

# Crypto Assets and Insider Trading Law’s Domain

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*ABSTRACT: An extensive literature evaluates whether and how best to regulate “insider” trading. Far less attention has been given to what sorts of assets should be subject to insider trading regulation to begin with—just equity securities, all sorts of investments, or some point in between? This Article offers a theory of the domain of insider trading law. It does so in the context of a contemporary controversy: whether insider trading law applies, and should apply, to crypto assets such as bitcoin. It shows that crypto assets are within the domain of insider trading law, alongside securities and commodities—but that many other familiar investment assets lie beyond the domain.*

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## I. INTRODUCTION

An extensive literature addresses the substance of insider trading law. For example, should new techniques of high frequency trading be penalized as a species of “Insider Trading 2.0?”<sup>1</sup> Should all insider trading be decriminalized?<sup>2</sup> Far less attention has been devoted to the domain of insider trading law.<sup>3</sup> For example, insider trading law applies to stock, but does it

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1. Merritt B. Fox et al., *Informed Trading and Its Regulation*, 43 J. CORP. L. 817, 882 (2018). Fox et al. couch their analysis as the regulation of “informed” trading rather than “insider trading,” but their focus is the same as the majority of the literature’s: When should we restrict trading based in part on what one knows? *Id.*

2. See generally HENRY G. MANNE, *INSIDER TRADING AND THE STOCK MARKET* (1966) (arguing for decriminalization of insider trading).

3. The title of this Article is a reference to Frank H. Easterbrook, *Statutes’ Domains*, 50 U. CHI. L. REV. 533 (1983).

cover bonds?<sup>4</sup> How about commercial real estate,<sup>5</sup> coveted artworks,<sup>6</sup> or copper?<sup>7</sup> Should it? The question of domain is distinct from the questions of whether we ought to have insider trading law at all or what precise form that law ought to take.

Most scholars have assumed a limited domain, covering just familiar securities such as common stock.<sup>8</sup> Some scholars have argued against including other asset classes as peer markets for consideration and regulation—or deregulation—and have offered rationales for doing so.<sup>9</sup> By contrast, I have previously argued for a wider domain, a change that has since become law,<sup>10</sup> but I did not provide a limiting principle. In this Article, I do; providing a simple test that demarks the outer boundary of insider trading law. In building up the case for this principle, I carefully attend to assets that are commonly thought to lie beyond the domain of insider trading law and policy, and which are important in their own right: crypto assets, such as bitcoin.

4. Compare 18 DONALD C. LANGEVOORT, *INSIDER TRADING: REGULATION, ENFORCEMENT, AND PREVENTION* § 3:12 (2019) (“With very few exceptions—for example, the situation where the issuer is aware of the trading before it occurs—the misappropriation theory is fully adequate to reach abuses in the trading of debt securities.” (footnote omitted)), with STEPHEN M. BAINBRIDGE, *INSIDER TRADING LAW AND POLICY* 79–81 (2014) (arguing against insider trading liability for bonds).

5. Josh Barbanel, *After Amazon HQ2, Uproar in New York Over Real Estate ‘Insider Trading’: The Proposed Legislation Would Prohibit People from Buying or Selling Real Estate Based on Any Nonpublic Government Action*, WALL ST. J. (Dec. 3, 2018, 8:00 AM), <https://www.wsj.com/articles/state-senator-proposes-law-to-ban-real-estate-deals-based-on-nonpublic-information-1543842000> [<https://perma.cc/gDTG-8CR5>].

6. Andrew M. Goldstein, *Collector Alain Servais on Insider Trading in the Art Market, “Blood-Sucking Leeches,” and Why We’re Now Just the Fashion Industry*, ARTSPACE (May 23, 2015), [https://www.artspace.com/magazine/interviews\\_features/how\\_i\\_collect/alain-servais-interview-part-2-52876](https://www.artspace.com/magazine/interviews_features/how_i_collect/alain-servais-interview-part-2-52876) [<https://perma.cc/DGM4-BASZ>].

7. Kurt A. Hohenstein, *Fair to All People: The SEC and the Regulation of Insider Trading (The SEC Takes Command)*, SEC HISTORICAL SOCIETY (Nov. 1, 2006), [http://www.sechistorical.org/museum/galleries/it/takeCommand\\_c.php](http://www.sechistorical.org/museum/galleries/it/takeCommand_c.php) [<https://perma.cc/892T-A8WF>]; see also Andrew Verstein, *Insider Trading in Commodities Markets*, 102 VA. L. REV. 447, 448 (2016) (“For while insider trading in securities has long been illegal, the same behavior has been entirely legal in the commodities and futures markets.”).

8. See generally RESEARCH HANDBOOK ON INSIDER TRADING (Stephen M. Bainbridge ed., 2013) (referencing securities as the sole domain for insider trading); Ian Ayres & Stephen Choi, *Internalizing Outsider Trading*, 101 MICH. L. REV. 313, 331–38 (2002) (discussing stock pricing and the effects of informed trading on stock prices); Victor Brudney, *Insiders, Outsiders, and Informational Advantages Under the Federal Securities Laws*, 93 HARV. L. REV. 322, 328–29 (1979) (arguing for insider trading restrictions in securities, and clarifying that this rationale “need not extend the common law of fraud to require comparable disclosure in other markets or for other commodities or services”).

9. See, e.g., James J. Park, *Insider Trading and the Integrity of Mandatory Disclosure*, 2018 WIS. L. REV. 1133, 1172.

10. Andrew Verstein, *The First Insider Trader in Commodities*, HARV. L. SCH. F. ON CORP. GOVERNANCE & FIN. REG. (Dec. 4, 2015), <https://corpgov.law.harvard.edu/2015/12/04/the-first-insider-trader-in-commodities> [<https://perma.cc/RHS5-Q2GK>].

Crypto assets are new, but they are already outside the domain of insider trading law for most skeptics.<sup>11</sup> American insider trading law regulates trading in material non-public information.<sup>12</sup> For example, an executive might sell her stock after seeing an early draft of an earnings report. By contrast, many doubt the existence of material non-public information about open-source, virtual currencies:

Since bitcoin is a digital asset that functions as a medium of exchange, all of the relevant information needed to price bitcoin is publicly available. For example, unlike traditional securities, there are no important periodic information events, such as earnings announcements. Since there is no “inside” information to exploit, bitcoin valuations are based on publicly available information, providing a relatively high degree of information transparency.<sup>13</sup>

Likewise, American insider trading law generally requires the trader to have breached a duty of disclosure arising out of a relationship of trust or confidence.<sup>14</sup> For example, a corporate executive occupies a trusted role at a corporation and, in some sense, works for the shareholders; it would be a betrayal to buy shares from the shareholders at a price they are sure to regret. By contrast, many crypto assets have no “executives” to trust or “shareholders” to betray. They are instead impersonal, decentralized,<sup>15</sup> and “trustless.”<sup>16</sup>

More foundationally, it is often argued that insider trading law does more harm to markets than good,<sup>17</sup> and this might be particularly true of crypto assets. The red tape of regulation and law enforcement could constrain the experimentation and informality at the heart of this free-wheeling, open-source movement.<sup>18</sup> Moreover, crypto assets require widespread adoption to

11. See, e.g., John P. Anderson, *Insider Trading and Cryptoassets: The Waters Just Got Muddier*, 104 IOWA L. REV. ONLINE (forthcoming 2019); Mihailis E. Diamantis, *The Light Touch of Caveat Emptor in Crypto's Wild West*, 104 IOWA L. REV. ONLINE (forthcoming 2019) (manuscript at 3–5) (on file with author).

12. See *Salman v. United States*, 137 S. Ct. 420, 425 n.2 (2016).

13. CRAIG M. LEWIS, SOLIDX MGMT. LLC, SOLIDX BITCOIN TRUST: A BITCOIN EXCHANGE TRADED PRODUCT 5 (2017), <https://www.sec.gov/comments/sr-nysearca-2016-101/nysearca2016101-1579480-131874.pdf> [<https://perma.cc/DP7F-W4Y4>].

14. This is the requirement for prosecution under Rule 10b-5, but other theories do not have this requirement. See *infra* Sections III.A, III.C.

15. Erik Voorhees, *Is Bitcoin Truly Decentralized? Yes—and Here Is Why It's Important*, BITCOIN MAG. (Jan. 22, 2015), <https://bitcoinmagazine.com/articles/bitcoin-truly-decentralized-yes-important-1421967133> [<https://perma.cc/FgA8-CFUW>].

16. PRIMAVERA DE FILIPPI & AARON WRIGHT, BLOCKCHAIN AND THE LAW: THE RULE OF CODE 26 (2018).

17. See BAINBRIDGE, *supra* note 4, at 176–82 (discussing such arguments).

18. M. Todd Henderson & Max Raskin, *A Regulatory Classification of Digital Assets: Toward an Operational Howey Test for Cryptocurrencies, ICOs, and Other Digital Assets*, 2019 COLUM. BUS. L. REV. 443, 447–49.

become viable, and regulation can put a drag on such adoptions.<sup>19</sup> Indeed, a central attraction of crypto assets for many users is that they work well even without state enforcement.<sup>20</sup>

Crypto assets also exhibit innovative technological features that may obviate the need for familiar regulatory responses (such as securities regulation, the area most closely associated with insider trading regulation) or even render them counterproductive. For example, crypto assets are subject to a radical check on market abuse: If users dislike a set of transactions, they are free to endorse a “fork” in the chain, which would undo the disputed transaction.<sup>21</sup> They, in effect, abandon the current asset en masse in favor of a nearly identical replacement, which differs only in that it does not recognize the disputed transaction. For example, when users of one crypto asset discovered a bug that allowed the disappearance of \$60 million,<sup>22</sup> they voted with their feet to abandon the old crypto asset and instead utilize a new asset—identical in every way except that it lacked the bug and the theft.<sup>23</sup> This radical exit option has no analog in the world of securities, where the stock of a company retains its claims on the company’s assets even if the majority of shareholders were to dump the stock in protest over insider trading.<sup>24</sup> Do familiar insider trading policies—fairness and the rest—make any sense when any form of market abuse is subject to radical revision? Why prioritize enforcement if the victims of insider trading can undo the offense democratically, especially when there are other real problems befalling the crypto asset market, such as market manipulation and outright fraud?<sup>25</sup>

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19. This problem has been called “the Hinman Paradox” by Professor Jim Park. See JAMES J. PARK, WHEN ARE TOKENS SECURITIES? SOME QUESTIONS FROM THE PERPLEXED 6–7 (UCLA Sch. of Law, Law & Econ., Research Paper No. 18-13, 2018), [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3298965&download=yes](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3298965&download=yes).

20. See Eric Hughes, *A Cypherpunk’s Manifesto*, ACTIVISM: CYPHERPUNKS (Mar. 9, 1993), <https://www.activism.net/cypherpunk/manifesto.html> [<https://perma.cc/HFY3-39PS>].

21. Wulf A. Kaal, *Crypto Economics—The Top 100 Token Models Compared* 30 (Univ. of St. Thomas Legal Studies, Research Paper No. 18-29, 2018), <https://ssrn.com/abstract=3249860> [<https://perma.cc/7V35-XH6F>] (noting that the majority of the top 100 tokens that launched before 2015 “overwhelmingly” use forks as a governance mechanism).

22. Michael del Castillo, *The DAO Attacked: Code Issue Leads to \$60 Million Ether Theft*, COINDESK (June 17, 2016, 2:00 PM), <https://www.coindesk.com/dao-attacked-code-issue-leads-60-million-ether-theft> [<https://perma.cc/2YV6-9AZN>].

23. David Siegal, *Understanding the DAO Attack*, COINDESK (June 25, 2016, 4:00 PM), <https://www.coindesk.com/understanding-dao-hack-journalists> [<https://perma.cc/P82W-XY97>].

24. Raina Haque et al., *Blockchain Development and Fiduciary Duty*, 2 STAN. J. BLOCKCHAIN L. & POL’Y 139, 165 n.153 (2019).

25. See, e.g., Peter J. Henning, *Can Cryptocurrencies Survive the Start of Government Regulation?*, N.Y. TIMES: DEALBOOK (Dec. 13, 2018), <https://www.nytimes.com/2018/12/13/business/dealbook/sec-ico-bitcoin.html> [<https://perma.cc/B5S9-DRYB>] [hereinafter Henning, *Can Cryptocurrencies Survive the Start of Government Regulation?*]; see also Peter J. Henning, *Should We Care About Insider Trading in Cryptoassets?*, 104 IOWA L. REV. ONLINE (forthcoming 2019) [hereinafter Henning, *Should We Care About Insider Trading in Cryptoassets?*].

Thus, the existing literature makes three broad claims against the enforcement of insider trading law in crypto assets: the law doesn't fit, it does more harm than good, and we have bigger fish to fry. Put simply, critics think that the domain of insider trading law ends far before it reaches crypto assets.

Much of this Article is a rejoinder to that consensus: I argue that enforcement of insider trading law in crypto assets fits naturally within existing doctrine, policies, and priorities.

Insider trading doctrine clearly applies to most familiar crypto assets and their traders. The legal requisites for insider trading regulation—jurisdiction, material non-public information, breach of duty—are frequently satisfied.<sup>26</sup> The most obvious examples of this concern misappropriation by employees of crypto asset trading venues about the venue's plans to support a crypto asset; allegations of this sort of insider trading have already ended up in federal court.<sup>27</sup> But there are many more examples, such as misappropriation by government officials and members of mining pools. Ultimately the question is not whether insider trading law applies to crypto assets; it is whether we want it to.

As a policy matter, the policies that justify insider trading law for other financial assets also apply to crypto assets: We care about fairness, price accuracy, property rights, and the rest.<sup>28</sup> While crypto assets boast many features that could seem to make familiar regulations inapposite, in fact, these features generate new and powerful avenues for insider trading. For example, while “forking” can solve some problems, it generates others.<sup>29</sup> Those with foreknowledge of a fork, or a market intermediary's reaction to the fork, know about a kind of material event with no easy analogue in existing insider trading cases literature.<sup>30</sup> Nor is regulation inappropriate in light of the innovative nature of this nascent market or anarchic values driving many crypto enthusiasts. Regulation can be useful for taming the former while respecting the latter.<sup>31</sup>

Although much of this Article focuses on insider trading with a new asset, an examination of insider trading law and policy in crypto assets teaches us more than the right way to regulate crypto assets. Most importantly, a discussion of crypto assets gives us purchase on a general theory of the domain of insider trading law. There is a principle that links common stock and crypto assets, which are within the domain of insider trading law, but not commercial real estate and precious art and other assets, which are clearly beyond the

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26. See *infra* Sections IV.B.5–C.

27. See *Berk v. Coinbase, Inc.*, No. 18-CV-01364-VC, 2018 WL 5292244, at \*2 (N.D. Cal. Oct. 23, 2018) (dismissing allegations of misappropriation and trading in crypto assets on other grounds).

28. See *infra* Part IV.

29. See *infra* text accompanying notes 72–74.

30. See *infra* Part III.

31. See *infra* Part III.

domain. A study in the domain's borderland helps us to be thoughtful about the lines we draw and self-conscious of the reasons for drawing them.

Specifically, I apply a market microstructure framework to delineate the reach of insider trading law. Informed trading tends to increase price accuracy and decrease liquidity. Optimal insider trading policy is a function of those two effects: discouraging types of trading that decrease liquidity by more than they increase price accuracy. While both effects vary by type of informed trading, only liquidity effects vary greatly by asset class. Insider trading law's domain includes those assets for which we expect informed trading to materially affect liquidity. That includes many high-volume, fungible assets such as stocks and crypto assets, but not parking lots and paintings.

The structure of this Article is as follows. Part II provides a stylized introduction to the technology and community of crypto assets. Part III reviews insider trading law. Part IV refutes the notion that insider trading doctrine does not cover or fit crypto assets. Part V addresses some reasons that crypto assets may differ from familiar assets in terms of the policies of insider trading law, showing that these considerations can support insider trading enforcement. Part VI widens the lens from crypto assets in search of a general principle of insider trading regulation.

Several caveats before beginning in earnest: First, this Article is not focused on many important legal and policy questions posed by crypto assets in relation to money laundering,<sup>32</sup> custody,<sup>33</sup> taxation,<sup>34</sup> contract law<sup>35</sup> and theory,<sup>36</sup> corporate governance,<sup>37</sup> environmental law,<sup>38</sup> financial stability,<sup>39</sup>

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32. Willard Foxton, *If Silk Road Was a Legitimate Startup, It Would Be Worth ~ \$2.4 Billion*, BUS. INSIDER (Oct. 4, 2013, 8:37 AM), <https://www.businessinsider.com/silk-road-valuation-worth-2-or-3-billion-2013-10> [<https://perma.cc/UD5N-JUY7>].

33. Moe Adham, *Crypto Custody Explained*, FORBES (Dec. 18, 2018, 9:00 AM), <https://www.forbes.com/sites/forbesfinancecouncil/2018/12/18/crypto-custody-explained> [<https://perma.cc/ZYM7-MAPE>].

34. Omri Marian, *Are Cryptocurrencies Super Tax Havens?*, 112 MICH. L. REV. FIRST IMPRESSIONS 38, 38–39 (2013).

35. Shaanan Cohney et al., *Coin-Operated Capitalism*, 119 COLUM. L. REV. 591, 595–98 (2019).

36. See Richard T. Holden & Anup Malani, *Can Blockchain Solve the Hold-Up Problem in Contracts?* 4–6 (Nat'l Bureau of Econ. Research, Working Paper No. 25833, 2019), <https://www.nber.org/papers/w25833.pdf> [<https://perma.cc/KQV9-CQ9P>].

37. George S. Geis, *Traceable Shares and Corporate Law*, 113 NW. U. L. REV. 227, 228–31 (2018).

38. Adam Rogers, *The Hard Math Behind Bitcoin's Global Warming Problem*, WIRED (Dec. 15, 2017, 7:00 AM), <https://www.wired.com/story/bitcoin-global-warming> [<https://perma.cc/T9BJ-NP3L>] (describing energy and environmental cost of bitcoin).

39. FIN. STABILITY BD., CRYPTO-ASSET MARKETS: POTENTIAL CHANNELS FOR FUTURE FINANCIAL STABILITY IMPLICATIONS 3–5 (2018), <http://www.fsb.org/wp-content/uploads/P101018.pdf> [<https://perma.cc/VC36-7PDF>].

law enforcement,<sup>40</sup> national autonomy,<sup>41</sup> bankruptcy,<sup>42</sup> theft,<sup>43</sup> and ordinary fraud.<sup>44</sup>

Second, genuine data and research on crypto assets remains scarce, and the technology changes rapidly in this space,<sup>45</sup> making it challenging to say anything both meaningful and enduring.<sup>46</sup> This Article is meant to improve our understanding of a rapidly evolving market by shining a flashlight at a particular shadow at a particular moment.<sup>47</sup>

Third, this Article does not argue for a specific form of insider trading regulation for crypto assets or elsewhere. The literature on insider trading is vast and cannot be rehashed as an aside in the middle of an otherwise full paper. This Article is meant to be compatible with most debates elsewhere in the literature. When scholars call for more or less regulation of insider trading, they have in mind some domain: This Article is about defining that domain.

## II. INTRODUCTION TO CRYPTO ASSETS

Crypto assets emerge as the confluence of several important social, economic, and technological trends. New technologies for distributed and peer-to-peer networks arose just before the financial crisis of 2007 shattered

40. See, e.g., DONG HE ET AL., INT'L MONETARY FUND, VIRTUAL CURRENCIES AND BEYOND: INITIAL CONSIDERATIONS 5 (2016), <https://www.imf.org/external/pubs/ft/sdn/2016/sdn1603.pdf> [<https://perma.cc/XNV8-ZK2A>].

41. John O. McGinnis & Kyle Roche, *Bitcoin: Order Without Law in the Digital Age*, 94 IND. L.J. (forthcoming 2019) (praising bitcoin for its ability to subvert inflation-based expropriation).

42. Kosaku Narioka, *Former Bitcoin King Is Bankrupt—And He Could Get Rich Again*, WALL ST. J. (Nov. 9, 2017, 5:30 AM), <https://www.wsj.com/articles/former-bitcoin-king-is-bankrupt-and-he-could-get-rich-again-1510223405?mod=e2tw> [<https://perma.cc/R22U-A7PG>] (describing how bankruptcy trustee's determination to pay off debts at 2014 prices, when bitcoin prices have since appreciated terrifically, may cause the bankrupt estate to hold \$977 million surplus).

43. Yessi Bello Perez, *Mt Gox: The History of a Failed Bitcoin Exchange*, COINDESK (Aug. 5, 2015, 2:21 AM), <https://www.coindesk.com/mt-gox-the-history-of-a-failed-bitcoin-exchange> [<https://perma.cc/V7X3-6YKN>] (describing the theft of \$350 million from customers of Mt Gox).

44. See generally *United States v. Zaslavskiy*, No. 17-CR-647(RJD), 2018 WL 4346339 (E.D.N.Y. Sept. 11, 2018) (describing an investor who promised real estate investments that were never made).

45. Teuta Franjkovic, *New Ethereum 2.0 Roadmap Finally Unveiled, 8 Teams Working on Its Progress*, COINSPEAKER (Dec. 10, 2018, 10:17 AM), <https://www.coinspeaker.com/ethereum-roadmap-unveiled> [<https://perma.cc/3Z3Y-5UFT>].

46. Ofer Eldar & Andrew Verstein, *The Enduring Distinction Between Business Entities and Security Interests*, 92 S. CAL. L. REV. 213, 268 (2019).

47. This Article frequently cites to news sites affiliated with crypto asset enterprises or catering to crypto enthusiasts. My intention is not to endorse as true what may be speculation or misinformation. I especially do not want to imply that we *know* that any given person *rumored* to have engaged in some form of market abuse actually did so. Still, I cite widely in order to gather suggestive evidence. If things like X are alleged and we have no reason to doubt that X could occur, we can better understand why we might want to think about X.

public confidence in familiar financial institutions.<sup>48</sup> A multitude of “Fintech” projects have since emerged.<sup>49</sup> Some used technology to cut through the complexity that had confounded the banks and governments.<sup>50</sup> Others sought to cut out the middle-man in financial markets, delivering a person-to-person experience linking borrower or entrepreneur with those who are helping to kickstart their project.<sup>51</sup> In 2008, a white paper by an anonymous author or group of authors laid the foundations for a potentially transformative technological development of currency, property, and finance.<sup>52</sup>

Crypto assets are a form of property distinguished by their use of a distributed ledger,<sup>53</sup> a system by which features of the asset and its current ownership are verified and recorded semi-publicly, with no one person serving as the official record-keeper.<sup>54</sup> Crypto assets are called “crypto” because the verification and recordation technology relies on cryptography.<sup>55</sup> Crypto assets are sometimes called virtual currency,<sup>56</sup> coins,<sup>57</sup> or tokens.<sup>58</sup>

48. James Li, A Survey of Peer-to-Peer Network Security Issues (Dec. 2007) (unpublished manuscript), <https://www.cse.wustl.edu/~jain/cse571-07/ftp/p2p> [<https://perma.cc/6AY7-2TE3>].

49. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-18-254, FINANCIAL TECHNOLOGY: ADDITIONAL STEPS BY REGULATORS COULD BETTER PROTECT CONSUMERS AND AID REGULATORY OVERSIGHT 3 (2018), <https://www.gao.gov/assets/700/690803.pdf> [<https://perma.cc/5R48-FUWU>] (“Fintech—originally short for financial technology—refers to the use of technology and innovation to provide financial products and services.”).

50. See, e.g., Douglas Merrill, *Big Data: It's Not Just for Breakfast Anymore*, WIRED, <https://www.wired.com/insights/2014/02/big-data-just-breakfast-anymore> [<https://perma.cc/4RR6-CSCZ>].

51. Andrew Verstein, *The Misregulation of Person-to-Person Lending*, 45 U.C. DAVIS L. REV. 445, 447 (2011); see also Craig Haynor, *A Look Ahead: Trends Driving Brands to Prioritize Direct to Consumer in 2019*, DIGITAL COMMERCE 360 (Dec. 4, 2018), <https://www.digitalcommerce360.com/2018/12/04/a-look-ahead-trends-driving-brands-to-prioritize-direct-to-consumer-in-2019> [<https://perma.cc/2DLB-VXQV>].

52. See generally SATOSHI NAKAMOTO, BITCOIN: A PEER-TO-PEER ELECTRONIC CASH SYSTEM (2008), <https://bitcoin.org/bitcoin.pdf> [<https://perma.cc/PC2S-K3ZE>] (discussing Bitcoin).

53. Shermin Voshmgir, *Blockchains & Distributed Ledger Technologies*, BLOCKCHAINHUB BERLIN, <https://blockchainhub.net/blockchains-and-distributed-ledger-technologies-in-general> [<https://perma.cc/S758-3N65>] (excerpt from SHERMIN VOSHM GIR, TOKEN ECONOMY: HOW BLOCKCHAINS AND SMART CONTRACTS REVOLUTIONIZE THE ECONOMY (2019)).

54. See generally SHERWIN DOWLAT & MICHAEL HODAPP, SATIS GRP., CRYPTO ASSET MARKET COVERAGE INITIATION: MARKET COMPOSITION (2018), [https://research.bloomberg.com/pub/res/d2gg3p\\_HtG3gHRCuzQjIyy8NVZQ](https://research.bloomberg.com/pub/res/d2gg3p_HtG3gHRCuzQjIyy8NVZQ) [<https://perma.cc/8JW6-ZKJD>] (providing an overview of the current cryptoasset space).

55. See Jake Frankenfield, *Cryptocurrency*, INVESTOPEDIA (Feb. 12, 2019), <https://www.investopedia.com/terms/c/cryptocurrency.asp> [<https://perma.cc/BJF3-UP2S>].

56. See UNIF. REGULATION OF VIRTUAL-CURRENCY BUS. ACT § 102(23) (UNIF. LAW COMM'N 2017) (defining virtual currency).

57. See Frankenfield, *supra* note 55.

58. *Id.*

Transactions are effectuated through program functions known as *smart contracts*.<sup>59</sup>

Crypto assets can be functionally organized into four overlapping types. First, a *payment token* is a crypto asset that is intended to be used as a form of virtual currency. For example, many merchants accept bitcoin in lieu of legal tender.<sup>60</sup> Second, some tokens are intended to raise money for a business and entitle the user to some portion of the value of a business. Because these tokens operate as substitutes for the traditional securities (stocks and bonds) used in capital markets, these can be called *security tokens*. It has become common in some circles to talk about an ICO, or initial coin offering, as a public sale of coins to raise money for an enterprise.<sup>61</sup>

Third, some tokens entitle the possessor to patronize a business as a customer or consumer. For example, Filecoin tokens entitle the user to claim a certain amount of cloud storage or cloud processing capacity from the related company, Filecoin.<sup>62</sup> Such crypto assets are often called *utility tokens*. The most familiar analogs to these crypto assets are gift cards: A \$25 Amazon.com gift card entitles the user to a certain amount of Amazon products in the future. Some forms of crowd-funding are also similar to crypto assets: Supporters may contribute money to a band in the hopes that they can someday hear their newly recorded album.<sup>63</sup>

Finally, some crypto assets are defined exclusively in terms of the value of other crypto assets. For example, it is now possible to buy Bitcoin Futures on the Chicago Mercantile Exchange (“CME”). Each dollar invested delivers five times the gains or losses of owning bitcoin itself.<sup>64</sup> This Bitcoin future is a

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59. Kevin Werbach & Nicolas Cornell, *Contracts Ex Machina*, 67 DUKE L.J. 313, 314 n.2 (2017) (“A smart contract is an agreement in digital form that is self-executing and self-enforcing.”); see also Nick Szabo, *Formalizing and Securing Relationships on Public Networks*, FIRST MONDAY (Sept. 1, 1997), <https://ojphi.org/ojs/index.php/fm/article/view/548/469> [<https://perma.cc/8QKR-MWQK>] (coining the term “smart contract”). Many crypto assets are composed of or supported by smart contracts.

60. Not all virtual currencies involve the distinctive technological features of cryptocurrency. Pepsi points and American Airlines Miles are arguably a kind of virtual currency, though both of these imaginary currencies operate with a single authoritative record keeper—the sponsor company. See, e.g., *Earn Miles*, AM. AIRLINES, <https://www.aa.com/i18n/aadvantage-program/miles/earn/earn-miles.jsp> [<https://perma.cc/7BWM-TUFE>]; *Pepsi Stuff Official Guidelines*, PEPSICO, <https://www.pepsistuff.com/termservice> [<https://perma.cc/7F5H-M6FQ>]; see also *infra* note 165 and accompanying text (news of blue-chip companies like Subway and Microsoft of accepting bitcoin).

61. This language is a pun on the IPO, or initial public offering (of securities).

62. FILECOIN, <https://filecoin.io> [<https://perma.cc/J6DH-SHMF>].

63. C. Steven Bradford, *Crowdfunding and the Federal Securities Laws*, 2012 COLUM. BUS. L. REV. 1, 16–19.

64. The CME determines that value by averaging the price of Bitcoin on several trading venues at a given time. *CME Bitcoin Futures Frequently Asked Questions*, CME GRP. (Dec. 15, 2017), <https://www.cmegroup.com/education/bitcoin/cme-bitcoin-futures-frequently-asked-questions.html> [<https://perma.cc/EZB9-zQRK>].

crypto *derivative* asset because it derives its values from some underlying crypto asset.

These categories are not mutually exclusive.<sup>65</sup> A business may raise money by pre-selling gift cards for the use of its services (utility), but it may bundle with those tokens the right to a portion of the venture's future profits (security) and the right to swap it for bitcoin at any time (derivative). Some merchants may decide to accept these tokens rather than cash (payment).

The crypto asset drama has a cast of four main characters,<sup>66</sup> though a given individual may play more than one role at once. *Users* invest in, spend, or trade crypto assets. *Developers* work to create, market, and improve crypto assets. Many developers are programmers who work on technical problems including code, but some developers play managerial, strategic, or communicative roles. *Trading venues* are web-based businesses at which crypto assets may be bought or sold.

Finally, *miners* play a distinctive role in maintaining the ledger, the decentralized scorecard of who owns what. Miners are persons or corporations that own computers, which they instruct to perform computational operations essential to maintaining the ledger. Users electronically signal that they have transacted, and miners' computers verify that the transaction genuinely took place and then record the transaction in the blockchain. For this service, they are compensated by fees, often in the form of the relevant crypto assets. The nomenclature of "mining" represents the sense in which the miners perform mundane labor, in order to realize something of value—which some other miner could reach if they "dig" more quickly or effectively in verifying and recording transactions.<sup>67</sup>

It is often said that crypto asset transactions are irreversible and immutable,<sup>68</sup> but this is only half-right. The redundant records produced across multiple computers means that no single actor can unilaterally alter or

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65. Kaal, *supra* note 21, at 15–16 (listing tokens with more than one functional status).

66. This list is not collectively exhaustive. We can also think of some news services and brokers as important infrastructure as well.

67. In the most familiar crypto assets, such as bitcoin, miners are tasked with performing computationally complex tasks in the course of recording transactions. In other assets, the miner functions as a reputational intermediary. See Michael Bradley et al., *Lawyers: Gatekeepers of the Sovereign Debt Market?*, 38 INT'L REV. L. & ECON. 150, 159–62 (2014). The miners record a transaction and then bet some portion of their crypto-wealth that the transaction was recorded correctly. As others come to endorse the miner's record (and, thus, certify that it is true), the miner becomes eligible to receive a reward. Those who record incorrectly lose their pledged wealth. This method of mining is called "proof-of-stake." See generally Craig Calcaterra & Wulf Kaal, *Secure Proof of Stake Protocol* (Jan. 18, 2018) (unpublished manuscript), [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3125827](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3125827) [<https://perma.cc/5UQH-PTUS>] (discussing the security problems of proof of stake protocols and how a Secure Proof of Stake protocol uses reputation-verifications to solve some of those problems).

68. Gideon Greenspan, *The Blockchain Immutability Myth*, MULTICHAIN (May 4, 2017), <https://www.multichain.com/blog/2017/05/blockchain-immutability-myth> [<https://perma.cc/8BEP-3KXB>].

conceal a record or lose it in a fire.<sup>69</sup> However, the blockchain is not utterly immutable except insofar as miners maintain it. Which transactions are “real,” and what properties the assets possess, are matters of consensus.<sup>70</sup> Miners decide which purported transactions to validate and which version of the ledger to validate. If miners decide en masse to negate a particular transaction or change the rules for such transactions in the future, then the crypto asset’s nature is instantly changed.<sup>71</sup>

Any time miners adopt a new version of a preexisting chain, it is a *fork*.<sup>72</sup> Forks are common means of updating the code of a crypto asset.<sup>73</sup> If all miners implement the change, then the fork amounts to a software update.

However, if some miners continue to process transactions under the old chain after a fork, then there are two chains. Both may persist, with independent value and a community of devoted users, or one may cannibalize attention and drive the other out of the economy. Which chain is the “real” chain and which one is irrelevant—or whether both are—is a purely social determination.<sup>74</sup> Crypto assets therefore evolve and grow through a two-step process. Some miners vote with their mining assets to support an alternative chain, and users vote with their wallets which version of the chain to buy and use.

Despite the word “crypto,” crypto assets are often massively transparent.<sup>75</sup> The transaction history and current ownership of each crypto asset is available

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69. Fight Club provides a relevant fantasy of credit scores being reset after the destruction of a centralized network. *See generally* FIGHT CLUB (Fox 2000 Pictures 1999).

70. Jeffery Atik & George Gerro, *Hard Forks on the Bitcoin Blockchain: Reversible Exit, Continuing Voice*, 1 STAN. J. BLOCKCHAIN L. & POL’Y 24, 28 (2018).

71. The record is still there, so long as anyone bothers to maintain it faithfully, but it will have lost all importance.

72. Strictly speaking, breaks into inconsistent block chains are *hard forks*, but this Article will just refer to forks when hard forks are intended. The alternative *soft fork* is far less interesting. A soft fork occurs when two different protocols are in use, but they are compatible. *See* Noelle Acheson, *Hard Fork vs Soft Fork*, COINDESK (Mar. 16, 2018), <https://www.coindesk.com/information/hard-fork-vs-soft-fork> [<https://perma.cc/DZ23-NBW9>]. The thing that is forking is the blockchain, a redundantly verified ledger of transactions and ownership. The chain is a chain of records composed of blocks of information which miners contribute.

73. For example, when a “bug” is found in code, the community can erase the bug by forking toward a version of the blockchain that treats all crypto assets identically, except that it does not have the bug. Joon Ian Wong & Ian Kar, *Everything You Need to Know About the Ethereum “Hard Fork,”* QUARTZ (July 18, 2016), <https://qz.com/730004/everything-you-need-to-know-about-the-ethereum-hard-fork> [<https://perma.cc/AHT5-JGDW>]. Forks may also occur by accident. Angela Walch, *In Code(rs) We Trust: Software Developers as Fiduciaries in Public Blockchains*, in REGULATING BLOCKCHAIN: TECHNO-SOCIAL AND LEGAL CHALLENGES (Philipp Hacker et al. eds., forthcoming 2019) (manuscript at 7) (on file with author).

74. *See* David Houck, *Bitcoin: Reacting to Money with Non-Money Attributes*, 1 GEO. L. TECH. REV. 371, 382–83 (2017).

75. Ahmed Kosba et al., *Hawk: The Blockchain Model of Cryptography and Privacy—Preserving Smart Contracts*, CRYPTOLOGY EPRINT ARCHIVE, <https://eprint.iacr.org/2015/675.pdf> [<https://perma.cc/PGV3-PUE7>] (last updated May 15, 2016).

for public view.<sup>76</sup> Although there are efforts to create assets with greater opacity,<sup>77</sup> transparency is a crucial element in existing distributed ledger systems. If transactional details were hidden, it would be impossible for miners to conclusively decide whether putative subsequent transactions were compatible with existing endowments. For example, if John transfers all his crypto assets to Rachel on Monday and then purports to transfer them all to Nancy on Tuesday, it is essential that the latter transaction be rejected by the community.<sup>78</sup> Only transparency makes this possible.

These two key traits of crypto assets, permanence and transparency, interact to produce a surprisingly accountable transactional universe. “[I]f at any point your true identity is linked to a wallet address, then the whole history of your transactions then becomes public knowledge.”<sup>79</sup> An investigator with knowledge of several people’s transactions may be able to piece together information about others’ identities.<sup>80</sup> Thus, crypto assets are far less private than many people imagine. The impression of total anonymity is partially a product of early associations with criminal enterprise,<sup>81</sup> and the inauspicious use of the word “crypto” in the asset’s description.

### III. INSIDER TRADING LAW

This Part provides a brief primer on federal insider trading law. Specific prohibitions on insider trading arise under three bodies of law: securities regulation, commodities regulation, and federal wire and mail fraud. This Part reviews the various theories of liability under each body of law.

#### A. SECURITIES REGULATION

The main source of insider trading law is securities regulation, as articulated in the Securities Act of 1933,<sup>82</sup> the Securities Exchange Act of 1934,<sup>83</sup> subsequent SEC rules, and judicial decisions. These laws apply only to trading in securities,<sup>84</sup> a category that includes most stocks and bonds, as well

76. DE FILIPPI & WRIGHT, *supra* note 16, at 39.

77. *Id.* (describing two such efforts).

78. *Id.*

79. Louis Nel, *Privacy Coins: Beginner’s Guide to Anonymous Cryptocurrencies*, BLOCKONOMI (Apr. 5, 2018), <https://blockonomi.com/privacy-cryptocurrency> [<https://perma.cc/38BM-MK9W>].

80. Julia Kagan, *Identity Theft*, INVESTOPEDIA (Aug. 11, 2019), <https://www.investopedia.com/terms/i/identitytheft.asp> [<https://perma.cc/D6YN-7ZNX>].

81. David Adler, *Silk Road: The Dark Side of Cryptocurrency*, FORDHAM J. CORP. & FIN. L.: BLOG (Feb. 21, 2018), <https://news.law.fordham.edu/jcfl/2018/02/21/silk-road-the-dark-side-of-cryptocurrency> [<https://perma.cc/6A2A-MVYF>].

82. Securities Act of 1933, Pub. L. No. 73-22, 48 Stat. 74 (codified as amended at 15 U.S.C. §§ 77a–77aa (2012)).

83. Securities Exchange Act of 1934, Pub. L. No. 73-291, 48 Stat. 881 (codified as amended at 15 U.S.C. §§ 78a–78pp (2012)).

84. A security is defined by § 2(a)(1) of the Securities Act and § 3(a)(10) of the Securities Exchange Act as, among other things, a “note, stock, treasury stock . . . bond . . . [or] investment

as similar assets and instruments whose value is fundamentally linked to them.<sup>85</sup>

There are three statutory or regulatory prohibitions on insider trading in securities. Most explicitly, § 16 of the Securities Exchange Act of 1934 (“Exchange Act”) makes officers, directors, and owners of at least ten percent of a publicly-traded entity’s shares (a trio sometimes called *statutory insiders*)<sup>86</sup> liable for disgorgement of any profits from trading their company’s shares within a six-month window, regardless of whether they had any kind of inside information. This “short-swing profits” rule operates mechanically to penalize rapid trading, even where it does not resemble quintessential insider trading.

Second, Exchange Act Rule 14e-3 bars trading while in possession of material nonpublic information about a pending tender offer.<sup>87</sup> Information “is material if there is a substantial likelihood that a reasonable shareholder would consider it important.”<sup>88</sup> In most cases, the mere knowledge that a tender offer is forthcoming will count as material information. A tender offer is a public invitation to sell or tender securities to an acquirer,<sup>89</sup> often in connection with an attempt to take over a company without the approval of the target company’s board.<sup>90</sup> Rule 14e-3 applies by its terms to equity, bonds, and other securities.<sup>91</sup>

Third, most insider trading cases are pursued under § 10(b) of the Exchange Act, a disclosure-oriented provision prohibiting fraudulent and deceptive practices.<sup>92</sup> To pursue insider trading under § 10(b), prosecutors or plaintiffs are required to argue that insider trading is not just unfair, but actually fraudulent.<sup>93</sup> This could be difficult since most securities trade in anonymous markets, in which traders make no affirmative representations at all, let alone false representations. Insider trading law overcomes this problem by identifying circumstances in which silence can be fraudulent. This means the law “prohibit[s] undisclosed trading on inside corporate information by

contract.” Securities Act of 1933 § 2(a)(1); Securities Exchange Act of 1934 § 3(a)(10); *see also* 15 U.S.C. §§ 77b(a)(1), 78c(a)(10) (2012).

85. *See* SEC v. W.J. Howey Co., 328 U.S. 293, 293 (1946).

86. 15 U.S.C. § 78p; Securities Exchange Act of 1934 § 16(a).

87. 17 C.F.R. § 240.14e-3 (2018); *see, e.g.*, WILLIAM K.S. WANG & MARC I. STEINBERG, INSIDER TRADING: LIABILITY AND COMPLIANCE §§ 9.01–9.04 (3d ed. 2013) (ebook).

88. TSC Indus., Inc. v. Northway, Inc., 426 U.S. 438, 449 (1976).

89. *See* Wellman v. Dickinson, 475 F. Supp. 783, 823–24 (S.D.N.Y. 1979).

90. Tender offers usually accompany a terrific appreciation in the target company’s stock. *Id.* at 823–25.

91. *See, e.g.*, 17 C.F.R. § 240.14e-3 (relating to regulations of exchange-traded securities under the Williams Act).

92. Securities Exchange Act of 1934, Pub. L. No. 73-291, § 10(b), 48 Stat. 881, 891 (codified as amended at 15 U.S.C. § 78(j) (2012)); 17 C.F.R. § 240.10b-5 (commonly known as Rule 10b-5).

93. *See* Chiarella v. United States, 445 U.S. 222, 233–35 (1980) (rejecting “a general duty between all participants in market transactions to forgo actions based on material, nonpublic information”).

individuals who are under a duty of trust and confidence that prohibits them from secretly using such information for their personal advantage.”<sup>94</sup> Courts have developed two theories under which such a duty of trust and confidence exists, such that a silent trader perpetrates the sort of fraud banned by Rule 10b-5.

The *classical theory* holds that a trader defrauds the shareholder with whom she trades by failing to disclose important information to a person for whom she is a fiduciary. The classical theory primarily contemplates inside trading by an officer or director,<sup>95</sup> who can be said to indirectly work for and manage property on behalf of her shareholders.<sup>96</sup> The insider occupies a sort of trustee role and should not take advantage of her beneficiaries by trading ruthlessly with them, using knowledge she only has because of her entrustment.<sup>97</sup> The classical theory also covers corporate advisors,<sup>98</sup> investment advisors and other financial professionals,<sup>99</sup> and government officials who owe a duty to all citizens not to misuse their offices for personal gain.<sup>100</sup>

The *misappropriation* theory holds that a trader who feigns loyalty to a company or person to gain access to secrets ultimately defrauds his source out of information when he misuses the information for trading.<sup>101</sup> It bars trading whenever someone learns information in a context that implies confidentiality, even if the trader is not a corporate insider. For example, the

94. *Salman v. United States*, 137 S. Ct. 420, 423 (2016).

95. *Steginsky v. Xcelera Inc.*, 741 F.3d 365, 370 n.5 (2d Cir. 2014).

96. *United States v. O'Hagan*, 521 U.S. 642, 643 (1997).

97. Stop Trading on Congressional Knowledge (STOCK) Act of 2012, Pub. L. No. 112-105, 126 Stat. 291 (barring trading for members of Congress and the judiciary on what seems to be the classical theory). *See generally* Sung Hui Kim, *The Last Temptation of Congress: Legislator Insider Trading and the Fiduciary Norm Against Corruption*, 98 CORNELL L. REV. 845 (2013) (revealing the rationale behind insider trading laws).

98. *Dirks v. SEC*, 463 U.S. 646, 655-57 (1983). *See generally* SEC v. Singer, 786 F. Supp. 1158 (S.D.N.Y. 1992) (highlighting possible attorney liability for insider trading).

99. *See* *Zweig v. Hearst Corp.*, 594 F.2d 1261, 1271 (9th Cir. 1979) (requiring a financial columnist to provide to the public all material information when publishing information on a security he or she owns); *Affiliated Ute Citizens of Utah v. United States*, 406 U.S. 128, 152-54 (1972) (highlighting the responsibilities of brokers under insider trading laws).

100. *Blyth & Co.*, Exchange Act Release No. 8499, 1969 WL 94740 (Jan. 17, 1969) (holding tippee of the official liable); *see also infra* text accompanying notes 215-16.

101. The misappropriation theory does not apply if the source granted valid permission for the trader to trade. *Salman v. United States*, 137 S. Ct. 420, 423 (2016) (recognizing that even without permission, traders may avoid liability if “they make appropriate disclosures ahead of time”). However, there is no protection where a trader has obtained permission to trade from someone who has no ultimate authority to grant it, in exchange for a personal benefit. *Id.* at 426-28; *United States v. Martoma*, 894 F.3d 64, 67-68 (2d Cir. 2017). For example, if a CEO shares secrets in exchange for reputational or pecuniary gains, or if a misappropriator shares her ill-gotten secret, the recipient is not permitted to trade on the newly acquired secret. *Dirks*, 463 U.S. at 663-64. One who is *tipped* information in breach of a duty inherits that duty and violates the law as a *tipper*.

misappropriation theory is violated if a member of Alcoholics Anonymous trades based on information learned at their confidential meetings,<sup>102</sup> or a broker front-runs (i.e., places trades ahead of) their client.<sup>103</sup>

### B. COMMODITIES

Commodities and futures are subject to the Commodity Exchange Act of 1936 (“’36 Act”) and the jurisdiction of the Commodity Futures Trading Commission (“CFTC”). Commodities are broadly (and somewhat circularly) defined as “all services, rights, and interests . . . in which contracts for future delivery are presently or in the future dealt in.”<sup>104</sup> This covers familiar commodities such as copper and corn, but also abstract and financial material such as interest rates,<sup>105</sup> foreign currencies,<sup>106</sup> and baskets of stock.<sup>107</sup>

While insider trading in commodities was permitted under the ’36 Act for all of the twentieth century,<sup>108</sup> the CFTC adopted rules in 2011 that seemed to import much of the insider trading jurisprudence from securities regulation.<sup>109</sup> Since that time, the CFTC has brought two insider trading cases.<sup>110</sup> The post-2011 insider trading regime in commodities is commonly said to track the misappropriation theory from the regulation of securities,<sup>111</sup> though some aspects of the regime identify duties of particular individuals

102. SEC v. McGee, 895 F. Supp. 2d 669, 674 (E.D. Pa. 2012).

103. Ray J. Grzebielski, *Why Martha Stewart Did Not Violate Rule 10b-5: On Tipping, Piggybacking, Front-Running and the Fiduciary Duties of Securities Brokers*, 40 AKRON L. REV. 55, 75-76 (2007).

104. 7 U.S.C. § 1a(9) (2012).

105. *Oversight of the Commodity Futures Trading Commission: Hearing Before the S. Comm. on Agric., Nutrition & Forestry*, 113th Cong. 5-6 (2013) (statement of Gary Gensler, Chairman, CFTC).

106. 7 U.S.C. § 1a(25)(A).

107. *Id.* § 1a(19)(i) (defining security indices as excluded commodities); 17 C.F.R. § 41.1(c) (2019) (defining broad-based security index).

108. See Verstein, *supra* note 7, at 457-58.

109. 7 U.S.C. § 9(1). Compare 17 C.F.R. § 180.1, with 17 C.F.R. § 240.10b-5.

110. Press Release, CFTC, Release No. 7459-16, CFTC Orders Jon P. Ruggles to Disgorge More than \$3.5 Million in Trading Profits and Pay a \$1.75 Million Penalty for His Illegal Futures and Options Trading (Sept. 29, 2016), <https://www.cftc.gov/PressRoom/PressReleases/pr7459-16> [<https://perma.cc/78DX-7R95>]; Press Release, CFTC, Release No. 7286-15, CFTC Orders Arya Motazedhi to Pay a Civil Monetary Penalty and Restitution and Bans Him from Trading and Registration for Engaging in Gas and Crude Oil Futures Transactions that Defrauded His Employer (Dec. 2, 2015), <https://www.cftc.gov/PressRoom/PressReleases/pr7286-15> [<https://perma.cc/SU57-7JNA>]; Verstein, *supra* note 10.

111. See, e.g., David Rosenfeld, *Cryptocurrencies, the CFTC, and Insider Trading Liability 3* (Jan. 2019) (unpublished manuscript) (on file with author) (interpreting the language of the CFTC rules to tie into the misappropriation theory rather than the classical theory).

—brokers,<sup>112</sup> exchange officials,<sup>113</sup> government officials<sup>114</sup>—as subject to a status-based duty, akin to the classical theory.

### C. MAIL AND WIRE FRAUD

The Department of Justice can bring insider trading cases under the federal mail fraud<sup>115</sup> and wire fraud statutes.<sup>116</sup> The elements of the charge are substantially similar to those of the misappropriation theory under SEC Rule 10b-5.<sup>117</sup> However, mail and wire fraud jurisprudence covers cases that 10b-5 does not.<sup>118</sup> The most important difference for the purposes of this Article is that federal prosecutors can bring cases that do not involve trading in securities or commodities.<sup>119</sup>

### IV. DOCTRINE: DO CRYPTO ASSETS FIT INSIDER TRADING LAW?

It is common to believe that insider trading law and crypto assets do not fit together.<sup>120</sup> The main insider trading theories for securities require the breach of a duty of trust or confidence and material non-public information, but many crypto assets seem to lack “issuers” or “shareholders” whose trust can be betrayed, or officers or directors who can commit a betrayal.<sup>121</sup>

112. See *United States v. Dial*, 757 F.2d 163, 169 (7th Cir. 1985). CFTC Rules §§ 155.3(a)(1) and 155.4(a)(1) require brokers of commodities to ensure that “their employees do not take advantage of their relationship with customers by using their knowledge of customer orders to trade ahead of or against the interests of such customers for their own benefit or that of their preferred customers.” Records of Cash Commodity and Futures Transactions; Trading Standards for Floor Brokers and Futures Commission Merchants, 41 Fed. Reg. 56,134, 56,139 n.18 (Dec. 23, 1976) (codified at 17 C.F.R. pt. 1); see also 17 C.F.R. §§ 155.3(a)(1), 155.4(a)(1) (2019).

113. 17 C.F.R. § 1.59(b) (2018); see also H.R. REP. NO. 102-978, at 23, 63–64 (1992), *reprinted in* 1992 U.S.C.A.A.N. 3179, 3195–96. Recent changes have increased the scope of this prohibition to include employees at clearinghouses, swap data repositories, and futures associations. 7 U.S.C. § 13(e) (2012).

114. 7 U.S.C. § 13(c) (barring insider trading by members of the CFTC and their staff).

115. 18 U.S.C. § 1341.

116. *Id.*

117. Indeed, the misappropriation theory was accepted by the U.S. Supreme Court in *O’Hagan*, which affirmed the defendant’s conviction on that basis under both 10b-5 and Wire Fraud. *United States v. O’Hagan*, 521 U.S. 642, 666–76 (1997).

118. See William K.S. Wang, *Application of the Federal Mail and Wire Fraud Statutes to Criminal Liability for Stock Market Insider Trading and Tipping*, 70 U. MIAMI L. REV. 220, 222 (2015).

119. See, e.g., *United States v. Sleight*, 808 F.2d 1012, 1014 (3d Cir. 1987) (applying mail fraud to cocoa futures); *United States v. Dial*, 757 F.2d 163, 164 (7th Cir. 1985) (applying mail and wire fraud to silver futures).

120. See, e.g., Anderson, *supra* note 11; Diamantis, *supra* note 11; Henning, *Should We Care About Insider Trading in Cryptoassets?*, *supra* note 25.

121. While much of the anti-regulatory case for crypto assets posits that they are special, some of the push may presume that they are like currencies or commodities. There is widespread skepticism about the viability of insider trading in currencies and commodities, which I have addressed elsewhere. See Andrew Verstein, *Benchmark Manipulation*, 56 B.C. L. REV. 215, 216–18 (2015) [hereinafter Verstein, *Benchmark Manipulation*]; see also Verstein, *supra* note 7, at 448–50.

Other skepticism arises out of issues that are distinctive to crypto assets. Some wonder whether crypto assets fit into any regulatory box subject to insider trading law.<sup>122</sup> Crypto assets are supported by software that is open source, so what “non-public” information is there? And just what is material to an asset as speculative as Bitcoin or as fanciful as some of its lesser known competitors, such as CryptoKitty?<sup>123</sup>

This Part shows that the law of insider trading can, and in many cases does, apply to cryptocurrency. Although the three key issues (jurisdiction; material non-public information; and duty) are treated separately below, it is worth keeping in mind the following case in which all three allegedly came together. In November 2017, a smallish cryptocurrency’s price soared on good news—an important trading website (Coinbase) would soon support it. Before making the announcement, Coinbase’s executives bought vast sums of the favored cryptocurrency (Bitcoin Cash). Trading in advance of an announcement violated company policy.<sup>124</sup> One trader sued alleging insider trading.<sup>125</sup> If true, the Coinbase incident would satisfy the elements of a familiar misappropriation-theory insider trading case—as the discussion below demonstrates.

This Part does not argue that the law *should* apply in any given case or any cases at all. That policy discussion exists in Parts V and VI. Rather, the point is that cryptocurrency is a perfectly sensible subject of insider trading regulation, and it is a policy decision whether to ratify that existing status.

#### A. REGULATED SUBJECT MATTER

Some have questioned whether insider trading law even applies to crypto assets, since the focus of American insider trading jurisprudence has concerned common stock in publicly traded companies, while crypto assets are something else entirely. These arguments are plainly wrong—it is obvious that crypto assets are subject to *at least* enough of the insider trading

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122. See Anderson, *supra* note 11; Diamantis, *supra* note 11; Henning, *Should We Care About Insider Trading in Cryptoassets?*, *supra* note 25; Ellen S. Podgor, *Cryptocurrencies and Securities Fraud: In Need of Legal Guidance*, 104 IOWA L. REV. ONLINE (forthcoming 2019).

123. CryptoKitties, *What the Heck Is a CryptoKitty?*, MEDIUM (Sept. 18, 2018), <https://medium.com/cryptokitties/what-the-heck-is-a-cryptokitty-4e14752e58c> [<https://perma.cc/N5AY-QD751>].

124. See *Berk v. Coinbase, Inc.*, No. 18-cv-01364-VC, 2018 WL 5292244, at \*1 (N.D. Cal. Oct. 23, 2018).

125. Although he lost his suit, the judge stated in dicta that the CFTC may well succeed if it brings a similar action. *Berk*, 2018 WL 5292244, at \*2. The plaintiff lost his CEA claim on standing. *Id.*

Coinbase is itself the largest trader on its own platform, making up 20 percent of its volume. It does not bar its employees from trading there, though they are barred from trading in advance of an announcement. BARBARA D. UNDERWOOD, OFFICE OF THE N.Y. STATE ATTORNEY GEN., VIRTUAL MARKETS INTEGRITY INITIATIVE 25 (2018), <https://virtualmarkets.ag.ny.gov> [<https://perma.cc/HGS3-P2ZF>].

jurisprudence to allow federal prosecutors to bring successful criminal actions.<sup>126</sup>

First, federal mail and wire fraud statutes apply to crypto assets. That is because federal mail and wire fraud statutes apply to insider trading in *any* asset, be it a security, a commodity, or a fanciful crypto asset. The U.S. Supreme Court in *United States v. O'Hagan* affirmed a criminal conviction of a lawyer who misappropriated material non-public information from his law firm and its clients and used it to trade.<sup>127</sup> In that case, the traded subject matter was stock, but there is nothing in the jurisprudence that limits the application of mail and wire fraud statutes to securities—and non-insider trading cases have used those statutes in numerous non-securities contexts.<sup>128</sup> Much of federal insider trading law applies regardless of the type of asset at issue, and crypto assets are certainly assets.

However, it is also worth examining why many crypto assets are subject to securities and commodities regulation (or both) with their attendant insider trading rules. This is because characterization of crypto assets as a security or commodity would empower civil enforcement by the SEC, CFTC, and private plaintiffs. It also unlocks additional grounds for liability.

SEC Chairman Clayton made waves in November 2018 when he seemed to announce that Bitcoin is not a security.<sup>129</sup> This is significant because Chairman Clayton was *for* characterizing crypto assets as securities before he was *against* it.<sup>130</sup> Despite the Chairman's statement, the SEC has taken numerous other steps to clarify its position. In 2017, a SEC report concluded one prominent set of crypto assets, DAO Tokens, were securities.<sup>131</sup> Further, the SEC has asserted that crypto assets are securities in enforcement actions

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126. Donna M. Nagy, *Insider Trading in Cryptoassets: Placing Jurisdictional Murkiness Off to One Side*, 104 IOWA L. REV. ONLINE (forthcoming 2019) (manuscript at 1–2) (on file with author); see also Hannibal Travis, *Common Law and Statutory Remedies for Insider Trading in Cryptocurrencies* 8–12 (Jan. 3, 2019) (unpublished manuscript) (on file with author) (describing state law remedies).

127. *United States v. O'Hagan*, 521 U.S. 642, 642 (1997).

128. See, e.g., *United States v. Sleight*, 808 F.2d 1012, 1014 (3d Cir. 1987) (applying mail fraud to cocoa futures); *United States v. Dial*, 757 F.2d 163, 164 (7th Cir. 1985) (applying mail and wire fraud to silver futures).

129. See Neeraj Agrawal, *SEC Chairman Clayton: Bitcoin Is Not a Security*, COIN CTR.: HOT TAKES (Apr. 27, 2018), <https://coincenter.org/link/sec-chairman-clayton-bitcoin-is-not-a-security> [<https://perma.cc/NG6V-LZ4W>]. And there are subtle arguments for why securities characterization is not a forgone conclusion. See generally Henderson & Raskin, *supra* note 18 (proposing two tests for categorizing digital assets as securities).

130. 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/5NRR-GZEG>].

131. Report of Investigation Pursuant to Section 21(a) of the Securities Exchange Act of 1934: The DAO, Exchange Act Release No. 81207, 117 SEC Docket 745 (July 25, 2017).

against promoters of crypto assets<sup>132</sup> and actions against trading venues for crypto assets.<sup>133</sup> Most analyses—by the SEC and others—have highlighted the substantial likelihood that any given crypto asset is indeed a security subject to securities regulation.<sup>134</sup>

To the degree that analysts conclude that securities laws are inapplicable, it tends to be regarding crypto assets that function more purely as a currency.<sup>135</sup> Such a conclusion, however, takes crypto assets out of the frying pan of securities regulation and into the fire of commodities regulation, which includes a similar set of insider trading rules.

Given the expansive definition of “commodity” and given the similarity between many crypto assets and currencies (which are subject to the CFTC’s jurisdiction), it is highly likely that any given crypto currency is subject to the anti-fraud provisions of the Commodity Exchange Act.<sup>136</sup> The CFTC has asserted,<sup>137</sup> and two federal courts have held,<sup>138</sup> that virtual currencies such as bitcoin are commodities for the purpose of the Commodity Exchange Act.<sup>139</sup>

132. Press Release, SEC, Two Celebrities Charged with Unlawfully Touting Coin Offerings (Nov. 29, 2018), <https://www.sec.gov/news/press-release/2018-268> [<https://perma.cc/3ER2-Q9RT>].

133. See Coburn, Exchange Act Release No. 84553, 2018 WL 5840155 (Nov. 8, 2018).

134. See, e.g., JAY B. SYKES, CONG. RESEARCH SERV., NO. R45301, SECURITIES REGULATION AND INITIAL COIN OFFERINGS: A LEGAL PRIMER 31–34 (2018); Thomas Lee Hazen, *Virtual or Crypto Currencies and the Securities Laws*, 38 FUTURE & DERIVATIVES L. REP. (Thomson Reuters), no. 10, Nov. 2018, at 1 (concluding that in “most, if not all, circumstances, virtual or crypto currencies are likely to be securities”); Hinman, *infra* note 262.

135. See generally Philipp Hacker & Chris Thomale, *Crypto-Securities Regulation: ICOs, Token Sales and Cryptocurrencies Under EU Financial Law*, 15 EUR. CO. & FIN. L. REV. 645 (2018) (arguing that pure currency tokens are exempt from securities regulations under EU law).

136. The CFTC has so far treated crypto assets as exempt commodities, akin to metals and electricity. 7 U.S.C. § 1a(20) (2012) (defining “exempt commodity” to mean any commodity that is not an agricultural or excluded commodity; “excluded commodity” is defined in § 1a(19) of the CEA to include any “interest rate, exchange rate, currency, security, security index” and other financial rates and assets). Interestingly, this characterization puts virtual currency in a different regulatory bucket than ordinary currency.

137. *In re Coinflip, Inc.*, CFTC No. 15-29, 2015 WL 5535736, at \*2 (Sept. 17, 2015).

138. *CFTC v. My Big Coin Pay, Inc.*, 334 F. Supp. 3d 492, 497–98 (D. Mass. 2018); *CFTC v. McDonnell*, 287 F. Supp. 3d 213, 228–29 (E.D.N.Y. 2018).

139. 7 U.S.C. § 1a(9) (explaining that the CEA defines “commodity” as agricultural products “and all other goods and articles . . . and all services, rights, and interests . . . in which contracts for future delivery are presently or in the future dealt in”). Futures are presently dealt in virtual currency. See, e.g., Akin Oyedele, *Bitcoin Futures Trading Gets the Green Light from US Regulators*, BUS. INSIDER (Dec. 1, 2017, 8:03 AM), <https://www.businessinsider.com/bitcoin-price-futures-trading-exchanges-cftc-2017-12> [<https://perma.cc/XU6Z-6WRG>] (“In a statement, the CFTC said the Chicago Mercantile Exchange and the CBOE Futures Exchange self-certified new contracts for bitcoin futures products. The Cantor Exchange self-certified a new contract for bitcoin binary options. The futures contracts will make it possible to bet on bitcoin prices without buying the cryptocurrency.”); see also Retail Commodity Transactions Involving Virtual Currency, 82 Fed. Reg. 60,335 (proposed Dec. 20, 2017) (to be codified at 17 C.F.R. pt. 1).

The CFTC can prosecute fraud in both the spot market (the crypto assets themselves) and derivative contracts arising from them.<sup>140</sup>

Recently, there have been legislative efforts to exclude some crypto assets from the coverage of the securities acts.<sup>141</sup> Whatever the prospects for these bills, their protections are not retroactive.<sup>142</sup> More importantly, there has been no effort to remove crypto assets from the ambit of the Commodity Exchange Act or wire fraud and mail fraud. Insofar as the Commodity Exchange Act also regulates insider trading and also applies to crypto assets, recent legislative fixes do not extinguish the need for insider trading analysis.

### B. MATERIAL, NON-PUBLIC INFORMATION

The touchstone for insider trading regulation in any form is the existence of material, non-public information.<sup>143</sup> Some examples of this are familiar to securities lawyers, such as a corporation's quarterly earnings report. But there is material non-public information even for crypto assets that do not neatly analogize to securities. The SEC addressed the issue of material non-public information in rejecting a proposal to let several securities exchanges begin trading shares in the Winklevoss twins' Bitcoin Exchange Traded Fund ("ETF"):<sup>144</sup>

Assuming there is no inside information related to the earnings or revenue of bitcoin, there may be material nonpublic information related to: the actions of regulators with respect to bitcoin; order flow, such as plans of market participants to significantly increase or

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140. Compare *supra* note 129 and accompanying text (noting that fraud statutes are not limited to securities), with *Berk v. Coinbase, Inc.*, No. 18-cv-01364-VC, 2018 WL 5292244, at \*2 (N.D. Cal. Oct. 23, 2018) (explaining that there is no private right of action as to spot market). Note that the CFTC's authority to prosecute fraud in the spot market, which is sufficient to ground insider trading claims, does not come alongside general regulatory authority. J. Christopher Giancarlo, Chairman, CFTC, Written Testimony of Chairman J. Christopher Giancarlo Before the Senate Banking Committee, Washington, D.C. (Feb. 6, 2018), <https://www.cftc.gov/PressRoom/SpeechesTestimony/opagiancarlo37> [<https://perma.cc/S6NH-HEB6>].

141. Recent legislation would exclude "digital tokens" from the coverages of the definition of a security. Token Taxonomy Act, H.R. 7356, 115th Cong. (2018). The authors seem to endorse Hinman's definition, which turns on whether a token has reached the threshold of functionality. Mark S. Nelson, *Reps. Davidson and Soto Would Redefine 'Security,' Clarify Use of Howey Test and Tax Treatment in New Blockchain Bill*, JIM HAMILTON'S WORLD SEC. REG. (Dec. 26, 2018), <http://jimhamiltonblog.blogspot.com/2018/12/reps-davidson-and-soto-would-redefine.html> [<https://perma.cc/RXQ8-5WA8>].

142. H.R. 7356. The bill does have one retroactive feature: Failure to register can be cured by rescinding the tokens. *Id.*

143. But see 17 C.F.R. §§ 240.16b-1 to 240.16b-8 (2018) does not require material non-public information as a matter of law.

144. An ETF is an exchange traded fund, which is an investment vehicle akin to a mutual fund that lets many investors pool their money to invest together. See generally Henry T.C. Hu & John D. Morley, *A Regulatory Framework for Exchange-Traded Funds*, 91 S. CAL. L. REV. 839 (2018) (an extended discussion on ETFs). An ETF is one kind of exchange-traded product ("ETP"), which means that it can be bought or sold on a stock exchange. *Id.* at 842 n.6.

decrease their holdings in bitcoin; new sources of demand, such as new ETPs that would hold bitcoin; or the decision of a bitcoin-based ETP, a bitcoin trading venue, or a bitcoin wallet service provider with respect to how it would respond to a “fork” in the blockchain, which would create two different, non-interchangeable types of bitcoin.<sup>145</sup>

Some of these additional considerations noted by the SEC are also familiar to securities lawyers: news coverage, regulatory treatment, exchange treatment, and trade data. All four of these familiar forms exist for crypto assets and ordinary assets. All these forms of material information are discussed below. In addition, the SEC notes arguably novel forms of material non-public information relating to forks. These are discussed both here and partially in Part VI.<sup>146</sup>

### 1. Issuer Information

For security tokens, which are functionally similar to securities, a whole ambit of information about the issuing company is plainly material and non-public.<sup>147</sup> The financial condition of the company issuing tokens is clearly material to the buyer of a token. So are the company’s business prospects and legal risks. Securities lawyers spend their careers opining on the many forms of information generated by a company that are material to its investors. Given that almost no issuers of tokens are in the habit of periodic disclosure, such company information is usually non-public.

Two practitioners recently noted another item of material non-public information that may apply to many crypto assets but has been neglected in many cases: *lockup agreements*, or restrictions on resale. This information is material because the expiration of a lockup often coincides with a substantial increase in marketable assets, putting downward pressure on the price.<sup>148</sup> When companies pay for acquisitions with securities,<sup>149</sup> the lockups imposed

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145. Order Setting Aside Action by Delegated Authority and Disapproving a Proposed Rule Change to List and Trade Shares of the Winklevoss Bitcoin Trust, Exchange Act Release No. 83723, 2018 WL 3596768 (July 26, 2018).

146. See *supra* Part VI.

147. Information that was material and non-public with respect to security tokens will be material and non-public with respect to many utility tokens as well. Recall that utility tokens represent credits to use a certain amount of the company’s product or service. Whether that product will ever be available (for a company that does not yet exist) or will remain available (for a company that still exists) may depend on the financial and business conditions of the issuing company. As bearers of default risk, these purchasers would consider material many of the same risk factors as bond and stock buyers.

148. Alfredo B.D. Silva & F. Dario de Martino, *Structuring Secondary Token Sales: How to Monetize Digital Tokens Under U.S. Securities Laws*, BLOOMBERG BNA: INSIGHT (Sept. 18, 2018), <https://web.archive.org/web/20180919180108/https://www.bna.com/insight-structuring-secondary-n73014482631> [<https://perma.cc/PS79-8XQ7>].

149. Crypto assets are increasingly used as acquisition consideration. Yuliya Chernova, *Ripple’s Xpring Isn’t Quite a Venture Fund—It’s More*, WALL ST. J.: PRO VENTURE CAP. (May 24, 2018, 7:30 AM), <https://www.wsj.com/articles/ripples-xpring-isnt-quite-a-venture-fundits-more-1527>

on those securities is obviously material to investors.<sup>150</sup> It even gets its own line in many familiar disclosure documents.<sup>151</sup> When companies waive their lockup period for someone, they promptly announce it on an 8-K.<sup>152</sup>

Lockups are common in crypto assets: “About . . . 15 percent of projects had a lockup period of 1 to 3 months, 17 percent locked their tokens up for 4 to 6 months, 14 percent had a lockup period of 8 to 12 months, and 6 percent of projects studied locked their tokens up for 18 to 24 months.”<sup>153</sup> They may lock up a substantial portion of the supply of crypto assets.<sup>154</sup> Yet organizations that use tokens to acquire assets and companies do not seem to disclose any lockups on resale of the acquisition consideration, and may forbid investors from disclosing the nature of lockups.<sup>155</sup>

Companies and individuals who trade during the lockup period do so while in possession of material non-public information, even if they are not themselves subject to the lockup. For example, suppose a venture capitalist buys crypto assets knowing that the founders are subject to a nine-month lockup. The venture capitalist sells her crypto assets eight months later, shortly before the founders become eligible to sell. The venture capitalist has traded while in possession of material non-public information and could

161439?mod=article\_inline [https://perma.cc/L33T-SPGJ] (using crypto assets to finance a venture capital fund); Cat Zakrzewski, *Omni Raises Funding from Ripple Execs and Highland Capital*, WALL ST. J. (Jan. 16, 2018, 7:30 AM), https://www.wsj.com/articles/omni-raises-funding-from-ripple-and-highland-capital-partners-1516105800?mod=article\_inline [https://perma.cc/PV8X-YVY] (using \$25 million crypto assets to finance an investment fund).

150. Anna T. Pinedo, *Market Trends 2017/18: Lock-Up Agreements*, MONDAQ, http://www.mondaq.com/unitedstates/x/727702/Shareholders/Market+Trends+201718+LockUp+Agreements [https://perma.cc/gUWT-WKPA] (last updated Aug. 15, 2018).

151. Amazon.com, Inc., Registration Statement (Form S-4) (July 27, 2009), https://www.sec.gov/Archives/edgar/data/1018724/000119312509155961/ds4.htm [https://perma.cc/LHD2-N6JH].

152. *Fast Answers: Form 8-K*, SEC, https://www.sec.gov/fast-answers/answersform8k.htm.html [https://perma.cc/EXE7-56VN] (last modified Aug. 10, 2012). Pursuant to §§ 13, 15(d) of the Securities Exchange Act of 1934, “public companies must report certain material corporate events on a more current basis. Form 8-K is the ‘current report’ companies must file with the SEC to announce major events that shareholders should know about.” *Id.*

153. *Token Lockup Periods for Successfully Funded ICO Projects in Q2 2018*, ICORATING (Aug. 6, 2018), https://icorating.com/news/2018-8-token-lockup-periods-for-successfully-funded-ico-projects-in-q2-2018 [https://perma.cc/T4KH-XTFH]; see also Shannan Cohny et al., *Coin-Operated Capitalism*, 119 COLUM. L. REV. 591, 638, app. A (noting that 36 of 45 audited crypto assets promised a lock up or vesting period for founders).

154. See RIALTO.AI, *Watch for ICO Lock-up Periods!*, MEDIUM (May 24, 2017), https://medium.com/@RialtoAI/watch-for-ico-lock-up-periods-4eba39af121e [https://perma.cc/75V8-TF8K] (finding that just under 90 percent of the mined supply of crypto asset Gnosis were locked up for one year).

155. Silva & de Martino, *supra* note 148; see also Rocco, *Futility Tokens: A Utility-Based Post-mortem*, TOKEN ECON. (Oct. 9, 2018), https://tokeneconomy.co/futility-tokens-a-utility-based-post-mortem-d7b1712a5a4e [https://perma.cc/XP52-ETYB] (asserting that one company, Mercury Protocol, allowed founders to resell on secondary market at lower price than simultaneous primary market sale). Arguably, the absence of a lock up is also material information.

potentially be liable for damages in a private securities suit to any contemporaneous trader, or in a government enforcement action.<sup>156</sup> Likewise, insiders who learn that a lockup period is going to be modified have material non-public information until that modification is disclosed.<sup>157</sup>

## 2. Media Coverage and Commercial Treatment

Positive and negative news coverage can affect the price of an asset and is plainly material for the purposes of insider trading law.<sup>158</sup> For example, in *United States v. Carpenter*,<sup>159</sup> the Second Circuit upheld the conviction of one of the authors of the Wall Street Journal's "Heard on the Street" column on an insider trading offense.<sup>160</sup> The majority rejected the dissent's notion that information is only material if it is "securities-related."<sup>161</sup> The court instead held that any information is material if it "in reasonable and objective contemplation might affect the value of the corporation stock or securities."<sup>162</sup>

Media coverage of crypto assets frequently impacts their price.<sup>163</sup> News that blue-chip companies like Subway and Microsoft would accept bitcoin pushed up the price of bitcoin.<sup>164</sup> Bitcoin fell five percent when Business Insider reported that Goldman Sachs would abandon plans to open a

156. The venture capitalist would only be liable if her trade was in breach of a duty (or a substitute). If the venture capitalist signed a non-disclosure agreement in connection with her investment, she might be bound to retain the company's secrets about the lockup, and thus violate the misappropriation theory by trading. See HOWARD J. KAPLAN ET AL., A.B.A., THE LAW OF INSIDER TRADING 3 (2012), [https://www.americanbar.org/content/dam/aba/administrative/litigation/materials/sac\\_2012/29-2\\_the\\_law\\_of\\_insider\\_trading.authcheckdam.pdf](https://www.americanbar.org/content/dam/aba/administrative/litigation/materials/sac_2012/29-2_the_law_of_insider_trading.authcheckdam.pdf) [<https://perma.cc/NVP2-RGNF>].

157. Rong Chen, *Modification to Token Lock-in Program*, ELA NEWS (Oct. 24, 2018), <https://elanews.net/2018/10/24/modification-to-token-lock-in-program> [<https://perma.cc/2UGA-47Sg>] (announcing a lockup policy change). The price of this crypto asset fell when the news was disclosed.

158. The information contained within the coverage can also be material. For example, if the Wall Street Journal reveals a Ponzi scheme, investors are likely to consider both the existence of the story and the underlying fraud to be material.

159. *United States v. Carpenter*, 791 F.2d 1024, 1024 (2d Cir. 1986).

160. *Id.* at 1026–27.

161. *Id.* at 1032 n.9.

162. *Id.* (quoting *SEC v. Texas Gulf Sulphur*, 401 F.2d 833, 849 (2d Cir. 1968)).

163. Non-news media makes a difference too. Bitcoin soared when it was announced that an episode of *The Good Wife* would focus on a relatively flattering portrayal of crypto assets. See *The Promise of the Blockchain: The Trust Machine*, ECONOMIST (Oct. 31, 2015), <https://www.economist.com/leaders/2015/10/31/the-trust-machine> [<https://perma.cc/X8Z2-8U5Y>] (placing Bitcoin on the cover); see also *The Good Wife: Bitcoin for Dummies* (CBS Productions Jan. 15, 2012) (airing an episode focused on bitcoin).

164. See, e.g., Wenjun Feng et al., *Informed Trading in the Bitcoin Market*, 26 FIN. RES. LETTERS 63, 63 (2018); see also Aaron Smith, *Microsoft Begins Accepting Bitcoin*, CNN (Dec. 11, 2014, 1:02 PM), <https://money.cnn.com/2014/12/11/technology/microsoft-bitcoin/index.html> [<https://perma.cc/N28K-P298>]; Evander Smart, *Bitcoin Year in Review: 2014—A Year to Remember*, CCN (Jan. 17, 2015), <https://www.ccn.com/bitcoin-year-in-review-2014> [<https://perma.cc/4Y8Y-Y229>] (discussing Dell's breakout into the bitcoin market in July 2014).

cryptocurrency trading desk.<sup>165</sup> Given this responsiveness to media coverage and breaking news, one with foreknowledge of such news would be able to profit predictably.<sup>166</sup>

### 3. Regulation and Enforcement

Actions by regulators also have the potential to affect the price of crypto assets. When regulators authorize bitcoin as a lawful payment method, the price goes up.<sup>167</sup> Regulation with the opposite force pushes the price back down.<sup>168</sup>

Earlier, we quoted the SEC's decision to reject the Winklevoss ETF.<sup>169</sup> That decision both addressed material non-public information and constituted it: The price of bitcoin fell three percent immediately after the decision was announced. Indeed, this rebuke was part of a series of rebukes, with at least one leading to rumors of insider trading. On August 4, 2018, bitcoin prices dropped while ether, another cryptocurrency which often moves in tandem, stayed still. Three days later, the SEC announced that it would need more time to evaluate a proposed bitcoin ETF listing on an exchange.<sup>170</sup> Many Bitcoin enthusiasts inferred that the SEC's delay meant bad news for the eventual approval of the product,<sup>171</sup> which had been

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165. See Michael Sheetz & Kate Rooney, *Bitcoin Falls After Goldman Reportedly Drops Crypto Trading Plans*, CNBC, <https://www.cnbc.com/2018/09/05/bitcoin-falls-after-goldman-reportedly-drops-crypto-trading-plans.html> [https://perma.cc/2D6F-3RNT] (last updated Sept. 5, 2018, 4:50 PM). But see Kate Rooney, *Goldman Sachs CFO Says Bank Is Working on Bitcoin Derivative for Clients*, CNBC, <https://www.cnbc.com/2018/09/06/goldman-sachs-cfo-calls-reports-of-shutting-down-crypto-desk-fake-news.html> [https://perma.cc/S8PG-JLKK] (last updated Sept. 6, 2018, 7:21 PM) (calling the rumors of a change of plans "fake news").

166. Rumors swirled that Goldman itself had shorted bitcoin right before the story. See Steven Gleiser, *Bitcoin's Insider Trading Problem*, BITCOIN CHASER (Sept. 10, 2018), [https://perma.cc/3XW4-XRMJ](https://bitcoinchaser.com/news/bitcoin-insider-trading)]. But it could also have been the journalist who broke the story. It seems that someone opened a \$74 million short position shortly before the article ran. Craig Russo, *Someone Took Out a \$74 Million Short on Bitcoin Right Before the Drop*, SLUDGEFEED (Sept. 5, 2018, 10:20 PM), <https://sludgefeed.com/someone-took-out-74-million-short-on-bitcoin-before-the-drop> [https://perma.cc/7BAR-JTPX].

167. See Shivdeep Dhaliwal, *Japan Is Set for Massive Explosion in Bitcoin Acceptance*, COINTELEGRAPH (Apr. 5, 2017), [https://perma.cc/4GgE-ZgYQ](https://cointelegraph.com/news/japan-is-set-for-massive-explosion-in-bitcoin-acceptance)]; see also Feng et al., *supra* note 164.

168. Maria Nikolova, *This Day in History: January 27, 2014—Bank of Russia Outlaws Bitcoin*, FINANCEFEEDS (Jan. 27, 2017, 5:21 AM), [https://perma.cc/TDB2-DF4Q](https://financefeeds.com/day-history-january-27-2014-bank-russia-outlaws-bitcoin)]; see also Feng et al., *supra* note 164.

169. Kate Rooney & Bob Pisani, *Winklevoss Twins Bitcoin ETF Rejected by SEC*, CNBC, <https://www.cnbc.com/2018/07/26/winklevoss-twins-bitcoin-etf-rejected-by-sec.html> [https://perma.cc/2F2E-7SC5] (last updated July 27, 2018, 7:53 AM).

170. Notice of Designation of a Longer Period for Commission Action on a Proposed Rule Change to List and Trade Shares of SolidX Bitcoin Shares Issued by the VanEck SolidX Bitcoin Trust, Exchange Act Release No. 83792, 2018 WL 3740716 (Aug. 7, 2018).

171. Notice of Designation of a Longer Period for Commission Action on Proceedings to Determine Whether to Approve or Disapprove a Proposed Rule Change to List and Trade Shares of SolidX Bitcoin Shares Issued by the VanEck SolidX Bitcoin Trust, Exchange Act Release No.

previously rejected in its bid for New York Stock Exchange listing.<sup>172</sup> It was later rumored that the price drop came from traders who somehow learned of the SEC's pending decision.<sup>173</sup> In each of these cases, government employees or their tippees would have had foreknowledge of the action.

However, even if government employees do not trade, those close to a company may have foreknowledge of regulation or enforcement due to their interactions with the government. For example, regulatory action often follows problems or scandals at bitcoin platforms.<sup>174</sup> Insiders at the scandal-ridden company would have been in a position to trade, knowing that new regulation or enforcement action was impending.<sup>175</sup>

#### 4. Exchange Listings

Listing a crypto asset for trading on an exchange or trading venue can have a big effect on the price of that crypto asset.<sup>176</sup> Trading venues and their insiders have “access to non-public news (like the impending listing of a new virtual currency on the platform).”<sup>177</sup> When Coinbase announced it would support Ethereum Classic, the crypto asset's price rose 20 percent.<sup>178</sup> In another notorious incident, cited at the beginning of this Part, Coinbase announced on twitter that it would support trading in Bitcoin Cash—after having repeatedly denied that such support was forthcoming.<sup>179</sup> Just before

84731, 2018 WL 6499900 (Dec. 6, 2018) (noting that the product's evaluation has since been delayed again).

172. Memorandum from Christina Thomas, Counsel to Comm'r Elad L. Roisman, SEC, on Meeting with Representatives of SolidX, VanEck, and CBOE, File No. SR-CboeBZX-2018-040, at 9 (Oct. 9, 2018), <https://www.sec.gov/comments/sr-cboebzx-2018-040/srcboebzx2018040-4507040-175984.pdf> [<https://perma.cc/TV9B-M7UU>].

173. *Did SEC Engage in Insider Trading Over the Bitcoin ETF Decision?*, TRUSTNODES (Aug. 8, 2018, 12:07 PM), <https://www.trustnodes.com/2018/08/08/sec-engage-insider-trading-bitcoin-etf-decision> [<https://perma.cc/7VG2-P93A>]. This is not the only example of regulators accused of trading on their own decisions. See Joseph Young, *South Korean Officials Initiated Insider Trading, Bought Bitcoin Before Trading Ban Fiasco*, CCN (Jan. 19, 2018), <https://www.ccn.com/south-korean-officials-initiated-insider-trading-bought-bitcoin-before-trading-ban-fiasco> [<https://perma.cc/A5DT-LDFT>].

174. See, e.g., Feng et al., *supra* note 164, at 68; see also Kashmir Hill, *Federal Judge Rules Bitcoin Is Real Money*, FORBES (Aug. 7, 2013, 1:59 PM), <https://www.forbes.com/sites/kashmirhill/2013/08/07/federal-judge-rules-bitcoin-is-real-money> [<https://perma.cc/PUP2-X843>] (discussing the Bitcoin Ponzi scheme scandal).

175. Many platforms permit their employees to trade. See UNDERWOOD, *supra* note 125, at 23–24.

177. *Id.*

177. *Id.* at 24.

178. Robert Devoe, *Coinbase to Add Ethereum Classic, Ripple XRP Fans Fuming*, BLOCKONOMI (June 12, 2018), <https://blockonomi.com/coinbase-etc> [<https://perma.cc/CX2W-BKCK>].

179. For another example, see Joseph Young, *Traders Accused of Insider Trading ZCash, as Price Surges After Bithumb Integration*, CCN (Sept. 28, 2017), <https://www.ccn.com/traders-accused-insider-trading-zcash-price-surges-bithumb-integration> [<https://perma.cc/EE5B-SBBN>] (describing trading by tippees of Korean trading venue in advance of support for another asset).

the announcement, the price of Bitcoin Cash surged to an all-time high, consistent with someone at Coinbase trading on or leaking the information.<sup>180</sup>

For all that rides on a listing, trading venues do not all observe best practices for making and disclosing their decisions, as Coinbase's tweet-based change implies. Trading venues' procedures are often opaque and discretionary.<sup>181</sup> New York's Office of the Attorney General summarized things this way:

Across the board, the OAG found that platforms' determinations of whether to list a given virtual asset were largely subjective. No platform articulated a consistent methodology used to determine whether and why it would list a given virtual asset. Some objective factors did appear to be considered by many. For instance, platforms often look at the total value or "market capitalization" of a virtual asset, or its average daily trading volume. But the OAG found there is no rhyme or reason to how those objective factors are applied, and there is certainly no consistent application across platforms.<sup>182</sup>

Nor is the uncertainty located just at the bottom of the pile. The second largest crypto asset by market capitalization, at the time of writing, remains untradeable at Coinbase.<sup>183</sup>

Similar uncertainty and opportunity surrounding listing decisions applies to platforms listing derivatives on crypto assets. In many cases, exchanges provide little ex ante guidance about whether they will list or delist a crypto asset,<sup>184</sup> even though these decisions can influence the price of the underlying crypto asset.<sup>185</sup> LedgerX, the first clearinghouse and derivatives

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180. Daniel Roberts, *The Leading Bitcoin Brokerage Is Under Fire for Possible Insider Trading*, YAHOO! FIN. (Dec. 20, 2017), <https://finance.yahoo.com/news/leading-crypto-brokerage-coinbase-fire-possible-insider-trading-bitcoin-cash-162147599.html> [<https://perma.cc/44E4-ZCBX>].

181. See, e.g., Coinbase, *Our Process for Adding New Assets*, MEDIUM: COINBASE BLOG (Jan. 4, 2018), <https://blog.coinbase.com/our-process-for-adding-new-assets-f97b7ba65bea> [<https://perma.cc/434C-8UNN>] ("A committee of internal experts is responsible for determining whether and when new assets will be added to the platform in accordance with our framework. These individuals—and all employees at Coinbase—are subject to confidentiality and trading restrictions.").

182. UNDERWOOD, *supra* note 125, at 22–23.

183. Kate Rooney, *Coinbase Considers Adding 30 New Cryptocurrencies to its Exchange, Including Highly Anticipated XRP*, CNBC, <https://www.cnbc.com/2018/12/07/coinbase-considers-adding-30-new-cryptocurrencies-including-xrp.html> [<https://perma.cc/WD2N-TABK>] (last updated Dec. 10, 2018, 10:12 AM) (describing how Coinbase is "considering" adding XRP).

184. Nor is there a need to obtain regulators' permission to list new assets. See Amy Leisinger, *Securities Regulation Daily Wrap Up, TOP STORY—Exchanges Self-Certify Contracts for Bitcoin Future Products*, SEC. REG. DAILY WRAP UP (Dec. 1, 2017), [http://business.cch.com/srd/SRD\\_Bitcoin\\_futures\\_12012017.pdf](http://business.cch.com/srd/SRD_Bitcoin_futures_12012017.pdf) [<https://perma.cc/4828-7EDC>].

185. In general, derivative contracts allow individuals to hedge the risk of investing in an asset and so make the asset more desirable. Derivative contracts may also increase net demand for crypto assets by overcoming difficult regulatory, security, and custody issues. Gabriel T. Rubin, *First Futures Contract to Pay Out in Bitcoin Poised for Green Light*, WALL ST. J. (Dec. 20, 2018, 5:30 AM), <https://www.wsj.com/articles/first-futures-contract-to-pay-out-in-bitcoin-poised-for-green>

exchange authorized by the CFTC,<sup>186</sup> has an official policy on its treatment of new assets produced by forks: “Our management and risk committees will evaluate each hard fork on a case by case basis. We will then publish public notices to our members as to our plan for that hard fork as soon as prudently possible.”<sup>187</sup> Although three factors are listed as relevant to this evaluation (marketplace support, feasibility and security, and regulatory comfort), they are hardly algorithmic.<sup>188</sup> LedgerX retains substantial discretion in whether to list derivatives, and LedgerX insiders will know before the market which way that discretionary process is leaning. Also worth noting is that LedgerX promises to notify its “members” as soon as prudently possible. But selective disclosure to members gives them an edge over non-members in trading crypto assets whose value may depend in large part on their treatment by LedgerX.<sup>189</sup> Long before the derivatives contract is added or removed, LedgerX members get a chance to opportunistically trade with non-members in the spot market.

LedgerX’s policy is largely discretionary, but more objective procedures do not eliminate the possibility for informed trading—they simply change how it happens.<sup>190</sup> A discretionary standard gives insiders at LedgerX (and, later, members) a leg up. A mechanical standard gives an advantage to whomever has early access to the data utilized in that mechanical standard.<sup>191</sup>

For example, the CME Group (formerly CBOT)—the oldest and perhaps most important derivatives exchange<sup>192</sup>—has publicized its criteria for adding new crypto assets for derivative contracts.<sup>193</sup> One condition is that the new

light-11545301801?mod=hp\_lead\_pos3 [https://perma.cc/R99P-RZ22] (describing enthusiasm and importance for institutional investors of new cash-settled derivative product). At times, derivative instruments can also drive down an asset’s price by making it easier and more profitable to express pessimistic views about the asset.

186. Press Release, CFTC, CFTC Grants DCO Registration to LedgerX LLC, Release No. 7592-17 (July 24, 2017), <https://www.cftc.gov/PressRoom/PressReleases/pr7592-17> [https://perma.cc/TSY4-TJFU].

187. Paul L. Chou, *LedgerX’s Policy Framework for Hard Forks*, LEDGERX: THOUGHTS ON CRYPTO BLOG (Oct. 24, 2017), <https://blog.ledgerx.com/ledgerxs-policy-framework-for-hard-forks> [https://perma.cc/5Q6K-B26R].

188. *Id.*

189. *Id.*

190. Verstein, *Benchmark Manipulation*, *supra* note 121, at 267–68.

191. *See* Verstein, *supra* note 7, at 469–74 (showing how informed trading is facilitated by objective criteria).

192. Steve Kummer & Christian Pauletto, State Secretariat for Economic Affairs SECO, The History of Derivatives: A Few Milestones, Lecture presented at EFTA Seminar in Zurich on Regulation of Derivatives Markets 11 (May 3, 2012), *available at* [https://www.seco.admin.ch/seco/en/home/Aussenwirtschaftspolitik\\_Wirtschaftliche\\_Zusammenarbeit/Wirtschaftsbeziehung/en/Internationaler\\_Handel\\_mit\\_Dienstleistungen/Spezifische\\_Themen.html](https://www.seco.admin.ch/seco/en/home/Aussenwirtschaftspolitik_Wirtschaftliche_Zusammenarbeit/Wirtschaftsbeziehung/en/Internationaler_Handel_mit_Dienstleistungen/Spezifische_Themen.html) [https://perma.cc/Y7CJ-PS32].

193. *CME CF Cryptocurrency Pricing Products: BRR & BRTI Index Hard Fork Policy*, CF BENCHMARKS (JULY 2019), <https://www.cryptofacilities.com/cms/storage/resources/cme-cf-hard-fork-policy.pdf> [https://perma.cc/26DQ-Z9M5] (indicating that this policy still confers

asset must be traded on at least two of the spot markets recognized by the CME. That means that insiders at the spot market have foreknowledge about whether the asset will be listed by the CME. Once the second exchange agrees to do so, it may be certain that a powerful form of support for the asset will become available.<sup>194</sup>

Of course, the decision to list a derivative is only one discretionary choice by a derivatives exchange. They may also update their calculation methodology. For example, introduction of a new price feed into the benchmark can greatly and predictably change the settlement price.<sup>195</sup> They may also decide whether to discontinue a product<sup>196</sup> or even halt trading.<sup>197</sup> A trading halt is inconvenient for traders in an asset, may limit the expression of pessimistic views, and may signal the exchange's pessimism about the viability of the asset.

## 5. Trading

Information about planned trades can be material because a large purchase or sale can move market prices. Brokers are often tempted to “front-run” their clients by placing orders likely to pay off in light of the following order,<sup>198</sup> and clients themselves sometimes plan to “self-front-run” by anticipating the effect of their own orders on the market.<sup>199</sup> The same

discretion upon the administrator in the case a crypto asset doesn't initially meet the inclusion criterion). The CBOE, another prominent derivatives exchange, also offered Bitcoin futures until June 2019, but with a different settlement mechanism. *XBT-Cboe Bitcoin Futures*, CBOE, <http://cfe.cboe.com/cfe-products/xbt-cboe-bitcoin-futures> [<https://perma.cc/E9XL-BD6V>]. It is set by reference to a daily auction price. This auction mechanism poses its own possibilities of manipulation and informed trading, owing to the low volume of trades at the auction. See Silva & de Martino, *supra* note 148.

194. Another requirement is that there be at least 100 trades in the crypto asset. A trader may know if they plan to personally make 100 trades in the near future, whereas other traders can only guess about the prospects for an active market in the asset.

195. Lee Reiners, *Bitcoin Futures: From Self-Certification to Systemic Risk*, 23 N.C. BANKING INST. 61, 78–80 (2019) (excluding two of the largest bitcoin exchanges).

196. Alexander Osipovich, *Cboe Abandons Bitcoin Futures*, WALL ST. J. (Mar. 18, 2019, 9:00 AM), <https://www.wsj.com/articles/cboe-abandons-bitcoin-futures-11552914001> [<https://perma.cc/39FW-HAZU>].

197. Josiah Wilmoth, *Bitcoin Cash: Pre-Fork Uncertainty Forces OKE to Close Futures Market Early*, CCN (Nov. 14, 2018), <https://www.ccn.com/bitcoin-cash-pre-fork-uncertainty-forces-okex-to-close-futures-market-early> [<https://perma.cc/H665-WD5U>].

198. See generally Patricia Hurtado & Lananh Nguyen, *Ex-HSBC FX Trader Sentenced to 2 Years, Sent Directly to Prison*, BLOOMBERG, <https://www.bloomberg.com/news/articles/2018-04-26/ex-hsbc-currency-trader-is-sentenced-to-two-years-in-prison> [<https://perma.cc/8G9D-W5C6>] (last updated Apr. 26, 2018, 4:35 PM) (“A federal jury found the bank's former global head of foreign exchange guilty of nine counts of wire fraud and conspiracy for front-running a \$3.5 billion client order in December 2011.”).

199. Jerry W. Markham, “Front-Running”—*Insider Trading Under the Commodity Exchange Act*, 38 CATH. U. L. REV. 69, 89 (1988).

dynamics are likely feasible in crypto asset markets,<sup>200</sup> with an additional possibility. When users transact crypto assets, miners record the transaction in the blockchain. There exists a window of time in which a miner knows about the transaction prior to recordation. A miner can decide in that moment whether to initiate their own transaction and insert it into the block prior to the temporarily prior one. They can use this to make a trade in light of information coming to market, or to literally usurp the very transaction they were meant to record.<sup>201</sup>

Even without front-running, there are plenty of other ways to gain from information about trading plans. Trading venues know something about the otherwise undisclosed identity of traders.<sup>202</sup> For example, in September of 2018, the co-founder of the third largest Crypto asset, Ripple Labs's XRP, began selling vast sums of his personal stake in the asset.<sup>203</sup> XRP declined 13 percent following the news.<sup>204</sup> The founder had announced similar sell off plans in 2014, resulting in an even bigger drop.<sup>205</sup> A broker or platform may know before others that large sales are coming from a founder and trade on the impending negative market reaction.

Even completely anonymous, aggregate trading data can be valuable. Aggregated order flow data helps traders in ordinary currency to outperform

200. To the degree that users dispense with brokers and centralized exchanges, they will be able to protect the flow of their trade information. See Devin Soni, *Eliminating Front Running with Decentralized Exchanges*, HACKERNOON (Mar. 26, 2018), <https://hackernoon.com/eliminating-front-running-with-decentralized-exchanges-2a5163991ffd> [<https://perma.cc/U62V-46M4>] (describing efforts to create a decentralized exchange free from front-running). But see BKP Admin, *An Overview of Decentralized Trading of Digital Assets*, BROOKLYN PROJECT (Nov. 15, 2018), <https://collaborate.thebcp.com/project/TL/document/g/version/10> [<https://perma.cc/5V7H-SSF2>] (“In general, with DEXs, front-running could be performed by miners, platform operators, or market participants.”).

201. James Prestwich, *Miners Aren't Your Friends: Miners and Consensus: Part 1 of 2*, MEDIUM: KEEP NETWORK BLOG (Jan. 10, 2018), <https://blog.keep.network/miners-arent-your-friends-cdegb6eoeqac> [<https://perma.cc/T36Z-PWH7>]; Martin Holst Swende, *Blockchain Frontrunning*, SWENDE BLOG (July 10, 2017), <http://swende.se/blog/Frontrunning.html> [<https://perma.cc/3BFT-XRGP>]; Will Warren, *Front-Running, Griefing and the Perils of Virtual Settlement (Part 1)*, MEDIUM: OX BLOG (Dec. 22, 2017), <https://blog.oxproject.com/front-running-griefing-and-the-perils-of-virtual-settlement-part-1-8554ab283e97> [<https://perma.cc/DWW8-FTCE>].

202. UNDERWOOD, *supra* note 125, at 24 (“[F]or instance, . . . information about the status of the platform order book, or information about its customers' identities.”).

203. Tomio Geron, *Ripple Co-Founder's Token Selloff Accelerates*, WALL ST. J. (Sept. 24, 2018, 7:30 AM), <https://www.wsj.com/articles/ripple-co-founders-token-selloff-accelerates-1537788600> [<https://perma.cc/QZM7-A4WM>].

204. Rakesh Sharma, *Ripple Is Up. So Why Is Its Cofounder Selling His XRP Tokens?*, INVESTOPEDIA, <https://www.investopedia.com/news/ripple-so-why-its-cofounder-selling-his-xrp-tokens> [<https://perma.cc/C7K2-8AXT>].

205. Daniel Cawrey, *Price of Ripple Plummets as Co-Founder Plans 9 Billion XRP Selloff*, COINDESK, <https://www.coindesk.com/price-ripple-xrp-plummets-co-founde-9-billion-selloff> [<https://perma.cc/X9ZK-GNRP>] (last updated May 23, 2014, 12:40 PM) (telling the story of the same, aforementioned Ripple founder selling off his cryptocurrency).

the market.<sup>206</sup> Trading venues now show great interest harvesting and selling equivalent data for crypto assets.<sup>207</sup>

Another crucial form of information known to markets is when orders are timed. For example, it is common for traders to place orders to execute only at a certain time of day, usually at closing or the moment at which a benchmark is set.<sup>208</sup> Net order flow at that moment can influence the benchmark price, and the value of any derivative contract based on it.<sup>209</sup> The same is true for crypto assets. The settlement value for Bitcoin futures is based on the average of the price of five spot markets, derived at a designated moment. Those five spot markets may be able to observe pre-set orders well in advance of the fixing moment. They can make an educated guess on how one of only five data points will resolve, and therefore what futures are worth.

\* \* \*

There are plainly many forms of material non-public information bearing on the price of crypto assets. Indeed, scholars have already taken steps to quantify the price impact of material non-public information on crypto assets. One paper identified dozens of incidents in which the price of a crypto asset moved substantially, seemingly because of disclosure of news, which was known privately prior to the disclosure and where there appears to have been substantial pre-disclosure trading in precisely the ways one would expect if some traders had foreknowledge of the news.<sup>210</sup> “[T]he average estimated profit of Bitcoin informed trading is between 100,922 and 915,455 USD per event; and between 222,973 and 2,367,409 USD per large event.”<sup>211</sup> Many of the types of information noted in this Article fall into the categories discussed above. This leaves the question of whether it is legal to trade on the forgoing information, which is often a matter of duty, discussed below.

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206. Lukas Menkhoff et al., *Information Flows in Foreign Exchange Markets: Dissecting Customer Currency Trades* 11–14, 35 (Bank for Int’l Settlements, Working Paper No. 405, 2016), <http://www.bis.org/publ/work405.pdf> [<https://perma.cc/7E9M-AJNF>]; see also Bettina Peiers, *Informed Traders, Intervention, and Price Leadership: A Deeper View of the Microstructure of the Foreign Exchange Market*, 52 J. FIN. 1589, 1607 (1997) (finding Deutsche Bank able to anticipate major currency price changes by 60 minutes). “Order flow is defined as the net of buyer-initiated and seller-initiated orders; it is a measure of net buying pressure.” Martin D.D. Evans & Richard K. Lyons, *Order Flow and Exchange Rate Dynamics*, 110 J. POL. ECON. 170, 171 (2002).

207. Alexander Osipovich, *What’s Bitcoin Worth? A New Plan to Bring Discipline to Crypto Prices*, WALL ST. J., [https://www.wsj.com/articles/bitcoin-draws-another-wall-street-giant-nyse-owner-1516271400?mod=article\\_inline](https://www.wsj.com/articles/bitcoin-draws-another-wall-street-giant-nyse-owner-1516271400?mod=article_inline) [<https://perma.cc/2HEV-5DEY>] (last updated Jan. 19, 2018, 12:23 AM).

208. Simon Goodley, *The Foreign Exchange Trader: ‘The Closer You Get to 4PM, the Less the Risk,’* GUARDIAN (Mar. 12, 2014, 4:39 PM), <https://www.theguardian.com/business/2014/mar/12/forex-trader-closer-4pm-less-risk> [<https://perma.cc/3LJW-RKXH>].

209. See Verstein, *supra* note 7, at 469–74.

210. Feng et al., *supra* note 164, at 65–66.

211. *Id.* at 68.

### C. BREACH OF DUTY

For the most part, American law bars only trading in breach of a duty of trust or confidence: “[T]he fiduciary concept is based fully on trust—one party entrusting another to make decisions on her behalf.”<sup>212</sup> By contrast, it is common to refer to cryptocurrency systems as “trustless.” This may suggest that there is no duty to support insider trading regulation. That said, relationships of trust and confidence are widespread in the crypto asset economy. The following shows many examples of duties of trust and confidence—or facts that permit liability without such a showing.

#### 1. Classical

Some crypto assets are issued as equity securities with officers or directors. For such crypto assets, the classical theory applies as is conventional: The officers and directors of the issuer owe a duty to the shareholder-traders of the crypto assets as a result of their common relationship to the issuing firm.<sup>213</sup> In other cases, where the crypto asset network is radically decentralized and there is no one analogous to an officer or director, there remain at least two ways the classical theory may still apply.

First, government actors have a classical duty to abstain from certain forms of trading under the STOCK Act of 2012. This law provides that all members and employees of Congress and all other federal officials and employees owe a “duty of trust and confidence” to the “United States Government” and to the “citizens of the United States” respecting “material nonpublic information” derived from their official positions or gained through performance of their official responsibilities.<sup>214</sup> Insofar as they learn about upcoming regulatory changes and enforcement actions, or obtain information from entities subject to regulation and investigation, it is illegal for them to trade securities and commodities (crypto or otherwise) on that basis.<sup>215</sup>

Second, brokers and exchanges have long been held to a classical-like duty to forswear trading on customer-specific data or changes in the exchange’s policy. The same could plausibly hold for intermediaries in crypto asset trades.<sup>216</sup>

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212. Walch, *supra* note 73, at 3.

213. William K.S. Wang, *Stock Market Insider Trading: Victims, Violators and Remedies—Including an Analogy to Fraud in the Sale of a Used Car with a Generic Defect*, 45 VILL. L. REV. 27, 46 (2000) (describing the “classical relationship” triangle).

214. See *supra* note 97 and accompanying text.

215. 7 U.S.C.A. § 6c(a)(4) (West 2019) (effective Apr. 4, 2012) (covering any “information that may affect or tend to affect the price of any commodity in interstate commerce, or for future delivery, or any swap”).

216. Whether the duty currently applies is somewhat debatable, since the regulatory status of many intermediaries is not yet certain. Clearly any exchange that is registered as a trading venue

A third rationale is that developers may owe a classical theory duty to the holders of the crypto assets they develop. Some scholars have prominently argued for this duty.<sup>217</sup> Such a view would make it a violation of duty for a software developer of virtual currency technology to exploit any information which is material and non-public. Arguably, bugs in the code would qualify for such characterization. For example, in a highly publicized event, the DAO (“Distributed Autonomous Organization”) was hacked and about \$55 million stolen.<sup>218</sup> A flaw in the code permitted this to happen. A coder who participated in the construction of this flawed code might be liable for negligently causing the flaw (Professor Walch’s point).<sup>219</sup> But that same public obligation to users to ensure good code may also bar trading on bad code that nevertheless goes unrepaired.

As greater attention comes to the crypto asset sector, we discover more cases of developers learning about and intentionally concealing troubling problems with code until repairs are completed.<sup>220</sup> These decisions may be well-intentioned, but developers who buy or sell crypto assets in the meantime may potentially run afoul insider trading norms.<sup>221</sup>

## 2. Misappropriation

As already discussed, Coinbase’s decision to list Bitcoin Cash on its platform had a large impact on the price of that crypto asset and others. Rumors swirled in the cryptocurrency community of the possible trading by Coinbase insiders, leading to a public statement by Coinbase’s CEO announcing a company policy barring trading on material non-public

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with the CFTC or SEC would be subject to familiar rules, as would any exchange that *should have* registered but didn’t.

217. Walch, *supra* note 73, at 9–16. *But see* Haque et al., *supra* note 24, at 144–45; cf. Gregory Scopino, *Preparing Financial Regulation for the Second Machine Age: The Need for Oversight of Digital Intermediaries in the Futures Markets*, 2015 COLUM. BUS. L. REV. 439, 494–507 (calling for registration of trading software developers).

218. See del Castillo, *supra* note 22.

219. It’s a fair question whether any code in the public domain can be called “non-public,” but that goes to the other element, not this one. This code is indeed in the public domain. See, e.g., Bitcoin, GITHUB, <https://github.com/bitcoin/bitcoin> [<https://perma.cc/L6AB-WQAW>]; Ethereum, GITHUB, <https://github.com/ethereum> [<https://perma.cc/2BDS-L925>].

220. See, e.g., Alyssa Hertig, *The Latest Bitcoin Bug Was So Bad, Developers Kept Its Full Details a Secret*, COINDESK (Sept. 24, 2018, 4:05 AM), <https://www.coindesk.com/the-latest-bitcoin-bug-was-so-bad-developers-kept-its-full-details-a-secret> [<https://perma.cc/99BP-JYNY>].

221. Is that a good thing? If developers are able to use secrecy to solve problems, then we should applaud legal technologies that prevent information from leaking. Insider trading is an important way that information leaks. On the other hand, developers are often crypto enthusiasts who relish the opportunity to trade. If they are forbidden from trading whenever secrets are known, they may be reluctant to accept secrets, or they may even leak secrets to release them to the public and end the blackout period. These are familiar tradeoffs in the securities insider trading literature, reemphasizing the parallels between crypto assets and familiar assets.

information.<sup>222</sup> These platforms differ greatly in the restrictions on employees.<sup>223</sup> At any platform with a trading policy like Coinbase's, violation of that policy would support a finding of liability under this misappropriation theory.

The misappropriation theory is not limited to just misuse of information by exchange employees. *Any* time someone has material non-public information, confidants who misappropriate it are potentially liable for insider trading. That certainly means agents of a trading platform (officers, directors, employees). It likewise means that the agents of large traders are liable when they trade on the basis of private trading plans or proprietary research.<sup>224</sup> So too are journalists who trade on the basis of a story,<sup>225</sup> regulators who tip friends in advance of an enforcement action,<sup>226</sup> or employees of a company that plans to announce greater or lesser support for a crypto asset.<sup>227</sup> There are as many ways to misappropriate information as there are to generate it.

It is common to think that crypto assets without an "issuer" do not have a source to whom an agent might owe a duty. The forgoing examples already dispel such a thought, but distinctive features of crypto assets actually indicate that there are *more* sources (whose defrauding can establish a misappropriation claim) with crypto assets than traditional assets. With common stock, there is just one company that has privileged information about its own plans. Will it dilute its own equity? Will it announce low earnings? Insiders at the company can defraud the company of this information, but no others will typically have this information.

This is not so for crypto assets, where several miners collectively perform the operations necessary to preserve and update the blockchain. Less than a dozen mining pools control 80 percent or more of the computing power that governs any given crypto asset.<sup>228</sup> Each one of those mining pools knows much better than the market whether it will support any proposed changes to the

222. Brian Armstrong, *Our Employee Trading Policy at Coinbase*, MEDIUM: COINBASE BLOG (Dec. 19, 2017), <https://blog.coinbase.com/our-employee-trading-policy-at-coinbase-1d4e860b7837> [<https://perma.cc/5T4V-4685>]. Half a year later, Coinbase announced the investigation concluded, with no illicit trading discovered. Helen Partz, *Coinbase Internal Investigation Concludes No Insider Trading Took Place*, COINTELEGRAPH (July 25, 2018), <https://cointelegraph.com/news/coinbase-internal-investigation-concludes-no-insider-trading-took-place> [<https://perma.cc/54GC-T3Z7>].

223. UNDERWOOD, *supra* note 125, at 24 ("Some platforms require employees, or a subset of employees with access to sensitive data (for instance, those with knowledge of forthcoming listings), to be pre-cleared before transacting . . ."). Others provide no restrictions, bar trading altogether, or address trading risks by limiting employees' access to information. *Id.*

224. *See supra* Section III.A (describing the misappropriation theory as barring trading on information learned in confidence even if the trader is not a corporate insider).

225. *See supra* Section IV.B.2.

226. *See supra* Section IV.B.3.

227. *See supra* Section IV.B.3.

228. *See infra* note 285 (Bitcoin Mining Distribution pie chart).

crypto asset, and it knows slightly before others what transactions have been executed. Each pool is therefore a principal with material non-public information. If agents at any pool use this information without permission to trade, they are culpable under the misappropriation theory.

There are still other ways for traders to misappropriate information. Several platforms deny that they engage in proprietary trading on their own account.<sup>229</sup> If they nevertheless trade, they could be liable for fraud. Insofar as the assurance of non-trading led customers to share their data with the platform, their information would have been misappropriated by the platform.<sup>230</sup> Platforms have foreknowledge of the trade requests of their customers. Trading *ahead* of such requests could easily defy the explicit or implicit assurances of the platform. Front-running is a form of market abuse that is partially coextensive with insider trading, and it has already been alleged in one platform.<sup>231</sup>

### 3. Tender Offer Trades

Not all insider trading theories require material non-public information or a breach of duty, but the few commentators to remember this in the context of crypto assets have quickly dismissed their importance.<sup>232</sup> This is a mistake. Two insider trading theories other than the familiar duty-based theories also apply to crypto assets.

Rule 14e-3 bars trading even on authorized information about an undisclosed tender offer,<sup>233</sup> and it applies to any security.<sup>234</sup> Insofar as tokens are securities, it applies to them. A tender offer for part of a security crypto asset would be subject to these rules.

It may seem fanciful to contemplate tender offers for crypto assets,<sup>235</sup> but such strategies are already in practitioner toolkits. For example, tender offers might be used to call in non-compliant tokens issued in the wild days of 2017 and 2018, in return for properly registered tokens:

To start, issuers of unregistered security tokens (let's call them "old tokens") would have to complete a formal SEC registration process

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229. UNDERWOOD, *supra* note 125, at 24–26.

230. It could also constitute deceptive acquisition. *Cf.* SEC v. Dorozhko, 574 F.3d 42, 51 (2d Cir. 2009).

231. William Suberg, *Cryptocurrency Exchange Yobit Investigated in Russia on Fraud Claims*, COINTELEGRAPH (Mar. 6, 2017), <https://cointelegraph.com/news/cryptocurrency-exchange-yobit-investigated-in-russia-on-fraud-claims> [<https://perma.cc/7C8W-SJ7A>].

232. David Golumbia, *Cryptocurrencies Aren't Currencies. They Aren't Stocks, Either*, MOTHERBOARD: TECH BY VICE (Aug. 22, 2017, 4:10 PM), [https://motherboard.vice.com/en\\_us/article/xwvv83/cryptocurrencies-arent-currencies-they-arent-stocks-either](https://motherboard.vice.com/en_us/article/xwvv83/cryptocurrencies-arent-currencies-they-arent-stocks-either) [<https://perma.cc/8G5X-4ZBY>] (analyzing tender offers in securities and then concluding, "There is simply no parallel between this phenomenon and 'market cap' in cryptocurrencies").

233. *See supra* Section III.A.

234. *See supra* Section III.A.

235. Golumbia, *supra* note 232.

for what are essentially replacement tokens (“new tokens”). Upon the approval of such a registration, issuers would have to swap old tokens for new tokens for all willing takers—a digital tender offer of sorts.<sup>236</sup>

A fine plan, perhaps, but it creates insider trading liability for anyone who trades on the eve of such a tender offer—including friends and advisors to the offeror who have been authorized to trade and those whose trades have nothing to do with the tender offer.

Insider trading regulation may also apply to impede efforts to construct investment funds in crypto assets.<sup>237</sup> Owning the underlying crypto assets creates security risks and payment challenges. Many investors will find it more familiar and convenient to buy shares in an investment fund that own crypto assets.<sup>238</sup> However, the SEC has shown reluctance to allow such products.<sup>239</sup> There is a workaround to sidestep the SEC’s reluctance, however: a “tender offer closed end funds.”<sup>240</sup>

A mutual fund is a regulated investment vehicle that permits its investors a right to redeem their shares at the end of the day for their pro rata share of the net asset value of the fund.<sup>241</sup> A closed end mutual fund is a mutual fund that denies its investors the right to make daily redemptions.<sup>242</sup> Closed end

236. Daniel Alter, *Why the SEC Should Give Amnesty to Illegal ICOs*, COINDESK, <https://www.coindesk.com/sec-give-amnesty-illegal-icos> [<https://perma.cc/55CU-82CV>] (last updated May 9, 2018, 11:36 AM). Other plans involve giving tokens in exchange for shares. One company in the Philippines proposed such a maneuver because it lacked sufficient cash to initiate a traditional cash-for-shares tender offer. See Arra B. Francia, *Calata Planning to Issue Digital Tokens in Exchange for Shares*, BUSINESSWORLD (Oct. 31, 2017, 12:14 AM), <https://www.bworldonline.com/calata-planning-issue-digital-tokens-exchange-shares> [<https://perma.cc/RJ6A-SGJU>].

237. Susan Gault-Brown, *Structuring Options for Retail Crypto Fund Products*, 51 REV. SEC. & COMMODITIES REG. 117, 119 (2018).

238. Rubin, *supra* note 185. There are many reasons for this preference. Some investors are legally permitted to buy funds but not exotic assets. Others fear forgetting the password for their electronic wallets.

239. Staff Letter from Dalia Blass, Div. of Inv. Mgmt. Dir., SEC, on Engaging on Fund Innovation and Cryptocurrency-Related Holdings to Paul Schott Stevens, President & CEO, Inv. Co. Inst., and Timothy W. Cameron, Head of Asset Mgmt. Grp., Sec. Indus. and Fin. Mkt. Assoc. (Jan. 18, 2018), <https://www.sec.gov/divisions/investment/noaction/2018/cryptocurrency-011818.htm> [<https://perma.cc/S5DV-RW54>] (stating that the SEC staff “do[es] not believe that it is appropriate for fund sponsors to initiate registration of funds that intend to invest substantially in cryptocurrency and related products”).

240. A “tender offer fund” is therefore different from an ordinary closed-end fund that uses a tender offer to buy back some of its own shares. James Chen, *Closed-End Fund*, INVESTOPEDIA, <https://www.investopedia.com/terms/c/closed-endinvestment.asp> [<https://perma.cc/EP57-L7SZ>] (last updated Apr. 22, 2019); Adam Hayes, *Tender Offer*, INVESTOPEDIA, <https://www.investopedia.com/terms/t/tenderoffer.asp> [<https://perma.cc/6SPQ-QQNT>] (last updated Apr. 5, 2019). Such periodic buybacks also raise insider trading concerns when the contents of the fund are crypto assets.

241. John Morley & Quinn Curtis, *Taking Exit Rights Seriously: Why Governance and Fee Litigation Don't Work in Mutual Funds*, 120 YALE L.J. 84, 92 (2010).

242. *Id.* at 102.

funds can go for decades without redeeming shares or paying dividends to their investors. However, one type of closed end fund (a tender offer closed end fund) seeks to enjoy the benefits of being closed while still providing reasonable options for their investors to recover their cash when needed. They do this by periodically offering to repurchase shares from their investors pursuant to a tender offer.<sup>243</sup> For example, the board of a closed end fund might offer every six weeks to redeem up to 25 percent of any investor's shares.<sup>244</sup> A fund that purchases crypto assets might be able to operate as a closed end fund with liquidity through tender offers, and thereby sidestep many regulatory hurdles.

Tender offers can therefore be used to support the existence of ETPs for crypto assets but doing so implicates the restrictions of SEC Rule 14e-3. Anyone who has knowledge of a closed-end fund's plans to provide liquidity by way of a tender offer cannot trade on the basis of that information, even with the fund manager's permission.<sup>245</sup>

#### 4. Short Swing Trades

Equity securities are subject to § 16 of the Securities Act of 1933, which penalizes rapid trading in equity securities by certain statutory insiders, including those who own ten percent of the stock. Essentially, it requires that profits made within a six-month window be disgorged. Section 16(a) requires prompt disclosure of any trades. There is no requirement that the trader know material non-public information, nor is there any argument that the source of information can relieve the trader of the consequences of the trading.

Large traders who come to own ten percent of a class of crypto assets (assuming that class qualifies as an equity security) would therefore be required to file documents with the SEC documenting every single trade they make.<sup>246</sup> They would also need to disgorge any profits made within a six-month window. To my knowledge, no trader has ever documented a trade in crypto assets with the SEC.

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243. Mutual funds are normally prohibited from redeeming shares except through the familiar end-of-day/NAV process. 17 C.F.R. § 242.102 (2012). However, an exception permits redemptions by tender offer. *Id.* § 242.102(b)(2).

244. Clair E. Pagnano et al., K&L Gates LLP, PowerPoint Presentation at 2017 Boston Investment Management Conference on Special Issues for Registered Closed-End, Tender Offer and Interval Funds, at slide 6 (Nov. 28, 2017), *available at* [http://m.klgates.com/files/Uploads/Documents/2017\\_IM\\_Conf/Boston/SessionIV.pdf](http://m.klgates.com/files/Uploads/Documents/2017_IM_Conf/Boston/SessionIV.pdf) [<https://perma.cc/F23K-X3MW>].

245. It is no surprise that a tender offer fund will make tender offers, though the details of the timing and price may well be non-public. A trader with foreknowledge of likely moves in the crypto asset prices arguably has material non-public information about a tender offer.

246. Most security tokens are probably not equity, but some may give control rights or rights to residual profits or otherwise resemble equity. *See generally* Evgeny Lyandres et al., Do Tokens Behave Like Securities? An Anatomy of Initial Coin Offerings (Apr. 20, 2019) (unpublished manuscript), [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3287583](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3287583) [<https://perma.cc/S3QV-AEBC>] (showing that coins tend to behave like equities).

This problem is likely to grow as time goes on. At present, the best known crypto assets are “proof of work” systems that reward miners who devote computing power to maintaining the system.<sup>247</sup> But the Ethereum Foundation hopes to transition ether (arguably the second most important crypto asset after Bitcoin) to a “proof of stake” system in the near future.<sup>248</sup> A proof of stake system rewards traders who accurately verify transactions *and* have bet a large amount of crypto assets that they are correct. To play the mining game in that brave new world will require substantial ownership. However, whomever buys ten percent or more of a proof of stake equity token will be essentially precluded from trading it. The implications of existing insider trading law may therefore grow considerably in the coming days.<sup>249</sup> Those who own enough to mine may be precluded from timely selling the rewards of their labor.

\* \* \*

The point of the forgoing analysis is not to argue that any particular instance of insider trading occurred or is subject to liability under the law. Nor is the point that the law ought to operate the way that it does. So far, the point is only to dispel the sense that the old categories somehow don’t apply. There is a long history of dismissing the viability of insider trading categories to currencies and commodities.<sup>250</sup> The point of the foregoing analysis is that we cannot proceed so blithely. We must decide whether insider trading law ought to apply the same way to cryptocurrency as other assets, even as we decide what our insider trading law ought to be. It is to that we now turn.

#### V. POLICIES & PRIORITIES: DO CRYPTO ASSETS NEED INSIDER TRADING LAW?

The desirability of insider trading in securities law has been hotly contested for decades. Advocates for deregulation assert that insider trading

247. Kaal, *supra* note 21, at 26 (showing that the plurality of the top 100 crypto assets use proof of work).

248. Nathaniel Popper, *There Is Nothing Virtual About Bitcoin’s Energy Appetite*, N.Y. TIMES (Jan. 21, 2018), <https://www.nytimes.com/2018/01/21/technology/bitcoin-mining-energy-consumption.html> [<https://perma.cc/PP2T-6B76>].

249. There is more to be said about this risk. Rule 16b-3(d)(1) exempts from § 16(b) any transaction between an executive and the issuer, which is authorized by the board. 17 C.F.R. § 240.16b-3(d)(1) (2018). Some analogous rules exempt transactions by non-executives that have been deemed unlikely to express fraudulent intent. *Id.* § 240.16a-9. Similar rules could be crafted to protect miners, but it is risky to assert exemption by analogy. *Cf.* *Huppe v. WPCS Int’l Inc.*, 670 F.3d 214, 216 (2d Cir. 2012) (holding that “a beneficial owner’s acquisition of securities directly from an issuer” is not exempt from § 16(b)). Likewise, the Supreme Court has recognized a safe harbor for “unorthodox transactions,” which mining sales may or may not be. *See Kern Cty. Land Co. v. Occidental Petroleum Corp.*, 411 U.S. 582, 600–04 (1973).

250. Verstein, *supra* note 7, at 458–63.

improves price accuracy and managerial incentives.<sup>251</sup> Advocates against deregulation dispute these claims,<sup>252</sup> and argue that insider trading is unfair to ordinary investors,<sup>253</sup> raises trading costs,<sup>254</sup> and constitutes a theft of property from the corporate issuer.<sup>255</sup>

Whatever the proper resolution of that debate, the crypto asset market is not somehow exempt from consideration. To the contrary, most of the policy rationales for and against insider trading law in securities and commodities apply to crypto assets as well. Indeed, some apply even more strongly. This Part presents familiar policy arguments relevant to the regulation of insider trading (such as fairness, price accuracy, and trading costs) in answer to three arguments often raised in opposition to insider trading law to the crypto asset market.

First, it is commonplace to argue that crypto assets are in a nascent stage and that their growth and innovation requires lawyers to keep their hands off.<sup>256</sup> A closely related point is that regulation can undermine efforts to establish a minimum effective scale of use, which crypto assets require for viability.<sup>257</sup> Against this, I argue that regulation and enforcement can encourage growth and adoption by removing the risk and cost associated with market abuse.

Second, while the availability of radical self-help through forking may seem to empower crypto asset users to solve their own market abuse problems without state assistance, I argue that forking creates entirely new problems, including new dimensions of insider trading.

Third, users of crypto assets may be ideologically opposed to legalistic interventions. They prefer to live and die by their code, and insider trading may be one of many risks they'd rather handle on their own. Or so the argument goes. Many actual and would-be crypto asset users do not feel this way, and the law should consider their expectations too. In any case, I argue that even "crypto-Crusoes" benefit from a legal system that treats their values as important—insider trading law can do that.

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251. See, e.g., MANNE, *supra* note 2, at 138 (describing incentives); Dennis W. Carlton & Daniel R. Fischel, *The Regulation of Insider Trading*, 35 STAN. L. REV. 857, 868 (1983) (explaining that insider trading increases price accuracy).

252. See generally Zohar Goshen & Gideon Parchomovsky, *The Essential Role of Securities Regulation*, 55 DUKE L.J. 711 (2006) (arguing that insider trading injures the viability of market analysts, and thus price accuracy).

253. Alan Strudler & Eric W. Orts, *Moral Principle in the Law of Insider Trading*, 78 TEX. L. REV. 375, 376–77 (1999).

254. Nicholas L. Georgakopoulos, *Insider Trading as a Transactional Cost: A Market Microstructure Justification and Optimization of Insider Trading Regulation*, 26 CONN. L. REV. 1, 6–7 (1993).

255. Stephen M. Bainbridge, *Incorporating State Law Fiduciary Duties into the Federal Insider Trading Prohibition*, 52 WASH. & LEE L. REV. 1189, 1252–57 (1995).

256. Diamantis, *supra* note 11 (manuscript at 1–2, 4).

257. PARK, *supra* note 19, at 6–11.

Fourth, crypto assets are currently plagued by fraud and market manipulation, but action against insider trading may well reduce those other ills.

A. *RED TAPE, LIQUIDITY AND THE HINMAN PARADOX*

It is now common to think that disruptive businesses grow best when they ignore laws.<sup>258</sup> Brilliant innovators feel the need to “Move Fast and Break Things.”<sup>259</sup> They must not let legal niceties crowd out technological and economic insights. These arguments take on greater resonance because of the Hinman Paradox, identified by Professor James Park.<sup>260</sup>

The paradox takes its name from William Hinman, the SEC’s Director of the Corporate Finance division, who gave a speech explaining why the SEC polices unregistered sales of nascent crypto assets even as it tolerates sales of the largest unregistered crypto assets, such as bitcoin. Hinman set out a standard that implied that the SEC’s job is done once a crypto asset becomes widely used enough that it no longer relies on a few promoters for success: “If the network on which the token or coin is to function is sufficiently decentralized—where purchasers would no longer reasonably expect a person or group to carry out essential managerial or entrepreneurial efforts—the assets may not represent an investment contract.”<sup>261</sup>

Hinman’s standard creates a chicken-and-egg problem that pits law against viability. As Professor Park puts it, “for a utility token to be distributed freely without regulation by the securities laws, it must be functional. But many utility tokens are only functional if they are distributed widely enough so that a de-centralized system arises.”<sup>262</sup> The reason that they are only functional if they are widely distributed is that,

“for many token platforms to operate efficiently, the platform must algorithmically or otherwise generate and pay tokens to miners, oracles, verifiers, or others who provide valuable services to the platform and the broader token ecosystem.” Therefore, “these

258. See generally Elizabeth Pollman & Jordan M. Barry, *Regulatory Entrepreneurship*, 90 S. CAL. L. REV. 383 (2017) (discussing “regulatory entrepreneurship” and the role of disruption within the business world).

259. Samantha Murphy, *Facebook Changes Its ‘Move Fast and Break Things’ Motto*, MASHABLE (Apr. 30, 2014), <https://mashable.com/2014/04/30/facebooks-new-mantra-move-fast-with-stability> [<https://perma.cc/5EXF-2RTC>].

260. See PARK, *supra* note 19 and accompanying text.

261. William Hinman, Dir., Div. of Corp. Fin., SEC, Digital Asset Transactions: When *Howey* Met *Gary (Plastic)*, Remarks at the Yahoo Finance All Markets Summit: Crypto (June 14, 2018), available at <https://www.sec.gov/news/speech/speech-hinman-061418> [<https://perma.cc/PG7P-RBS5>].

262. PARK, *supra* note 19, at 6.

tokens must be capable of being delivered to any person . . . and must be freely tradeable upon receipt. . . ."<sup>263</sup>

Functional platforms reward miners with coins and these coins are only suitable inducement if salable. They are especially salable if they do not require registration, but they require registration if they are not yet functional. The Hinman Paradox is that assets escape regulation through widespread use, but they cannot achieve widespread use if they are regulated.<sup>264</sup>

While Park is right to notice the Hinman Paradox, the analysis is incomplete because it presumes regulation is an *impediment* to the liquidity needed to make a system functional. In fact, market regulation is supposed to *improve* liquidity.<sup>265</sup> Investors are more likely to buy if they do not fear information asymmetries or if trading costs are low. Market regulation generally advances these goals.<sup>266</sup> In particular, insider trading law enforcement lowers trading costs,<sup>267</sup> and concern over trading costs is now one of the most promising theories for justifying insider trading regulation.<sup>268</sup>

Moreover, many crypto enthusiasts don't just desire viable assets—they want viable *money*.<sup>269</sup> For non-state money, the urgency of improving liquidity is even higher. As Professor Gorton and others have shown in their analysis of the rise and fall of mortgage-backed securities as a form of private money, the crucial factor in the success of the instrument is its information insensitivity.<sup>270</sup> Informationally insensitive assets are ones for which it is very difficult to have any kind of informational advantage about its quality. All mortgage-backed

263. *Id.* at 6 (alteration in original) (quoting Robert Rosenblum et al., *Getting to a Fully Operational Token Platform*, WILSON SONSINI GOODRICH & ROSATI: PRACTITIONER INSIGHT (Oct. 11, 2018), <https://www.wsgr.com/email/Practitioner-Insight/Token%20Platform/Practitioner-Insight-token-platform-web.html> [<https://perma.cc/NQ4V-BVDB>]).

264. Neither Park nor Hinman argue that registration is therefore *bad*. Rather, Park argues that Hinman's statement simply makes registration hard to avoid. It is my inference that the Hinman Paradox may have a deregulatory lesson.

265. Utpal Bhattacharya & Hazem Daouk, *The World Price of Insider Trading*, 57 J. FIN. 75, 92 (2002).

266. Merritt B. Fox et al., *The New Stock Market: Sense and Nonsense*, 65 DUKE L.J. 191, 222–24 (2015).

267. Bhattacharya & Daouk, *supra* note 265, at 92–93. The literature is not unambiguous. See Stanislav Dolgoplov, *Insider Trading and the Bid-Ask Spread: A Critical Evaluation of Adverse Selection in Market Making*, 33 CAP. U. L. REV. 83, 148 (2004).

268. See Fox et al., *supra* note 1, at 822–25; Georgakopoulos, *supra* note 254, at 1–2.

269. See, e.g., Chris Douthit, *Can Cryptocurrencies Become Real Currencies?*, HACKERNOON (July 24, 2018), <https://hackernoon.com/can-cryptocurrencies-become-real-currencies-addde1db21d> [<https://perma.cc/U7AA-RXKB>].

270. Tri Vi Dang et al., *Ignorance, Debt and Financial Crises* 4, 36–38 (Apr. 2015) (unpublished manuscript), [http://www.columbia.edu/~td2332/Paper\\_Ignorance.pdf](http://www.columbia.edu/~td2332/Paper_Ignorance.pdf) [<https://perma.cc/URD7-EBS5>]; Gary B. Gorton & Andrew Metrick, *Securitized Banking and the Run on Repo* 6–9 (Nat'l Bureau of Econ. Research, Working Paper No. 15223, 2009), <https://www.nber.org/papers/w15223.pdf> [<https://perma.cc/4N2F-G3FU>]; see, e.g., GARY B. GORTON, *SLAPPED BY THE INVISIBLE HAND: THE PANIC OF 2007*, at 22–65 (2010) (ebook).

securities (“MBS”) look pretty much alike—universally and terrifically complicated—so market participants mostly treated them as fungible. If they were simpler assets, payees might have been apprehensive before taking MBS as payment or collateral; is the seller only offering *this* MBS to me because she knows that it is about to default on its payment obligations? For an asset to work as a liquid unit of payment, recipients must not think there is any point in researching the asset’s quality,<sup>271</sup> or any fear that the seller is foisting a lemon onto them.<sup>272</sup> If they did, then every transaction would include a friction of due-diligence. Put simply, people must trust that their money is valuable without having to check. For money to work, a combination of economic and legal factors must reduce the gains of research to less than the cost of research. Gorton shows how this combination was achieved with asset-backed securities.<sup>273</sup>

The stakes are equally high for crypto assets that want to be spendable.<sup>274</sup> If the goal is to be realized, economics and law must work together to eliminate the recipients’ fear that the spender knows something bad about the asset. Insider trading law is calibrated to remove that worrisome information asymmetry. A legal process used to make assets more informationally insensitive and support their money-like attributes.

Thus, regulation isn’t an impediment to widespread distribution of crypto assets; it is an important bridge to making that transition. Given that, the Hinman Paradox (regulated unless functional, functional only if widely used, regulation impairs use) must be supplemented by what we can call the Hinman Corollary: Regulation can help a token to be widely used. The Hinman Paradox poses a puzzle: How do you escape the pull of regulation if the only way out is through? The Hinman Corollary reconstructs the puzzle: Having achieved sufficient scale so as to be functional and thus avoid regulation, how do you not lose the regulation that preserves that scale? This question looms large under Hinman’s approach, but it is quite the opposite problem initially posited, and it is no argument against law enforcement.

### B. FORKS

It is often asserted that regulation is less necessary for crypto assets because any problematic transactions can always be erased by the consensus of the community. For example, the infamous DAO token hack involved the

271. Gary Gorton et al., *The Safe-Asset Share*, 102 AM. ECON. REV. 101, 102 (2012).

272. George A. Akerlof, *The Market for “Lemons”: Quality Uncertainty and the Market Mechanism*, 84 Q.J. ECON. 488, 489–90, 495 (1970).

273. Gary B. Gorton & Guillermo Ordoñez, *The Supply and Demand for Safe Assets* 1–5 (Nat’l Bureau of Econ. Research, Working Paper No. 18732, 2013), <https://www.nber.org/papers/w18732.pdf> [<https://perma.cc/435B-HCJR>].

274. Hossein Nabilou & André Prüm, *Ignorance, Debt, and Cryptocurrencies: The Old and the New in the Law and Economics of Concurrent Currencies*, 5 J. FIN. REG. 29, 57–58 (2019) (discussing potential for crypto assets to become information insensitive “safe” assets).

extraction of almost \$60 million of ether from an investment community,<sup>275</sup> but it was effectively erased when miners and users forked the code to a new version of ether that was the same except in that the attack did not take place.<sup>276</sup> The crypto-burglars still had the ether they stole, but in a form the community ceased to recognize. It is the equivalent of a community boycotting all the dollars stolen from a bank—who needs cops if this amazing form of self-help is available?

While the self-help possibilities for crypto assets are potentially transformative, there are four reasons it would be premature to end familiar forms of law enforcement at this time. First, the decision to build community consensus around a fork is costly.<sup>277</sup> The decision to alter block size for bitcoin (which created Bitcoin Cash) took years of negotiations and troubleshooting, including numerous international meetings for developers and miners.<sup>278</sup> These decisions are contentious,<sup>279</sup> and it is inefficient to incur such decision costs every time there is alleged wrongdoing. There is a reason that we do not ask for a national referendum in every criminal trial—it pays to delegate to a professional law enforcement system.

Second, forking poses distinctive costs to users of the crypto asset. In the days leading up to the potential fork, uncertainty reigns as users are unsure whether their asset will be changed or useless as a result of the fork. After the fork, it is common for competing versions of the (similarly named) asset to trade simultaneously, depressing the price of both. Forks that annul fraudulent transactions may have innocent victims, such as those who received payments that are no longer recognized by the community.

Third, and most interestingly, radical self-help in the form of forking unlocks a powerful new form of informed trading, without a perfect analog in the securities realm: Miners and users know whether forks will occur and whether they will succeed before other users do, because they help make the decision.

To understand this point, begin with a consideration of voting. Individuals always know before others how they will vote. In corporate elections, a large shareholder's voting plans may be material non-public

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275. del Castillo, *supra* note 22.

276. Siegel, *supra* note 23.

277. Alex Evans, *A Brief Study of Cryptonetwork Forks*, PLACEHOLDER (Sept. 17, 2018), <https://www.placeholder.vc/blog/2018/9/17/a-brief-study-of-cryptonetwork-forks> [<https://perma.cc/8S85-7NBA>]. There is also a risk that a minority of users could refuse to endorse the new protocol, perhaps because they have benefited from the disputed code of conduct.

278. Bitcoin Roundtable, *Bitcoin Roundtable Consensus*, MEDIUM (Feb. 20, 2016), <https://medium.com/@bitcoinroundtable/bitcoin-roundtable-consensus-266d475a61ff> [<https://perma.cc/QHF5-89C2>].

279. For this reason, only a limited number of forks have ever occurred. *See, e.g., List of Bitcoin Forks*, ICONOW, <https://iconow.net/list-of-bitcoin-forks> [<https://perma.cc/gZSD-QGM8>].

information, because it can foretell the future of a corporation.<sup>280</sup> Will bad management be retained? Will a proposed merger collapse? These considerations have a big impact on share price, and a large investor can decide a close vote. That large investor *necessarily* knows better than third-parties how its vote will be cast. There is an ineradicable form of asymmetric information where a few people make important decisions.

Crypto assets also involve votes of a kind, and thus empower powerful voters to profit from their foreknowledge of the vote's likely result. Crypto assets do not strictly operate on democratic principles, but a parallel system applies in the form of miners' "votes" on which blockchain to validate and users' "votes" on which crypto assets to value and patronize.<sup>281</sup> In both cases, prior knowledge of how patrons of the asset will respond to a conflict can prove important in predicting the future price of assets.<sup>282</sup>

Consider, for example, the Ethereum DAO fork, in which users decided whether to retain their existing support for Ethereum or switch their efforts over to a new version that erased the harmful effects of a bug-related theft. "The preparations for the hard fork included . . . an advance poll of the Ethereum miners to see how likely the hard fork was to succeed. Only a very small percentage of ether holders or miners voted in the advance polls, but the Ethereum developers decided to proceed with the hard fork."<sup>283</sup> Presumably a large miner would not need a poll to have a decent guess at how she would vote and how the vote itself might come out.

Those guesses might be highly accurate, given that mining is a highly concentrated operation.<sup>284</sup> As of summer 2018, two subsidiaries of a single

280. Institutional S'holder Servs. Inc., Advisers Act Release No. IA-3611, 106 SEC Docket 1681, 2013 WL 11113059 (May 23, 2013) (settling with a prominent proxy advisor, agreeing employees' data about their customers' likely votes in corporate controversies, and conceding that this was material non-public information).

281. Both forms of voting are a kind of "voting with your feet." See Charles M. Tiebout, *A Pure Theory of Local Expenditures*, 64 J. POL. ECON. 416, 416-18 (1956).

282. For example, news reports spent ample time speculating on how large miners would respond to a fork in Bitcoin Cash. The common assumption was that the less supported asset would quickly become valueless. See Jeremy Wall, *Bitcoin Cash (BCH) Hard Fork: The Competition Is Heating Up*, INVEST IN BLOCKCHAIN (Nov. 15, 2018), <https://www.investinblockchain.com/bitcoin-cash-hard-fork> [<https://perma.cc/DZN4-LEWR>]. Forks give some crypto assets a locally zero-sum quality. The success of one crypto asset may directly threaten the viability of certain other crypto assets. There is no analogue in securities, where the success of Apple's stock only weakly competes with Microsoft and other firms. There is no alt-Apple stock that competes for market share with regular Apple stock and claims the right to call itself "Apple."

283. Walch, *supra* note 73, at 8 (footnote omitted); see also Atik & Gerro, *supra* note 70, at 29 ("The press and others tally these flags to measure the prospects for a consensus.").

284. This follows the path of non-cryptocurrency markets, in which dealer markets have consolidated. See, e.g., Katie Martin, *Deutsche Bank Wins Euromoney FX Poll*, WALL ST. J. (May 8, 2013, 5:38 PM), <https://www.wsj.com/articles/SB10001424127887324244304578471422221191246> [<https://perma.cc/3S2A-U5LS>] (describing competition in becoming the world's biggest currency-dealing bank).

corporation controlled 42 percent of all Bitcoin mining capacity.<sup>285</sup> Another 40 percent is controlled by just four more firms.<sup>286</sup> Concentration is even greater at other crypto assets: Only two miners make up the majority of Ethereum mining.<sup>287</sup> The rapid cartelization of the mining field means that just three or four teams are in a position to unilaterally control the future of many crypto assets, and the cooperation of a dozen or so would mean that any resulting fork would see no substantial opposition.<sup>288</sup>

It is possible to profit based on predictions about how miners will vote even when decisions concern crypto assets that do not yet exist, since derivatives contracts often trade long before the fork occurs. For example, in the recent fork in Bitcoin Cash between large and small block size advocates<sup>289</sup> wild price swings in the futures market ahead of time were driven largely by expectations about which powerful miners and platforms supported which form of the crypto asset.<sup>290</sup> Insiders at such a mining operation or platform could guess better than others where their support would ultimately fall, and thus the true price of the asset underlying the futures contract.

### C. CRYPTO ANARCHISM

Some crypto enthusiasts are driven by their desire for, or belief in the inevitability of, the demise of the familiar banking system,<sup>291</sup> state-issued

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285. Josiah Wilmoth, *Bitmain's Mining Pools Now Control Nearly 51 Percent of the Bitcoin Hashrate*, CCN (June 25, 2018), <https://www.ccn.com/bitmain-mining-pools-now-control-nearly-51-percent-of-the-bitcoin-hashrate> [<https://perma.cc/ZR5J-3LRY>].

286. *Id.*

287. *Top Miners by Blocks*, ETHERSCAN, <https://etherscan.io/stat/miner?range=7&blocktype=blocks> (last visited Aug. 12, 2019).

288. Miners can of course signal or “flag” their likely vote. Atik & Gerro, *supra* note 70, at 28. But this flagging is not required, and, in any case, miners still know better than others what they will flag support for, which itself can be material information.

289. See generally Aaron Hankin, *What You Need to Know About the Bitcoin Cash ‘Hard Fork,’* MARKETWATCH (Nov. 15, 2018, 8:00 AM), <https://www.marketwatch.com/story/what-you-need-to-know-about-the-bitcoin-cash-hard-fork-2018-11-13> [<https://perma.cc/BRW7-DCER>] (describing split in the most famous Bitcoin hard fork).

290. See Press Release, CFTC, Release No. 7592-17, CFTC Grants DCO Registration to LedgerX LLC (2017), <https://www.cftc.gov/PressRoom/PressReleases/pr7592-17> [<https://perma.cc/D3GA-HHF6>].

291. See Franklin R. Edwards & Frederic S. Mishkin, *The Decline of Traditional Banking: Implications for Financial Stability and Regulatory Policy* 2 (Nat'l Bureau of Econ. Research, Working Paper No. 4993, 1995), <https://www.nber.org/papers/w4993> [<https://perma.cc/4PWP-DFMM>].

money,<sup>292</sup> or of states altogether.<sup>293</sup> Others value secrecy far more than price and convenience.<sup>294</sup> They are disproportionately libertarian.<sup>295</sup> So it may seem ironic to bring the power of the state to defend this community from insider trading.

Relatedly, many crypto assets have been developed as open source projects.<sup>296</sup> The open source community resists the notion that anyone “owns” the intellectual property of the venture.<sup>297</sup> The absence of ownership chafes with some of the strongest arguments in favor of insider trading regulation,<sup>298</sup> which rely on the notion of property—that the trader misappropriates the information of another person.<sup>299</sup>

Of course, most crypto asset users have not repudiated the state,<sup>300</sup> and may welcome enforcement of applicable laws.<sup>301</sup> If crypto assets grow to be widely used, their users will increasingly exhibit the same needs and expectations as the population as a whole and thus come to expect similar protections.

292. See, e.g., Alasdair Macleod, *Why a Dollar Collapse Is Inevitable*, SEEKING ALPHA (Apr. 6, 2018, 7:35 AM), <https://seekingalpha.com/article/4161382-dollar-collapse-inevitable> [<https://perma.cc/3VJD-GSZ4>]; The PolyCapitalist, *Barry Eichengreen on Timing the Inevitable Decline of the US Dollar*, BUS. INSIDER (Jan. 7, 2011, 2:04 PM), <https://www.businessinsider.com/timing-the-inevitable-decline-of-the-us-dollar-2011-1> [<https://perma.cc/LKG2-YV7X>].

293. Neil Gross, *Is the United States Too Big to Govern?*, N.Y. TIMES (May 11, 2018), <https://www.nytimes.com/2018/05/11/opinion/sunday/united-states-too-big.html> [<https://perma.cc/5W4Q-GGQC>].

294. See Scott Helme, *Perfect Forward Secrecy—An Introduction*, SCOTT HELME (May 10, 2014), <https://scotthelme.co.uk/perfect-forward-secrecy> [<https://perma.cc/V7ZV-GJRX>].

295. Georgia Frances King, *The Venn Diagram Between Libertarians and Crypto Bros Is So Close It's Basically a Circle*, QUARTZ (May 23, 2018), <https://qz.com/1284178/almost-half-of-crypto-currency-and-bitcoin-bros-identify-as-libertarian> [<https://perma.cc/ST3J-LVJS>].

296. Henderson & Raskin, *supra* note 18, at 451–52; see, e.g., *bitcoin/COPYING*, GITHUB, <https://github.com/bitcoin/bitcoin/blob/master/COPYING> [<https://perma.cc/NSK7-XURH>]; Samuel Furter ed., *Licensing*, GITHUB: ETHEREUM WIKI (Apr. 27, 2019, 3:46 PM), <https://github.com/ethereum/wiki/wiki/Licensing> [<https://perma.cc/9PL9-GD5E>].

297. Henderson & Raskin, *supra* note 18, at 541–42.

298. See generally *id.* (discussing how his argument appears to conflate lack of property rights in the code with lack of property rights in other information, such as expected changes in the code, or uses in the asset related to the code).

299. See Bainbridge, *supra* note 255, at 1252–57 (discussing property rationale).

300. See generally Anne H. Dyhrberg et al., *How Investible Is Bitcoin? Analyzing the Liquidity and Transaction Costs of Bitcoin Markets*, 171 ECON. LETTERS 140 (2018) (finding U.S. retail investors predominate bitcoin trading).

301. It is a fair question whether it is good policy to encourage widespread investment in crypto assets. But skepticism about crypto asset investment does not by itself urge regulatory abstention. By analogy, many of us are skeptical that investors should invest large sums in penny stocks or the securities of reverse-IPO companies; these investments are often bad values, sold to unsophisticated persons who may regret the purchase. But that hardly argues against insider trading regulation of those securities. There are more logical ways to discourage unsound investment—banning the products, requiring a certain sophistication to buy them, educating investors—than leaving investors to the wolves.

Even users with strong misgivings about the current financial and governmental system may embrace rules that support its alternatives. Gold has long been a mainstay for such investors. Gold has also been the epicenter of widespread market manipulation<sup>302</sup> and insider trading.<sup>303</sup> Goldbugs do not seem to have abandoned their bullion as prosecutors have sought to reduce market abuse by large banks.<sup>304</sup> To the contrary, most gold investors are probably pleased that they can invest without artificial scarcity or volatility. Here, the cops help the skeptics by ensuring the stability of their backup plan. Sometimes the enemy of one's enemy is one's friend.

Recognition of crypto enthusiasts' distinctive values may even support regulatory intervention, since market regulation and insider trading law turn on what is material<sup>305</sup> and crypto enthusiasts simply care about non-financial aspects of the asset.<sup>306</sup> For a buyer of crypto assets with one such outlook, there exists an entirely different set of material information bearing on the desirability of a crypto asset.

Such a buyer may regret their purchase if they discover that the crypto asset's developers or miners have taken steps to link the asset with familiar commercial institutions,<sup>307</sup> or to assist law enforcement officials in tracking illicit purchases using the asset.<sup>308</sup> A seller who knows about a pending compromise on one of these axes may sell the asset without disclosing

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302. Gold Silver Worlds, *FT Removes Article "Gold Price Rigging Fears Put Investors on Alert,"* GOLDSILVERWORLDS (Feb. 24, 2014), <http://goldsilverworlds.com/physical-market/ft-removes-article-gold-price-rigging-fears-put-investors-on-alert> [<https://perma.cc/BL62-JGTQ>] (documenting screenshots of retracted Financial Times article by Madison Marriage from February 23, 2014 describing widespread manipulation in gold market).

303. See generally Verstein, *supra* note 7 (explaining how gold played a role in commodities and insider trading).

304. Hugh Son & Dan Mangan, *Former JP Morgan Trader Pleads Guilty to Manipulating US Metals Markets for Years*, CNBC, <https://www.cnbc.com/2018/11/06/ex-jp-morgan-trader-pleads-guilty-to-manipulating-metals-markets.html> [<https://perma.cc/L46S-ZZWF>] (last updated Nov. 12, 2018, 10:43 AM).

305. Securities law favors an objective definition of materiality that deemphasizes the idiosyncratic preferences of any particular investor. *TSC Indus., Inc. v. Northway, Inc.*, 426 U.S. 438, 445 (1976). However, a subjective standard can be applied where the victim's idiosyncratic tendencies were known to the defendant. 5C ARNOLD S. JACOBS, *DISCLOSURE & REMEDIES UNDER THE SECURITIES LAWS* § 12:32, Westlaw SECDRL (updated June 2019) ("[A] defendant may deliberately play on the plaintiff's idiosyncrasies by making a statement he knows the plaintiff is likely to treat as material although a reasonable investor would not. Courts then should hold the information is material.").

306. On investors interests in goals other than profits, see Cynthia A. Williams, *The Securities and Exchange Commission and Corporate Social Transparency*, 112 HARV. L. REV. 1197, 1287-89 (1999).

307. See Rosalie Stafford-Langan, *Crypto Goes Mainstream: What Big Finance Is Doing*, FIN. NEWS, <https://www.fn.london.com/articles/what-the-biggest-financial-institutions-are-doing-about-cryptocurrencies-20180807> [<https://perma.cc/9EMW-7USE>] (last updated Aug. 9, 2018, 2:06 PM).

308. See, e.g., Adrian Zmudzinski, *Law Enforcement Inquiries Sent to Kraken Nearly Tripled in 2018*, COINTELEGRAPH (Jan. 6, 2019), <https://cointelegraph.com/news/law-enforcement-inquiries-sent-to-kraken-nearly-tripled-in-2018> [<https://perma.cc/3W48-UCSY>].

anything to the buyer.<sup>309</sup> Can't we say that the seller sold without disclosing material non-public information?<sup>310</sup>

If crypto asset enthusiasts want assets that exhibit certain properties—such as privacy, independence from states and banks—they must be able to trust that the developers and promoters are working to create and maintain such a product. The law can support that trust by recognizing information about the presence or absence of those properties as material. Insider trading law is a natural way to support these efforts. Just as we don't let insiders sell stock with knowledge that the company really is not profitable, notwithstanding public pronouncements to the contrary, insider trading law can prioritize non-monetary values of crypto enthusiasts in order to support their efforts to seek acceptable assets, and to reduce the chance that fly-by-night promoters sell products that do not live up to past assumptions.

#### D. PRIORITIZING FRAUD AND MANIPULATION

Whatever the merits and fit of applying insider trading law to crypto assets, some commentators have argued that this is hardly the highest priority for enforcement officials. Instead, fraud and market manipulation are far bigger problems for this asset class.

There is some appeal to this notion because fraud is indeed widespread. Many crypto assets are complete farces.<sup>311</sup> Worse yet, crypto assets seem to be vulnerable to a distinctive form of fraud in the form of a 51 percent attack.<sup>312</sup>

309. See C. Edward Kelso, *Bitcoin ETFs Are a Terrible Idea: Andreas Antonopoulos*, BITCOIN.COM: NEWS (Aug. 18, 2018), <https://news.bitcoin.com/bitcoin-etfs-are-a-terrible-idea-andreas-antonopoulos> [<https://perma.cc/J6R9-4NR5>] (“If developers, for example, have found a way to upgrade the system to make it more privacy oriented, perhaps the heavy financial backers of that ETF fund would work to make sure it never came about so as to not rile their friends in government.”).

310. For a discussion of how fraud can undermine idiosyncratic value or altogether make them repudiate their investment, see Sarah Dadush, *The Law of Identity Harm*, 96 WASH. U. L. REV. 803, 849–51 (2019).

311. Shane Shifflett & Coulter Jones, *Buyer Beware: Hundreds of Bitcoin Wannabes Show Hallmarks of Fraud*, WALL ST. J. (May 17, 2018, 12:05 PM), <https://www.wsj.com/articles/buyer-beware-hundreds-of-bitcoin-wannabes-show-hallmarks-of-fraud-1526573115> [<https://perma.cc/C7EC-L27Z>] (investigating a high proportion of inaccurate information); see, e.g., Complaint at ¶¶ 33–49, SEC v. AriseBank, No. 3:18-cv-00186-M (N.D. Tex. filed Feb. 2, 2018) (noting that crypto asset promoters lied about operating a 100-year-old bank).

312. A 51 percent attack is a form of opportunism executed by obtaining a majority of the computing power of a blockchain network and then using this power to alter the transaction history to one's benefit. Alex, *Coinbase, Bitfly Say Reorganizations Detected on Ethereum Classic's Blockchain; ETC Devs Deny Claim—ADTmag*, CRYPTO CENTERNEWS (Jan. 8, 2019), <http://cryptocenternews.com/2019/01/coinbase-bitfly-say-reorganizations-detected-on-ethereum-classics-blockchain-etc-devs-deny-claim-adtmag>. The cost of renting sufficient computing power may have been a mere \$5000. Alex Tabarrok, *Ethereum Double Spend Attack?*, MARGINAL REVOLUTION (Jan. 8, 2019, 7:25 AM), <https://marginalrevolution.com/marginalrevolution/2019/01/ethereum-classic-double-spend-attack.html> [<https://perma.cc/6KAW-7CAN>].

Likewise, market manipulation is rife,<sup>313</sup> including familiar techniques such as spoofing<sup>314</sup> and pump-and-dump.<sup>315</sup> And the existing infrastructure seems inadequate to address market manipulation.<sup>316</sup>

For all the problems with fraud and market manipulation, it is not logical to leave insider trading unaddressed while the “larger” issues are dealt with. For one thing, there are costs to having insider trading law that goes unenforced.<sup>317</sup> For another, there is literally no tradeoff between one form of enforcement or another to the degree that private litigation is facilitated. Private plaintiffs will bring whatever civil suits are viable. A private right of action exists for plaintiffs who trade in commodity futures based on crypto assets that count as commodities<sup>318</sup> or securities.<sup>319</sup> They need not show that they directly traded with the insider so long as they traded contemporaneously.<sup>320</sup> Already, private plaintiffs have filed civil suits alleging insider trading in crypto assets.<sup>321</sup>

More importantly, there is an intimate link between market manipulation, fraud, and insider trading; they are sister sins. To a great degree, they rely on one another to be effective. Reducing insider trading is a powerful way to reduce market manipulation and fraud.

Insider trading supports market manipulation because market manipulators pose as insider traders.<sup>322</sup> Market manipulators seek to

313. John M. Griffin & Amin Shams, *Is Bitcoin Really Un-Tethered?* 2–3 (June 13, 2018) (unpublished manuscript), [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3195066](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3195066) [<https://perma.cc/K7L5-36LR>] (suggesting that a single bitcoin exchange may have been responsible for propping up the price of the currency).

314. Paul Vigna & Alexander Osipovich, *Bots Are Manipulating Price of Bitcoin in ‘Wild West of Crypto,’* WALL ST. J. (Oct. 2, 2018, 8:00 AM), <https://www.wsj.com/articles/the-bots-manipulating-bitcoins-price-1538481600> [<https://perma.cc/QJ38-JJ9W>]. Two bills were recently introduced to Congress, calling for the CFTC to study how to prevent market manipulation in virtual currencies. U.S. Virtual Currency Market and Regulatory Competitiveness Act of 2018, H.R. 7225, 115th Cong. (2018); Virtual Currency Consumer Protection Act of 2018, H.R. 7224, 115th Cong. (2018).

315. Tao Li et al., *Cryptocurrency Pump-and-Dump Schemes 1* (Mar. 3, 2019) (unpublished manuscript), [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3267041](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3267041) [<https://perma.cc/63MY-DKH5>].

316. UNDERWOOD, *supra* note 125, at 19 (identifying that six out of ten major crypto asset platforms have no market manipulation policy).

317. Utpal Bhattacharya & Hazem Daouk, *When No Law Is Better Than a Good Law*, 13 REV. FIN. 577, 582–84 (2009) (arguing that unenforced insider trading laws increase the cost of capital for firms).

318. 7 U.S.C. § 25 (2012).

319. *Kardon v. Nat’l Gypsum Co.*, 69 F. Supp. 512, 514 (E.D. Pa. 1946) (recognizing an implied right of action).

320. 15 U.S.C. § 78t-1(a) (2012).

321. *See, e.g., Berk v. Coinbase, Inc.*, No. 18-cv-01364-VC, 2018 WL 5292244, at \*2 (N.D. Cal. Oct. 23, 2018).

322. Rajesh K. Aggarwal & Guojun Wu, *Stock Market Manipulations*, 79 J. BUS. 1915, 1915–21 (2006).

influence market prices, and the surest way to do that is to trick other market participants into thinking that some trader out there knows something non-public about the company.<sup>323</sup> If a trader wants a stock price to go up, they can buy in a way that implies they know good news about the stock—other traders will take the hint and bid up the stock too, or at least refuse to sell on the same terms as before. This strategy would not be effective if everyone knew the manipulator had only public information.<sup>324</sup> Widespread insider trading makes the manipulator's bluff more credible and effective. Thus, reducing insider trading (or at least enhancing enforcement) helps to reduce the viability of market manipulation.

Legal insider trading can also provide cover for otherwise illegal market manipulation. Most courts dismiss market manipulation cases if the manipulator had mixed motives.<sup>325</sup> That means that a person who intended to manipulate the market, but can cite non-manipulative reasons to trade, will not be liable for market manipulation. The presence of material non-public information can support that defense. For example, in *CFTC v. Wilson*, a trading firm profited by aggressively bidding for instruments in a manner that pushed up the price in the “right” direction.<sup>326</sup> The CFTC's market manipulation claim failed because the trader had information that suggested the price should eventually go up, and he was just pushing the price toward the “real” price. In that case, there is no argument that the trader's knowledge of the real price was linked to non-public information acquired in breach of a duty. He was free to trade on it. The more information is a lawful basis for trades, the more market manipulation will find real or pretextual cover.

The point is not that there is always a *positive* relationship between one form of market abuse and another.<sup>327</sup> The point is that there is always a *deep*

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323. Accord Xiaquan Jiang & Mir A. Zaman, *Aggregate Insider Trading: Contrarian Beliefs or Superior Information?*, 34 J. BANKING & FIN. 1225, 1225–26 (2010); see Franklin Allen & Douglas Gale, *Stock-Price Manipulation*, 5 REV. FIN. STUDIES 503, 503–10 (1992) (identifying three forms of market manipulation); see also Paul G. Mahoney, *The Stock Pools and the Securities Exchange Act*, 51 J. FIN. ECON. 343, 356–67 (1999) (arguing that many instances of apparent market manipulation are really insider trading).

324. Fox et al., *supra* note 1, at 888–89 (describing anti-noise traders).

325. *Masri* requires manipulation to be a but-for motive. *SEC v. Masri*, 523 F. Supp. 2d 361, 371–72 (S.D.N.Y. 2007); see Andrew Verstein, *The Jurisprudence of Mixed Motives*, 127 YALE L.J. 1106, 1137–39 (2018). This is no easy thing to prove, but it is the most liberal test used. *Mulheren* seemingly requires that the defendant's sole motive be manipulative. *United States v. Mulheren*, 938 F.2d 364, 372 (2d Cir. 1991). And other cases find that no bad motive can support a market manipulation claim unless the manipulation is paired with some other objectively fraudulent act. *GFL Advantage Fund, Ltd. v. Colkitt*, 272 F.3d 189, 205 (3d Cir. 2001).

326. *CFTC v. Wilson*, 27 F. Supp. 3d 517, 532 (S.D.N.Y. 2014). Of course, informed trading remains a valid cover in the cases where insider trading prosecutions would be impossible because no law has been broken on that score.

327. Insider trading may reduce manipulation by bringing truth to light. MANNE, *supra* note 2, at 149. It may make manipulation easier by discouraging fundamental research. Goshen & Parchomovsky, *supra* note 252, at 719.

relationship that makes regulation of one a candidate way to reduce regulation of the other—for crypto assets and elsewhere.

## VI. THE LIMITS OF INSIDER TRADING LAW

While there is a rich debate about the extent and contours of federal insider trading law, almost all commentators support penalizing trades undertaken with asymmetric information, at least *some* of the time. Insider trading law is only one form of information regulation. The law of contracts also imposes on parties the duty to correct some errors of an ignorant counterparty.<sup>328</sup> The fundamental question of insider trading law is not what precisely to prohibit, but where the background law of contracts is enough and where an additional layer of federal law should be imposed. Does the law of insider trading in securities provide a model for commodities? Crypto assets? Real estate or fine art? Just how wide is the domain of insider trading law?

One candidate answer links to existing laws: Insider trading law should apply where an asset is already subject to an extensive disclosure regime.<sup>329</sup> But disclosure obligation is not a binary classification. Some securities are subject to far less intensive disclosure obligations than others.<sup>330</sup> And many non-securities are subject to reporting requirements, even though these assets have struck most commentators as inappropriate for insider trading regulation.<sup>331</sup> More foundationally, the choice to extensively regulate is a choice—perhaps fine art *should* be subject to federal registration, if only to bring it into the domain of insider trading law. Defining the domain of insider trading law by reference to existing laws at best gives us an internally consistent answer, without any assurance that it is otherwise the *right* answer.

Several policies used to justify insider trading law are likewise unsatisfying as limiting principles. For example, concern for property rights in information may justify insider trading in securities, but such a theory doesn't explain why we currently *focus* insider trading law on securities. There is informational property to steal in other assets, such as art and real estate, but we do not have a dedicated federal agency devoted to addressing misuse of that information. Likewise, if it is unfair for executives to bring home secrets relative to stock prices, it is also unfair for them to bring home secrets relative

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328. Anthony T. Kronman, *Mistake, Disclosure, Information, and the Law of Contracts*, 7 J. LEGAL STUD. 1, 2–9 (1978); see also RESTATEMENT (SECOND) OF CONTRACTS § 154 (AM. LAW. INST. 1979) (allocating risk of asymmetric information, in such a way that sometimes encourages disclosure); RESTATEMENT (SECOND) OF TORTS § 551(2)(a)–(e) (AM. LAW INST. 1976) (delineating common law of disclosure); Melvin A. Eisenberg, *Disclosure in Contract Law*, 91 CAL. L. REV. 1645, 1651–55 (2003).

329. Park, *supra* note 9, at 1163–70.

330. For example, exempt securities of non-reporting companies may be sold without SEC registration and without periodic disclosures.

331. For example, Professor Park would distinguish securities from commodities on the basis that commodities are subject to *less extensive* reporting requirements. See Park, *supra* note 9, at 1145–46. His point is well taken, but it again locates the domain's boundary in terms of a scalar rather than a binary.

to real estate prices, but there is no active prosecution of insider traders in real estate. While fairness, property, and other policies are plausible justifications for insider trading law, they are not promising policies for defining its domain.

To my mind, it is more productive to begin with first principles. To add another layer of law upon the existing contractual information rules is to do two things: First, it is to penalize more conduct.<sup>332</sup> The appropriate contours of federal insider trading law are up for debate, but there is no doubt that if there is any federal insider trading regime it will create new impositions not found at common law. Second, it is to establish a new class of professional enforcers: class action plaintiffs, regulators, and prosecutors. With these two core features in mind, we can ask what properties of an asset make it sensible to have greater restrictions on informed trading and to empower a new class of enforcers.

Each of these principles is capable of careful examination, but the short answer is this: (A) it makes sense to penalize more conduct where traders that lack special information would take costly self-protective measures if exposed to widespread informed traders, and thus harm liquidity; and (B) it makes sense to empower professional enforcers where the “victims” of informed trading would insufficiently litigate their claims on their own.

Thus, insider trading law is most helpful when it supplements the common law of disclosure with respect to an asset when most traders would excessively protect themselves prior to trading and insufficiently protect themselves after trading.<sup>333</sup> The policies explored here are therefore informed by both market microstructure economics and the economics of enforcement.

#### A. RESTRICTING TRADES TO IMPROVE LIQUIDITY

How much informed trading is it best for any given market to have? Traders who know material non-public information improve the accuracy of

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332. Much of this analysis draws on Fox et al., *supra* note 1, at 817. However, that article focused on evaluating the details of an informed trading regulation for securities. It made no effort to evaluate assets apart from securities. That article was concerned with what the law should be, while this one is concerned with what the law should apply to.

333. These two factors are not wholly dispositive. Insider trading law is largely a body of mandatory law. Mandatory law is most appropriate in domains where we doubt market participants could contract for a more efficient regime—either where there are important externalities, where transaction costs are high, or where we have political commitments to certain outcomes. A longer discussion would address these staples of the “issuer choice” or internalization literature for insider trading law. For now, we should acknowledge an important fact about crypto assets—their implementation through smart contracts could allow promoters of crypto assets to imbue some rules for their trading. In principal, crypto asset developers could design products that express specific attitudes toward insider trading. However, this difference is a difference in degree, rather than kind from existing assets. See Ayres & Choi, *supra* note 8, at 358–402.

asset prices by expressing their informed views through trading,<sup>334</sup> and the possibility of trading profits encourages them to acquire information to begin with.<sup>335</sup> To the degree prices are accurate, observers of the prices can make better decisions, such as how to invest or redeploy resources in the real economy.<sup>336</sup>

But informed trading also has a cost: Informed traders' profits come at the expense of uninformed traders. Extensive informed trading can demoralize investors from entering a market at all.<sup>337</sup> It can also raise the expected cost of trading. In many markets, rising trading costs is reflected in wider "bid-ask spreads" which are the implied commissions charged by market intermediaries called "market makers."<sup>338</sup> Wide spreads make it hard for investors to achieve their trading goals and they blunt the accuracy of market prices.

Professors Fox, Glosten, and Rauterberg use the tradeoff between price accuracy and liquidity as the main evaluative lens for scrutinizing various types of informed trading:

How well the market functions can be described largely in terms of its two most important characteristics: price accuracy and liquidity. . . . every type of informed trading has a positive impact on price accuracy and a negative impact on liquidity. But, the ratio of these two impacts and the duration of the price accuracy improvement vary greatly from one type to another.<sup>339</sup>

For example, the ratio is "good" for trades by careful researchers of market fundamentals, who bring new information to the market. By contrast, the ratio is "bad" for executives trading just before an earnings report, since the earnings information would be disclosed soon anyway. Fox et al. would allow the former and ban the latter.

While the price accuracy gains of insider trading differ by type of trade, the liquidity effects do not appreciably do so. If market makers lose money to

334. Ronald J. Gilson & Reinier H. Kraakman, *Mechanisms of Market Efficiency*, 70 VA. L. REV. 549, 631 (1984).

335. See generally Goshen & Parchomovsky, *supra* note 252 (arguing that securities regulations should protect information traders and their ability to recoup their information investment).

336. Merritt B. Fox, *Shelf Registration, Integrated Disclosure, and Underwriter Due Diligence: An Economic Analysis*, 70 VA. L. REV. 1005, 1020 (1984); Marcel Kahan, *Securities Laws and the Social Costs of "Inaccurate" Stock Prices*, 41 DUKE L.J. 977, 1005-16 (1992).

337. This is one of the motivating ideas behind some insider trading-related legislation. H.R. REP. NO. 100-910, at 7-8 (1988), *reprinted in* 1988 U.S.C.C.A.N. 6043, 6044-45 ("[T]he small investor will be—and has been—reluctant to invest in the market if he feels it is rigged against him."); see also *United States v. O'Hagan*, 521 U.S. 642, 658 (1997) ("[I]nvestors likely would hesitate to venture their capital in a market where [insider] trading . . . is unchecked by law.").

338. Dolgoplov, *supra* note 267, at 116 & nn.159-62; Nabil Khoury et al., *PIP Transactions, Price Improvement, Informed Trades and Order Execution Quality*, 16 EUR. FIN. MGMT. 211, 226 (2010) (finding Boston Options Exchange market makers adopt positions matching those of analysts).

339. Fox et al., *supra* note 1, at 833 (footnote omitted).

an informed trader, it does not make any difference how the counter-party acquired their advantage; a bookie loses money against a gambler who knows the outcome of the match, regardless of how the gambler knows. Thus, price accuracy matters in evaluating particular trading practices, but only liquidity matters in evaluating the general domain of insider trading regulation. Assets for which the liquidity harm of informed trading is large should be subject to insider trading regulation in some cases (the details of which must be decided in light of price accuracy effects); assets for which the liquidity harm of informed trading is small should not be subject to insider trading regulations. Therefore, we can decide the domain of insider trading regulation in part based on the liquidity cost of informed trading, prior to any fine tuning in light of price accuracy.

Consider how this first principle applies to various asset types. Informed trading has a clear cost in terms of liquidity for securities markets. We can be confident that market intermediaries in securities widen their spreads in the presence of informed traders.<sup>340</sup> And while it is perhaps hard to prove,<sup>341</sup> it is widely believed that investors are demoralized by widespread insider trading and that a relatively level playing field is necessary in order to induce retail investors to pull their money out from under their mattresses—an important social policy goal.

Similar stories can be told about commodity markets. Trading costs rise in response to expected losses to informed traders.<sup>342</sup> It may become more difficult to trade and hedge if sophisticated intermediaries fear that they are in the presence of an insider.<sup>343</sup> A similar story can be told about crypto assets, although less definitively.<sup>344</sup> The presence of informed traders plausibly affects the reactions of traders. There is no natural user of crypto assets who must trade in them regardless of the market conditions. The goal of many

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340. See *supra* note 338 and accompanying text.

341. BAINBRIDGE, *supra* note 4, at 189 (expressing skepticism); John P. Anderson, *Insider Trading and the Myth of Market Confidence*, 56 WASH. U. J.L. & POL'Y 1, 5–12 (2018).

342. See Henry L. Bryant & Michael S. Haigh, *Bid-Ask Spreads in Commodity Futures Markets*, 14 APPLIED FIN. ECON. 923, 924 & n.1 (2002); see, e.g., Carol L. Osler et al., *Price Discovery in Currency Markets*, 30 J. INT'L MONEY & FIN. 1696, 1696–98 (2011) (noting the relationship between FX spreads and adverse selection).

343. Verstein, *supra* note 7, at 480.

344. Whether virtual currencies are currently priced in ways that reflect fundamentals of some kind is a matter of debate. Accord David Yermack, *Is Bitcoin a Real Currency? An Economic Appraisal*, in HANDBOOK OF DIGITAL CURRENCY: BITCOIN, INNOVATION, FINANCIAL INSTRUMENTS, AND BIG DATA 31, 38–43 (David Lee Kuo Chuen ed., 2015); see also Shaen Corbet et al., *Datedamping the Bitcoin and Ethereum Bubbles*, 26 FIN. RES. LETTERS 81, 87 (2018) (noting speculative bubbles); Gerald P. Dwyer, *The Economics of Bitcoin and Similar Private Digital Currencies*, 17 J. FIN. STABILITY 81, 82 (2015) (noting volatility). Compare Saralees Nadarajah & Jeffrey Chu, *On the Inefficiency of Bitcoin*, 150 ECON. LETTERS 6, 9 (2017) (finding that bitcoin is informationally efficient), and Aviral Kumar Tiwari et al., *Informational Efficiency of Bitcoin—An Extension*, 163 ECON. LETTERS 106, 108 (2018), with Andrew Urquhart, *The Inefficiency of Bitcoin*, 148 ECON. LETTERS 80, 82 (2016) (arguing that bitcoin shows *increasing* informational efficiency).

asset promoters of creating a liquid currency is highly dependent upon reducing adverse selection and trading costs.<sup>345</sup>

The story is different for other assets, such as real estate and precious art, because the effect of information asymmetries do less to inefficiently alter conduct in the real economy. Buyers of real estate routinely pay six percent commissions to brokers plus myriad other costs.<sup>346</sup> Buyers of art routinely pay 50 percent or more in commissions.<sup>347</sup> Both transactions are ones where the parties are used to bearing meaningful frictions due to informational imbalances, so the odds are low that a small additional friction will prove debilitating. One reason is that some purchases in this realm are personal rather than financial (the buyer wants to live in the house, or view the artwork), and so may be less elastic as a result. Another reason is that most participants in the real estate and art markets are only occasional participants—they do not buy and sell all day. There are no “dealers” in the real estate world, who stand ready to buy and sell any property at any time.<sup>348</sup> Art markets have dealers, but their turnover is also much lower than the rapid-fire transactions of a securities dealer. Taken together, this means that there is no one actor who is constantly penalized by the cost of informed trading and may take socially inefficient self-protected actions as a result.

Insider trading law prevents informed traders from making gains at the expense of market intermediaries and other traders. Whether this is of great social significance is largely a function of the “victims’” reactions. If they flee the market or charge more for liquidity (as in securities, commodities and crypto assets), then we may be in the domain of insider trading law, and the question then becomes whether there are offsetting price accuracy effects that make one particular type of transaction or another desirable, notwithstanding its cost. If intermediaries and counter-parties *don't* greatly adjust their behavior in light of the informed trading (as with art and real estate), then we are likely beyond the domain of insider trading law and existing common law information protections—and freedoms—should prevail.<sup>349</sup>

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345. See *supra* Section V.A.

346. Dan Moskowitz, *How Real Estate Agent and Broker Fees Work*, INVESTOPEDIA, <https://www.investopedia.com/articles/active-trading/031215/how-real-estate-agent-and-broker-fees-work.asp> [<https://perma.cc/5VJR-WDJM>] (last updated June 25, 2019). Of course, sellers nominally pay the broker, but the cost is indirectly borne by buyers who enter the market.

347. Jason T. Borbet, *An Artist's Business Guide to Commissions*, FORBES (Apr. 16, 2015, 1:52 PM), <https://www.forbes.com/sites/jasonborbet/2015/04/16/an-artists-business-guide-to-commissions> [<https://perma.cc/3CVU-TCZL>].

348. Home flippers may expect to own a house only for a little while, but they are quite different from a market maker.

349. To be sure, there is a wealth transfer in favor of the informed trader, which may seem (or be) unfair. This Article does not consider fairness arguments except insofar as they impact efficiency or welfare. My goal is not to dismiss such arguments. However, many fairness arguments are couched in the context of the common law of contract, rather than insider trading law. And

*B. PROFESSIONAL ENFORCERS*

The common law of contract imposes some duties on contractors to disclose information to their counter-party or abstain from trading with them. For example, a seller of real estate may not sell a home with an undisclosed knowledge of a latent defect, just as some sellers of stock may not sell stock with undisclosed knowledge of the equivalent of a latent defect.<sup>350</sup> But common law claims are pressed only by the victimized contractor. Insider trading law is enforced by numerous professionals: class action lawyers and government enforcement officials.

Where some federal theory of liability bars insider trading, securities insider trading law can be enforced criminally by the Department of Justice, or civilly by the Securities and Exchange Commission (“SEC”), a federal agency that oversees the stock markets. Federal laws also allow private civil actions by injured persons arguably harmed by insider traders. For 14e-3 and 10b-5 actions, the trader need not prove they actually bought from or sold to the insider. It is enough that they traded “contemporaneously” with the insider.<sup>351</sup> For 16(b), the entity at which the trader is an insider may sue at the demand of any shareholder.

An additional layer of law is justified to a greater degree if these professional enforcers are justified. Two factors bear on this question: (1) the necessity of expertise, and (2) the value of the asset and asset class.

Professional enforcers can develop expertise. This expertise makes it easier to enforce the law. But expertise is only sometimes of large value. It is of large value when the subject matter is complex, such that amateur enforcers may bungle things, and when cases are sufficiently alike that there is even some general subject to become an expert in.

Asset value is the other factor. When an asset class is of great overall value, it is likely worth social resources preventing problems with that asset class. However, single plaintiffs will bring their own case if the value is great to them, too. So, what is required is an asset that makes up a high aggregate value to society, but a relatively low value to the harmed investor. Then it is worth a public enforcer precisely because the victim may just let things go, resulting in underenforcement.<sup>352</sup>

These two principles broadly comport with my claims about the domain of insider trading law. To see why, consider the candidate asset classes.

it is very difficult to generate widespread agreement on fairness arguments, making useful a first look on welfare considerations.

350. See, e.g., *Mitchell v. Skubiak*, 618 N.E.2d 1013, 1017 (Ill. Ct. App. 1993).

351. 15 U.S.C. § 78t-1(a) (2012).

352. Professional enforcement is not the only possible solution to underenforcement—increasing the severity of punishment can often achieve similar effects. Gary S. Becker, *Crime and Punishment: An Economic Approach*, 76 J. POL. ECON. 169, 169–70 (1968).

Securities insider trading is well-situated for professional enforcement.<sup>353</sup> The markets are complex. The law, economics, and microstructure of securities and securities trading baffles most law students, to say nothing of investors. It takes professionals to understand finance and to bring cases arising in capital markets. The importance of the subject is also great—the dollar value of securities is staggering, and it represents the industrial policy and retirement prospects of a nation. And it is not just complexity. Insider trading is difficult to detect. It requires costly forensic techniques, such as wiretaps and confidential witnesses, which only the government and sophisticated firms use. Theory and experience teach that professional enforcement is justified if insider trading is to be reduced in securities.<sup>354</sup>

A similar story is true of commodities. How many Americans understand the last few minutes of the film *Trading Places*?<sup>355</sup> How many private plaintiffs could spot and prosecute market manipulation in the pork bellies market, or the jargon-laden, international manipulation of Libor?<sup>356</sup> Likewise, the stakes are publicly important but perhaps not privately. Although commodities prices sometimes swing wildly, the small changes in price implied by material non-public information is often not sufficient to motivate a victim to sue—in part because her position is hedged and her losses on one instrument are largely offset by another. The long-term harm is one she is in no position to vindicate—widespread breakdown in the value of hedging and speculation instruments.

Although it is early, it seems plausible that crypto assets fit with the forgoing, such that crypto assets warrant expert enforcers. Crypto assets have a large market capitalization,<sup>357</sup> and they may presage a transformative phase in the technological evolution of capitalism.<sup>358</sup> But few investors have more than a tiny portion of their savings invested in crypto assets, and those who have lost money in one way or another have little hope of privately pursuing

353. See Bainbridge, *supra* note 255, at 1262–66 (identifying obstacles to private enforcement of insider trading law).

354. Jonathan Macey has argued that insider trading law warrants specialized monitors, but that the ultimate enforcement can be left to private parties. JONATHAN R. MACEY, *INSIDER TRADING: ECONOMICS, POLITICS, AND POLICY* 40–41 (1991). The SEC can detect insider trading and then tell corporations or traders, who can then decide whether to sue. Whatever the merits of Macey's proposal, it is consistent with the analysis in this Section. If monitoring, but not litigation, is the proper function of specialized enforcers, we are still left with the question of which domain warrants such enforcers, and the answer will track this discussion.

355. *TRADING PLACES* (Paramount Pictures 1983). Readers unfamiliar with this Dan Aykroyd and Eddie Murphy comedy really should consider watching it.

356. See generally DAVID ENRICH, *THE SPIDER NETWORK* (2017) (recounting an inside account of the Libor scandal); see also Gabriel Rauterberg & Andrew Verstein, *Index Theory: The Law, Promise and Failure of Financial Indices*, 30 *YALE J. ON REG.* 1, 5 (2013). Libor is the London Interbank Offered Rate, an important benchmark of interest rates. *Id.*

357. *Top 100 Cryptocurrencies by Market Capitalization*, COINMARKETCAP, <https://coinmarketcap.com> [<https://perma.cc/R93T-7HS7>] (as of June 23, 2019, a total market cap of \$326 billion).

358. DE FILIPPI & WRIGHT, *supra* note 16, at 1–9.

an action. This is compounded by the fact that many promoters and exchanges are located overseas.<sup>359</sup> Few users of crypto assets understand finance, economics, and computer science to fully understand the risks they face, the factors which might lead to informed trading, and the path for pressing their rights.

Real estate and art are different on these two factors. Each property is somewhat unique, making it harder for experts to develop expertise. Traders tend to use the assets they own, giving them a local expertise that may exceed that of professional enforcers.<sup>360</sup> And the purchase of a building or precious art is often a serious expenditure for the buyer, who may have incentive enough to litigate unfair dealing.

## VII. CONCLUSION

The precise contours of insider trading law are debatable. Should we have an ad hoc rule banning short-swing trades?<sup>361</sup> Should the recipient of a gift of information be allowed to trade on it?<sup>362</sup> But the conceptually antecedent question involves the domain of insider trading doctrine: For what types of assets should we even be engaged in these questions?

One common approach to this question is to blithely assume that equity securities stand alone. When some other asset is presented for consideration—corn, bonds, bitcoin—the familiar reply is to deny that insider trading is possible for that asset and deny that the traders in that asset need or want the government’s help. These replies have long dominated discussions of insider trading in commodities<sup>363</sup> and traditional currencies,<sup>364</sup> but they are now being deployed to exclude cryptocurrencies and other crypto assets from the domain of insider trading law and policy. This Article addressed crypto assets both on their own merits as an important asset class worthy of attention, and also as a token for the broader approach to the paradigm. There is no simple reason to think that crypto assets stand outside of insider trading law and policy. Indeed, many distinctive features of these novel assets make familiar market abuse rationales more applicable than ever.

But if the line isn’t drawn with common stock, where is it drawn? Should it be a federal crime any time someone buys or sells *anything* with less than perfect candor? There are costs to insider trading law, whatever its form, and they should only be borne in contexts where they stand some chance of being worth the candle.

359. See Henning, *Can Cryptocurrencies Survive the Start of Government Regulation?*, *supra* note 25.

360. They may live in or work in real estate (or talk to tenants who do). They may view the artwork. In either asset, they may observe information that is hard to verify.

361. Steve Thel, *The Genius of Section 16: Regulating the Management of Publicly Held Companies*, 42 HASTINGS L.J. 391, 414–15 (1991).

362. *United States v. Martoma*, 894 F.3d 64, 78 (2d Cir. 2017).

363. See Verstein, *Benchmark Manipulation*, *supra* note 121, at 216–20.

364. See Verstein, *supra* note 7, at 447–53.

Instead, it is helpful to realize that the core of the matter concerns the marginal contribution of insider trading law to the existing body of contract law: the creation of an extra limit on informed trading and an extra layer of enforcement. These differences are justified where traders react too much in protecting themselves *ex ante* and too little in protecting themselves *ex post*. That is to say we should have insider trading law in domains where traders and intermediaries are likely to withdraw from markets due to widespread informed trading—especially in high-volume intermediated markets—and where experts are able to develop expertise in a wide variety of somewhat fungible but complex assets, the value of which to single litigants may be too low relative to the overall social value. Those considerations put crypto assets, securities, and commodities within the domain of insider trading, but leave many other assets beyond.