WE THE INVESTORS

March 12, 2025

Securities and Exchange Commission
100 F Street, NE
Washington, DC 20549

PETITION FOR RULEMAKING UNDER THE SECURITIES EXCHANGE ACT OF 1934
Petition to Amend Regulation SHO to Require Pre-Borrows for All Short Sales, Impose Fees for Fails-to-Deliver, and Eliminate Market Maker Exceptions

To the Securities and Exchange Commission:

Pursuant to Section 10 of the Administrative Procedure Act (5 U.S.C. § 553(e)) and Rule 192(a) of the Commission's Rules of Practice (17 CFR § 201.192(a)), we hereby petition the Securities and Exchange Commission (SEC) to amend Regulation SHO (17 CFR Part 242, Rules 200–204) to address persistent failures in short sale regulation and trade settlement. After twenty years, Regulation SHO has failed to eliminate naked short selling and large, persistent fails-to-deliver (FTDs), undermining investor confidence and market integrity. Attached to this petition is a draft paper (Welborn, 2025) that provides a comprehensive analysis of Reg SHO Threshold Lists and FTD data from 2005 to 2024. The persistence of FTDs—peaking at $19.8 billion in September 2024—reflects structural flaws in the current regulatory framework, including inadequate penalties, loopholes for market makers, and reliance on unenforceable "reasonable grounds" standards for short sales. This undermines confidence in markets and represents a systemic risk. Based on this analysis, we propose three specific amendments to Reg SHO: (1) mandate a pre-borrow requirement for all short sales, (2) impose monetary fees or fines for FTDs, and (3) eliminate all market maker exceptions to locate and close-out rules.

Background and Rationale

Regulation SHO, enacted in 2005, aimed to standardize short selling rules and curb naked short selling—sales executed without locating or borrowing shares—and resultant FTDs. The attached research, detailed in "Reg SHO at Twenty" (Welborn, 2025), analyzes daily Threshold Lists and FTD data from the National Securities Clearing Corporation (NSCC) over Reg SHO's history. Despite amendments in 2007, 2008, and 2009, including the elimination of the options market maker exception, naked short selling persists. As of 2024, dozens of companies remain on the Threshold List, with average daily FTDs at $2.9 billion—unchanged from 2005—and peaks exceeding $19 billion in September 2024. Some companies have been on this list for hundreds of days in a row throughout 2023 - 2024. High-profile events like GameStop in

January of 2021 (and several subsequent large price movements) and Robinhood's 2025 $45 million fine for Reg SHO violations underscore these inadequacies.

As such, we are petitioning for the following changes to be made to Reg SHO:

1. Mandatory Pre-Borrow for All Short Sales
   The current "locate" requirement (Rule 203(b)) allows short sales if a broker-dealer has "reasonable grounds" to believe shares can be borrowed, a standard easily circumvented. Data from the SEC's 2008 Emergency Order, requiring pre-borrows for 19 financial stocks, showed significant reductions in FTDs without harming market quality (OEA, 2009). A universal pre-borrow mandate would eliminate ambiguity, ensuring shares are secured before sale, reducing naked shorting, and aligning with the SEC's 2008 findings.
2. Fees or Fines for Fails-to-Deliver
   Reg SHO lacks punitive measures for FTDs, a flaw evident since the SEC dropped monetary penalties from its 2003 proposal despite public support (SEC, 2004). Consequently, daily FTDs have remained entrenched, with threshold securities like the SPDR S&P Retail ETF (XRT) accumulating 1,691 threshold days and short interest exceeding 699% of shares outstanding (Welborn, 2025). The U.S. Treasury market's "fails charge" since 2009 demonstrates that fees incentivize timely settlement, reducing fails even in low-rate environments without impairing market liquidity (NY Fed, 2020). Applying fees or fines to FTDs in equity markets would deter intentional delays and fund enforcement, addressing the $2.9 billion daily FTD average documented in the attached research (Welborn, 2025).
3. No Exceptions for Market Making
   Rule 204's close-out exceptions for "bona fide" market making (e.g., T+6 versus T+4 for others) enable persistent FTDs, particularly in ETFs, which now dominate Threshold Lists (OEA, 2011). Enforcement actions against firms like Arenstein (AMEX, 2007) and Wolfson (SEC, 2012) reveal abuse of such exceptions. Eliminating them would ensure uniform accountability, as the supposed liquidity benefits do not justify the systemic risks of unchecked FTDs, evidenced by ETF FTDs reaching 90% of daily fails on some days (Bradley et al., 2011). OEA's 2009 study found no adverse liquidity effects after the elimination of the OMM exception. Bid-ask spreads for affected stocks narrowed by 12%, while trading volumes remained stable (OEA, 2009). These results align with Paul Atkins' 2012 critique of regulatory carveouts: "Exceptions for 'bona fide' activities often become loopholes for abuse" (WSJ, 2012).

Request for Action

We urge the SEC to initiate rulemaking to amend Regulation SHO as follows:

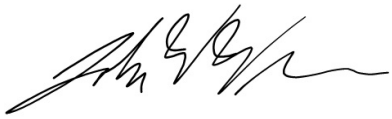
- Rule 203: Require all short sales, without exception, to be backed by a confirmed borrow of securities prior to execution.
- Rule 204: Impose escalating monetary fees or fines for FTDs, applicable to all market participants, with proceeds supporting enforcement.

- Rule 204: Eliminate all market maker exceptions to locate and close-out requirements, ensuring uniform settlement timelines.

These changes address Reg SHO's mixed legacy, supported by two decades of data showing persistent FTDs and enforcement gaps. They align with the SEC's mandate under the Securities Exchange Act of 1934 to maintain fair and orderly markets (15 U.S.C. § 78b). I respectfully request the Commission publish this petition for public comment and act promptly to restore trust in U.S. equity markets.

Respectfully submitted,

Dave Lauer
Co-Founder
Urvin Finance and We The Investors



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Attachment A: “Reg SHO at Twenty” by John Welborn (March 12, 2025)

Reg SHO at Twenty°

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This Draft: March 2025

Abstract

Regulation SHO ("Reg SHO") was enacted by the Securities and Exchange Commission in 2004 to address concerns regarding so-called naked short selling and large and persistent trade settlement failures. Reg SHO was also designed to bring consistency, transparency, and fairness to short sale rules that varied across the major stock exchanges. This paper is the first comprehensive analysis of the impact and efficacy of Reg SHO at reducing naked short selling and fails-to-deliver (FTDs) over its twenty-year history. I use daily Regulation SHO Threshold Lists and FTD data for the period from the start of Reg SHO in 2005 through the end of 2024, together with academic and proprietary databases, to document the composition and magnitude of high FTD securities. I conclude that the Reg SHO legacy is mixed and further reforms are necessary to ensure investor confidence in markets.

JEL Classification: G11; G12; G14; G21; G28; K22

Keywords: fail-to-deliver; Regulation SHO; short selling; Securities and Exchange Commission; short interest

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1. Introduction

The year 2025 marks the 20-year anniversary of SEC Regulation SHO (“Reg SHO”), which governs short selling and trade settlement in US stock markets. Reg SHO was proposed by the SEC in January of 2004, approved in October 2004, and enacted in January 2005. Formally, Reg SHO comprises SEC Rules 200 through 204 in the Federal Register (17 CFR Part 242).

Reg SHO standardized short selling rules and addresses concerns about “naked” short selling and unsettled trades known as fails-to-deliver (FTDs). Prior to Reg SHO, the NYSE and Nasdaq listing exchanges had their own rules concerning short selling and trade settlement. Reg SHO was designed to regulate the different standards. Reg SHO was also written to address concerns about naked short selling that emerged during the Dot Com boom and bust of the early 2000s.

Reg SHO’s legacy is mixed. The final rule, enacted in 2005, contained a series of regulatory loopholes that were abused by dishonest market participants to naked short sell and fail to deliver. Moreover, the final rule draft eliminated an initial proposal for monetary penalties for failing to deliver. Reg SHO also did not require any disclosure about which firms were failing to deliver and to what extent. As a result, thousands of companies experienced large and persistent fail-to-deliver positions worth billions of dollars during the period from 2005 through 2008.

The SEC amended Reg SHO in 2007, 2008 and 2009 to address key loopholes and reduce naked short selling and FTDs. Due to these changes, after 2009, the number of companies experiencing persistent naked short selling declined, as did the aggregate dollar value of fails-to-deliver. The SEC and FINRA also brought a series of high-profile enforcement cases which revealed the extent to which Reg SHO was manipulated, particularly the so-called options market maker (OMM) exception.

Nevertheless, these Reg SHO reforms and enforcement actions reduced but did not eliminate naked short selling and FTDs. Dozens of public companies are currently on the Reg SHO Threshold List, which is a list of firms with large and persistent FTD positions. The average daily dollar value of FTDs is just under $3b and is relatively unchanged from 2005. A related mystery is why so many Threshold List tickers are exchange traded funds (ETFs).

Reg SHO's inadequacies are further revealed by the fact that certain companies remain on the Threshold List for hundreds of trading days, including the S&P 500 Retail ETF (XRT) and GameStop (GME). A related and unresolved regulatory challenge emerges when the same stock is re-lent multiples times through short sales, a process known as "chained lending" or "rehypothecation." To wit, the XRT short interest is often over 100% of shares outstanding.

At the 20-year anniversary of Reg SHO, I explore concerns about naked short selling and large and persistent FTDs. I also evaluate the merits of the following proposals: (1) A mandatory pre-borrow requirement for all short sales; (2) Monetary penalties for failing to deliver; and (3) Elimination of all market making exceptions to timely settlement rules.

A critical research challenge is the quality and accessibility of data related to Reg SHO. Daily Regulation SHO Threshold Lists are provided directly by the exchanges, and these data files are both incomplete and missing unique CUSIP identifiers. In contrast, FTD data from the National Securities Clearing Corporation (NSCC), available through the SEC Freedom of Information Act (FOIA) office, are complete historically and contain sufficient identifying information.

In the analysis below, I begin with a history of short selling and trade settlement regulations. I then explore the data on naked short selling, the Reg SHO Threshold Lists, and fails-to-deliver that I can reconstruct from academic and proprietary data sources. I close with a discussion of the three policy proposals that may help to address ongoing settlement failure challenges

2. Short Selling

Short selling is a trading strategy that profits when asset prices decline. In a typical short sale, an asset is borrowed and sold with the expectation that it can be repurchased later, at a lower price, for return to the lender. Short selling is legal and (generally) helps to ensure market liquidity and efficient price discovery by moderating asset prices. There are many reasons why a trader may choose to sell short, including hedging and speculating. There is no meaningful way to differentiate between hedging and speculating from publicly available short sale data.

In securities markets, a naked short sale occurs when a short seller does not locate or borrow shares prior to effecting a short sale. If the naked short seller does not borrow stock by settlement date, then a trade settlement failure may occur. Naked short selling is generally illegal, but there are exceptions, and the regulation of short selling is complex.

The fundamental challenge of analyzing short selling in modern securities markets is there are layers of financial intermediaries that separate stock lenders and stock borrowers. Stock is held in various account types at myriad institutions throughout the financial landscape. Often, stock lent to short sellers is done without the knowledge of the beneficial owner. As a result, there is no self-regulating mechanism to address trade settlement failures when they occur.

Previously, short selling was rare and a small fraction of total trading volume. This changed in the 1990s with the advent of prime brokerage, which was a novel institutional service offered by new class of investment funds to high-net-worth investors (SEC 1994). As the name implies, “hedge” funds seek to maximize returns while limiting risk, which necessarily involves hedging and shorting via stocks and options. Since that time, the quantity of short selling has only increased, and is arguably just as common as long trading today in most markets.

The act of borrowing securities from one party, and selling them to another, is a complex multiparty transaction. Short selling is also complicated by the fact that trade settlement is not instantaneous. Stock transfers are delayed by layers of trade netting within the brokers and at the clearinghouse. Net settlement increases efficiency but reduces accountability insofar as failed trades are not traceable to their origin. Settlement failures are documented as anonymous debits at the clearinghouse, and counterparties have neither the information nor the incentive to force settlement. Oversight of prompt and accurate trade settlement falls to securities regulators and self-regulatory organizations (SROs) such as the major stock exchanges.

2.2 Short Selling and the Securities Exchange Act of 1934

The Securities Exchange Act of 1934 was motivated by a desire "to ensure the maintenance of fair and honest markets" (73rd Congress, 1934, p. 881). There is evidence that manipulation of the stock issuance process contributed to the market volatility that preceded the 1929 stock market crash (Flynn, 1934). The 1933 Pecora Investigation, which led to creation of the SEC, concluded that stock "pool" operators had used "unsavory and unethical methods employed in the flotation and sale of securities" to manipulate stock prices (Fletcher, 1934).

There is anecdotal support for the Pecora Commission's claims. At the turn of the century, the stock speculator Daniel Drew battled with Cornelius Vanderbilt over control of the Harlem and Erie Railroads by issuing unregistered securities and selling short stock that he had not borrowed. Drew famously quipped, "He who sells what isn't his'n, must buy it back or go to pris'n" (White, 1910, p. 3). Similarly, Alan Ryan, Chairman of Stutz Motor Car, battled with so-called "bear raiders" who sold millions of Stutz shares that they had not borrowed or did not own (Brooks, 1969).

Drew and other stock speculators of the era understood that trade settlement is not instantaneous. In markets for fungible goods like stock, trade is often facilitated by a clearing house that anonymizes the buyer–seller relationship. This intermediation encourages efficiency and liquidity because the clearinghouse reduces transaction times and assumes counterparty risk. Such intermediation, however, may reduce transparency and accountability. Trade settlement failures can occur as a result. Short selling may exacerbate settlement problems because short sellers do not own the stock they sell. The 1934 Act did not, however, specifically address problems associated with naked short selling or trade settlement.

2.3 The Wall Street Back Office Crisis

The "Back Office Crisis" of the late 1960s compelled Wall Street firms and the SROs to address trade settlement problems. Starting in the summer of 1967, the volume of trading on the New York Stock Exchange (NYSE) and the American Stock Exchange (AMEX) far exceeded the capacity of brokerage firms' clerical staff to process related paperwork. This paperwork backlog was serious enough that at least one brokerage firm was forced to close. By January 1968, aggregate trade "fails" had increased by 93 percent (Columbia Law Review, 1969).

Securities regulators voiced their concerns publicly. SEC Commissioner Hugh F. Owens remarked that the "fails situation" could cripple market liquidity and "seriously threaten our whole economy" (Owens, 1968). A February 1969 memo to Ken Cole, President Nixon's aide, from Paul W. McCracken, Chairman of President Nixon's Council of Economic Advisors, shows that concerns reached the Executive level. McCracken writes, "It is our judgment that there is a substantive problem here…I recommend that we have a discussion of the matter at a meeting of the Cabinet Committee on Economic Policy" (McCracken, 1969).

To address the crisis, the exchanges closed every Wednesday, and settlement was extended to trade date plus five days ("T+5"). Securities dealers at the time considered a range of solutions to the back-office problem that would penalize firms who fail. In a "mandatory buy-in," a broker with a fail-to-receive (FTR) must, rather than waiting for delivery, buy stock at the current market price and bill the owing firm for the shares not delivered. Another solution would impose net capital penalties on broker–dealers with outstanding fails. A third proposal would have severely limited the trading abilities of firms with high fails (Columbia Law Review, 1969).

These proposed punitive solutions did not address the main cause of the backlog, which was direct settlement in paper certificates. To address inefficiencies associated with paper settlement, NYSE members founded the Central Certificate Service (CCS) in June of 1968. The CCS had two clear advantages over paper settlement. First, the CCS held all stock certificates in a central location and noted ownership transfers using book entries. Second, the CCS automated the trade clearing process electronically with punch cards. Nevertheless, participation in the CCP was voluntary and success was initially limited (Benn, 2002). Eventually, wider CCS participation led to creation of the Depository Trust Company (DTC) in 1973 (DTCC, 2012).

In the Securities Act Amendments of 1975, Congress required universal adoption of "immobilization" in the clearing system. By ending the practice of physical certificate transfer, the Amendments were designed "to foster the development of a national securities market system and a national clearance and settlement system" (94th Congress, 1975). The National Securities Clearing Corporation (NSCC) was founded in 1976 to provide clearing, settlement, and central counterparty risk services. While physical stock was held "immobilized" in the DTC, the NSCC aggregated order flow and generated instructions for net changes in DTC accounts at the end of each trading day through a process known as "multilateral netting" (Donald, 2007).

2.3 United States v. Naftalin (1979)

Though efficient, multilateral netting did not prevent fraud and market manipulation, as was evident in the 1979 SCOTUS case United States v. Naftalin. In 1971, the SEC ordered public hearings against Naftalin and Company, Inc., a registered broker–dealer, and its president, Neil T. Naftalin. The SEC alleged that Naftalin executed sell orders for stock that he did not own and could not deliver to a counterparty, Merrill Lynch, Pierce, Fenner and Smith.

In 1973, an administrative law judge found that Naftalin committed fraud by executing long sales of stock that were short sales and delayed settlement indefinitely under false pretenses. Naftalin's conduct was revealed when the prices of the securities involved began to rise, at which time he notified the counterparties that he could not make delivery. For the broker–dealers waiting for delivery from Naftalin, the cost of buying-in securities on the open market to settle the trades was over $1.2 million. Naftalin's registration as a broker–dealer was revoked, and he was barred from the securities industry for life (SEC, 1973).

Naftalin was convicted in United States District Court for the District of Minnesota on eight counts of employing a scheme to defraud in the offer or sale of stock in violation of section 17(a)(1) of the Securities Act of 1933 and sentenced to five years imprisonment. Naftalin appealed the District Court's decision on the grounds that the fraud had occurred between brokers and not investors whom the 1933 Act was designed to protect. The United States Court of Appeals, Eighth Circuit, agreed and vacated the District Court Decision (8th Circuit, 1972).

In 1979, the U.S. Supreme Court agreed to hear United States v. Neil T. Naftalin. The Supreme Court found that section 17(a)(1) of the 1933 Act applied to brokers and investors alike and reversed the Appeals Court decision. The criminal conviction against Naftalin for fraudulently selling short and intentionally failing to deliver stood.

2.4 Continuous Net Settlement and the Pollack Report

The 1970s settlement institutions were designed to eliminate the costs and risks from lengthy delivery failures like those uncovered in the Naftalin case. Every day, NSCC aggregates trade data and provides electronic settlement instructions to the Depository Trust Clearing Corporation (DTCC). The NSCC organizes this process through the Continuous Net Settlement (CNS) system. Through CNS, the NSCC effectively "steps in between two parties to a trade and nets each party's obligation to trade over multiple trades, so that each obligation to receive or deliver, and an obligation to deliver or receive, can be combined together into one" (Sirri, 2007).

CNS helps to provide liquidity when there are occasional or temporary problems with trade settlement. If a broker fails to deliver stock by T+3, the NSCC allocates that FTD to a different broker–dealer using a random distribution algorithm. The DTC account that did not receive securities because of this allocation will have a net fail-to-receive (FTR) position. The broker who has failed to receive will nonetheless credit the securities positions to his customer accounts. Additional liquidity comes from the Stock Borrow Program (SBP), which allows NSCC firms to loan shares automatically from DTC accounts in the event of a CNS fail. CNS and the SBP preclude identifying or tracking which specific brokers fail to deliver or receive.

The anonymity of CNS may open the settlement system to abuse by preventing counterparties from self-regulating settlement failures. Regulators have voiced concerns regarding CNS for decades. In 1985, the National Association of Securities Dealers (NASD) commissioned Irving M. Pollack, a securities law expert and former SEC Commissioner, to conduct a comprehensive review of short selling in NASDAQ securities. Pollack (1986) concluded that better institutions were needed to guarantee prompt close-out of short sales.

Pollack (1986) observed that, while CNS had substantially increased efficiency, the system effectively insulated the clearing corporation and brokers from the costs associated with FTDs and FTRs. Thus, CNS did not prevent FTDs and FTRs from increasing without limit and permitted some brokers to postpone delivery indefinitely (Pollack, 1986, p. 50). Pollack (1986) warned that FTDs and FTRs could therefore cause serious difficulties in a lengthy bear market. “The fact that there is no automatic mechanism preventing the substantial buildup of short positions at the clearing corporation and of fails to receive in brokerage firms carries the potential for serious problems, particularly in the event of crisis market conditions (Pollack, 1986, p. 69). The phrase, “short positions at the clearing corporation” refers to fails-to-deliver.

2.5 SEC Regulation SHO

CNS’s inability to moderate FTDs became clear during the dotcom bust of the early 2000s. In 2003, the SEC requested comment on proposed regulations “to address the problem of ‘naked’ short selling” (SEC, 2003a). The SEC received comments from a wide range of market participants, including industry professionals and retail investors (SEC, 2003b). The final short sale rule, Regulation SHO, was passed in August 2004 and became effective in January 2005.

SEC Regulation SHO was designed to regulate short selling formally and reduce FTDs. Regulation SHO requires the five major U.S. stock exchanges to publish a daily list, referred to as the Regulation SHO Threshold List, of stocks with high FTDs. At the time, these exchanges were the NASDAQ, NYSE, NYSE Arca, NYSE Amex, and the Chicago Stock Exchange (CHX). To qualify for the Threshold List, a stock must have, for five consecutive settlement days at a clearing agency, an aggregate FTD position totaling 10,000 shares or more and equal to at least 0.5% of the issuer's total shares outstanding (SEC, 2004).

Regulation SHO imposes locate and close-out requirements for short sales. The locate requirement is satisfied if a broker–dealer has reasonable grounds to believe that a security can be located (for borrow) prior to delivery date. A broker–dealer must document a locate prior to executing a short sale. Specifically, the rule prohibits execution of a short sale unless a broker–dealer has either borrowed the security or "has reasonable grounds to believe that the security can be borrowed so that it can be delivered on the date delivery is due" (SEC, 2004). The close-out requirement obliges broker–dealers to settle FTD positions for threshold securities that have persisted for 13 consecutive settlement days. Closing out requires the broker–dealer to purchase securities of like kind and quantity and to settle the trade on behalf of the customer.

Regulation SHO was influenced by short sale rulemaking by the SROs. The "locate" and "reasonable grounds" language above is borrowed from NASD Rule 3370 and NYSE Rule 440C, which predate Regulation SHO. The NYSE permitted use of an "Easy to Borrow" list to satisfy the "reasonable grounds" standard that a security sold short was available for borrowing. Note, however, that "repeated failures to deliver in securities included on an 'Easy to Borrow' list would indicate that the broker–dealer's reliance on such a list did not satisfy the 'reasonable grounds' standard" (NYSE 1997, p. 4662).

Similarly, the NASD required a member firm to make an "affirmative determination" that stock sold short would be available to borrow by settlement date. The NASD approved use of a so-called "Hard to Borrow" Lists to satisfy the affirmative determination requirement insofar as "a specific security absent from the list is easy to borrow" (NASD 2000, p. 171). Furthermore, Rule 3370 "was designed to prevent abusive short selling and ensure that short sellers satisfy their settlement obligations" (NASD 2000, p. 171).

NASD 3370 incorporated recommendations on the reporting and settlement of short sales contained in a 1986 NASD study by former SEC Commissioner Irving M. Pollack. Pollack (1986) concluded that, given the structure of the CNS system, it was possible for large FTD positions to accumulate at the clearinghouse "in perpetuity." "While these procedures generally protect the clearing corporation, they permit short selling brokers to assume much larger positions than they might otherwise be able to undertake if they were prevented from continually rolling over short positions without borrowing securities for delivery" (Pollack 1986, p. 61).

2.6 Exceptions to Regulation SHO

Regulation SHO contained two loopholes that hampered the rules' ability to reduce settlement fails. First, the Grandfather Clause exempted all pre-existing FTD positions. According to SEC Director of Market Regulation Erik Sirri, "Regulation SHO's grandfather provision was adopted because the Commission was concerned about creating buy-side volatility through short squeezes if large pre-existing fail to deliver positions had to be closed out too quickly after a security became a threshold security" (Sirri 2007). The Commission proposed eliminating the grandfather provision in 2006 and finalized its elimination in 2007.

Second, Regulation SHO contained an exception to the locate and close-out requirements for short sales for market makers. Specifically, SEC (2004) allowed, "…[an] exception from the uniform ''locate'' requirement, as Rule 203(b)(2)(iii), for short sales executed by market makers...including specialists and options market makers, but only in connection with bona-fide market making activities." SEC (2003a) describes how the Exception was intended to mean that all market makers were permitted to sell stock short without locating that stock

Market makers act as temporary counterparties to buyers or sellers to foster liquidity. Thus, market makers sometimes sell stock they do not have to hedge long positions. In general, OMMs strive to offset long positions with short positions of similar magnitude and duration. This is known as maintaining a “delta neutral” portfolio, where delta captures the sensitivity of changes in options prices to changes in the underlying stock price. While most market maker positions are closed out at the end of each trading day, OMMs take short positions that last until an option contract expires, which may be weeks or months. Often, OMMs manage portfolios of trades which require offsetting a book of long positions with short positions of similar magnitude and duration. This is known as maintaining a “delta neutral” portfolio, where delta informs how much of the underlying security must be bought or sold to hedge the options position.

NASD 3370 and NYSE 440C also contained limited short sale locate and close-out exceptions for market makers engaged in bona fide market making, but the proposal to establish Regulation SHO notes that “the SRO requirements [had] not fully addressed the problems of naked short selling and extended fails to deliver” (SEC, 2003a). Thus, Regulation SHO did not create a new exception per se. Rather, the rule was written to strengthen and narrow pre-existing exceptions without disrupting legitimate market making activity. Regulation SHO was also designed to “establish a uniform standard specifying the procedures for all short sellers to locate securities for borrowing” (SEC, 2003a).

The Exception did not apply to stocks already on the Regulation SHO Threshold List; an options market maker could only maintain FTDs “if the options positions were created prior to the time that the underlying security became a threshold security” (SEC, 2004). Thus, all FTDs in Threshold stocks are subject to the mandatory close-out requirement if they are older than 13 days and were not executed to hedge a pre-existing options position.

According to the SEC (2007b), “The options market maker exception was created to address concerns regarding liquidity and the pricing of options.” When OMMs sell put options or buy call options they are in a long position. They can hedge their long options position by selling short the underlying equity. The Exception allowed OMMs to hedge the risk of long options positions for the duration of an options contract if unable to borrow, which allowed them to delay short sale close-out until options expiration if necessary.

An example of this situation is when a market maker writes a put option with a future expiration date (a long position for the market maker). The Exception allowed the market maker to hedge that long position by shorting an equivalent quantity of the underlying stock and delay delivery if unable to borrow. At option expiration, the put buyer either (a) sells stock back to the market maker (which the OMM can use to settle his short hedge), or (b) the put expires out of the money, and the market maker buys stock to settle the short hedge.

With hard to borrow securities, shorting is most costly because a short seller has to pay to borrow the underlying equity in addition to posting collateral. Due to the Exception, OMMs did not have to pay interest on short sales of stocks with negative rebates for the options contract duration if unable to borrow. For contracts with expiration dates far in the future, this Exception could result in large cost savings.

The SEC limited the Exception to bona-fide market making, which “does not include activity that is related to speculative selling strategies or investment purposes of the broker–dealer” (SEC, 2004). Further, “bona-fide market making does not include transactions whereby a market maker enters into an arrangement with another broker–dealer or customer in an attempt to use the market maker's exception for the purpose of avoiding compliance with [Regulation SHO]” (SEC, 2004).

While the Exception was written to promote legitimate hedging by market makers, some traders were not engaged in bona-fide market making and were consequently fined and barred from trading. In 2007, FINRA, acting on behalf of AMEX's regulatory division, found that Scott and Brian Arenstein, "who were not bona-fide options market makers, improperly utilized the Reg SHO market maker location exemption to avoid locating shares prior to effecting short sale transactions in Reg SHO threshold securities…[and] engaged in transactions that circumvented delivery obligations" (AMEX 2007a, p. 2).

The Arenstein cases also alerted the SEC to a fraudulent trading strategy to "reset" the settlement date for a failed trade. "Options market makers' practice of "rolling" positions from one expiration month to the next potentially allows these options market makers to not close out positions as required by the close-out requirements of Regulation SHO" (SEC, 2007b, p. 22).

The Arenstein case caused the SROs to restate the existing requirement that all exceptions were limited to bona-fide market making. For example, the Chicago Board Options Exchange states that, "only options market–makers that are engaged in *bona-fide* options market-making may utilize the exception to Regulation SHO's "locate" requirement when effecting a short sale in the underlying security as a hedge" (CBOE 2007).

In August of 2007, the SEC proposed eliminating the Options Market Maker Exception to Regulation SHO. "The ability of options market makers to sell short and never have to close out a resulting fail to deliver position... may have a negative impact on the market for those securities" (SEC, 2007b, p. 21). The SEC eliminated the Exception in September 2008. In the final rule, the SEC wrote that, "[f]ails to deliver in threshold securities that result from hedging activities by options market makers will no longer be excepted from Regulation SHO's close-out requirement" (SEC, 2008b, p. 1).

The SEC (2009b, 2011, and 2012) and FINRA found evidence that the OMM abuse continued. The Wolfson case, for example, documents how one options market maker,

> …improperly utilized the Market Maker Exception to avoid locating shares before effecting short sales as part of "reverse conversion" and "assist" transactions… As a result, [Wolfson was] … able to attract the business of prime brokerage firms seeking to create inventory for stock loans on hard to borrow securities. (SEC, 2012, pp. 3–4)

This is important because hedge funds and large institutional investors often rely on prime brokers to locate and borrow stock for short sales. Options market makers like Arenstein and Wolfson executed complex options trades known as "reverse conversions" to generate stock loan inventory for prime brokers. For this purpose, a reverse conversion does not qualify as bona-fide market making. Rather, according to the SEC,

> Reverse conversions are executed to meet a one-sided demand for hard-to-borrow threshold securities. The buyers of the threshold securities, in this case large prime brokerage firms, engaged in the conversion transaction that allowed them to acquire a long stock position that is hedged by the synthetic short options position. The brokerage firm could then loan out the shares of the threshold securities and received fees from the borrowers. Those loan fees can be quite significant when the stock is a threshold security, because threshold securities are generally hard to borrow and therefore command large fees in the stock loan market (2012, pp. 3–4).

Numerous subsequent SEC and FINRA enforcement cases have outlined abuses of Reg SHO and market making exceptions, including SEC (2009), The SEC and FINRA have since brought numerous disciplinary actions against options market makers (OMMs) for naked short selling and failing to deliver in connection with market making that is not bona fide, including SEC (2009b), ISE (2011), NASDAQ (2011), and NYSE AMEX (2011), and (SEC, 2012, pp. 3–4). Table 3 contains a partial list of SEC and FINRA enforcement actions related to Reg SHO.

2.7 The 2008 Emergency Order

Reg SHO's inadequacies became apparent to the SEC at the onset of the 2008 Global Financial Crisis. In June 2008, the SEC used its emergency authority to impose a temporary pre-borrow requirement for short sales. The SEC claimed to be motivated out of concern that naked short selling would exacerbate a burgeoning financial crisis. SEC Chairman Christopher Cox said, "Today's Commission action aims to stop unlawful manipulation through 'naked' short selling that threatens the stability of financial institutions." (SEC 2008X).

Notably, the SEC order applied only to 19 financial stocks. These stocks were the 17 primary dealers, which are firms that make markets in U.S. Treasury Securities, and Fannie Mae and Freddie Mac. The order was effective from July 21, 2008, to August 12, 2008. The SEC wrote in its emergency order:

> "In these unusual and extraordinary circumstances, we have concluded that requiring all persons to borrow or arrange to borrow the securities identified in Appendix A prior to effecting an order for a short sale of those securities is in the public interest and for the protection of investors to maintain fair and orderly securities markets, and to prevent substantial disruption in the securities markets. This emergency requirement will eliminate any possibility that naked short selling may contribute to the disruption of markets in these securities." (SEC 2008a)

Later in 2008, the SEC also temporarily banned short selling in all financial stocks and finally amended Regulation SHO to eliminate loopholes and impose close-out rules.

In 2009, the SEC Office of Economic Analysis produced an "Analysis of the July Emergency Order Requiring a Pre-Borrow on Short Sales." The OEA Report found "Large and significant decreases in fails to deliver," "little change in short interest," and "no significant changes in bid-ask spread or market depth." On the other hand, the OEA report found evidence that stock lending rates were higher than before the order. "Our results suggest that imposing a pre-borrow requirement may have had the intended effect of reducing fails" (OEA, 2009).

2.8 The 2008 Amendments to Regulation SHO

The daily dollar value of FTDs grew until the SEC took decisive action to address settlement failures in the third quarter of 2008. First, the SEC eliminated the options market maker exception to Regulation SHO, discussed above. Next, the SEC passed Interim Final Temporary Rule 204T to address "abusive 'naked' short selling in all equity securities" (SEC, 2008a). Final Rule 204 was enacted on July 31, 2009 (SEC, 2009a). Concurrent with 204 and other regulatory actions, Threshold Lists and the number of FTDs shrank significantly (Stratmann and Welborn, 2013). SEC Rule 204T addressed concerns regarding large and persistent settlement failures in all stocks including common stocks and ETFs.[1]

> [Short] sellers sometimes intentionally fail to deliver securities as part of a scheme to manipulate the price of a security, or possibly to avoid borrowing costs associated with short sales, especially when the costs of borrowing stock are high…large and persistent fails to deliver may deprive shareholders of the benefits of ownership, such as voting and lending…Moreover, sellers that fail to deliver securities on settlement date may attempt to use this additional freedom to engage in trading activities to improperly depress the price of a security (SEC, 2009a, pp. 5–7).

Rule 204 modified Regulation SHO in several ways. First, the Regulation SHO close-out requirements were expanded to include all equity securities, whereas prior close-out rules applied only to stocks with "large and persistent level of fails to deliver, i.e., threshold securities" (SEC, 2009a, p. 24). Second, 204 modified the statutory close-out period for both long and short sales to the start of trading hours on the day after settlement date (T+4). The rule requires market participants with FTDs at the clearing corporation to "close out the fail to deliver position by borrowing or purchasing securities of like kind and quantity" (SEC, 2009a, p. 13).

[1] Angel (2008), in an open letter to the SEC, urges the Commission to address the "enormous settlement failures in the ETF market."

Market participants who continue to fail after T+4 are subject to a pre-borrow requirement for short sales and possible disciplinary action. For all market participants, the rule imposed “a requirement to borrow or arrange to borrow securities prior to accepting or effecting further short sales in that security” (SEC, 2009a, p. 30).

A statutory pre-borrow requirement for failing to deliver existed prior to Rule 204. Rule 203(b)(3)(iv) of Regulation SHO imposes a similar penalty on market participants with outstanding FTDs in Threshold securities older than thirteen consecutive settlement days. Rule 204, however, expands the penalty to include all equity securities, including ETFs, and shortens the close-out period to T+4 days. Rule 204 also permits the SROs or the SEC to impose monetary penalties for failing to close out aged fail-to-deliver positions (FINRA, 2012).

Nevertheless, Final Rule 204 contains a key close-out exception for market makers. Specifically, the Final Rule states that FTDs that result from “certain” bona fide market making must be closed out by the “third settlement day after settlement date” (SEC, 2009a, p. 14). The purpose of this exception is to ensure market liquidity by allowing market makers “to facilitate customer orders in a fast-moving market” (SEC, 2009a, p. 37).

The temporary market making close-out exception to Rule 204 may explain the rise in ETF FTDs. In addition, Rule 204(a)(3) “permits a borrow as well as a purchase to close out a fail to deliver position” (SEC, 2009a, p. 39). This provision is important because a significant and growing segment of ETF trading concerns so-called “borrow-to-create” and “create-to-lend” transactions. The former characterizes transactions where market makers or APs borrow and bundle shares of ETF component stocks to obtain one creation unit (Welter, 2010). The latter concerns transactions where ETF market makers create ETF shares for securities lending purposes (Shastry, 2011). I discuss concerns about ETF FTDs in the next section.

2.8 ETF Settlement Failures

While common stock FTDs fell sharply after 2008, ETF FTDs rose. According to the SEC OEA, ETFs are now a "significant portion" of the SEC Regulation SHO Threshold List, (OEA, 2011). According to data from 2011, "ETF fails account for approximately 60 percent of the nearly $2 billion of daily equity trading fails reported to the SEC, and on some days they account for 90 percent of all exchange traded fails" (Bradley et al., 2011, p. 6).

ETF settlement failures were a concern when Regulation SHO was drafted in 2004. At the time, regulators "observed high levels of fails in some ETFs" (SEC, 2004). SRO representatives from the NASDAQ and AMEX argued, however, that ETF FTDs were not problematic "[b]ecause ETF shares can be continuously created and redeemed in-kind, open clearing positions can be closed-out through the creation of ETFs and the delivery of securities to the clearing corporation" (NASDAQ, 2004). Similarly, the AMEX commented that ETF market makers should be exempt from locate and close-out requirement to guarantee sufficient market liquidity (AMEX, 2004).

The SEC rejected both arguments and declined to exempt ETFs from the Regulation SHO locate requirements (SEC, 2004). Nevertheless, neither Regulation SHO nor Rule 204T has reduced ETF FTDs. In 2012, it was reported that the SEC was conducting an ongoing investigation into "failed trades and ETFs." The regulatory focus on naked short selling and FTDs in ETFs has prompted responses from industry experts. Nadig (2011) argues that ETFs dominate the Regulation SHO Threshold List because of a "timing mismatch." That is, market makers have an extra three days past settlement date to close-out FTDs, and they take advantage of this "extra time" (Nadig, 2011, p. 9). This suggests that ETF FTDs are potentially an opportunistic yet benign response to close-out exceptions.

Similarly, Morningstar, an ETF index licensor, suggests that “The ETF creation/redemption mechanism, along with the very high velocity of many ETFs' share bases, explains why settlement failures are more frequent in ETF shares than in common equities” (Johnson, 2011). Morningstar also argues that the process of creating new ETF shares to satisfy a settlement obligation may take as long as trade date plus 4 or 5 days. They suggest that ETF FTDs are ultimately resolved, but not in time to accommodate the T+3 settlement cycle. This explanation, however, does not address why ETF FTD levels may be high and persistent.

Amery (2011) contends that ETF market makers have incentives to delay settlement. First, it may be cheaper to borrow or create ETF shares via an AP rather than buy them on the open market to cover a short sale. Second, time differences between ETF rebate rates and financing rates may create arbitrage opportunities for market makers who delay settlement. A 2011 report for the Kauffman Foundation argues that ETF FTDs create systemic risk by creating “a cumulative and potentially compounding liquidity risk” (Bradley et al., 2011).

> Every fail introduces a cumulative and potentially compounding liquidity risk into the orderly process of settling the $7.5 trillion of security transactions completed each day, which could be especially dangerous during times when financial institutions are short of liquidity (Bradley et al., 2011, p. 2).

A report by Goldman Sachs speaks to the mechanism by which this liquidity contraction could occur. Boroujerdi et al. (2012) explain that ETFs may trade more than shares outstanding because short sellers borrow and re-lend shares through “chained lending.” While the Goldman Report argues that chained lending does not create systemic risk because ETF shares can be bought, borrowed, or created at any time to unwind short position, “the overall liquidity and availability of an ETF in the lending process will be directly impacted by that of the underlying securities” (Boroujerdi, 2012, p. 14).

Similarly, the Goldman Report argues that ETF FTDs are predominantly a result of heavy trading volumes coupled with AP share creation and redemption delays that last longer than the settlement cycle. Nevertheless, the authors recognize "the potential for economic loss … if one [is] not able to lend out shares given settlement postponements" (Boroujerdi, 2012, p. 15). This suggests that ETF FTDs may create stock borrow constraints that exacerbate market movements.

Bogan et al. (2012) provide evidence that ETF short selling more than shares outstanding creates systemic risk. "As short interest builds in the ETF shares themselves, the underlying index equities held by the ETF operator become a fraction of the implied ownership of the ETF in the market—the rest is promised back by borrowers (short sellers through their prime brokers). [Thus] the market value of the total ownership of the ETF far outstrips the underlying assets held in index stocks by the ETF operator" (Bogan et al., 2012, p. 79). The author argues that ETF values relative to component assets could be driven to zero during a liquidity crisis such as May 6, 2010 "Flash Crash." Further, Bogan et al. (2012) hypothesize that unusually high ETF short interest and settlement failures are signs of potential market instability.

There is also evidence that ETF trading played a key role in the May 2010 Flash Crash. Seventy percent of the equity trades broken by the SROs for price drops more than 60% were in ETFs (CFTC and SEC, 2010a, p. 5). The final report by regulators notes the "disproportionate impact the market disruption of May 6 had on ETFs" (CFTC and SEC, 2010b, p. 6). Additional research on ETFs and liquidity crises are in Borkovec et al. (2010), Madhavan (2012), and Cespa and Foucault (2012). Ben-David et al. (2018) find that "find that stocks with higher ETF ownership display significantly higher volatility." Evans et. al. (2024) present evidence that ETF FTDs reflect "operational shorting" by market makers driven by the need to provide liquidity.

2.9 Recent Academic Literature on FTDs

The literature on naked short selling has grown since the advent of the Regulation SHO Threshold List in 2005 as well as the public release of FTD data in 2007. Angel and McCabe (2009, p. 246) argue that "so-called 'naked' short selling involves an abuse of the flexibility in the system for the settlement of stock trades." Putniņš (2010, p. 13) concludes that "US clearing and settlement system does not provide any significant disincentives for naked short selling." Stokes (2009) explores legal and regulatory remedies for firms that claim to be victims of naked short selling and settlement failures. Using pre-Regulation SHO data, Evans et al. (2009) demonstrate that market makers choose to fail when stock borrow costs are high.

Edwards and Hanley (2010) study short selling and FTDs during initial public offerings (IPOs). The authors find no evidence that naked short selling causes FTDs or that short sellers earn abnormal returns during IPOs. Stratmann and Welborn (2013) provide evidence that market makers took advantage of an options market making exception to the short sale locate and close-out provisions of SEC Regulation SHO. This led to higher FTDs in optionable stocks relative to non-optionable stocks.

A related literature looks at the relationship between the stock lending market and prices. Asquith et al. (2005) find that stocks that are short sale-constrained tend to exhibit abnormal negative returns. Avellaneda and Lipkin (2009) develop a theoretical model to demonstrate how stock borrow constraints, such as low equity float or high borrow costs, lead to overpricing and volatility. Branson (2010) argues that high short sale demand, coupled with weak securities lending regulation, has led to an opaque stock lending market that does not adequately restrict manipulative naked short selling. Dive et al. (2011) explore the growing importance of securities lending as a revenue source for major banks.

Boulton and Braga-Alves (2012) argue that naked short selling does not cause abnormal negative returns because stocks that appear on the Regulation SHO Threshold List tend to be overpriced. Lecce et al. (2012), however, reach the opposite conclusion using data from the Australian Stock Exchange (ASX). The latter authors take advantage of a unique feature the ASX whereby certain stocks may be sold short without borrowing on certain dates. They find that naked short selling leads to higher abnormal negative returns, higher volatility, and lower liquidity in stocks with higher borrowing costs.

Stratmann and Welborn (2013) use a difference-in-differences analysis to examine the effects of eliminating the options market maker exception to Regulation SHO. The authors find that "eliminating the Exception led to fewer fails-to-deliver and higher stock borrow rates for optionable stocks as compared to non-optionable stocks. Further, removing the Exception reduced fails-to-deliver for optionable stocks when the price of borrowing stock was high."

Fotak et. al. (2014) examine settlement failures in NYSE stocks for the period from 2005 to 2008. They find that "greater FTDs lead to higher liquidity and pricing efficiency." Fotak et. al. (2014) also "do not find any evidence that FTDs caused price distortions or the failure of financial firms during the 2008 financial crisis."

Stratmann and Welborn (2016) examine how high FTDs affect abnormal returns. The authors demonstrate that "stocks with fails-to-deliver (FTDs) experience negative abnormal returns that are proportional to their FTD levels." Stratmann and Welborn (2016) also find that "short sellers of low and high FTD stocks obtain positive estimated profits" and "FTDs reflect nonbinding short sale constraints which do not restrict informed short selling." The authors show that FTDs are highly correlated with short selling, but are able to conclude whether high FTDs *cause* abnormal returns

3. Data

We have only two metrics by which to evaluate the efficacy of Reg SHO. These are (1) daily Reg SHO Threshold Lists, and (2) daily data on fails-to-deliver (FTDs) from the SEC Freedom of Information Act (FOIA) Office. In this section, I consider how these two panel data series have evolved from when Reg SHO was enacted in 2005.

The goal of this investigation is to generate meaningful aggregate statistics on Reg SHO Threshold firms. To conduct an analysis of securities over 20 years, I use two databases from Wharton Research Data Services (WRDS). The first dataset, from the Center for Research on Security Prices (CRSP), is best for historical tickers that may no longer be active. The second dataset, Compustat, is best for current active tickers and recent data. While there is overlap between the two datasets, this is also real divergence in their coverage of the 15k+ SHO tickers.

15,190 unique tickers have appeared on Reg SHO Threshold Lists since January 3, 2005. Of those, 14,771 have unique CUSIPs, as some companies have multiple tickers on the Threshold List. Are related challenge is that some tickers are recycled among different companies, and many tickers are dead or dormant. The biggest methodological challenge is that Reg SHO did not require the major listing exchanges to include CUSIP data in their daily threshold lists.

Of the 15,190 unique Threshold tickers, 4,658 are not covered in any WRDS database, such as CRSP or Compustat. This incomplete coverage frustrates analysis and reflects a policy error created by omitting CUSIPs in Reg SHO reporting. Moreover, only 5,301 Threshold SHO tickers appear in both the CRSP and Compustat databases. Within the CRSP data, we have coverage on 2,105 Threshold tickers that are not in Compustat. Within the Compustat data, we have coverage on 3,773 tickers that are not in CRSP. A “match” is created when we match a ticker and a date to a specific Reg SHO Threshold List for a given day.

3.1 Regulation SHO Data

Figure 1 presents the historical daily Reg SHO totals, broken down by listing exchange. The exchanges which currently publish daily Reg SHO Threshold List data are the New York Stock Exchange (NYSE), the Nasdaq Stock Market, FINRA OTC, and BATS Exchange (CBOE-BZX). Due to consolidation in exchange ownership, the Chicago Stock Exchange (CHX) data is now part of the NYSE Reg SHO Threshold data.

For the period from January 2005, when Reg SHO was enacted, through Q4 2008, when the options market maker exception to Reg SHO was eliminated, mean daily Threshold List totals were 282 stocks, with a standard deviation of 83 stocks. The highest total number of Reg SHO stocks was 514 on April 1, 2008. During this time, Nasdaq stocks averaged 80% of total Threshold Securities.

For the period from 2009 through 2019, average daily total threshold stocks dropped to 95, with a standard deviation of 26. NYSE stocks were half of daily totals on average, and Nasdaq stocks were 1/3. In October 2014, securities who failed to meet new Nasdaq listing requirements shifted to the FINRA “Over the counter” (OTC) market. Thereafter, an average of 15% of daily threshold securities were from FINRA OTC listings.

For the period from 2020 through 2024, average daily threshold securities were 75, with a max of 215 and standard deviation of 25. NYSE securities were 30% of the daily average and Nasdaq were 33%. In Q2 2023, Nasdaq securities again began to dominate threshold totals. As of the end of 2024, Nasdaq securities were roughly 60% of daily threshold totals. Securities listed on BATS Global Markets, which is owned by the Chicago Board Options Exchange (CBOE), averaged 10% of threshold stocks during this recent period. There was also a new local high of 96 total threshold securities on 26 December 2024.

Figure 2 breaks down the daily threshold list totals by security type. For the period from 2005 through 2008, common stocks averaged 145, or 50% of daily threshold totals, with a high of 7% and a standard deviation of 8%. Unknown category securities are averaged 102, or 37% of daily totals from this period. As discussed above, these stock tickers are reported in daily files with names but without CUSIPs. As a result, we are unable to recover classifying data for these Threshold securities from either the CRSP or Compustat databases.

For the period from 2009 through 2019, ETFs were over half of daily threshold securities, with a daily average of 50 ETFs. In contrast, known common stocks fell to 22% of average daily totals, or 20 securities. ADRs and Unknown securities tied for the 3rd largest category with 12% each of daily threshold totals.

For the period from 2020 to 2024, ETFs declined from 51% to 40% of average daily totals. At the same time, common stocks rose to 31% of the daily average, ADRs rose to 15%, and Unknown securities fell to 10%. Other security types, including mutual funds, preferred shares, structured products, common stock plus warrant units, and warrants alone were at or under 1%. Notably, ETFs and total threshold securities peaked at 135 and 215, respectively, on March 27, 2020, at the height of market concerns regarding the Covid-19 Pandemic.

Tables 4 through 7 present lists of securities with the longest tenure on Reg SHO Threshold Lists. Tables 4 present threshold summary data for the all-time top common stocks such as Overstock.com (OSTK; 921 total days), Krispy Kreme Doughnuts (KKD; 645 total days), Netflix.com (NFLX; 641 total days), and Chipotle Mexican Grill (CMG; 544 total days). Table 5 lists common stocks with a 2024 threshold date, such as Sunpower Corp (SPWR; 547 days), Beyond Meat Inc (BYND; 382 days); Nikola Corp. (NKLA; 138 days), and Bakkt Holdings (BKKT; 123 days).

Tables 6 and 7 list ETFs with the largest Reg SHO Threshold Totals. The ETF with the longest total days on the list is XRT, the S&P 100 Retail ETF, with 1,691 total threshold days. XRT was on the threshold list as recently as 27 December 2024. FTDs in XRT have been as high as $418 million dollars. XRT is notable for frequently having short interest greater than shares outstanding, which is a mystery that we explore in greater depth below.

Many of the ETFs with long Reg SHO Threshold listings are leveraged, such as the Direxion Daily Gold Miners Bear 2x Shares, (DUST; 1627 days), the Direxion Daily 30-Year Treasury Bull 3X (TMF; 1583 days), Direxion Energy Bear 3X Shares (ERY; 1464 days), and the ProShares Ultra VIX Short-Term Futures ETF (UVXY; 1297 days). Of those ETFs that were on the threshold list in 2024, the regional banking ETF KRE saw FTDs peak at $274 million.

Figure 3 shows the breakdown of Reg SHO Threshold securities by type. Common stocks are the largest group with 39.70% of the total. ETFs are in second place with 20%. Unknown securities, which are mostly from the 2005-2008 period, are 8.5%. ADRs are 8.5%.

Figure 4 breaks down the total Threshold days for the period from 2005 to 2024 by security type. Surprisingly, unknown securities account for almost 65%, or 2/3, of all Reg SHO Threshold days. This may reflect the fact that many of these tickers are temporary and related to corporate actions. Nevertheless, it is striking that almost 2/3 of the Threshold database contains ticker symbols and names that are not stored in CRSP or Compustat. Common stocks are the next largest category at under 20%. One reason this may be “low” is that a relatively small set of tickers end up on the Threshold List. ETFs are in third place with 10.4% of total threshold days.

Figure 5 is a histogram that shows the distribution of total Reg SHO Threshold days. Unsurprisingly, this is a long-tailed distribution with a median of 4 days, a mode of 1 day, and a max of 1,546 days. This reflects the fact that most stocks drop off the list after 1 day.

3.2 Fail-to-deliver Data

Figures 6 and 7 show the daily total dollar value of FTD for the period from 2007 through 2024. These data are from the SEC Freedom of Information Act (FOIA) office and are reported on a bi-monthly basis, with a two-week lag. I generated these totals using the daily price and fail quantity data provided by the SEC, per ticker (and/or cusip) per day. I did not use any WRDS data, such as CRSP or Compustat to determine these totals, which is why the data set begins in April 2007, which is when the SEC started to report price data with daily FTDs.

Figure 6 presents the daily dollar value of FTDs for the full period. The average for this period is $2.9 billion USD. The figure shows clearly the “drop” in daily FTDs after the October 2008 amendments to Reg SHO. The highest FTD level was $20.3 billion on 23 September 2008. Notably, the second highest FTD level was $19.8 billion on 23 September 2024. Median FTDs were $2.26 billion for this period.

Figure 7 truncates the data from Figure 6 to just consider the last five years of data, from 2019 to 2024. Interestingly, the average daily FTDs for this period were $2.8billion, which is just under the full sample average of $2.9 billion. Moreover, median FTDs were higher at $2.44 billion. One noteworthy “trend” in the data are spikes that tend to coincide with quarterly options expiration dates. For example, in 2021, FTDs appear to peak on 23 March, 21 June, and 21 September, which are each 1-2 settlement days after options expiration dates. This suggests that there may be a connection between settlement failures and options trading, at least temporarily.

Figures 8 and 9 show daily FTDs (USD) by security type for Threshold stocks only. For the period from 2005 through 2008, common stocks averaged 80% of daily FTDs. From 2009 to 2019, however, ETFs were 75% of average of daily FTDs. For the final period, from 2009 through 2019, common stocks and ETFs were 41% and 44.5% of FTDs, respectively.

Table 8 lists the securities according to their maximum value of FTDs, in descending order. It is notable that 5 of the top 10 securities on this list are major Index ETFs. The largest maximum FTDs were in IWM, the Russell 2000 Index ETF, with $10.99 billion on 27 June 2007. The next highest FTDs were in SPY, the S&P 500 ETF, with $7.5 billion on 16 March 2023. Next are Microsoft and Nvidia, which each had an FTD peak on 23 September 2024 of over $3 billion dollars each. This is a remarkable coincidence and merits further investigation.

Table 9 is a sample list of securities that have experienced a short interest of 90% or more at some point during the period from 2004 through 2024. The daily short interest data are highly proprietary data from FIS Securities. I paired these data with the Compustat daily data, which reflect daily changes in shares outstanding. As we have already established, the Compustat data do not provide good coverage of inactive or dead tickers, or at least not as good as CRSP. But the CRSP data do not update shares outstanding daily, so they are of limited use for daily insights.

Again, XRT is at the top of the list with 699 days over 90% shares short. Curiously, the maximum loan percentage is 699%, which indicates that there are days where short interest is almost 7x shares outstanding. Again, this is a shocking statistic, and merits further investigation. Also on this list are Ameriprise Financial (AMP), Barclay's S&P 500 ETF (VXX), Peleton Interactive Inc (PTON), and Pre-Paid Legal Services (PPD).

We look more carefully at XRT in Figures 10 and 11. Figure 10 shows FTDs versus the loan percentages for XRT for the period from 2007 to present. Figure swaps FTDs for price. Figure 10 shows a strong correlation between FTDs and loan percentage, which is consistent with the logic that short selling and settlement failures are related. Figure 10 indicates that some spikes in XRT FTDs correspond to price drops, such as in September 2020 and in September 2022.

4. Policy Proposals

The data in the previous section indicates that Reg SHO has been ineffective at reducing the size and persistence of trade settlement failures. I therefore consider three proposals for reforming Reg SHO to reduce large and persistent fail-to-deliver (FTD) positions. First, I discuss monetary penalties for failing to deliver securities. Second, I consider the logistics and implications of a mandatory pre-borrow requirement for all short sales. Finally, I explore options for reasonable restrictions on market maker exceptions to timely settlement rules.

4.1 Monetary Penalties for failing to deliver

In the original 2003 draft of Regulation SHO, the SEC proposed imposing monetary Penalties for failing to deliver. SEC (2003) contains the following language, (emphasis added):

> "In addition, the rule would require the rules of the registered clearing agency that processed the transaction to include the following provisions: (A) A broker or dealer failing to deliver such securities shall be referred to the NASD and the designated examining authority for such broker-dealer for appropriate action;[55] and (B) The registered clearing agency shall withhold a benefit of any mark-to-market amounts or payments that otherwise would be made to the party failing to deliver,[56] and take other appropriate action, *including assessing appropriate charges against the party failing to deliver*. Both of these requirements should assist the Commission in preventing abuses and promote the prompt and accurate clearance and settlement of securities transactions.

In total, the SEC received 462 comment letters on proposed Regulation SHO, including from 1 academic, 10 associations and organizations, 10 attorneys and law firms, 13 Broker-Dealers, 7 companies, 1 national securities clearing agency, 14 national securities exchange & markets, and over 400 individuals. Due to the overwhelming response to proposed Regulation SHO, in July 2004, after the commend period had closed, the SEC released a summary of the comments received.

Most commenters opposed naked short selling and settlement failures of any kind. Moreover, “About half of the commenters focusing on the delivery portion of Rule 203 requested the Commission impose harsher penalties for failures to deliver” (SEC, 2004). Nevertheless, industry leaders opposed monetary penalties for failing to deliver. A group letter from officials Citigroup, Goldman Sachs, Merrill Lynch and Morgan Stanley recommended “that the Commission proceed with imposing a mandatory buy-in for failures, while eliminating the 90-day suspension and penalties associated with securities with a significant number of delivery failure” (SEC, 2004a).

Ultimately, the SEC followed the advice of industry officials and ignored the support of retail investors. The final rule of Reg SHO made no mention of “charges” or “penalties” for failing to deliver. In so doing, the SEC may have followed the guidance of the Securities Industry Assocation (SIA, now known as SIFMA), which argued that, “[b]ecause of NSCC’s continuous net settlement system nets all buys and sells within a particular firm, the broker-dealer cannot determine which customer’s transaction gave rise to the fail” (SEC, 2004a).

Nevertheless, subsequent major enforcement actions the American Stock Exchange, FINRA, and the SEC have demonstrated that this claim was false. In numerous cases, including Amex (2007), SEC (2009), SEC (2011), SEC (2012), and others, securities regulators had no difficulty connecting specific trade settlement failures with specific unlawful actors, notwithstanding the challenges presented by the net settlement system.

While the SEC was debating whether to impose penalties for failing to deliver equity securities, the U.S. Treasury was engaging the same debate and analysis over U.S. Treasury fails. In 2005, the NY Federal Reserve Bank published a report entitled “Explaining Settlement Fails.” This report examined the size, causes, and consequences of UST fails for the 1990-2004 period.

The authors of this study document a growing but volatile record of settlement failures in UST. “The evidence suggests that most episodes of elevated settlement fails are related to market participants’ incentive to avoid failing. Fails have tended to be high in the weeks before and during the Treasury Department’s quarterly refundings and in the weeks that include the end of a calendar quarter, when security borrowing costs tend to be high” (NY Fed, 2005).

The problem of UST settlement fails became acute in 2008, in connection with the failure of Lehman Brothers and other market disruptions. One analysis noted that “the Treasury market experienced an extraordinary volume of fails that threatened to erode the perception of the market as being free of credit risk” (NY Fed, 2010). In response, the Treasury Market Practices Group (TPMG) met to discuss solutions to the US fails problem. In 2009, TMPG introduced a “dynamic fails charge” to incentivize timely settlement of Treasury securities and reduce fails. “The fails charge thus preserves a significant economic incentive for timely settlement even when interest rates are close to zero” (NY Fed, 2010).

The TMPG fails charge policy was later updated in 2016 and 2018 and reflects grave concerns about fails-to-deliver in connection with orderly markets. A 2020 TMPG FAQ notes:

> “Persistent elevated fail levels create market inefficiencies, increase credit risk for market participants and heighten overall systemic risk. In higher rate environments, the time value of money that is lost when delivery is not made as contracted provides an incentive to sellers to deliver bonds as agreed. Given that this incentive is smaller in low short-term rate environments, sellers are less sensitive to the timeliness of delivery. The TMPG recommends a financial charge to provide an incentive to sellers to deliver securities in a timely fashion or cure fails that do occur thereby minimizing overall fail levels.” (NY Fed, 2020)

Nevertheless, UST fails are still not zero, and TMPG may need to update their fails considering new from 2024 which indicate that US fails have risen to a new record high (FA Mag, 2024). The UST experience underscores the need for monetary penalties for failing to deliver stocks.

4.2 Universal pre borrow requirement

As discussed above, the July 15, 2008 SEC Emergency Order required traders to borrow securities prior to effecting short sales in the stocks of the 17 primary dealers and the 2 Government-sponsored enterprises (GSE), Fannie Mae and Freddie Mac. The SEC said,

> "False rumors can lead to a loss of confidence in our markets. Such loss of confidence can lead to panic selling, which may be further exacerbated by "naked" short selling. As a result, the prices of securities may artificially and unnecessarily decline well below the price level that would have resulted from the normal price discovery process. If significant financial institutions are involved, this chain of events can threaten disruption of our markets" (SEC 2008a)

The SEC Order referred to market volatility related to the sale of The Bear Stearns Companies Inc in March 2008 as inspiration for the order. Notably, in response to industry pressure, the SEC later exempted market makers from the pre-borrow requirement.

> The borrow and arrangement-to-borrow requirement of the Order does not apply to certain bona fide market makers. (The settlement date delivery requirement of the Order applies to these market makers.) The purpose of this accommodation is to permit market makers to facilitate customer orders in a fast-moving market without possible delays associated with complying with the borrow and arrangement-to-borrow requirement of the Order. (SEC 2008a2)

Nevertheless, the OEA (2009) report documents a clear reduction in naked short selling and FTDs in the affected securities. Below are the key findings of the OEA (2009) report:

- Large and statistically significant decreases in short selling volume
- Dramatic, but temporary, initial increases in stock lending rates followed by rates still higher than before the Order
- Large and significant decreases in fails to deliver
- Little change in short interest
- No significant changes in bid-ask spread or market depth
- No significant migration of trading volume to London for cross-listed securities
- No significant changes in option trading volume or open interest
- No significant changes in volume

The implication is that a short sale pre-borrow requirement would not impact market quality.

4.3 Elimination of all market making exceptions

While the options market maker exception was eliminated in 2008, Reg SHO still offers certain locate and delivery flexibility for registered market makers. Specifically, market makers engaged in short selling can rely on the "locate" requirement differently when they are executing transactions as part of normal market-making activities, such as hedging or filling customer orders. Market makers are also allowed to sell short without a locate when the short sale is made to hedge their inventory positions and is part of bona fide market-making activity. This justification for this is that market makers can manage risk and provide market liquidity.

For market makers, Rule 204 amended Reg SHO in the following ways. First, Rule 204 instituted mandatory close-out requirements for situations where there are persistent fails to deliver. If a security has a fail to deliver for a certain period (usually no more than 13 consecutive settlement days), then the market maker (or any entity failing to deliver) must close out that position. This was a shift from Rule 203, where there were no such explicit closure requirements for ongoing fails.

Second, Rule 204 established a time frame for when close-out actions need to occur. This timeline required market makers and others to be more diligent in managing their short positions and ensuring they can deliver securities in a timely fashion. Previously, there were no definitive timelines set for resolving FTDs.

Third, while the locate requirement continued to exist in some form, Rule 204 clarified and expanded the expectations placed upon market makers regarding the need to have a reasonable belief that securities can be borrowed when executing short sales. For market makers, this required adopting more systematic procedures to ensure compliance and trades could not be executed on an "as-available" basis without proper locates.

Fourth, Rule 204 brought explicit attention to threshold securities. If a security is designated as a threshold security, then additional obligations apply to market makers, including close-out requirements after certain fails. Arguably, this provision was novel in creating a heightened level of scrutiny on specific stocks.

Finally, while Rule 204 required compliance from all market participants, it nevertheless recognized the unique role of market makers, allowing some exceptions for bona fide market-making activities. This recognition meant that while they had to comply with regulations, they also retained some operational flexibility to perform their essential function in the marketplace without facing undue restrictions.

Whatever the justification for continued market making exceptions to Reg SHO, the data presented above show that the current rule regime is inadequate to prevent large and persistent FTDs. Furthermore, after Rule 204 was added to Reg SHO in 2009, the overall trend in FTDs has been upward and with higher highs. As previously observed, the second highest total FTD day was on 23 September 2024 with $19.8 billion.

Perhaps not coincidentally, the largest Reg SHO fines and most noteworthy SEC enforcement actions have involved securities firms engaged in executing and clearing short sales. Indeed, market makers and industry professionals who commented on the original 2003 Reg SHO proposal were among the most vocal proponents of the market making exceptions to locate and close-out provisions. Many of those Reg SHO commenters were later sanctioned by the SEC for engaging in fraudulent or violative activities, including Bernard and Peter Madoff (2003), Scott Arenstein (2003), UBS Securities (2003), Goldman Sachs & Co. (2004), Morgan Stanley & Co (2004), and Citigroup Global Markets (2004).

5. Conclusion

This analysis shows how Reg SHO, despite years of consideration and amendments, has provided an ineffective framework for governing short selling and trade settlement. Data from the NSCC CNS system show that daily FTDs average are consistently $3b dollars. Moreover, as established in the academic literature, FTDs are highly correlated with shorts selling and are not the result of random clerical errors. Regulation SHO Threshold List data from the self-regulatory organizations (SROs) show that the number of stocks with large and persistent FTDs has not decreased. FTDs are concentrated in ETFs like XRT, for reasons poorly understood.

I propose a series of remedies to reduce FTDs and improve market integrity. The first proposal involves universal penalties and/or charges for firms that fail to deliver securities for any reason. I base this recommendation on best practices in the market for U.S. Treasury securities, where fails charges have been in place since 2008. The SEC knew that penalties for failing to deliver securities were the appropriate remedy when Reg SHO was proposed in 2003, and the SEC has an opportunity now to implement the original proposal.

Second, I propose a universal pre borrow requirement for all shorts by all market participants. This recommendation is based on the SEC's own 2008 emergency order in the securities of the primary dealers, which the SEC Office of Economic Analysis found reduced naked short selling and FTDs without reducing market quality or trading volumes. The related finding, that a pre-borrow requirement raised borrow costs, is a logical finding when compared to a rules regime where short sellers benefitted from "fuzzy" borrowing requirements.

Third, I propose to eliminate all market making exceptions to short sale rules. While perhaps well intended, market making exceptions appear to be the reason why dozens of stocks remain on the threshold list for weeks and months. At age twenty, the SEC has an important opportunity to fix Reg SHO and eliminate large and persistent FTDs once and for all.

References

112th Congress. 2012. *Securities Exchange Act of 1934 [as amended through P.L. 112-158].*

73rd Congress. 1934. *Securities Exchange Act of 1934 (Chapter 404).*

94th Congress. 1975. *Securities Acts Amendments of 1975, Public Law 94-29.*

Agapova, A. 2011. "Conventional Mutual Index Funds Versus Exchange-Traded Funds." *Journal of Financial Markets* 14: 232–343. https://doi.org/10.1016/j.finmar.2011.02.002 .

Aggarwal, R. 2012. "The Growth of Global ETFs and Regulatory Challenges." *Georgetown McDonough School of Business Research Paper No. 2012-04.* https://doi.org/10.2139/ssrn.2022530 .

Aitken, M. J., Frino, A., McCorry, M. S., and Swan, P. L. 1998. "Short Sales Are Almost Instantaneously Bad News: Evidence from the Australian Stock Exchange." *Journal of Finance* 53: 2205–2223. https://doi.org/10.2307/117083 .

American Stock Exchange. 2004. "Comments of Michael J. Ryan, Jr. Re: File No. S7-23-03 (Short Sales; Proposed Rule)." http://www.sec.gov/rules/proposed/s72303/amex022004.htm .

American Stock Exchange. 2007a. "In the Matter of Scott H. Arenstein and SBA Trading LLC, Case No. 07-71 [AMXC07013]." http://www.amex.com/atamex/regulation/discipline/2007/SArensteinSBA_Decision_072007.pdf .

American Stock Exchange. 2007b. "In the Matter of Brian A. Arenstein and ALA Trading LLC, Case No. 07-174 [AMXC07015]." http://www.amex.com/atamex/regulation/discipline/2007/BArensteinALA_Decision_072007.pdf .

American Stock Exchange. 2007c. "American Stock Exchange Announces Two Disciplinary Actions for Violations of Regulation SHO Short Sale Rules." http://www.prnewswire.com/news-releases/american-stock-exchange-announces-two-disciplinary-actions-for-violations-of-regulation-sho-short-sale-rules-52788882.html .

Amery, P. 2011. "Delayed ETF Settlements—What's the Problem?" *Index Universe.* http://www.indexuniverse.com/sections/features/9403-delayed-etf-settlements-whats-the-problem.html?showall=&fullart=1&start=2 .

Angel, J. J., Christophe, S. E., and Ferri, M. G. 2003. "A Close Look at Short Selling on Nasdaq." *Financial Analysts Journal* 59: 66–74. https://doi.org/10.2469/faj.v59.n5.2727 .

Angel, J. J. 2008. "The Commission Should Address the Enormous Settlement Failures in the ETF Market." *Comment Letter to the SEC.* Release Nos. 33-8901; IC-28193; File No. S7-07-08. www.sec.gov/comments/s7-07-08/s70708-6.pdf .

Angel, J. J., and McCabe, D. M. 2009. "The Business Ethics of Short Selling and Naked Short Selling." *Journal of Business Ethics* 85: 239–249. https://doi.org/10.1007/s10551-008-9772-0 .

Angrist, J., and Prischke, J.-S. 2009. *Mostly Harmless Econometrics: An Empiricist's Companion.* Princeton University Press.

Arenstein, Scott. 2004. "Comment Letter on Regulation SHO, File No. S7-23-03." March 26, 2004. SBA Trading, LLC and LTA Trading, LLC. Available at: https://www.sec.gov/files/rules/proposed/s72303/sarenstein03262004.txt .

Asquith, P., Pathak, P. A., and Ritter, J. R. 2005. "Short Interest, Institutional Ownership, and Stock Returns." *Journal of Financial Economics* 78: 243–276. https://doi.org/10.1016/j.jfineco.2004.06.001 .

Autore, D., Boulton, T., and Braga-Alves, M. 2011. "Failures to Deliver, Short Sale Constraints, and Stock Overvaluation." *SSRN Scholarly Paper No. ID 1572356.* Social Science Research Network. https://doi.org/10.2139/ssrn.1572356 .

Avellaneda, M., and Lipkin, M. 2009. "A Dynamic Model for Hard-to-Borrow Stocks." http://ssrn.com/abstract=1357069 .

Battalio, R., and Schultz, P. 2011. "Regulatory Uncertainty and Market Liquidity: The 2008 Short Sale Ban's Impact on Equity Option Markets." *Journal of Finance* 66: 1540–1626. https://doi.org/10.1111/j.1540-6261.2011.01684.x .

Beber, A., and Pagano, M. 2013. "Short-Selling Bans Around the World: Evidence from the 2007-09 Crisis." *Journal of Finance* 68: 343–381. https://doi.org/10.1111/j.1540-6261.2012.01716.x .

Ben-David, Itzhak, Francesco Franzoni, and Rabih Moussaawi. 2018. "Do ETFs Increase Volatility?" *Journal of Finance* 73(6): 2471–2535. https://doi.org/10.1111/jofi.12727 .

Benn, A. 2002. *The Unseen Wall Street of 1969-1975: And Its Significance for Today.* Praeger.

Birdthistle, W. A. 2008. "The Fortunes and Foibles of Exchange-Traded Funds: A Positive Market Response to the Problems of Mutual Funds." *Delaware Journal of Corporate Law* 33: 69–109. https://www.lawjournalpress.com/jersey/articles/Delaware_Journal_Corporate_Law33.pdf .

Boehme, R. D., Danielsen, B. R., and Sorescu, S. M. 2006. "Short-Sale Constraints, Differences of Opinion, and Overvaluation." *Journal of Financial & Quantitative Analysis* 41: 455–487. https://doi.org/10.2139/ssrn.671879 .

Boehmer, E., Jones, C. M., and Zhang, X. 2008. "Which Shorts Are Informed?" *Journal of Finance* 63: 491–527. https://doi.org/10.1111/j.1540-6261.2008.01328.x .

Boehmer, E., Huszar, Z. R., and Jordan, B. D. 2010. "The Good News in Short Interest." *Journal of Financial Economics* 96: 80–97. https://doi.org/10.1016/j.jfineco.2010.02.003 .

Boehmer, E., Jones, C. M., and Zhang, X. 2013. "Shackling Short Sellers: The 2008 Shorting Ban." *Review of Financial Studies* 26: 1363–1400. https://doi.org/10.1093/rfs/hhs127 .

Boehmer, E., and Wu, J. 2013. "Short Selling and the Price Discovery Process." *Review of Financial Studies* 26: 287–322. https://doi.org/10.1093/rfs/hhs120 .

Bogan, A. A., Connor, B., and Bogan, E. C. 2010. "Can an ETF Collapse?" *Bogan Associates.* http://boganassociates.com/whitepapers.html .

Bogan, A. A., Connor, B., Bogan, T. R., and Bogan, E. C. 2012. "Asymmetries in Short Selling of Exchange-Traded Funds and the Potential for Systemic Risk." *Journal of Index Investing* 2: 74–83. https://doi.org/10.3905/jii.2012.2.2.074 .

Boni, L. 2006. "Strategic Delivery Failures in U.S. Equity Markets." *Journal of Financial Markets* 9: 1–26. https://doi.org/10.1016/j.finmar.2005.06.001 .

Borkovec, M., Domowitz, I., Serbin, V., and Yegerman, H. 2010. "Liquidity and Price Discovery in Exchange-Traded Funds: One of Several Possible Lessons from the Flash Crash." *Journal of Index Investing* 1(2): 24–42. https://doi.org/10.3905/jii.2010.1.2.024 .

Boroujerdi, R. D., Chanin, M., Mehta, D., and Shaffner, A. 2012. "ETFs for the Single Stock Manager: Correlations, Myths & Realities." *Goldman Sachs Equity Research.*

Boulton, T. J., and Braga-Alves, V. 2010. "The Skinny on the 2008 Naked Short-Sale Restrictions." *Journal of Financial Markets* 13: 397–421. https://doi.org/10.1016/j.finmar.2010.07.002 .

Boulton, T. J., and Braga-Alves, V. 2012. "Naked Short Selling and Market Returns." *Journal of Portfolio Management* 8: 133–142. https://doi.org/10.3905/jpm.2012.38.3.133 .

Bradley, H., Fawls, R., Litan, R. E., and Sommers, F. 2011. "Canaries in the Coal Mine: How the Rise in Settlement 'Fails' Creates Systemic Risk for Financial Firms and Investors." Kauffman Foundation. http://www.kauffman.org/research-and-policy/Canaries-in-the-Coal-Mine.aspx .

Branson, D. M. 2010. "More Muscle Behind Regulation SHO? Short Selling and the Regulation of Stock Borrow Programs." *Virginia Law & Business Review* 5: 1–32.

Brooks, J. 1969. *Once in Golconda: A True Drama of Wall Street 1920-1938.* Harper.

Brown, S. J., and Warner, J. B. 1980. "Measuring Security Price Performance." *Journal of Financial Economics* 8: 205–258. https://doi.org/10.1016/0304-405X(80)90029-9 .

Brown, S. J., and Warner, J. B. 1985. "Using Daily Stock Returns: The Case of Event Studies." *Journal of Financial Economics* 14: 3–31. https://doi.org/10.1016/0304-405X(85)90042-3 .

Budge, H. H. 1969. "Remarks of Hamer H. Budge, Chairman, Securities and Exchange Commission." *Investment Bankers Association of America.* Boca Raton, Florida.

Cameron, A. C., Gelbach, J. B., and Miller, D. L. 2011. "Robust Inference with Multi-way Clustering." *Journal of Business and Economic Statistics* 29: 238–249. https://doi.org/10.1198/jbes.2010.07136 .

Campbell, J. Y., Lo, A. W., and MacKinlay, A. C. 1996. *The Econometrics of Financial Markets.* Princeton University Press.

Carhart, M. M. 1997. "On Persistence in Mutual Fund Performance." *Journal of Finance* 52: 57–82. https://doi.org/10.1111/j.1540-6261.1997.tb03808.x .

Cespa, G., and Foucault, T. 2012. "Illiquidity Contagion and Liquidity Crashes." SSRN. http://ssrn.com/abstract=1804351 .

CFTC & SEC. 2010a. "Preliminary Findings Regarding the Market Events of May 6, 2010." Report of the Staffs of the CFTC and SEC to the Joint Advisory Committee on Emerging Regulatory Issues. http://www.cftc.gov/ucm/groups/public/@otherif/documents/ifdocs/opa-jointreport-sec-051810.pdf .

CFTC & SEC. 2010b. "Findings Regarding the Market Events of May 6, 2010." Report of the Staffs of the CFTC and SEC to the Joint Advisory Committee on Emerging Regulatory Issues. http://www.sec.gov/news/studies/2010/marketevents-report.pdf .

Chang, E. C., Cheng, J. W., and Yu, Y. 2007. "Short-Sales Constraints and Price Discovery: Evidence from the Hong Kong Market." *Journal of Finance* 62: 2097–2121. https://doi.org/10.1111/j.1540-6261.2007.01254.x .

Chicago Board Options Exchange. 2007. "Regulatory Circular RG07-87, 'Short Sales, Regulation SHO Requirement to Close-Out Short Positions in Threshold Securities.'" https://www.cboe.org/publish/RegCir/RG07-087.pdf .

Christophe, S. E., Ferri, M. G., and Angel, J. J. 2004. "Short-Selling Prior to Earnings Announcements." *Journal of Finance* 59: 1845–1875. https://doi.org/10.1111/j.1540-6261.2004.00685.x .

Christophe, S. E., Ferri, M. G., and Angel, J. J. 2007. "Should Owners of Nasdaq Stocks Fear Short-Selling?" *Journal of Portfolio Management* 33: 122–131. https://doi.org/10.3905/jpm.2007.694682 .

Christophe, S. E., Ferri, M. G., and Hsieh, J. 2010. "Informed Trading Before Analyst Downgrades: Evidence from Short Sellers." *Journal of Financial Economics* 95(1): 85–106. https://doi.org/10.1016/j.jfineco.2009.04.002 .

Code of Federal Regulations. 2023. *Definition of 'Short Sale' and Marking Requirements, Vol. 17, Sec. 242.200.* U.S. Government Publishing Office. https://www.ecfr.gov/current/title-17/chapter-II/part-242/section-242.200 .

Code of Federal Regulations. 2023. *Circuit Breaker, Vol. 17, Sec. 242.201.* U.S. Government Publishing Office. https://www.ecfr.gov/current/title-17/chapter-II/part-242/section-242.201 .

Code of Federal Regulations. 2023. *Borrowing and Delivery Requirements, Vol. 17, Sec. 242.203.* U.S. Government Publishing Office. https://www.ecfr.gov/current/title-17/chapter-II/part-242/section-242.203 .

Code of Federal Regulations. 2023. *Close-out Requirement, Vol. 17, Sec. 242.204.* U.S. Government Publishing Office. https://www.ecfr.gov/current/title-17/chapter-II/part-242/section-242.204 .

Cohen, L., Diether, K. B., and Malloy, C. J. 2007. "Supply and Demand Shifts in the Shorting Market." *Journal of Finance* 62: 2061–2096. https://doi.org/10.1111/j.1540-6261.2007.01257.x .

Columbia Law Review. 1969. "The Back Office Problem and the Antitrust Laws." *Columbia Law Review* 69: 299–308. https://doi.org/10.2307/1121638 .

Culp, C. L., and Heaton, J. B. 2008. "The Economics of Naked Short Selling." *Regulation* 31: 46–51.

Danielsen, B. R., and Sorescu, S. M. 2001. "Why Do Option Introductions Depress Stock Prices? A Study of Diminishing Short Sale Constraints." *Journal of Financial and Quantitative Analysis* 36: 451–484. https://doi.org/10.2307/2676183 .

D'Avolio, G. 2002. "The Market for Borrowing Stock." *Journal of Financial Economics* 66: 271–306. https://doi.org/10.1016/S0304-405X(02)00108-X .

Depository Trust and Clearing Corporation. 2006. "DTCC Clarification on Fails to Deliver (Media Statement)."

Depository Trust and Clearing Corporation. 2012. "Strengthening the U.S. Financial Markets: A Proposal to Fully Dematerialize Physical Securities, Eliminating the Costs and Risks They Incur (White Paper)."

Desai, H., Ramesh, K., Thiagarajan, S. R., and Balachandran, B. V. 2002. "An Investigation of the Informational Role of Short Interest in the Nasdaq Market." *Journal of Finance* 57: 2263–2287. https://doi.org/10.1111/1540-6261.00597 .

Devos, E., McInish, T., McKenzie, M., and Upson, J. 2010. "Naked Short Selling and the Market Impact of Failures-to-Deliver: Evidence from the Trading of Real Estate Investment Trusts." *SSRN Scholarly Paper No. ID 1592446.* Social Science Research Network. https://doi.org/10.2139/ssrn.1592446 .

Diamond, D. W., and Verrecchia, R. E. 1987. "Constraints on Short-Selling and Asset Price Adjustment to Private Information." *Journal of Financial Economics* 18: 277–311. https://doi.org/10.1016/0304-405X(87)90052-5 .

Diether, K. B., Lee, K.-H., and Werner, I. M. 2009. "Short-Sale Strategies and Return Predictability." *Review of Financial Studies* 22: 575–607. https://doi.org/10.1093/rfs/hhn043 .

Dive, M., Hodge, R., and Jones, C. 2011. "Developments in the Global Securities Lending Market." *Bank of England Quarterly Bulletin Q3* : 224–233.

Donald, D. C. 2007. "The Rise and Effects of the Indirect Holding System: How Corporate America Ceded Its Shareholders to Intermediaries." *Working Paper Series No. 68.* Institute for Law and Finance.

Duffie, D., Garleanu, N., and Pedersen, L. H. 2002. "Securities Lending, Shorting, and Pricing." *Journal of Financial Economics* 66: 307–339. https://doi.org/10.1016/S0304-405X(02)00121-5 .

Edwards, A. K., and Hanley, K. W. 2010. "Short Selling in Initial Public Offerings." *Journal of Financial Economics* 98: 21–39. https://doi.org/10.1016/j.jfineco.2010.05.001 .

Elton, E. J., Gruber, M. J., Comer, G., and Li, K. 2002. "Spiders: Where Are the Bugs?" *Journal of Business* 75: 453–472.

Engle, R., and Sarkar, D. 2002. "Pricing Exchange Traded Funds." NYU Working Paper No. S-DRP-02-11. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1296379 .

Engle, R., and Sarkar, D. 2006. "Premium-Discounts and Exchange Traded Funds." *The Journal of Derivatives* 13: 27–45. https://doi.org/10.3905/jod.2006.648882 .

Evans, R. B., Geczy, C. C., Reed, A. V., and Musto, D. K. 2009. "Failure is an Option: Impediments to Short Selling and Option Prices." *Review of Financial Studies* 22: 1955–1980. https://doi.org/10.1093/rfs/hhn052 .

Evans, Richard B., Rabih Moussawi, Michael S. Pagano, and John Sedunov. 2024. "Operational Shorting and ETF Liquidity Provision." Darden Business School Working Paper No. 2961954, 2019 Academic Research Colloquium for Financial Planning and Related Disciplines. Available at SSRN: https://ssrn.com/abstract=2961954 or http://dx.doi.org/10.2139/ssrn.2961954 . Last revised August 4, 2022.

Fama, E. F., and French, K. R. 1993. "Common Risk Factors in the Returns on Stocks and Bonds." *Journal of Financial Economics* 33: 3–56. https://doi.org/10.1016/0304-405X(93)90023-5 .

Federal Register. 2003. "Short Sales." 68 Fed. Reg. 63066 (Nov. 6, 2003). https://www.federalregister.gov/documents/2003/11/06/03-27660/short-sales .

Ferri, R. A. 2009. *The ETF Book.* Hoboken, NJ: John Wiley & Sons.

Figlewski, S. 1981. "The Informational Effects of Restrictions on Short Sales: Some Empirical Evidence." *Journal of Financial & Quantitative Analysis* 16: 463–476. https://doi.org/10.2307/2330735 .

Figlewski, S., and Webb, G. P. 1993. "Options, Short Sales, and Market Completeness." *Journal of Finance* 48: 761–777. https://doi.org/10.1111/j.1540-6261.1993.tb04789.x .

Finadium. 2007. "Vodia Group Publishes Impact of Reg SHO Options Market Maker Exception on Options Liquidity." www.finadium.com/pdfs/RegShoOptions.pdf .

Financial Advisor Magazine. 2024. "Failed Trades in 20 Year Treasurys Have Soared to a Record." https://www.fa-mag.com/news/failed-trades-in-20-year-treasurys-have-soared-to-a-record-79806.html .

Finnerty, J. D. 2005. "Short Selling, Death Spiral Convertibles, and the Profitability of Stock Manipulation." *Working Paper, Fordham University.*

FINRA. 2012. "Clearview Correspondent Services, LLC. Disciplinary and Other FINRA Actions." http://www.finra.org/web/groups/industry/@ip/@enf/@da/documents/disciplinaryactions/p151416.pdf .

Fleming, M. J., and Garbade, K. D. 2002. "When the Back Office Moved to the Front Burner: Settlement Fails in the Treasury Market After 9/11." *Federal Reserve Bank of New York Economic Policy Review* 8: 35–57.

Fletcher, D. U. 1934. *Stock Exchange Practices (Report No. 1455).* Committee on Banking and Currency, 73rd Congress, Session II.

Flynn, J. T. 1934. *Security Speculation: Its Economic Effects (First Edition).* Harcourt Brace.

Fotak, Veljko, Vikas Raman, and Pradeep K. Yadav. 2014. "Fails-to-Deliver, Short Selling, and Market Quality." Journal of Financial Economics 114(3): 493-516. https://doi.org/10.1016/j.jfineco.2014.07.012 .

Foucault, T., Sraer, D., and Thesmar, D. J. 2011. "Individual Investors and Volatility." *The Journal of Finance* 66: 1369–1406. https://doi.org/10.1111/j.1540-6261.2011.01674.x .

Gastineau, G. L. 2001. "Exchange-Traded Funds: An Introduction." *Journal of Portfolio Management* 27: 88–96. https://doi.org/10.3905/jpm.27.3.88 .

Gastineau, G. L. 2002. "Equity Index Funds Have Lost Their Way." *Journal of Portfolio Management* 28: 55–64. https://doi.org/10.3905/jpm.28.4.55 .

Gastineau, G. L. 2004. "The Benchmark Index ETF Performance Problem." *Journal of Portfolio Management* 12: 96–103. https://doi.org/10.3905/jpm.2004.12.4.96 .

Geczy, C. C., Musto, D. K., and Reed, A. V. 2002. "Stocks Are Special Too: An Analysis of the Equity Lending Market." *Journal of Financial Economics* 66: 241–269. https://doi.org/10.1016/S0304-405X(02)00120-3 .

Goldfarb, Z. A. 2011. "S&P Downgrades U.S. Credit Rating for First Time." *Washington Post.* http://www.washingtonpost.com/business/economy/sandp-considering-first-downgrade .

Guedj, I., and Huang, J. 2009. "Are ETFs Replacing Index Mutual Funds?" *AFA 2009 San Francisco Meetings Paper.* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1108728 .

Harper, J. T., Madura, J., and Schnusenberg, O. 2006. "Performance Comparison Between Exchange-Traded Funds and Closed-End Country Funds." *Journal of International Financial Markets, Institutions & Money* 14: 104–122. https://doi.org/10.1016/j.intfin.2005.03.001 .

Harris, L., Namvar, E., and Phillips, B. 2009. "Price Inflation and Wealth Transfer During the 2008 SEC Short-Sale Ban." *Working Paper, University of Southern California.*

International Securities Exchange. 2011. *Final Disciplinary Actions as of December 31, 2011.* http://www.ise.com/assets/files/legal/2011_Disciplinary_Sanctions.pdf .

Johnson, B. 2011. "ETF Settlement Delays Not a Cause for Alarm." *Morningstar.* http://seekingalpha.com/article/258197-etf-settlement-delays-not-a-cause-for-alarm .

Jones, C. M., and Lamont, O. A. 2002. "Short Sale Constraints and Stock Returns." *Journal of Financial Economics* 66: 207–239. https://doi.org/10.1016/S0304-405X(02)00114-X .

Jones, C. M. 2012. "Shorting Restrictions: Revisiting the 1930s." *Financial Review* 47: 1–35. https://doi.org/10.1111/j.1540-6288.2012.00338.x .

Kaufman, T. 2009. "Kaufman Turns up Heat on SEC to Curb Abusive Short Sales." https://kaufman.senate.gov/press/press_releases/release/?id=ca3242db-4ec7-4966-ad09-a302d139019f .

Kolasinski, A. C., Reed, A., and Thornock, J. R. 2013a. "Can Short Restrictions Actually Increase Informed Short Selling?" *Financial Management* 42: 155–181. https://doi.org/10.1111/fima.12007 .

Kolasinski, A. C., Reed, A. V., and Ringgenberg, M. C. 2013b. "A Multiple Lender Approach to Understanding Supply and Search in the Equity Lending Market." *Journal of Finance* 68: 559–595. https://doi.org/10.1111/j.1540-6261.2013.01806.x .

Kostovetsky, L. 2003. "Index Mutual Funds and Exchange-Traded Funds." *Journal of Portfolio Management* 26: 80–92. https://doi.org/10.3905/jpm.2003.319330 .

Lakonishok, J., Lee, I., Pearson, N. D., and Poteshman, A. M. 2007. "Option Market Activity." *Review of Financial Studies* 20: 813–857. https://doi.org/10.1093/rfs/hhm020 .

Lamont, O. A., and Thaler, R. H. 2003. "Can the Market Add and Subtract? Mispricing in Tech Stock Carve-Outs." *Journal of Political Economy* 111: 227–268. https://doi.org/10.1086/367924 .

Lamont, O. A., and Stein, J. C. 2004. "Aggregate Short Interest and Market Valuations." *American Economic Review* 94: 29–32. https://doi.org/10.1257/0002828041302121 .

Lecce, S., Lepone, A., McKenzie, M. D., and Segara, R. 2012. "The Impact of Naked Short Selling on the Securities Lending and Equity Market." *Journal of Financial Markets* 15: 81–107. https://doi.org/10.1016/j.finmar.2011.11.002 .

Madhavan, A. 2012. "Exchange-Traded Funds, Market Structure and the Flash Crash." *Blackrock, Inc.* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1932925 .

Madoff, Bernard L. and Madoff, Peter B. 2004. "Comment Letter on Regulation SHO, File No. S7-23-03." January 8, 2004. Bernard L. Madoff Investment Securities. Available at: https://www.sec.gov/files/rules/proposed/s72303/s72303-284.pdf.

Madura, J., and Ngo, T. 2008. "Short Interest in Exchange-Traded Funds." *Financial Market Portfolio Management* 22: 381–402. https://doi.org/10.1007/s11408-008-0093-2 .

Mayhew, S., and Mihov, V. 2004. "How Do Exchanges Select Stocks for Options Listing?" *Journal of Finance* 59: 447–471. https://doi.org/10.1111/j.1540-6261.2004.00623.x .

McCracken, P. W. 1969. "Memorandum for Ken Cole."

Mitchell, M., Pulvino, T., and Stafford, E. 2002. "Limited Arbitrage in Equity Markets." *Journal of Finance* 57: 551–584. https://doi.org/10.1111/1540-6261.00437 .

Nadig, D. 2011. "The Facts About ETF Settlement." *Exchange Traded Funds Report* 123. http://www.indexuniverse.com/docs/magazine/1/2011_182.pdf .

Nagel, S. 2005. "Short Sales, Institutional Investors, and the Cross-Section of Stock Returns." *Journal of Financial Economics* 78: 277–309. https://doi.org/10.1016/j.jfineco.2004.05.005 .

National Association of Securities Dealers, Inc. 1969. "A National System for Reporting, Clearing, and Settling Over-the-Counter Securities Transactions."

National Association of Securities Dealers. 2000. "Hard to Borrow List, NASD Rule 3370, Notice to Members 00-28." http://www.finra.org/web/groups/industry/@ip/@reg/@notice/documents/notices/p004114.pdf .

NASDAQ. 2004. "Comments of Christopher R. Concannon, Re: SEC Release No. 34-48709." http://www.sec.gov/rules/proposed/s72303/cconcannon03252004.htm#P151_30854 .

NASDAQ OMX PHLX. 2011. "Notice, Pursuant to Exchange By-Law 18-2, of Disciplinary Action Against Keystone Trading Partners, Member Organization, and Timothy D. Lobach, Associated Person of Keystone." *FINRA Matter No. 20100229926.* http://www.nasdaqtrader.com/content/marketregulation/phlxreg/2011_4.pdf .

New York Federal Reserve Bank Research. 2005. https://www.newyorkfed.org/medialibrary/media/research/current_issues/ci11-9.pdf .

New York Federal Reserve Bank Research. 2010. https://www.newyorkfed.org/research/epr/10v16n2/exesum_garb.html .

New York Federal Reserve. 2020. https://www.newyorkfed.org/medialibrary/microsites/tmpg/files/TMPG-Fails-Charge-FAQ-10-19-2020.pdf .

New York Stock Exchange. 1997. "Deliveries Against Short Sales, NYSE Rule 440C." http://www.nyse.com/nysenotices/nyse/rule-interpretations/pdf;jsessionid=701EDD54B314976E8CC6A7CBAF6B14FD?number=197 .

NYSE Euronext. 2009. "Steven Moses Hazan and Hazan Capital Management, L.L.C. Settle Enforcement Actions Involving Violations of Regulation SHO Short Sale Rules." http://www.nyse.com/press/1249380496048.html .

NYSE AMEX LLC. 2011. "Labranche Structured Products, Member and Harsh Padia, Trader, Hearing Board Decision 11-Amex-5." http://www.nyse.com/pdfs/11-AMEX-5.pdf .

Office of Economic Analysis. 2008a. "Impact of Recent SHO Amendment on Fails to Deliver." Securities and Exchange Commission. *Memo to File.*

Office of Economic Analysis. 2009. "Impact of Recent SHO Amendment on Fails to Deliver." Securities and Exchange Commission. *Memo to File.*

Office of Economic Analysis. 2011. "Impact of Recent SHO Rule Changes on Fails to Deliver." Securities and Exchange Commission. *Memo to File.*

Owens, H. F. 1968. "The SEC and Some Current Regulatory Problems: Address by Hugh F. Owens, Commissioner, Securities and Exchange Commission." *Connecticut Investment Bankers Association,* Hartford, Connecticut.

Petajisto, A. 2011. "Inefficiencies in the Pricing of Exchange-Traded Funds." *SSRN.* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2000336 .

Pollack, I. M. 1986. "Short-Sale Regulation of NASDAQ Securities." *National Association of Securities Dealers.*

Pontiff, J. 1996. "Costly Arbitrage: Evidence from Closed-End Funds." *Quarterly Journal of Economics* 111: 1135–1151. https://doi.org/10.2307/2946636 .

Poterba, J. M., and Shoven, J. B. 2002. "Exchange-Traded Funds: A New Investment Option for Taxable Investors." *American Economic Review* 92: 422–427. https://doi.org/10.1257/000282802760507711 .

Putniņš, T. J. 2010. "Naked Short Sales and Fails to Deliver: An Overview of Clearing and Settlement Procedures for Stock Trades in the US." *Journal of Securities Operation and Custody* 2: 340–350. https://doi.org/10.2139/ssrn.1532322 .

Reuters. 2012. Jessica Toonkel, Carrick Mollenkamp, and Cezary Podkul. "SEC Widens Probe of Exchange-Traded Funds." *Reuters, February 17, 2012.* http://www.reuters.com/article/2012/02/17/us-sec-probe-etf-idUSTRE81G27020120217 .

Securities and Exchange Commission. 1971. "SEC Order Cites Naftalin and Company." *Securities and Exchange Commission News Digest.*

Securities and Exchange Commission. 1973. "In the Matter of Naftalin & Co., Inc., and Neil T. Naftalin (Administrative Proceeding, File No. 3-3277)."

Securities and Exchange Commission. 1994. "17 CFR Parts 240 and 242, Short Sales; Proposed Rule." http://www.sec.gov/rules/proposed/34-48709.htm .

Securities and Exchange Commission. 1994. "No-Action Letter to Mr. Jeffrey C. Bernsteh, Prime Broker Committee, c/o Bear, Stearns & Co., Inc." Retrieved from https://www.sec.gov/divisions/marketreg/mr-noaction/pbroker012594-out.pdf .

Securities and Exchange Commission. 2003a. "17 CFR Parts 240 and 242, Short Sales; Proposed Rule." http://www.sec.gov/rules/proposed/34-48709.htm .

Securities and Exchange Commission. 2003b. "Interpretive Release, Commission Guidance on Rule 3b-3 and Married Put Transactions." Release No. 34-48795. http://www.sec.gov/rules/interp/34-48795.htm .

SEC. 2004a. "Summary of Comments." https://www.sec.gov/files/rules/extra/s72303comsum.pdf .

Securities and Exchange Commission. 2004b. "17 CFR Parts 240, 241, and 242, Short Sales; Final Rule and Notice." http://www.sec.gov/rules/final/34-50103.pdf .

Securities and Exchange Commission. 2005. "Division of Market Regulation: Key Points About Regulation SHO." http://www.sec.gov/spotlight/keyregshoissues.htm .

Securities and Exchange Commission. 2007a. "Amendments to Regulation SHO, Release No. 34-55520." http://sec.gov/rules/proposed/2007/34-55520.pdf .

Securities and Exchange Commission. 2007b. "Amendments to Regulation SHO, Release No. 34-56213." http://sec.gov/rules/proposed/2007/34-56213.pdf .

Securities and Exchange Commission. 2007c. "In the Matter of Goldman Sachs Execution & Clearing, L.P., f/k/a/ Spear, Leeds & Kellogg, L.P. Administrative Proceeding, File No. 3-12590." http://www.sec.gov/litigation/admin/2007/34-55465.pdf .

SEC. 2007X. "Comments on Amendments to Regulation SHO." http://sec.gov/comments/s7-19-07/s71907.shtml .

Securities and Exchange Commission. 2008a. "Amendments to Regulation SHO, Interim Final Temporary Rule." http://sec.gov/rules/final/2008/34-58773.pdf .

SEC. 2008a2. https://www.sec.gov/files/rules/other/2008/34-58190.pdf .

Securities and Exchange Commission. 2008b. "Amendments to Regulation SHO, Release No. 34-58775." http://www.sec.gov/rules/final/2008/34-58775.pdf .

Securities and Exchange Commission. 2009a. "Amendments to Regulation SHO, Final Rule." http://sec.gov/rules/final/2009/34-60388.pdf .

Securities and Exchange Commission. 2009b. "In the Matter of Hazan Capital Management and Steven M. Hazan. Administrative Proceeding, File No. 3-13570." http://www.sec.gov/litigation/admin/2009/34-60441.pdf .

Securities and Exchange Commission. 2012. "In the Matter of Jeffrey A. Wolfson, Robert A. Wolfson, and Golden Anchor Trading II, LLC (n/k/a/ Barabino Trading, LLC). Administrative Proceeding, File No. 3-14726." http://www.sec.gov/litigation/admin/2012/34-66283.pdf .

Schlusche, B. 2009. "Price Formation in Spot and Futures Markets: Exchange Traded Funds vs Index Futures." *The Journal of Derivatives* 17: 26–40. https://doi.org/10.3905/jod.2009.17.1.026 .

Schussel, G., and May, J. 1969. *Wall Street Automation: A Primer.*

Shastry, K. 2011. "ETFs and Securities Lending." *Securities Lending Times.* http://www.securitieslendingtimes.com/sltimes/SLTimes_issue_16.pdf .

Shin, S., and Soydemir, G. 2010. "Exchange-Traded Funds, Persistence in Tracking Errors and Information Dissemination." *Journal of Multinational Financial Management* 20: 214–234. https://doi.org/10.1016/j.mulfin.2010.06.005 .

SIRRI. 2007. https://www.sec.gov/news/speech/2007/spch061307ers-1.htm .

Stokes, A. B. 2009. "In Pursuit of the Naked Short." *Journal of Law and Business* 5: 1–61.

Stratmann, T., and Welborn, J. W. 2013. "The Options Market Maker Exception to SEC Regulation SHO." *Journal of Financial Markets* 16: 195–226. https://doi.org/10.1016/j.finmar.2013.02.002 .

Sullivan, R. N., and Xiong, J. X. 2012. "How Index Trading Increases Market Vulnerability." *Financial Analysts Journal* 68: 70–84. https://doi.org/10.2469/faj.v68.n4.4 .

Thompson, S. B. 2011. "Simple Formulas for Standard Errors That Cluster by Both Firm and Time." *Journal of Financial Economics* 99: 1–10. https://doi.org/10.1016/j.jfineco.2010.04.001 .

U.S. Court of Appeals, Eighth Circuit. 1972. "In the Matter of Naftalin & Co., Inc., a Minnesota Corporation, Alleged Bankrupt, Appellee-Cross Appellant, v. Merrill Lynch, Pierce, Fenner & Smith, Inc., a Delaware Corporation, et al., Petitioners-Appellants-Cross Appellees." Nos. 71-1634, 71-1672. 469 F.2d 1166 Fed. Sec. L. Rep. P 93,673.

U.S. Court of Appeals, Eighth Circuit. 1979. "Fed. Sec. L. Rep. P 97,130, United States of America, Appellee, v. Neil T. Naftalin, Appellant, 606 F.2d 809, Docket No. 77-1290."

U.S. Supreme Court. 1979. "United States, Petitioner, v. Neil T. Naftalin." 441 U.S. 768, 99 S.Ct. 2077, 60 L.Ed.2d 624, No. 78-561.

Welter, L. 2010. "No Shortage of Share Lending." *Index Universe.* www.indexuniverse.com/publications/journalofindexes/joi-articles/7262-no-shortage-of-share-lending.html .

White, B., and Bouck, J. 1910. *The Book of Daniel Drew: A Glimpse of the Fisk-Gould-Tweed Regime from the Inside.* Doubleday, Page & Co.

Wurgler, J. 2010. "On the Economic Consequences of Index-Linked Investing." *National Bureau of Economic Research Working Paper* 16376. http://www.nber.org/papers/w16376 .

List of Tables and Figures

Table 1

Timeline of Key Short Selling and Regulation SHO Events

#	Month	Year	Event	Code / Title	Link
1	February	1963	NYSE shuts down trading on Feb 6 to tackle backlog of trades		
2	June	1967	NYSE founds Central Certificate Service (CCC)		
3		1973	Creation of Depository Trust Company (DTC)		
4		1975	Securities Act Amendments of 1975		
5		1976	Creation of National Securities Clearing Corporation (NSCC)		
6		1986	NASD "Pollack Report" on short selling		
7	June	1992	"Short Sales"	NYSE Rule 10 / FINRA 3310	
8		1996	"Customer Account Statements: Recommendations and Obligations..."	NYSE Rule 440C	
9	February	1997	"Short Sales and Borrowing"	NASD Rule 2650 / FINRA 4320	https://www.finra.org/rules-guidance/rulebooks/finra-rules/4320
10		1998	Collapse of Long Term Capital Management (LTCM)		
11	March	1999	"Credited and Debited Securities."	NASD Rule 3370	
12	October	2001	Enron Collapse		
13	October	2003	Proposed Rule, Short Sales. (Replaces Rules 3b-3, 10a-1, and 10a-2)	SEC Rules 200, 202T, and 203	https://www.sec.gov/rules-regulations/2004/07/short-sales#34-48709proposed
14	July	2004	SEC Comments on Reg SHO	SEC Rule 242 (formally)	https://www.sec.gov/files/rules/extra/s72303comsum.pdf
15	September	2004	Final Rule, Short Sales	Rule 242 of SEC Act.	https://www.sec.gov/rules-regulations/2004/07/short-sales#34-48709proposed
16	July	2006	Proposed Rule, Amendments to Regulation SHO	Rule 203b3	
17	March	2007	Proposed Rule, Amendments to Regulation SHO	Rule 203b3	https://www.sec.gov/rules-regulations/2007/08/amendments-regulation-sho#34-55520propose
18	August	2007	Elimination of the Grandfather Clause	Rule 203b3	https://www.sec.gov/rules-regulations/2007/08/amendments-regulation-sho#34-56212final
19	July	2008	Proposed Rule; Reopening comment on Amendments to Regulation SH	Rule 203	https://www.sec.gov/rules-regulations/2008/10/amendments-regulation-sho#34-58107propose
20	July	2008	SEC Enhances Investor Protections Against Naked Short Selling	12(k)2 of the 1934 Act	https://www.sec.gov/news/press/2008/2008-143.htm
21	March	2008	“Naked” Short Selling Anti-Fraud Rule	Rule 10b-21	https://www.sec.gov/rules-regulations/rulemaking-activity?search=S7-08-08
22	August	2008	Comments on "Naked" Short Selling Anti-Fraud Rule	Rule 10b-21	https://www.sec.gov/comments/s7-08-08/s70808.shtml
23	October	2008	Elimination of the Options Market Maker Exception	Rules 200 and 203	https://www.sec.gov/rules-regulations/rulemaking-activity?search=S7-19-07
24	October	2008	Final - "Naked" Short Selling Anti-Fraud Rule	Rule 10b-21	https://www.sec.gov/rules-regulations/rulemaking-activity?search=S7-08-08
25	October	2008	Interim final temporary rule; request for comments	Rule 204T	https://www.sec.gov/rules-regulations/2009/07/amendments-regulation-sho#34-58773final
26	July	2009	Rule 204 Finalized	Rule 204	https://www.sec.gov/rules-regulations/2009/07/amendments-regulation-sho#34-60388final
27	August	2009	Short Sale Price Test Restriction	Rule 10a-1	https://www.sec.gov/rules-regulations/rulemaking-activity?search=S7-08-09
28	November	2009	OEA, "Impact of Recent SHO Rule Changes on Fails to Deliver"	Rules 203, 204T	https://www.sec.gov/files/oeamemo110409.pdf

Table 2a

Regulation SHO, Rule 200

Part 242	Name	Description
200	Definition of “short sale” and marking requirements	**Definition of Short Sale :** A short sale is defined as any sale of a security that the seller does not own or a sale that is executed through a borrowed security. **Ownership Conditions :** A person is considered to own a security if they have title to it, have made an unconditional purchase contract, hold convertible or exchangeable securities, have exercised an option to acquire it, have rights or warrants that have been exercised, or hold a futures contract with a notification of physical settlement. **Broker-Dealer Provisions :** Brokers or dealers are deemed to own a security under certain conditions, even if not net long, particularly when acting in specific capacities related to arbitrage or index position unwinding, provided the sale occurs outside of significant index declines. **Marking Requirements :** All sell orders for equity securities must be marked as “long,” “short,” or “short exempt” based on the seller's ownership status and the conditions under which the sale is made. **Exemptions :** The Commission may grant exemptions from these provisions upon written application or on its own motion, which may apply to specific transactions, securities, or groups of persons.

Source: Code of Federal Regulations. 2023. Definition of ‘Short Sale’ and Marking Requirements, vol. 17, sec. 242.200. U.S. Government Publishing Office, https://www.ecfr.gov/current/title-17/chapte

Table 2b

Regulation SHO, Rule 201

Part 242	Name	Description
201	Circuit Breaker	**Circuit Breaker Mechanism** : A trading center must establish policies to prevent the execution of short sale orders of a covered security at prices equal to or below the current national best bid if the security has decreased by 10% or more from its previous closing price. **Enforcement and Monitoring** : Trading centers are required to regularly monitor the effectiveness of their short sale policies and take immediate corrective action when deficiencies are identified. **Short Exempt Orders** : After a 10% price decline notification, brokers can mark short sale orders as "short exempt" if they are at a price above the current national best bid. Brokers must implement procedures to prevent incorrect designation of these orders. **Conditions for Short Exempt Orders** : Specific conditions allow brokers to mark short sale orders as "short exempt," including ownership of the covered security, market maker activities, and compliance with good faith requirements for short selling, particularly in odd lots or in the context of underwriting. **VWAP Transactions and Limits** : Short sales executed at the volume-weighted average price (VWAP) must adhere to specific criteria, including limits on the percentage of a security's average daily trading volume that can be shorted, to prevent market manipulation.

Source: Code of Federal Regulations. 2023. Circuit breaker, vol. 17, sec. 242.201. U.S. Government Publishing Office, https://www.ecfr.gov/current/title-17/chapter-II/part-242.

Table 2c

Regulation SHO, Rule 203

Part 242	Name	Description
203	Borrowing and delivery requirements	**Long Sales Restrictions** : Brokers or dealers may not lend or arrange the loan of any security for delivery if the sale is marked "long" and the broker has reasonable grounds to believe the security will not be delivered on the settlement date. Exceptions exist under certain conditions, including loans to other brokers and specific circumstances involving seller notification. **Short Sale Requirements** : Brokers and dealers cannot accept short sale orders unless they have either borrowed the security or have a reasonable belief that it can be borrowed, along with documentation of this compliance. There are specific exceptions for registered brokers relying on another broker who is compliant. **Fail to Deliver Provisions** : Participants at a registered clearing agency must close out fail to deliver positions for threshold securities within specified time frames (e.g., 13 consecutive settlement days) by purchasing securities equivalent in kind and quantity. **Threshold Security Definition** : A threshold security is defined based on the presence of significant fail to deliver positions and must meet criteria including an aggregate fail position that exceeds 10,000 shares or 0.5% of total shares outstanding over five consecutive settlement days. **Exemptive Authority** : The SEC may grant exemptions to any provisions of this rule for specific transactions, classes of transactions, or persons, either unconditionally or with specified conditions, ensuring it serves the public interest and protects investors.

Source: Code of Federal Regulations. 2023. Borrowing and delivery requirements, vol. 17, sec. 242.203. U.S. Government Publishing Office, https://www.ecfr.gov/current/title-17/chapter-II/part-242.

Table 2d

Regulation SHO, Rule 204

Part 242	Name	Description
204	Close-out requirement	**Close-Out Requirement** : Participants of a registered clearing agency must deliver securities by the settlement date for both long and short sales. If there's a fail to deliver position, they must close it out by borrowing or purchasing equivalent securities by the next trading day. **Specific Close-Out Timelines** : The rule outlines different timelines for closing out fail to deliver positions: (1) By the next trading day for general fail to delivers, (2) By the third trading day for positions arising from long sales, and (3) By the thirty-fifth calendar day for sales where the seller is deemed to own the security but hasn't delivered. **Restrictions on Short Sales** : If a participant has an unresolved fail to deliver position, they and any brokers or dealers dependent on them cannot accept short sale orders unless they first borrow the security or make arrangements to borrow it until the fail to deliver is resolved. **Notification Requirements** : Participants must notify brokers or dealers of any fail to deliver positions they have not closed out, as well as inform them once they successfully close out such positions. **Exemptions and Allocations** : If a portion of a fail to deliver position is allocated to another broker or dealer, that entity must comply with the same close-out requirements. However, if a broker or dealer purchases or borrows the securities in compliance with specific conditions, they may not be subject to some requirements of the rule.

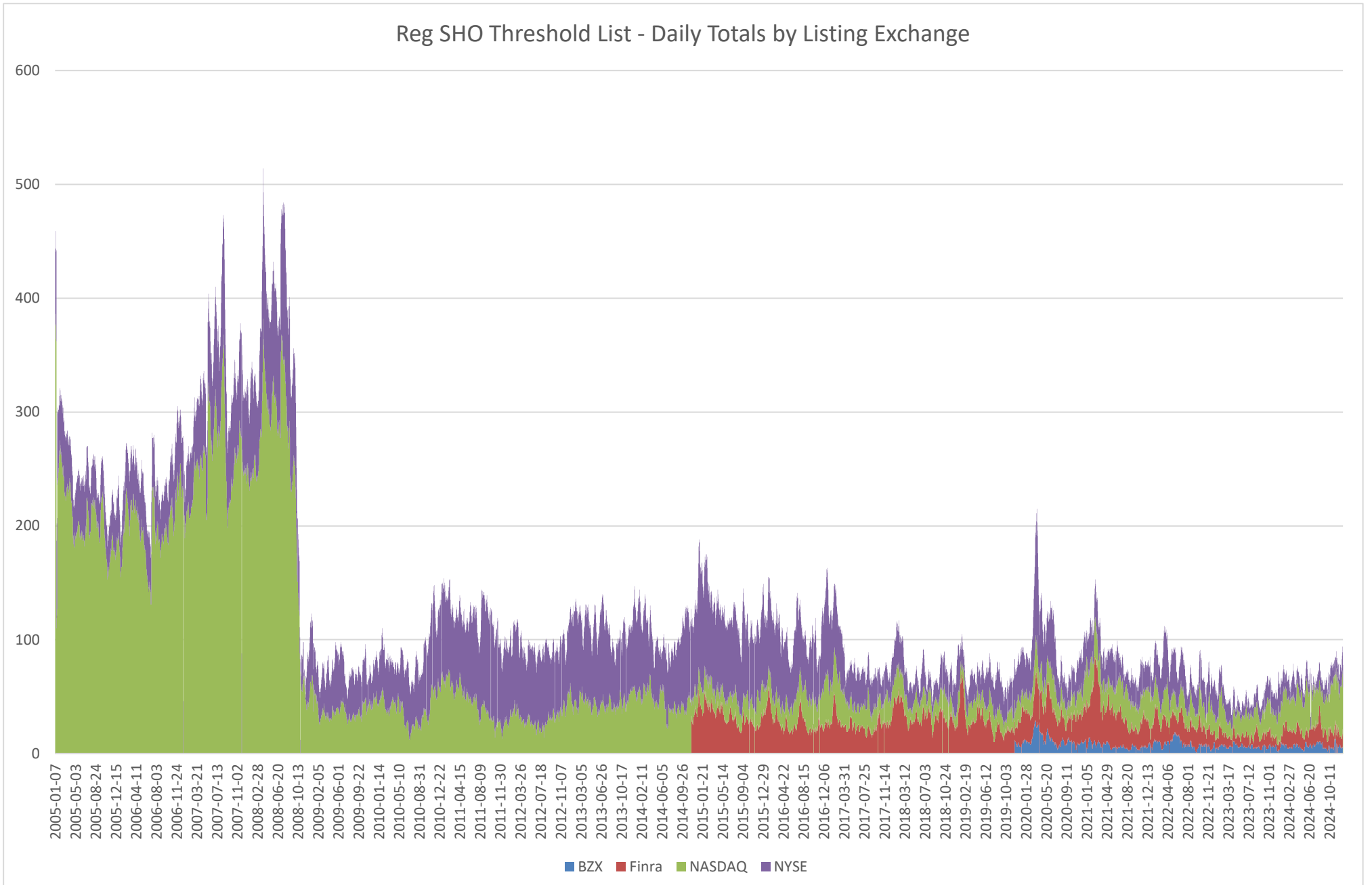
Source: Code of Federal Regulations. 2023. Close-out requirement, vol. 17, sec. 242.204. U.S. Government Publishing Office, https://www.ecfr.gov/current/title-17/chapter-II/part-242.

Table 3

List of Key Reg SHO Enforcement Actions

#	Year	Party	Fine	Link
1	2007	Goldman Sachs	$2 million	https://www.sec.gov/news/press/2007/2007-41.htm
2	2007	Arenstein	$5 million	https://www.thekomisarscoop.com/wp-content/uploads/2021/05/Arenstein-AMEX-Decision_072007.pdf
3	2009	HCM	$4 million	https://www.sec.gov/news/press/2009/2009-179.htm
4	2011	UBS Securities LLC	$ 8 million	https://www.sec.gov/news/press/2011/2011-240.htm
5	2012	Wolfson	$4.5 million	https://www.sec.gov/files/litigation/admin/2012/34-67451.pdf
6	2012	OptionsXpress	$4.8 million	https://www.sec.gov/newsroom/press-releases/2012-2012-66htm, https://www.sec.gov/files/litigation/opinions/2016/33
7	2013	CBOE	$6 million	https://www.sec.gov/newsroom/press-releases/2013-2013-107htm
8	2014	Penson Securities	$125 thousand	https://www.sec.gov/newsroom/press-releases/2014-101, https://www.reuters.com/article/markets/sec-says-ex-penson-c
9	2015	Merrill Lynch	$11 million	https://www.sec.gov/newsroom/press-releases/2015-105
10	2016	Goldman	$15 million	https://www.sec.gov/newsroom/press-releases/2016-9
11	2018	Citigroup Global	$450 thousand	https://www.finra.org/sites/default/files/fda_documents/2014041142501%20Citigroup%20Global%20Markets%20Inc.%2(
12	2020	Biltmore	$125 thousand	https://www.sec.gov/enforcement-litigation/administrative-proceedings/34-88744-s
13	2021	Murchinson	$7 million	https://www.sec.gov/newsroom/press-releases/2021-156, https://www.sec.gov/files/litigation/admin/2021/34-92684.pdf
14	2022	Citigroup Global	$1.5 million	https://www.finra.org/sites/default/files/fda_documents/2018057494001%20Citigroup%20Global%20Markets%20Inc.%2(
15	2022	UBS Securities LLC	$2.5 million	https://www.finra.org/sites/default/files/2022-10/UBS-Securities-AWC-100422.pdf
16	2023	Maxim	$800 thousand	https://www.sec.gov/enforcement-litigation/administrative-proceedings/34-98605-s
17	2023	Simplex Trading	$200 thousand	https://www.sec.gov/enforcement-litigation/administrative-proceedings/34-98346-s
18	2025	Morgan Stanley	$5 million	https://seclaw.com/morgan-stanley-agrees-to-pay-5-million-for-reg-sho-violations-in-prime-brokerage-swaps-business/
19	2025	Robinhood	$45 million	https://www.sec.gov/newsroom/press-releases/2025-5

Figure 1
Reg SHO Threshold List - Daily Totals by Listing Exchange



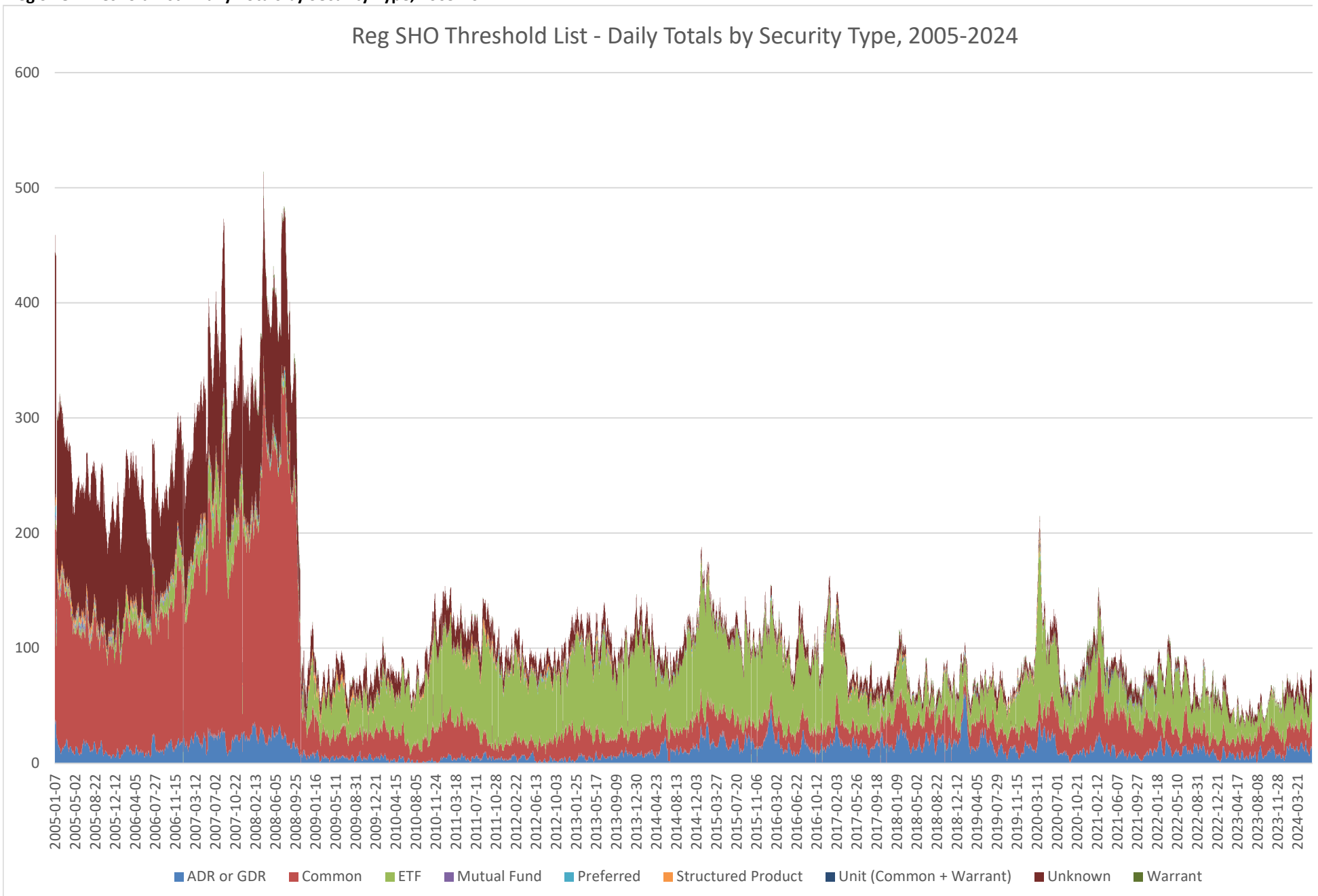
This figure represents daily total threshold securities by listing exchange. Historical Reg SHO threshold list data are currently provided by four major listing exchanges: Nasdaq, NYSE, FINRA OTC, and BATS. Nasdaq files are available at https://www.nasdaqtrader.com/trader.aspx?id=regshothreshold&os=io..&ref=app. NYSE data are avilable at https://www.nyse.com/regulation/threshold-securities. FINRA OTC data are available at https://otce.finra.org/otce/otcThreshold. BATS data are available at https://www.cboe.com/us/equities/market_statistics/reg_sho_threshold/.

Figure 1 Descriptive Statistics

This table contains descriptive statistics for Figure 1. Historical Reg SHO threshold list data are currently provided by four major listing exchanges: Nasdaq, NYSE, FINRA OTC, and BATS. Nasdaq files are available at https://www.nasdaqtrader.com/trader.aspx?id=regshothreshold&os=io..&ref=app. NYSE data are avilable at https://www.nyse.com/regulation/threshold-securities. FINRA OTC data are available at https://otce.finra.org/otce/otcThreshold. BATS data are available at https://www.cboe.com/us/equities/market_statistics/reg_sho_threshold/.

Reg SHO Threshold List % Daily Totals by Exchange						Reg SHO Threshold List Daily Totals by Exchange				
Time Period		Exchange				Exchange				
		BZX	Finra	NASDAQ	NYSE	BZX	Finra	NASDAQ	NYSE	Total
2005-2008	max	0.00%	0.00%	100.00%	100.00%	-	-	386.00	138.00	514.00
	min	0.00%	0.00%	0.00%	0.00%	-	-	-	-	12.00
	avg	0.00%	0.00%	79.65%	20.35%	-	-	224.75	57.28	282.02
	stdev	0.00%	0.00%	7.46%	7.46%	-	-	62.43	24.55	82.53
2009-2019	max	14.86%	71.74%	100.00%	85.57%	12.00	72.00	74.00	116.00	188.00
	min	0.00%	0.00%	0.00%	0.00%	-	-	-	-	12.00
	avg	0.09%	15.55%	33.41%	50.95%	0.07	13.78	31.09	50.37	95.32
	stdev	1.01%	18.23%	14.26%	13.82%	0.79	16.25	14.19	21.61	26.03
2020-2024	max	25.40%	62.22%	80.36%	55.61%	29.00	76.00	58.00	111.00	215.00
	min	0.00%	0.00%	0.00%	0.00%	-	-	-	-	27.00
	avg	10.54%	26.31%	33.10%	30.05%	7.82	20.29	23.17	23.32	74.61
	stdev	4.32%	8.45%	12.40%	9.47%	4.24	11.11	7.94	13.81	25.21

Figure 2
Reg SHO Threshold List - Daily Totals by Security Type, 2005-2024



This figure represents daily total threshold securities by security type. Historical Reg SHO threshold list data are currently provided by four major listing exchanges: Nasdaq, NYSE, FINRA OTC, and BATS. Nasdaq files are available at https://www.nasdaqtrader.com/trader.aspx?id=regshothreshold&os=io..&ref=app. NYSE data are avilable at https://www.nyse.com/regulation/threshold-securities. FINRA OTC data are available at https://otce.finra.org/otce/otcThreshold. BATS data are available at https://www.cboe.com/us/equities/market_statistics/reg_sho_threshold/. Security type are from CRSP and Compustat.

Figure 2 Descriptive Statistics

This table contains descriptive statistics for Figure 2. Historical Reg SHO threshold list data are currently provided by four major listing exchanges: Nasdaq, NYSE, FINRA OTC, and BATS. Nasdaq files are available at https://www.nasdaqtrader.com/trader.aspx?id=regshothreshold&os=io..&ref=app. NYSE data are avilable at https://www.nyse.com/regulation/threshold-securities. FINRA OTC data are available at https://otce.finra.org/otce/otcThreshold. BATS data are available at https://www.cboe.com/us/equities/market_statistics/reg_sho_threshold/. Security type are from CRSP and Compustat.

Time Period		Reg SHO Threshold List - Daily Totals % by Security Type, 2005-2024								
		ADR or GDR	Common	ETF	Mutual Fund	Preferred	Structured Product	Jnit (Common + Warrant	Unknown	Warrant
2005-2008	max	16.92%	75.00%	42.34%	2.90%	3.90%	6.17%	0.26%	78.26%	3.31%
	min	0.00%	2.17%	0.00%	0.00%	0.00%	0.00%	0.00%	15.56%	0.00%
	avg	5.77%	50.09%	5.03%	0.53%	0.48%	1.11%	0.00%	36.85%	0.15%
	stdev	1.95%	8.06%	6.02%	0.50%	0.52%	0.83%	0.02%	7.79%	0.34%
2009-2019	max	63.83%	51.35%	79.66%	2.90%	5.00%	13.43%	5.56%	63.16%	8.62%
	min	0.00%	6.67%	0.00%	0.00%	0.00%	0.00%	0.00%	1.41%	0.00%
	avg	12.23%	22.13%	50.97%	0.22%	0.34%	1.49%	0.10%	12.15%	0.36%
	stdev	9.77%	7.68%	13.59%	0.49%	0.69%	1.66%	0.37%	5.43%	0.83%
2020-2024	max	44.44%	63.27%	69.44%	4.60%	3.45%	3.47%	8.33%	25.00%	12.86%
	min	0.00%	10.92%	2.86%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	avg	15.47%	31.39%	40.44%	0.22%	0.19%	0.24%	0.60%	10.33%	1.12%
	stdev	6.12%	9.00%	10.91%	0.61%	0.53%	0.60%	1.19%	4.90%	1.58%

Time Period		Reg SHO Threshold List - Daily Totals by Security Type, 2005-2024								
		ADR or GDR	Common	ETF	Mutual Fund	Preferred	Structured Product	Jnit (Common + Warrant	Unknown	Warrant
2005-2008	max	38.00	318.00	48.00	7.00	9.00	9.00	1.00	225.00	5.00
	min	-	1.00	-	-	-	-	-	2.00	-
	avg	16.34	145.28	12.30	1.43	1.29	2.85	0.01	102.08	0.44
	stdev	7.34	58.90	9.64	1.27	1.23	1.92	0.10	26.83	0.90
2009-2019	max	63.00	43.00	119.00	3.00	5.00	9.00	2.00	33.00	5.00
	min	-	1.00	-	-	-	-	-	1.00	-
	avg	11.05	20.11	50.66	0.21	0.32	1.33	0.08	11.27	0.29
	stdev	8.64	6.51	22.59	0.48	0.65	1.44	0.27	5.21	0.64
2020-2024	max	37.00	74.00	135.00	4.00	3.00	5.00	7.00	20.00	9.00
	min	-	5.00	1.00	-	-	-	-	-	-
	avg	11.53	22.86	30.90	0.16	0.16	0.23	0.46	7.49	0.81
	stdev	5.87	9.16	16.70	0.47	0.44	0.66	0.91	3.61	1.13

Table 4

Reg SHO Threshold List - Top Common Stocks, 2005-2024

Data represent the U.S. common stocks with the longest duration on the Regulation SHO Threshold List for the period from 2005 through 2024. Market cap data are determined by pairing the ticker symbol and threshold dates from the various listing exchanges with data from the Center for Research on Securities Prices and Compustat. "First Day" represents the first date on a Reg SHO Threshold List. "Last Day" represents the last date on a Reg SHO Threshold List.

#	Ticker	Days	Name	First Day	Last Day	Exchange	CUSIP	Max MktCap (m	Avg MktCap (m	Max FTDs (m)
1	OSTK	921	OVERSTOCK COM INC DEL	1/27/2005	9/23/2019	NASDAQ	690370101	$1,896.74	$518.78	$32.00
2	MDTL	865	MEDIS TECHNOLOGIES LTD	3/29/2005	10/21/2008	NASDAQ	58500P107	$709.88	$361.40	$39.12
3	AVTO	824	AVANTOGEN ONCOLOGY, INC. COMMON STOCK	7/18/2013	10/26/2016	Finra	05350Y100			$0.05
4	PEIX	759	PACIFIC ETHANOL, INC. NEW	1/7/2005	3/2/2012	NASDAQ	69423U206	$663.63	$315.57	$15.15
5	NFI	711	NOVASTAR FINANCIAL, INC.	1/7/2005	1/16/2008	NYSE	669947889	$378.90	$140.55	$100.44
6	TRLG	689	TRUE RELIGION APPAREL INC	8/18/2005	10/21/2008	NASDAQ	89784N104	$758.32	$510.14	$43.83
7	KKD	645	KRISPY KREME DOUGHNUTS, INC.	1/7/2005	2/1/2008	NYSE	501014104	$707.58	$296.75	$11.35
8	NFLX	641	NETFLIX COM INC	1/7/2005	10/6/2008	NASDAQ	64110L106	$2,505.09	$1,691.43	$60.06
9	FFH	614	FAIRFAX FINANCIAL HOLDINGS LIMITED	1/7/2005	10/2/2008	NYSE	303901102	$5,845.23	$4,060.44	$105.77
10	LZB	586	LA-Z-BOY INCORPORATED	11/28/2005	10/21/2008	NYSE	505336107	$611.33	$416.86	$9.88
11	SPWR	584	SUNPOWER CORP COM STK (DE)	12/12/2005	8/14/2024	NASDAQ	867652406	$5,249.11	$2,682.69	$174.89
12	ZOLT	578	ZOLTEK COMPANIES INC	1/7/2005	10/22/2008	NASDAQ	98975W104	$1,540.00	$967.44	$43.43
13	TASR	576	TASER INTERNATIONAL INC	1/7/2005	7/7/2008	NASDAQ	87651B104	$1,186.05	$798.35	$35.17
14	AURC	554	AURUS CORP. COMMON STOCK	12/19/2005	6/7/2011	NASDAQ	05208R109	$6.03	$2.90	$0.36
15	CMG	544	CHIPOTLE MEXICAN GRILL, INC.	2/6/2006	10/30/2008	NYSE	169656105	$2,206.48	$1,381.53	$246.70
16	MSO	538	MARTHA STEWART LIVING OMNIMEDIA, INC.	1/7/2005	10/21/2008	NYSE	573083102	$253.23	$211.73	$4.15
17	AGEN	499	ANTIGENICS INC. (DEL)	1/7/2005	2/4/2010	NASDAQ	037032109	$151.43	$116.34	$5.22
18	SPDC	488	SPEED COMMERCE, INC COM STK	1/7/2005	8/12/2015	NASDAQ	84764T106	$155.68	$54.16	$1.89
19	NAT	487	NORDIC AMERICAN TANKER SHIPPING	1/7/2005	4/28/2009	NYSE	G65773106	$1,406.54	$1,114.03	$23.99
20	MTTCF	475	MEATTECH 3D LTD COMMON SHARES	8/12/2020	6/30/2022	Finra	M6S89X179	$282.92	$90.68	$2.52
21	CDID	472	QUAD ENERGY CORP. COMMON STOCK	1/2/2013	11/13/2014	NASDAQ	74734A204			
22	AGIX	469	ATHEROGENICS INC	1/3/2006	10/13/2008	NASDAQ	047439104	$152.45	$56.58	$39.64
23	BRLC	460	SYNTAX-BRILLIAN CORPORATION	7/22/2005	7/18/2008	NASDAQ	87163L103	$632.73	$312.02	$22.12
24	OSIR	453	OSIRIS THERAPEUTICS INC NEW COMMON STOCK	8/18/2006	4/17/2017	Finra	68827R108	$636.80	$396.67	$11.17
25	DSTI	448	DAYSTAR TECH INC COM STK (DE)	1/7/2005	4/8/2011	NASDAQ	23962Q308	$119.07	$62.75	$2.26
26	RVXCF	444	RESVERLOGIX CORP COMMON STOCK	1/16/2007	7/14/2022	Finra	76128M108	$535.32	$245.31	$2.80
27	AERG	436	APPLIED ENERGETICS, INC	4/1/2005	6/13/2008	NASDAQ	03819M106	$439.06	$261.93	$6.64
28	TGMGF	435	THETA GOLD MINES LTD ORDINARY SHARES AUSTRALIA	9/11/2020	5/10/2023	Finra	Q86618107			$0.22
29	FLIP	433	FTS GROUP INC	1/21/2005	10/7/2008	NASDAQ	30266R106	$3.95	$2.98	$0.07
30	CORS	430	CORUS BANKSHARES INC	5/15/2006	10/23/2008	NASDAQ	220873103	$1,070.94	$579.91	$36.55
31	WCI	424	WCI COMMUNITIES, INC.	8/14/2006	8/4/2008	NYSE	92923C104	$937.70	$314.00	$39.60
32	CTIC	419	CELL THERAPEUTICS INC COM STK	3/15/2005	10/22/2012	NASDAQ	150934883	$243.96	$125.15	$3.37
33	MMNFF	418	MEDMEN ENTERPRISES INC ORDINARY SHARES (CANADA	6/15/2018	4/8/2022	Finra	58507M107	$509.66	$179.68	$14.90
34	USNA	416	USANA HEALTH SCIENCES	5/30/2006	12/12/2017	NYSE	90328M107	$1,763.71	$605.59	$93.12
35	MBVX	412	MABVAX THERAPEUTICS HOLDINGS,	12/22/2006	8/10/2017	NASDAQ	55414P504	$327.35	$119.13	$4.07
36	DNDN	408	DENDREON CORPORATION	3/21/2007	11/6/2013	NASDAQ	24823Q107	$1,941.96	$612.67	$219.41
37	NILE	407	BLUE NILE INC	2/18/2005	8/15/2012	NASDAQ	09578R103	$1,512.47	$773.33	$86.74
38	NTRI	406	NUTRI/SYSTEM INC.	2/21/2007	10/28/2008	NASDAQ	67069D108	$2,498.87	$1,072.57	$159.46
39	MWA	395	MUELLER WATER PRODUCTS, INC.	7/3/2006	10/22/2008	NYSE	624758108	$559.62	$310.97	$43.83
40	CCC	393	CALGON CARBON CORPORATION	8/23/2006	10/21/2008	NYSE	129603106	$905.05	$596.44	$11.32
41	NVEC	393	NVE CORPORATION NEW	1/7/2005	10/2/2008	NASDAQ	629445206	$188.85	$145.15	$2.27
42	HTE	391	HARVEST ENERGY TRUST	8/11/2006	11/25/2008	NYSE	41752X101	$4,224.23	$3,303.28	$8.42
43	NFLD	391	NORTHFIELD LABORATORIES INC	1/7/2005	9/26/2007	NASDAQ	666135108	$146.15	$64.59	$7.12
44	CALM	391	CAL-MAINE FOODS INC	1/7/2005	10/29/2008	NASDAQ	128030202	$1,015.76	$704.28	$145.07
45	WBMD	386	WEBMD HEALTH CORP CL A	11/3/2005	10/8/2008	NASDAQ	94770V102	$488.77	$307.63	$37.55
46	GLBC	383	GLOBAL CROSSING LTD NEW (BERMU	1/7/2005	12/20/2006	NASDAQ	G3921A175			
47	BHS	383	BROOKFIELD HOMES CORPORATION	6/14/2006	10/21/2008	NYSE	112723101	$961.27	$525.68	$11.65
48	ABLE	383	ABLE ENERGY INC	3/10/2005	9/29/2006	NASDAQ	003709102			
49	BYND	382	BEYOND MEAT INC COM (DE)	6/11/2019	7/8/2024	NASDAQ	08862E109	$14,135.81	$3,041.83	$203.17
50	IRBT	381	IROBOT CORPORATION	12/28/2005	10/2/2008	NASDAQ	462726100	$589.61	$409.45	$10.09

Table 5

Reg SHO Threshold List - Top Common Stocks (with 2024 date)

Data represent the U.S. common stocks with the longest duration on the Regulation SHO Threshold List for the period from 2005 through 2024, and which have a threshold date in 2024. Market cap data are determined by pairing the ticker symbol and threshold dates from the various listing exchanges with data from the Center for Research on Securities Prices and Compustat. "First Day" represents the first date on a Reg SHO Threshold List. "Last Day" represents the last date on a Reg SHO Threshold List.

#	Ticker	Days	Name	First Day	Last Day	Exchange	CUSIP	Max MktCap (m)	Avg MktCap (m	Max FTDs (m)
1	SPWR	584	SUNPOWER CORP COM STK (DE)	12/12/2005	8/14/2024	NASDAQ	867652406	$5,249.11	$2,682.69	$174.89
2	BYND	382	BEYOND MEAT INC COM (DE)	6/11/2019	7/8/2024	NASDAQ	08862E109	$14,135.81	$3,041.83	$203.17
3	ASTI	335	ASCENT SOLAR TECHNOLOGIES INC	3/30/2007	8/29/2024	NASDAQ	043635804	$305.91	$106.19	$11.90
4	MULN	324	MULLEN AUTOMOTIVE INC COM PAR	10/23/2017	12/27/2024	NASDAQ	62526P505	$828.78	$121.66	$26.14
5	AFMJF	297	ALPHAMIN RESOURCES CORP CLEAN SHARES (MAURI	10/21/2020	12/2/2024	Finra	V0195Q103	$1,386.33	$770.32	$2.05
6	NVAAF	267	NOVA MINERALS LTD. ORDINARY SHARES	1/4/2022	3/11/2024	Finra	Q69170134			$0.31
7	FFIE	266	FARADAY FUTURE INTELLIGENT ELE	4/14/2021	12/20/2024	NASDAQ	307359885	$1,793.84	$480.71	$36.41
8	ANY	198	SPHERE 3D CORP NEW COM NO PAR	3/21/2016	6/26/2024	NASDAQ	84841L407	$212.27	$27.46	$16.77
9	NUWE	188	NUWELLIS INC COM PAR $0.0001	7/19/2012	12/4/2024	NASDAQ	67113Y603	$71.82	$5.88	$4.19
10	RECAF	187	RECONNAISSANCE ENERGY AFRICA LTD COMMON SH	7/24/2020	7/31/2024	Finra	75624R108	$1,690.65	$642.16	$6.30
11	AYRO	182	AYRO INC COM NEW	4/15/2005	6/17/2024	NASDAQ	054748207	$33.14	$8.95	$7.94
12	FCEL	182	FUELCELL ENERGY INC COM NEW	1/27/2005	12/11/2024	NASDAQ	35952H700	$618.85	$185.53	$11.02
13	DGLY	179	DIGITAL ALLY INC NEW COM NEW	7/21/2014	9/3/2024	NASDAQ	25382T200	$145.70	$40.66	$5.90
14	DJT	179	TRUMP MEDIA & TECHNOLOGY GROUP	12/10/2021	7/9/2024	NASDAQ	25400Q105	$9,610.77	$3,284.23	$118.91
15	WINT	176	WINDTREE THERAPEUTICS INC COM	6/16/2006	9/20/2024	NASDAQ	97382D501	$280.40	$160.68	$8.23
16	CYCC	169	CYCLACEL PHARMACEUTICALS INC C	5/9/2005	6/7/2024	NASDAQ	23254L801	$58.98	$27.75	$4.39
17	BIOL	166	BIOLASE INC COM PAR $.001 NEW	1/7/2005	3/5/2024	NASDAQ	090911702	$83.23	$17.54	$2.81
18	SINT	156	SINTX TECHNOLOGIES INC COM PAR	12/8/2014	6/11/2024	NASDAQ	829392703	$36.82	$11.32	$1.17
19	IVP	156	INSPIRE VETERINARY PARTNERS IN	12/22/2023	12/2/2024	NASDAQ	45784E205	$21.80	$5.16	$2.72
20	USAU	151	U S GOLD CORP COM NEW	10/7/2015	12/3/2024	NASDAQ	90291C201	$89.95	$8.71	$0.79
21	MYMD	146	MYMD PHARMACEUTICALS INC COM N	7/14/2017	4/22/2024	NASDAQ	62856X201	$73.47	$22.98	$0.93
22	WHLR	144	WHEELER REAL ESTATE INVT TR IN	9/5/2013	12/24/2024	NASDAQ	963025846	$25.96	$7.68	$2.39
23	TBLT	143	TOUGHBUILT INDS INC COM PAR $.	3/4/2019	8/7/2024	NASDAQ	89157G868	$62.37	$18.28	$6.87
24	NKLA	138	NIKOLA CORP COM NEW	6/11/2020	12/27/2024	NASDAQ	654110303	$27,089.38	$5,477.91	$279.72
25	IVCTF	138	INVICTUS ENERGY LTD ORDINARY SHARES	8/2/2022	2/7/2024	Finra	Q496BG104			$1.01
26	DBGI	130	DIGITAL BRANDS GROUP INC COM P	6/30/2021	12/4/2024	NASDAQ	25401N408	$65.94	$10.19	$2.97
27	BKYI	129	BIO-KEY INTL INC COM PAR $0.00	1/21/2005	11/12/2024	NASDAQ	09060C507	$4.04	$1.68	$0.44
28	FRGT	127	FREIGHT TECHNOLOGIES INC SHS N	9/15/2021	10/21/2024	NASDAQ	G51413139	$18.26	$4.57	$1.59
29	MSPR	124	MSP RECOVERY INC CL A PAR 0.00	6/2/2022	12/27/2024	NASDAQ	553745308	$165.13	$29.34	$3.12
30	BKKT	123	BAKKT HOLDINGS, INC.	11/2/2021	5/20/2024	NYSE	05759B305	$979.79	$353.83	$132.91
31	YLLXF	121	YELLOW CAKE PLC ORDINARY SHARES	1/19/2023	4/19/2024	Finra	G98334108	$2,114.35	$1,409.81	$1.11
32	JAGX	121	JAGUAR HEALTH INC COM PAR $0.0	5/22/2015	6/24/2024	NASDAQ	47010C805	$65.21	$22.17	$1.10
33	SPCB	118	SUPERCOM LTD NEW ORD SH PAR VA	1/7/2008	9/25/2024	NASDAQ	M87095309	$163.02	$14.52	$1.78
34	SCPX	114	SCORPIUS HOLDINGS, INC.	3/29/2016	8/23/2024	NYSE	42237K508	$59.72	$24.40	$2.16
35	UAVS	112	AGEAGLE AERIAL SYSTEMS, INC.	10/4/2018	12/27/2024	NYSE	00848K309	$390.98	$77.12	$7.05
36	PEGY	109	PINEAPPLE ENERGY INC COM PAR $	10/13/2022	11/7/2024	NASDAQ	72303P404	$49.82	$15.63	$2.83
37	GOVX	109	GEOVAX LABS INC COM PAR $0.001	12/21/2020	8/1/2024	NASDAQ	373678606	$96.50	$29.01	$6.52
38	SYTA	109	SIYATA MOBILE INC COM NO PAR	11/2/2021	6/12/2024	NASDAQ	83013Q707	$21.48	$9.17	$1.34
39	CGC	108	CANOPY GROWTH CORP COM NEW (CA	1/23/2023	7/12/2024	NASDAQ	138035704	$1,553.96	$672.43	$58.57
40	BDRX	108	BIODEXA PHARMACEUTICALS INC SP	3/6/2019	6/4/2024	NASDAQ	59564R708	$8.04	$3.84	$0.98
41	ADTX	107	ADITXT INC COM PAR $0.001 NEW	1/3/2022	12/27/2024	NASDAQ	007025703	$25.93	$6.81	$2.25
42	ATNF	103	180 LIFE SCIENCES CORP COM NEW	12/18/2020	1/30/2024	NASDAQ	68236V203	$365.61	$128.34	$3.66
43	LGMK	102	LOGICMARK INC COM PAR$ NEW 04/	1/28/2016	11/6/2024	NASDAQ	67091J503	$90.33	$27.48	$4.14
44	MTEM	98	MOLECULAR TEMPLATES INC COM NE	2/28/2005	10/30/2024	NASDAQ	608550208	$95.17	$66.18	$4.28
45	CMND	96	CLEARMIND MEDICINE INC COM NEW	4/12/2023	7/24/2024	NASDAQ	185053402	$7.40	$4.15	$0.60
46	ABIO	93	ARCA BIOPHARMA INC COM PAR $.0	6/10/2009	4/17/2024	NASDAQ	00211Y506	$47.42	$21.38	$2.00
47	SMX	92	SMX SEC MATTERS PLC SHS CL A N	3/16/2023	11/26/2024	NASDAQ	G8267K208	$63.00	$8.14	$0.87
48	SLS	92	SELLAS LIFE SCIENCES GROUP INC	4/1/2008	8/6/2024	NASDAQ	81642T209	$311.59	$85.66	$6.89
49	CNSP	91	CNS PHARMACEUTICALS INC. COM C	4/26/2023	11/14/2024	NASDAQ	18978H300	$11.10	$4.88	$0.35
50	VLCN	89	VOLCON INC COM PAR $0.00001 NE	10/26/2021	12/4/2024	NASDAQ	92864V509	$148.64	$15.73	$3.61

Table 6

Reg SHO Threshold List - Top ETFs, 2005-2024

Data represent the U.S. Exchange Traded Funds (ETFs) with the longest duration on the Regulation SHO Threshold List for the period from 2005 through 2024. Market cap data are determined by pairing the ticker symbol and threshold dates from the various listing exchanges with data from the Center for Research on Securities Prices and Compustat. "First Day" represents the first date on a Reg SHO Threshold List. "Last Day" represents the last date on a Reg SHO Threshold List.

#	Ticker	Days	Name	First Day	Last Day	Exchange	CUSIP	Max MktCap (m	Avg MktCap (m	Max FTDs (m
1	XRT	1691	SPDR S&P RETAIL ETF	12/30/2008	12/27/2024	NYSE	78464A714	$1,354.66	$544.97	$481.16
2	DUST	1627	DIREXION DAILY GOLD MINERS INDEX BEAR 2X SHARES	2/2/2011	10/15/2024	NYSE	25460G880	$927.73	$140.27	$45.17
3	TMF	1583	DIREXION DAILY 20+ YEAR TREASURY BULL 3X SHARES (BASED C	12/16/2009	8/18/2022	NYSE	25459W540	$456.39	$98.24	$34.45
4	ERY	1460	DIREXION DAILY ENERGY BEAR 2X SHARES	12/5/2008	8/28/2023	NYSE	25460G179	$176.71	$57.62	$22.15
5	EDZ	1381	DIREXION DAILY EMERGING MARKETS BEAR 3X SHARES	2/12/2009	8/31/2023	NYSE	25460E547	$253.49	$106.92	$29.74
6	UVXY	1294	PROSHARES ULTRA VIX SHORT-TERM FUTURES ETF	11/7/2011	12/26/2024	BZX	74347Y755	$2,547.92	$392.26	$134.11
7	JDST	1245	DIREXION DAILY JUNIOR GOLD MINERS INDEX BEAR 2X SHARES	5/13/2014	12/23/2024	NYSE	25461A577	$509.59	$79.78	$61.64
8	TNA	1223	DIREXION DAILY SMALL CAP BULL 3X SHARES	5/22/2009	12/27/2024	NYSE	25459W847	$2,296.13	$680.43	$154.58
9	SRTY	1216	PROSHARES ULTRAPRO SHORT RUSSELL2000	5/13/2010	4/16/2024	NYSE	74347G390	$207.15	$72.72	$20.67
10	FAZ	1194	DIREXION DAILY FINANCIAL BEAR 3X SHARES	1/12/2009	12/27/2024	NYSE	25460E240	$1,467.92	$611.85	$140.91
11	SOXS	1079	DIREXION DAILY SEMICONDUCTOR BEAR 3X SHARES	9/29/2010	5/16/2024	NYSE	25460G112	$835.22	$82.09	$69.03
12	LABD	1070	DIREXION DAILY S&P BIOTECH BEAR 3X SHARES	9/15/2015	12/27/2024	NYSE	25460G716	$198.48	$76.73	$14.44
13	SCO	1013	PROSHARES ULTRASHORT BLOOMBERG CRUDE OIL	2/24/2009	5/25/2021	NYSE	74347W668	$421.74	$134.65	$90.93
14	ZSL	970	PROSHARES ULTRASHORT SILVER	2/26/2009	10/25/2024	NYSE	74347Y847	$720.32	$94.63	$50.64
15	XOP	940	SPDR S&P OIL & GAS EXPLORATION & PRODUCTION ETF	3/11/2009	3/28/2023	NYSE	78468R556	$3,490.70	$1,080.01	$472.07
16	TZA	914	DIREXION DAILY SMALL CAP BEAR 3X SHARES	12/3/2008	12/27/2024	NYSE	25460E232	$1,134.75	$544.62	$120.71
17	SMH	907	VANECK VECTORS ETF TR SEMICOND	1/17/2012	6/18/2020	NASDAQ	92189F676	$2,271.99	$544.35	$329.77
18	TWM	823	PROSHARES ULTRASHORT RUSSELL2000	11/10/2008	11/20/2024	NYSE	74347G168	$677.97	$236.08	$38.41
19	FAS	815	DIREXION FINANCIAL BULL 3X SHARES	4/23/2009	2/14/2014	NYSE	25459Y694	$3,420.96	$1,532.70	$134.56
20	SQQQ	792	PROSHARES TR ULTRAPRO SHORT QQ	4/6/2010	12/3/2024	NASDAQ	74347G192	$2,158.40	$214.79	$52.65
21	UWM	773	PROSHARES ULTRA RUSSELL2000	10/15/2009	8/3/2020	NYSE	74347R842	$676.95	$213.91	$225.18
22	URTY	767	PROSHARES ULTRAPRO RUSSELL2000	5/13/2010	7/17/2020	NYSE	74347X799	$241.90	$108.38	$21.03
23	FXE	747	INVESCO CURRENCYSHARES EURO CURRENCY TRUST	1/27/2006	5/7/2024	NYSE	46138K103	$974.03	$338.36	$236.83
24	SPXL	732	DIREXION DAILY S&P 500 BULL 3X SHARES	5/6/2009	9/30/2020	NYSE	25459W862	$1,404.86	$306.50	$70.99
25	DRV	695	DIREXION DAILY REAL ESTATE BEAR 3X SHARES	8/5/2009	5/9/2022	NYSE	25460G419	$109.66	$33.45	$10.93
26	DRIP	687	DIREXION DAILY S&P OIL & GAS EXP. & PROD. BEAR 2X SHARES	3/8/2016	8/8/2023	NYSE	25460G328	$1,048.72	$46.59	$37.93
27	DUG	684	PROSHARES ULTRASHORT ENERGY	12/29/2008	4/9/2024	NYSE	74347G358	$564.43	$83.88	$18.06
28	ERX	669	DIREXION DAILY ENERGY BULL 3X SHARES	11/26/2008	3/19/2020	NYSE	25459W888	$633.17	$260.58	$27.86
29	RUSS	669	DIREXION DAILY RUSSIA BEAR 3X SHARES	1/27/2012	3/18/2020	NYSE	25460E828	$76.24	$32.10	$7.97
30	TMV	651	DIREXION DAILY 20+ YEAR TREASURY BEAR 3X SHARES (BASED C	12/22/2009	3/12/2024	NYSE	25460G849	$675.61	$324.77	$222.29
31	TECS	650	DIREXION DAILY TECHNOLOGY BEAR 3X SHARES	5/5/2009	9/5/2024	NYSE	25460G393	$115.43	$34.56	$9.65
32	EDC	647	DIREXION DAILY EMERGING MARKETS BULL 3X SHARES	3/6/2009	7/1/2020	NYSE	25490K281	$887.05	$283.83	$56.13
33	SVXY	624	PROSHARES SHORT VIX SHORT-TERM FUTURES ETF	11/10/2011	10/18/2023	BZX	74347W130	$962.21	$215.73	$45.88
34	VIXY	607	PROSHARES VIX SHORT-TERM FUTURES ETF	4/14/2011	9/4/2024	BZX	74347Y789	$1,219.50	$275.61	$36.25
35	VCSH	591	VANGUARD SHT-TERM CORP BD ETF	12/10/2009	3/19/2014	NASDAQ	92206C409	$80.67	$75.95	$62.03
36	SPXS	589	DIREXION DAILY S&P 500 BEAR 3X SHARES	12/2/2008	11/21/2024	NYSE	25460E265	$794.97	$192.12	$32.71
37	USO	580	UNITED STATES OIL FUND, LP	7/27/2009	9/8/2023	NYSE	91232N207	$2,571.99	$1,409.94	$225.43
38	UCO	567	PROSHARES ULTRA BLOOMBERG CRUDE	11/6/2009	2/27/2020	NYSE	74347W247	$1,164.47	$330.04	$37.75
39	IYR	558	ISHARES DOW JONES US REAL ESTATE INDEX FUND	1/30/2006	2/12/2018	NYSE	464287739	$6,279.06	$3,603.18	$648.99
40	SPXU	529	PROSHARES ULTRAPRO SHORT S&P 500	7/13/2009	5/14/2024	NYSE	74349Y845	$697.57	$407.58	$44.92
41	XME	527	SPDR S&P METALS & MINING ETF	7/29/2009	7/6/2021	NYSE	78464A755	$2,195.60	$668.53	$152.66
42	YANG	521	DIREXION DAILY FTSE CHINA BEAR 3X SHARES	4/7/2010	12/16/2024	NYSE	25461A460	$216.58	$56.46	$22.68
43	IYT	516	ISHARES DOW JONES TRANSPORTATION AVERAGE INDEX FUND	2/6/2006	9/27/2016	NYSE	464287192	$975.04	$539.52	$101.42
44	DRN	508	DIREXION DAILY REAL ESTATE BULL 3X SHARES	9/8/2009	4/28/2020	NYSE	25459W755	$190.28	$111.04	$13.89
45	SKF	490	PROSHARES ULTRASHORT FINANCIALS	10/31/2008	11/3/2021	NYSE	74347G713	$1,735.28	$338.24	$209.81
46	UPRO	489	PROSHARES ULTRAPRO S&P 500	7/13/2009	7/18/2016	NYSE	74347X864	$780.78	$295.38	$42.61
47	TQQQ	477	PROSHARES ULTRAPRO QQQ	2/25/2010	11/21/2016	NASDAQ	74347X831	$1,419.97	$368.95	$38.08
48	EFZ	470	PROSHARES TRUST SHORT MSCI EAFE	2/10/2010	8/22/2024	NYSE	74347R370	$281.20	$107.02	$21.56
49	DOG	466	PROSHARES SHORT DOW30	10/31/2008	5/21/2021	NYSE	74347B235	$467.95	$256.43	$26.50
50	FXY	460	INVESCO CURRENCYSHARES JAPANESE YEN TRUST	4/26/2007	5/19/2023	NYSE	46138W107	$650.45	$216.45	$66.55

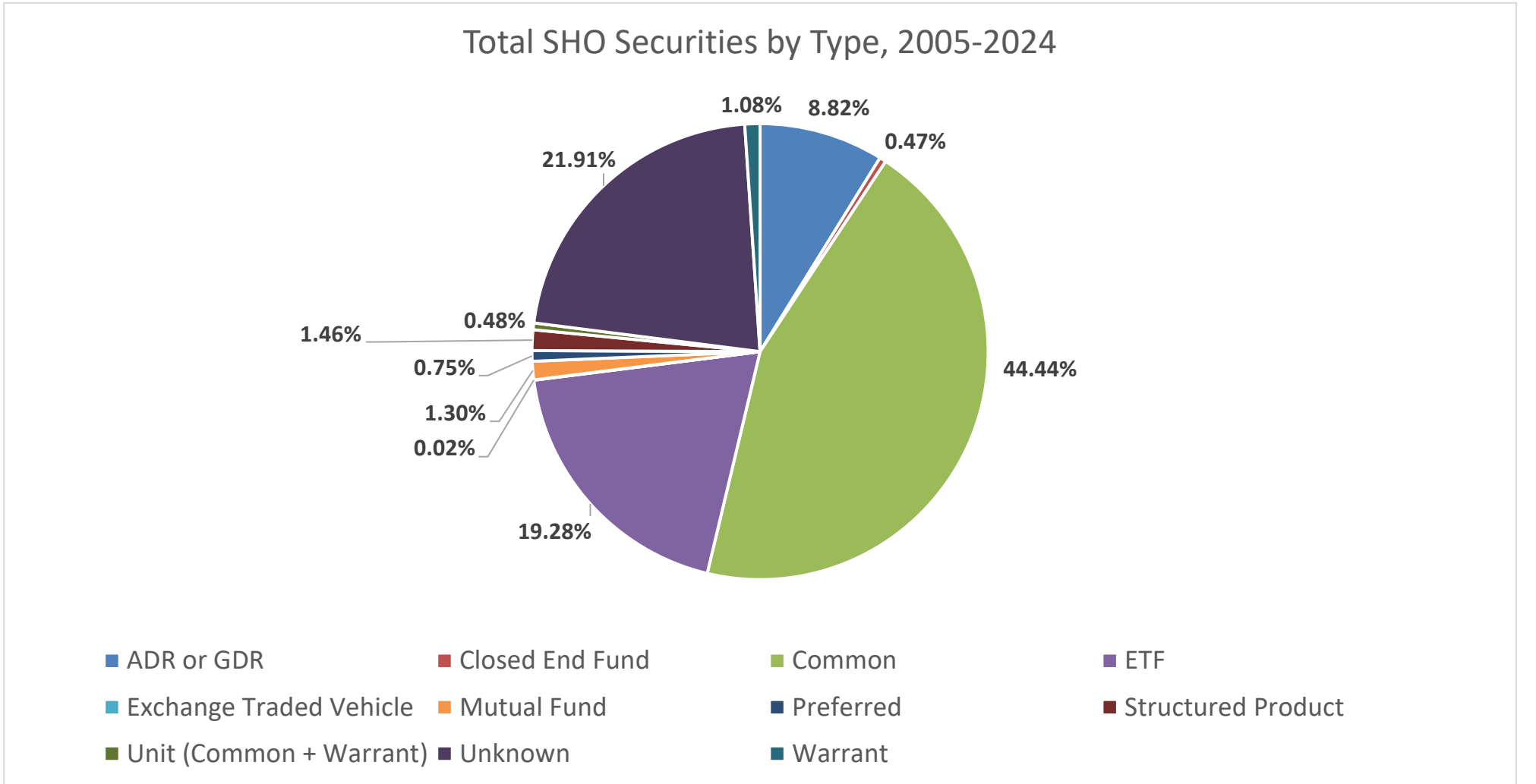
Table 7

Reg SHO Threshold List - Top ETFs (with 2024 Date)

Data represent the U.S. Exchange Traded Funds (ETFs) with the longest duration on the Regulation SHO Threshold List for the period from 2005 through 2024, and which have a threshold date in 2024. Market cap data are determined by pairing the ticker symbol and threshold dates from the various listing exchanges with data from the Center for Research on Securities Prices and Compustat. "First Day" represents the first date on a Reg SHO Threshold List. "Last Day" represents the last date on a Reg SHO Threshold List.

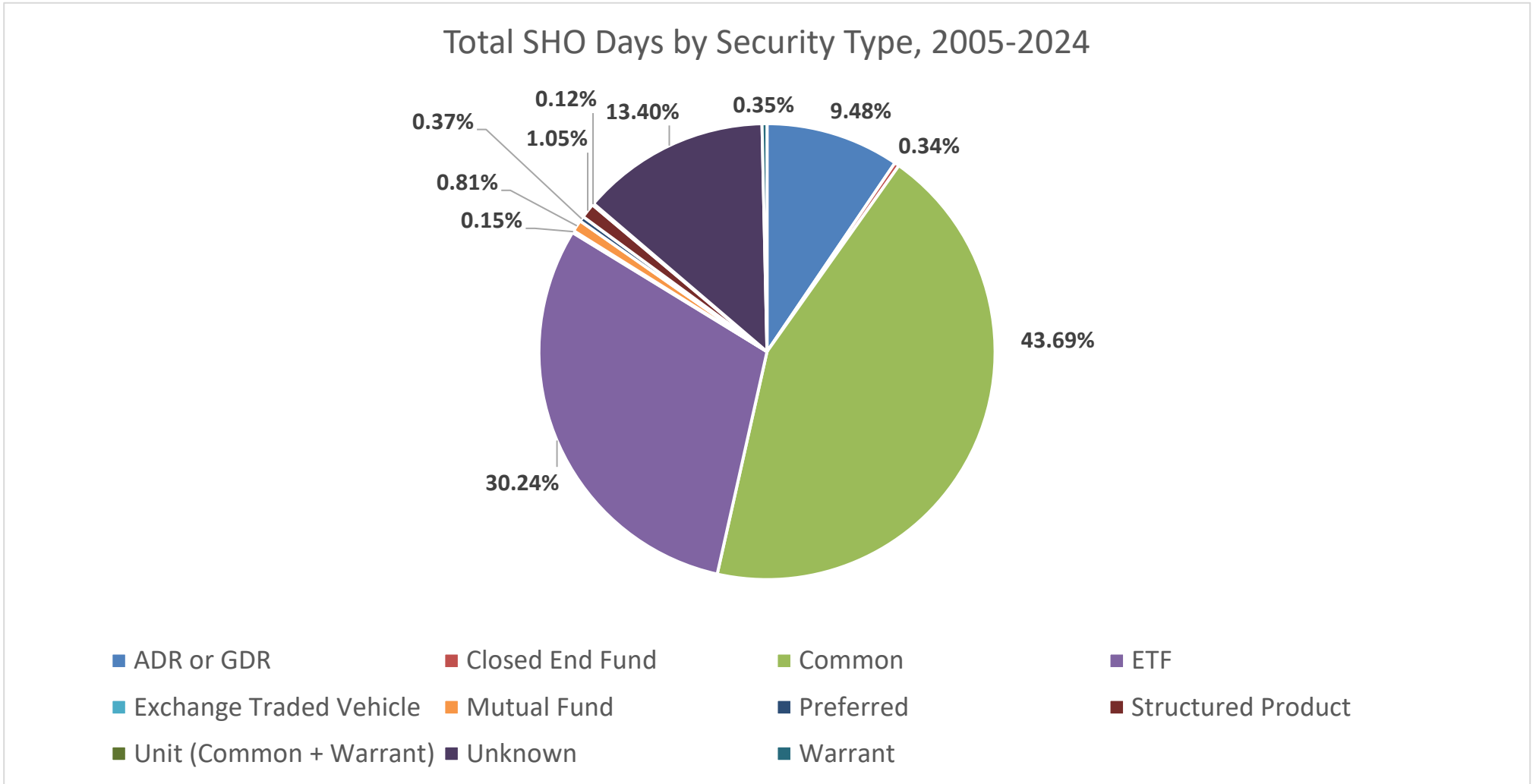
#	Ticker	Days	Name	First Day	Last Day	Exchange	CUSIP	Max MktCap (m	Avg MktCap (m	Max FTDs (m)
1	XRT	1691	SPDR S&P RETAIL ETF	12/30/2008	12/27/2024	NYSE	78464A714	$1,354.66	$544.97	$481.16
2	DUST	1627	DIREXION DAILY GOLD MINERS INDEX BEAR 2X SHARES	2/2/2011	10/15/2024	NYSE	25460G880	$927.73	$140.27	$45.17
3	UVXY	1294	PROSHARES ULTRA VIX SHORT-TERM FUTURES ETF	11/7/2011	12/26/2024	BZX	74347Y755	$2,547.92	$392.26	$134.11
4	JDST	1245	DIREXION DAILY JUNIOR GOLD MINERS INDEX BEAR 2X SHARE	5/13/2014	12/23/2024	NYSE	25461A577	$509.59	$79.78	$61.64
5	TNA	1223	DIREXION DAILY SMALL CAP BULL 3X SHARES	5/22/2009	12/27/2024	NYSE	25459W847	$2,296.13	$680.43	$154.58
6	SRTY	1216	PROSHARES ULTRAPRO SHORT RUSSELL2000	5/13/2010	4/16/2024	NYSE	74347G390	$207.15	$72.72	$20.67
7	FAZ	1194	DIREXION DAILY FINANCIAL BEAR 3X SHARES	1/12/2009	12/27/2024	NYSE	25460E240	$1,467.92	$611.85	$140.91
8	SOXS	1079	DIREXION DAILY SEMICONDUCTOR BEAR 3X SHARES	9/29/2010	5/16/2024	NYSE	25460G112	$835.22	$82.09	$69.03
9	LABD	1070	DIREXION DAILY S&P BIOTECH BEAR 3X SHARES	9/15/2015	12/27/2024	NYSE	25460G716	$198.48	$76.73	$14.44
10	ZSL	970	PROSHARES ULTRASHORT SILVER	2/26/2009	10/25/2024	NYSE	74347Y847	$720.32	$94.63	$50.64
11	TZA	914	DIREXION DAILY SMALL CAP BEAR 3X SHARES	12/3/2008	12/27/2024	NYSE	25460E232	$1,134.75	$544.62	$120.71
12	TWM	823	PROSHARES ULTRASHORT RUSSELL2000	11/10/2008	11/20/2024	NYSE	74347G168	$677.97	$236.08	$38.41
13	SQQQ	792	PROSHARES TR ULTRAPRO SHORT QQ	4/6/2010	12/3/2024	NASDAQ	74347G192	$2,158.40	$214.79	$52.65
14	FXE	747	INVESCO CURRENCYSHARES EURO CURRENCY TRUST	1/27/2006	5/7/2024	NYSE	46138K103	$974.03	$338.36	$236.83
15	DUG	684	PROSHARES ULTRASHORT ENERGY	12/29/2008	4/9/2024	NYSE	74347G358	$564.43	$83.88	$18.06
16	TMV	651	DIREXION DAILY 20+ YEAR TREASURY BEAR 3X SHARES (BASED	12/22/2009	3/12/2024	NYSE	25460G849	$675.61	$324.77	$222.29
17	TECS	650	DIREXION DAILY TECHNOLOGY BEAR 3X SHARES	5/5/2009	9/5/2024	NYSE	25460G393	$115.43	$34.56	$9.65
18	VIXY	607	PROSHARES VIX SHORT-TERM FUTURES ETF	4/14/2011	9/4/2024	BZX	74347Y789	$1,219.50	$275.61	$36.25
19	SPXS	589	DIREXION DAILY S&P 500 BEAR 3X SHARES	12/2/2008	11/21/2024	NYSE	25460E265	$794.97	$192.12	$32.71
20	SPXU	529	PROSHARES ULTRAPRO SHORT S&P 500	7/13/2009	5/14/2024	NYSE	74349Y845	$697.57	$407.58	$44.92
21	YANG	521	DIREXION DAILY FTSE CHINA BEAR 3X SHARES	4/7/2010	12/16/2024	NYSE	25461A460	$216.58	$56.46	$22.68
22	EFZ	470	PROSHARES TRUST SHORT MSCI EAFE	2/10/2010	8/22/2024	NYSE	74347R370	$281.20	$107.02	$21.56
23	PSQ	449	PROSHARES SHORT QQQ	5/1/2009	2/20/2024	NYSE	74347B714	$1,013.05	$393.16	$91.18
24	KRE	443	SPDR S&P REGIONAL BANKING ETF	10/31/2008	6/11/2024	NYSE	78464A698	$4,495.90	$1,298.27	$274.34
25	KOLD	417	PROSHARES ULTRASHORT BLOOMBERG NATURAL GAS	1/30/2013	12/27/2024	NYSE	74347Y813	$627.84	$99.53	$54.32
26	EUM	411	PROSHARES TRUST SHORT MSCI EMERGING MARKETS	3/3/2009	4/24/2024	NYSE	74347R396	$490.96	$184.29	$19.58
27	FXA	385	INVESCO CURRENCYSHARES AUSTRALIAN DOLLAR TRUST	8/14/2006	1/26/2024	NYSE	46090N103	$855.43	$317.68	$55.59
28	TBF	377	PROSHARES SHORT 20+ YEAR TREASURY ETF	9/9/2009	9/25/2024	NYSE	74347X849	$1,541.80	$399.15	$44.95
29	UVIX	317	2X LONG VIX FUTURES ETF	4/21/2022	8/22/2024	BZX	92891H507	$171.95	$64.22	$10.14
30	GLL	300	PROSHARES ULTRASHORT GOLD	9/1/2009	4/16/2024	NYSE	74347W395	$168.06	$82.94	$12.02
31	RWM	290	PROSHARES SHORT RUSSELL2000	10/28/2009	12/27/2024	NYSE	74348A210	$520.35	$299.74	$25.17
32	JNUG	276	DIREXION DAILY JUNIOR GOLD MINERS INDEX BULL 2X SHARES	4/4/2014	1/2/2024	NYSE	25460G831	$1,083.14	$423.32	$77.03
33	EWQ	262	ISHARES MSCI FRANCE ETF	2/13/2006	7/10/2024	NYSE	464286707	$823.90	$393.67	$69.66
34	FRI	237	FIRST TRUST S&P REIT INDEX FUND	8/5/2009	9/17/2024	NYSE	33734G108	$453.64	$156.81	$24.49
35	SVIX	226	-1X SHORT VIX FUTURES ETF	4/7/2022	4/19/2024	BZX	92891H101	$200.22	$75.63	$16.62
36	QABA	213	FIRST TRUST NASDAQ ABA COMMUNI	5/6/2010	1/4/2024	NASDAQ	33736Q104	$412.18	$153.69	$6.96
37	MYY	201	PROSHARES SHORT MIDCAP400	2/13/2009	7/2/2024	NYSE	74347B250	$81.78	$27.44	$27.64
38	SSG	201	PROSHARES ULTRASHORT SEMICONDUCTORS	3/3/2009	4/17/2024	NYSE	74349Y860	$37.71	$15.32	$4.02
39	HAP	199	VANECK NATURAL RESOURCES ETF	11/7/2008	5/31/2024	NYSE	92189F841	$156.92	$82.04	$12.36
40	TBX	197	PROSHARES SHORT 7-10 YEAR TREASURY	3/19/2013	1/12/2024	NYSE	74348A608	$107.58	$47.63	$10.72
41	SEF	195	PROSHARES SHORT FINANCIALS	5/4/2009	3/5/2024	NYSE	74347B185	$181.90	$63.91	$6.34
42	JXI	193	ISHARES GLOBAL UTILITIES ETF	10/24/2006	9/16/2024	NYSE	464288711	$331.72	$114.56	$19.54
43	SPDN	175	DIREXION DAILY S&P 500 BEAR 1X SHARES	7/28/2016	12/26/2024	NYSE	25460E869	$260.21	$128.82	$12.22
44	FRTY	169	ALGER MID CAP 40 ETF	4/9/2021	8/28/2024	NYSE	015564107	$45.38	$30.70	$3.30
45	KIE	162	SPDR S&P INSURANCE ETF	2/10/2009	6/7/2024	NYSE	78464A789	$741.82	$232.83	$21.16
46	CNXT	157	VANECK CHINEXT ETF	4/9/2015	10/18/2024	NYSE	92189F627	$98.60	$43.85	$12.82
47	TBT	155	PROSHARES TRUST ULTRASHORT LEHMAN 20+ YEAR TREASUR	3/17/2016	3/27/2024	NYSE	74347B201	$2,177.27	$1,242.07	$54.19
48	JPEM	143	JPMORGAN DIVERSIFIED RETURN EMERGING MARKETS EQUIT	7/14/2016	6/10/2024	NYSE	46641Q308	$339.14	$132.22	$13.12
49	FCVT	132	FIRST TR EXCHANGE TRADED FD IV	12/1/2016	11/12/2024	NASDAQ	33739Q507	$337.72	$140.94	$8.60
50	NVDQ	124	T-REX 2X INVERSE NVIDIA DAILY TARGET ETF	2/16/2024	12/26/2024	BZX	26923N488	$68.00	$21.94	$4.92

Fugure 3
Reg SHO Threshold List - Total SHO Securities by Type, 2005-2024



This figure represents aggregate threshold securities by type. Historical Reg SHO threshold list data are currently provided by four major listing exchanges: Nasdaq, NYSE, FINRA OTC, and BATS. Nasdaq files are available at https://www.nasdaqtrader.com/trader.aspx?id=regshothreshold&os=io..&ref=app. NYSE data are avilable at https://www.nyse.com/regulation/threshold-securities. FINRA OTC data are available at https://otce.finra.org/otce/otcThreshold. BATS data are available at https://www.cboe.com/us/equities/market_statistics/reg_sho_threshold/. Securities type data are from CRSP and Compustat.

Figure 4
Reg SHO Threshold List - Total SHO Days by Security Type, 2005-2024



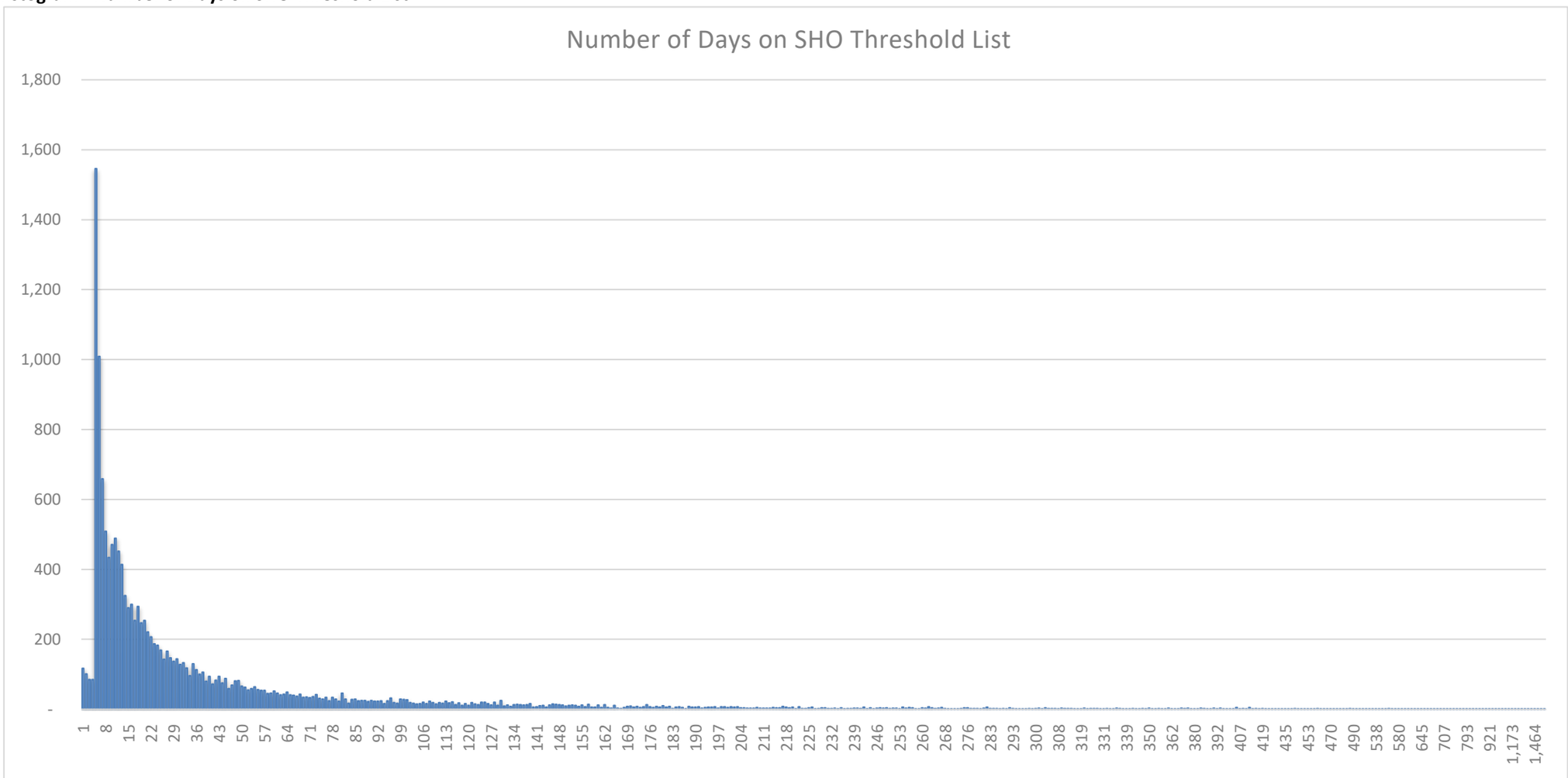
This figure represents aggregate threshold days by security type. Historical Reg SHO threshold list data are currently provided by four major listing exchanges: Nasdaq, NYSE, FINRA OTC, and BATS. Nasdaq files are available at https://www.nasdaqtrader.com/trader.aspx?id=regshothreshold&os=io..&ref=app. NYSE data are avilable at https://www.nyse.com/regulation/threshold-securities. FINRA OTC data are available at https://otce.finra.org/otce/otcThreshold. BATS data are available at https://www.cboe.com/us/equities/market_statistics/reg_sho_threshold/. Securities type data are from CRSP and Compustat.

Figures 3 & 4 Descriptive Statistics

This table contains descriptive statistics for Figures 3 and 4. Historical Reg SHO threshold list data are currently provided by four major listing exchanges: Nasdaq, NYSE, FINRA OTC, and BATS. Nasdaq files are available at https://www.nasdaqtrader.com/trader.aspx?id=regshothreshold&os=io..&ref=app. NYSE data are avilable at https://www.nyse.com/regulation/threshold-securities. FINRA OTC data are available at https://otce.finra.org/otce/otcThreshold. BATS data are available at https://www.cboe.com/us/equities/market_statistics/reg_sho_threshold/. Securities type data are from CRSP and Compustat.

Security Type	# of SHO Securities	% of SHO Securities	# of SHO Days	% of SHO Days
ADR or GDR	1,419	8.82%	61872	9.48%
Closed End Fund	75	0.47%	2194	0.34%
Common	7,151	44.44%	285270	43.69%
ETF	3,102	19.28%	197443	30.24%
Exchange Traded Vehicle	3	0.02%	1012	0.15%
Mutual Fund	210	1.30%	5316	0.81%
Preferred	121	0.75%	2397	0.37%
Structured Product	235	1.46%	6842	1.05%
Unit (Common + Warrant)	77	0.48%	813	0.12%
Unknown	3,526	21.91%	87468	13.40%
Warrant	173	1.08%	2282	0.35%
Total	16,092		652,909	

Figure 5
Histogram - Number of Days on SHO Threshold List



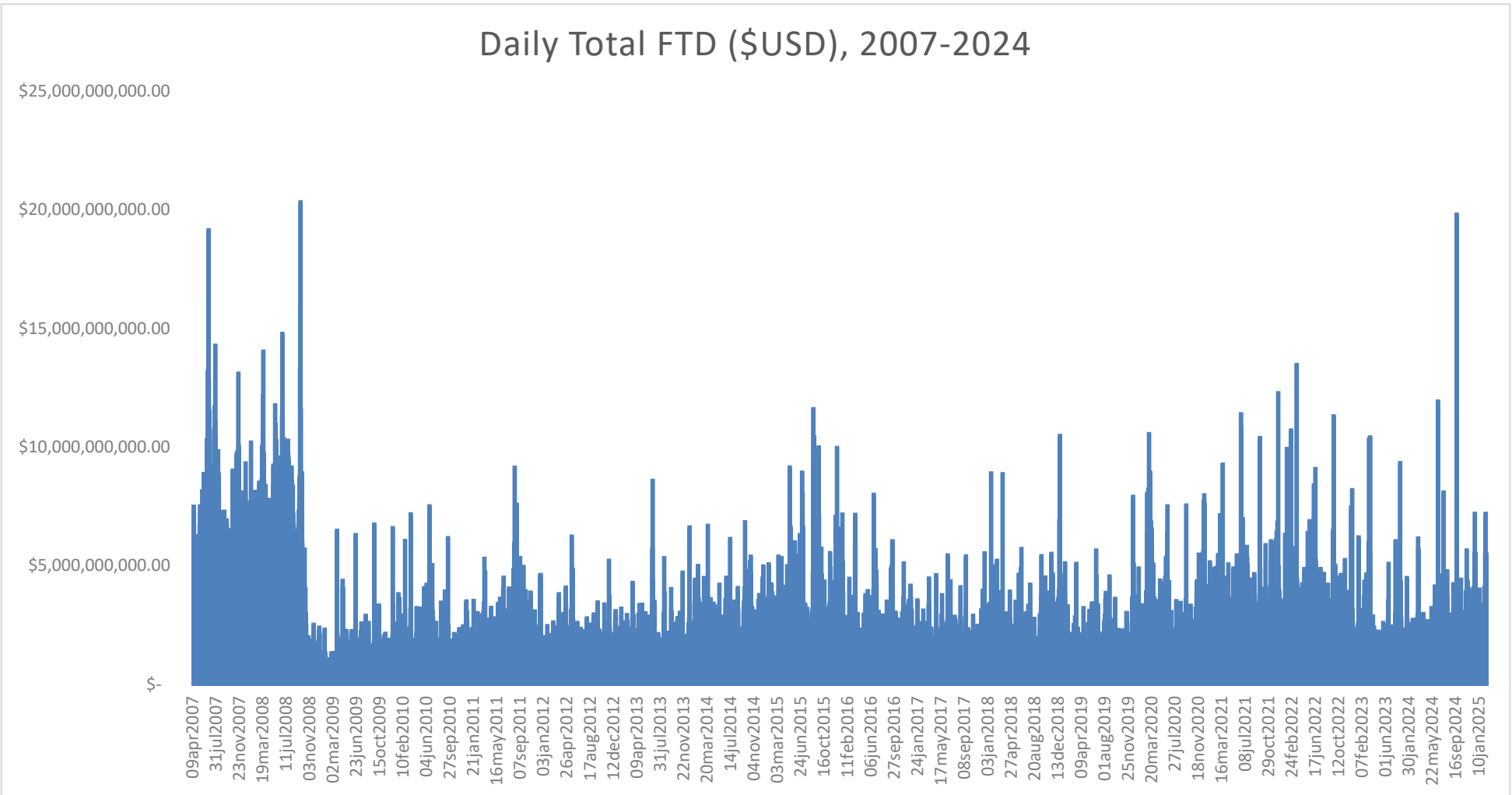
This figure categorizes threshold securities by total days on the SHO List. Historical Reg SHO threshold list data are currently provided by four major listing exchanges: Nasdaq, NYSE, FINRA OTC, and BATS. Nasdaq files are available at https://www.nasdaqtrader.com/trader.aspx?id=regshothreshold&os=io..&ref=app. NYSE data are avilable at https://www.nyse.com/regulation/threshold-securities. FINRA OTC data are available at https://otce.finra.org/otce/otcThreshold. BATS data are available at https://www.cboe.com/us/equities/market_statistics/reg_sho_threshold/. Securities type data are from CRSP and Compustat.

Figure 5 Descriptive Statistics

This contains desscriptive statistics for Figure 5. Historical Reg SHO threshold list data are currently provided by four major listing exchanges: Nasdaq, NYSE, FINRA OTC, and BATS. Nasdaq files are available at https://www.nasdaqtrader.com/trader.aspx?id=regshothreshold&os=io..&ref=app. NYSE data are avilable at https://www.nyse.com/regulation/threshold-securities. FINRA OTC data are available at https://otce.finra.org/otce/otcThreshold. BATS data are available at https://www.cboe.com/us/equities/market_statistics/reg_sho_threshold/. Securities type data are from CRSP and Compustat.

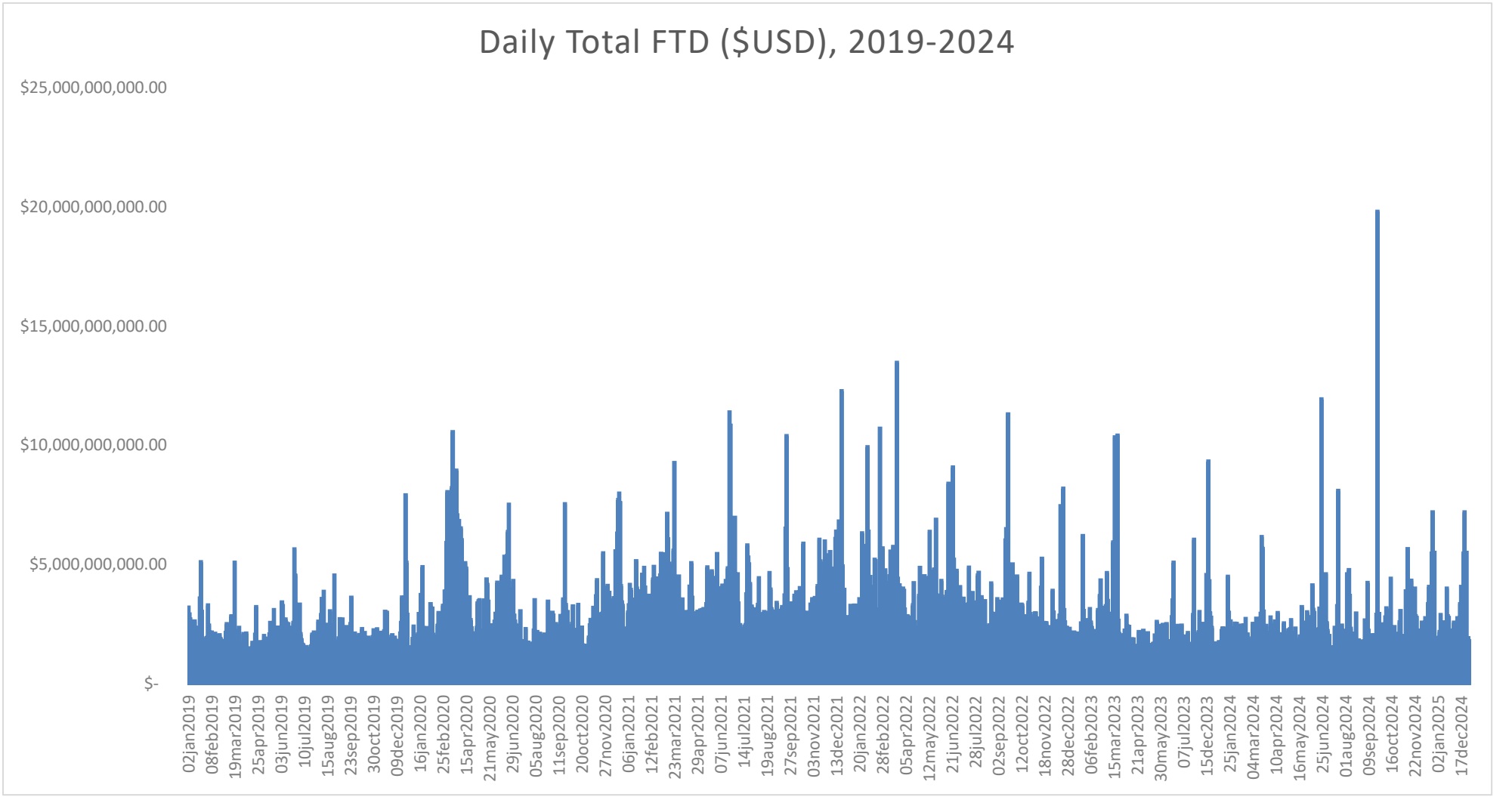
	Count of Tickers
Max	1,546
Min	1
Average	33.81
StDev	113.02
Median	4
Mode	1

Figure 6
Daily Total FTDs ($ USD), 2007-2024



This figure presents the aggregate daily dollar value of FTDs for all exchanges for the period from 2007 through 2024. Data on Fails-to-Deliver (FTDs) are gathered by the National Securities Clearing Corporation's (NSCC) Continuous Net Settlement (CNS) system, and published by the SEC Freedom of Information Act (FOIA) Office. All files are published online at https://www.sec.gov/data-research/sec-markets-data/fails-deliver-data. Daily fail values are generated by multiplying the daily quantity of fails by price, per ticker, as provided by the SEC.

Figure 7
Daily Total FTDs ($ USD), 2019-2024



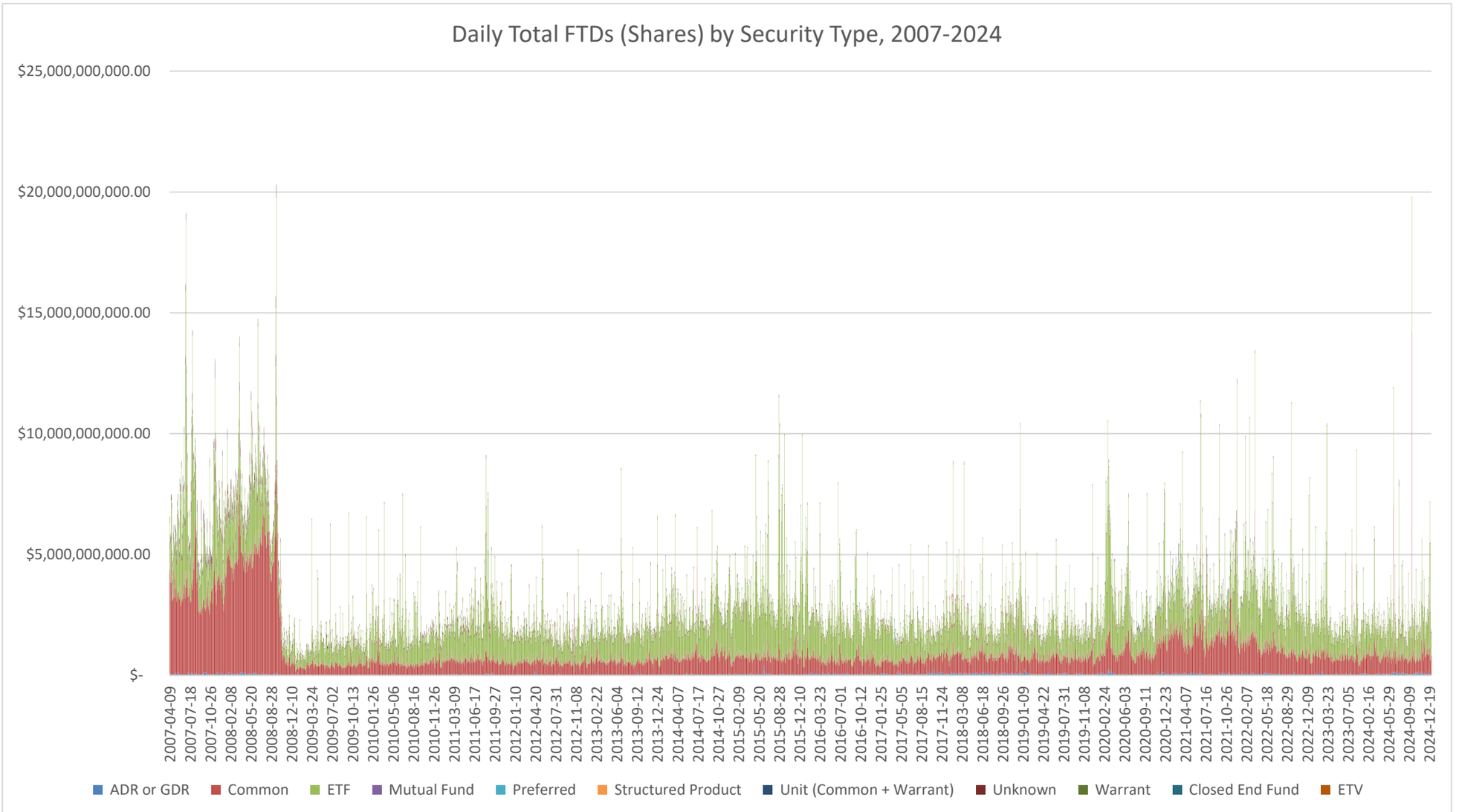
This figure presents the aggregate daily dollar value of FTDs for all exchanges for the period from 2019 through 2024. Data on Fails-to-Deliver (FTDs) are gathered by the National Securities Clearing Corporation's (NSCC) Continuous Net Settlement (CNS) system, and published by the SEC Freedom of Information Act (FOIA) Office. All files are published online at https://www.sec.gov/data-research/sec-markets-data/fails-deliver-data. Daily fail values are generated by multiplying the daily quantity of fails by price, per ticker, as provided by the SEC.

Figure 6 & 7 Descriptive Statistics

This table contains descriptive statistics for Figures 6 and 7. Data on Fails-to-Deliver (FTDs) are gathered by the National Securities Clearing Corporation's (NSCC) Continuous Net Settlement (CNS) system, and published by the SEC Freedom of Information Act (FOIA) Office. All files are published online at https://www.sec.gov/data-research/sec-markets-data/fails-deliver-data. Daily fail values are generated by multiplying the daily quantity of fails by price, per ticker, as provided by the SEC.

	Daily Total FTDs (m)	
	2007-2024	**2019-2024**
Max	$20,315.16	$19,801.54
Mean	$466.82	$829.39
Average	$2,931.22	$2,897.67
StDev	$1,968.72	$1,561.20
Median	$2,277.34	$2,470.86

Figure 8
Daily Total FTDs ($ USD) by Security Type, SHO Stocks only, 2007-2024



This figure categorizes the FTDs in Threshold securities only by security type for the period from 2007 through 2024. Data on Fails-to-Deliver (FTDs) are published online at https://www.sec.gov/data-research/sec-markets-data/fails-deliver-data. Daily fail values are generated by multiplying the daily quantity of fails by price, per ticker, as provided by the SEC. Data on security type come from the Center for Research on Security Prices (CRSP) and Compustat, both accessed via Wharton Research Data Services (WRDS).

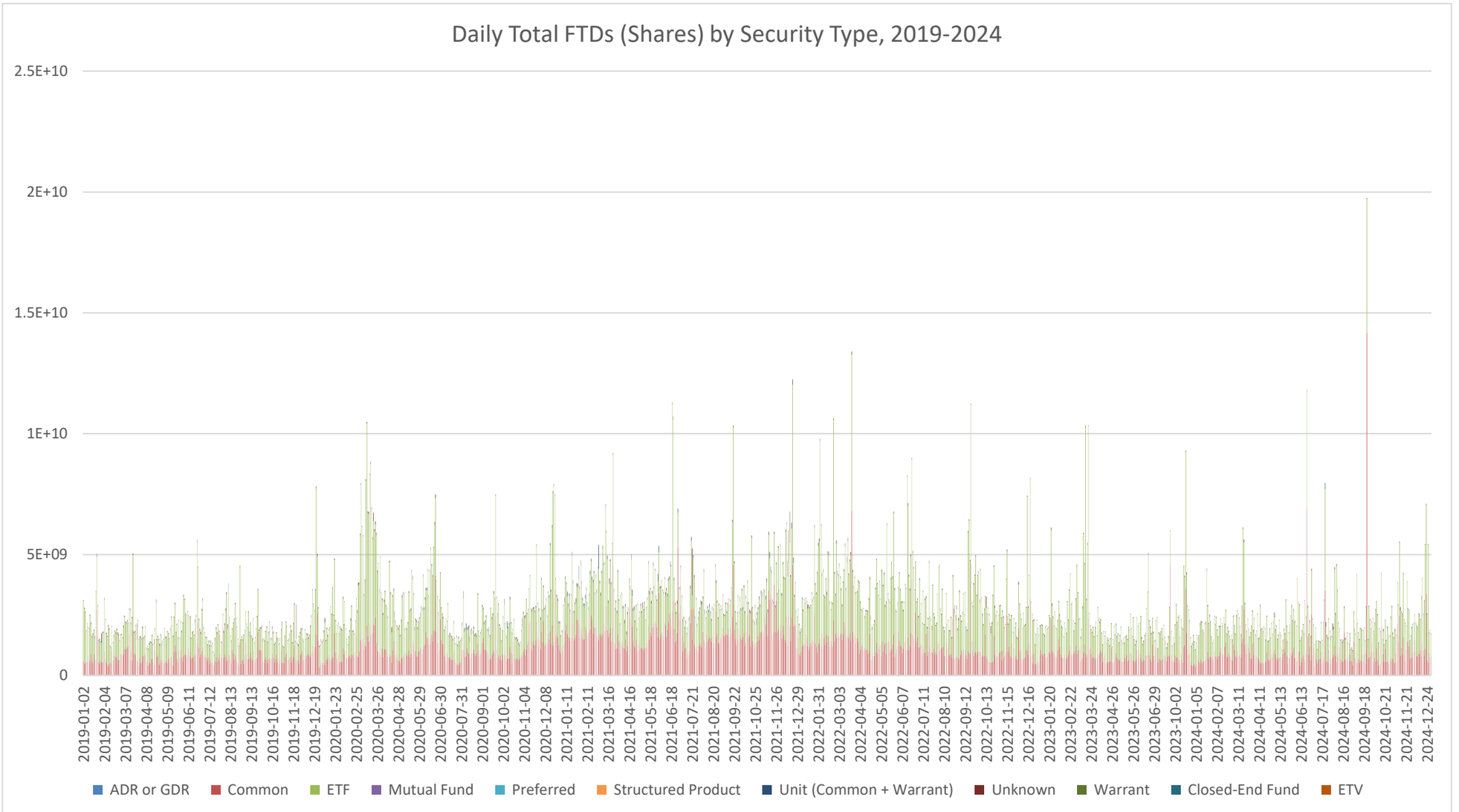
Figure 8 Descriptive Statistics

This table contains descriptive statistics for Figure 8. Data on Fails-to-Deliver (FTDs) are published online at https://www.sec.gov/data-research/sec-markets-data/fails-deliver-data. Daily fail values are generated by multiplying the daily quantity of fails by price, per ticker, as provided by the SEC. Data on security type come from the Center for Research on Security Prices (CRSP) and Compustat, both accessed via Wharton Research Data Services (WRDS).

Time Period		Percentage Daily Total FTDs ($ USD) by Security Type, SHO Stocks only, 2007-2024										
		ADR or GDR	Closed End Fund	Common	ETF	ETV	Mutual Fund	Preferred	Structured Product	Jnit (Common + Warrant	Unknown	Warrant
2005-2008	max	8.00%	2.46%	83.15%	75.25%	5.73%	0.02%	10.09%	3.52%	0.50%	20.35%	0.29%
	min	0.12%	0.41%	17.56%	11.61%	0.00%	0.00%	0.07%	0.24%	0.00%	0.53%	0.00%
	avg	1.01%	1.06%	60.04%	33.05%	0.60%	0.00%	0.62%	0.89%	0.03%	2.68%	0.02%
	stdev	0.72%	0.35%	12.58%	12.61%	0.75%	0.00%	0.60%	0.44%	0.06%	1.63%	0.03%
2009-2019	max	15.85%	26.15%	76.87%	93.49%	13.00%	0.26%	35.35%	7.78%	3.90%	98.71%	1.24%
	min	0.00%	0.00%	1.22%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%
	avg	2.07%	0.73%	31.63%	60.98%	0.67%	0.00%	0.51%	1.13%	0.05%	2.21%	0.03%
	stdev	1.61%	0.79%	9.42%	10.99%	1.03%	0.01%	0.85%	0.74%	0.17%	3.68%	0.06%
2020-2024	max	11.18%	9.40%	76.77%	90.70%	3.56%	0.70%	3.96%	4.28%	16.74%	35.70%	1.50%
	min	0.22%	0.03%	8.73%	20.05%	0.00%	0.00%	0.03%	0.02%	0.00%	0.03%	0.00%
	avg	2.19%	0.38%	39.46%	55.31%	0.08%	0.01%	0.36%	0.54%	0.43%	1.17%	0.07%
	stdev	1.41%	0.46%	10.65%	11.16%	0.23%	0.04%	0.34%	0.63%	1.01%	1.82%	0.12%

Time Period		Daily Total FTDs ($ USD) by Security Type, SHO Stocks only, 2007-2024									
		ADR or GDR	Common	ETF	Mutual Fund	Preferred	Structured Product	Unit (Common + Warrant)	Unknown		Warrant
2005-2008	max	$ 166,337,288.11	$ 133,655,450.22	$ 9,561,770,524.54	$ 14,407,051,533.97	$ 387,432,064.95	$ 449,065.19	$ 228,388,114.65	$ 134,463,271.95	$ 41,446,648.22	$ 738,330,662.25	$ 14,495,523.35
	min	$ 8,254,736.63	$ 7,354,810.72	$ 142,709,098.98	$ 182,428,046.00	$ -	$ -	$ 3,808,541.29	$ 7,378,457.84	$ -	$ 15,407,870.87	$ 23,584.89
	avg	$ 56,187,571.41	$ 66,484,811.66	$ 3,943,493,917.62	$ 2,208,540,390.07	$ 42,350,788.66	$ 8,016.93	$ 36,948,535.37	$ 52,851,941.76	$ 1,831,407.71	$ 157,357,901.36	$ 1,212,031.89
	stdev	$ 32,471,572.46	$ 26,609,380.36	$ 1,643,594,339.21	$ 1,663,494,142.69	$ 54,349,070.84	$ 36,944.08	$ 27,267,481.16	$ 25,678,942.13	$ 3,284,425.06	$ 92,453,518.49	$ 1,487,199.14
2009-2019	max	$ 418,890,655.76	$ 617,592,781.07	$ 4,493,169,924.16	$ 10,013,551,713.07	$ 281,371,975.79	$ 3,535,407.86	$ 830,364,291.76	$ 165,262,029.10	$ 83,575,486.86	$ 3,320,830,462.74	$ 47,558,849.62
	min	$ -	$ -	$ 38,963,644.41	$ -	$ -	$ -	$ -	$ -	$ -	$ 5,976,346.30	$ -
	avg	$ 43,290,512.09	$ 13,921,248.78	$ 680,390,376.78	$ 1,465,610,331.45	$ 13,449,595.87	$ 25,083.53	$ 9,992,165.96	$ 22,838,971.43	$ 1,156,201.47	$ 45,945,410.28	$ 619,842.40
	stdev	$ 32,356,326.28	$ 15,593,098.25	$ 309,384,383.34	$ 967,748,881.65	$ 19,458,059.27	$ 141,272.60	$ 18,368,441.83	$ 14,034,059.23	$ 3,618,082.18	$ 102,610,159.56	$ 1,788,216.77
2020-2024	max	$ 299,104,728.87	$ 429,247,695.33	$ 14,179,559,673.13	$ 9,376,096,681.26	$ 92,176,653.41	$ 22,289,975.11	$ 116,564,366.94	$ 118,178,883.29	$ 912,310,441.37	$ 1,891,626,984.02	$ 34,536,128.01
	min	$ 9,548,080.43	$ 2,223,036.07	$ 370,271,610.95	$ 366,082,403.70	$ -	$ -	$ 2,236,458.02	$ 881,090.56	$ 8,521.09	$ 2,491,150.40	$ 22,700.30
	avg	$ 59,191,726.10	$ 11,274,290.34	$ 1,192,076,709.58	$ 1,742,226,108.81	$ 2,517,826.80	$ 219,722.55	$ 10,193,586.66	$ 13,316,314.95	$ 12,825,478.37	$ 35,246,026.45	$ 2,022,491.60
	stdev	$ 33,959,620.39	$ 18,968,058.03	$ 758,783,911.26	$ 1,130,387,806.80	$ 6,472,432.96	$ 1,013,727.12	$ 9,657,472.01	$ 14,011,334.89	$ 35,676,169.79	$ 83,876,486.16	$ 3,552,403.35

Figure 9
Daily Total FTDs ($ USD) by Security Type, SHO Stocks only, 2019-2024



This figure categorizes the FTDs in Threshold securities only by security type for the period from 2019 through 2024. Data on Fails-to-Deliver (FTDs) are published online at https://www.sec.gov/data-research/sec-markets-data/fails-deliver-data. Daily fail values are generated by multiplying the daily quantity of fails by price, per ticker, as provided by the SEC. Data on security type come from the Center for Research on Security Prices (CRSP) and Compustat, both accessed via Wharton Research Data Services (WRDS).

Figure 9 Descriptive Statistics

This table contains descriptive statistics for Figure 9. Data on Fails-to-Deliver (FTDs) are published online at https://www.sec.gov/data-research/sec-markets-data/fails-deliver-data. Daily fail values are generated by multiplying the daily quantity of fails by price, per ticker, as provided by the SEC. Data on security type come from the Center for Research on Security Prices (CRSP) and Compustat, both accessed via Wharton Research Data Services (WRDS).

Time Period		Percentage Daily Total FTDs ($ USD) by Security Type, SHO Stocks only, 2007-2024										
		ADR or GDR	Closed End Fund	Common	ETF	ETV	Mutual Fund	Preferred	Structured Product	Jnit (Common + Warrant	Unknown	Warrant
2019-2024	max	11.18%	9.40%	76.77%	90.70%	3.56%	0.70%	3.96%	4.28%	16.74%	35.70%	1.50%
	min	0.22%	0.03%	8.73%	20.05%	0.00%	0.00%	0.03%	0.02%	0.00%	0.03%	0.00%
	avg	2.19%	0.38%	39.46%	55.31%	0.08%	0.01%	0.36%	0.54%	0.43%	1.17%	0.07%
	stdev	1.41%	0.46%	10.65%	11.16%	0.23%	0.04%	0.34%	0.63%	1.01%	1.82%	0.12%

Time Period		Daily Total FTDs ($ USD) by Security Type, SHO Stocks only, 2007-2024									
		ADR or GDR	Common	ETF	Mutual Fund	Preferred	Structured Product	Unit (Common + Warrant)	Unknown		Warrant
2019-2024	max	$ 299,104,728.87	$ 429,247,695.33	$ 14,179,559,673.13	$ 9,376,096,681.26	$ 92,176,653.41	$ 22,289,975.11	$ 116,564,366.94	$ 118,178,883.29	$ 912,310,441.37	$ 1,891,626,984.02	$ 34,536,128.01
	min	$ 9,548,080.43	$ 2,223,036.07	$ 370,271,610.95	$ 366,082,403.70	$ -	$ -	$ 2,236,458.02	$ 881,090.56	$ 8,521.09	$ 2,491,150.40	$ 22,700.30
	avg	$ 59,191,726.10	$ 11,274,290.34	$ 1,192,076,709.58	$ 1,742,226,108.81	$ 2,517,826.80	$ 219,722.55	$ 10,193,586.66	$ 13,316,314.95	$ 12,825,478.37	$ 35,246,026.45	$ 2,022,491.60
	stdev	$ 33,959,620.39	$ 18,968,058.03	$ 758,783,911.26	$ 1,130,387,806.80	$ 6,472,432.96	$ 1,013,727.12	$ 9,657,472.01	$ 14,011,334.89	$ 35,676,169.79	$ 83,876,486.16	$ 3,552,403.35

Table 8

Stocks with Highest FTDs, 2007-2024

This table shows tickers with the highest individual fail dates from the SEC FOIA data set on FTDs. Data on Fails-to-Deliver (FTDs) are gathered by the National Securities Clearing Corporation's (NSCC) Continuous Net Settlement (CNS) system, and published by the SEC Freedom of Information Act (FOIA) Office. All files are published online at https://www.sec.gov/data-research/sec-markets-data/fails-deliver-data. Daily fail values are generated by multiplying the daily quantity of fails by price, per ticker, as provided by the SEC.

#	CUSIP	Ticker	Description	Price	Max FTDs (m)	Date of Max
1	464287655	IWM	ISHARES RUSSELL 2000 INDEX	$ 81.74	$10,994.41	6/27/2007
2	78462F103	SPY	SPDR S&P 500 ETF TR	$ 389.28	$7,568.59	3/16/2023
3	594918104	MSFT	MICROSOFT CORP;COM USD0.000012	$ 435.27	$4,449.89	9/23/2024
4	67066G104	NVDA	NVIDIA CORP	$ 116.00	$3,810.04	9/23/2024
5	464287200	IVV	ISHARES CORE S&P 500 ETF	$ 399.60	$3,236.77	12/15/2022
6	46090E103	QQQ	INVESCO QQQ TR	$ 305.97	$3,228.20	3/21/2023
7	124857202	CBS	CBS CORPORATION CLASS B COM NE	$ 60.68	$3,195.31	7/15/2014
8	G0403H108	AON	AON PLC ORD SHS CL A NEW (IRL)	$ 327.74	$2,663.79	10/17/2023
9	921937827	BSV	VANGUARD BD INDEX FD INC SHORT	$ 77.28	$2,431.56	5/13/2022
10	73935A104	QQQ	POWERSHARES QQQ TR UNIT SER-1	$ 137.53	$2,300.66	7/6/2017
11	G5494J103	LIN	LINDE PLC SHS (IRL)	$ 165.47	$1,920.35	11/1/2018
12	46434V613	IUSB	ISHARES CORE TOTAL USD BOND MA	$ 46.98	$1,854.85	9/6/2024
13	19260Q107	COIN	COINBASE GLOBAL INC COM CL A (	$ 322.75	$1,795.34	4/16/2021
14	464288885	EFG	MSCI EAFE GROWTH ETF	$ 106.25	$1,713.10	6/7/2024
15	81369Y605	XLF	FINANCIAL SECTOR SPDR	$ 21.39	$1,656.47	9/29/2008
16	35671D857	FCX	FREEPORT-MCMORAN COPPER & GOL	$ 71.17	$1,626.71	4/16/2007
17	46429B267	GOVT	ISHARES U.S. TREASURY BOND ETF	$ 23.34	$1,544.80	3/21/2023
18	252787106	DIA	DIAMONDS TRUST SERIES 1	$ 130.33	$1,505.58	11/21/2007
19	464287234	EEM	ISHARES MSCI EMERGING MARKETS	$ 145.00	$1,475.20	9/24/2007
20	87165B103	SYF	SYNCHRONY FINL COM STK (DE)	$ 31.65	$1,439.98	11/20/2015
21	037833100	AAPL	APPLE INC;COM NPV	$ 161.02	$1,438.01	11/23/2021
22	629491101	NYX	NYSE EURONEXT COM	$ 96.74	$1,384.55	4/9/2007
23	81369Y506	XLE	ENERGY SECTOR SPDR	$ 73.24	$1,368.72	11/15/2007
24	151020104	CELG	CELGENE CORPORATION	$ 108.24	$1,322.34	11/21/2019
25	50075N104	KFT	KRAFT FOODS INC CL-A	$ 32.80	$1,284.82	8/11/2008
26	485170302	KSU	KANSAS CITY SOUTHERN	$ 293.59	$1,242.07	12/15/2021
27	83088V102	WORK	SLACK TECHNOLOGIES INC CL A	$ 45.20	$1,220.71	7/21/2021
28	464288877	EFV	MSCI EAFE VALUE ETF	$ 56.40	$1,189.75	9/6/2024
29	464288513	HYG	ISHARES TR	$ 87.60	$1,122.69	6/22/2021
30	456837103	ING	ING GROEP NV ADS (BEAR DEP RCT	$ 38.49	$1,103.48	8/16/2007
31	78468R663	BIL	SPDR SER TR SPDR BLOOMBERG BAR	$ 91.60	$1,066.41	3/13/2020
32	464286533	EEMV	ISHARES MSCI EMERGING MARKETS	$ 51.73	$1,029.11	9/29/2022
33	922908769	VTI	VANGUARD TOTAL STOCK MARKET ET	$ 143.63	$933.96	6/7/2018
34	922908363	VOO	VANGUARD INDEX FDS S&P 500 ETF	$ 226.81	$910.23	8/17/2017
35	25278X109	FANG	DIAMONDBACK ENERGY INC COM	$ 181.00	$886.08	9/23/2024
36	78467Y107	MDY	SPDR S&P MIDCAP 400 ETF TR UTS	$ 228.46	$877.35	10/7/2013
37	G0633U119	ASZU	AUSTERLITZ ACQUISITION CORP II	$ 10.25	$870.53	3/2/2021
38	88160R101	TSLA	TESLA INC COM STK (DE)	$ 622.77	$860.95	12/17/2020
39	464286871	EWH	ISHARES MSCI HONG KONG IDX FD	$ 19.05	$856.57	6/11/2013
40	28414H103	ELAN	ELANCO ANIMAL HEALTH INC COM (	$ 31.64	$855.44	3/13/2019
41	922042858	VWO	VANGUARD EMERGING MARKETS ETF	$ 48.47	$845.04	1/18/2011
42	316188309	FBND	FIDELITY MERRIMACK STR TR TOTA	$ 44.79	$843.24	4/9/2024
43	G0177J116	AGNPRA	ALLERGAN PLC 5.5% PFD CONV SER	$ 849.78	$829.06	4/3/2017
44	G0083B116	ATVFF	ACTAVIS PLC PFD CONV SER A (IR	$ 1,032.21	$825.77	3/4/2015
45	464287739	IYR	ISHARES DJ US REAL EST IDX FD	$ 64.80	$824.28	12/21/2012
46	464287242	LQD	ISHARES IBOXX $ INVESTMENT GRA	$ 102.99	$813.32	9/27/2022
47	464285204	IAU	ISHARES GOLD TRUST ISHARES NEW	$ 45.10	$798.83	8/7/2024
48	92826C839	V	VISA INC CLASS A COM	$ 59.73	$796.77	3/25/2008
49	78463V107	GLD	SPDR GOLD TR, SPDR GOLD SHS	$ 179.52	$795.29	9/22/2020
50	31620M106	FIS	FIDELITY NATIONAL INFORMATION	$ 133.25	$789.92	8/1/2019

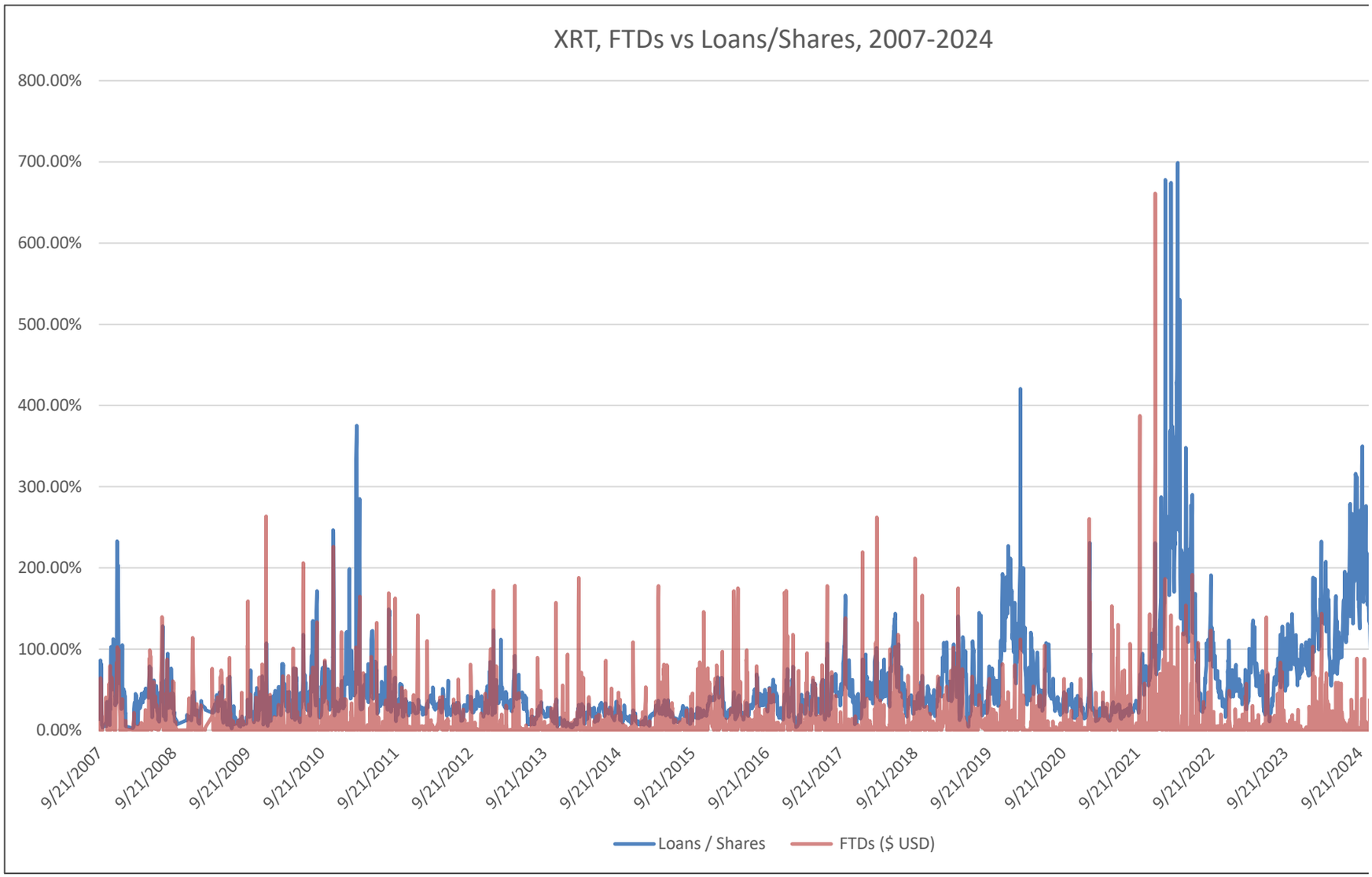
Table 9

Sample of Securities with > 90% Short Interest

This table presents a sample of securities with daily short interest over 90% during the period from 2005 through 2024. Securities lending data are from FIS. Median market cap is the median market capitalization for this period. Max loan % is the highest ratio of shares on loan to shares outstanding for the period from 2005 through 2024. During the sample period, 500 securities had a SI percentage greater than 90%.

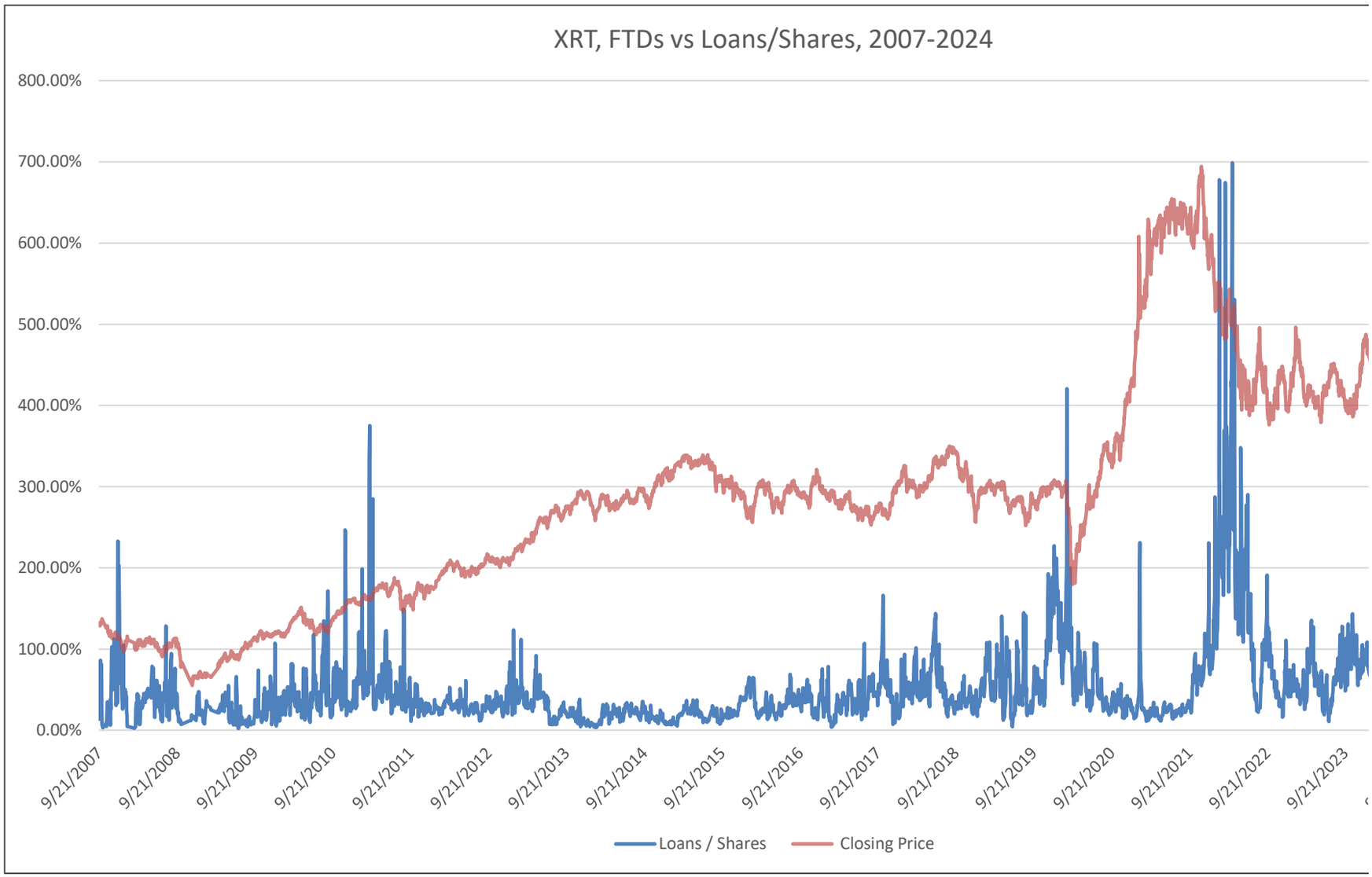
#	CUSIP	Ticker	Description	Days > 90%	Max Loan %	Median Market Cap (m)
1	78464A714	XRT	SPDR SERIES TR SPDR S&P RETAIL	628	699%	$361.92
2	03076C106	AMP	AMERIPRISE FINANCIAL, INC. COM	349	445%	$11,138.04
3	06746L422	VXX	BARCLAYS BK PLC IPATH S&P 500	89	176%	$868.08
4	70614W100	PTON	PELOTON INTERACTIVE INC CL A C	38	106%	$1,298.75
5	46625H365	AMJ	JPMORGAN CHASE & CO ALERIAN ML	35	105%	$286.12
6	740065107	PPD	PRE-PAID LEGAL SERVICES INC	30	232%	$563.91
7	06748M196	VXX	BARCLAYS BK PLC IPATH ETN LKD	29	169%	$301.03
8	099724106	BWA	BORGWARNER INC	17	97%	$4,355.08
9	H50430232	LOGI	LOGITECH INTERNATIONAL S.A .OR	17	111%	$2,884.42
10	118440106	BKE	BUCKLE INC (THE)	17	99%	$1,686.41
11	48667L106	KDDIY	KDDI Corporation Unsponsored A	17	231%	$235.06
12	680277100	OSBC	OLD SECOND BANCORP INC	17	157%	$93.26
13	17325E309	DWT	CITIGROUP GLB MKT HLD INC INV	17	118%	$50.11
14	760281204	RBCAA	REPUBLIC BANCORP INC CL A	15	190%	$327.19
15	929740108	WAB	WABTEC (COMMON)	14	144%	$2,057.66
16	902653104	UDR	UDR INC COM	12	181%	$2,770.05
17	876851106	TAYC	TAYLOR CAPITAL GROUP INC	12	228%	$129.61
18	55608B105	MIC	MACQUARIE INFRASTRUCTURE COMI	11	114%	$567.71
19	92189F676	SMH	VANECK VECTORS ETF TR SEMICOND	10	161%	$170.60
20	320817109	FRME	FIRST MERCHANTS CORP	10	98%	$139.31
21	872417308	TGE	TGC INDUSTRIES INC-	10	348%	$77.71
22	33734E103	FMY	FIRST TRUST MORTGAGE INCOME FU	10	238%	$69.57
23	92552V100	VSAT	VIASAT INC	9	671%	$1,222.07
24	869099101	SUSQ	SUSQUEHANNA BANCSHARES INC	9	355%	$1,045.10
25	890110109	TMP	TOMPKINS FINANCIAL CORPORATION	8	263%	$375.62
26	30239F106	FFG	FBL FINANCIAL GROUP INC CL-A	7	417%	$663.49
27	90328M107	USNA	USANA HEALTH SCIENCES INC	7	462%	$483.94
28	974250102	WINA	WINMARK CORPORATION	7	226%	$157.53
29	869233106	SUSS	SUSSER HOLDINGS CORPORATION CC	7	4821%	$144.50
30	G20045202	CETV	CENTRAL EUROPEAN MEDIA ENTRP-A	6	152%	$1,665.97
31	22542D795	XIV	VELOCITYSHARES DAILY INVERSE V	6	113%	$1,169.71
32	382410405	GDP	GOODRICH PETROLEUM CORP(NEW)	6	110%	$688.87
33	422806109	HEI	HEICO CORP	6	271%	$490.98
34	88830R101	TITN	TITAN MACHINERY INC. COMMON ST	6	1371%	$230.17
35	749361200	RCNI	RCN CORP NEW	5	139%	$760.04
36	453096208	IPSU	IMPERIAL SUGAR COMPANY-NEW	5	93%	$189.76
37	075896100	BBBY	BED BATH & BEYOND INC	5	92%	$123.85
38	G16962105	BG	BUNGE LIMITED	4	158%	$8,831.92
39	902494103	TSN	TYSON FOODS INC CL A	4	134%	$5,386.47
40	584690309	MRX	MEDICIS PHARMACEUTICAL CL-A	4	19041%	$1,442.95
41	870875101	SWZ	SWISS HELVETIA FUND INC	4	156%	$376.77
42	89531P105	TREX	TREX CO INC	4	165%	$324.98
43	89214P109	TOWN	TOWNE BANK (VA)	4	100%	$320.59
44	88146M101	TRNO	TERRENO REALTY CORPORATION COI	4	93%	$179.65
45	22542D282	DGAZ	CREDIT SUISSE AG NASSAU BRH VE	4	107%	$93.05
46	25271C102	DO	DIAMOND OFFSHORE DRILLING INC	3	442%	$12,426.14
47	929160109	VMC	VULCAN MATERIALS COMPANY (HOLI	3	99%	$5,765.88
48	G0450A105	ACGL	ARCH CAPITAL GROUP LTD	3	1257%	$3,968.18
49	254546104	DNEX	DIONEX CORP	3	115%	$1,302.37
50	826565103	SIGM	SIGMA DESIGNS INC	3	301%	$378.64

Figure 10
XRT, FTDs vs SI/Shares Out, 2007-2024



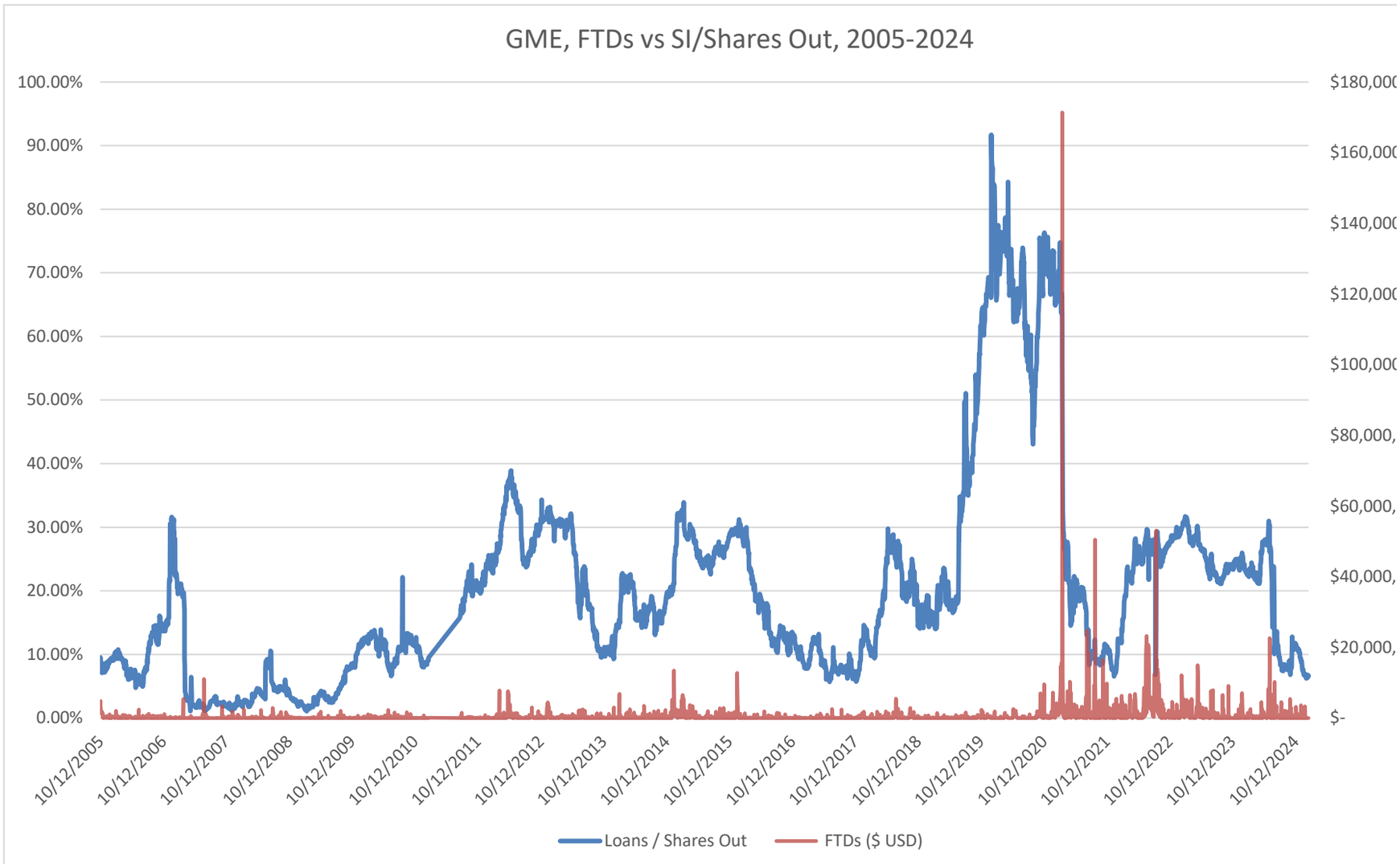
This figure contains daily data for the SPDR S&P Retail ETF (XRT) for the period from 2007 through 2024. The dollar value of daily FTDs is from the SEC FOIA Office. The ratio of shares outstanding is generatied using daily short interest data from FIS and shares outstanding data from Compustat.

Figure 11
XRT, Price vs SI/Shares Out, 2007-2024



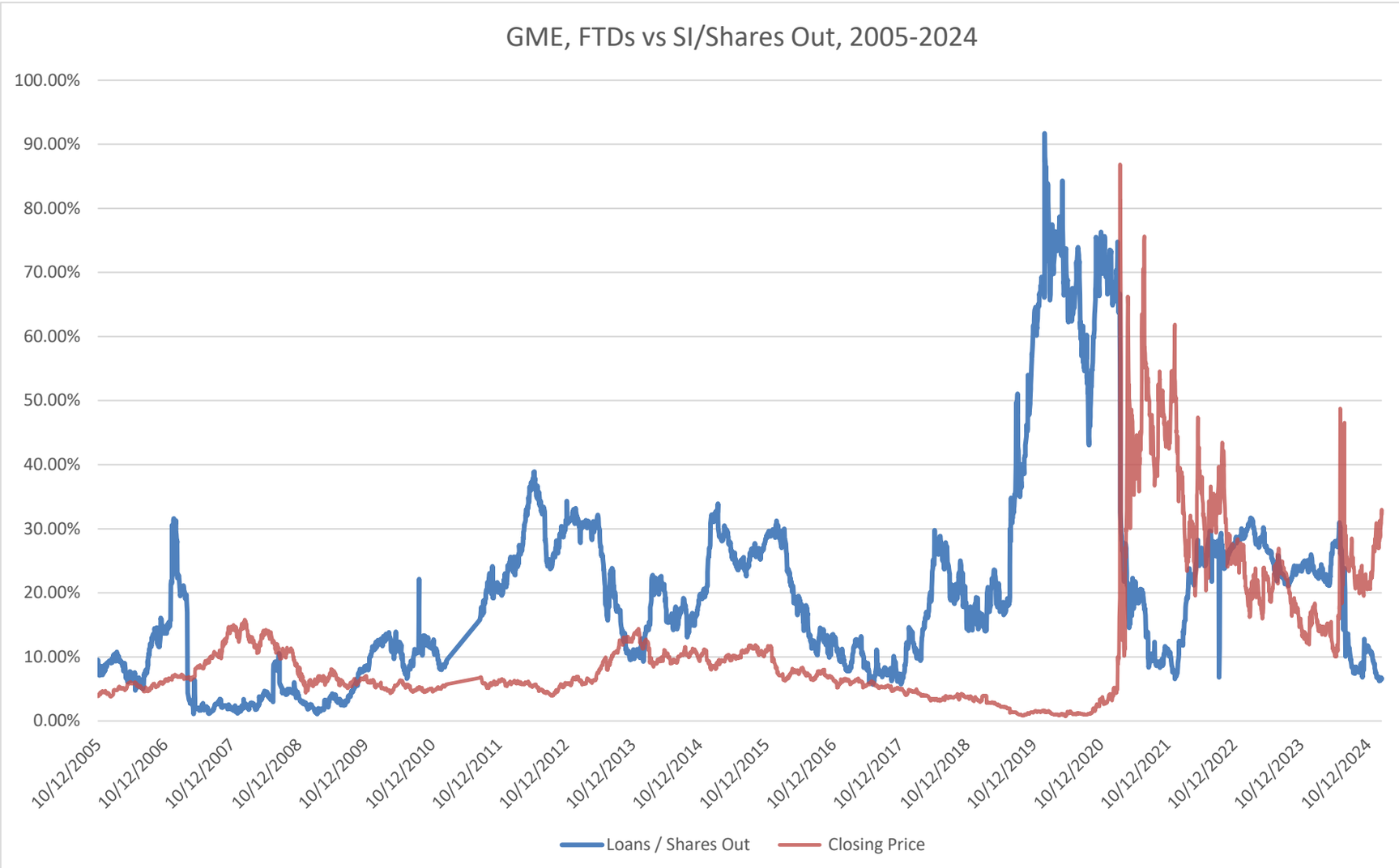
This figure contains daily data for the SPDR S&P Retail ETF (XRT) for the period from 2007 through 2024. The dollar value of daily FTDs is from the SEC FOIA Office. The ratio of shares outstanding is generatied using daily short interest data from FIS and shares outstanding data from Compustat.

Figure 12
GME, FTDs vs SI/Shares Out, 2007-2024



This figure contains daily data for GameStop Corp. (GME) for the period from 2007 through 2024. The dollar value of daily FTDs is from the SEC FOIA Office. The ratio of shares outstanding is generatied using daily short interest data from FIS and shares outstanding data from Compustat.

Figure 13
GME, Price vs SI/Shares Out, 2007-2024



This figure contains daily data for GameStop Corp. (GME) for the period from 2007 through 2024. The dollar value of daily FTDs is from the SEC FOIA Office. The ratio of shares outstanding is generatied using daily short interest data from FIS and shares outstanding data from Compustat.