-01/02, 2017 WL 2919026, at *2 (W.D. La. July 7, 2017) (where defendant pleaded guilty to conspiring to operate an unlicensed money service business in violation of 18 U.S.C. § 1960); see also Nikhilesh De, *Detroit Bitcoin Trader Gets Jail Time for Unlicensed Money Business*, COINDESK (Dec. 5, 2017, 3:20 PM), <https://www.coindesk.com/detroit-bitcoin-trader-gets-jail-time-for-unlicensed-money-business/>; Jordan Pearson, *People Keep Getting Charged with a Crime for Selling Bitcoin*, VICE (July 18, 2017, 6:00 AM), https://motherboard.vice.com/en_us/article/j5qa7y/people-keep-getting-charged-with-a-crime-for-selling-bitcoin; Katy Steinmetz, *This Bitcoin-Trading Family Man Faced Years in Prison. Now He’s Telling His Story*, TIME (Mar. 1, 2018), <http://time.com/5161663/bitcoin-sting-jason-klein-crypto-irs-money-transmitter/>. See generally FINCEN GUIDANCE 2013, *supra* note 293, at 3 (“The definition of a money transmitter does not differentiate between real currencies and convertible virtual currencies. Accepting and transmitting anything of value that substitutes for currency makes a person a money transmitter under the regulations implementing the BSA.”); 31 C.F.R. § 101.312.

³⁰¹ See FINCEN GUIDANCE 2014, *supra* note 300:

From time to time, as your letter has indicated, it may be necessary for a user to convert Bitcoin that it has mined into a real currency or another convertible virtual currency, either because the seller of the goods or services the user wishes to purchase will not accept Bitcoin, or because the user wishes to diversify currency holdings in anticipation of future needs or for the user’s own investment purposes. In undertaking such a conversion transaction, the user is not acting as an exchanger, notwithstanding the fact that the user is accepting a real currency or another convertible virtual currency and transmitting Bitcoin, so long as the user is undertaking the transaction solely for the user’s own purposes and not as a business service performed for the benefit of another. A user’s conversion of Bitcoin into a

expensive and hardware-intensive for individuals to successfully mine Bitcoin,³⁰² such an exception results in it being functionally impossible for individuals to gain access to Bitcoin's functions without having to provide their identifying information to the government.³⁰³

Further complicating the effort of obtaining Bitcoin is the fact that forty-nine states require "money transmitters" (as defined in various ways) that operate within their boundaries to obtain a license by the state's regulators prior to engaging in money transmitter services.³⁰⁴ Accordingly, depending on the state in which you are located, you may or may not be required to obtain a money transmission license and to comply with recordkeeping requirements and bond costs in order to sell even small amounts of bitcoin to a third party wishing to utilize the Bitcoin network, with no distinction between whether the person is purchasing Bitcoin for purely commercial or expressive purposes, or a combination of both.³⁰⁵

real currency or another convertible virtual currency, therefore, does not in and of itself make the user a money transmitter.

³⁰² See Aaron Hankin, *Here's How Much It Costs to Mine A Single Bitcoin in Your Country*, MARKETWATCH (May 11, 2018, 9:18 AM), <https://www.marketwatch.com/story/heres-how-much-it-costs-to-mine-a-single-bitcoin-in-your-country-2018-03-06> [hereinafter *Here's How Much It Costs*]. As of May 2018, the average energy cost, exclusive of hardware and other infrastructural requirements, to mine 1 bitcoin in the United States was \$4,758. *Id.*

³⁰³ See generally FINCEN GUIDANCE 2014, *supra* note 300; FINCEN GUIDANCE 2013, *supra* note 293, at 3 (stating that, unless there is an applicable limitation or exemption, an administrator or exchanger of virtual currency is an MSB and subject to FinCEN regulations).

³⁰⁴ See, e.g., FLA. STAT. § 560.204 (2009); see Justin Wales & Arnaldo Rego, *Is Cryptocurrency Money? Depends on Your State*, LONGHASH (Aug. 29, 2018, 3:20 PM), <https://www.longhash.com/news/is-cryptocurrency-money-depends-on-your-state>. Montana is the exception to the rule. *Id.*

³⁰⁵ See Wales & Rego, *supra* note 305. A money transmitter license or equivalent license is required in at least 9 states for sales of virtual currencies, with at least 12 more states having not issued sufficient guidance to determine whether a state license is required. *Id.* Even in states that do not require a license, FinCEN's MSB rules still apply and have been used to federally prosecute "transmitters" selling bitcoin within an unregulated state. See, e.g., *Lord*, 2017 WL 2919026, at *2.

V. AN ILLUSTRATIVE EXAMPLE: FINCEN'S MONEY SERVICER INTERPRETATION AS A PRIOR RESTRAINT

The conclusion by federal and many state regulators that Bitcoin should be regulated purely as a currency is problematic because it limits access to the ever-growing uses of the technology outlined in Part I. The decision to regulate Bitcoin as money for purposes of requiring sellers to register and obtain identifying information about purchasers is no doubt rooted in virtual currencies being used by bad actors to facilitate crimes.³⁰⁶ This understandable wish to prevent crime, coupled with the widespread misconception that Bitcoin's only use is as a digital currency, has resulted in the application of regulations that are arguably overbroad and in violation of the First Amendment.

The only practical avenue for most U.S. citizens to participate in the Bitcoin network is to purchase Bitcoin through the secondary market.³⁰⁷ The Supreme Court has long recognized that while prior restraints on speech “are not unconstitutional *per se* . . . [a]ny system of prior restraint . . . ‘comes . . . bearing a heavy presumption against its constitutional validity.’”³⁰⁸ The presumption against prior restraints is “heavier” and the protection greater because “prior restraints on speech and publication are the most serious and the least tolerable infringement on First Amendment rights.”³⁰⁹

³⁰⁶ See Yaya J. Fanusie & Tom Robinson, *Bitcoin Laundering: Analysis of Illicit Flows into Digital Currency Services*, FDD (Jan. 12, 2018), https://www.fdd.org/wp-content/uploads/2018/01/MEMO_Bitcoin_Laundering.pdf.

³⁰⁷ See *Here's How Much It Costs*, *supra* note 303. See generally Ofir Beigel, *Mining VS Buying Bitcoins – Where Will \$10k Get You ?*, 99BITCOINS, <https://99bitcoins.com/mining-vs-buying-bitcoins-whats-profitable/> (last updated Jan. 2, 2018, 12:00 AM) (explaining that it is likely much more economical to buy bitcoin rather than mining it); Jim Wang, *Average Income in America: What Salary in the United States Puts You in the Top 50%, Top 10%, and Top 1%? (Updated for 2019)*, WALLETHACKS, <https://wallethacks.com/average-median-income-in-america/> (last updated Sept. 11, 2019) (showing that 90% of the U.S. has a yearly income of \$95,000 or less).

³⁰⁸ *Se. Promotions, Ltd. v. Conrad*, 420 U.S. 546, 558 (1975) (citing *Bantam Books, Inc. v. Sullivan*, 372 U.S. 58, 70 (1963)); see also *New York Times Co. v. United States*, 403 U.S. 713, 714 (1971); *Organization for a Better Austin v. Keefe*, 402 U.S. 415, 419 (1971); *Carroll v. President of Princess Anne*, 393 U.S. 175, 181 (1968); *Near v. Minn. ex rel. Olson*, 283 U.S. 697, 716 (1931).

³⁰⁹ *Neb. Press Ass'n v. Stuart*, 427 U.S. 539, 559 (1976).

By treating those who sell Bitcoin as money transmitters and requiring that they obtain and keep identifying records of their sellers, FinCEN and the various states that have adopted state-based registration and record requirements have created a prior restraint on speech by conditioning one's right to expression on Bitcoin's network on an advance registration requirement.³¹⁰ This requirement is problematic not only under the prior restraint doctrine,³¹¹ but also because Bitcoin keeps an immutable public record of each transaction made, making it nearly impossible for a U.S. resident to lawfully express oneself through the Bitcoin blockchain anonymously.

As the Supreme Court understood in *McIntyre v. Ohio Election Commission* in which it struck down an Ohio statute that prohibited anonymous political speech or campaign literature as unconstitutional: "Anonymity is a shield from the tyranny of the majority. It thus exemplifies the purpose behind the Bill of Rights, and of the First Amendment in particular: to protect unpopular individuals from retaliation . . . at the hand of an intolerant society."³¹²

A registration requirement on the purchase of Bitcoin treats purchasers that wish to speak at a particular public venue differently than those wishing to speak elsewhere merely because of the technical requirements of the platform. As early as 1945, the Supreme Court has recognized registration as a condition for exercising rights of free speech and assembly to be an unconstitutional prior restraint.³¹³ Federal appellate courts have similarly stricken advance

³¹⁰ See *Prior Restraint*, BLACK'S LAW DICTIONARY (11th ed. 2019).

³¹¹ See generally *Conrad*, 420 U.S. at 558 ("Any system of prior restraint . . . comes to this Court bearing a heavy presumption against its constitutional validity.") (quoting *Sullivan*, 372 U.S. at 70).

³¹² *McIntyre v. Ohio Elections Comm'n*, 514 U.S. 334, 357 (1995) (internal citations omitted); see also, *Talley v. California*, 362 U.S. 60, 60, 64–65 (1960) (striking down California statute that required leaflets to fully identify distributor as violative of the First Amendment, and holding that the ability to anonymously distribute ideas is fundamental to the free speech rights guaranteed by the First Amendment).

³¹³ See *Thomas v. Collins*, 323 U.S. 516, 540 (1945) ("We think a requirement that one must register before he undertakes to make a public speech to enlist support for a lawful movement is quite incompatible with the requirements of the First Amendment."); see also *Buckley v. Valeo*, 424 U.S. 1, 81 (1976) (describing *Thomas* as holding "unconstitutional a prior restraint in the form of a registration requirement for labor organizers"); cf. *Buckley v. Am. Fed'n of Television & Radio Artists*, 419 U.S. 1093, 1096 (1974) (Douglas, J., dissenting) (acknowledging

registration requirements as unconstitutional prior restraints.³¹⁴ The analysis should be no different merely because one wishes to speak through a highly advanced global network.³¹⁵

CONCLUSION

This Article by no means should be read to suggest that virtual currencies like Bitcoin are *per se* not subject to regulations, or that the application of the First Amendment to digital networks that possess both commercial and expressive uses is straightforward. As we hope is clear, the exact bounds of First Amendment protection available to Bitcoin and similar technologies is difficult to foresee because it is a uniquely innovative technology and there is consequently no directly applicable judicial precedent. However, with a proper and often overlooked understanding of what Bitcoin is, and what it is potentially capable of as a communicative medium, it is not difficult to understand that scholarship and analysis of how the First Amendment can be applied to protect its broader uses should be explored. Our hope is that this Article offers a starting point for the discussion.

that the question of whether a union dues requirement should be characterized as prior restraint on free speech rights remains open, but observing that cases dealing with flat license fees or registration requirements “tend to suggest that even a minimal payment designed solely to cover administrative costs may be impermissible in a First Amendment context”).

³¹⁴ See, e.g., *McGlone v. Bell*, 681 F.3d 718, 733 (6th Cir. 2012) (policy requiring unaffiliated speakers to submit a written application for registration of a proposed activity imposes unconstitutional prior restraint because exercise of First Amendment rights depended on prior approval of public official); *Rosen v. Port of Portland*, 641 F.2d 1243, 1247, 1249 (9th Cir. 1981) (holding unconstitutional requirement of advance registration as condition to peaceful pamphleteering, picketing, or communicating with the public and recognizing that “[a]dvance notice or registration requirements drastically burden free speech” and “stifle spontaneous expression”).

³¹⁵ See *Packingham v. North Carolina*, 137 S. Ct. 1730, 1735–36 (2017) (recognizing the First Amendment right to contemplate communication made on social media and the internet).