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Decentralized Public Ledger Systems and Securities Law: New Applications of Blockchain Technology and the Revitalization of Sections 11 And 12(A)(2) of the Securities Act Of 1933

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DECENTRALIZED PUBLIC LEDGER SYSTEMS AND SECURITIES LAW: NEW APPLICATIONS OF BLOCKCHAIN TECHNOLOGY AND THE REVITALIZATION OF SECTIONS 11 AND 12(A)(2) OF THE SECURITIES ACT OF 1933

INTRODUCTION

When Bitcoin launched in 2009,[1] it was the first virtual cryptocurrency to gain popularity and attain widespread use.[2] Much attention has been paid to Bitcoin's well-publicized advances and setbacks as the world's foremost virtual currency.[3] Less attention has been paid, however, to the decentralized public ledger technology that enables Bitcoin to function.[4] That technology is just as innovative as Bitcoin itself.[5] Decentralized public ledgers are a revolution in digital data storage and have the "potential to fundamentally shift the way in which society operates."[6]

This Note will examine one such societal shift—a change in how shareholders access and assert their rights the securities markets. Specifically, this Note proposes that decentralized public securities ledgers will enable private shareholders to more fully access the protections of Sections 11 and 12(a)(2) of the Securities Act of 1933 in cases of securities fraud.

To facilitate understanding of this new technology, Section I describes the history and function of decentralized public ledger networks. It provides an overview of common ledger formats, and details current and future applications of the technology.

Section II examines how decentralized public ledgers relate to the securities markets at both the national and state levels. It details how the Securities and Exchange Commission ("SEC") plans to implement and

1. *Frequently Asked Questions*, BITCOIN, https://perma.cc/62TW-C5VP.
2. *Id.*; *see also* Tara Mandjee, *Bitcoin, Its Legal Classification and Its Regulatory Framework*, 15 J. BUS. & SEC. L. 1, 5 (2014).
3. Benjamin Wallace, *The Rise and Fall of Bitcoin*, WIRED MAG. (Nov. 23, 2011), https://perma.cc/JB9S-U57H; *see also* Marc Andreessen, *Why Bitcoin Matters*, N.Y. TIMES (Jan. 21, 2014), https://perma.cc/XY2F-PWBU (detailing the formation, rise in popularity, and impact of Bitcoin as both a technological innovation and a virtual cryptocurrency).
4. Trevor I. Kiviat, *Beyond Bitcoin: Issues in Regulating Blockchain Transactions*, 65 DUKE L.J. 569, 577 (2015).
5. Wallace, *supra* note 3.
6. Aaron Wright & Primavera De Fillippi, Decentralized Blockchain Technology and the Rise of Lex Cryptographia 2 (Mar. 12, 2015) (unpublished manuscript), https://perma.cc/P7BQ-L8ZL.

regulate the use of decentralized public ledgers and explains how Delaware is currently using the technology to create new classes of corporate stock.

Lastly, Section III of this Note posits that applying decentralized public ledger technology to securities transactions will increase the number of plaintiffs who are capable of achieving standing under Sections 11 and 12(a)(2) of the Securities Act of 1933 (the "Securities Act"). After detailing the history of Section 11, Section 12(a)(2), and the tracing doctrine, Section III explains how decentralized public securities ledgers will transform the tracing doctrine from a nigh-insurmountable pleading burden to a simple records search. It will help a wider scope of plaintiffs meet the judicially-imposed tracing doctrine. Although making this burden easier to fulfill will expand the potential plaintiff pool, and thus may create logistical issues for courts and defendants, the internal structure and pleading requirements of the Securities Act will effectively limit frivolous suits. This, in turn, will better fulfill the statutory language and remedial intent of Sections 11 and 12(a)(2) of the Securities Act.

I. DECENTRALIZED PUBLIC LEDGER SYSTEMS: A HISTORY OF CRYPTOGRAPHIC INNOVATION AND APPLICATION

Decentralized public ledgers merge traditional record-keeping methods with technological advances to create a new system for preserving and sharing data.[7] Because decentralized public ledgers are a relatively new innovation, Part I of this Note traces their development and explains core features of the technology. It then explores the different formats that digital ledgers can take. Part I concludes by examining current and future applications of decentralized public ledger technology—including how decentralized ledgers facilitate the use of digital currencies, smart contracts, and financial transactions.

7. Kiviat, *supra* note 4, at 577–78.

A. The Development and Function of Decentralized Public Ledgers

Decentralized public ledgers are the technological synthesis of over twenty years of advancements in cryptographic algorithms and computer networking.[8] Prior to these advancements, it was impossible for disparate individuals to agree that an Internet transaction was valid without a trusted centralized authority present to verify the transaction.[9] For example, an Internet user could not digitally transfer money to another user without an intermediary to confirm that the money being transferred actually existed in the quantities and format represented.[10] It is because of this problem, known in computer science circles as the "Byzantine Generals Problem,"[11] that services such as PayPal were invented.[12] PayPal and other transactional management services perform an intermediary role by evaluating and confirming the validity of online transactions.[13]

Decentralized public ledgers, however, enable secure Internet transactions and data storage without the need for a third-party authority to monitor and confirm validity.[14] They allow unrelated groups of people to independently form a consensus regarding the validity of a transaction.[15] Transactions performed via decentralized public ledgers are thus often called "trustless," because they do not require participants to trust in each

8. Wright & De Fillippi, *supra* note 6, at 2.
9. Kiviat, *supra* note 4, at 577–78.
10. *Id.*
11. *See* Debraj Ghosh, *How the Byzantine General Sacked the Castle: A Look into Blockchain*, MEDIUM (Apr. 5, 2016), https://perma.cc/V8PG-EG8W. *See also* Jim Gray, *Notes on Data Base Operating Systems*, *in* LECTURE NOTES IN COMPUTER SCIENCE 394, 465 (G. Goos & J. Hartmanis eds., 1978), https://perma.cc/M6LY-VT4C. The Byzantine Generals Problem is also known as the "Two Generals Problem" and is often explained via the following hypothetical: two generals are each preparing their troops to attack a common enemy. The two teams of troops are situated on separate hills that flank the common enemy. The generals of each troop can communicate with each other only by messenger. Each message sent between the two generals is risky, as it could be intercepted by the enemy. The two generals have agreed to attack together because a successful attack requires both teams of troops to attack the enemy simultaneously, but they have not agreed on a time for the attack to begin. The issue, then, is that the two generals must agree on an attack time and each general must know that the other general knows they have agreed—which is a complicated transaction, as a receipt of message delivery can be lost as easily as the original message. Thus, a potentially infinite chain of messages is required to reach consensus. *See also* E. A. Akkoyunlu, K. Ekanadham & R. V. Huber, *Some Constraints and Tradeoffs in the Design of Network Communications*, *in* PROCEEDINGS OF THE FIFTH ACM SYMPOSIUM ON OPERATING SYSTEMS PRINCIPLES 67, 73 (J.C. Browne & Juan Rodriguez-Rosell eds., 1975) (explicating the problem for the first time); Wright & De Fillippi, *supra* note 6, at 5 (discussing the concept); Leslie Lampert, *The Byzantine Generals Problem*, 4 ACM TRANSACTIONS ON PROGRAMMING LANGUAGES AND SYSTEMS 382 (July 1982) (examining the history, function, and application of the Byzantine Generals Problem to digital code and cryptography).
12. Kiviat, *supra* note 4, at 577; *see also About*, PAYPAL, https://perma.cc/ZVZ2-AF38.
13. *How to Use PayPal? How Does PayPal Work?* TECHWELKIN, https://perma.cc/G8Y2-P2XD.
14. Kiviat, *supra* note 4, at 577–79.
15. Carla L. Reyes, *Moving Beyond Bitcoin to an Endogenous Theory of Decentralized Ledger Technology Regulation: An Initial Proposal*, 61 VILL. L. REV. 191, 197 (2016).

other, or to trust in a third-party intermediary, for an exchange to take place.[16]

Decentralized public ledgers enable trustless transactions because of three key features: decentralized consensus mechanisms, distributed data storage, and cryptographic algorithms.[17]

Decentralized consensus mechanisms are a technological advance that enable trustless consensus as to the validity of a transaction.[18] These mechanisms have different forms, depending on the digital structure of the decentralized ledger, but they all function in the same basic manner.[19] Before a transaction or piece of data can be digitally stored in the decentralized public ledger, the ledger's members must come to a consensus regarding the transaction or data's validity.[20] In this manner, the ledger members supplant a centralized authority that can confirm transactions.[21] Rather than having a service such as PayPal validate a transaction, the members themselves vouch for its legitimacy.[22] Once a transaction reaches consensus, it is permanently stored in the ledger.[23]

Data storage is thus the next key innovation in decentralized public ledgers.[24] When a transaction requires a trusted central authority for its validation, the authority is the only entity that maintains a complete record of the transaction.[25] For instance, PayPal's individual users cannot each access a full record of all confirmed PayPal transactions.[26] Rather, PayPal itself has that information stored on its own server.[27] The network of PayPal users, and the data accompanying their online transactions, thus constitute a centralized network.[28] Without PayPal's central storage, maintenance, and protection of the complete transactional records on its internal servers, the network would be unable to function.[29]

16. Kiviat, *supra* note 4, at 577; *see also* Jessie Cheng & Benjamin Geva, *Understanding Block Chain and Distributed Financial Technology: New Rails for Payments and an Analysis of Article 4A of the of the UCC*, BUS. L. TODAY (Mar. 2016).

17. Reyes, *supra* note 15, at 197.

18. *Id.*

19. *Id.* at 198–99.

20. *Id.* at 197–98; *see also* Joshua Fairfield, *Smart Contracts, Bitcoin Bots, and Consumer Protection*, 71 WASH. & LEE L. REV. ONLINE 35, 36 (2014).

21. Kiviat, *supra* note 4, at 577–78.

22. *Id.*

23. Reyes, *supra* note 15, at 197–98.

24. Sloane Brakeville & Bhargav Perepa, *Blockchain Basics: Introduction to Distributed Ledgers*, IBM DEVELOPERWORKS (May 9, 2016), https://perma.cc/8CL9-76S7; *see also* Kiviat, *supra* note 4, at 577–80.

25. Brakeville & Perepa, *supra* note 24.

26. TECHWELKIN, *supra* note 13.

27. *Id.*

28. Kiviat, *supra* note 4, at 577.

29. TECHWELKIN, *supra* note 13.

Decentralized public ledgers, in contrast, gain their name from a decentralized network structures.[30] When ledger members reach a consensus as to the validity of a transaction, that transaction is stored in each member's copy of the ledger, which is saved on each member's individual computer.[31] Each member of the ledger thus retains a complete record of all ledger transactions at all times, rather than trusting the record to a single centralized authority.[32]

The decentralized nature of public ledger networks supports the third key feature of the ledgers: cryptographic algorithms.[33] Decentralized public ledgers utilize a "probabilistic approach" to protect their data.[34] When information travels over a decentralized network and can only be stored via group consensus, the information becomes more "transparent and verifiable."[35] Potential attackers attempting to flood a ledger with false information, either by entering completely falsified data or by entering valid transactions multiple times, are blocked from doing so. Such actions are unlikely to gain consensus across the network.[36] Further, unlike ledger data stored in centralized networks, a decentralized public ledger's data cannot be altered merely by gaining access to the network or server.[37] As a decentralized public ledger is independently stored on the computers of everyone involved in the ledger, hacking or tampering with one member's ledger will merely create an inconsistency that can be easily exposed and resolved by comparing it to the ledgers of other members.[38] As yet another layer of protection, ledger networks are frequently protected by innovative defense algorithms.[39]

These three key features of decentralized public ledgers—decentralized consensus mechanisms, distributed data storage, and cryptographic algorithms—are a true revolution in computer technology.[40] Decentralized public ledgers "enable [disparate] 'people to agree on a particular state of affairs and record that agreement in a secure and verifiable manner'" for the first time in technological history.[41] The result is an online list of

30. David S. Evans, *Economic Aspects of Bitcoin and Other Decentralized Public-Ledger Currency Platforms* (Coase-Sandor Inst. for Law & Econ. Working Paper No. 685, 2014).

31. *Id.*

32. *Id.*; *see also* Kiviat, *supra* note 4, at 577–580.

33. Wright & De Fillippi, *supra* note 6, at 1.

34. *Id.* at 6.

35. *Id.*

36. *Id.*

37. Brakeville & Perepa, *supra* note 24.

38. Wright & De Fillippi, *supra* note 6, at 6–8.

39. *Id.*

40. *Id.* at 1–2.

41. Reyes, *supra* note 15, at 197; *see also* Wright & De Fillippi, *supra* note 6, at 4–5, 5 n.15 (stating that decentralized public ledger technology uses public key cryptography for authentication and economic incentives to ensure the network maintains the technology).

transactions that is public, permanent, trustless,[42] and resistant to fraud or error because it is "maintained by no one . . . available to everyone . . . [and] maintained by a consensus protocol."[43]

B. Decentralized Public Ledger Formats

Although decentralized public ledgers share basic structural characteristics, those characteristics can be organized in a variety of formats.[44] Most notably, the form of consensus protocol varies depending on the design given to the decentralized ledger by its programmers and users.[45] The ultimate purpose of the ledger, whether it is to record currency transactions, administer contract agreements, or document financial transactions, also influences its format.[46]

Bitcoin's "blockchain" is currently the most popular format for a distributed ledger system.[47] The blockchain is a computer network that encrypts each incoming ledger transaction and aggregates it into a group of similarly-timed transactions, termed a "block."[48] Each block serves as a data storage container that connects in chronological order to the previous block in the transactional chain.[49] A new block can only connect to the transactional chain after ledger users reach consensus as to the block's validity.[50]

Bitcoin's blockchain uses a proof-of-work consensus model to verify its transactions. A proof-of-work consensus model "require[s] the client requesting the service prove that some work has been done" before they are permitted to store their transaction in the ledger.[51] For Bitcoin, ledger users achieve consensus by utilizing the network's computational power to solve complex mathematical problems. When the problems are solved, the transactional block is validated and added to the chain.[52] Once connected to the chain, the transactional information contained in the block cannot be permanently altered or deleted without accessing the ledger copy stored on every computer connected to the network—a nearly impossible feat, given

42. Kiviat, *supra* note 4, at 577.
43. Fairfield, *supra* note 20, at 36.
44. Reyes, *supra* note 15, at 198–99.
45. *Id.* at 197–99.
46. *Id.* at 200.
47. Mandjee, *supra* note 2.
48. Christina Batog, *Blockchain: A Proposal to Reform High Frequency Trading Regulation*, 33 CARDOZO ARTS & ENT. L.J. 739, 755 (2015).
49. Reyes, *supra* note 15, at 197.
50. *Id.* at 198.
51. Pedro Franco, UNDERSTANDING BITCOIN: CRYPTOGRAPHY, ENGINEERING, AND ECONOMICS 102 (2015).
52. Reyes, *supra* note 15, at 198.

that millions of computers are connected to the Bitcoin network at any moment.[53]

Bitcoin's blockchain format and proof-of-work consensus model has achieved immense popularity and become nearly synonymous with decentralized public ledgers. Decentralized ledgers can take other forms, however. Ripple is a decentralized ledger that validates transactions by using a "unique node list" rather than a proof-of-work consensus model.[54] In the unique node list format, potential transactions are aggregated into lists that are then distributed to a random subsection of network users.[55] The subset of users vote on the prospective transactions, and only those that are approved by a consensus of eighty percent or more are entered into the permanent ledger.[56]

In another consensus model, termed the "proof-of-stake" model, transaction validation also depends on majority voting. However, voting rights are granted as a percentage of the number of resources each computer makes available to the network. Thus, network users who choose to store network files on their computers possess more voting power than users who choose not to store network files.[57]

As these examples demonstrate, decentralized public ledgers can take nearly any form their programmers and users desire. While most current ledgers base their consensus format on network power and voting, other consensus models are currently in development.[58]

C. Current and Future Uses for Decentralized Public Ledgers

Although virtual cryptocurrencies such as Bitcoin were the first and most popular use for decentralized public ledgers, the technology can be integrated into almost any field that requires data storage.[59] One such application, the smart contract, has become well-established in the past two years.[60] Smart contracts utilize information stored in decentralized public

53. Kiviat, *supra* note 4, at 579.

54. Reyes, *supra* note 15, at 198; *see also* Bryant Gehring, *How Ripple Works*, RIPPLE (Oct. 16, 2014), http://perma.cc/UM6B-4EPU (describing the Ripple's database structure and unique node protocols).

55. Adrian Blundell-Wignall, *The Bitcoin Question: Currency Versus Trust-Less Transfer Technology* (OECD Working Papers on Fin., Ins. and Private Pensions, No. 37, 2014), https://perma.cc/ATY3-RJZC.

56. JO VAN DE VELDE ET AL., EUROCLEAR & OLIVER WYMAN, BLOCKCHAIN IN CAPITAL MARKETS: THE PRIZE AND THE JOURNEY (2016).

57. Reyes, *supra* note 15, at 199.

58. *See, e.g.*, IDDO BENTOV, CHARLES LEE, ALEX MIZRAHI & MENI ROSENFELD, PROOF OF ACTIVITY: EXTENDING BITCOIN'S PROOF OF WORK VIA PROOF OF STAKE (2014), https://perma.cc/5JVK-BVEA.

59. Wright & De Fillippi, *supra* note 6, at 1.

60. Reyes, *supra* note 15, at 201.

ledgers to digitally perform certain actions when a triggering condition is recorded in the ledger.[61] In this manner, smart contracts encode the logic of contractual clauses into decentralized public ledgers. The ledger can then automatically facilitate, verify, and enforce the performance of the contract.[62] Parties can confirm that a contract condition has occurred without the need for a third party to oversee and validate its occurrence.[63] Smart contracts thus increase the security of contracts while simultaneously reducing their transactional costs.[64] Smart contracts are currently in use to enforce common contractual conditions, such as payment terms, liens, or confidentiality.[65] Smart contract capabilities are expected to expand as the technology continues to develop in coming years.[66]

For example, a smart contract can be implemented into a decentralized public ledger that stores information regarding property ownership.[67] When new data is entered into the ledger and achieves consensus, the smart contract enables each node in the distributed public ledger to act as a title registry and escrow.[68] Changes of ownership will automatically be stored in the ledger's data chain, via the terms of the smart contract programmed into the ledger itself.[69]

Another example of a current smart contract is one programmed into the account of a Bitcoin user. A user can construct the contract so that when a certain number of Bitcoin transactions are stored in the blockchain, the ledger will automatically transfer the assets those Bitcoins represent into a specified banking account.[70] In addition, some Bitcoin-based smart contracts enable automatic title transfer. If a Bitcoin user wants to sell a general property title, for instance, a smart contract can be entered into the ledger that will automatically transfer the title to the buyer. The trigger for

61. Batog, *supra* note 48, at 756; *see also* Nick Szabo, *Formalizing and Securing Relationships on Public Networks*, FIRST MONDAY (Sept. 1, 1997), https://perma.cc/UL7S-QDYA (predicting the development of smart contract technology).

62. ALEX TAPSCOTT & DON TAPSCOTT, THE BLOCKCHAIN REVOLUTION: HOW THE TECHNOLOGY BEHIND BITCOIN IS CHANGING MONEY, BUSINESS, AND THE WORLD, 72–83 (2016).

63. Wright & De Fillippi, *supra* note 6, at 10.

64. Peter Coy & Olga Kharif, *This is Your Company On Blockchain*, BLOOMBERG (Aug. 25, 2016), https://perma.cc/2E4E-SG6Y.

65. Szabo, *supra* note 61.

66. CHRISTOPHER D. CLACK, VIKRAM A. BAKSHI & LEE BRAINE, BARCLAYS BANK, SMART CONTRACT TEMPLATES: FOUNDATIONS, DESIGN LANDSCAPE, AND RESEARCH DIRECTIONS (2016), https://perma.cc/5LDX-E4WP.

67. NICK SZABO, SATOSHI NAKAMOTO INST., SECURE PROPERTY TITLES WITH OWNER AUTHORITY (2005), https://perma.cc/WS9Z-KTDP.

68. *Id.*; *see also* Wright & De Fillippi, *supra* note 6, at 10–12 (providing more detail about smart contract title applications).

69. *Id.*

70. Fairfield, *supra* note 20, at 38; *see also* Wright & De Fillippi, *supra* note 6, at 10 n.46; VITALIK BUTERIN, A NEXT GENERATION SMART CONTRACT & DECENTRALIZED APPLICATION PLATFORM (2015), https://perma.cc/R5JN-NRU6.

the execution of this smart contract occurs when the buyer transfers the sale price of the title into the seller's Bitcoin account and the proof-or-work consensus model has verified its credibility.[71]

Additional types of smart contracts currently in use include assurance contracts,[72] contracts regulating the transfer of financial instruments,[73] and other programmable transactions in which the distributed ledger's nodes can monitor the actions that trigger the smart contract's execution.[74] Several open source projects have recently formed with the intent of creating programming languages that can support more sophisticated types of contracts—contracts with varying, complexly-coded terms that bind parties, via a distributed public ledger, to promises of future action.[75]

Due to their unique capacity for immediate and trustless exchange of value, decentralized public ledgers also hold great promise for the financial markets. Decentralized public ledgers dramatically lower the transaction costs associated with digital value exchange.[76] Moving value, even in its digital form, takes money and time. This money and time can be traced largely to the need for centralized authorities to verify digital transactions. For example, the Automated Clearing House is a centralized verification authority that supports over twenty percent of all electronic payments made in the United States.[77] More than $40 trillion moves through the Automated Clearing House each year in over 25.5 billion discrete transactions.[78] Each transaction through the Automated Clearing House takes an average of two to three days to process, and servicing fees for that processing range from six to nine percent. In 2015, Automated Clearing House users paid $36 billion in servicing fees.[79] Banks, a commonly used centralized verification authority, spend close to $100–150 billion per year on information technology and securities operations meant to verify, protect, and store customer data.[80] In the stock markets, post-trade and securities servicing

71. Reyes, *supra* note 15, at 201.

72. Clack, Bakshi, & Braine, *supra* note 66.

73. David Wigan, *Bitcoin Technology Will Disrupt Derivatives, Says Banker*, IFR ASIA (June 11, 2016), https://perma.cc/G8MT-4596.

74. Rory Ross, *Smart Money: Blockchains are the Future of the Internet*, NEWSWEEK (Sept. 12, 2015), https://perma.cc/WL6L-ZL4J.

75. *See* Wright & De Fillippi, *supra* note 6, at 12. Ethereum, Counterparty, and Mastercoin are the three most significant open source projects for smart contracts. *Id.*

76. Mandjee, *supra* note 2, at 61–62.

77. *History and Network Statistics*, NACHA: THE ELECTRONIC PAYMENTS ASS'N, https://perma.cc/7GL8-NDJM. (last visited Nov. 12, 2017).

78. OVERALL ACH VOLUME MORE THAN 25.5 BILLION IN 2016, NACHA: THE ELECTRONIC PAYMENTS ASS'N (2017), https://perma.cc/P9JQ-3NHS.

79. *ACH Volume Increases 5.3 Percent in 1st Quarter 2015*, NACHA: THE ELECTRONIC PAYMENTS ASSOCIATION, https://perma.cc/F2GM-8UXH.

80. Shepherd, *supra* note 56, at 20.

fees charged by brokers to verify securities transactions total approximately $100 billion per year.[81]

Decentralized public ledgers, in contrast, enable digital transactions to take place almost immediately. There is no need for processing time by an intermediary. As soon as ledger users reach a consensus, the transaction is verified and secured. Although decentralized public ledgers do require some transaction costs to cover their creation and maintenance, the average transaction cost in distributed ledger markets is currently just two percent.[82] This lower amount allows for potential cost savings of $24 billion per year to consumers who switch their online transactions from traditional modes of digital value exchange to decentralized public ledgers.[83]

II. DECENTRALIZED PUBLIC LEDGERS AND THE SECURITIES MARKET: A MAJOR TECHNOLOGICAL SHIFT

Part II of this Note extends Part I's discussion of decentralized public ledgers in the financial markets by delving deeper into the technology's applications in the securities markets. First, it examines the ways in which distributed public ledger technology can be employed in the securities context. It then considers how both the national and state securities markets, as represented by the SEC and Delaware, plan to implement and regulate distributed public ledgers.

A. How to Secure a Security: Decentralized Public Ledgers and Stocks

Although decentralized public ledgers have the potential to serve multiple functions within the securities context, their most obvious application is as a data storage system to record and track the movement of securities transactions.[84] Currently, when a buyer purchases a security, he receives a certificate or similar document that confirms how many shares of stock he purchased, the name of the issuer from whom the stock was purchased, and the purchase price.[85] This transaction is recorded in multiple fora. The securities issuer retains a record of stockholders, as well as brokers

81. *Id.*
82. Kiviat, *supra* note 4, at 586.
83. *Id.* at 587.
84. KURT MATTSON, A.S. PRATT & SONS, DELAWARE LOOKS AT LEGAL CLASSIFICATION FOR BLOCKCHAIN SHARES (2016).
85. Stephanie Powers, *How to Read a Stock Certificate*, SAPLING (Feb. 25, 2009), https://www.sapling.com/4811405/read-stock-certificate. *See also Stock Certificates, Proving Ownership*, U.S. SEC. & EXCHANGE COMMISSION, https://perma.cc/74W9-A8T8. (last visited Nov. 12, 2017).

or dealers that were involved in the purchase.[86] Brokers and dealers also maintain their own records of their transactions.

If the securities markets employed decentralized public ledgers to manage transactions, however, all of these records could be consolidated on a decentralized network via blockchain or another ledger format.[87] As in the broader financial markets, transactional times and costs would decrease for securities purchasers using decentralized ledger technology.[88] While such a development may negatively impact current transactional intermediaries, such as stockbrokers and dealers, it would yield great benefits for consumers.[89] Decreased costs, and the unique data safety net engendered by the decentralized structure of public ledgers, would likely increase consumer confidence and participation in the securities markets.[90]

As the technology continues to develop, smart contracts are also expected to become a component of digital securities transactions.[91] For instance, a smart contract could be embedded into a decentralized securities ledger and direct the ledger's nodes to automatically buy or sell certain stocks when those stocks reach a price set by the network user.[92] While these innovations are not yet part of the American securities markets, industry experts predict that such developments are not far off.[93]

B. *National Securities Markets: The SEC's Response to Decentralized Public Ledger Technology*

Spurred by the immense popularity of Bitcoin and similar applications of decentralized public ledger technology in the financial markets, the SEC has begun to address decentralized ledger technology in the context of securities transactions.[94] In 2013, the SEC founded its Digital Currency Working Group to consider regulatory issues related to virtual cryptocurrencies.[95] The name has since been changed to the Distributed Ledger Technology Working Group (the "Group"), as it now addresses public ledger technologies in contexts other than just currency.[96] A major concern for the Group is the "application of existing laws to [B]itcoin

86. *Id.*
87. Mattson, *supra* note 84.
88. *See* Michael del Castillo, *How the SEC's Blockchain Lead is Defining Future Regulation*, COINDESK (Nov. 17, 2016), https://perma.cc/BVJ2-B6NY.
89. *Id.*
90. Mattson, *supra* note 84.
91. Andrea Tinianow, Mark Smith, Caitlin Long, & Marco Santori, *Delaware's 2017 Resolution: Make Blockchain a Reality*, COINDESK (Jan. 3, 2017), https://perma.cc/8KDW-CSUZ.
92. *Id.*
93. *Id.*
94. Castillo, *supra* note 88.
95. *Id.*
96. *Id.*

financial instruments."[97] For example, in 2016 the SEC began working through legal issues with two different exchanges hoping to host Bitcoin exchange traded funds.

For the SEC, however, the most significant issue related to decentralized public ledger technology is not Bitcoin-based products sold over exchanges. Rather, it is crypto-stocks, stored and traded on decentralized public ledgers, which are poised to significantly disrupt and alter SEC practices. In December of 2015, the SEC approved Overstock.com's plan to issue securities on a "custom-built blockchain stock exchange."[98] At the time, the SEC proposed regulations on the transfer agents who would manage those securities.[99] These regulations have not yet been ratified, however, due to extensive debate regarding how decentralized ledger technology, particularly in the form of blockchain applications, should be classified in the SEC's regulatory scheme.[100] As former SEC Chairwoman Mary Jo White noted in a June 2016 speech on the subject, the key regulatory issue facing the SEC is "whether blockchain applications require registration under existing Commission regulatory regimes, such as those for transfer agents or clearing agencies," or whether the technology is singular enough to warrant an entirely new registration and regulation system.[101] The SEC made little progress on resolving these questions between June and November of 2016. Consequently, in November 2016, Mary Jo White stated that to "the extent there are real benefits to participants in the financial services sector and their customers, especially to back-office functionality, we are [still] considering whether this technology will obviate certain services and participants or, rather, be adopted into current infrastructures."[102] Although current SEC Chairman Jay Clayton stated in July 2017 that certain types of ledgers can fall under the federal definition of a security, including Initial Coin Offerings and Token Sales, the SEC has not revealed how it plans to classify other common applications of the technology.[103] Given extensive actor interest in integrating distributed

97. *Id.*

98. Castillo, *supra* note 88; *see also* Mattson, *supra* note 84; Andrew Harnik, *SEC Approves Plan to Issue Stock Via Bitcoin's Blockchain*, WIRED (Dec. 15, 2015), https://perma.cc/748D-QQYY (explaining how Overstock's blockchain stocks were developed).

99. Andrew Harnik, *SEC Approves Plan to Issue Stock Via Bitcoin's Blockchain*, WIRED (Dec. 15, 2015), https://perma.cc/748D-QQYY.

100. Ruoke Yang, *When is Bitcoin a Security Under U.S. Securities Law?*, 18 J. TECH. L. & POL'Y 99, 117–18 (Dec. 2013).

101. Mattson, *supra* note 84.

102. Mary Jo White, *Opening Remarks at the Fintech Forum*, U.S. SEC. & EXCHANGE COMMISSION (Nov. 14, 2016), https://perma.cc/5422-PM79; *see also* Castillo, *supra* note 88 (analyzing Mary Jo White's remarks).

103. *SEC Issues Investigative Report Concluding DAO Tokens, a Digital Asset, Were Securities*, U.S. SEC. & EXCHANGE COMMISSION (Jul. 25, 2017), https://www.sec.gov/news/press-release/2017-131.

public ledgers into the securities markets, the SEC will have to determine its stance on these significant issues sooner rather than later.[104]

C. State Securities Markets: Delaware's Technological Push

Although the SEC has yet to clarify its perspective on the topic, Delaware is actively pursuing the use of decentralized public ledger technology to issue and track corporate stock transactions.[105] As part of its Delaware Blockchain Initiative, the state has partnered with Symbiont, a smart contract start-up, to create a system that can "move the process of registering companies, tracking share movements, and managing shareholder communications into a digital environment."[106] The state government is in the process of creating a new type of corporate share, the "distributed ledger share," that will join traditional certificated and uncertificated shares.[107] Within the next year, all Delaware corporations will be able to issue distributed ledger shares.[108] This development will have far-reaching impacts, as more than sixty-six percent of the Fortune 500, and eighty-five percent of all initial public offerings, incorporate in Delaware.[109] Delaware's governor, Jack Markell, noted in a July 2016 speech that such shares will enable "immediate clearance, [and] immediate settlement," without relying on intermediaries such as clearinghouses, custodians, exchanges, and fiduciaries.[110] A central component of the initiative is the establishment of a legal foundation for the entire lifecycle of a corporate share.[111]

In addition, Delaware is posed to integrate smart contracts into its distributed public ledger in 2017.[112] This will enable companies to file documents directly onto the distributed ledger, including "a large majority of the 'foundational' documents of finance" such as incorporation documents and Uniform Commercial Code ("UCC") filings.[113] Delaware officials believe that its distributed public ledger options will "enable[e] significant improvements to the financial industry's workflows."[114]

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104. Castillo, *supra* note 88.
105. Marco A. Santori, *Why Cos. Must Pay Attention to Delaware's Blockchain Plan*, LAW 360 (May 2016), https://perma.cc/MF7L-P6L2; *see also* Tinianow, Smith, Long, & Santori, *supra* note 91 (providing an updated perspective on Delaware's progress).
106. Mattson, *supra* note 84.
107. *Id.*
108. Santori, *supra* note 105.
109. Tinianow, Smith, Long, & Santori, *supra* note 91.
110. Mattson, *supra* note 84.
111. *Id.*
112. Tinianow, Smith, Long, & Santori, *supra* note 91.
113. *Id.*
114. *Id.*

III. DISTRIBUTED LEDGER SHARES AND THE TRACING DOCTRINE: RESURRECTING SECTIONS 11 AND 12(A)(2) OF THE SECURITIES ACT OF 1933

As decentralized public ledgers are a tremendous technological advancement that will engender significant changes in the financial and legal spheres, it is perhaps unsurprising that such technology has been the subject of considerable analysis from experts in varying fields.[115] In the legal context, much scholarly attention has been devoted to the regulatory effects of decentralized public ledgers.[116] This Part of the Note will evaluate a different legal effect of decentralized ledgers, however—their potential to facilitate claims brought under Sections 11 and 12(a)(2) of the Securities Act. First, this Part details the history and mechanics of Sections 11 and 12(a)(2) of the Securities Act. Next, it explains how judicial interpretation of these sections has imposed a tracing requirement for shareholders seeking relief following fraudulent securities transactions. Lastly, it posits that using decentralized public ledgers to facilitate securities transactions will, for the first time, enable shareholders seeking relief under Section 11 or 12(a)(2) to realistically meet the burden of the judicially-imposed tracing doctrine.

A. Sections 11 and 12(a)(2) of the Securities Act: A History

Congress enacted the Securities Act in 1933 as a response to the disastrous market crash of 1929.[117] It was intended to foster transparency by requiring companies offering securities to make substantive disclosures.[118] To incentivize corporate compliance with the disclosure requirements, the Securities Act incorporates public and private enforcement mechanisms for instances of disclosure fraud.[119] This Note focuses on two sections of the Securities Act that describe private enforcement mechanisms: Section 11 and Section 12(a)(2).[120]

1. Section 11 of the Securities Act

Section 11 details how a security purchaser can bring a private claim against companies that have made material misstatements or omissions in their registration statements.[121] It was included in the Securities Act to

115. *See, e.g.*, Mandjee, *supra* note 2; Kiviat, *supra* note 4; Wright & De Fillippi, *supra* note 6; Reyes, *supra* note 15; Szabo, *supra* note 67.
116. *See* Reyes, *supra* note 15.
117. JAMES D. COX ET AL., SECURITIES REGULATION: CASES AND MATERIALS 3–5 (2013).
118. *Id.*
119. *Id.*
120. *Id.*
121. *See* 15 U.S.C. § 77k(a) (2012).

motivate securities issuers to provide full, truthful disclosures to securities buyers.[122] Part (a) of Section 11 states that

> In case any part of the registration statement, when such part became effective, contained an untrue statement of a material fact or omitted to state a material fact required to be stated therein or necessary to make the statements therein not misleading, any person acquiring such security (unless it is proved that at the time of such acquisition he knew of such untruth or omission) may, either at law or in equity, in any court of competent jurisdiction, sue—
>
> (1) every person who signed the registration statement;
>
> (2) every person who was a director of (or person performing similar functions) or partner in the issuer at the time of the filing of the part of the registration statement with respect to which his liability is asserted;
>
> (3) every person who, with his consent, is named in the registration statement as being or about to become a director, person performing similar functions, or partner;
>
> (4) every accountant, engineer, or appraiser, or any person whose profession gives authority to a statement made by him, who has with his consent been named as having prepared or certified any part of the registration statement, or as having prepared or certified any report or valuation which is used in connection with the registration statement, with respect to the statement in such registration statement, report, or valuation, which purports to have been prepared or certified by him;
>
> (5) every underwriter with respect to such security.
>
> If such person acquired the security after the issuer has made generally available to its security holders an earning statement covering a period of at least twelve months beginning after the effective date of the registration statement, then the right of recovery under this subsection shall be conditioned on proof that such person acquired the security relying upon such untrue statement in the registration statement or relying upon the registration statement and not knowing of such omission, but such reliance may be established without proof of the reading of the registration statement by such

122. *See* Ernst & Ernst v. Hochfelder, 425 U.S. 185, 195 (1976).

person.[123]

A critical component of Section 11 is its liability standard.[124] Shareholders who purchase securities pursuant to a materially misleading registration statement possess a strict liability claim under Section 11.[125] Thus, such shareholders may sue entities associated with the inaccurate registration statement's release for either purposeful or innocent misstatements.[126]

To bring a claim under Section 11, plaintiff shareholders must prove that the registration statement in question contained a material misstatement or omission.[127] If the shareholder purchased their securities within twelve months after the effective date of the registration statement at issue, they need not prove reliance on the statement to make a claim.[128] On the other hand, if shareholders purchased their securities more than twelve months after the effective date of the registration statement at issue, and the issuer has already distributed an earnings statement, the shareholders must demonstrate reliance upon the registration statement.[129]

Several defenses are available to defendants in Section 11 suits. Defendants may invoke the statute of limitations.[130] Defendants may also dispute that the alleged misstatement or omission was material.[131] They can bring a due diligence defense. Alternately, they can try to prove that plaintiffs were aware of the alleged misstatement or omission and relied upon the registration statement anyway.[132]

If the plaintiffs in a Section 11 case succeed in proving their claim and overcoming any defenses, they are entitled to damages equaling the difference between the amount paid for their securities and the actual value of the securities at the time of the suit.[133] The burden then shifts to the defendants to show that the security's value depreciation was due to reasons other than the misleading statements or omissions.[134] Should the defendants fail to make such a defense, they are jointly and severally liable for any judgment given and have the right to contribution.[135]

123. 15 U.S.C. § 77k(a).
124. Herman & MacLean v. Huddleston, 459 U.S. 375, 381–82 (1983).
125. *Id.*
126. *Id.*
127. Hillary A. Sale, *Disappearing Without a Trace: Sections 11 and 12(a)(2) of the 1933 Securities Act*, 75 WASH. L. REV. 429, 435 (2000).
128. *Id.*
129. *Id.*
130. *Id.*
131. *Id.*
132. *Id.*
133. 15 U.S.C. § 77k(e) (2012).
134. *Id.*
135. 15 U.S.C. § 77k(f) (2012).

2. Section 12(a)(2) of the Securities Act

Section 12(a)(2) of the Securities Act is similar in structure and intent to Section 11.[136] However, while Section 11 involves misstatements or omissions in registration statements, Section 12(a)(2) involves misstatements or omissions in a prospectus or oral communication.[137] The section states that

> [a]ny person who . . . offers or sells a security . . . by the use of any means or instruments of transportation or communication in interstate commerce or of the mails, by means of a prospectus or oral communication, which includes an untrue statement of a material fact or omits to state a material fact necessary in order to make the statements, in the light of the circumstances under which they were made, not misleading . . . shall be liable . . . to the person purchasing such security from him. [138]

Thus, to make a Section 12(a)(2) claim, plaintiff shareholders must show the existence of a material misstatement or omission in a prospectus or oral communication.[139] They must also show that they did not know of the misstatement or omission at the time the security was purchased.[140]

In response to such claims, defendants can argue that they "did not know, *and* in the exercise of reasonable care could not have known" of the alleged misstatement or omission.[141] Defendants may also attempt to prove that the alleged misstatement or omission did not affect the security's price or performance.[142] If defendants do not prove their defenses, plaintiffs may receive rescission if they still possess the security, or damages if it has already been resold.[143]

B. Development of the Tracing Doctrine

In the years since Sections 11 and 12(a)(2) of the Securities Act were drafted, judicial interpretation has augmented their pleading standards to include a tracing requirement.[144] Tracing is a "judicially created requirement that to access [S]ections 11 and 12(a)(2) shareholders must plead and prove

136. 15. U.S.C. § 77l(a) (2012).
137. *Id.*
138. *Id.*
139. *Id.*
140. *Id.*
141. Therese H. Maynard, *Liability Under Section 12(2) of the Securities Act of 1933 for Fraudulent Trading in Postdistribution Markets*, 32 WM. & MARY L. REV. 847, 851 (1991).
142. *See id.*
143. 15 U.S.C. § 77l(a) (2012).
144. Sale, *supra* note 127, at 429.

that they bought shares issued either 'in' the public offering for which the registration statement or prospectus was issued, or 'pursuant to' that offering."[145] The tracing doctrine is ultimately a requirement of standing.[146] Unless a plaintiff can establish direct connections between his securities and the registration statements or prospectuses containing misstatements or omissions, courts will not grant him standing to bring a case under either Section 11 or Section 12(a)(2).[147]

The tracing doctrine began as an attempt to resolve perceived judicial confusion over which types of shareholders were entitled to recover under Section 11.[148] There are two types of shareholders who can potentially bring a claim under Section 11 and Section 12(a)(2): 1) original shareholders, or those who were the first purchasers of the security offered; and 2) aftermarket shareholders, or those who purchased the security in the secondary trading markets.[149] Because aftermarket shareholders often purchase securities that have been held by multiple prior purchasers, sometimes years after the securities were first issued, it can be difficult for such shareholders to prove that their securities were issued under a particular offering.[150] Thus, the courts imposed the tracing doctrine requirement to resolve whether or not these aftermarket shareholders were entitled to recover under Sections 11 or 12(a)(2).[151]

Barnes v. Osofsky was one of the first cases to require that plaintiffs trace their securities to a specified offering.[152] A Section 11 case out of the Second Circuit, *Barnes* held that although the language of Section 11 does not limit standing to only original shareholders, Section 11 remedies are nevertheless only available to original shareholders.[153] The court noted that since the purpose of Section 11 was to "[e]nsure full and accurate disclosure through registration," it was "unlikely" that Congress intended a Section 11 remedy for anyone other than original shareholders.[154] To rule otherwise would extend the scope of Section 11 liability too far.[155] The court noted, however, that aftermarket shareholders would be able to pursue remedy under Section 12(a)(2).[156] *Barnes* effectively limited Section 11 claims to original shareholders, as it is extremely difficult for an aftermarket shareholder to

145. *Id.* at 441.
146. *Id.*
147. *Id.* at 441–42.
148. Sale, *supra* note 127 (citing Barnes v. Osofsky, 373 F.2d 269, 271, 273 (2d Cir. 1967)).
149. *Id.* (citing *Barnes*, 373 F.2d at 271).
150. *Id.* (citing *Barnes*, 373 F.2d at 272).
151. *Id.* (citing *Barnes*, 373 F.2d at 272–73).
152. *Id.* at 445; *see also Barnes*, 373 F.2d at 272.
153. *Barnes*, 373 F.2d at 272–73.
154. *Id.* at 272.
155. *Id.*
156. *Id.* at 272, 272 fn.1.

show that their particular shares, which have changed ownership multiple times, were originally issued in connection to an offering containing a material misstatement or omission.[157]

Though *Barnes* established tracing as a requirement, potential plaintiffs were not provided with an explanation of how to meet that requirement until *Kirkwood v. Taylor*.[158] In *Kirkwood*, both individual stockholders and a class of stockholders attempted to trace their securities to an allegedly misleading registration statement.[159] The plaintiffs used four different methods to trace the origin of their securities and, in dismissing three of those methods as insufficient, the court established the steps needed to successfully trace a security.[160]

The first method considered by the court was direct tracing. To show that a plaintiff's shares qualify under direct tracing, the plaintiff must show: 1) a broker indicated interest for the plaintiff buyer in an imminent security issuance; 2) the customer received a copy of the preliminary prospectus for the issuance; 3) a purchase order was written indicating an offering purchase on the part of the plaintiff buyer; 4) the purchase price matched the offering price of the stock in question; 5) a lack of commission existed for the broker; 6) a confirmation slip with language related to the offering was created; and 7) a special brokerage firm code, matching the securities transaction, exists.[161] Plaintiffs have standing only for those shares they can trace using this method.[162] As such, only original shareholders can effectively trace their securities under direct tracing.[163]

The second method considered, and eventually dismissed, by the court in *Kirkwood* was fungible-mass tracing based upon statistical probability.[164] For this argument, plaintiff shareholders claimed that because brokers keep securities in holding accounts, thereby creating one fungible mass of securities, no one can know with certainty which type of security is transferred to an aftermarket shareholder—one from the original offering, or one from a subsequent offering.[165] Accordingly, the plaintiffs argued that statistics should be permitted to show that it was more likely than not their securities were issued as part of the original offering made in relation to the material misstatement or omission.[166] The court acknowledged that

157. Sale, *supra* note 127, at 445.
158. 590 F. Supp. 1375 (D. Minn. 1984).
159. *Id.* at 1378.
160. *Id.* at 1378–83.
161. *Id.* at 1378.
162. *Id.*.
163. Sale, *supra* note 127, at 447–48.
164. Kirkwood, 590 F. Supp. at 1378–79.
165. *Id.*
166. *Id.*

although plaintiffs need not show proof beyond a reasonable doubt to satisfy the tracing doctrine, proof that one's shares "might" have been issued pursuant to a registration statement is insufficient.[167] It noted, however, that future developments in the precision of statistical analysis could render fungible-mass tracing a workable method.[168]

A third method, called contrabroker tracing, was also proffered by the *Kirkwood* plaintiffs.[169] The plaintiffs proposing this method claimed they had purchased their shares from a broker who, in turn, had purchased the shares from another broker in the stock.[170] If the second broker was an underwriter for the original offering, the shareholders argued, their shares could be traced to that original offering.[171] The court dismissed this tracing method, stating that it would require some type of assurance that the broker's account contained only offering shares purchased from the underwriter at the exact moment plaintiffs purchased their shares from the broker.[172] The plaintiffs could offer no such assurance.[173]

Lastly, plaintiff shareholders argued for heritage tracing.[174] They claimed that because they could compare their individual certificates to stock certificates issued in the original offering, they could use the code numbers on those certificates to link their shares to the original offering.[175] The court responded that because total shares in the original offering exceeded total shares recorded on the individual certificates, there was no way to determine if any of the aftermarket shares were truly linked to the offering document.[176]

Thus, only direct tracing could be used to assert standing for a Section 11 claim.[177] Other courts have subsequently extended this direct tracing requirement to claims brought under Section 12(a)(2) as well.[178]

167. *Id.* at 1380.
168. *Id.* at 1378–81.
169. *Id.* at 1381.
170. *Id.*
171. *Id.*
172. *Id.*
173. *Id.*
174. *Id.* at 1382–83.
175. *Id.*
176. *Id.*
177. *Id.*
178. See, e.g., Ballay v. Legg Mason Wood Walker, Inc., 925 F.2d 682 (3d Cir. 1991) (holding that Section 12(a)(2) only applies to original shareholders); *In re* Adams Golf, Inc. Sec. Litig., 176 F. Supp. 2d 216 (D. Del. 2001), *aff'd in part, rev'd in part,* 381 F.3d 267 (3d Cir. 2004) (same); Prof'l Serv. Indus., Inc. v. Kimbrell, No. CIV. A. 90-1326-B, 1992 WL 403639 (D. Kan. July 14, 1992) (same); Warden v. Crown Am. Realty Tr., No. CIV. A. 96-25J, 1998 WL 725946 (W.D. Pa. Oct. 15, 1998), *aff'd*, 229 F.3d 1140 (3d Cir. 2000) (same); First Union Discount Brokerage Servs., Inc. v. Milos, 997 F.2d 835, 843–44 (11th Cir. 1993) (same); Fujisawa Pharm. Co., Ltd. v. Kapoor, 814 F. Supp. 720, 728 (N.D. Ill. 1993) (same); Comeau v. Rupp, 810 F. Supp. 1127, 1154 (D. Kan. 1992); Newman v. Comprehensive Care Corp., 794 F. Supp. 1513, 1524–25 (D. Or. 1992) (same); *In re* Delmarva Sec.

C. *The Tracing Doctrine's Repercussions for Claims Brought Under Sections 11 and 12(a)(2) of the Securities Act*

Judicial implementation of the tracing doctrine has precluded plaintiffs from making successful Section 11 and 12(a)(2) claims in all but a small minority of cases.[179] Not only does direct tracing impede aftermarket shareholders attempting to bring a claim under either Sections 11 or 12(a)(2), but it also restricts the claims of original shareholders who cannot fulfill the rigorous, seven-step direct tracing method outlined in *Kirkwood*.[180] At times, the judicial burdens imposed by the tracing doctrine confuse plaintiffs and even defy logic. In *Stack v. Lobo*, for instance, the court dismissed a Section 12(a)(2) claim because in their complaint, the plaintiffs failed to directly trace their shares and prove they were original purchasers.[181] Such a ruling would make sense, given judicial precedent regarding the tracing requirement, if the defendant corporation had conducted multiple securities offerings.[182] However, the defendant in question had only issued securities once, in their initial public offering ("IPO").[183] Therefore, plaintiffs were automatically original shareholders.[184] Subsequent cases have echoed this line of thinking for both Section 11 and Section 12(a)(2) claims.[185]

Such a restricted construction of standing under Sections 11 and 12(a)(2) of the Securities Act "diminishes [its] remedial purpose"[186] The Securities Act was passed to motivate issuers to accurately disclose critical information to prospective securities purchasers.[187] The tracing doctrine

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Litig., 794 F. Supp. 1293, 1309 (D. Del. 1992) (same); Bennett v. Bally Mfg. Corp., 785 F. Supp. 559, 561–62 (D. S.C. 1992); Bank of Denver v. Se. Capital Grp., Inc., 763 F. Supp. 1552, 1559 (D. Colo. 1991) (same); T. Rowe Price New Horizons Fund, Inc. v. Preletz, 749 F. Supp. 705, 708 n.1 (D. Md. 1990) (same); Grinsell v. Kidder, Peabody & Co., 744 F. Supp. 931, 932–34 (N.D. Cal. 1990) (same); Leonard v. Stuart–James Co., 742 F. Supp. 653, 658 (N.D. Ga. 1990) (same); Mix v. E.F. Hutton & Co., 720 F. Supp. 8, 10–12 (D. D.C. 1989) (same); Anheuser-Busch Cos., Inc. v. Summit Coffee Co., 858 S.W.2d 928 (Tex. App. 1993), *writ denied* (Mar. 30, 1994), *cert. granted, judgment vacated*, 514 U.S. 1001 (1995), and *opinion withdrawn in part*, 934 S.W.2d 705 (Tex. App. 1996), *writ dismissed by agreement* (Oct. 24, 1996) (same); Tregenza v. Great Am. Commc'ns Co., 823 F. Supp. 1409 (N.D. Ill.), *aff'd*, 12 F.3d 717 (7th Cir. 1993) (same); *In re* Phar-Mor, Inc. Sec. Litig., No. CIV. A. 93-521, 1993 WL 623308 (W.D. Pa. Dec. 6, 1993) (same).

179. Sale, *supra* note 127, at 464.
180. *Id.*
181. 903 F. Supp. 1361 (N.D. Cal. 1995).
182. *Barnes*, 373 F.2d at 272.
183. Stack, 903 F. Supp. at 1375.
184. *Id.*
185. *See, e.g.*, Wachovia Equity Sec. Litig. v. Wachovia Corp., 753 F. Supp. 2d 326, 374 (S.D.N.Y. 2011) (holding that plaintiffs did not meet tracing doctrine burden); *In re* Century Aluminum Co. Sec. Litig., 749 F. Supp. 2d 964 (N.D. Cal. 2010) (same); Grand Lodge of Pa. v. Peters, 550 F. Supp. 2d 1363 (M.D. Fla. 2008) (same); Krim v. PCOrder.com, 402 F.3d 489 (5th Cir. 2005) (same).
186. Sale, *supra* note 127, at 462.
187. *Id.* at 430.

subverts this legislative motive, however, by eviscerating the two main means of subjecting securities offerors to private liability—Sections 11 and 12(a)(2)[188] Rather than providing private plaintiffs with an opportunity for redress, the tracing doctrine has altered Sections 11 and 12(a)(2) so severely that, in the words of one scholar, they are now merely a "sword in the hands of defendants."[189]

D. The Potential for Decentralized Public Ledgers to Revitalize Sections 11 and 12(a)(2) of the Securities Act

Although the tracing doctrine remains a stringent requirement, the implementation of decentralized public ledgers into securities markets will foster plaintiff success in achieving the standing now required to bring claims under Sections 11 and 12(a)(2) of the Securities Act. Delaware's nascent system for issuing distributed ledger shares will be employed as an exemplar to illustrate how ledger shares can facilitate plaintiff standing under the tracing doctrine.

When distributed ledger shares are issued by a Delaware corporation, each share purchased by an original purchaser will be permanently logged in Delaware's decentralized public ledger for stocks.[190] When those shares are subsequently sold and repurchased by aftermarket purchasers, each ongoing transfer of ownership will be chronologically linked and stored in the ledger using consensus mechanisms.[191] Thus, for the first time in their history, shares will no longer be fungible goods.[192] Rather than just being able to show *how many* shares they own in a company, distributed ledger shareholders will be able to show *which specific* shares they own in a company.[193] Shareholders will also be able to access the complete transactional history of their shares, from the first offering to any later aftermarket transfers or purchases, at any time by merely accessing the ledger copy stored on their computers.[194]

A decentralized public ledger for securities thus will enable shareholder plaintiffs to easily meet the tracing requirements for Section 11 and 12(a)(2)

188. *See* 15 U.S.C. § 77k(a)–(e).

189. Sale, *supra* note 127, at 464.

190. *See* Mattson, *supra* note 84, at 1; *see generally* Andrea Pinna & Wiebe Ruttenberg, *Distributed Ledger Technologies in Securities Post-Trading: Revolution or Evolution?*, 172 OCCASIONAL PAPER SERIES (Apr. 2016); Shepherd, *supra* note 56; Michael Mainelli & Alistair Milne, *The Impact and Potential of Blockchain on the Securities Transaction Lifecycle* (Swift Inst. Working Paper No. 20155-007, 2016).

191. Mattson, *supra* note 84, at 1.

192. *Id.*

193. David Dinkins, *Delaware Approves Tracking of Stock Ownership on Blockchain, Major Effects*, THE COINTELEGRAPH, (Sept. 20, 2017), https://perma.cc/D5YT-WCCT.

194. Mattson, *supra* note 84, at 1; *see also* Mainelli & Milne, *supra* note 190, at 7–10 (noting the transactional capabilities of blockchain technology).

claims. Consider the direct tracing method outlined in *Kirkwood*.[195] The court described a string of factors that, if shown, indicate a plaintiff fulfilled the direct tracing requirement. These factors include 1) that a broker indicated interest for the plaintiff buyer in an imminent security issuance; 2) the customer received a copy of the preliminary prospectus for the issuance; 3) a purchase order was written indicating an offering purchase on the part of the plaintiff buyer; 4) the purchase price matched the offering price of the stock in question; 5) a lack of commission existed for the broker; 6) a confirmation slip with language related to the offering was created; and 7) a special brokerage firm code, matching the securities transaction, exists.[196] With distributed ledger shares, however, secondary proof methods such as purchase orders and firm codes will no longer be required to link a plaintiff's shares to an offering. Rather, the share itself will be linked to the offering via a substantial, traceable chain of digital data permanently stored in a decentralized public ledger.[197] To fulfill direct tracing requirements, a plaintiff will simply have to provide the court with a copy of the ledger. The result is an easier, cheaper tracing method that will promote private redress for securities fraud.

By increasing the type and number of plaintiffs capable of showing standing under Sections 11 and 12(a)(2), securities-based decentralized public ledgers will better fulfill the underlying purpose and promise of the Securities Act. As previously noted, Congress enacted the Securities Act in reaction to the market crash of 1929.[198] It was intended to foster financial transparency by requiring companies issuing securities to make substantive, public disclosures.[199] This was meant to correct the informational asymmetry that ineluctably separates securities issuers from securities purchasers.[200] Thus, the statutes were written to ensure that securities fraud is not just a matter of public welfare, but also a cause of private injury.[201] If securities issuers are not subject to private liability for material misstatements or omissions regarding the issuance of their securities, they have less incentive to perform due-diligence operations.[202] Yet, by imposing a nearly impossible tracing burden on potential plaintiffs, courts have "departed from the basic canon of statutory interpretation—interpreting the

195. 590 F. Supp. 1375, 1378 (D. Minn. 1984).

196. *Id.*

197. Reyes, *supra* note 15, at 195; *see also* Santori, *supra* note 105, at 2; *see generally* Pinna & Ruttenberg, *supra* note 190; Shepherd, *supra* note 56; Mainelli & Milne, *supra* note 190.

198. Cox, *supra* note 117, at 5–10.

199. *Id.*

200. *Id.*

201. *Id.*

202. Thomas W. Joo, *Who Watches the Watchers? The Securities Investor Protection Act, Investor Confidence, and the Subsidization of Failure*, 72 U.S.C. L. REV. 1071, 1120 (1999).

statute to give it meaning."[203] For, although no language in either Section 11 or Section 12(a)(2) restricts aftermarket shareholders from seeking redress for securities fraud, the tracing doctrine has prevented aftermarket, and even some original, purchasers from making such claims.[204] The advent of decentralized public ledgers will allow both subsets of shareholders to meet their direct tracing obligations and seek appropriate redress.

E. Potential Problems and Proposed Solutions

Although decentralized public ledgers will benefit securities buyers, there are potential problems attendant to such a technological development. For instance, enabling aftermarket shareholders to trace their securities all the way back to an original offering renews the very concerns that led the *Barnes* court to concoct the tracing doctrine in the first place. If any aftermarket shareholder can demonstrate standing through tracing on a decentralized stock ledger, increased accessibility to Section 11 and 12(a)(2) remedies may result in prohibitively large plaintiff groups.[205]

Every time a share is traded, the group of potential aftermarket shareholder plaintiffs grows. In 2016, there were over 1.8 billion trades made on the New York Stock Exchange alone.[206] Thus, over its lifetime, a single share of stock may be traded thousands, or even millions, of times. With a decentralized public ledger to chronologically track and record each of these share trades, the resulting list of shareowners will concurrently stretch to the thousands or millions. In the case of fraud related to a set of shares, a decentralized ledger would thus generate an extensive pool of both original and aftermarket potential plaintiffs.

However, despite the potential for decentralized ledgers to dramatically increase plaintiff pools for private security fraud claims, there are safeguards that will prevent Section 11 and 12(a)(2) claims from becoming judicially untenable or unfairly punitive. First, reducing the burdens of direct tracing through decentralized stock ledger technologies will not automatically result in massive payouts by corporate defendants to millions of plaintiffs. Rather, it will only ease the tracing requirement so that fewer "potentially valid claims" raised by plaintiffs are eliminated "at the pleading stage."[207] To be successful, plaintiffs will still have to prove that a material misstatement or omission exists and that it affected the value of their

203. Sale, *supra* note 127, at 464.
204. Barnes v. Osofsky, 373 F.2d 269, 272 (2d Cir. 1967).
205. *Id.* at 273.
206. *NYSE Group Volume in All Stocks Traded, 2010–Current*, NYSE (Oct. 2017), https://perma.cc/RF5S-XB5P.
207. Sale, *supra* note 127, at 492.

securities.[208] Further, aftermarket plaintiffs who purchased their stock more than twelve months after the initial offering will still have to demonstrate reliance upon that material misstatement or omission.[209] Thus, although decentralized public ledgers have the potential to increase the number of plaintiffs who can meet initial pleading burdens, they will not concurrently increase the liability of defendants.[210] Decentralized public ledgers do not eliminate the need for substantial, extensive discovery into the nature and effect of an alleged misstatement or omission.

Second, although proponents of the tracing doctrine have argued that modifying or eliminating the tracing requirement would increase the likelihood of frivolous shareholder complaints, such arguments belie the structure of the Securities Act itself.[211] Drafters constructed the Securities Act to limit frivolous suits.[212] For instance, Section 11(e) of the Securities Act permits courts to require that plaintiffs post a bond for costs and attorneys' fees, allows the court to assess such costs,[213] and states that the court may actively manage and limit discovery to diminish frivolous claims or claims made solely for settlement.[214] Although decentralized public ledgers may increase prospective plaintiff groups, they do nothing to assist these plaintiff groups with court-assessed costs or settlement-based claims.[215]

Lastly, the public interest purposes of the Securities Act must be recalled before equating an increase in aftermarket purchaser plaintiffs with unfair defendant outcomes. The Securities Act was drafted under the premise that strict private liability would incentivize securities issuers to disclose truthful, complete information to their buyers.[216] Under these parameters, expediting the ability of aftermarket purchasers to bring fraud claims should encourage issuers to be even more diligent in their disclosures. Further, defendants will only be required to pay original and aftermarket shareholder plaintiffs if they choose to settle a case or if they are found guilty of committing fraud.[217] As previously noted, the Securities Act already includes safeguards to protect defendants from frivolous settlements.[218] If defendants are found guilty and are required to issue redress to large

208. 15 U.S.C. § 77l(2).
209. *Id.*
210. Sale, *supra* note 127, at 490–93.
211. *Id.*
212. 15 U.S.C. § 77k(e).
213. *Id.*
214. 15 U.S.C. § 78u-4.
215. Steven Thel, *Section 12(2) of the Securities Act: Does Old Legislation Matter?*, 63 FORDHAM L. REV. 1183, 1184–85 (1995).
216. Cox, *supra* note 117, at 5–10.
217. 15 U.S.C. § 77k; 15 U.S.C. § 77l.
218. 15 U.S.C. § 77k(e).

plaintiff groups, it would only further the remedial intent underlying the Securities Act.[219]

CONCLUSION

Decentralized public ledgers are a technological innovation poised to revolutionize data storage and digital transactions. Much scholarship has been devoted to examining how such ledgers affect currencies, the financial markets, contract execution, value transfer, and other spheres of activity. T his Note has channeled that scholarship to expose and analyze a unique legal juxtaposition—the ability of technologically advanced decentralized ledgers to reinvigorate one of the oldest components of American securities law, the Securities Act of 1933.

Part I detailed the history of decentralized public ledger systems. It explained how these systems function, provided examples of different system frameworks, and concluded with a broad overview of current and future applications of this technology in the financial markets.

Part II focused on a specific subset of the financial markets, the securities markets. It considered how decentralized public ledgers could be applied to securities. It then described how both the SEC and Delaware plan to implement and regulate decentralized public ledger securities.

Finally, Part III of this Note concluded that applying decentralized public ledger technology to securities transactions will enable more plaintiffs to achieve standing under Sections 11 and 12(a)(2) of the Securities Act. It detailed how decentralized ledger stocks will permit a wider range of plaintiffs to meet the burden of the judicially-imposed tracing doctrine. By transforming the tracing doctrine from a nigh-insurmountable obstacle to a mere computer search on a ledger database, more plaintiffs will be able to seek relief under the private causes of action in the Securities Act. Although widening the potential plaintiff pool could create logistical issues for courts and defendants, the internal structure and pleading requirements of the Securities Act will effectively limit frivolous suits. This, in turn, will better fulfill the statutory language and remedial intent of Sections 11 and 12(a)(2) of the Securities Act of 1933.

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219. Cox, *supra* note 117, at 5–10.

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