

NOTES

BROKER-DEALERS FOR VIRTUAL CURRENCY: REGULATING CRYPTOCURRENCY WALLETS AND EXCHANGES

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With the rise of cryptocurrency as a popular investment, cryptocurrency wallets and exchanges have proliferated, offering platforms that allow investors to hold and trade cryptocurrency. Because these platforms hold cryptocurrency on their customers' behalf, they present problems associated with custody. Namely, how do investors ensure that these platforms do not misuse or mishandle their assets? And how will customer assets be treated if a platform enters bankruptcy?

To answer these questions, this Note looks to the experience of broker-dealers, exploring the similarities between the problems confronting cryptocurrency platforms today and the problems that broker-dealers faced in the late 1960s. Widespread broker-dealer failures during the late 1960s revealed problems with mishandled client assets, insufficient capital, and inadequate protection of customer assets in bankruptcy. Similar problems plague cryptocurrency platforms today.

This Note therefore points to the regulation of broker-dealers as a template for how to approach the regulation of cryptocurrency platforms. Looking to the regulatory responses to broker-dealer failures in the late 1960s—including the customer protection rule, net capital rule, and alternative bankruptcy regime created by the Securities Investor Protection Act—this Note proposes that a similar regulatory framework could be applied to cryptocurrency platforms.

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INTRODUCTION

Investors piled into cryptocurrencies¹ in 2017,² fueling a surge in cryptocurrency prices.³ The price of Bitcoin, the most well-known cryptocurrency, increased over 1,000% in 2017.⁴ As a sign of the mania surrounding these new investments, celebrities from Paris Hilton to Floyd Mayweather have endorsed cryptocurrencies.⁵ This new investment was enabled by cryptocurrency wallets and exchanges. These platforms, akin to broker-dealers for virtual currency, are the entities through which many investors hold and trade cryptocurrency.⁶ The rise of these new cryptocurrency platforms raises questions about how they should be regulated.

As with any custodial relationship—in which the custodian holds assets on a customer's behalf—there is a fundamental problem of trust associated with these platforms. Namely, why should customers entrust their cryptocurrency to these platforms? And if these cryptocurrency platforms fail, will customers be able to recover their investments? These are not idle concerns. Cryptocurrency platforms have failed at an exceedingly high rate,⁷ and customers have lost hundreds of millions of dollars as a result.⁸ To answer these questions, this Note looks to the experience of broker-dealers, beginning with the observation that cryptocurrency platforms function much like broker-dealers for cryptocurrency. Just as

1. Cryptocurrencies are digital assets recorded on a decentralized, public ledger. See *infra* section I.A.1 for a description of cryptocurrencies.

2. Companies raised over \$2 billion in the first nine months of 2017 by issuing new cryptocurrency through a process known as an initial coin offering (ICO). See Paul Vigna, *What's an Initial Coin Offering? ICOs Explained in 11 Questions*, *Wall St. J.* (Oct. 2, 2017), <https://www.wsj.com/articles/whats-an-initial-coin-offering-icos-explained-in-11-questions-1506936601> (on file with the *Columbia Law Review*) [hereinafter Vigna, *What's an ICO*].

3. See CRIX, <http://thecrix.de/> [<https://perma.cc/KBE5-CY42>] (last visited Aug. 14, 2018) (showing a significant rise in the CRIX, an index of cryptocurrencies weighted by market value, through 2017).

4. Paul Vigna, *For Bitcoin, a Year Like No Other*, *Wall St. J.* (Dec. 31, 2017), <https://www.wsj.com/articles/for-bitcoin-a-year-like-no-other-1514721601> (on file with the *Columbia Law Review*).

5. See Richard Waters, *To Coin a Craze: Silicon Valley's Cryptocurrency Boom*, *Fin. Times* (Sept. 13, 2017), <http://www.ft.com/content/2b0d8926-96d9-11e7-b83c-9588e51488a0> (on file with the *Columbia Law Review*).

6. This Note uses the term “cryptocurrency platform” to refer to online cryptocurrency wallets and centralized cryptocurrency exchanges. See *infra* section I.A.2 for a discussion of cryptocurrency wallets and exchanges.

7. See *infra* section II.B.4.

8. See *infra* section II.B.2 (discussing the collapse of Mt. Gox, formerly one of the largest Bitcoin exchanges).

broker-dealers enable investors to hold and trade securities,⁹ cryptocurrency platforms allow customers to invest in cryptocurrency.

Customer protection regulation for broker-dealers changed dramatically during the 1970s in response to widespread broker-dealer failures.¹⁰ During the 1960s, there was a significant rise in the stock market, drawing new investors who had previously eschewed stocks.¹¹ In 1952, only 6.5 million Americans owned stocks; by 1965, that number was over 20 million.¹² In the late 1960s, markets experienced a downturn, and broker-dealers failed en masse, leading to severe customer losses.¹³ In response, Congress enacted the Securities Investor Protection Act of 1970 (SIPA),¹⁴ and the SEC promulgated rules intended to address many of the perceived weaknesses leading to broker-dealers' failures in the late 1960s.¹⁵

This Note argues that cryptocurrency platforms face many problems similar to those that plagued broker-dealers during the late 1960s, and, therefore, Congress's and the SEC's responses to these problems provide a potential framework from which to approach regulating cryptocurrency platforms. Part I provides a brief background of cryptocurrency and cryptocurrency platforms and then discusses how broker-dealers are regulated. Part II discusses similarities between broker-dealers in the 1960s and cryptocurrency platforms today and argues that SIPA and the SEC's broker-dealer regulations provide a useful framework from which to approach regulation of cryptocurrency platforms. Part III proposes how the broker-dealer regulatory framework may be adapted to cryptocurrency platforms.

I. CRYPTOCURRENCY PLATFORMS AND REGULATION OF BROKER-DEALERS

This Part begins with a brief overview of cryptocurrency and cryptocurrency platforms and then proceeds to discuss Congress's and the SEC's responses to broker-dealer failures during the late 1960s. Section I.A considers cryptocurrency and the platforms that allow customers to hold and trade cryptocurrencies. Section I.B describes SIPA, including

9. See *infra* section II.A (discussing briefly how broker-dealers are defined under the securities laws).

10. See *infra* section I.B.

11. Wyatt Wells, *Certificates and Computers: The Remaking of Wall Street, 1967 to 1971*, 74 *Bus. Hist. Rev.* 193, 194 (2000).

12. *Id.* at 194–95.

13. See *infra* section I.B.1.

14. Securities Investor Protection Act of 1970, Pub. L. No. 91-598, 84 Stat. 1636 (codified as amended at 15 U.S.C. §§ 78aaa–78lll (2012)).

15. See *infra* sections I.B.2–3 (discussing the customer protection and net capital rules).

the historical context in which Congress enacted the law, and key broker-dealer regulations promulgated by the SEC.

A. *Cryptocurrency and Cryptocurrency Platforms*

1. *What Is Cryptocurrency?* — Cryptocurrencies are digital assets recorded on decentralized, public ledgers.¹⁶ The ledger, known as a blockchain,¹⁷ serves as a record of asset ownership and transfers, much like a land registry.¹⁸ Owning cryptocurrency involves having a private key.¹⁹ This private key, when matched with the public blockchain, allows owners to access their cryptocurrency and transfer it to another person.²⁰ A transfer occurs when it is recorded on the blockchain.²¹ Because the blockchain is maintained through a decentralized process, once a transaction is recorded on the blockchain, it is virtually impossible to reverse.²² This prevents someone from “double-spending,” or transferring the same cryptocurrency twice.²³

While the best-known cryptocurrency may be Bitcoin, there are numerous other types, often referred to as “altcoins.”²⁴ As new coins are

16. See Omri Marian, A Conceptual Framework for the Regulation of Cryptocurrencies, 82 U. Chi. L. Rev. Dialogue 53, 55 (2015), https://chicagounbound.uchicago.edu/cgi/viewcontent.cgi?article=1035&context=uchrev_online (on file with the *Columbia Law Review*).

17. See V. Gerard Comizio, Virtual Currencies: Growing Regulatory Framework and Challenges in the Emerging Fintech Ecosystem, 21 N.C. Banking Inst. 131, 133–35 (2017) (describing the blockchain for Bitcoin).

18. See Marian, *supra* note 16, at 55. Of course, unlike with land, there is no physical possession of property. As such, records on the blockchain serve as the only proof of ownership.

19. See *id.* at 56.

20. See *id.* at 55.

21. The recording is done through a decentralized process known as “mining.” See *id.* (describing the process through which miners update the blockchain).

22. See Lam Pak Nian & David Lee Kuo Chuen, Introduction to Bitcoin, *in* Handbook of Digital Currency: Bitcoin, Innovation, Financial Instruments, and Big Data 5, 19–20 (David Lee Kuo Chuen ed., 2015) [hereinafter Handbook of Digital Currency] (describing how the blockchain is updated by miners who employ high-powered computers to solve computationally intensive problems and how the mining process makes it “exponentially difficult to reverse previous transactions”).

23. See *id.* at 15–16 (discussing how the technology behind Bitcoin solves the “double-spending” problem); François R. Velde, Bitcoin: A Primer, Chi. Fed Letter (Fed. Reserve Bank of Chi., Chi., Ill.), Dec. 2013, at 2, <https://www.chicagofed.org/publications/chicago-fed-letter/2013/december-317> (on file with the *Columbia Law Review*) (“[T]he [B]itcoin protocol provides an elegant solution to the problem of creating a digital currency—i.e., how to regulate its issue, defeat counterfeiting and double-spending, and ensure that it can be conveyed safely—without relying on a single authority.”).

24. See Sarah Jane Hughes & Stephen T. Middlebrook, Advancing a Framework for Regulating Cryptocurrency Payments Intermediaries, 32 Yale J. on Reg. 495, 505 (2015) (describing Bitcoin and altcoins). The term “altcoin” means alternative to Bitcoin. What Is

constantly launched in the market, the list of altcoins grows.²⁵ New altcoins raised over \$2 billion in the first nine months of 2017.²⁶ By one count, there are over 800 cryptocurrencies, though the largest ones make up a disproportionate share of the aggregate market capitalization of cryptocurrencies.²⁷ Because more altcoins are entering the market and each altcoin is different, it is difficult to provide a definition that encompasses them all.²⁸ Nevertheless, they generally follow the structure described above: digital assets recorded on a decentralized blockchain.²⁹ In addition to being recorded on a decentralized blockchain, another factor that distinguishes cryptocurrencies from other digital assets is that they are convertible to legal tender on a cryptocurrency exchange—as opposed to, for example, digital currencies in video games, which generally are not convertible into cash.³⁰

2. *Cryptocurrency Wallets and Exchanges.* — An online cryptocurrency wallet is a service that stores and safeguards cryptocurrency on behalf of customers.³¹ Recall, owning cryptocurrency simply involves having a private key, which allows owners to transfer their cryptocurrency.³² Wallet providers hold private keys on behalf of their customers, acting as their

an Altcoin?, Bitcoin Mag., <https://bitcoinmagazine.com/guides/what-altcoin> [<https://perma.cc/DKB9-DQZE>] (last visited Aug. 11, 2018).

25. These launches are typically done through an ICO. See Vigna, What's an ICO, *supra* note 2.

26. See *id.*

27. Market capitalization is the number of coins in circulation multiplied by the price per coin. See All Coins, CoinMarketCap, <https://coinmarketcap.com/coins/views/all> [<https://perma.cc/SPT3-F3YS>] (last visited Aug. 12, 2018) (listing various types of cryptocurrencies in descending order of dollar market capitalization).

28. See Hughes & Middlebrook, *supra* note 24, at 505 (“[E]stablishing firm definitions [for altcoins] is a challenge’ as these new altcoin variations continue to emerge.” (quoting The Clearing House & Indep. Cmty. of Bankers of Am., *Virtual Currency: Risks and Regulation 2* (2014), <https://www.theclearinghouse.org/~media/Files/Research/20140623-Virtual-Currency-White-Paper.pdf> [<https://perma.cc/UXN9-J8MU>])).

29. Julie Verhage, Camila Russo & Lily Katz, What's an ICO? Like an IPO but with Digital Coins, Bloomberg (Sept. 18, 2017), <https://www.bloomberg.com/news/articles/2017-09-18/what-s-an-ico-like-an-ipo-but-with-digital-coins-quicktake-q-a> (on file with the *Columbia Law Review*) (last updated Oct. 23, 2017) (“Transactions [for cryptocurrency] will take place on a blockchain, the digital ledger technology first developed for [B]itcoin . . .”).

30. See Hughes & Middlebrook, *supra* note 24, at 506.

31. See Nian & Chuen, *supra* note 22, at 18–19. Instead of entrusting private keys to an online wallet, some people choose to manage their own wallets. These personal wallets can be hosted on computers, mobile devices, or specialized hardware. See How to Store Your Bitcoin, Coindesk, <http://www.coindesk.com/information/how-to-store-your-bitcoins> [<https://perma.cc/N52R-PRRS>] (last updated Jan. 20, 2018) (describing various types of cryptocurrency wallets).

32. See *supra* notes 19–20 and accompanying text.

custodians.³³ In fact, when customers hold cryptocurrency in an online wallet, they do not have access to their private keys;³⁴ instead, they must trust their wallet providers to hold the cryptocurrency on their behalf.

Unlike wallets, which simply hold cryptocurrency on their clients' behalf, cryptocurrency exchanges also provide marketplaces where users can trade one cryptocurrency for another or for government-issued currency.³⁵ These exchanges differ in the currency pairs they offer and their fees.³⁶ Fees typically include a commission for each trade and withdrawal fees for transferring cryptocurrency out of the exchange.³⁷ Because the industry is still nascent, cryptocurrency markets are quite fragmented; by one count, there are almost eighty exchanges.³⁸ They are also located in various jurisdictions.³⁹

33. See Nian & Chuen, *supra* note 22, at 18–19.

34. See, e.g., Where Can I Find the Private Keys for My Wallet?, Coinbase, <https://support.coinbase.com/customer/portal/articles/1526452-where-can-i-find-the-private-keys-for-my-wallet> [<https://perma.cc/5AWR-5H3J>] (last visited Aug. 12, 2018) (telling Coinbase customers that they do not have access to the private keys for their cryptocurrency). For a discussion of how online wallets typically hold their customers' cryptocurrency, see *infra* notes 213–218 and accompanying text.

35. See Nirupama Devi Bhaskar & David Lee Kuo Chuen, Bitcoin Exchanges, *in* Handbook of Digital Currency, *supra* note 22, at 559, 559–60.

36. See Best Cryptocurrency Exchanges: The Ultimate Guide, Blockgeeks, <http://blockgeeks.com/guides/best-cryptocurrency-exchanges> [<https://perma.cc/5Z8Y-XE4G>] (last visited Aug. 11, 2018) (listing several cryptocurrency exchanges and how they differ).

37. See, e.g., Coinbase Pricing & Fees Disclosures, Coinbase, <https://support.coinbase.com/customer/portal/articles/2109597-buy-sell-bank-transfer-fees> [<https://perma.cc/4A87-QU9U>] (last visited Aug. 11, 2018) (describing a “transfer” fee for withdrawing cryptocurrency and a commission of “0 to 50 basis points [0.00% to 0.50%]” for buying or selling cryptocurrency); Digital Assets/Cryptocurrency Withdrawal Fees, Kraken, <http://support.kraken.com/hc/en-us/articles/201893608-What-are-the-withdrawal-fees> [<https://perma.cc/8K3J-AVFN>] (last visited Aug. 11, 2018) (describing withdrawal fees based on the currency being withdrawn); Fee Schedule, Kraken, <https://www.kraken.com/help/fees> [<https://perma.cc/6TK6-ELEG>] (last visited Aug. 11, 2018) (outlining per-trade fees for various currency pairs); What Fees Does Bittrex Charge?, Bittrex (May 11, 2017), <http://support.bittrex.com/hc/en-us/articles/115000199651-What-fees-does-Bittrex-charge> [<https://perma.cc/6MAP-8QXZ>] (describing a 0.25% commission and a transfer fee for withdrawal of cryptocurrency).

38. See Cryptocurrency Exchanges/Markets List, CryptoCoinCharts, <https://cryptocoincharts.info/markets/info> [<https://perma.cc/JB6J-GNZ8>] (last visited Aug. 11, 2018).

39. See, e.g., Samuel Gibbs, Bitcoin Worth \$78m Stolen from Bitfinex Exchange in Hong Kong, *Guardian* (Aug. 3, 2016), <https://www.theguardian.com/technology/2016/aug/03/bitcoin-stolen-bitfinex-exchange-hong-kong> [<https://perma.cc/44CV-7W3R>]; Cynthia Kim & Heekyong Yang, Uproar over Crackdown on Cryptocurrencies Divides South Korea, *Reuters* (Jan. 12, 2018), <https://www.reuters.com/article/us-southkorea-bitcoin/idUSKBN1F10YG> [<https://perma.cc/5CAH-QF86>]; Rachel Rose O'Leary, Japan Issues Licenses for 11 Bitcoin Exchanges, *Coindesk* (Sept. 29, 2017), <https://www.coindesk.com/japans-finance-regulator-issues-licenses-for-11-bitcoin-exchanges/> [<https://perma.cc/5CAH-QF86>].

Exchanges combine both wallet and exchange services.⁴⁰ In order to trade on an exchange, customers must hold cryptocurrency in the exchange's wallet.⁴¹ Exchanges execute trades only between customers that have wallets with the exchange. By providing both wallet and exchange services, they are one-stop shops for people who are looking to trade and invest in cryptocurrencies.⁴² Most cryptocurrency trading is done on these exchanges.⁴³

B. *Regulation of Broker-Dealers*

This section turns to regulation of broker-dealers, beginning with the historical context under which Congress and the SEC enacted and implemented various broker-dealer reforms during the early 1970s. Namely, many broker-dealers failed amid market and operational turmoil during the late 1960s.⁴⁴ The section goes on to describe Congress's and the SEC's responses to these broker-dealer failures, including the customer protection rule, net capital rule, and alternative bankruptcy regime for broker-dealers.

perma.cc/SVP6-TZGY]. The fact that so many cryptocurrency exchanges are international presents a potential problem of regulatory jurisdiction that is beyond the scope of this Note.

40. See Bhaskar & Chuen, *supra* note 35, at 560 ("At a Bitcoin exchange, a client can buy, sell, or store [B]itcoins at the exchange rate and in the currency supported by that particular Bitcoin exchange.").

41. See *id.* ("When a client wants to sell [B]itcoins through an exchange, he or she has to transfer those [B]itcoins to the wallet of the exchange. An exchange creates a wallet for every user in their system and one can trade [B]itcoins with this wallet.").

42. These exchanges, in which the platform provides both wallet and exchange services, are known as centralized exchanges. By contrast, *decentralized* exchanges do not require traders to hold cryptocurrency on the exchange's wallet. Instead, traders manage their own wallets, and the decentralized exchange merely facilitates direct, peer-to-peer transactions. See Loi Luu, *Solving the Liquidity Challenge of Decentralized Exchanges*, Coindesk (Aug. 13, 2017), <http://www.coindesk.com/solving-liquidity-challenge-decentralized-exchanges> [<https://perma.cc/T375-BMZT>] (last updated Aug. 14, 2017) ("[F]unds are held by the user in a personal wallet, rather than with a third party."); Antonio Madeira, *What Is a Decentralized Exchange*, CryptoCompare (July 23, 2018), <https://www.cryptocompare.com/exchanges/guides/what-is-a-decentralized-exchange/> [<https://perma.cc/89SB-Z4LW>] ("A decentralized exchange is an exchange market that does not rely on a third party service to hold the customer's funds."). Because this Note addresses issues that arise when customers entrust their assets to a custodian, this Note deals only with centralized exchanges and online wallets. In decentralized exchanges and personally managed wallets, cryptocurrency is never entrusted to a custodian.

43. See Arvind Narayanan et al., *Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction* 259 (2016). Centralized exchanges make up the majority of trading activity in large part because it is difficult to facilitate sufficient liquidity on decentralized exchanges. See Luu, *supra* note 42 (describing the liquidity challenge faced by decentralized exchanges); see also *supra* note 42 (describing the distinction between centralized and decentralized exchanges).

44. See *infra* section I.B.1.

1. *Historical Background.* — In order to understand broker-dealer regulation and its potential application to cryptocurrency platforms, it is helpful to understand its historical background. Congress enacted SIPA in 1970 in response to a series of broker-dealer failures during the late 1960s.⁴⁵ The decade before these failures featured a sustained bull market,⁴⁶ with more and more investors speculating in stocks.⁴⁷ Trading volume increased over 180% from 1963 to 1968,⁴⁸ and brokerages began having difficulty dealing with this new business, not least because securities were still held and delivered in physical (that is, paper) form.⁴⁹ Broker-dealers had to deliver physical securities with each transaction. Often, each transaction required dozens of paper documents.⁵⁰

In order to ease the administrative burden inherent in each transaction, broker-dealers began registering securities in their own name—a practice known as using “street names”—instead of delivering physical securities to customers.⁵¹ Broker-dealers would simply note on their own books that they were holding these securities for a customer.⁵² This blurred the line between a broker-dealer’s securities and its customers’ securities: Instead of separating its own assets from those of its customers, a broker-dealer would instead hold one fungible pool of securities.⁵³ As a result, many broker-dealers began financing themselves with customers’ assets. That is, some would borrow money secured by customers’ securities.⁵⁴ By one estimate, 41% and 33% of broker-dealers’

45. See Abe Mastbaum, *A Practical Guide to U.S. Capital Markets* ch. 11, Westlaw (database updated July 2016).

46. Bull markets are periods of general increases in share prices. See, e.g., Wells, *supra* note 11, at 194 (discussing the bull market during the 1960s). Bear markets are the inverse: periods of general decreases in share prices. See, e.g., *id.* at 216 (discussing the bear market during the late 1960s and early 1970s).

47. See *id.* at 194–95 (“Whereas only about six and a half million Americans owned equities in 1952, over twenty million did so in 1965, and that number had climbed to almost thirty-two million by 1970.”).

48. Harold S. Bloomenthal & Donald Salcito, *Customer Protection from Brokerage Failures: The Securities Investor Protection Corporation and the SEC*, 54 *U. Colo. L. Rev.* 161, 164 (1983).

49. See Neal L. Wolkoff & Jason B. Werner, *The History of Regulation of Clearing in the Securities and Futures Markets, and Its Impact on Competition*, 30 *Rev. Banking & Fin. L.* 313, 317 (2010).

50. See *id.*

51. See Mastbaum, *supra* note 45 (“[I]t became common to register securities in ‘street name,’ that is in the name of the broker-dealer . . . handling the settlements.”).

52. Michael E. Don & Josephine Wang, *Stockbroker Liquidations Under the Securities Investor Protection Act and Their Impact on Security Transfers*, 12 *Cardozo L. Rev.* 509, 529 (1990).

53. *Id.* at 530.

54. See SEC, *Study of Unsafe and Unsound Practices of Brokers and Dealers*, H.R. Doc. No. 92-231, at 134 (1st Sess. 1971) (describing improper hypothecation of customer securities).

assets on the New York Stock Exchange (NYSE) were financed by client assets in 1969 and 1970, respectively.⁵⁵

Even still, broker-dealers faced a paperwork crisis.⁵⁶ There was an insufficient number of back-office employees to process the volume of trading.⁵⁷ Exchanges had to close early so that broker-dealers could work through the backlog of paperwork.⁵⁸ Trades often failed or took extremely long to settle.⁵⁹ Losses caused by failure to receive or deliver securities reached four billion dollars.⁶⁰ Theft was also rampant: Because of the backlog, broker-dealers often lost track of where their securities were, inviting theft.⁶¹ Then-U.S. Attorney General John Mitchell testified that more than \$400 million worth of securities had been stolen between 1969 and 1970.⁶²

Adding to these operational problems, a bear market in 1969 led to a sharp drop in the value of broker-dealers' proprietary holdings and depressed trading volume.⁶³ Broker-dealers, already plagued by operational issues, began failing in the face of reduced trade commissions and severe declines in the value of their proprietary accounts.⁶⁴ Approximately 160 NYSE broker-dealers closed, merged, or filed for bankruptcy during this period.⁶⁵ Customer losses were significant.⁶⁶ In response, Congress enacted SIPA in 1970 to protect customers from losses in the event of subsequent broker-dealer failures,⁶⁷ and the SEC promulgated the customer protection rule and net capital rule, discussed below.

2. *Customer Protection Rule.* — Responding to problems stemming from the commingling of a broker-dealer's assets with those of its customers,⁶⁹ the customer protection rule is intended to separate a broker-dealer's own activities and assets from those of its customers, ensuring that there are sufficient assets to satisfy customers' claims in the

55. Id. at 75.

56. See Wells, *supra* note 11, at 201–02.

57. Id. at 204–06.

58. Bloomenthal & Salcito, *supra* note 48, at 165.

59. See Wells, *supra* note 11, at 203.

60. Wolkoff & Werner, *supra* note 49, at 317–18.

61. See SEC, *supra* note 54, at 145–46.

62. Marjorie Hunter, Big Board Too Busy to Stop 1968–69 Thefts, *N.Y. Times* (June 24, 1971), <https://www.nytimes.com/1971/06/24/archives/big-board-too-busy-to-stop-196869-thefts-haack-tells-senate-of-near.html> (on file with the *Columbia Law Review*).

63. See Wells, *supra* note 11, at 216.

64. See Bloomenthal & Salcito, *supra* note 48, at 165; see also SEC, *supra* note 54, at 14.

65. Wolkoff & Werner, *supra* note 49, at 318.

66. Bloomenthal & Salcito, *supra* note 48, at 166.

67. See 69 Am. Jur. 2d Securities Regulation—Federal § 834, Westlaw (database updated Aug. 2018).

69. See *supra* notes 51–53 and accompanying text.

event of failure.⁷⁰ The rule is primarily composed of two parts: (1) requiring broker-dealers to have possession or control of customer securities and (2) protecting customers' cash.⁷¹

To safeguard customers' securities, the customer protection rule requires a broker-dealer to "promptly obtain and . . . thereafter maintain the physical possession or control of all . . . securities carried by a broker or dealer for the account of customers."⁷² "Promptly" generally means the broker-dealer must assess its inventory of securities each day to ensure that it has sufficient securities to satisfy all of its customers' claims.⁷³ If there is a shortfall, then the broker-dealer must take steps to make up any difference.⁷⁴ For example, if its customers collectively own 250,000 shares of IBM, a broker-dealer must have "possession or control" of 250,000 shares of IBM to satisfy its customers' claims. In addition, the securities held on behalf of customers must be unencumbered—free of any lien or other claim.⁷⁵ In effect, the customer protection rule requires that a broker-dealer have sufficient securities such that, if all of its customers were to simultaneously withdraw their securities, the broker-dealer would be able to deliver *all* of them.

In addition to securities, the customer protection rule also covers customers' cash holdings. Broker-dealers must maintain a deposit in a separate account representing the net amount of funds that the broker-dealer owes to its customers.⁷⁶ The rule governing cash is somewhat more lax than the rule governing securities. Unlike securities, which must be inventoried daily, the net amount of funds owed to customers is calculated only weekly.⁷⁷ However, the customer protection rule also limits broker-dealers' ability to use such cash in risky operations,⁷⁸ limiting the likelihood that there will be a significant cash shortfall.

3. *Net Capital Rule.* — In response to the failure of undercapitalized broker-dealers during the late 1960s and early 1970s, the SEC also

70. See Michael P. Jamroz, *The Customer Protection Rule*, 57 *Bus. Law.* 1069, 1071 (2002).

71. See *id.* at 1070.

72. 17 C.F.R. § 240.15c3-3(b)(1) (2018).

73. See Bloomenthal & Salcito, *supra* note 48, at 168.

74. 17 C.F.R. § 240.15c3-3(d).

75. See *id.* § 240.15c3-3(c)(2), (5).

76. See *id.* § 240.15c3-3(e).

77. See *id.* § 240.15c3-3(e)(3)(i).

78. See Bloomenthal & Salcito, *supra* note 48, at 173 ("The formula prescribed for determining the amount of the deposit is designed to protect customers' cash balances by allowing brokers to deploy customers' cash only in relatively safe areas of the brokerage business.").

promulgated the net capital rule.⁷⁹ Though broker-dealers had been subject to capital requirements since the 1940s, the rules were inadequate.⁸⁰ By 1970, broker-dealers had become leveraged ten to one,⁸¹ with the largest firms exhibiting even higher leverage.⁸² Observing the number of broker-dealer failures during the late 1960s and early 1970s, the SEC concluded that broker-dealers were undercapitalized.⁸³

The net capital rule ensures that broker-dealers maintain adequate liquidity to satisfy their customers' claims.⁸⁴ However, the purpose of the net capital rule is not to avoid broker-dealer failures per se. Instead, the primary purpose of the net capital rule is to ensure that customers can recover their assets in the event of a broker-dealer failure without resorting to formal liquidation proceedings.⁸⁵ In a self-liquidation, a broker-dealer facing financial distress typically sells itself to a financially healthy broker-dealer with relatively few disruptions for the distressed broker-dealer's customers.⁸⁶ Self-liquidations are usually preferred to formal liquidations because they are less costly and result in fewer delays for customers.⁸⁷ For example, during a period of market stress for broker-dealers during the late 1980s, there were eighteen self-liquidations compared to eight formal liquidations.⁸⁸

The net capital rule requires broker-dealers to maintain net capital in excess of certain thresholds. Net capital is essentially the value of the

79. This was done pursuant to the 1975 amendments to the Exchange Act, which directed the SEC to "establish minimum financial responsibility requirements for all brokers and dealers." See Steven L. Molinari & Nelson S. Kibler, *Broker-Dealers' Financial Responsibility Under the Uniform Net Capital Rule—A Case for Liquidity*, 72 *Geo. L.J.* 1, 15–16 (1983) (internal quotation marks omitted) (quoting 15 U.S.C. § 78o(c)(3) (1976)).

80. See *id.* at 5–8 (describing the net capital rule promulgated by the SEC in 1942 and NYSE Rule 325, and how these rules were inadequate).

81. Ten-to-one leverage means that, for every \$100 worth of assets a broker-dealer holds, it has only \$10 of equity. The higher a broker-dealer's leverage, the higher the risk of insolvency. For instance, if the broker-dealer's assets drop in value from \$100 to \$90 in the above example, then its equity will drop from \$10 to \$0, leading to insolvency. See SEC, *supra* note 54, at 74–75 ("[A]t year end 1970, NYSE member firms had \$1.9 billion in equity capital and \$18.6 billion in assets. . . . [T]otal liabilities (including subordinated borrowings) were 90 percent of total assets for NYSE member firms.").

82. See *id.* at 75–76 (describing how the thirteen largest broker-dealers made up approximately 52% of all NYSE members' assets but just 37% of their equity).

83. *Id.*

84. See Molinari & Kibler, *supra* note 79, at 18.

85. Michael P. Jamroz, *The Net Capital Rule*, 47 *Bus. Law.* 863, 863–64 (1992) [hereinafter Jamroz, *Net Capital Rule*]; see also *Net Capital Rule, Exchange Act Release No. 34-31511, 52 SEC Docket 2694, 2697–98* (Nov. 24, 1992) ("A supervised self-liquidation can avoid the delays that might arise in the context of a court-imposed liquidation.").

86. Jamroz, *Net Capital Rule*, *supra* note 85, at 865.

87. *Id.*

88. *Id.*

firm if it were to liquidate.⁸⁹ It is calculated as net worth under Generally Accepted Accounting Principles (GAAP), with various adjustments to reflect a liquidation.⁹⁰ For example, assets that cannot be easily converted into cash, such as real estate or furniture, are excluded from net capital.⁹¹ Most importantly, “haircuts”—discounts to market value—are applied to securities held by the broker-dealer, reflecting the estimated price the broker-dealer would receive in liquidation.⁹² Riskier securities—whose values are more volatile—have a higher haircut whereas safer securities have a lower haircut.⁹³ For example, equity securities are subject to a 15% haircut whereas short-dated Treasury bills are not discounted at all.⁹⁴

The net capital rule provides two methods to benchmark net capital: the basic and the alternative methods. Under the basic method, which most smaller firms use,⁹⁵ the broker-dealer’s “aggregate indebtedness” cannot exceed 1,500% of its net capital,⁹⁶ with aggregate indebtedness defined as the “total money liabilities of a broker or dealer arising in connection with any transaction whatsoever.”⁹⁷ Essentially, under the basic method, broker-dealers cannot have liabilities exceeding fifteen times their net capital.

The alternative method, which most large firms use,⁹⁸ requires the firm to maintain net capital in excess of the greater of \$250,000 or 2% of the amount that is owed by customers to the broker-dealer.⁹⁹ The motivating principle behind the alternative method is that a broker-dealer with

89. See *id.* at 867 (“[T]he [net capital] [r]ule . . . assumes the firm will liquidate.”).

90. *Id.* at 866–67.

91. 17 C.F.R. § 240.15c3-1(c)(2)(iv) (2018) (“Deducting fixed assets and assets which cannot be readily converted into cash . . . including . . . [r]eal estate; furniture and fixtures . . .”).

92. See Jamroz, *Net Capital Rule*, *supra* note 85, at 867.

93. See Molinari & Kibler, *supra* note 79, at 19.

94. Compare 17 C.F.R. § 240.15c3-1(c)(2)(vi)(J) (applying a 15% haircut to equities), with *id.* § 240.15c3-1(c)(2)(vi)(A)(1) (applying a 0% haircut to U.S. government debt with less than three months to maturity).

95. U.S. Gen. Accounting Office, *GAO/GGD-98-153, Risk-Based Capital: Regulatory and Industry Approaches to Capital and Risk* 133–34 (1998), <http://www.gao.gov/assets/160/156259.pdf> [<https://perma.cc/T543-26AM>].

96. 17 C.F.R. § 240.15c3-1(a)(1)(i).

97. *Id.* § 240.15c3-1(c)(1). Some liabilities are excluded from “aggregate indebtedness.” See *id.* § 240.15c3-1(c)(1)(i)–(xv).

98. See Jerry W. Markham & Thomas Lee Hazen, *Broker-Dealer Operations Under Securities and Commodities Law* § 4:2, Westlaw (database updated Nov. 2017) (“[A]pproximately 90 percent of all customer funds in securities held by broker-dealers were covered by the alternate net capital method.”).

99. See Molinari & Kibler, *supra* note 79, 16–17 (describing the net capital requirement as “two percent of customer-related receivables”); see also 17 C.F.R. § 240.15c3-1(a)(1)(ii).

sufficient capital should be able to liquidate itself informally—without resort to the courts.¹⁰⁰

Because the broker-dealer is supposed to have sufficient securities and cash to satisfy all of its customers' claims under the customer protection rule,¹⁰¹ the broker-dealer's net capital is meant to provide an additional cushion to cover the administrative costs of liquidation in the event of failure.¹⁰² Under the alternative method, a broker-dealer complying with both the customer protection and net capital rules would thus have enough securities and cash to satisfy all of its customers' claims plus a sufficient cushion—its net capital—to operate until it returned all of its customers' securities in liquidation.

4. *Broker-Dealer Bankruptcy*. — In addition to the net capital rule, which was intended to obviate the need for formal liquidation proceedings, SIPA created a backstop in the form of an alternative proceeding to Chapter 7 bankruptcy for broker-dealers.¹⁰³ In both Chapter 7 bankruptcy proceedings and liquidation under SIPA, broker-dealer customers are preferred to general creditors in bankruptcy.¹⁰⁴ Specifically, customer property—securities held by the broker for its customers—is separated from the general estate in both Chapter 7

100. See *supra* note 85 and accompanying text. Broker-dealers must resort to liquidation in bankruptcy; they have no recourse to Chapter 11 bankruptcy, which permits the debtor to reorganize itself rather than liquidating. See Richard Lieb, *The Bankrupt Stockbroker*, 1980 *Ann. Surv. Bankr. L.* 353, 355 (“[A] stockbroker is ineligible for Chapter 11 relief.”).

101. See *supra* section I.B.2.

102. See Jamroz, *Net Capital Rule*, *supra* note 85, at 2698 (“While requiring additional amounts of capital will not prevent firms from failing, the additional capital serves as a fund from which the expenses associated with a liquidation can be paid.”).

103. Lieb, *supra* note 100, at 355–56 (“When a SIPA protective decree application is filed . . . that filing by itself automatically stays any stockbroker liquidation proceeding pending under Chapter 7 of the Code . . .”); A. Michael Sabino, *Failed Stockbrokerages and the Bankruptcy Courts in the 21st Century: Bringing Order to Chaos*, 2002 *Ann. Surv. Bankr. L.* 131, 140–41 (describing how SIPA “prevails over” the bankruptcy code for stockbroker liquidations). Chapter 7 bankruptcy is a type of bankruptcy proceeding that involves liquidation of the debtor's assets. This is in contrast to Chapter 11 bankruptcy, which allows the debtor to reorganize itself instead of liquidation. Cf. Lieb, *supra* note 100, at 356 (“Under the [bankruptcy] [c]ode, . . . both stockbrokers and commodity brokers are specifically excluded from eligibility for reorganization under Chapter 11.”).

104. See Thomas W. Joo, *Who Watches the Watchers? The Securities Investor Protection Act, Investor Confidence, and the Subsidization of Failure*, 72 *S. Cal. L. Rev.* 1071, 1119 (1999) (“[M]ost of the business of a liquidation [under SIPA] has great importance to the industry and its customers, and very little to do with the interests of general creditors.”); Lieb, *supra* note 100, at 353 (“Since . . . 1938, the Bankruptcy Act has granted certain priorities to a bankrupt stockbroker's customers over the claims of noncustomer general creditors . . .”).

bankruptcy and liquidation under SIPA.¹⁰⁵ General creditors do not have a claim on customer property; instead, customer property is used only to satisfy customers' claims.¹⁰⁶ Because brokers typically have relatively few assets other than their customers' property,¹⁰⁷ this feature of the bankruptcy regime strongly favors customers.

SIPA established further protections for customers. Seeking an alternative to the bankruptcy code, Congress established the Securities Investor Protection Corporation (SIPC) to oversee bankruptcy proceedings for broker-dealers.¹⁰⁸ In any broker-dealer bankruptcy proceeding, SIPC can step in to manage the liquidation of the broker-dealer.¹⁰⁹ A key difference between SIPC-managed liquidations and Chapter 7 bankruptcy is that the former favors distribution of securities back to customers whereas the latter requires liquidation of securities into cash.¹¹⁰ Investors typically prefer receiving securities rather than cash because in-kind distribution of securities avoids a forced liquidation of investors' holdings. Because distributions under Chapter 7 bankruptcy are based upon the value of the customer's holdings on the date of the bankruptcy filing,¹¹¹ the value of cash distributed in Chapter 7 bankruptcy can deviate from the value of the customer's holdings when there are changes in the market value of the customer's securities between the filing and distribution dates. For example, suppose a customer has 100 Amazon shares in her brokerage account, worth \$1,000 per share as of the bankruptcy filing date. She will be entitled only to

105. See Joo, *supra* note 104, at 1095. There is another category of assets known as "customer name securities"—securities that are registered in the customer's name. These securities are returned to the customer whose name the security is registered in. However, because securities are typically registered in the broker-dealer's name (that is, "street name"), there are typically few customer name securities. See *id.*; see also *supra* note 51 and accompanying text.

106. See Don & Wang, *supra* note 52, at 542 (describing how customer property is distributed among customers); Lieb, *supra* note 100, at 362–63 (same).

107. See Joo, *supra* note 104, at 1095–96 (describing the division of a broker-dealer's estate into three categories—customer name securities, customer property, and a general estate—of which customer property is the largest).

108. *Id.* at 1074.

109. See 11 U.S.C. § 742 (2012) ("SIPC may file an application for a protective decree under [SIPA]. The filing of such application stays all proceedings in the case under [the bankruptcy code] If SIPC completes the liquidation of the debtor, then the court shall dismiss the case.").

110. Compare *id.* § 750 ("The trustee may not distribute a security . . ."), with 15 U.S.C. § 78fff-2(b) (2012) ("[T]he court shall[,] . . . with respect to claims relating to . . . securities[,] . . . authorize the trustee to deliver securities . . .").

111. See 11 U.S.C. § 741(6)(A)(i) (describing how net equity is calculated "at the time of the filing of the petition"). Net equity is the basis upon which customer property is distributed. See *id.* § 752(a) ("The trustee shall distribute customer property ratably to customers on the basis and to the extent of such customers' allowed net equity claims and in priority to all other claims . . .").

\$100,000 (100 shares multiplied by \$1,000 per share) in Chapter 7 bankruptcy, even if her Amazon shares have appreciated to \$1,200 by the time of distribution.¹¹² Distributing securities in kind avoids this problem.

The second difference between Chapter 7 bankruptcy and a SIPC-managed liquidation is that SIPC provides insurance to cover unsatisfied customer claims. As such, if there are insufficient securities to satisfy all of the customers' claims, SIPC is authorized to purchase securities to make up the shortfall.¹¹³ Specifically, SIPC insures up to \$500,000 per customer, of which a maximum of \$250,000 can be cash.¹¹⁴ The insurance protects only the broker-dealer's customers, not its general creditors.¹¹⁵ SIPC itself is funded by assessments on broker-dealers.¹¹⁶ Through SIPC insurance and preference for in-kind distribution of securities in bankruptcy, Congress reformed the broker-dealer bankruptcy process to protect customers from losses.

II. PARALLELS BETWEEN BROKER-DEALERS AND CRYPTOCURRENCY PLATFORMS

Following Part I's description of the problems faced by broker-dealers in the late 1960s, this Part highlights how similar problems are in many ways arising among cryptocurrency platforms. It then argues that SIPA and the regulatory response to broker-dealer failures described in Part I might provide a framework from which to approach regulation of cryptocurrency platforms.

Section II.A briefly explains how cryptocurrency platforms function as the broker-dealers for cryptocurrencies. Sections II.B and II.C highlight how problems that plagued broker-dealers in the late 1960s might arise among cryptocurrency platforms. Section II.B describes the problem of fractional reserves, which is reminiscent of how broker-dealers commingled their own assets with those of their customers during the 1960s, and suggests that recent state efforts to regulate

112. To be sure, if Amazon shares *decrease* in value, then the customer may prefer receiving cash. But, in general, if customers are holding securities for investment purposes, then they would likely prefer to receive the securities in kind, preserving their investment, rather than being forced to effectively sell their securities on the filing date.

113. See 15 U.S.C. § 78fff-2(d) ("The trustee shall . . . purchase securities as necessary for the delivery of securities to customers in satisfaction of their claims . . . in order to restore the accounts of such customers as of the filing date."); Don & Wang, *supra* note 52, at 542–43 (highlighting the "adoption of a provision authorizing SIPC trustees to purchase securities in satisfaction of customer claims").

114. What SIPC Protects, SIPC, <https://www.sipc.org/for-investors/what-sipc-protects> [<https://perma.cc/U4TA-PBXY>] (last visited Aug. 12, 2018).

115. See Joo, *supra* note 104, at 1097.

116. Alexander C. Dill, Broker-Dealer Regulation Under the Securities Exchange Act of 1934: The Case of Independent Contracting, 1994 Colum. Bus. L. Rev. 189, 221.

cryptocurrency are likely to be insufficient. It then briefly highlights the risk of cryptocurrency platform failures. Section II.C argues that, under current law, there are inadequate protections for cryptocurrency platform customers in bankruptcy. Finally, section II.D argues that the broker-dealer reforms enacted in the early 1970s provide an effective framework from which to approach regulation of cryptocurrency platforms.

A. *Cryptocurrency Platforms as Broker-Dealers*

Cryptocurrency platforms functionally act much like broker-dealers for cryptocurrencies.¹¹⁷ Specifically, like broker-dealers, they provide two key functions: (1) acting as custodians for customer assets¹¹⁸ and (2) executing trades for their customers.¹¹⁹

To be considered a broker under the Securities Exchange Act of 1934, an entity must be “engaged in the business of effecting transactions in securities for the account of others.”¹²⁰ Cryptocurrency platforms are “engaged in the business of effecting transactions” on behalf of their customers: Like brokers, they profit by receiving and executing customers’ orders, typically charging customers on a per-trade basis.¹²¹ However, to meet the Exchange Act definition of a broker, cryptocurrencies would need to be considered “securities” for purposes of the federal securities laws.¹²² The SEC, in a report published in July 2017, endorsed a case-by-case determination of whether cryptocurrencies are securities.¹²³ Given

117. A complete statutory analysis of whether cryptocurrency platforms are broker-dealers for purposes of the federal securities laws is beyond the scope of this Note. However, SEC Chairman Jay Clayton has suggested that some cryptocurrency platforms may be operating as broker-dealers. See Public Statement, Jay Clayton, Chairman, SEC, Statement on Cryptocurrencies and Initial Coin Offerings (Dec. 11, 2017), <https://www.sec.gov/news/public-statement/statement-clayton-2017-12-11/> [<https://perma.cc/7HKP-C3EK>] (“I also caution those who operate systems and platforms that effect or facilitate transactions in [cryptocurrencies] that they may be operating . . . broker-dealers that are in violation of the Securities Exchange Act of 1934.”).

118. See *supra* section I.A.2.

119. See *supra* notes 35–37 and accompanying text.

120. 15 U.S.C. § 78c(a)(4)(A) (2012).

121. See *supra* notes 35–37 and accompanying text.

122. 15 U.S.C. § 78c(a)(4)(A) (“The term ‘broker’ means any person engaged in the business of effecting transactions in *securities* for the account of others.” (emphasis added)).

123. Specifically, the SEC endorsed the *Howey* test in determining whether a cryptocurrency is a security for purposes of the federal securities laws. See Report of Investigation Pursuant to Section 21(a) of the Securities Exchange Act of 1934: The DAO, Exchange Act Release No. 81207, at 1, 11–15 (July 25, 2017), <https://www.sec.gov/litigation/investreport/34-81207.pdf> [<https://perma.cc/6ZNF-XBWJ>] (applying the *Howey* test to DAO tokens, a type of cryptocurrency). The *Howey* test was originally developed in *SEC v. W.J. Howey Co.*, in which the Supreme Court defined “investment

this case-by-case approach, the regulatory landscape is uncertain as to which cryptocurrencies are securities and which are not.¹²⁴

However, a detailed analysis of whether cryptocurrency platforms are broker-dealers for purposes of the federal securities laws is not necessary here. Regardless of whether cryptocurrencies are considered securities, cryptocurrency platforms face the same basic problem that plagues broker-dealers—namely, why should customers entrust their assets to the cryptocurrency platform? Because these platforms functionally act much like broker-dealers for cryptocurrency, the experience of broker-dealers provides insight into how cryptocurrency platforms might be regulated, regardless of whether cryptocurrencies are considered securities.¹²⁵

B. *The Problem of “Fractional Reserves” and the Risk of Cryptocurrency Platform Failures*

1. *Fractional Reserves.* — Like brokers, cryptocurrency platforms hold assets on their customers’ behalf. When customers own cryptocurrency on a platform, what they really have is an IOU from the platform.¹²⁶ This presents the same fundamental issue of trust that broker-dealers faced in the late 1960s as stock ownership moved from physical form to being

contract,” a type of security defined in the Securities Act of 1933. 328 U.S. 293, 298–99 (1946) (“[A]n investment contract for purposes of the Securities Act means a contract, transaction or scheme whereby a person invests his money in a common enterprise and is led to expect profits solely from the efforts of the promoter or a third party . . .”).

124. See Paul Vigna, Digital-Coin Companies Shrug Off SEC Scrutiny, *Wall St. J.* (July 26, 2017), <http://www.wsj.com/articles/digital-coin-companies-shrug-off-sec-scrutiny-1501110893> (on file with the *Columbia Law Review*) (highlighting the uncertainty around how the *Howey* test might be applied to other cryptocurrencies). But cf. William Hinman, Dir. of the Div. of Corp. Fin., SEC, Digital Asset Transactions: When *Howey* Met Gary (Plastic) (June 14, 2018), <https://www.sec.gov/news/speech/speech-hinman-061418> [<https://perma.cc/P7NB-SXDJ>] (concluding that Bitcoin and Ether, another popular cryptocurrency, do not appear to be securities under the *Howey* test).

125. It is worth noting that futures commission merchants (FCMs), who execute futures contracts (but not securities transactions) on behalf of customers, are subject to similar regulation as broker-dealers: They are also required to segregate customer assets and are subject to capital requirements. See Futures Commission Merchants (FCMs): Segregation of Customer Funds, CFTC, <https://www.cftc.gov/IndustryOversight/Intermediaries/FCMs/fcmsegregationfunds> [<https://perma.cc/Z5X5-G3BB>] (last visited Aug. 12, 2018) (describing how FCMs are required to segregate customer funds from their own funds); see also Futures Commission Merchants (FCMs): Minimum Adjusted Net Capital Requirements for Futures Commission Merchants and Introducing Brokers, CFTC, <http://www.cftc.gov/IndustryOversight/Intermediaries/FCMs/fcmibminimumnetcapital> [<https://perma.cc/WM57-B8AE>] (last visited Aug. 12, 2018) (describing capital requirements for FCMs). As such, even if cryptocurrencies are considered currencies or commodities (as opposed to securities), regulation of FCMs suggests that the same regulatory principles—protection of customer funds and capital requirements—would apply.

126. See *supra* notes 33–34 and accompanying text (explaining how cryptocurrency wallets act as custodians of customer assets).

held in the broker's name.¹²⁷ When broker-dealers held stock in paper form, customers had physical proof of their stock ownership. Once brokers began holding stocks in "street name," customers had to trust that their brokers were actually holding stock on their behalf. Indeed, before the customer protection rule, brokers often mishandled customer securities, leading to delayed trades or stolen securities.¹²⁸ They also used customer securities for their own purposes. For example, broker-dealers used customer assets to fund their own trading activities.¹²⁹

This same problem—misuse and mismanagement of customer assets—could occur among cryptocurrency platforms. Just as a broker holds customers' assets in its own name, a cryptocurrency platform holds its clients' assets in its own name by managing the private keys.¹³⁰ Because customers do not even have access to these private keys,¹³¹ they must trust that the platform will not misuse their cryptocurrency. Like broker-dealers in the late 1960s, a cryptocurrency platform could use customer assets to fund its own activities, and thus may not hold sufficient assets to satisfy all of its customers' claims—otherwise known as running a fractional reserve.

To illustrate, suppose a platform has only two customers, each owning ten Bitcoin. If the platform holds only fifteen Bitcoin on behalf of customers (using the other five Bitcoin to finance its own trading), then it has insufficient reserves to satisfy all of its customers' claims. If both customers withdraw or sell all of their Bitcoin simultaneously, then the platform will face a shortfall of five Bitcoin as a result of the fractional reserve. Because cryptocurrency platforms are largely unregulated, it is unclear what percentage of client assets are actually held by cryptocurrency platforms. This has led to problems, most famously in the case of Mt. Gox, discussed in the following section.

2. *Mt. Gox*. — Mt. Gox was one of the largest Bitcoin exchanges, handling around 80% of Bitcoin trades at its peak.¹³² In 2013, customers began experiencing months-long delays in withdrawals.¹³³ Finally, in

127. See *supra* notes 49–53 and accompanying text (outlining the transition from paper to "street name" stock ownership).

128. See *supra* notes 56–62 and accompanying text (describing the paperwork crisis and resulting problems).

129. See *supra* notes 54–55 and accompanying text.

130. See *supra* notes 31–33 and accompanying text.

131. See *supra* note 34 and accompanying text.

132. Samuel Gibbs, Head of Mt Gox Bitcoin Exchange on Trial for Embezzlement and Loss of Millions, *Guardian* (July 11, 2017), <https://www.theguardian.com/technology/2017/jul/11/gox-bitcoin-exchange-mark-karpeles-on-trial-japan-embezzlement-loss-of-millions> [<https://perma.cc/NQG5-EXUW>].

133. Robert McMillan, The Inside Story of Mt. Gox, Bitcoin's \$460 Million Disaster, *Wired* (Mar. 3, 2014), <https://www.wired.com/2014/03/bitcoin-exchange/> [<https://perma.cc/DDG2-6KL4>].

February 2014, Mt. Gox collapsed, announcing that it had lost over 750,000 of its customers' Bitcoin, representing several hundred million dollars in losses at the time.¹³⁴ Because it failed under somewhat mysterious circumstances, it is unclear what exactly led to Mt. Gox's demise.¹³⁵ There have been persistent rumors that Mt. Gox was running on a fractional reserve basis, meaning Mt. Gox used customer Bitcoin to fund its own activities.¹³⁶ Regardless of the ultimate cause of Mt. Gox's failure, it is clear that, at the time of its collapse, Mt. Gox had insufficient Bitcoin holdings to satisfy all of its customers' claims.¹³⁷

In many ways, Mt. Gox's collapse echoes the failures of many broker-dealers in the late 1960s. At a minimum, Mt. Gox likely mismanaged customer assets. Just as broker-dealers lost track of customer securities,¹³⁸ Mt. Gox lost most of its Bitcoin by the summer of 2013, months before it declared bankruptcy in February 2014.¹³⁹ Whatever the cause of its collapse—whether intentional pilfering of customer assets or negligence in safeguarding customer deposits—Mt. Gox did not adequately protect its customers' cryptocurrency, leading to insolvency.

Learning from the experience of Mt. Gox, many cryptocurrency platforms now claim that they do not use customer deposits to fund their own activities. For example, Coinbase, a large cryptocurrency platform,

134. See Robin Sidel, Eleanor Warnock & Takashi Mochizuki, *Almost Half a Billion Worth of Bitcoins Vanish*, *Wall St. J.* (Feb. 28, 2014), <https://www.wsj.com/articles/mt-gox-to-hold-news-conference-1393579356> (on file with the *Columbia Law Review*). As of August 15, 2018, those 750,000 lost Bitcoin are worth over \$4.6 billion dollars based on a Bitcoin price of approximately \$6,200 (750,000 Bitcoin x \$6,200). See Bitcoin (USD) Price, Coindesk, <https://www.coindesk.com/price/> (on file with the *Columbia Law Review*) (last visited Aug. 15, 2018).

135. See Comizio, *supra* note 17, at 140 (speculating about possible reasons for Mt. Gox's collapse, including theft, fraud, and mismanagement).

136. See, e.g., Eric Mu, *Why There Should Be a Bitcoin Central Bank*, *Forbes* (Aug. 24, 2014), <http://www.forbes.com/sites/ericxlm/2014/08/24/why-there-should-be-a-bitcoin-central-bank> [<https://perma.cc/R3VU-SCCG>] (speculating that Mt. Gox was operating on a fractional reserve basis, resulting in its collapse); Jon Southurst, *Most Mt Gox Bitcoins Were Gone by May 2013, Report Claims*, Coindesk (Apr. 19, 2015), <https://www.coindesk.com/most-mt-gox-bitcoins-were-gone-by-may-2013-report-claims> [<https://perma.cc/LN9J-RVP2>] (last updated Apr. 21, 2015) (citing a report concluding that Mt. Gox had been "operating on a fractional reserve basis").

137. See Nathaniel Popper, *Mt. Gox Creditors Seek Trillions Where There Are Only Millions*, *N.Y. Times: Dealbook* (May 25, 2016), <https://www.nytimes.com/2016/05/26/business/dealbook/mt-gox-creditors-seek-trillions-where-there-are-only-millions.html> (on file with the *Columbia Law Review*) ("The Japanese trustee overseeing the case said . . . that only \$91 million in assets has been tracked down to distribute to claimants . . . [which represents] a tiny portion of the amount that claimants have requested.").

138. See *supra* notes 56–62 and accompanying text.

139. Ben McLannahan, *MtGox 'Lost Coins' Long Before Collapse*, *Fin. Times* (Apr. 19, 2015), <http://www.ft.com/content/0694b99c-e647-11e4-ab4e-00144feab7de> (on file with the *Columbia Law Review*).

tells its customers: “Customer deposits are not sent anywhere. Unlike other financial institutions, we do not lend out customer funds. 100% of your funds are securely stored.”¹⁴⁰ Another platform tried to use technological solutions to prove that it had adequate reserves to back up client deposits.¹⁴¹ However, absent adequate regulatory oversight, customers who choose to invest in cryptocurrency are still left taking these cryptocurrency platforms at their word.

3. *State Regulation.* — It should be noted that cryptocurrency platforms are not entirely unregulated; several states have begun regulating them, with some even addressing the issue of safeguarding customer assets and the problem of fractional reserves.¹⁴² However, state regulations are unlikely to be sufficient because they are not uniform and are easy to sidestep. The contradictory regulatory approaches of New York and Hawaii highlight these problems.

New York established a framework for regulating cryptocurrency platforms, known as BitLicense, in 2015.¹⁴³ In addition to anti-money laundering and cybersecurity provisions,¹⁴⁴ BitLicense addresses the issue of safeguarding customer assets.¹⁴⁵ Specifically, New York requires cryptocurrency platforms to “hold Virtual Currency of the same type and amount as that which is owed or obligated” to customers.¹⁴⁶ It also prohibits platforms from “selling, transferring, assigning, lending, hypothecating, pledging, or otherwise using or encumbering assets, including Virtual Currency . . . except for the sale, transfer, or assignment of such assets at the direction of [the customer].”¹⁴⁷ By requiring platforms to hold unencumbered cryptocurrency in the amount that is owed to customers, New York’s BitLicense regulation safeguards customer assets and effectively prevents fractional reserves.

140. Does Coinbase Use Customer Deposits for Anything?, Coinbase, <https://support.coinbase.com/customer/portal/articles/667213-does-coinbase-use-customer-deposits-for-anything> [<https://perma.cc/GC2G-TTH3>] (last visited Aug. 11, 2018).

141. This is known as proof of reserves. See Nermin Hajdarbegovic, Kraken Bitcoin Exchange Passes ‘Proof of Reserves’ Cryptographic Audit, Coindesk (Mar. 24, 2014), <https://www.coindesk.com/krakens-audit-proves-holds-100-bitcoins-reserve> [<https://perma.cc/GGV3-PXHW>] (last updated Jan. 6, 2015) (describing how Kraken, a cryptocurrency exchange, implemented and passed a proof-of-reserves audit).

142. See *infra* notes 143–147 and accompanying text.

143. See Press Release, N.Y. State Dep’t of Fin. Servs., NYDFS Announces Approval of First BitLicense Application from a Virtual Currency Firm (Sept. 22, 2015), <http://www.dfs.ny.gov/about/press/pr1509221.htm> [<https://perma.cc/FUG6-XN44>].

144. While cryptocurrency raises novel anti-money laundering issues, they are beyond the scope of this Note.

145. See Press Release, N.Y. State Dep’t of Fin. Servs., *supra* note 143.

146. N.Y. Comp. Codes R. & Regs. tit. 23, § 200.9(b) (2017).

147. *Id.* § 200.9(c).

Hawaii, however, takes a different approach to protecting customer assets. Hawaii's Money Transmitters Act requires cryptocurrency platforms to hold cash reserves, rather than cryptocurrency, against customers' cryptocurrency deposits.¹⁴⁸ For example, a platform holding 100 Bitcoin on behalf of customers would have to hold the dollar equivalent of 100 Bitcoin in cash as reserves. A cryptocurrency platform attempting to comply with both New York and Hawaii's regulations would thus be required to hold *both* 100 Bitcoin (to satisfy New York's requirement to "hold Virtual Currency of the same type and amount as that which is owed or obligated" to customers¹⁴⁹) and the dollar equivalent of 100 Bitcoin in cash (to satisfy Hawaii's requirement).

Faced with precisely such a costly regulatory dilemma, Coinbase simply decided to stop operating in Hawaii.¹⁵⁰ This highlights yet another shortcoming of state regulation: Because state regulation generally only covers activity within the state or involving its residents, it can be easy to sidestep. For example, New York's BitLicense covers only activities involving "New York or a New York Resident," allowing cryptocurrency platforms to potentially circumvent these regulations by avoiding business with New York and its residents.¹⁵¹ Federal legislation, on the other hand, would be more difficult to avoid.

4. *Risk of Platform Failures.* — While Mt. Gox was the largest cryptocurrency exchange to collapse, there have been a plethora of other failures. An early study indicates that 45% of cryptocurrency exchanges have failed, with the median exchange lasting just 381 days.¹⁵² To be sure,

148. Kevin Helms, *Coinbase Exits as Hawaii Requires Bitcoin Companies to Hold Fiat Reserves*, Coindesk (Feb. 28, 2017), <https://news.bitcoin.com/coinbase-exits-as-hawaii-requires-money-transmitter-license/> [<https://perma.cc/D977-TU2K>] (describing Hawaii's money transmitter license requirements as applied to cryptocurrency platforms); see also Haw. Rev. Stat. § 489D-8 (2018) ("A licensee, at all times, shall possess permissible investments having an aggregate market value . . . of not less than the aggregate amount of all outstanding payment obligations."). "Permissible investments" are generally cash or cash-like instruments. See *id.* § 489D-4.

149. N.Y. Comp. Codes R. & Regs. tit. 23, § 200.9(b).

150. See Helms, *supra* note 148.

151. N.Y. Comp. Codes R. & Regs. tit. 23, § 200.2(q). Kraken, a cryptocurrency exchange, decided to stop operating in New York to avoid New York's BitLicense regime. See David Floyd, *Kraken CEO: Crypto Exchange Won't Answer New York AG's Inquiry*, Coindesk (Apr. 18, 2018), <http://www.coindesk.com/kraken-ceo-crypto-exchange-wont-comply-with-new-york-inquiry> [<https://perma.cc/2HGU-ESC6>] (last updated Apr. 19, 2018). But cf. Hughes & Middlebrook, *supra* note 24, at 540–41 (discussing how, as a practical matter, it may be difficult for cryptocurrency platforms "to avoid engaging in activity that involves New York").

152. See Tyler Moore & Nicolas Christin, *Beware the Middleman: Empirical Analysis of Bitcoin-Exchange Risk*, in *Financial Cryptography and Data Security* 25, 28 (Ahmad-Reza Sadeghi ed., 2013). By another count, thirty-six exchanges had failed as of 2015. See Luke Parker, *36 Bitcoin Exchanges that Are No Longer with Us*, *Brave New Coin* (Oct. 23,

some of these failures likely reflect the growing pains of a nascent and fast-moving industry. Nevertheless, the prevalence of failures suggests that more could be done to protect customer assets, since customers are often unable to reclaim their lost cryptocurrency holdings following exchange failures.¹⁵³

To date, hacking has been the most common reason behind cryptocurrency platform failure.¹⁵⁴ But in addition to hacking, cryptocurrency platforms could fail due to inadequate risk management or excessive risk taking. Like any broker-dealer who holds risky assets, cryptocurrency platforms operate with the risk of insolvency. Any cryptocurrency platform that trades or holds cryptocurrency on its own behalf is subject to the vagaries of the cryptocurrency market. Coinbase, for example, holds a significant inventory of cryptocurrency to facilitate trades and payments.¹⁵⁵ While the company “runs complex software that monitors price fluctuations and responds almost instantly in an effort to avoid serious losses,”¹⁵⁶ past financial crises demonstrate that losses are not always predictable. A market downturn would also likely dampen trading activity, reducing commission revenue for cryptocurrency platforms. Just as the market downturn in the late 1960s led to widespread broker-dealer failures,¹⁵⁷ an unforeseen downturn could render some cryptocurrency platforms insolvent.

C. *Cryptocurrency Platform Bankruptcy*

Given the problem of fractional reserves and the risk of platform failures, the bankruptcy procedure for cryptocurrency platforms may prove to be important. Unfortunately, the current procedure is potentially deficient. Instead of a SIPC-managed liquidation, which is available only for registered broker-dealers, cryptocurrency platforms are subject to Chapter 7 bankruptcy.¹⁵⁸ As such, in bankruptcy, customers

2015), <https://bravenewcoin.com/news/36-bitcoin-exchanges-that-are-no-longer-with-us/> [<https://perma.cc/77YP-DJWS>].

153. See Moore & Christin, *supra* note 152, at 27–28.

154. See *id.* at 26–27 (identifying breaches in nine out of forty exchanges examined).

155. See Cade Metz, *The Next Big Thing You Missed: There’s a Sure-Fire Way to Control the Price of Bitcoin*, *Wired* (Jan. 14, 2014), <https://www.wired.com/2014/01/bitcoin-derivatives/> [<https://perma.cc/7KRH-L2NG>] (“Coinbase holds an awful lot of [B]itcoin in its own digital wallets.”).

156. *Id.*

157. See *supra* notes 63–64 and accompanying text.

158. SIPC-managed liquidations are available only to SIPC members, who are broker-dealers registered under the Securities Exchange Act. See 15 U.S.C. § 78ccc(2)(A) (2012) (“SIPC shall be a membership corporation the members of which shall be all persons registered as brokers or dealers under [the Securities Exchange Act] . . .”). Cryptocurrency platforms are not registered as broker-dealers under the Securities Act.

receive the value of their liquidated cryptocurrency in cash instead of receiving their cryptocurrency in kind.¹⁵⁹

However, many customers, especially those holding cryptocurrency as an investment, likely prefer to receive cryptocurrency rather than a forced liquidation of their investments.¹⁶⁰ First and foremost, empirical analysis suggests that cryptocurrency is “primarily held for investment purposes,” not as a medium of exchange.¹⁶¹ Moreover, in bankruptcy, the value of a customer’s claim is determined by the value of her holdings “at the time of the filing of the [bankruptcy] petition.”¹⁶² As such, changes in value between filing date and ultimate recovery are ignored. Given the volatility of cryptocurrencies, the value of what customers receive in cash might diverge substantially from the value of their cryptocurrency.¹⁶³ Finally, returning cryptocurrency to customers is likely faster and less costly than liquidation into cash.

Mt. Gox’s bankruptcy proceedings illustrate this preference for in-kind distribution over distribution of cash. A group of Mt. Gox’s former customers requested that their bankruptcy payouts be done in Bitcoin rather than cash in part because they believe Bitcoin is “superior” to cash.¹⁶⁴ Further, pending ongoing bankruptcy proceedings, Mt. Gox’s customers appear to be entitled only to the market price of their Bitcoin holdings as of April 2014, when the court ordered liquidation of the exchange.¹⁶⁵ At the time, Bitcoin was worth approximately \$483.¹⁶⁶ As of

See *supra* notes 120–124 and accompanying text (discussing whether cryptocurrency platforms might be considered broker-dealers).

159. See, e.g., Order Granting Receiver’s Motion for Authorization to Liquidate Certain Cryptocurrencies Secured by the Receiver at 1–2, *Leidel v. Project Inv’rs, Inc.*, No. 9:16-cv-80060-MARRA (S.D. Fla. Oct. 5, 2016), <http://cryptsyreceivership.com/v1/wp-content/uploads/2016/06/Oct-5-2016-Order-to-Liquidate-Certain-Cryptocurrencies.pdf> [<https://perma.cc/7BYG-9PEX>] (ordering the receiver to liquidate cryptocurrencies).

160. See *supra* notes 110–112 and accompanying text.

161. See Dirk G. Baur et al., *Bitcoin: Medium of Exchange or Speculative Assets?* 15–16 (Sept. 26, 2017) (unpublished manuscript), <https://ssrn.com/abstract=2561183> (on file with the *Columbia Law Review*) (concluding that Bitcoin is primarily “held for investment purposes” based on analysis of Bitcoin transaction data).

162. 11 U.S.C. § 741(6)(A)(i) (2012).

163. See, e.g., *supra* note 134 and accompanying text (illustrating the dramatic change in value of Bitcoin since Mt. Gox’s bankruptcy).

164. Ben McLannahan, *Mt Gox Creditors Want Payouts in Bitcoins*, *Fin. Times* (July 23, 2014), <http://www.ft.com/content/ed3b578e-1258-11e4-a581-00144feabdc0> (on file with the *Columbia Law Review*).

165. Alexandra Harney & Steve Stecklow, *Twice Burned—How Mt. Gox’s Bitcoin Customers Could Lose Again* (Nov. 16, 2017), <https://www.reuters.com/investigates/special-report/bitcoin-gox/> [<https://perma.cc/SD7F-FR8L>]. While Mt. Gox is being liquidated under Japanese bankruptcy law, U.S. Chapter 7 bankruptcy has the same general principle. See *supra* note 111 and accompanying text (noting that, under Chapter 7 of the bankruptcy code, the values of claims are fixed as of the bankruptcy filing date).

166. Harney & Stecklow, *supra* note 165.

August 2018, it is worth over \$6,200,¹⁶⁷ potentially leaving customers with significant forgone gains. Furthermore, after all creditors are paid, Mt. Gox's shareholders will receive any surplus. Without a preference for distribution of cryptocurrency in kind rather than liquidation to cash, Mt. Gox could potentially reap the gain from its customers' Bitcoin investments.¹⁶⁸

An additional source of uncertainty in cryptocurrency platform bankruptcy is whether customers' claims would be prioritized against those of general creditors. Because cryptocurrency platforms are not SIPC members, their liquidations are governed by the bankruptcy code.¹⁶⁹ The bankruptcy code has special provisions for stockbroker liquidations that generally benefit the stockbroker's customers over other creditors.¹⁷⁰ Specifically, customer assets are used only to satisfy customers' claims; general creditors do not have claims to customer property.¹⁷¹

Under current law, however, it is unclear whether a cryptocurrency platform would be considered a "stockbroker" and thus subject to these special provisions. The bankruptcy code defines "stockbroker" as an entity "that is engaged in the business of effecting transactions in securities . . . for the account of others."¹⁷² Given the SEC's case-by-case approach to determining whether cryptocurrency is a security,¹⁷³ there is at least some uncertainty as to whether cryptocurrency platforms are "effecting transactions in securities" for purposes of the bankruptcy code.¹⁷⁴ Without these special provisions, customers' assets might be used to satisfy the claims of general creditors in bankruptcy.

D. *Broker-Dealer Regulation as a Framework for Regulating Cryptocurrency Platforms*

In light of the similarities between the problems faced by cryptocurrency platforms and broker-dealers, this section argues that broker-dealer regulation provides a robust framework with which to approach regulation of cryptocurrency platforms. This section assesses the three elements of the broker-dealer regulatory framework described in section I.B—the customer protection rule, net capital rule, and broker-dealer bankruptcy regime—in the context of cryptocurrency platforms. It

167. See Bitcoin Price, *supra* note 134.

168. See Harney & Stecklow, *supra* note 165.

169. See *supra* note 158 and accompanying text.

170. See 11 U.S.C. § 752 (2012) (describing how "customer property" is first distributed to customers, not general creditors).

171. See *supra* notes 104–107 and accompanying text.

172. 11 U.S.C. § 101(53A)(B).

173. See *supra* note 123 and accompanying text.

174. 11 U.S.C. § 101(53A)(B) (emphasis added).

argues that this framework could address many of the problems identified in sections II.B and II.C. The section concludes with a brief discussion of the potential for private solutions to these problems.

1. *Customer Protection Rule.* — As illustrated in section II.B.1, cryptocurrency platforms face the same problem that broker-dealers did in the late 1960s: the potential for these platforms to misuse their customers' assets.¹⁷⁵ As the Mt. Gox example suggests, mismanagement of customer cryptocurrency can result in serious customer losses.¹⁷⁶ A customer protection rule would ensure that cryptocurrency platforms act as custodians for customer assets by requiring that the platforms take stock of their cryptocurrency on a daily basis to ensure that they keep sufficient assets to satisfy all of their customers' claims.¹⁷⁷ Such a rule would have likely alerted Mt. Gox to the fact that it had lost its customers' cryptocurrency long before it declared bankruptcy, potentially avoiding such a catastrophic collapse.

A customer protection rule would effectively prevent cryptocurrency platforms from running fractional reserves. To understand why fractional reserves are not appropriate for cryptocurrency platforms, it is worth considering how broker-dealers differ from banks. Banks run fractional reserves as a matter of course.¹⁷⁸ However, broker-dealers have a fundamentally different business model than banks. Whereas banks pay customers interest for their deposits and then use those deposits to fund other activities such as loans,¹⁷⁹ broker-dealers do not pay customers interest on their assets or use customer assets to fund other activities; instead, they typically profit by charging their clients for trades.¹⁸⁰ Moreover, because banks engage in maturity transformation—borrowing short-term from depositors and lending longer term (such as a thirty-year mortgage)—they have access to the central bank, which provides liquidity to the bank if it has insufficient cash to meet its short-term obligations.¹⁸¹ Unlike banks, broker-dealers do not have recourse to the central bank because they do not engage in maturity transformation. On the spectrum between broker-dealers and banks, cryptocurrency

175. See *supra* section II.B.1.

176. See *supra* notes 134–139 and accompanying text.

177. See *supra* section I.B.2.

178. See Xavier Freixas et al., *Lender of Last Resort: What Have We Learned Since Bagehot?*, 18 *J. Fin. Servs. Res.* 63, 64 & 80 n.2 (2000).

179. See *id.* at 64 (“A distinguishing characteristic of banks is that their assets are largely illiquid term loans while their liabilities predominantly are unsecured short-term deposits.”).

180. See Markham & Hazen, *supra* note 98, § 3:1 (noting that receiving compensation for facilitating transactions is a hallmark of the broker-dealer).

181. See Freixas et al., *supra* note 178, at 64 (discussing the central bank's lender of last resort function as a response to bank runs).

platforms fall on the side of broker-dealers. Like broker-dealers, they are in the business of effecting transactions for customers and do not have access to the central bank. As such, cryptocurrency platforms, like broker-dealers, should not be allowed to run fractional reserves.

To be sure, a customer protection rule could impose higher costs upon customers relative to a world in which cryptocurrency platforms could run fractional reserves, since it is economically costly to have assets sitting idle that could otherwise be used to fund productive ventures. These costs are passed on to customers. For example, in addition to per-trade fees, broker-dealers often impose minimum-balance requirements on their customers.¹⁸² Similarly, cryptocurrency platforms often charge their customers withdrawal fees for transferring cryptocurrency out of the platform's wallet.¹⁸³ Contrast these fee structures with that of banks: Because they run fractional reserves, banks not only pay interest on customer deposits, they also often offer their customers "free" services, such as free checking.¹⁸⁴ Nevertheless, because cryptocurrency platforms hold themselves out as custodians of customer assets,¹⁸⁵ it is appropriate to treat them as such.

In addition, a customer protection rule would not drastically affect most cryptocurrency platforms. Many cryptocurrency platforms claim that they do not run fractional reserves, suggesting that they already hold sufficient assets to satisfy all of their customers' claims.¹⁸⁶ A customer protection rule would simply apply a regulatory approach consistent with how these cryptocurrency platforms claim to operate.

2. *Net Capital Rule.* — In light of a slew of cryptocurrency platform failures,¹⁸⁷ capital requirements for these platforms may also be prudent. Ensuring that platforms retain sufficient capital would help cushion them against adverse movements in the market and ensure that, in the event of their failure, customers could still receive their cryptocurrency holdings. Just like broker-dealers during the late 1960s, inadequately capitalized platforms with significant proprietary holdings of risky assets

182. See, e.g., What to Expect When You Open a Brokerage Account, FINRA, <http://www.finra.org/investors/what-expect-when-you-open-brokerage-account> [<https://perma.cc/5VPG-CUV9>] (last visited Aug. 12, 2018) (advising customers to ask brokerages about "[f]ees for not maintaining a minimum balance").

183. See *supra* note 37 and accompanying text.

184. See, e.g., Press Release, Consumer Fin. Prot. Bureau, CFPB Takes Action Against M&T Bank for Deceptively Advertising Free Checking (Oct. 9, 2014), <https://www.consumerfinance.gov/about-us/newsroom/cfpb-takes-action-against-mt-bank-for-deceptively-advertising-free-checking> [<https://perma.cc/3Z7E-DQL4>] (describing a CFPB enforcement action against a bank for deceptively advertising free checking).

185. See *supra* notes 33–34 and accompanying text.

186. See *supra* notes 140–141 and accompanying text.

187. See *supra* section II.B.4.

may become insolvent during a severe downturn, resulting in customer losses.

Moreover, the goal of the net capital rule—to ensure that customers can recover their assets in the event of a broker-dealer failure¹⁸⁸—appears appropriate for cryptocurrency platforms. Unlike in the case of banks or other highly interconnected financial institutions that pose systemic risk,¹⁸⁹ the goal for cryptocurrency platforms need not be to avoid failures per se. First, cryptocurrencies, despite their significant growth, are still a relatively small portion of the financial markets. In aggregate, cryptocurrency market capitalization is approximately \$200 billion.¹⁹⁰ By comparison, the U.S. equity market is approximately \$32 trillion.¹⁹¹ Second, to date, cryptocurrency platforms have been standalone entities instead of interconnected financial institutions.¹⁹² As such, it is unlikely that the bankruptcy of a single cryptocurrency platform would trigger cascading failures and pose systemic risk. Given cryptocurrency platforms' relatively small size and independence from other financial institutions, the goal of capital requirements, like in the broker-dealer context, need not be to avoid failures altogether but rather should be to avoid significant customer losses in the event of a platform failure.

3. *Bankruptcy and Insurance.* — The bankruptcy regime for broker-dealers also provides a strong framework for resolving failing cryptocurrency platforms. A SIPC-like liquidation procedure, in which customers could receive their cryptocurrency rather than the dollar value of their liquidated investments, would be an improvement over the traditional

188. See *supra* notes 84–85 and accompanying text.

189. Systemic risk refers to the risk of harm to the financial system as a whole. For example, the failure of a large bank may have follow-on effects that adversely affect the entire financial system. See Freixas et al., *supra* note 178, at 68–70 (describing how banks pose systemic risk).

190. Steven Russolillo, Paul Vigna & Akane Otani, *Cryptocurrency Market Plumbs New Depths in 2018*, *Wall St. J.* (Aug. 14, 2018), <https://www.wsj.com/articles/cryptocurrency-market-plumbs-new-depths-in-2018-1534241274> (on file with the *Columbia Law Review*).

191. Sec. Indus. & Fin. Mkts. Ass'n, *2018 Fact Book 30* (2018), <https://www.sifma.org/wp-content/uploads/2017/08/US-Fact-Book-2018-SIFMA.pdf> [<https://perma.cc/W4WZ-SLEA>]. U.S. bond markets are even larger at \$41 trillion. See *Bonds Outstanding*, SIFMA, <http://www.sifma.org/resources/research/bond-chart> [<https://perma.cc/P2FT-6F88>] (last visited Aug. 12, 2018).

192. This may change, as traditional financial players consider entering cryptocurrency markets. See, e.g., Paul Vigna, Telis Demos & Liz Hoffman, *Goldman Sachs Explores a New World: Trading Bitcoin*, *Wall St. J.* (Oct. 2, 2017), <https://www.wsj.com/articles/goldman-sachs-explores-a-new-world-trading-bitcoin-1506959128> (on file with the *Columbia Law Review*) (“Goldman Sachs . . . is weighing a new trading operation dedicated to [B]itcoin and other digital currencies, the first blue-chip Wall Street firm preparing to deal directly in this burgeoning yet controversial market . . .”).

bankruptcy process, which requires liquidation to cash.¹⁹³ As discussed in section II.C, customers holding cryptocurrency for investment purposes would likely prefer to receive cryptocurrency in kind rather than the dollar equivalent;¹⁹⁴ a SIPC-like proceeding would enable this result.

In addition, a SIPC-like bankruptcy regime would help resolve any uncertainty about whether customers' claims are prioritized to those of general creditors.¹⁹⁵ Unlike debt or equity claimants in bankruptcy, customers of cryptocurrency platforms are not "investing" in the platform. Instead, they are entrusting their assets to the platform for safekeeping. As such, their assets should be segregated from the general estate in bankruptcy. A SIPC-like bankruptcy regime would achieve this goal.¹⁹⁶ Moreover, it would be incongruous to protect customers of broker-dealers but not customers of cryptocurrency platforms because investors may expect to receive similar protection in both contexts.

Finally, insurance akin to that provided by SIPC could help further protect customers from losses. SIPC has been remarkably successful in fulfilling its mandate to protect customer funds. From 1971 to 2016, only 356 out of 767,300 customer claims were unsatisfied; these 356 unsatisfied claims exceeded the dollar limits under SIPA.¹⁹⁷ Finally, SIPC's funding model, based on assessments on broker-dealers,¹⁹⁸ would ensure that cryptocurrency platforms collectively bear the risk of their failures.

4. *Potential for Private Solutions.* — Some of the issues highlighted above do not preclude the possibility of private solutions. While problems with the bankruptcy process for cryptocurrency platforms may require changes to the bankruptcy code, problems regarding custody of customer assets or inadequate capital do not necessarily require governmental solutions. For example, a self-regulatory organization (SRO)—a private organization that regulates its own industry¹⁹⁹—could set custody and capital requirements for member platforms and punish members who violate those standards.

193. See *supra* note 110 and accompanying text.

194. See *supra* notes 160–163 and accompanying text.

195. See *supra* notes 169–174 and accompanying text (describing the uncertainty around whether customers of cryptocurrency platforms are prioritized over general creditors under current law).

196. See *supra* notes 104–107 and accompanying text (describing how customers are prioritized over general creditors in a SIPC-managed liquidation).

197. See Norman S. Poser, James A. Fanto & Jill I. Gross, *Broker-Dealer Law and Regulation* § 12.03[C], at 12-41 (4th ed. Supp. 2018).

198. See *supra* note 116 and accompanying text.

199. See Emily Hammond, *Double Deference in Administrative Law*, 116 *Colum. L. Rev.* 1705, 1714–17 (2016) (describing the structure of self-regulatory organizations).

In fact, SROs have been prevalent in the securities industry for many years.²⁰⁰ For example, before the advent of the net capital rule, the NYSE required its members to hold a minimum amount of capital.²⁰¹ Today, the Financial Industry Regulatory Authority (FINRA), an SRO that governs broker-dealers,²⁰² enforces, among other things, the net capital rule and customer protection rule.²⁰³ It is at least conceivable that an SRO could play a similar role in the nascent cryptocurrency industry.²⁰⁴

There is some early evidence that cryptocurrency platforms may privately establish industry standards. Several cryptocurrency exchanges recently formed an SRO, the Virtual Commodity Association (VCA), to oversee cryptocurrency marketplaces.²⁰⁵ The VCA hopes to establish “[a] thoughtful SRO framework that provides a virtual commodity regulatory

200. See William A. Birdthistle & M. Todd Henderson, *Becoming a Fifth Branch*, 99 *Cornell L. Rev.* 1, 13–24 (2013) (describing the evolution of SROs in the securities industry since before the New Deal).

201. See Molinari & Kibler, *supra* note 79, at 7–8. The NYSE’s rule proved inadequate during the late 1960s in part due to inadequate enforcement by the NYSE. *Id.* This raises the natural question whether private actors have adequate incentives to regulate themselves. For a comparison of the differing enforcement incentives of SROs versus government actors in the context of securities laws, see James J. Park, *Rules, Principles, and the Competition to Enforce the Securities Laws*, 100 *Calif. L. Rev.* 115, 143–62 (2012). Whether government regulators or private actors such as SROs are best suited to regulate cryptocurrency platforms is beyond the scope of this Note.

202. See FINRA, *About FINRA*, <http://www.finra.org/about> [<https://perma.cc/TB2H-5SVU>] (last visited Aug. 24, 2018) (“FINRA is dedicated to investor protection and market integrity through effective and efficient regulation of broker-dealers.”). The SEC oversees FINRA’s rulemaking and enforcement activities. See Hammond, *supra* note 199, at 1734–39 (describing the SEC’s oversight of FINRA).

203. See Markham & Hazen, *supra* note 98, § 4.40 n.4 (“FINRA may, where a firm is in violation of the net capital rule, direct it to cease operations, or it may impose other restrictions.”); see also, e.g., Press Release, FINRA, *FINRA Fines Wedbush Securities Inc. \$1.5 Million for Customer Protection, Net Capital Rule Violations and Related Failures* (Feb. 5, 2018), <http://www.finra.org/newsroom/2018/wedbush-securities-fined-15-million-customer-protection-net-capital-violations> [<https://perma.cc/Y87G-PWMJ>] (describing fines by FINRA for violations of the customer protection and net capital rules).

204. For a discussion of the viability of a cryptocurrency SRO, see Ryan Clements, *Can a Cryptocurrency Self-Regulatory Organization Work? Assessing Its Promise and Likely Challenges*, *The FinReg Blog* (June 21, 2018), <https://sites.duke.edu/thefinregblog/2018/06/21/can-a-cryptocurrency-self-regulatory-organization-work-assessing-its-promise-and-likely-challenges/> [<https://perma.cc/C3E7-QHMF>].

205. See Paul Vigna, *Winklevoss Effort to Self-Regulate Cryptocurrency Gets Members*, *Wall St. J.* (Aug. 20, 2018), <https://www.wsj.com/articles/winklevoss-effort-to-self-regulate-cryptocurrency-gets-members-1534804308> (on file with the *Columbia Law Review*) (describing the founding of the Virtual Commodity Association); see also Press Release, *Virtual Commodity Ass’n, The Virtual Commodity Association Working Group Has Formed and Is Planning Inaugural Meeting* (Aug. 20, 2018), <http://www.businesswire.com/news/home/20180820005066/en/Virtual-Commodity-Association-Working-Group-Formed-Planning> [<https://perma.cc/HD6X-3KUL>]; *Virtual Commodity Ass’n*, <http://virtualcommodities.org> [<https://perma.cc/6TYM-SGFX>] (last visited Aug. 25, 2018).

program for the virtual commodity industry.”²⁰⁶ Along similar lines, a trade group published industry best practices for digital asset exchanges, including principles akin to those that animate the customer protection rule—requiring cryptocurrency platforms to maintain unencumbered custody of customer assets.²⁰⁷ Though it is too early to tell how these private efforts will fare, they suggest that some cryptocurrency platforms recognize the need for industry-wide rules and standards.

III. A FRAMEWORK FOR REGULATING CRYPTOCURRENCY PLATFORMS

In light of the parallels between broker-dealers and cryptocurrency platforms described in Part II, this Part explores how the broker-dealer regulatory framework could be applied to cryptocurrency platforms. While a complete analysis of the intricacies of broker-dealer regulation is beyond the scope of this Note, this Part argues that the broker-dealer regulatory framework—as embodied by the customer protection rule, net capital rule, and SIPC-managed liquidation process—can be applied to cryptocurrency platforms with some caveats and modifications. The sections consider each rule in turn.

A. *Customer Protection Rule*

The regulatory framework provided by the customer protection rule can be applied to cryptocurrency platforms. Under such a rule, platforms, like broker-dealers, would have to effectively segregate their own assets from those of their customers. On a daily basis, cryptocurrency platforms would have to obtain “physical possession or control” of sufficient cryptocurrency to satisfy all of their customers’ claims.²⁰⁸ Separately, platforms would also have to maintain a cash reserve account in an amount equal to the net amount of cash owed to customers.²⁰⁹

Cryptocurrency, however, poses two unique challenges to the customer protection rule. First, as a digital asset, cryptocurrency does not fit neatly within the “physical possession or control” requirement. Second, as a “currency,” cryptocurrency is at least arguably subject to the

206. Cameron Winklevoss, *Joining the Virtual Commodity Association*, Medium (Aug. 20, 2018), <http://medium.com/gemini/joining-the-virtual-commodity-association-8bdf3b2f803e> [https://perma.cc/HXV9-AK2L].

207. See Asia Sec. Indus. & Fin. Mkts. Ass’n, *ASIFMA Best Practices for Digital Asset Exchanges* 24 (2018), <http://www.asifma.org/uploadedfiles/resources/asifma%20best%20practices%20for%20digital%20asset%20exchanges%20june%202018.pdf> [https://perma.cc/TY84-2XZE] (“Digital asset exchanges that . . . maintain custody or control of digital assets . . . on behalf of a person must hold that same type and amount of digital assets . . . owed to the person. Digital asset exchanges should not create a right of lien, offset or encumbrance . . . with respect to user digital assets . . .”).

208. 17 C.F.R. § 240.15c3-3(b)(1) (2018).

209. See *supra* notes 76–78 and accompanying text.

less stringent rules for cash, as opposed to securities, under the customer protection rule.

1. *Physical Possession or Control.* — For a customer protection rule to apply to cryptocurrency, the physical possession or control requirement would have to encapsulate how cryptocurrency is held and stored. “Physical possession,” literally construed, does not make sense in the context of an asset that exists only in digital format.²¹⁰ “Control,” however, could potentially encompass how cryptocurrency platforms hold virtual currency. Currently, control is statutorily defined: Broker-dealers are deemed to be in control of securities when they hold unencumbered securities in certain control locations, such as a clearing corporation or bank.²¹¹ However, unlike broker-dealers, which hold securities in control locations, cryptocurrency platforms typically manage their own currency—that is, they store their own private keys.²¹²

Platforms typically split their cryptocurrency between “hot wallets” and “cold storage.”²¹³ Hot wallets are connected to the internet and therefore easy to access and use.²¹⁴ Unfortunately, this also leaves them vulnerable to hacks.²¹⁵ As such, platforms keep the majority of their cryptocurrency in cold storage.²¹⁶ Cold storage refers to cryptocurrency stored in a manner that is unconnected to the internet, such as on flash drives or even physical paper.²¹⁷ Cold storage mitigates the risk of

210. Cryptocurrency exists only on the blockchain, a digital ledger. See *supra* section I.A.1 (discussing how cryptocurrency is held and transferred).

211. See 17 C.F.R. § 240.15c3-3(c) (defining the control locations where broker-dealers can hold securities and satisfy the control requirement); Markham & Hazen, *supra* note 98, § 5:4 (“The possession or control requirement means that broker-dealers must have securities in physical possession or at one of several ‘central locations’” (quoting 17 C.F.R. § 240.15c3-3)).

212. See *supra* notes 33–34 and accompanying text.

213. See, e.g., Security, Gemini, <https://gemini.com/security/> [<https://perma.cc/K4EH-2XLX>] (last visited Aug. 12, 2018) (describing how assets are split between a “hot wallet” and “cold storage”); Security Practices, Kraken, <https://www.kraken.com/security/practices> [<https://perma.cc/KH9U-B8WW>] (last visited Aug. 12, 2018) (“[N]ew deposits go directly to cold wallets [C]oins that are needed to maintain operational liquidity are stored in hot (online) wallets.”).

214. See Joseph Young, Storing Bitcoin in Exchanges and Hot Wallets Is Risky—What to Do Instead, *Cointelegraph* (Aug. 4, 2016), <https://cointelegraph.com/news/storing-bitcoin-in-exchanges-and-hot-wallets-is-risky-what-to-do-instead/> [<https://perma.cc/E3PF-AF8P>] (describing how hot wallets allow instantaneous sending and receiving of cryptocurrency).

215. See *id.*

216. See, e.g., Security, Coinbase, <http://www.coinbase.com/security> [<https://perma.cc/Z82W-WY55>] [hereinafter Coinbase: Security] (last visited Aug. 12, 2018) (“98% of customer funds are stored offline.”).

217. Immaculate Dadiso Motsi-Omojiade, Financial Intermediation in Cryptocurrency Markets—Regulation, Gaps and Bridges, *in* 1 *Handbook of Blockchain, Digital Finance, and Inclusion* 207, 215 (David Lee Kuo Chuen & Robert Deng eds., 2018) (“Cold storage services store client’s cryptocurrencies in a manner that is not connected to the Internet

hacking by storing cryptocurrency in an unhackable medium.²¹⁸ In the case of both hot wallets and cold storage, cryptocurrency platforms are handling their own private keys, meaning they have access to and control of their cryptocurrency.²¹⁹ As such, the possession or control requirement—if platforms are to be regulated similarly to broker-dealers—should be interpreted so as to encompass both hot wallets and cold storage. Perhaps “control” could be defined to include any form of storage in which cryptocurrency platforms are managing their own private keys and are therefore in control of their cryptocurrency.

2. *Cash or Security?* — A customer protection rule for cryptocurrency platforms should not treat cryptocurrencies as cash. Given that the current customer protection rule has separate regulations for securities and cash, a potential issue is whether cryptocurrency might be considered currency and therefore subject to the rules for cash as opposed to the rules for securities. Setting aside the thorny issue of whether cryptocurrencies are securities for purposes of federal securities laws,²²⁰ it is clear that the customer protection rules for cash are inapposite for cryptocurrency. First, calculations of how much cash broker-dealers are required to set aside for customers are done on a weekly basis, as opposed to a daily basis for securities.²²¹ Weekly determinations could expose platforms to serious shortfalls in cryptocurrency that could prove difficult to make up during times of market turmoil. Compared to cash, cryptocurrency is much more difficult to locate in a crunch.²²² In addition, the customer protection rule allows broker-dealers to indirectly profit from their customers’ idle cash by sweeping customer cash into money-market funds or bank deposits in return for a fee.²²³ The same

through various techniques such as the provision of paper wallets, flash drives and bespoke hardware devices . . .”).

218. See *id.* However, cryptocurrency stored in cold storage is costlier to retrieve. For example, Coinbase’s cold storage is kept in safety deposit boxes and vaults, which could prove costly and time consuming to retrieve. See Coinbase: Security, *supra* note 216 (“We distribute [B]itcoin geographically in safe deposit boxes and vaults around the world.”).

219. See *supra* notes 19–20 and accompanying text.

220. For a brief discussion of the SEC’s current case-by-case approach to the question of whether cryptocurrencies are securities for purposes of the federal securities laws, see *supra* notes 123–124 and accompanying text.

221. See *supra* note 77 and accompanying text.

222. Cryptocurrency is relatively illiquid compared to most financial assets, meaning it is comparatively difficult or costly to purchase or sell. See Simon Trimborn et al., Investing with Cryptocurrencies—A Liquidity Constrained Investment Approach 9 (SFB 649 Discussion Paper No. 2017-014, 2017), <https://www.econstor.eu/bitstream/10419/169204/1/SFB649DP2017-014.pdf> [<https://perma.cc/AN2R-BVHX>] (“[C]ryptocurrencies have far lower daily trading amount than traditional financial assets, causing a liquidity problem . . .”).

223. Broker-dealers are permitted, with their customers’ consent, to sweep customer funds into money-market funds or Federal Deposit Insurance Corporation (FDIC)-insured

principles, if applied to cryptocurrency, could prove problematic because platforms may be incentivized to sweep customer cryptocurrency into risky or illiquid investment vehicles in return for high fees. Because daily, rather than weekly, determinations are more appropriate for illiquid assets such as cryptocurrency, the stricter customer protection rule for securities should apply to cryptocurrency.

B. *Net Capital Rule*

The basic framework for the net capital rule can be applied to cryptocurrency platforms. As with broker-dealers, net capital for cryptocurrency platforms would be net worth under GAAP with various adjustments.²²⁴ First, net capital would exclude illiquid assets.²²⁵ Then, platforms would apply predetermined haircuts—discounts to market value—to their assets based upon the riskiness of those assets.²²⁶ The net capital rule already supplies haircuts for securities, but there would need to be a new haircut, approximating the price the broker-dealer would receive for the asset during liquidation in distress, applicable to cryptocurrencies.

Because the prices of cryptocurrencies are extremely volatile,²²⁷ the haircut for cryptocurrencies would likely have to be quite high, reflecting the potential for lower prices when cryptocurrency platforms seek to liquidate their holdings. Currently, equity securities have the highest haircut.²²⁸ The haircut for cryptocurrencies would likely have to be

bank deposits. Customers receive a higher rate of return from the money-market fund or enjoy FDIC insurance on the bank deposit while the broker-dealer typically receives a fee from the money-market fund or bank for sweeping customer cash to them. See 17 C.F.R. § 240.15c3-3(a)(17) (2018) (“*Sweep Program* means a service provided by a broker or dealer . . . offer[ing] to its customer the option to . . . transfer free credit balances in the securities account of the customer to either a money market mutual fund . . . or an account at a bank whose deposits are insured by the [FDIC].”). See generally George Tepe, Note, Broker-Dealer Use of “Idle” Customer Assets: Customer Protection with Sweep Programs and Securities Lending, 2016 Colum. Bus. L. Rev. 823, 830–35 (discussing how broker-dealer sweep programs make use of idle customer cash).

224. See *supra* notes 89–90 and accompanying text.

225. See *supra* note 91 and accompanying text.

226. See *supra* note 92 and accompanying text.

227. See, e.g., Jeffrey Chu et al., GARCH Modelling of Cryptocurrencies, *J. Risk & Fin. Mgmt.*, Oct. 1, 2017, at 1, 13 (“Our results show that cryptocurrencies such as Bitcoin, Ethereum, Litecoin and many others exhibit extreme volatility especially when we look at their inter-daily prices.”); Cameron Harwick, Cryptocurrency and the Problem of Intermediation, 20 *Indep. Rev.* 569, 574 (2016) (“On stability of value, however, cryptocurrencies reveal their inadequacy as day-to-day currency. . . . [T]he primary impediment is purchasing-power volatility. Bitcoin, for example, . . . has suffered from frequent and severe jumps and crashes since its inception in 2010.”).

228. Compare 17 C.F.R. § 240.15c3-1(c)(2)(vi)(J) (applying a 15% haircut to equities), with *id.* § 240.15c3-1(c)(2)(vi)(A)–(K) (listing haircuts for various fixed-income securities).

higher than even the haircut for equity securities, reflecting their higher volatility.²²⁹ In addition to a higher haircut for cryptocurrency, it also makes sense to apply larger haircuts for undue concentration in certain cryptocurrencies. With the proliferation of so many altcoins—some individually quite small²³⁰—cryptocurrency platforms may hold a significant portion of a given altcoin. Lack of liquidity when selling concentrated positions is a potential concern, especially considering that even the markets for larger cryptocurrencies can be relatively illiquid.²³¹

A related issue is whether to apply a uniform haircut for all cryptocurrencies or haircuts that vary by currency, reflecting the fact that some cryptocurrencies may be less risky than others. Given the short history of cryptocurrencies, a uniform haircut would likely be more appropriate. Admittedly, the current net capital rule has crude risk sensitivities: With minor exceptions, haircuts are set at the asset class level, meaning there is no distinguishing between, say, stock of a high-risk biotech startup and stock of a large utility company.²³² Similarly, a uniform haircut for cryptocurrencies would mean there would be no distinguishing between different types of cryptocurrencies.

A more risk-based approach would adjust for riskiness within asset classes. However, such an approach presents several problems. First, risk-based capital requirements typically rely on models to determine the amount of risk associated with an asset.²³³ For these models to work, there must, at a minimum, be sufficient, representative historical data to adequately calibrate the models.²³⁴ For example, in the prelude to the

229. See David Lee Kuo Chuen et al., *Cryptocurrency: A New Investment Opportunity?*, *J. Alternative Inv.*, Winter 2018, at 16, 21 (“CRIX [an index of cryptocurrencies] tends to have a high return volatility compared to the S&P 500 [an index of large-capitalization U.S. stocks].”).

230. See *All Coins*, *supra* note 27 (listing many cryptocurrencies with relatively small dollar market capitalizations).

231. See Trimborn et al., *supra* note 222, at 9.

232. See 17 C.F.R. § 240.15c3-1(c)(2)(vi) (listing the applicable haircuts for various types of securities). For bonds, haircuts also vary by maturity. See, e.g., *id.* § 240.15c3-1(c)(2)(vi)(F)(1) (providing different haircuts for fixed rate nonconvertible debt securities based on maturity). There are also further adjustments for undue concentration and illiquid securities. See *id.* § 240.15c3-1(c)(2)(vi)(K), (M) (defining haircuts for securities with a limited market or securities in which the broker-dealer has an undue concentration).

233. See John C. Coffee, Jr. & Hillary A. Sale, *Redesigning the SEC: Does the Treasury Have a Better Idea?*, 95 *Va. L. Rev.* 707, 742 (2009) (“[T]he investment bank generates a mathematical model that crunches historical data to evaluate how risky its portfolio assets were and how much capital it needed to maintain . . .”).

234. See Erik F. Gerding, *Law, Bubbles, and Financial Regulation* 510–11 (2013) (“Like every model . . . those used by regulators are only as good as their simplifying assumptions. Moreover, models do not forecast risks adequately when the data on financial

financial crisis, banks likely misjudged the risk of mortgage-backed securities in part because of poorly calibrated models.²³⁵ At this relatively early stage of cryptocurrency's development, risk-based capital requirements are unlikely to be effective because there are insufficient data with which to adequately estimate risk. Bitcoin, the oldest cryptocurrency, has been around only since 2009.²³⁶

Second, even if regulators could come up with different haircuts for different types of cryptocurrency, risk-based capital requirements for broker-dealers have seen mixed results at best. In 2004, the SEC established the Consolidated Supervised Entity (CSE) program which allowed the five largest broker-dealers at the time, including Bear Stearns and Lehman Brothers, to use internal models to assess the amount of risk associated with, and therefore the amount of capital required for, each of the broker-dealers' assets.²³⁷ By 2008, all five broker-dealers had either failed or converted themselves into bank holding companies.²³⁸ This foray into risk-based capital requirements has been criticized for being inadequate in the lead-up to the financial crisis.²³⁹ Given the poor track record of risk-based capital requirements for broker-dealers and the lack of adequate, representative price data for cryptocurrencies, a uniform haircut for cryptocurrency is likely most appropriate.

institutions being inputted are shoddy. This is encapsulated by the old phrase 'garbage in, garbage out.'").

235. See, e.g., Robert F. Weber, *New Governance, Financial Regulation, and Challenges to Legitimacy: The Example of the Internal Models Approach to Capital Adequacy Regulation*, 62 *Admin. L. Rev.* 783, 863 (2010) (describing a large bank's inadequate modelling of risks in its mortgage securitization business).

236. Comizio, *supra* note 17, at 133.

237. See Weber, *supra* note 235, at 830 (describing the CSE program); see also Coffee & Sale, *supra* note 233, at 735 (discussing how the five major investment banks at the time opted into the CSE program).

238. See Coffee & Sale, *supra* note 233, at 735.

239. See, e.g., *id.* at 740–41 (positing three reasons why the CSE program was inadequate); Norman S. Poser, *Why the SEC Failed: Regulators Against Regulation*, 3 *Brook. J. Corp. Fin. & Com. L.* 289, 299 (2009) (criticizing the CSE program for allowing investment banks to take on "extreme leverage"); Weber, *supra* note 235, at 834 (noting that each of the major investment banks was adequately capitalized under the CSE program despite facing mounting financial distress). Apart from broker-dealers, there is similar criticism of the overreliance on internal risk models in determining capital requirements for banks. See, e.g., Andrew G. Haldane & Vasileios Madouros, *The Dog and the Frisbee*, in *The Changing Policy Landscape: A Symposium Sponsored by the Federal Reserve Bank of Kansas City* 109, 126–31 (Richard A. Babson ed., 2013) (arguing that simple leverage ratios—equity divided by total assets—were superior to risk-based capital in predicting bank distress during the financial crisis of 2007–2008).

C. *Bankruptcy and Insurance*

Cryptocurrency platforms facing bankruptcy can be subject to a SIPC-like liquidation scheme. In bankruptcy, the trustee would favor in-kind distribution of cryptocurrency to customers as opposed to liquidation to cash. This would avoid a scenario like the pending Mt. Gox bankruptcy proceeding, in which customers might be deprived of the appreciation of their Bitcoin investments because their claims are valued as of the bankruptcy filing date.²⁴⁰ In addition, customers under a SIPC-like liquidation scheme would be preferred to general creditors in bankruptcy. Namely, cryptocurrency held on behalf of customers would be used to satisfy customers only, not general creditors.

A SIPC-like insurance scheme could also be applied to cryptocurrency platforms. A potential problem, however, is the cost of such insurance. Hacking is a significant and unique source of risk for cryptocurrency platforms.²⁴¹ Multiple platforms have failed or suffered losses as a result.²⁴² The cost of insurance might therefore be quite high. Given the unique cost and risk of hacking, it would not be appropriate to include cryptocurrency platforms under the jurisdiction of SIPC because it would impose the cost and risk of hacking—unique to cryptocurrency—upon traditional broker-dealers. Instead, an insurance scheme for cryptocurrency platforms should be separate from SIPC and funded by assessments on these platforms alone.

CONCLUSION

Cryptocurrencies have become one of the hottest new investments in the past year. While cryptocurrency returns have been eye-popping, cryptocurrency platforms have proved to be a significant source of risk for investors: Platforms have failed at a high rate, and, in some cases, customer losses have been significant. As more investors begin to trade and hold cryptocurrencies through cryptocurrency platforms, so too must regulation begin to address these new broker-dealers for virtual currency. Left unaddressed, existing problems may fester.

240. See *supra* notes 165–168 and accompanying text.

241. See *supra* note 154 and accompanying text; see also Steven Russolillo & Eun-Young Jeong, Cryptocurrency Exchanges Are Getting Hacked Because It's Easy, *Wall St. J.* (July 16, 2018), <http://www.wsj.com/articles/why-cryptocurrency-exchange-hacks-keep-happening-1531656000> (on file with the *Columbia Law Review*) (detailing cyberattacks on cryptocurrency exchanges and their increasing frequency).

242. See Steve Stecklow et al., Chaos and Hackers Stalk Investors on Cryptocurrency Exchanges, *Reuters* (Sept. 29, 2017), <https://www.reuters.com/investigates/special-report/bitcoin-exchanges-risks> [<https://perma.cc/EDY7-CCCN>] (listing various cryptocurrency hacks and associated losses).

Fortunately, history provides a useful guide for how to regulate these entities. Broker-dealers in the 1960s faced many of the same problems that are now arising among cryptocurrency platforms: high failure rates and inadequate protection of customer assets. This Note argues that the regulatory response to broker-dealer failures in the late 1960s—namely, the customer protection rule, net capital rule, and SIPC bankruptcy scheme—provides a strong regulatory framework for cryptocurrency platforms.

