Shorting Crypto Assets and Insider Trading

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ABSTRACT: This Essay, prepared for a discussion group on insider trading and crypto assets, uses the introduction of futures trading in Bitcoin as a case study in how making it easier for investors to sell financial assets short can enhance market liquidity and reduce insider trading.

I. INTRODUCTION

Investors and regulators often have a shared hostility toward those who sell securities short.[1] Selling a security short is looked upon with disdain because of distaste for people who are betting things will be worse, not better, in the future.[2] There is also a concern that those who have a financial interest in bad things happening might use nefarious means to make their bets pay

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1. Selling a security short involves entering into a transaction where the investor profits if the value of the security declines in the future. *See, e.g.*, Peter Molk & Frank Partnoy, *Institutional Investors as Short Sellers?*, 99 B.U. L. REV. 837, 839 n.1 (2019) ("The short seller thus bets that the share price will decline between her initial sale and later purchase.").

2. *See, e.g.*, Arturo Bris, William N. Goetzmann & Ning Zhu, *Efficiency and the Bear: Short Sales and Markets Around the World*, 62 J. FIN. 1029, 1029 (2007) (describing how angry shareholders of the East India Company had the first regulations prohibiting short selling enacted in 1610, a mere eight years after the founding of the Amsterdam Exchange); *id.* at 1072 ("Critics often view short sales as immoral—the exploitation of others' misfortune and an exacerbating factor in periods of market crisis.").

off. In times of panic, short selling is frequently among the first practices to be banned.[3]

Yet most scholars argue that the ability to short securities is good for securities markets.[4] These scholars observe that facilitating the shorting of securities allows all views about the future value of a security to be incorporated into that security's price.[5] If the shorting of an asset is prohibited, then those who are optimistic about the asset's future value can access the market at a lower cost than those who are pessimistic. In addition, allowing short sales increases incentives for investors to uncover negative information about the firm that can enhance share price accuracy, because the ability to sell a security short makes it easier to monetize the value of this negative information.[6]

Making it easier to short a firm's securities can also reduce insider trading. Insiders can profit when they have access to information about the future value of the firm's shares that is not yet incorporated into the firm's share price. If securities prices are more accurate, because of the activities of short-sellers, then the opportunities to trade on material non-public information will be fewer.[7]

The relationships between selling short, securities price accuracy, and opportunities to profit from inside information are especially relevant to crypto assets because crypto assets can be particularly difficult to sell short.[8] To sell a security short an investor usually needs to be able to borrow that security from someone else.[9] However, crypto assets are not readily available to borrow for this purpose.[10] Derivatives markets provide another mechanism for investors to bet that the value of a security will decline in the future.[11]

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3. One recent example is the ban on selling short the securities of financial sector firms implemented in response to the market downturn in 2008. *See, e.g.*, *SEC Halts Short Selling of Financial Stocks to Protect Investors and Markets*, U.S. SEC. & EXCH. COMM'N (Sept. 19, 2008), https://www.sec.gov/news/press/2008/2008-211.htm [https://perma.cc/8FCF-Z7Y9]. For an analysis of the costs of the 2008 ban on short selling see Ekkehart Boehmer, Charles M. Jones & Xiaoyan Zhang, *Shackling Short Sellers: The 2008 Shorting Ban*, 26 REV. FIN. STUD. 1363 (2013), and Peter N. Dixon, *Why Do Short Selling Bans Increase Adverse Selection and Decrease Price Efficiency?*, 11 REV. ASSET PRICING STUD. 122 (2021).

4. *See infra* Part II. *See also* Molk & Partnoy, *supra* note 1, at 840–41.

5. *See infra* notes 15–24 and accompanying text.

6. For an analytic model of this effect see Dixon, *supra* note 3, at 126–139.

7. *See infra* Part III.

8. For a definition of crypto assets see Andrew Verstein, *Crypto Assets and Insider Trading Law's Domain*, 105 IOWA L. REV. 1, 8–13 (2019).

9. *See* Molk & Partnoy, *supra* note 1, at 839 n.1 ("In a typical short position, an investor (the 'short seller') borrows shares she does not yet own and sells those shares at current market prices; the short seller later 'covers' the short position by buying shares in the future and returning the borrowed shares.").

10. *But see* Olga Kharif, *Lenders are Thriving on the Bitcoin Bust*, L.A. TIMES (Jan. 2, 2019, 4:00 PM), https://www.latimes.com/business/la-fi-bitcoin-loans-20190102-story.html [https://perma.cc/S6VH-PU5K] (describing the growth in firms that provide loans based on crypto assets and then provide the crypto assets pledged as collateral to short sellers).

11. The term derivative here refers to any financial contract for which the payoff is derivative of the value of some other asset. Nic Paget-Clarke, *An Interview with Frank Partnoy:*

However, derivatives markets need to be created and sustained by implementing a system of protections and guidelines, and derivatives markets for crypto assets are in their infancy.[12]

The experience with Bitcoin during the period from 2017 through 2019 provides a case study in how facilitating the shorting of a security might impact both the trading value of the underlying security and the level of ongoing insider trading.[13] Starting in December 2017, both the Chicago Board Options Exchange ("CBOE") and the Chicago Mercantile Exchange ("CME") established a market for trading Bitcoin futures.[14] Futures are contracts that represent an agreement to buy or sell an asset at an agreed upon price at a specific time in the future.[15] Around the same time that Bitcoin futures markets were established, there was a significant decline in Bitcoin prices.[16] Researchers at the Federal Reserve Bank hypothesized that these two events were connected, because the introduction of a public futures market allowed investors to short Bitcoin at lower transaction costs.[17]

While this timing could just be coincidental, this Essay uses this confluence of events to explore scholarly discourse on the connections between futures markets, asset price corrections, and insider trading. If these events are more than coincidence, then making it easier to short crypto assets, perhaps by facilitating or even mandating derivative trading in these assets, could prove helpful in addressing insider trading in this context.

Deregulation, Derivatives, and Moral Hazard, IN MOTION MAGAZINE (Dec. 15, 2013), http://www.inmotionmagazine.com/global/partnoy_f_int13.html [https://perma.cc/EL5J-QRU3] ("The basic definition of derivative hasn't changed over time. It might not be particularly useful, but here it is: a derivative is a financial instrument whose value is based on or derived from something else.").

12. *See, e.g.*, Paul Meier, Setting up a Derivatives Exchange: What to Look for and Points to Consider (Sept. 5, 2005) (unpublished manuscript), https://www.afmorg.net/document/161/Setting%20up%20a%20Derivatives%20exchange.doc [https://perma.cc/355Z-GHXR] (discussing how to set up a successful derivatives market).

13. *See infra* Part III. With respect to the advisability of imposing insider trading restrictions on crypto assets generally see Verstein, *supra* note 8, at 38–48.

14. Oliver Smith, *How to Short Sell Bitcoin, and Why More People Aren't*, FORBES (July 12, 2018, 8:28 AM), https://www.forbes.com/sites/oliversmith/2018/07/12/how-to-short-sell-cryptocurrencies-and-why-more-people-arent/?sh=533e09b74e63 [https://perma.cc/7A87-GGQA]. For a discussion of the controversy and difficulties surrounding the introduction of these futures contracts see generally Lee Reiners, *Bitcoin Futures: From Self-Certification to Systemic Risk*, 23 N.C. BANKING INST. 61 (2019).

In March, 2019, the CBOE closed their market in Bitcoin futures, but the CME Bitcoin futures market remains open. *See* Wolf Richter, *That Didn't Last Long: Cboe Bails on Bitcoin Futures Trading*, WOLF ST. (Mar. 18, 2019), https://wolfstreet.com/2019/03/18/didnt-last-long-cboe-bails-on-bitcoin-futures-trading [https://perma.cc/5SJQ-HH8X].

15. *See* Verstein, *supra* note 8, at 10–11 (discussing crypto asset futures).

16. *See* Galina Hale, Arvind Krishnamurthy, Marianna Kudlyak & Patrick Shultz, *How Futures Trading Changed Bitcoin Prices*, FED. RSRV. BANK S.F. (May 7, 2018), https://www.frbsf.org/economic-research/publications/economic-letter/2018/may/how-futures-trading-changed-bitcoin-prices/#:~:text=How%20Futures%20Trading%20Changed%20Bitcoin%20Prices,-Galina%20Hale%2C%20Arvind&text=From%20Bitcoin's%20inception%20in%202009,rapidly%20starting%20in%20mid%2DDecember [https://perma.cc/4SAB-FPER].

17. *Id. See infra* notes 27–28 and accompanying text for a further discussion of this topic.

II. POTENTIAL BENEFITS OF SHORT SELLING

This Part reviews some of the foundational scholarship on the benefits to financial markets that can be provided by short sellers. There is both theory and evidence suggesting that difficulty in shorting an asset can increase the likelihood that the trading price of that asset is inflated.

The theoretical claim that restrictions on shorting can lead to an upward bias in price first appears in a 1977 article by Edward M. Miller in the *Journal of Finance* titled *Risk, Uncertainty, and Divergence of Opinion*.[18] Miller develops a model that shows how a simple divergence in views can lead to an upward bias in an asset's price when there is no simple way to short the asset.[19] Miller's idea is simple: If the ability to sell short is restricted, this will limit supply that might otherwise be provided by those willing to sell the security short. If supply is reduced and demand remains the same, a logical implication would be that price will rise.[20]

In a related vein, Douglas Diamond and Robert Verrecchia in a 1987 article in the *Journal of Financial Economics* titled *Constraints on Short-Selling and Asset Price Adjustment to Private Information* model circumstances under which market prices will not incorporate private information as quickly when shorting is not possible.[21] However, in the Diamond and Verrecchia model, the absence of a mechanism for shorting securities does not lead to an upward bias in securities prices. This is because in the Diamond and Verrecchia model, investors take into account the fact that it is more difficult to express a pessimistic view about share price in the absence of an ability to short the security. Recognizing this constraint allows investors and market-makers to rationally assess the meaning of a reduced supply of a particular security.[22] Whether investors will make the rational adjustment predicted by the Diamond and Verrecchia model when supply is restricted because of difficulty in shorting a security is an empirical question.

In addition to the Miller and the Diamond and Verrecchia articles providing analytic models describing benefits from allowing investors to engage in short sales discussed just above, there is empirical research suggesting that the information quality of securities prices is improved when investors can short a security.[23] The best evidence that the ability to short a security increases share price informativeness comes from "multi-market" studies. "Multi-market" studies compare measures of share informativeness in securities markets where shorting securities can be easily done with measures of share informativeness in securities markets where shorting securities is

18. Edward M. Miller, *Risk, Uncertainty, and Divergence of Opinion*, 32 J. FIN. 1151 (1977).

19. *Id.* at 1151–54.

20. *Id.* at 1154.

21. Douglas W. Diamond & Robert E. Verrecchia, *Constraints on Short-Selling and Asset Price Adjustment to Private Information*, 18 J. FIN. ECON. 277 (1987).

22. *Id.* at 278 ("Rational expectation formation changes the election rules and removes any upward bias to prices . . . .").

23. Miller, *supra* note 18; Diamond & Verrecchia, *supra* note 21.

more difficult to carry out. For example, Arturo Bris and co-authors in *Efficiency and the Bear: Short Sales and Markets around the World* published in the *Journal of Finance* in 2007, compare share price informativeness and the ease of shorting securities in forty-seven equity markets to find that there is a greater amount of variability in the returns generated from holding the securities of different firms in markets where shorting of securities is allowed.[24] Bris et al. interpret this greater variability as evidence that share prices are more informative in markets where short selling is allowed.[25]

Whether the absence of a short market leads to an upward bias in securities prices is less clear. In the narrower context of the United States, there is some evidence that prohibiting short sales can lead to an upward bias in asset values. For example, Ana Fostel and John Geanakoplos in their 2012 article *Tranching, CDS, and Asset Prices: How Financial Innovation Can Cause Bubbles and Crashes* in *American Economic Journal: Macroeconomics* argue that excessive home valuations and the ensuing mortgage crisis in 2008 were exacerbated by the difficulty in shorting the mortgage market in the years leading up to the crisis.[26]

A related question is whether the ability to sell securities short can lead to an increased risk of market crashes. Bris et al. examine the relationship between the ease with which securities can be shorted in a particular market and the likelihood of a major downturn in that market.[27] As they explain, some regulators argue against facilitating the trading of securities on a short basis, because of a concern that short sales can exacerbate downward selling pressure during a market downturn.[28] The Bris et al. findings do not support this concern. Bris et al. find that: "short sales have no significant impact on the frequency of crashes."[29]

Additional evidence on the effects of allowing securities to be sold short comes from a pilot program on short selling carried out by the U.S. Securities and Exchange Commission ("SEC") between May 2, 2005 and August 6, 2007. The program known as the Regulation SHO Pilot Program is described in detail in a report published by the SEC Office of Economic Analysis titled *Economic Analysis of the Short Sale Price Restrictions Under the Regulation SHO Pilot* dated February 6, 2007.[30] The Regulation SHO Pilot Program exempted one-

24. Bris et al., *supra* note 2.

25. *Id.* at 1046–60.

26. Ana Fostel & John Geanakoplos, *Tranching, CDS, and Asset Prices: How Financial Innovation Can Cause Bubbles and Crashes*, 4 AM. ECON. J.: MACROECONOMICS 190, 190 (2012).

27. Bris et al., *supra* note 2, at 1061–63.

28. *Id.*

29. *Id.* at 1031.

30. *See* OFF. OF ECON. ANALYSIS, U.S. SEC. & EXCH. COMM'N, ECONOMIC ANALYSIS OF THE SHORT SALE PRICE RESTRICTIONS UNDER THE REGULATION SHO PILOT (2007), https://www.sec.gov/news/studies/2007/regshopiloto20607.pdf [https://perma.cc/KGQ3-5SKG] (describing the results of a pilot program on short sales).

third of the stocks in the Russell 3000 Index, selected at random, from various price restrictions that otherwise limited the ability to sell securities short.[31]

Several studies have used data gathered from the Regulation SHO Pilot Program to evaluate the effects of removing barriers to shorting a security. The SEC in its initial evaluation of the data from the Regulation SHO Pilot Program found that price restrictions that place limits on the ease with which investors can short a stock "may cause stocks to be slightly overvalued."[32] Subsequent studies of the Regulation SHO Pilot Program suggest that the price informativeness of securities prices also increases when barriers to short selling are removed. These results are nicely summarized by Shuo Kan and Stephen Gong in *Does High Stock Return Synchronicity Indicate High or Low Price Informativeness? Evidence from a Regulatory Experiment*, an article published in the *International Review of Finance* in 2018.[33]

In summary, despite much resistance from various market participants, short selling appears in theory and based on the available evidence to enhance share price accuracy.

III. SHORT SELLING AND INSIDER TRADING

There is, in turn, both theoretical and empirical scholarship that considers the relationship between short selling and insider trading.[34] Most notable is an article published by Massimo Massa and colleagues in the *Journal of Financial Economics* in 2015 titled *Competition of the Informed: Does the Presence of Short Sellers Affect Insider Selling?*[35] The starting presumption of the Massa et al. article is that short sellers are better informed than other sellers.[36] If this presumption is correct, then the presence of short sellers, because they are better informed, will create an incentive for insiders to trade more quickly, lest the short sellers trade first and take away the insider's ability to trade profitability. Massa et al. carry out a number of tests of their hypothesis, including an analysis based on the effects of the Regulation SHO Pilot Program.[37] Massa et al. concluded "that 'informed' professional investors (e.g., short sellers) improve market efficiency not only by directly trading, but also (and possibly more importantly) by speeding up the trades of the insiders."[38] If Massa et al. are correct, then allowing short selling might not

31. Rules that prohibit shorting a security when the security's price is declining include a "tick test" and a "bid test." *Id.* at 3.

32. *Id.* at 8.

33. Shuo Kan & Stephen Gong, *Does High Stock Return Synchronicity Indicate High or Low Price Informativeness? Evidence from a Regulatory Experiment*, 18 INT'L. REV. FIN. 523 (2017).

34. *See, e.g.*, Mozaffar Khan & Hai Lu, *Do Short Sellers Front-Run Insider Sales?*, 88 ACCT. REV. 1743 (2013); Massimo Massa, Wenlan Qian, Weibiao Xu & Hong Zhang, *Competition of the Informed: Does the Presence of Short Sellers Affect Insider Selling?*, 118 J. FIN. ECON. 268 (2015).

35. Massa et al., *supra* note 34.

36. *Id.* at 268.

37. *Id.* at 273–86. For a discussion of the Regulation SHO Pilot Program, see *supra* notes 30–33 and accompanying text.

38. Massa et al., *supra* note 34, at 270.

only increase pricing accuracy and limit speculative excess, but also reduce the deleterious effects of untoward behavior in crypto assets trading.[39]

IV. BITCOIN PRICING, FUTURES, AND SHORT SELLING

This Part discusses in more detail the experience with Bitcoin from 2017 through 2019 to suggest how facilitating the shorting of a security can impact the trading value of the underlying security, and the level of ongoing insider trading. The situation most germane to exploring the relationship between crypto asset valuation and short selling is the price behavior of Bitcoin once futures trading began on the CBOE and the CME in December 2017.[40]

In the years prior to the introduction of Bitcoin futures at the end of 2017, Bitcoin prices were on a tear. At the end of 2013, one token of bitcoin sold for nearly $806.[41] Then, there were a few down years. At the end of 2015, one token of bitcoin sold for $430.[42] At the end of 2016, one token of bitcoin was back up to $963.[43] Then, by the end of 2017, one token of bitcoin had soared to a price of $13,850.[44] However, by December 2018, the price of one token of bitcoin was back down to $3,709.[45]

Interestingly, the downturn in Bitcoin prices coincided with the introduction of futures trading in Bitcoin on the CBOE and the CME. This timing led economists working at the Federal Reserve Bank of San Francisco to publish an *Economic Letter* titled *How Futures Trading Changed Bitcoin Prices* in May of 2018 arguing that the introduction of futures trading and the downturn in trading price was not a coincidence.[46] Their argument is that opening up futures trading in Bitcoin allowed investors who were pessimistic about the future value of Bitcoin to monetize these beliefs more easily and that the effect of incorporating these beliefs into the market price of Bitcoin was to provide a counterbalance for the speculative demand that had previously been driving up the price of Bitcoin.[47]

This hypothesized link between Bitcoin pricing and the ability to trade Bitcoin futures is consistent with both the theory and evidence discussed

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39. *See* Verstein, *supra* note 8, at 34–49 (considering potential benefits of prohibiting insider trading with crypto assets).

40. *See supra* note 14 and accompanying text.

41. All bitcoin prices are based on public price data accessed at *Bitcoin*, INVESTING.COM, https://www.investing.com/crypto/bitcoin/historical-data [https://perma.cc/PU54-8AAQ] (price for Dec. 31, 2013).

42. *Id.* (price for Dec. 31, 2015).

43. *Id.* (price for Dec. 31, 2016).

44. *Id.* (price for Dec. 31, 2017).

45. *Id.* (price for Dec. 31, 2018). At the time of this writing, the price of a token of bitcoin had risen substantially again to $51,322 (as of March 25, 2021). *Id.* (price for Mar. 25, 2021).

46. Hale et al., *supra* note 16.

47. *Id.*

above, suggesting that allowing short positions can curb excessive exuberance.[48]

V. CONCLUSION

There are benefits from facilitating short selling, including more accurate securities pricing and reduced opportunities for insider trading. One noteworthy feature of crypto assets is that they are difficult to sell short. In light of these observations, it is intriguing to note the degree to which bitcoin prices declined when a public futures market was initially established.

In many securities markets, techniques that facilitate short selling are better developed than in the market for crypto assets. As a result, in these securities markets, regulators are regularly encouraged to place restrictions on short sales, regardless of evidence suggesting that such restrictions may make asset prices less informative or ease the way for profitable insider trading.

The situation with crypto assets is different. For crypto assets, there are rarely easy ways to take a short position. In this context, maybe regulators' efforts should push in the opposite direction from what is typically the case. Rather than using regulation to curb short activity, perhaps regulation should encourage, or dare I even say, mandate accessibility of crypto assets to short positions.

48. *See supra* Part II. With respect to the advisability of imposing insider trading restrictions on crypto assets generally, see generally Verstein, *supra* note 8 (discussing the domain of laws surrounding insider trading and whether various insider trading rules should apply to bitcoin and other cryptocurrencies).