XII.   *Delaware Explicitly Legalizes Corporate Documentation via Blockchain*

A. Introduction

In May 2016, with the support of former Delaware Governor Jack Markell, the Delaware Blockchain Initiative was launched to usher in a new era of blockchain technology utilization for the benefit of corporations registered in the state of Delaware.[1] Just one of its many applications, blockchain technology enables companies to authorize and distribute their shares directly to investors via the internet.[2] Blockchain technology is a decentralized network of computers working together to maintain a transaction ledger.[3] This technology allows for ultimate ledger transparency and accuracy as every transaction in a given sphere is recorded[4] on the ledger and subsequently verified by a system of connected computers, or "nodes."[5] As part of the initiative, the Delaware State Bar proposed a series of amendments to the Delaware General Corporate Law (DGCL) enacted into law on August 1, 2017.[6] DGCL now allows[7]

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[1] *See* Marco A. Santori, *Governor Jack Markell announces Delaware Blockchain Initiative*, THE GLOBAL DEL. BLOG (June 10, 2016), https://global.delaware.gov/2016/06/10/delaware-to-create-distributed-ledger-based-share-ownership-structure-as-part-of-blockchain-initiative/ [http://perma.cc/BRG9-4YFU].

[2] *See also* Cade Metz, *Overstock Begins Trading Its Shares Via the Bitcoin Blockchain*, WIRED (Dec. 15, 2016, 6:20 PM), https://www.wired.com/2016/12/overstock-com-issues-stock-via-bitcoin-blockchain/ [http://perma.cc/85HM-LXGM].

[3] Shawn Amuial & Joe Dewey, *What is a Blockchain?*, BLOOMBERG: BIG L. BUS. (Sept. 22, 2015), https://bol.bna.com/what-is-a-blockchain/ [http://perma.cc/P648-532C] ("The blockchain is often described as a decentralized peer to peer network that maintains a public (or in some cases, private) ledger of transactions.").

[4] *Id*. ("[E]very transfer of Bitcoin ever made is available for the world to view in Bitcoin's blockchain.").

[5] *Id*.

[6] Michael del Castillo, *Delaware House Passes Historic Blockchain Regulation*, COINDESK (July 1, 2016, 3:54 PM), https://www.coindesk.com/delaware-house-passes-historic-blockchain-regulation/ [http://perma.cc/Z3YM-M8GV].

[7] Jeff John Roberts, *Companies Can Put Shareholders on a Blockchain Starting Today*, FORTUNE (Aug. 1, 2017), http://fortune.com/2017/

public and private corporations registered in Delaware to maintain shareholder registries and issue new shares on a blockchain system.[8]

Corporations largely view these laws as a landmark event declaring the potential for growth of the technology, but do not point to extensive current adoption.[9] For that reason, this article focuses on possible future implications of widespread adoption as well as causes of slowed implementation. Section B expounds on the technical changes made to DGCL. Section C explores potential benefits of blockchain adoption for Delaware corporations and their shareholders. Section D highlights concerns regarding blockchain adoption and implementation. Section E examines how blockchain is being used and developed abroad.

B. Delaware General Corporate Law

Taking effect as of August 1, 2017,[10] amendments to § 219(c) and § 224 of Title 8 of the Delaware Code[11] explicitly allow for the use of blockchain to record and trade stock.[12] Section 219(c) defines stock ledger as the records kept by a corporation detailing its shareholder registry and all issuances and transfers of its stock in accordance with § 224.[13] This definition was a new addition to § 219(c) pursuant to the August 1 amendments.[14] Section 224 states that companies are explicitly allowed to use electronic distributed ledger technologies

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08/01/blockchain-shareholders-law/   [http://perma.cc/66YG-GUTA]   ("The Delaware statute is enabling.").

[8] *Id*. ("Delaware law went into effect that lets corporations maintain shareholder lists, along with other corporate records, using the technology.").

[9] Metz, *supra* note 2 ("[I]it's largely symbolic . . . . [I]t demonstrates that we're live.").

[10] del Castillo, *supra* note 6.

[11] *See generally* DEL. CODE ANN. tit. 8, § 219(c), § 224 (West 2017).

[12] del Castillo, *supra* note 6.

[13] DEL. CODE ANN. tit. 8, § 219(c) (West 2017) ("'[S]tock ledger' means one or more records administered by or on behalf of the corporation in which the names of all of the corporation's stockholders of record . . . and all issuances and transfers of stock of the corporation are recorded . . . .").

[14] *Id.* (showing the language was added by means of amendment addition rather than crossing out or replacing of previously included content).

such as blockchain in order to record their stock ledgers as well as any issuances or transfers of shares made by the corporation.[15]

C. Potential Benefits of Blockchain Implementation

1. Perfectly Accurate Records of Shareholder Ownership and Voting

Blockchain technology is poised to reduce transaction settlement times from three days to nearly zero.[16] An example best illustrates the importance of this improvement. The Dole Food Company settled a class action litigation in which investors filed roughly 49 million facially valid claims to Dole shares, but there were only about 37 million shares outstanding at the time of settlement.[17] The cause of this discrepancy was unsettled trades.[18] Because settlement took three days, the centralized ownership ledger did not properly record activity during the period preceding the close of trading for Dole stock, which led both buyers and sellers to make facially valid ownership claims.[19] The problems presented by "contemporaneous ownership claims"[20] could be eradicated with

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[15] DEL. CODE ANN. tit. 8, § 224 (West 2017) (indicating that persons may also make use of "one or more electronic networks or databases (including one or more distributed electronic networks or databases)").

[16] Metz, *supra* note 2 ("On Wall Street it takes up to three days to settle a stock trade—to actually move the shares between two parties. Blockchain tech can take this from three days down (T-3) to zero (T-0).").

[17] Andrea Tinianow & Caitlin Long, *Delaware Blockchain Initiative: Transforming the Foundational Infrastructure of Corporate Finance*, HARV. L. SCH. F. ON CORP. GOVERNANCE AND FIN. REG. (Mar. 16, 2017), https://corpgov.law.harvard.edu/2017/03/16/delaware-blockchain-initiative-transforming-the-foundational-infrastructure-of-corporate-finance/ [http://perma.cc/6W3W-N2EZ] ("Investors filed claims to 49.2 million Dole shares that were 'facially eligible,' but only 36.8 million Dole shares were outstanding.").

[18] *Id*. ("Most of the difference was caused by unsettled trades during the final three trading days.").

[19] *Id*. ("DTC's centralized ledger did not reflect all of the trades in Dole's common stock on the day of the merger or during the two days preceding it." (quoting *in re* Dole Food Co., Inc., C.A. No. 8703-VCL, 2017 WL 624843, at *2 (Del. Ch. Feb. 15, 2017))).

[20] Joanna Diane Caytas, *Blockchain in the U.S. Regulatory Setting: Evidentiary Use in Vermont, Delaware, and Elsewhere*, COLUM. SCI. AND TECH. L. REV. 1, 1–2 (2017).

blockchain technology which would record trades in a matter of minutes, not days, allowing for a clear and accurate picture of ownership at a designated point in time.[21] Further, Blockchain systems allow Delaware to maintain a perfect record of the number of shares outstanding by electronically validating shares issued upon the blockchain system.[22]

Another issue with current share ownership tracking is unclear voting. Clarifying the actual owner of a given share of stock is further complicated by the fact that publicly traded stock is not actually owned by the purchasing entity, but rather by a depository known as the Central Depository Trust Co. (DTC).[23] What a purchaser of stock actually owns is a "contractual right against their broker."[24] This system of nominee ownership creates difficulty in determining how the owner of a share has truly voted.[25] For example, T. Rowe Price (TRP) was the beneficial holder of several million shares of a company for which a merger vote was upcoming.[26] As the beneficial holder of these shares, TRP was entitled to vote these shares as they wanted, but as the holder of record, DTC was the party responsible for actually

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[21] *Id.* ("These systemic issues could be prevented by using a decentralized ledger, where every broker-dealer could instantly record trades . . . clarifying ownership for every share within the system at every moment . . . .").

[22] Tinianow & Long, *supra* note 17 (stating that by putting in place a system by which only "cryptographically 'signed'" shares are "considered validly-authorized," Delaware "establishes a perfect record of authorized shares, and the distributed ledger can then track shares that are issued and outstanding.").

[23] Brian Patrick Eha, *You Don't Really Own Your Securities; Can Blockchains Fix That?*, AM. BANKER (July 27, 2016, 3:29 PM), https://www. americanbanker.com/news/you-dont-really-own-your-securities-can-blockchains-fix-that [http://perma.cc/APX3-VY4W] ("In the United States publicly traded stock does not exist in private hands . . . . [N]early all publicly traded equities and a majority of bonds are owned by a little-known partnerships, Cede & Co., which is the nominee of the Depository Trust Co . . . .").

[24] *Id.*

[25] J. Travis Laster, Vice Chancellor, Del. Ch. Ct., Keynote Speech at the Fall 2016 Meeting of the Council of Institutional Investors: The Block Chain Plunger (Sept. 29, 2016) (transcript available at http://www.cii.org/files/09_29_16_laster_remarks.pdf [http://perma.cc/K5JS-MUC5]) ("[A] beneficial holder cannot necessarily obtain end to end confirmation as to how its shares have been voted.").

[26] *Id.* ("T. Rowe Price was the beneficial owner of several million shares.").

casting the vote.[27] Further, because of conflicting state and federal law, DTC had to transfer its voting rights to TRP's participant, State Street.[28] Ultimately, two additional intermediary parties were added to aid in the process of vote collection.[29] Along the chain between owner of record and beneficial owner there was a clerical error which caused TRP's vote to be miscast.[30] Despite TRP having previously expressed their disapproval of the proposed merger, DTP ultimately voted in favor of the merger.[31] Because they voted in favor of the merger, TRP lost their right to seek appraisal of their shares,[32] ultimately costing the company $200 million.[33] Blockchain technology would render an intermediary owner such as DTC unnecessary and restore ownership directly to the actual owner.[34] Without an intermediary between the owner and the vote, miscast corporate voting would be eradicated.[35]

2. Cost Cutting

Currently, the fees associated with settling and clearing trades post transaction are estimated at roughly $100 billion.[36] Blockchain

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[27] *Id.* ("T. Rowe had the right to vote its shares as it wished, and DTC had an obligation to ensure that it voted T. Rowe's shares accurately.").

[28] *Id.* ("To get T. Rowe's instructions, DTC first had to transfer its state law coting authority to T. Rowe's participant, State Street.").

[29] *Id.* ("State Street outsourced to Broadridge Financial Solutions the task of collecting and implementing voting instructions from T. Rowe . . . . T. Rowe used an additional party, Institutional Shareholder Services to help transmit its voting instructions.").

[30] *Id.* ("T. Rowe entered voting instructions to vote against the merger . . . . Then because of a meeting adjournment, ISS sent a new record that replaced T. Rowe's first vote. T. Rowe did not know this happened. So T. Rowe's system issued its default response: to vote in favor of the merger . . . . Through Broadridge, Cede voted T. Rowe's shares in favor of the merger.").

[31] *Id.* ("Despite being a vocal opponent of the merger, T. Rowe wound up voting for it. And it lost standing to seek appraisal.").

[32] *Id.* ("To pursue an appraisal under Delaware law, a stockholder must have 'neither voted in favor of the merger… nor consented thereto in writing.'" (Quoting DEL CODE ANN. tit. 8, § 262 (West, Westlaw through 81 Laws 2017, chs. 1-194))).

[33] *Id.* ("It cost T. Rowe two-hundred million dollars and bad press.").

[34] *Id*.

[35] *Id*. ("With no intermediaries and a quasi-transparent accounting system, beneficial owners could get end-to-end confirmation of their votes without revealing how they voted.").

[36] Laster, *supra* note 25.

technology has the potential to eliminate fee-charging intermediaries from transactions entirely.[37] Blockchain transactions are not entered manually into a database or overseen by a centralized authority, but rather are entered by user command input directly into a decentralized system.[38] Nodes then set about confirming the validity of the command.[39] This self-verification process eliminates profit-driven middlemen from transactions.[40] This cost cutting ability is a principal aim of those currently exploring blockchain implementation.[41] The potential annual costs savings from such implementation could reach $10 billion for each of the world's largest investment banks.[42]

D. Blockchain Implementation Concerns

1. Slowed Adoption

Amidst excitement about the potential benefits inherent in blockchain adoption, there are also concerns regarding system integration between legacy systems and new blockchain technology.[43]

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[37] Lael Brainard, Governor, Fed. Reserve Sys., Speech at Institute of International Finance Blockchain Roundtable: The Use of Distributed Ledger Technologies in Payment, Clearing, and Settlement (Apr. 14, 2016) (transcript available at https://www.federalreserve.gov/newsevents/speech/brainard 20160414a.htm [http://perma.cc/3BWV-S62K]) ("The essential advantage of the technology is that it provides a credible way to transfer an asset without the need for trust in intermediaries or counterparties, much like a physical cash transaction.").

[38] Amuial & Dewey, *supra* note 3 ("With the blockchain, transactions are not entered into the database manually by . . . . Instead a user simply executes a command to send its bitcoin to another person . . . .").

[39] *Id.* ("[T]he transaction is verified by nodes.").

[40] del Castillo, *supra* note 6 ("[M]iddlemen who profit along the several steps . . . between buyers and sellers of stocks could be cut out of the process.").

[41] Paul Vigna, *The Newest Bank Blockchain: Will This Be the Breakthrough?*, WALL ST. J. (Feb. 28, 2017, 2:32 PM), https://www.wsj.com/articles/the-newest-bank-blockchain-will-this-be-the-breakthrough-1488285211 ("[Blockchain] aims to eliminate the need for a costly infrastructure of middlemen and third parties overseeing transactions.").

[42] *Id.* ("[E]ight of the world's largest investment banks could realize an average of $10 billion in annual cost savings, by 2025, assuming blockchain technology reaches widespread use.").

[43] Brainard, *supra* note 37 ("[T]here are also concerns about the costs and risks from the early adoption of rapidly evolving and uncertain technologies . . . in integrating new technologies into legacy systems . . . .").

The same concern of integration applies to integration between multiple blockchain systems.[44] Where highly complex and expensive legacy systems are already in place, there is a growing concern that financial institutions will have neither the motivation nor the desire to invest large capital into developing replacement or partner systems on blockchain.[45] This desire to abstain from making large capital investments in blockchain implementation has led financial industry players to conclude that the transition process is likely to be long and drawn out.[46] Blockchain's strength is the utilization of secure networks by several large players, but where there is a failure to motivate the industry to develop the technology, adoption slows.[47]

2. Matters Unaddressed by Amendment

The August 1 amendments to the DGCL allow corporations to issue and track shares on blockchain, but do not provide insight as to how corporations with shares currently outstanding may migrate to such a system.[48] Blockchain requires a share to be uncertificated,[49] which is to say a share that is not issued upon a paper certificate or a digitally signed PDF.[50] Thus, because of their electronic nature, a share

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[44] *Id.*

[45] *Id*. ("A major threshold question for the adoption of distributed ledger technology . . . is whether the advantages outweigh the costs of replacing legacy systems.").

[46] *See* Metz, *supra* note 2 ("The big banks, it seems, have realized this disruption isn't happening anytime soon. 'Things have slowed down, gotten more methodical.'") (quoting Rick Stinchfield).

[47] Brainard, *supra* note 37 ("[A] large scale adoption of the technology is unlikely to take place until the industry is faced with a need to invest and adapt. Until that point adoption is likely to be slow and drawn out.").

[48] Matthew J. O'Toole & Michael K. Reilly, *The First Block in the Chain: Proposed Amendments to the DGCL Pave the Way for Distributed Ledgers and Beyond*, HARV. L. SCH. F. ON CORP. GOVERNANCE AND FIN. REG. (Mar. 16, 2017), https://corpgov.law.harvard.edu/2017/03/16/the-first-block-in-the-chain-proposed-amendments-to-the-dgcl-pave-the-way-for-distributed-ledgers-and-beyond/ [http://perma.cc/ZDY7-Z339.

[49] *Id.* ("[A]ny Delaware corporation that has certificates outstanding may not be able to easily transition to a distributed ledger, which by definition is a system that would operate to transfer only uncertificated shares.").

[50] Jeron Paul, *7 Pitfalls of Issuing Electronic Stock Certificates for Private Companies and How to Avoid Them,* CAPSHARE BLOG (Mar. 8, 2016), https://www.capshare.com/blog/7-pitfalls-of-issuing-electronic-stock-

issued upon blockchain will always be uncertificated.[51] Corporations that have certificated shares outstanding, as nearly all publicly traded corporations do, face a significant hurdle in blockchain adoption,[52] as outstanding certificated shares cannot be uncertificated until surrendered back to the corporation.[53] While the new amendments create exciting new platforms upon which corporations are now able to operate their business, the current DGCL does not present a means through which corporations will be able to easily take advantage of these opportunities.[54]

Additionally, Delaware's blockchain law does not address potential implications for the secondary securities market where the bulk of trading occurs.[55] There are huge potential benefits in applying blockchain technology to the secondary securities market, but Delaware law does not address this matter.[56]

3. Hacks

While generally thought to be immensely secure, blockchain systems are susceptible to hacking.[57] A 2016 hack which targeted DAO, a digital currency investment fund, exploited a loophole which

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certificates/ [http://perma.cc/YG8E-6PQF] ("Certificated shares can either have a paper stock certificate . . . or a digitally signed PDF.").

[51] *Id.*

[52] O'Toole & Reilly, *supra* note 48 ("To the extent a Delaware corporation adopts blockchain technology while it has stock certificates outstanding, which would be the case for the vast majority of publicly traded corporations, there remains a potential impediment to achieving the benefits afforded by the new technology.").

[53] Brainard, *supra* note 37 ("DGCL provides that the board of directors may provide by resolution that some or all of the corporation's capital stock shall be uncertificated shares . . . . Section 158 also provides, however, that any such resolution shall not apply to shares represented by a certificate until such certificate is surrendered to the corporation.").

[54] *See* O'Toole & Reilly, *supra* note 48.

[55] Brainard, *supra* note 37.

[56] *Id.* ("Although the amendments do not address the workings of the secondary securities market, the potential benefits of blockchain technology on that market are potentially far-reaching.").

[57] Paul Vigna, *Fund Based on Digital Currency Ethereum to Wind Down After Alleged Hack*, WALL ST. J. (June 17, 2016 7:27 PM), https://www.wsj.com/articles/investment-fund-based-on-digital-currency-to-wind-down-after-alleged-hack-1466175033.

allowed for $55 million to be siphoned.[58] The nature of a distributed ledger acts as a "double-edged sword" and subsequently increases the potential damage caused by a hack.[59] Because blockchain systems are a series of interconnected points within one network, a hack into one point could potentially open the entire network to intrusion.[60] Additionally, because the security measures employed by blockchain systems are similar, a successful hack into one system could prove to be the key in hacking several additional systems.[61]

E. Blockchain Implementation Abroad

1. Singapore

In 2016, The Monetary Authority of Singapore launched Project Ubin,[62] a blockchain exploration collaboration with 11 major financial institutions and five technology companies,[63] in order to utilize blockchain technology for "clearing and settlement of payment

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[58] *Id.*

[59] Angelos Delivorias, *Distributed Ledger Technology and Financial Markets*, EUROPEAN PARLIAMENTARY RESEARCH SERVICE (PE 593.565) (Nov. 2016), http://www.europarl.europa.eu/RegData/etudes/BRIE/2016/ 593565/EPRS_BRI(2016)593565_EN.pdf   [http://perma.cc/BK3S-HD3V] ("[W]hile the [distributed nature of the ledger] does increase security, . . . if nevertheless someone were to hack the system, they could obtain access to all the information, and not only the information stored at the point of attack.").

[60] *Id.*

[61] *Id.* ("[G]iven that the protocols used by different distributed ledger networks tend to be similar, the hacking of one network may jeopardize the security of many others.").

[62] *Project Ubin: Central Bank Digital Money using Distributed Ledger Technology*, MONETARY AUTH. OF SING. (May 26, 2017), http://www.mas. gov.sg/Singapore-Financial-Centre/Smart-Financial-Centre/Project-Ubin.aspx [http://perma.cc/NR72-NDJT] ("MAS announced . . . it is partnering R3, a Distributed Ledger Technology company, and a consortium of financial institutions on a proof-of-concept project to conduct inter-bank payments using Blockchain technology.").

[63] Press Release, Monetary Authority of Singapore, MAS and ABS Lead Consortium to Harness Blockchain Technology for More Efficient Inter-Bank Payments (Oct. 5, 2017) [hereinafter Press Release, Monetary Authority of Singapore], http://www.mas.gov.sg/News-and-Publications/Media-Releases/ 2017/MAS-and-ABS-lead-consortium-to-harness-blockchain-technology.aspx [http://perma.cc/G79Z-Q2VS].

and securities."[64] Phase one was a trial period in which the government used blockchain technology to issue a digital currency tied to the national currency.[65] Phase two was further exploration into the applicability of digital ledger technology in curing overworked centralized systems.[66] This phase has yielded technology allowing for a previously unachieved combination of decentralization and privacy.[67] Having the ability to preserve the privacy of traditional settlement systems while utilizing the benefits of decentralization is a crucial step toward incentivizing financial institutions to implement blockchain technology.[68] If Delaware companies were able to develop or borrow similar technology it would provide additional incentives to take advantage of the DGCL and implement blockchain technology.

2. United Kingdom

The Bank of England currently operates the centralized Real-Time Gross Settlement System (RTGS) to settle and clear large scale payment transactions.[69] This system operates by providing a few financial institutions with direct access to the system while the rest of the user base is forced to employ one of four agent banks.[70] With RTGS taking on five hundred billion pounds of payments each day[71] and many frustrated indirect users,[72] the Bank has decided to undertake a reform of their current system.[73] In support of this reform, the Bank

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[64] *Id.*

[65] *See* Stan Higgins, *Tokenized Dollars: Singapore's Central Bank Details New Blockchain Trial*, COINDESK (May 31, 2017, 11:30 AM), https://www. coindesk.com/tokenized-dollars-singapores-central-bank-details-new-blockchain-trial/ [http://perma.cc/T59J-JKMF].

[66] Press Release, Monetary Authority of Singapore, *supra* note 63.

[67] *Id.*

[68] *Id.* ("A key outcome of the consortium's effort is the ability to perform netting while protecting the privacy of transactions.").

[69] Mark Carney, Governor, Bank of Eng., Speech at International FinTech Conference 2017: Building the Infrastructure to Realise FinTech's Promise (Apr. 12, 2017) (transcript available at http://www.bankofengland.co.uk/publications/Documents/speeches/2017/speech974.pdf [http://perma.cc/2GBC-V3GW]).

[70] *Id.*

[71] *Id.* ("[E]ach day processes £1/2 trillion of payments . . . .").

[72] *See id.* ("These indirect users . . . want to reduce their reliance on the systems.").

[73] *Id.* ("The bank has decided to widen access to RTGs.").

has conducted blockchain proof-of-concept testing and plans to make their next settlement system compatible with blockchain technology.[74] With England poised to present a test case for the large scale use of blockchain technology in a settlement system, some of the Delaware companies concerns with implementing blockchain technology may be dispelled over time.

F. Conclusion

It is unclear exactly how corporations will take advantage of the Delaware amendments. Cost cutting and direct ownership present beneficial opportunities for corporations and the financial industry.[75] However, with no impending large-scale disruption in the market,[76] the adoption of blockchain technology appears to be more akin to a marathon than a sprint.[77] While most agree that blockchain implementation is inevitable,[78] concerns regarding legacy system transitions[79] and potential security threats remain.[80] These concerns are likely to emerge as the technology matures and actual blockchain usage increases.[81] Technological advances out of Singapore,[82] and implemented usage in England may work to quell some of these concerns sooner rather than later.[83] Though it is not clear when blockchain technology will take hold of the financial industry, most believe it is a matter of when, and not if this happens.[84]

Ryan Strassman[85]

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[74] *Id.*

[75] *See* Laster, *supra* note 25 ("Custodians become unnecessary. Ownership lists only with beneficial owners.").

[76] Metz, *supra* note 2.

[77] *See id*.

[78] *Id*. ("The internet isn't about to supplant Wall Street just yet. But the incentives are there to make 21st century stock trading look very different than it ever has before.").

[79] Brainard, *supra* note 38.

[80] *See id.*

[81] *Id.*

[82] *See* Press Release, Monetary Authority of Singapore, *supra* note 63.

[83] *See* Carney, *supra* note 69.

[84] *See* Amuial & Dewey, *supra* note 3 ("[B]lockchain is not a fad and it will live up to its disruptive potential.").

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