

BLOCKCHAIN TECHNOLOGY AND RACE IN CORPORATE AMERICA

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Abstract

Blockchain technology provides anonymous and secure transactional guarantees through democratized trust and disintermediation. Minorities and disenfranchised communities can benefit from the evolving technology and its anti-discrimination features. The article evaluates how blockchain technology helps minimize discriminatory practices in corporate America and creates a more equal society.

Key Words: Blockchain, Distributed Ledger Technology, Artificial Intelligence, Machine Learning, Data Science, Data Scientists, Entrepreneurship, Innovation, Big Data, Efficiency, Race, Community Development, Minorities, Discrimination, Optimization, Equality

JEL Categories: K20, K23, K32, L43, L5, O31, O32

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I. Introduction

Race is at the core of American democracy¹ yet racial equality in America is elusive.² Race has played a large role in American politics and business since the end of slavery. Whereas in the early days of the American democracy the race struggle involved access to property, voting and other fundamental rights, the modern-day race conversation has shifted towards barriers to entry in corporate America.

Inequalities along racial lines in America can be traced in data.³ Researchers have commonly recognized the disproportionate large number of minorities in unskilled labor who are likely to remain untrained.⁴ During the Great Recession, a large number of African American manufacturing jobs were lost, but have steadily been returning.⁵ After the Great Recession, African American unemployment rose at a greater rate than Caucasian unemployment and African American unemployment also stayed higher for longer.⁶ This data suggests that minorities in America are “first fired, last hired”.⁷ While minorities have been able to improve in attaining upper-level corporate positions in the 1980s and 1990s, minorities were still disproportionately affected by layoffs through corporate restructuring in the 1980 and 1990s.⁸ In the early 2000, however, the risk for minorities to be laid off because of corporate restructuring decreased.⁹

Discrimination is a common phenomenon in corporate America. Opaque promotion processes in corporations require political

¹ Alfreda Robinson, *Corporate Social Responsibility and African American Reparations: Jubilee*, 55 Rutgers L. Rev. 309, 318 (2003)

² *Id.* at 313–23

³ CITE all data driven empirical studies on this subject.

⁴ Cheryl Wade, *The Impact of U.S. Corporate Policy on Women and People of Color*, 7 J. GENDER RACE & JUST. 213, 221 (2003).

⁵ Christian E. Weller and Jaryn Fields, *The Black and White Labor Gap in America: Why African Americans Struggle to Find Jobs and Remain Employed Compared to Whites*, AMERICANPROGRESS.ORG (July 25, 2011, 9:00 AM), <https://www.americanprogress.org/issues/economy/reports/2011/07/25/9992/the-black-and-white-labor-gap-in-america/>

⁶ *Id.*

⁷ *Id.*

⁸ George Wilson & Debra Branch McBrier, *Race and Loss of Privilege: African American/White Differences in the Determinants of Job Layoffs From Upper-Tier Occupations*, 20 SOC. FOR. 301, 305 (2005)

⁹ Soohan Kim, Alexandra Kalev, Frank Dobbin, *Progressive Corporations at Work: The Case of Diversity Programs*, 36 N.Y.U. REV. L. & SOC. CHANGE 171, 174 (2012)

positioning with corporate institutions.¹⁰ Using Fortune 1000 corporations as a sample, one study suggests that 76% of the sample dataset had at least one minority member on their board which reflects an increase of 2% from 2003 and a 32% increase from ten years before.¹¹ Within this minority sub-sect, African Americans account for 47%, Latinos account for 18% and Asians account for 11%.¹² Contrasting these numbers with the ethnic composition of the United States, in the 2010 United States Census, African Americans made up 12.6% of the population, Latinos made up 16.3% of the population and Asians made up 4.8% of the population.¹³ Minorities as a whole made up 37.7% of the United States population.¹⁴ This means that of the minorities in the United States, 33.4% are African American, 47.7% are Latino and 12.7% are Asian.¹⁵ The remainder of the minority population identify as some other race.

The data suggest that minority groups are being underrepresented in Corporate America by significant margins without considering external factors. In the sample dataset of Fortune 1000 companies, 37% of employees are women and about 15% are minorities.¹⁶ Management positions are held only at 17% by women and 6% by minorities.¹⁷ Executive level management positions are only at 6% women and 3% minorities.¹⁸

Based on the available data, this paper examines discriminatory practices afflicting disenfranchised communities in corporate America including its origins in corporate structures, corporate culture, and on the level of the board of directors. After examining such discriminatory influences in corporate America, the paper examines how employing blockchain technology can support a more equal society and help counteract historically grown and path dependent inequalities in corporate America.

¹⁰ Devon W. Carbado & Mitu Gulati, *Race to the Top of the Corporate Ladder: What Minorities Do When They Get There*, 61 WASH. & LEE L. REV. 1645, 1691 (2004) [hereinafter Carbado].

¹¹ Lisa M. Fairfax, *The Bottom Line on Board Diversity: A Cost-Benefit Analysis of the Business Rationales for Diversity on Corporate Boards*, 2005 WIS. L. REV. 795, 799 (2005).

¹² *Id.* at 800

¹³ United States Census Bureau, <https://www.census.gov/quickfacts/fact/table/US/PST045216> (last visited July 31, 2017); Janis Sarra, *Class Act: Considering Race and Gender in the Corporate Boardroom*, 79 ST. JOHN'S L. REV. 1121, 1126 (2005).

¹⁴ *Id.*

¹⁵ *Id.*

¹⁶ Ramona L. Paetzold & Rafael Gely, *Through the Looking Glass: Can Title VII Help Women and Minorities Shatter the Glass Ceiling?*, 31 HOUS. L. REV. 1517, 1519–20 (1995).

¹⁷ *Id.*

¹⁸ *Id.*

II. Blockchain Technology

Leading technologists around the world have hailed blockchain technology as one of the most important technological innovations since the Internet.¹⁹ The peer-to-peer interactions and transactions in a decentralized network where all participants are equal and verification and validation of each transaction is provided by all parties in the network through the blockchain technology provide near unlimited opportunities and applications. For instance, in the financial world, a global consensus record of information and transactions creates the much-needed transparency and, at the same time, opens global access to finance, including in areas of the world where the banking system—in contrast to a mobile telephone network—is not readily available.²⁰ The technology incentivizes direct transactions, including compensation, between the creator and consumer, eliminating the need

¹⁹ COGNIZANT, MARKETFORCE & PEGASYSTEMS, *The Future of Financial Legal Services* 6, 28-30 (2016), <https://www.pega.com/sites/pega.com/files/docs/2016/Jan/the-future-of-retail-financial-services-study.pdf> [hereinafter Cognizant]; John Naughton, *Is Blockchain the Most Important IT Invention of Our Age?*, THE GUARDIAN (Jan. 24, 2016, 4:00 EST), <https://www.theguardian.com/commentisfree/2016/jan/24/blockchain-bitcoin-technology-most-important-tech-invention-of-our-age-sir-mark-walport>; William Mougayar, *The Blockchain Is the New Google*, TECHCRUNCH (May 11, 2016) <https://techcrunch.com/2016/05/11/the-blockchain-is-the-new-google/>; Michael Crosby, Nachiappan, Pradhan Pattanayak, Sanjeev Verma & Vignesh Kalyanaraman, *Blockchain Technology: Beyond Bitcoin 3* (2015), <http://scet.berkeley.edu/wp-content/uploads/BlockchainPaper.pdf>; Kyle Torpey, *Why the Bitcoin Blockchain Is the Biggest Thing Since the Internet*, NASDAQ (Apr. 19, 2016, 9:32:27 AM EST), <http://www.nasdaq.com/article/why-the-bitcoin-blockchain-is-the-biggest-thing-since-the-internet-cm608228>; Carrie Kirby, *Andreessen at Coin Summit: Bitcoin Today Is the Internet in 1994*, COINDESK (Mar. 25, 2014, 20:21 GMT), <http://www.coindesk.com/marc-andreessen-balaji-srinivasan-discuss-bitcoin/>; Dinis Guarda, *Over 50 Bitcoin and Blockchain Thoughts and Quotes You Need to Read*, TRADERSDNA (July 4, 2016), <http://www.tradersdna.com/bitcoin-and-blockchain/over-50-bitcoin-and-blockchain-thoughts-and-quotes-you-need-to-read/>; Rich Daly, *Blockchain: Wall Street's Most Game-Changing Technology Advance Since the Internet*, FORBES (July 11, 2016, 6:00 PM), <https://www.forbes.com/sites/richdaly/2016/07/11/blockchain-wall-streets-most-game-changing-technology-advance-since-the-internet/#33987a154d87>.

²⁰ See, e.g., Michele Chandler, *Mobile Banking Takes Off in Nigeria*, STANFORD GRADUATE SCHOOL OF BUSINESS (Jan. 24, 2012), <https://www.gsb.stanford.edu/insights/mobile-banking-takes-nigeria>; Cade Metz, *Why Bitcoin Will Thrive First in the Developing World*, WIRED (Feb. 2, 2016, 8:00 AM), <https://www.wired.com/2016/02/why-bitcoin-will-thrive-first-in-the-developing-world/> (noting that in Nigeria, for example, banking transactions are readily executed over mobile phones because no infrastructure exists for consumer banking. Donations and aid to third world countries can finally be provided without the interference of suboptimal bureaucratic organizations that don't allocate the aid as intended by the donor.).

for intermediation.²¹

Blockchain technology creates a platform for trust through truth and transparency for parties. Blockchain technology can be described as “an open, distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way.”²² Moreover, blockchain records are incredibly secure, as it is nearly impossible to alter a transaction once it has been added to the blockchain.²³ Because the blockchain (at the least the public blockchain) is in fact public and immutable, the technology increases transparency, while at the same time significantly reducing transaction costs. Intermediaries, including lawyers, are replaced by code, connectivity, crowd, and collaboration.²⁴

Blockchain technology has been defined in many different ways, and no truly uniform definition seems to exist. Some refer to it as a giant worldwide, distributed, immutable “google spreadsheet” for transactions.²⁵ Others define blockchain by focusing on its central elements, e.g., it is a transaction ledger, electronic, decentralized, immutable, and provides cryptographic verification, among several other elements.²⁶ Vitalik Buterin, the founder of Ethereum, perhaps most prominently defined blockchain as follows:

²¹ Rene Bader & Thorsten Deckers, *How Does Blockchain Work?: Transactions Without an Intermediary*, ISBUZZNEWS (May 6, 2017), <http://www.informationsecuritybuzz.com/articles/blockchain-work-transactions-without-intermediary/>; Jill Richmond, *How Blockchain Is Transforming the Creative Industry*, NASDAQ (Apr. 26, 2017, 8:25:46 PM EDT), <http://www.nasdaq.com/article/how-blockchain-is-transforming-the-creative-industry-cm780005>.

²² Marco Iansiti & Karim R. Lakhani, *The Truth About Blockchain*, 2017 HARV. BUS. R. 118 (Jan.–Feb.), <https://hbr.org/2017/01/the-truth-about-blockchain>.

²³ Sean Murray, *This So-Hot Robot Is Launching a Marketplace Lending Hedge Fund*, DEBANKED (Jan. 26, 2017), <http://debanked.com/2017/01/this-so-hot-robot-is-launching-a-marketplace-lending-hedge-fund/>.

²⁴ Erik P.M. Vermeulen, *There Is No Escape from Blockchains and Artificial Intelligence...Lawyers Better Be Prepared!*, MEDIUM (Jan. 23, 2017) <https://medium.com/@erikpmvermeulen/there-is-no-escape-from-blockchains-and-artificial-intelligence-lawyers-better-be-prepared-2d7a8221c627>.

²⁵ Jonathan Shieber, *Colu Aims to Bring Blockchain Technology Everywhere*, TECHCRUNCH (Jan. 27, 2015), <https://techcrunch.com/2015/01/27/colu-aims-to-bring-blockchain-technology-everywhere/>; Craig Leppan, *Who Is Blockchain Going to Affect the Most*, OVATIONS (July 29, 2015), <http://www.ovationsgroup.com/blockchain/>.

²⁶ See, e.g., Alan Morrison, *Blockchain and Smart Contract Automation: Blockchains Defined*, PWC (2016), <http://www.pwc.com/us/en/technology-forecast/2016/blockchain/pwc-smart-contract-automation-definition.pdf>; Alistair Dabbs, *What Is Blockchain, and Why Is It Growing in Popularity?*, ARSTECHNICA (Nov. 6, 2016, 8:00 AM), <https://arstechnica.com/information-technology/2016/11/what-is-blockchain/>; Lee Grant, *Blockchain – Definition, Origin, and History*, TECHBULLION (Sept. 6, 2016), <http://www.techbullion.com/blockchain-definition-origin-history>; Vimi Grewel-Carr & Stephen Marshall, *Blockchain: Enigma. Paradox. Opportunity* 4–7 (2016),

Public blockchains: a public blockchain is a blockchain that anyone in the world can read, anyone in the world can send transactions to and expect to see them included if they are valid, and anyone in the world can participate in the *consensus process* – the process for determining what blocks get added to the chain and what the current state is. As a substitute for centralized or quasi-centralized trust, public blockchains are secured by *cryptoeconomics* – the combination of economic incentives and cryptographic verification using mechanisms such as proof of work or proof of stake, following a general principle that the degree to which someone can have an influence in the consensus process is proportional to the quantity of economic resources that they can bring to bear. These blockchains are generally considered to be “fully decentralized”.²⁷

Rather than attempting to agree on a mutually acceptable phraseology for a definition, a description of the core elements of ledger technology can help define the blockchain. As such, a blockchain is a shared digital ledger or database that maintains a continuously growing list of transactions among participating parties regarding digital assets – together described as “blocks.”²⁸ The linear and chronological order of transactions in a chain will be extended with another transaction link

<https://www2.deloitte.com/content/dam/Deloitte/uk/Documents/Innovation/deloitte-uk-blockchain-full-report.pdf>.

²⁷ Vitalik Buterin, *On Public and Private Blockchains*, ETHEREUM BLOG (Aug. 7, 2015), <https://blog.ethereum.org/2015/08/07/on-public-and-private-blockchains/>, contrasting public blockchains (the original idea) with consortium blockchains and fully private blockchains: “Consortium blockchains: a consortium blockchain is a blockchain where the consensus process is controlled by a pre-selected set of nodes; for example, one might imagine a consortium of 15 financial institutions, each of which operates a node and of which 10 must sign every block in order for the block to be valid. The right to read the blockchain may be public, or restricted to the participants, and there are also hybrid routes such as the root hashes of the blocks being public together with an API that allows members of the public to make a limited number of queries and get back cryptographic proofs of some parts of the blockchain state. These blockchains may be considered ‘partially decentralized.’” *Id.* “Fully private blockchains: a fully private blockchain is a blockchain where write permissions are kept centralized to one organization. Read permissions may be public or restricted to an arbitrary extent. Likely applications include database management, auditing, etc [sic] internal to a single company, and so public readability may not be necessary in many cases at all, though in other cases public auditability is desired.” *Id.*

²⁸ See, e.g., Michele D’Aliessi, *How Does the Blockchain Work?* MEDIUM (June 1, 2016), <https://medium.com/@micheledaliessi/how-does-the-blockchain-work-98c8cd01d2ae#.w76hifu2>; Monica Pearson, *Blockchain Is the New Buzzword*, EXPERIAN, (Jan. 31, 2016), <https://www.experian.com/blogs/insights/2016/01/blockchain-is-the-new-buzzword/>.

that is added to the block once such additional transaction is validated, verified, and completed.²⁹ The chain of transactions is distributed to a limitless number of participants, so-called nodes,³⁰ around the world in a public or private peer-to-peer network.

Blockchain technology removes fraudulent transactions. Compared with existing methods of verifying and validating transactions by third-party intermediaries, blockchain's security measures make blockchain validation technologies more transparent and less prone to error and corruption. While blockchain's use of digital signatures helps establish the identity and authenticity of the parties involved in the transaction, it is the completely decentralized network connectivity via the Internet that allows the most protection against fraud.³¹ Network connectivity allows multiple copies of the blockchain to be available to all participants across the distributed network.³² The decentralized, fully-distributed nature of the blockchain makes it practically impossible to reverse, alter, or erase information in the blockchain.³³ Blockchain's distributed consensus model, e.g., the network "nodes" verify and validate chain transactions before execution of the transactions, makes it extremely rare for a fraudulent transaction to be recorded in the blockchain.³⁴ That model also allows node verification of transactions without compromising the privacy of the

²⁹ See, e.g., D'Aliessi, *supra* note 28; Pearson, *supra* note 28.

³⁰ See, e.g., D'Aliessi, *supra* note 28. Participants can be individuals, organizations, and even things. See, e.g., Hemant Saxena, *Blockchain Technology and Microsoft's Plan to Develop Blockchain As a Service*, WINDOWS CLUB (Feb. 16, 2017), http://www.thewindowsclub.com/blockchain-microsoft-plans-develop-service?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+TheWindowsClub+%28The+Windows+Club%29; Sloane Brakeville & Bhargav Perepa, *Blockchain Basics: Introduction to Distributed Ledgers*, IBM: DEVELOPERWORKS (May 9, 2016; updated Dec. 15, 2016), <https://www.ibm.com/developerworks/cloud/library/cl-blockchain-basics-intro-bluemix-trs/>; the only condition for participants is the necessity of an Internet connection. See, e.g., D'Aliessi, *supra* note 28.

³¹ See, e.g., Brakeville & Perepa, *supra* note 30. For an in-depth, nuanced discussion of this point, see Peter Van Valkenburgh, *Open Matters: Why Permissionless Blockchains Are Essential to the Future of the Internet*, COINCENTER 3–4, 23–26 (2016), <https://coincenter.org/files/2016-12/openmattersv1-1.pdf>.

³² See, e.g., D'Aliessi, *supra* note 28.

³³ See, e.g., Brakeville & Perepa, *supra* note 30; Antony Lewis, *A Gentle Introduction to Immutability of Blockchains*, BITS ON BLOCKS (Feb. 29, 2016), <https://bitsonblocks.net/2016/02/29/a-gentle-introduction-to-immutability-of-blockchains/>.

³⁴ See, e.g., Francois Janinotto, *The Blockchain Explained to Web Developers, Part 1: The Theory*, MARMELAB BLOG (Apr. 28, 2016), <https://marmelab.com/blog/2016/04/28/blockchain-for-web-developers-the-theory.html>; Razvan Peteanu, *Fraud Detection in the World of Bitcoin*, BITCOIN MAG. (Mar. 26, 2014, 5:50 AM EST), <https://bitcoinmagazine.com/articles/fraud-detection-world-bitcoin-1395827419/> (noting, "Fundamentally, detecting fraud is hard precisely because it is rare, dynamic and not necessarily obviously fraudulent.").

parties and is therefore arguably safer than a traditional model that requires third-party intermediary validation of transactions.³⁵

Cryptographic hashes further increase blockchain security. Cryptographic hashes are complex algorithms that use the details of all previous transactions in the existing blockchain before adding the next block to generate a unique hash value.³⁶ That hash value ensures the authenticity of each transaction before it is added to the block. The smallest change to the blockchain, even a single digit/value, results in a different hash value. A different hash value makes any form of manipulation immediately detectable.³⁷

Smart contracts and smart property are blockchain-enabled computer protocols that verify, facilitate, monitor, and enforce the negotiation and performance of a contract.³⁸ The term “smart contract” was first introduced by Nick Szabo, a computer scientist and legal theorist, in 1994.³⁹ An often-cited example for smart contracts is the purchase of music through Apple’s iTunes platform.⁴⁰ A computer code ensures that the “purchaser” can only listen to the music file on a limited number of Apple devices.⁴¹

More complex smart contract arrangements in which several parties are involved require a verifiable and unhackable system provided by blockchain technology.⁴² Through blockchain technology,

³⁵ For a discussion of privacy on the blockchain, see Valkenburgh, *supra* note 31, at 33–40. For an overview of various consensus mechanisms see Sigrid Seibold & George Samman, *Consensus: Immutable Agreement for the Internet of Value*, KPMG (2016), <https://assets.kpmg.com/content/dam/kpmg/pdf/2016/07/kpmg-blockchain-consensus-mechanism-channel-islands.pdf>; Valkenburgh, *supra* note 31, at 15–40.

³⁶ See, e.g., Lewis, *supra* note 33.

³⁷ *Id.*

³⁸ See e.g., Morrison, *supra* note 26; Nicolette Kost De Sevres & Bradley Cohen, *The Blockchain Revolution, Smart Contracts and Financial Transactions*, DLA PIPER (Apr. 26, 2016), <https://www.dlapiper.com/en/czech/insights/publications/2016/04/the-blockchain-revolution/>.

³⁹ *Smart Contracts: The Blockchain Technology That Will Replace Lawyers*, BLOCKGEEKS, <http://blockgeeks.com/guides/smart-contracts/> (last visited Mar. 18, 2017); Schumpeter, *Not-So-Clever Contracts*, ECONOMIST (Jul 30, 2016), <http://www.economist.com/news/business/21702758-time-being-least-human-judgment-still-better-bet-cold-hearted>.

⁴⁰ See, e.g., Horsten Koepl & Jeremy Kronik, *Blockchain Technology—What’s in Store for Canada’s Economy and Financial Markets?* 15 (2017), https://www.cdhowe.org/sites/default/files/attachments/research_papers/mixed/Commentary_468_0.pdf; R. Douglas Vaughn & Anna Outzer, *Understanding How the Block Chain Could Impact the Legal Industry*, LAW 360 (Jan. 11, 2017), <https://www.law360.com/articles/879810/understanding-how-blockchain-could-impact-legal-industry>.

⁴¹ Vaughn & Outzer, *supra* note 40; Jeffrey Glazer, *Smart Contracts Are a Future*, U. WIS. – MADISON: L. & ENTREPRENEURSHIP CLINIC (Sept. 14, 2015), <https://www.uwle.org/blog/smart-contracts-are-a-future>.

⁴² See, e.g., ETHEREUM, <https://www.ethereum.org/> (last visited Apr. 17, 2017); Gavin Wood, *Ethereum: A Secure Decentralised Generalised Transaction Ledger*,

smart contracting often makes legal contracting unnecessary as smart contracts often emulate the logic of legal contract clauses.⁴³ Ethereum, the leading platform for smart contracting, describes smart contracting in this context as follows:

Ethereum is a decentralized platform that runs smart contracts: applications that run exactly as programmed without any possibility of downtime, censorship, fraud or third party interference. These apps run on a custom built blockchain, an enormously powerful shared global infrastructure that can move value around and represent the ownership of property. This enables developers to create markets, store registries of debts or promises, move funds in accordance with instructions given long in the past (like a will or a futures contract) and many other things that have not been invented yet, all without a middle man or counterparty risk.⁴⁴

1. *Disruptive Innovation*

Blockchain technology has vast disruptive innovative properties. Despite the very early stage developments in blockchain technology, the possible applications are near limitless. For example, until recently, most commentators viewed Bitcoin as a hype, susceptible to fraud, price manipulation and corruption.⁴⁵ Yet, the pace of innovation in cryptocurrencies and their application in different

<http://gavwood.com/paper.pdf>; Luke Parker, *Industry Research Papers Highlight Blockchain Technology's Disruptive Potential*, BRAVE NEWCOIN (July 3, 2016), <https://bravenewcoin.com/news/industry-research-papers-highlight-blockchain-technologys-disruptive-potential/>.

⁴³ Mark Anderson, *Smart Contracts and Blockchain Technology*, IP DRAUGHTS (June 18, 2016, 12:14 PM), <https://ipdraughts.wordpress.com/2016/06/18/smart-contracts-and-blockchain-technology/>. See generally Josh Stark, *Making Sense of Blockchain Smart Contracts*, COINDESK (June 4, 2016, 18:39 GMT), <http://www.coindesk.com/making-sense-smart-contracts/>; Josh Stark, *How Close Are Smart Contracts to Impacting the Real World of Law?*, COINDESK, (Apr. 11, 2016, 14:00 GMT), <http://www.coindesk.com/blockchain-smarts-cntracts-real-world-law/>; Ted Mylnar & Ira Schafer, *Why Smart Contracts Will Need 'Smart Term Sheets' to Match*, COINDESK (Dec. 9, 2016, 14:36 GMT), <http://www.coindesk.com/smart-contracts-will-need-smart-term-sheets-match/>. For an example of what startups hope to accomplish with smart contracting, see Legalese, <https://legalese.com/> (last visited Apr. 17, 2017).

⁴⁴ ETHEREUM, *supra* note 42.

⁴⁵ See, e.g., Izabella Kaminska, Simon Taylkor & Carola Hoyos, *Bitcoin and Blockchain: The Future of Money of Just Hype?*, FIN. TIMES (Sept. 21, 2016), <https://www.ft.com/content/3bea303c-7a7e-11e6-b837-eb4b4333ee43>; Office of Inv'r Educ. and Advocacy, U.S. SEC, *Ponzi Schemes Using Virtual Currencies* (July 2103), http://www.sec.gov/investor/alerts/ia_virtualcurrencies.pdf

industries and commercial settings is faster than ever.⁴⁶ The high levels of investor activity in the blockchain area appears to provide a reliable indicator of the commercial maturity of blockchain technology. The VC investment in startup companies that utilize blockchain technology has increased exponentially since 2012. Investor interest in the technology will undoubtedly further increase. Particularly, the applicability of blockchain-based smart contracts to digital marketplaces, the sharing economy, the Internet of Things (*IoT*) and artificial intelligence will further accelerate its development.⁴⁷

Blockchain technology startups have the potential to create lasting societal changes. Some predict a future in which such blockchain startups can remove intermediaries altogether from commerce as smart contracts in the blockchain, such as the ones in the Ethereum platform,⁴⁸ regulate commerce entirely, enabled by the trust created between parties through immutable blockchain technology.⁴⁹

Business, administrative, and legal processes that rely on legal intermediaries may become redundant because of advances in and acceptance and implementation of blockchain technology. Forms of keeping legal ledgers such as notary and registry services, legal motions practice in court, legal title companies, among several others, may be among the first services to disappear in the not too distant future.

⁴⁶ Money is No Object: Understanding the Evolving Cryptocurrency Market, PWC (2015), <https://www.pwc.com/us/en/financialservices/publications/assets/pwc-cryptocurrency-evolution.pdf>

⁴⁷ See, e.g., Arun Sudararajan, *The Rise of the Sharing Economy: The end of Employment and the Rise of Crowd-based Capitalism* (2016); Ben Dickson, *Decentralizing IoT Networks Through Blockchain*, TECHCRUNCH (June 28, 2016), <https://techcrunch.com/2016/06/28/decentralizing-iot-networks-throughblockchain/>; Scott Amyx, *Decentralized IoT to Drive Disruption and Business Transformation*, IOT ONE (Aug. 1, 2016), <https://www.iotone.com/guide/decentralized-iot-to-drive-disruption-and-businesstransformation/g113>; C. J. Dew, *Post Capitalism: Rise of the Collaborative Commons*, MEDIUM, (Mar. 18, 2015), <https://medium.com/basic-income/postcapitalism-rise-of-the-collaborative-commons-62b0160a7048#.ar6aev65l>; Trent McConaghy, *How Blockchains Could Transform Artificial Intelligence*, DATAECONOMY (Dec. 21, 2016), <http://dataeconomy.com/2016/12/blockchains-forartificial-intelligence/>; Mark Fenwick, Wulf A. Kaal & Erik P.M. Vermeulen, *Legal Education in the Blockchain Revolution*, SSRN (Mar. 22, 2017), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2939127 [hereinafter Fenwick].

⁴⁸ ETHEREUM, <http://www.ethereum.org> (last visited Apr. 26, 2017) (“a decentralized platform that runs smart contracts: application that run exactly as programmed without any possibility of downtime, censorship, fraud, or third party interference.”)

⁴⁹ See e.g. Fenwick, *supra* note 48; Rob Marvin, *Blockchain: The Invisible Technology That’s Changing the World*, PC MAG (Aug. 29, 2017, 1:38 PM EST), <https://www.pcmag.com/article/351486/blockchain-the-invisible-technology-thats-changing-the-wor>; Joseph Young, *The Unbreachable Data Made Possible With Bitcoin & Ethereum Blockchain, Here’s How*, COINTELEGRAPH (Apr. 19, 2017), <https://cointelegraph.com/news/the-unbreachable-data-made-possible-with-bitcoin-ethereum-blockchain-heres-how>.

Similarly, corporate processes that have ledger functionality but rely on legal intermediaries could be streamlined very quickly by implementing blockchain technology. When blockchain technology becomes more widely accepted and applications are spreading into consumer territory, existing legal/financial/backoffice processes and structures will likely be among the first processes to become redundant.

The combination of blockchain technology startups with platforms, artificial intelligence and machine learning offer opportunities for developing new technologies. Leveraging the big data that is collected by using FinTech solutions and blockchain applications in combination with machine learning creates more creative and faster tools. This, in turn, creates a surge of new and innovative platforms with disruptive effects for the many industries.

2. Limitations

Blockchain technology and smart contracts executed on blockchain technology platforms, such as Ethereum.org, are faced with possible technological and legal limitations. First, the world of blockchain and smart contracting has not yet reached maturity.⁵⁰ While blockchain enabled smart contracts generally do not require legal involvement across the spectrum of transactions, legal professionals often still believe that “code” in smart contracts can only deal with very simple transactions, such as buying music or perhaps a car, arguing that more complicated legal arrangements will necessitate the draftsmanship and negotiations of traditional lawyers.⁵¹ Even if more complex

⁵⁰ See, e.g., Garrick Hileman, *State of Blockchain Technology Q1 2016: Blockchain Funding Overtakes Bitcoin*, COINDESK (May 11, 2016, 15:15 GMT), <http://www.coindesk.com/state-of-blockchain-q1-2016/>; Alan Morrison, *Blockchain and Smart Contract Automation: How Smart Contracts Automate Digital Business*, PWC (2016), at 5-8 <https://www.pwc.com/us/en/technology-forecast/2016/blockchain/pwc-smartcontract-automation-digital-business.pdf>; Prasad Satavolu & Abhijeet Sangamnerkar, *Blockchain's Smart Contracts: Driving the Next Wave of Innovation Across Value Chains*, COGNIZANT 20-20 INSIGHTS (June 2016), at 6-9, <https://www.cognizant.com/whitepapers/blockchains-smart-contracts-driving-the-next-wave-of-innovation-across-manufacturing-value-chains-codex2113.pdf>; Rob Marvin, *Blockchain in 2017: The Year of Smart Contracts*, PC (Dec. 12, 2016), <http://www.pcmag.com/article/350088/blockchain-in-2017-the-year-of-smartcontracts>; Chris Kanaracus, *Don't Believe the Blockchain Hype: Examining the Weaknesses and Risks*, ZDNet (Apr. 13, 2016, 14:22 PDT), <http://www.zdnet.com/article/dont-believe-the-blockchain-hype-examining-itsweaknesses-and-risks/>; 2016: *A Pivotal Year for Blockchain*, SWIFT (May 12, 2016), https://www.swift.com/insights/news/2016_a-pivotal-year-for-blockchain; Laura Shin, *Looking to Integrate Blockchain into Your Business? Here's How*, Forbes (May 10, 2016, 8:00 AM), <https://www.forbes.com/sites/laurashin/2016/05/10/looking-to-integrateblockchain-into-your-business-heres-how/#715aa8911a15>.

⁵¹ See, e.g., Mark Fenwick, Wulf A. Kaal & Erik P.M. Vermeulen, *Legal Education in the Blockchain Revolution*, SSRN (Mar. 22, 2017), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2939127; Kevin Shook, *Self-*

transactions could be coded and included in smart contracts, a widespread belief in the legal community suggests that lawyers will remain responsible for drafting the terms and arrangements that would later have to be coded by specialists.⁵²

Legal limitations pertaining to smart contracts and blockchain technology originate mostly from concerns over the legal origin of smart contracting. While smart contracts may reflect the underlying contract between parties, lawyers may argue that “smart contracts” are void and unenforceable under the law. Contractual legal rules regarding formation, interpretation, conditions and remedies require substantive adjustments of smart contracts in contract law.⁵³

The Blockchain evolution in combination with smart contracting also raises legal concerns regarding: privacy, data protection, security and integrity. While blockchain technology itself offers unprecedented genuine data and privacy protection, the storage of blockchain data across a global network of nodes often will not comply with specific consumer protection rules, directives, and guidelines around the

Enforcing Smart Contracts Will Change Your Life, CORPORATE COUNSEL (Feb. 6, 2017), <http://www.corpcounsel.com/id=1202778557927/SelfEnforcing-Smart-ContractsWill-Change-Your-Life?slreturn=20170213090556>; Richad Howlett, *A Lawyer's Perspective: Can Smart Contracts Exist Outside the Legal Structure?* BITCOIN MAGAZINE (July 11, 2016, 2:52 PM EST), <https://bitcoinmagazine.com/articles/alawyer-s-perspective-can-smart-contracts-exist-outside-the-legal-structure-1468263134/>; Ira J. Shafer & Theodore Mylnar, *Blockchain Smart Contracts Need a New Kind of Due Diligence*, HOGAN LOVELLS (Sept. 22, 2016), <https://www.hoganlovells.com/en/blogs/fintech-blog/blockchain-smart-contractsneed-a-new-kind-of-due-diligence>; Andy Robinson & Tom Hingley, *Smart Contracts: The Next Frontier?* OXFORD BUSINESS LAW BLOG (May 23, 2016), <https://www.law.ox.ac.uk/business-law-blog/blog/2016/05/smartcontracts-next-frontier>; Norton Rose Fulbright, *Smart Contracts: Coding the Fine Print, a Legal and Regulatory Guide* 12 (2016), https://www.accmeetings.com/AM16/faculty/files/Article_471_734F_NRF24493_Smart_Contracts_V6_LR.PDF.

⁵² Mark Fenwick, Wulf A. Kaal & Erik P.M. Vermeulen, *Legal Education in the Blockchain Revolution*, SSRN (Mar. 22, 2017), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2939127.

⁵³ *Id.*; Matthew McMillan, *Smart Contracts: Legal and Regulatory Challenges of Smart Contracts*, HENRY DAVIS YORK (Dec. 8, 2016), <https://www.hdy.com.au/our-insights/insights/legal-regulatory-challenges-ofsmart-contracts>; Lex Disturbia: The Impact of Smart Contracts on the Law, GOWLING WLG (Mar. 16, 2016), <https://www.lexology.com/library/detail.aspx?g=0b7cf43a-7032-4750-9220-caca5c529281>; Kate Withers, *Smart Contracts: Opportunities and Legal Risks in FinTech*, NAT'L L. REV. (Nov. 8, 2016), <http://www.natlawreview.com/article/smart-contracts-opportunities-and-legalrisks-fintech>; Martin von Haller Gronbaek, *Blockchain 2.0, Smart Contracts and Challenges*, BIRD & BIRD (June 16, 2016), <https://www.twobirds.com/en/news/articles/2016/uk/blockchain-2-0--smartcontracts-and-challenges>

world.⁵⁴ The existing legal issues arising in the context of sharing platforms,⁵⁵ demonstrate that future blockchain-enabled sharing services may not be accepted quickly and without resistance on the part of incumbents challenged by new ways of delivering a service or product.

Blockchain technology and smart contracts executed over the blockchain face many of the same limitations other new technology companies face. The lack of maturity has slowed the progression of integration into the corporate world. There is still a lack of legal framework for the industry to work with, which causes uncertainty. Without knowing which laws apply, the whole industry is operating in a grey area of the law.

By operating in a grey area of law, a new level of volatility is introduced. Once Congress adopts a policy on the treatment of blockchain services, companies will be better able utilize the technology in a more legal and efficient way.

Another issue the blockchain community has seen is when Ethereum introduced what is known as a Decentralized Autonomous Organization (DAO). The DAO was launched in May 2016,⁵⁶ in an attempt to set up a corporation like organization without the traditional structure.⁵⁷ The DAO did not have a physical address as it was merely computer code.

During a fundraising period, the DAO raised roughly \$168 Million from around 10,000 participants. Unfortunately, the code had not yet been perfected and hackers were able to take a third of the DAO tokens and transfer them into another account. This hack and other technological limitations, led to the demise of the DAO.⁵⁸

⁵⁴ *Id.*; See, e.g., Andres Guadamuz & Chris Marsden, *Blockchains and Bitcoin: Regulatory Responses to Cryptocurrencies*, FIRST MONDAY (Dec. 7, 2015), <http://firstmonday.org/article/view/6198/5163>. For a good overview of the complexities of the global regulation of blockchain technology, see Javier Sebastian Cermeño, *Blockchain in Financial Services: Regulatory Landscape and Future Challenges for Its Commercial Application*, BBVA RESEARCH, at 6–18 (2016), https://www.bbvaresearch.com/wp-content/uploads/2016/12/WP_16-20.pdf. For a summary of international law actions relating to digital currencies, see *Digital Currencies: International Actions and Regulations*, PERKINS COIE (May 2017), <https://www.perkinscoie.com/en/news-insights/digital-currencies-internationalactions-and-regulations.html> (last visited November 14, 2017).

⁵⁵ Such as *Uber*, *Lyft*, *Sidecar*, *RelayRides*, *SpinLister* and *JustPark* (transportation), *Airbnb* and *DogVacay* (lodging), *Postmates*, *Prime Now*, and *Instacart* (on-demand delivery services), and *Rent the Runway* (clothing).

⁵⁶ Christoph Jentzsch, the co-founder of IoT company *Slock.it*, was one of the “key founders” of *The DAO*, a new style venture capital fund. Carla Reyes, et al, *Distributed Governance*, 59 WM. & MARY L. REV. ONLINE 1 (Sep. 22, 2017), <https://wmlawreview.org/distributed-governance>.

⁵⁷ *Id.*

⁵⁸ Vitalik Buterin, *Critical Update Re: DAO Vulnerability*, ETHEREUM BLOG (June 17, 2016), <https://blog.ethereum.org/2016/06/17/critical-update-re-dao-vulnerability>.

III. Disenfranchised Communities in Corporate America

Unlike their Caucasian peers, minorities still face obstacles in corporate America that affect their ability to succeed. Perhaps the most common method of assessing business success is the expediency and degree of promotions in corporate America. Breaking into upper management ranks typically requires not only a high level of technical skill and understanding of the respective business, but also requires significant abilities to navigate the political environment. Because of societal perceptions of minorities,⁵⁹ minority groups face an uphill battle in navigating the political environment in corporate America, which in turn can significantly affect their positioning and success in corporate America. However, some evidence exists that minorities can overcome the promotion gap in corporate America if they are seen as value enhancers by their superiors. If minorities are promoted, they often share common characteristics which can be predictors of minority success: “(a) is both a risk-taker and overly confident, (b) is a team player, and (c) is perceived by the employer to have the capacity to manage other non-whites.”⁶⁰

⁵⁹ For instance, minorities are often subject to prejudices as a result of daily media portraying them as Criminals. Cheryl L. Wade, *Corporate Governance As Corporate Social Responsibility: Empathy and Race Discrimination*, 76 TUL. L. REV. 1461, 1473-75 (2002). To quote one example: “while it is indisputable that African Americans engage in criminal activity, these frequent portrayals of African-American criminality, coupled with the social reality of racial isolation and de facto segregation, may make it difficult for... corporate managers, to empathize with African-American victims of racial discrimination.” *Id.* These prejudices can have a lasting impact on an individual’s career. African Americans are denied opportunities within the corporate setting “due to racial, ethnic, and cultural factors”. Dionne Rosser-Mims and Glenn A. Palmer, *The Career Paths of African Americans in the Corporate and Political Arenas*, ADULT EDUCATION RESEARCH CONFERENCE (2009), <http://newprairiepress.org/cgi/viewcontent.cgi?article=3802&context=aerc>. As a result of these corporate barriers, African Americans career trajectories is not linear, but marked with more frequent ups and downs. *Id.* As a result of these pressures, minorities are forced to assimilate to the culture if they want to be successful. Liwen Mah, *The Legal Profession Faces New Faces: How Lawyers’ Professional Norms Should Change to Serve A Changing American Population*, 93 CAL. L. REV. 1721, 1738–39 (2005); Benn Penn, *LGBT Minorities Face High Unemployment, Job Discrimination, Low Wages, Study Finds*, BLOOMBERG (Nov. 18, 2014), <https://www.bna.com/lgbt-minorities-face-high-unemployment-job-discrimination-low-wages-study-finds/> (finding that LGBTQ community is another one of the most disadvantaged groups in America. The study found that LGBT workers typically receive lower wages when compared to their co-workers.).

⁶⁰ Carbado *supra* note 10 at 1677; Madeleine Wyatt and Jo Silvester, *Reflections on the Labyrinth: Investigating Black and Minority Ethnic Leaders’ Career Experiences*, 68 HUMAN RELATIONS 1243 (2015) (Identifies similar factors such as visibility, network, and development).

1. Corporate Structure

The corporate structure in America influences whether and at what rate minorities are promoted. For instance, promotion to high level executive positions often involves skillsets that are assessed subjectively, such as leadership skills, personality, judgment, attitude, initiative etc.⁶¹ Such criteria allow supervisors and managers to apply criteria that facially seems objective, but can be distorted with relative ease. Moreover, if minorities are promoted, they don't necessarily use their new position to promote other minorities. In other words, in the existing corporate structure in American, minorities often have incentives to race to the top lifting the ladder behind them.⁶² Several factors support this finding. First, the corporate culture in America is individualistic and aggressive.⁶³ Second, top management are supported so long as others in the corporate structure continue to hold them in power.⁶⁴ This gives them an incentive to keep the upper management the same. If upper management allows others into positions of equal or greater power, the possibility of them being squeezed out increases.

Mentoring and targeted recruitment can help minorities break through the discriminatory incentives in the existing corporate structure in America.⁶⁵ Programs that did not support changing the workforce composition included diversity training, diversity performance evaluations, and grievance procedures.⁶⁶ In programs that did not work, managers were often defined as the source of the problem.⁶⁷ Some of the more successful programs involved task forces and targeted recruiting efforts which engaged the managers in finding solutions.⁶⁸ Mentorship with a superior manager helped minorities to be successful.⁶⁹ Such success stories seem to suggest companies should focus more on mentoring programs and less on the formal evaluations.

⁶¹ Daniel Gyebi, *The Civil Rights Act of 1991: Favoring Women and Minorities in Disparate Impact Discrimination Cases Involving High-Level Jobs*, 36 HOW. L.J. 97, 114–15 (1993).

⁶² Carbado, *supra* note 1010 at 1692; *supra* Gyebi note 62 at 114–15.

⁶³ Robinson, *supra* note 2.

⁶⁴ Wade, *supra* note 4, at 222.

⁶⁵ John Rice, *C-Level Diversity*, 6 STAN. SOC. INNOVATION R. (2008); *see* Soohan, *supra* note 9.

⁶⁶ *Id.*

⁶⁷ *Id.*

⁶⁸ *Id.*

⁶⁹ *Id.*; Anne-Marie Dean et al., *Women and Minorities in Corporate America: An Empirical Examination*, 14 INT'L ALLIED ACAD. INT'L CONF.: PROC. OF THE ACAD. OF ORG. CULTURE, COMM. & CONFLICT 2 (Apr. 2009); Victoria C. Sepand, *The Black Ceiling: Barriers to Career Advancement for African American Women in the US*, SCRIPS SENIOR THESIS (2015). The study was limited to African American women and they can advance within the corporate world. In addition, the study also found that women can retain employment more easily when the corporation takes a down turn.

The corporate structure in America is bound to change in the coming years because of the shift in labor markets. Since the early 2000's, the percentage of minorities who are earning bachelors and graduate degrees has increased.⁷⁰ This data suggests that a business imperative for hiring minorities will be created because corporations expanded their labor pool to include minorities, given the overall tightening in the labor markets, will create an advantage for themselves over corporations that have limited access to diverse workers.⁷¹

2. *Corporate Culture*

Corporate culture can be defined by core commonalities in the way corporations are managed. Understanding corporate culture can help minorities gain a general understanding pertaining to the reason they are not promoted at the same rate as their Caucasian peers. By recognizing these reasons enable minorities to take steps to overcome these barriers to entry in the corporate world.

The Glass ceiling experienced by minority groups in America corporate culture⁷² can manifest itself in many ways. The most common identifiers of the glass ceiling include lack of training, lack of mentors, informal recruiting processes, wage gaps despite comparable work, and placement in a job with little growth opportunity.⁷³ Any of these manifestations of the glass ceiling undermine a minority employee's career progression and can have associated long-term effects on minority employment and community development.

⁷⁰ Steven A. Ramirez, *Diversity and the Boardroom*, 6 STAN. J.L. BUS. & FIN. 85, 90-93 (2000). "From 1973 to 1996, the percentage of Latinos awarded B.A. degrees grew from 6.1 to 13.4 percent for women, and from 6.6 to 12 percent for men. For African Americans the increase was from approximately 7.2 to 17.7 percent. Because these populations will expand most markedly in the key 18-24 year old range, college enrollment is expected to rise 23 percent for African Americans and 73 percent for Latinos from 1995 to 2015." *Id.*

⁷¹ *Id.* at 93.

⁷² David A. Cotter et al., *The Glass Ceiling Effect*, 80.2 SOC. FORCES 655, 657-58 (2001) "A glass ceiling inequality represents a gender or racial difference that cannot be explained through other job-relevant characteristics of the employee; this inequality is more pronounced at higher levels of earning and authority." *Id.* The farther a minority person goes in her career, the more likely it is she will encounter barriers to success. *Id.*

⁷³ Belle Rose Ragins et al., *Gender Gap in the Executive Suite: CEOs and Female Executives Report on Breaking the Glass Ceiling*, 12 ACAD. OF MGMT. EXEC. 28, 29-33 (1998).

Several core factors help explain the role of corporate culture and its effect on minorities in America.⁷⁴ The clone syndrome,⁷⁵ e.g. companies desire to hire people that are similar to the existing workforce, can lead to minority underrepresentation in corporations.⁷⁶ The clone syndrome makes it difficult for a minority and women to break into a job predominantly held by white men. Similarly, if a corporation lacks diversity and allows group thinking, the board will likely struggle to identify issues because the corporation needs a fresh perspective.⁷⁷ This can harm the corporation in the long term as it is less able to identify strengths and weaknesses. Changing the mindset of the corporate environment may require challenging basic assumptions of the men in charge.⁷⁸ By not speaking out against sexist or racial comments, the corporate culture of an organization can increase the acceptability of such comments.⁷⁹

The discriminatory effect of existing corporate hierarchies may have their origin in the education system.⁸⁰ Children in struggling school systems lack access to resources that better functioning school system in other districts can make available. Starting a career with lacking educational resources requires harder work to overcome barriers. Without access to the same resources, careers in corporate America are automatically geared towards those children that received

⁷⁴ Women's groups, such as Catalyst, among others, have advanced the research on glass ceilings and the role of corporate culture. Catalyst is a nonprofit organization that researches and advises businesses on women's issues and concerns. See CATALYST INC., Mission and History, <http://www.catalyst.org/about/mission.shtml> (last visited Aug. 2, 2017).

⁷⁵ Sujata S. Menjoge, *Testing the Limits of Anti-Discrimination Law: How Employers' Use of Pre-Employment Psychological and Personality Tests Can Circumvent Title VII and the ADA*, 82 N.C. L. REV. 326, 343–44 (2003).

⁷⁶ *Id.* Allan G. King & Syeeda S. Amin, *Social Framework Analysis As Inadmissible "Character" Evidence*, 32 LAW & PSYCHOL. REV. 1, 2 (2008); Liwen Mah, *The Legal Profession Faces New Faces: How Lawyers' Professional Norms Should Change to Serve A Changing American Population*, 93 CAL. L. REV. 1721, 1738–39 (2005). Liwan takes more of a traditional approach in saying that because the dominant perception is an Anglo-American one, the individuals that fit that mold will be rewarded. There is typically a clash over cultures, which can eliminate candidates from positions because they are perceived as not being able to fit in. This further incentivizes the assimilation of individuals into a culture.

⁷⁷ See, e.g., Lisa M. Fairfax, *supra* note 87.

⁷⁸ Cheryl L. Wade, *Transforming Discriminatory Corporate Cultures: This Is Not Just Women's Work*, 65 MD. L. REV. 346, 346–47 (2006).

⁷⁹ *Id.*

⁸⁰ See generally Lewis D. Solomon, *The Role of For-Profit Corporations in Revitalizing Public Education: A Legal and Policy Analysis*, 24 U. TOL. L. REV. 883 (1993) (describing illiteracy among high school students and noting that rate of illiteracy for minority students is much higher than the percentage of white students who are illiterate). See also Frances Lee Ansley, *Stirring the Ashes: Race, Class and the Future of Civil Rights Scholarship*, 74 CORNELL L. REV. 993 (1989). African Americans “attend largely separate and unequal schools.” *Id.* at 1000.

the required resources.⁸¹ Accordingly, Caucasians dominate education, business, and politics.⁸²

3. *Boards of Directors*

Diversity on boards of U.S. corporations has been divisive for many decades.⁸³ Whereas the European Union has considered measures for board diversity by proposing mandating the participation of women on boards (although the measure did not pass),⁸⁴ board diversity in U.S. corporations is still largely elusive. According to some estimates, the lack of inclusion of minorities in corporate America costs the U.S. economy \$1 trillion per year, taking into account the pay gap between whites and minorities.⁸⁵ The structure of corporations and the role of corporate culture⁸⁶ help explain part of the reasons for lacking board diversity in the United States.

Board diversity benefits corporations. By allowing minorities on the board, creativity increases with the different perspectives represented by minorities which acts as a defense against groupthink.⁸⁷ While corporations also arguably have a social and moral obligation to celebrate diversity,⁸⁸ business leaders typically look for business reasons to include minorities.⁸⁹ Fiduciary obligations of the board may provide additional business reasons for board diversity. Board members are obliged to take actions that are in the best interest of the corporation.⁹⁰ The board is required to act in good faith and make

⁸¹ Tracy Anbinder Baron, *Keeping Women Out of the Executive Suite: The Courts' Failure to Apply Title VII Scrutiny to Upper-Level Jobs*, 143 U. PA. L. REV. 267, 270–71 (1994); Jerry Kang, *Negative Action Against Asian Americans: The Internal Instability of Dworkin's Defense of Affirmative Action*, 31 HARV. C.R.-C.L. L. REV. 1, 44–45 (1996)

⁸² Kang, *supra* note 82 at 44–45; Baron, *supra* note 82 at 267–68.

⁸³ See Donald C. Langevoort, *Commentary: Puzzles About Corporate Boards and Board Diversity*, 89 N.C. L. REV. 841, 841–42 (2011).

⁸⁴ Proposal for Directive 2012/0299/COD, http://eur-lex.europa.eu/procedure/EN/2012_299

⁸⁵ Steven A. Ramirez, *Rethinking the Corporation (and Race) in America: Can Law (and Professionalization) Fix "Minor" Problems of Externalization, Internalization, and Governance?*, 79 ST. JOHN'S L. REV. 977, 1002 (2005).

⁸⁶ See *supra* Fn 61 to 82.

⁸⁷ See, e.g., Fairfax, *supra* note 11; Evan Roberts, *Corporate Leadership and the Unfinished Diversity Movement*, 14 DUQ. BUS. L.J. 277, 278–79 (2012).

⁸⁸ Fairfax, *supra* note 11; Cheryl L. Wade, *Racial Discrimination and the Relationship Between the Directorial Duty of Care and Corporate Disclosure*, 63 U. PITT. L. REV. 389, 427 (2002). There are also speculative benefits of having minority leadership improves working conditions for lower level employees.

⁸⁹ *Id.* at 840–41.

⁹⁰ See Model Bus. Corp. Act, § 8.30(a); See Model Bus. Corp. Act § 8.02 (2002) (allowing corporations to identify requirements for directors in their articles of incorporation or their bylaws); Thomas W. Joo, *A Trip Through the Maze of "Corporate Democracy": Shareholder Voice and Management Composition*, 77 ST. JOHN'S L. REV. 735, 736 (2003); Larry Catá Backer, *Director Independence and the*

decisions the board reasonably believe to be in the best interests of the corporation.⁹¹ Directors must act after they have gained sufficient relevant information or data pertaining to the transactions in question.⁹² Arguably, a diverse board helps protect against group thinking which is in the best interest of the corporation.

Board inclusion can create risks for minorities. Minority board members are held to a different set of expectations than their Caucasian counterparts. Because board members are expected to interact with clients in order to help drive shareholder value, the minority board members are often expected to help bring in a minority clientele.⁹³ However, if the product the respective corporation produces is not used by minorities, the minority board member will be perceived as a failure for not bringing in minority clients.⁹⁴ This may stigmatize minority board members and impact their careers. Moreover, minority board members are often overextended because they tend to sit on too many boards that wish to show diversity.⁹⁵ By having a small group of minorities who serve on a large number of boards, corporations are in fact losing the diversity of viewpoints they were initially looking for in a minority board member.

IV. Blockchain Solutions for Disenfranchised Communities

Blockchain technology holds great promise as a technology solution for disenfranchised communities. It is well established that blockchain technology holds great promise as an internet-like technology.⁹⁶ Its anti-discriminatory and equality enhancing features have received less attention in the literature.

1. Blockchain-Enabled Trust as Anti-Discrimination

Blockchain technology allows an unprecedented increase in trust between anonymous transacting parties. Blockchain's digital signatures enable a heightened level of security for society through transparency, eliminating errors and fraud within the network.⁹⁷ The

Duty of Loyalty: Race, Gender, Class, and the Disney-Ovitz Litigation, 79 ST. JOHN'S L. REV. 1011, 1103 (2005).

⁹¹ See Model Bus. Corp. Act, § 8.30(a); See Model Bus. Corp. Act § 8.30(a).

⁹² See, e.g., *Smith v. Van Gorkom*, 488 A.2d 858, 893 (Del. 1985)

⁹³ *Fairfax supra* note 11, at 842.

⁹⁴ *Id.*

⁹⁵ *Id.* at 843.

⁹⁶ Cognizant, *supra* note 19; Naughton, *supra* note 19; Mougayar, *supra* note 19; Crosby, ET AL., *supra* note 19; Kirby, *supra* note 19; Guarda, *supra* note 19; Rich Daly, *Blockchain: Wall Street's Most Game-Changing Technology Advance Since the Internet*, FORBES (July 11, 2016), <https://www.forbes.com/sites/richdaly/2016/07/11/blockchain-wall-streets-most-game-changing-technology-advance-since-the-internet/#33987a154d87>.

⁹⁷ See, e.g., *Brakeville & Perepa, supra* note 30. For an in-depth, nuanced discussion of this point, see *Valkenburgh, supra* note 31, at 23–26.

decentralized network enabled by the technology allows multiple copies of any transaction to be accessible to all members of the community for verification,⁹⁸ making the reversal, alteration or erasing of information nearly impossible.⁹⁹ Cryptographic hashes further increase trust and security of blockchain transactions by evaluating previous transactions using a complex algorithm before adding a new block to the chain.¹⁰⁰ If the hash value is even incrementally off, the new block will not be added to the chain and any change or manipulation becomes immediately detectable by others in the network.¹⁰¹ Finally, Blockchain technology's consensus model, e.g., the network of nodes agrees on the validity of a certain transaction and only the agreed upon and perfected transactions are recorded on the blockchain,¹⁰² allows a technology-enabled unbiased transactional verification mechanism that is unprecedented in centralized legacy systems.

The trust developed through blockchain technology benefits disenfranchised communities. Blockchain technology's consensus model enables an unbiased transactional verification mechanism for known or anonymous parties. By establishing a network of transacting parties that trust each other despite anonymity, the technology enables unbiased transactions and eliminates prejudices against minorities. The transaction parameters or products are judged by the transacting parties based on quality perceptions not based on other less rational and biased factors. This allows quality of the transaction and/or final product to be the true deciding factor in the market place, eliminating prejudices. Users can join the blockchain-enabled crypto marketplace without fear of prejudices from superiors in traditional corporate hierarchies. This eliminates bias-driven inefficiencies in the market economy and the associated diseconomies of scale and waste, which have been estimated at around \$1 trillion dollars annually in the existing centralized business infrastructure.¹⁰³ Corporations and society at large benefit from less biased and accordingly more efficient processes.

2. DAOs as Equalizing Organizations

A prominent example that helps illustrate the potential of blockchain-based organizations that support non-discriminatory practices and limit the impact of existing corporate hierarchies and their

⁹⁸ See, e.g., D'Aliesi, *supra* note 28; Pearson, *supra* note 28.

⁹⁹ See, e.g., Brakeville & Perepa, *supra* note 30; Lewis, *supra* note 33.

¹⁰⁰ See e.g., Lewis, *supra* note 33.

¹⁰¹ *Id.*

¹⁰² For an overview of various consensus mechanisms see Sigrid Seibold & George Samman, Consensus: Immutable Agreement for the Internet of Value, KPMG (2016), <https://assets.kpmg.com/content/dam/kpmg/pdf/2016/07/kpmg-blockchain-consensus-mechanism-channel-islands.pdf>

¹⁰³ See Ramirez, *supra* note 71.

discriminatory effects on disenfranchised communities is the decentralized autonomous organization (DAO).

The DAO was launched in May 2016,¹⁰⁴ in the founders' attempt to set up a corporate-type organization without using a conventional corporate structure. The founders' central idea was that the wisdom of the crowd would lead to smarter and more game-changing investment decisions.¹⁰⁵ The DAO had to operate as a kind of venture capital fund managed directly by the token holders.¹⁰⁶

The DAO governance structure was built on software, code and smart contracts that ran on the public decentralized blockchain platform *Ethereum*.¹⁰⁷ The DAO did not have a physical address as it was merely computer code. And it was not an organization with a traditional hierarchy as we know it from traditional corporate structures where authority and empowerment flows downwards from investors/shareholders through a board of directors to management and eventually staff.¹⁰⁸ Indeed, it had no directors, managers or employees. Because a series of smart contracts granted DAO token holders voting rights, the blockchain-based smart contracts imitated the role of articles of association or bylaws. Because the DAO code was open source, the token holders would not only vote on "investment proposals", but also on any change made to the code.¹⁰⁹ Accepted proposals would also be backed by a software code, defining the relationship (in terms of rights, obligations and performance metrics) between the DAO and the funded proposals.

During a crowdfunding campaign in May 2016, all investors could become a DAO participants by purchasing DAO Tokens.¹¹⁰ The

¹⁰⁴ Christoph Jentzsch, the co-founder of IoT company *Slock.it*, was one of the "key founders" of *The DAO*, a new style venture capital fund. See Christoph Jentzsch, 'Blessing and a Curse': *The DAO's Developers on Blockchain in 2016*, COINDESK (Dec. 27, 2016, 13:27 BST), <http://www.coindesk.com/blessing-and-a-curse-the-daos-developers-on-blockchain-in-2016/>; Reyes, Carla L. and Packin, Nizan Geslevich and Edwards, Benjamin P., *Distributed Governance* (December 13, 2016). Available at

SSRN: <https://ssrn.com/abstract=2884978> or <http://dx.doi.org/10.2139/ssrn.2884978>

¹⁰⁵ *Id.*

¹⁰⁶ Reyes, Carla L. and Packin, Nizan Geslevich and Edwards, Benjamin P., *Distributed Governance* (December 13, 2016). Available at SSRN: <https://ssrn.com/abstract=2884978> or <http://dx.doi.org/10.2139/ssrn.2884978>

¹⁰⁷ Clint Finley, *A \$50 Million Hack Just Showed That the DAO Was All Too Human*, WIRED (June 18, 2016, 4:30 AM), <https://www.wired.com/2016/06/50-million-hack-just-showed-dao-human/>; Brent Miller, *Smart Contracts and the Role of Lawyers (Part 2) – About "Code Is Law,"* BIG LAW KM (Oct. 22, 2016), <https://biglawkm.com/2016/10/22/smart-contracts-and-the-role-of-lawyers-part-2-about-code-is-law/>.

¹⁰⁸ *Id.*

¹⁰⁹ *Id.*

¹¹⁰ Reyes, Carla L. and Packin, Nizan Geslevich and Edwards, Benjamin P., *Distributed Governance* (December 13, 2016). Available at SSRN: <https://ssrn.com/abstract=2884978> or <http://dx.doi.org/10.2139/ssrn.2884978>

DAO raised more than \$168 million from approximately 10,000 “investors”.¹¹¹ DAO Tokens were designed to be fully transferable and tradeable on “peer-to-peer” exchanges, similar to shares in a traditional listed corporation. The automated structure was intended to give “participants” in the DAO direct real-time control over contributed funds. Alas, things went terribly wrong with the DAO. Fundamental flaws in the DAO code enabled hackers to transfer one third of the total funds to a subsidiary account.¹¹² This hack in combination with additional technological limitations brought down the DAO initiative.¹¹³

People who work for a DAO are free from existing corporate hierarchies and their possible discriminatory effects. People who work for a DAO would not be subject to a supervisor, boss, or CEO. Instead, one works in a dynamic set of working relationships that continuously and dynamically self-organize around projects and outcomes, not corporate hierarchies with implicit hierarchical biases that discriminate against minorities or people from disenfranchised communities that have not been able to work in the expected parameters of the existing corporate hierarchies in terms of background, education, etc.

Disenfranchised communities will increasingly be able to afford the buy-in into a DAO. The increasing access to DAOs eradicates a possible income based or wealth based bias because participants in the DAO are required to buy into the DAO. People who wish to work in a DAO structure are required to acquire a coin or token, whose ownership is recorded in the DAO blockchain. Currently, the most common access point involves buying cryptocurrencies, such as Ether or Bitcoin, with existing currencies such as US dollars and using such cryptocurrencies to acquire coins or tokens the respective DAO one wishes to join.¹¹⁴

The compensation afforded to DAO members can take the form of increases in value of the DAO token the members own or can take the form of earning tokens by performing tasks for the DAO. Because the total outstanding and publicly held supply of tokens for any given DAO is fully transparent and pre-determined in code, the value of the

¹¹¹ Hailed as the largest crowdfunding effort in the shortest time frame, Cade Metz, *The Biggest Crowdfunding Project Ever—The DOA—is Kind of A Mess*, WIRED (Jun. 6, 2016, 7:00 AM), <https://www.wired.com/2016/06/biggest-crowdfunding-project-ever-dao-mess/>.

¹¹² See, e.g., Nathaniel Popper, *A Hacking of More Than \$50 Million Dashes Hopes in the World of Virtual Currency*, N.Y. TIMES (June 17, 2016), https://www.nytimes.com/2016/06/18/business/dealbook/hacker-may-have-removed-more-than-50-million-from-experimental-cybercurrencyproject.html?_r=0; Schumpeter, *Not-So-Clever Contracts*, ECONOMIST (July 28, 2016), Vitalik Buterin, *Critical Update Re: DAO Vulnerability*, ETHEREUM BLOG (June 17, 2016), <https://blog.ethereum.org/2016/06/17/critical-update-re-dao-vulnerability/>.

¹¹³ *Id.*

¹¹⁴ Practically speaking, for most users the Coinbase webpage is the first access point that facilitates continuing access through exchanges such as Bittrex or Kraken.

respective DAO tokens increases along with demand. Moreover, because the total supply of tokens is pre-determined in the DAO code, dilution by central administrators such as government officials or self-interested or biased executives/supervisors/CEOs is impossible, which further illustrates the power of blockchain structures such as the DAO. Accordingly, compensation of DAO members originates from supply and demand. Importantly, the compensation of DAO members can also take the form of earning tokens by performing tasks for the DAO. In other words, people / token holders can earn a separate income in addition to token value appreciation by supporting the DAO achieve its objectives.

Disenfranchised communities benefit from the core distinguishing characteristics that separate the DAO from traditional organizations. Unlike a traditional organization, the priorities and work schedules of DAO members are not determined in a classical top-down corporate hierarchy. In fact, the traditional forms of command and control, giving and receiving orders does not exist because the functionality of a supervisor, CEO of boss does not exist in a DAO structure. While token holders in the DAO community may identify DAO requirements or needs, such as for instance a new or optimized webpage that helps the DAO community, such requirements are not identified in the form of a mandate. In other words, no particular DAO member is tasked with performing the identified optimization. In other words, disenfranchised communities who become DAO members are not required to perform tasks in a classical corporate hierarchy that they either cannot enter or are ill-equipped to function in, given the traditional demands of such hierarchies on education, background, and cultural fit.

Disenfranchised communities benefit from the non-hierarchical performance expectations in a DAO structure. First of all, a common denominator for all DAO token members is the unifying desire to optimize the DAO structure and the DAO token value. If a member-identified optimization has the potential to make the DAO more meaningful, useful, or valuable to the token holder members, the DAO token holders will desire to perform such optimization tasks as it is in their very interest to do so to help increase the value of the DAO tokens. Accordingly, token holders are determined to increase the value of tokens rather than lower the value. To increase the value of its tokens, members can make DAO optimization proposals, e.g. optimize the webpage, that explain what actions ought to be taken to optimize and what value such actions will add to the respective DAO token holder community. The token holder community then votes on a given optimization proposal. If a proposal passes, the proposing DAO member will receive an award in the form of new tokens. Any such payment is added to the respective DAO blockchain but now requires for the proposing token holder to perform on the proposed parameters of

optimization. In other words, once the optimization proponent has made a deal with the DAO, it's in the blockchain and the proponent is required to deliver on the proposal or her contract is cancelled.

For disenfranchised communities working in a DAO structure this means they will not and cannot be judged by race or cultural biases. Instead, their performance in an anonymized proposal voting scheme is the only basis for assessment and payment. If they perform well, they will get remunerated regardless of politics (there are none), background, or education. The only thing that counts is performance of optimization parameters. This is an important difference between classical corporate hierarchies and DAO member performance of optimization proposals, e.g. the DAO's non-discriminatory performance measures.

Non-performance penalties in the DAO structure are free from racial or cultural biases. If disenfranchised community members do not deliver on a proposal that was voted in by the DAO token holder community they lose credibility in the DAO token holder community and may be perceived as lacking an ability to add value. In fact, non-performance on proposal comes with significant reputational penalties and non performers in the DAO structure will be less likely to have future opportunities to earn tokens because the other token holders are unlikely to approve non performer proposals. Crucially, non-performance reputational penalties are entirely free from racial implications as the token holders are unlikely to even know each other. Rather, they all work towards a common goal of optimizing the DAO and the token value.

The DAO token holders' focus on adding value benefits all constituents. Because projects that cannot add value take token holders' time away from more productive endeavors, token holders become focused on managing their time and efforts. Unlike in traditional hierarchical organization where face-time and unproductive meetings are the norm, the self-governing DAO token optimizer avoids any such corporate hierarchy inefficiencies and frees herself from top-down inefficiencies and bad outcomes. In essence, the DAO work proposal and value optimization structure allows the avoidance of bad projects, bad colleagues, and unproductive meetings as the only thing that counts is the value proposition. In other words, the focus shifts from political positioning and supervisor pleasing without performance to a laser sharp focus on adding active value to a given project. If value can be added, the tasks will be performed, if the assessment of the proposal suggests that the value proposition is in doubt token holders will try to spend their time and skills on more productive and value-adding tasks. Importantly, because the DAO structure functions without supervisors DAO token holders who decide they cannot add value on a given task can move to more productive endeavors that better utilize their skills without any penalties that would exist in the traditional hierarchical corporate structure.

Politics in the DAO structure have a different nature compared with traditional hierarchical corporate structures. In a traditional corporate hierarchy, position in the hierarchy and associated authority determine effort. In other word, the supervisor in the hierarchical structure can determine where, what, and when workers have to perform, resulting in suboptimal outcomes, attendance of unproductive and useless meetings, among many other negative effects. By contrast, in the decentralized DAO environment, influence is determined by the value a given token holder contributed to a project's success. If a token holder adds substantial value to the DAO, other DAO token holders will want to add their skills in the same context which focuses the token holders' efforts on the highest possible value proposition. This "value to effort focus of work flows in the DAO structure has the potential to revolutionize the way society works. At the same time, the value to effort focus of work flows makes racial and cultural biases much less pronounced and protects disenfranchised communities.

In summary, DAO token holders have enormous incentives to create value for the DAO based on their respective beliefs and skillsets and not based on expectations of supervisors in traditional top-down corporate hierarchies. In other words, the DAO value creation efforts by DAO token holders is free of implicit racial biases and cultural norms, helping to create a freer and less unequal society.

V. Conclusion

Equality is a natural byproduct of the blockchain-driven evolution of the crypto economy. Blockchain's trust enhancing consensus model, smart contracting in anonymous networks, and DAOs allow for the evolution of a more equal society. Human biases are less likely to survive in a decentralized networked society which benefits not only minorities but society at large.