



A Short Story on Shorting: A New Era for Structuring Trades

Summary

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During January 2021, stocks popular with retail investors experienced extraordinary rallies, resulting in tremendous financial losses for market participants who were short these stocks. The result will be a complete rethinking of how to express short positioning to limit economic risk and visibility to the investing public.

In this paper we examine strategies to express a short bias in specific equities, paying particular attention to the cost-benefit and visibility tradeoff of each method. This introductory note will explore a topic that is outside of our usual subjects of systematic trading and portfolio management.



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Introduction

The noteworthy moves of certain stocks popular with retail investors in January and February 2021 was extraordinary. Some stock prices rallied 200%-1000% in a matter of weeks, lifting their companies' aggregate market capitalizations by tens of billions of dollars. The impetus of these moves has been attributed to public message boards, such as Reddit's wallstreetbets, which provides retail traders a forum to share ideas and opinions about specific stocks.

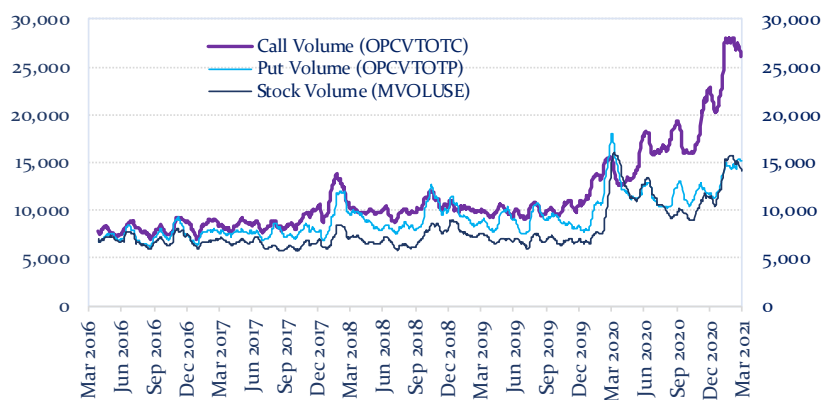
Just as remarkable as the moves in these stocks were the financial losses that accrued to asset managers who were short these names. The entire risk-reward calculus of shorting stocks has likely changed for years. The bar for shorting stocks has also increased as the risk dynamics of short positions are different than those for long positions. This became particularly clear in January 2021. This note is an introductory guide for long-short equity managers that discusses strategies to express short bets, paying particular attention to the costs and benefits of each. We focus not only on the economics of each strategy but also the visibility of these positions to the investing public.

Retail Trading Frenzy

The retail frenzy in equity trading did not begin in 2021. The table was set for increased retail participation in stocks when the largest discount brokers cut their trading commissions to zero in October 2019. Other 2020 factors including market volatility, prevalent work from home, and government stimulus checks finding their way into brokerage accounts resulted in an increase in trading volumes that continued into 2021. This increase in retail trading was not limited only to equities. Single stock equity options saw even larger growth with much of it concentrated on smaller orders. Additionally, this option volume was more pronounced in calls instead of puts.

A recent academic [paper](#) studied retail activity and estimated its pricing implications on these stocks.

Call, Put, and Stock Volume



Stock and option volume increased in 2020 and the beginning of 2021.

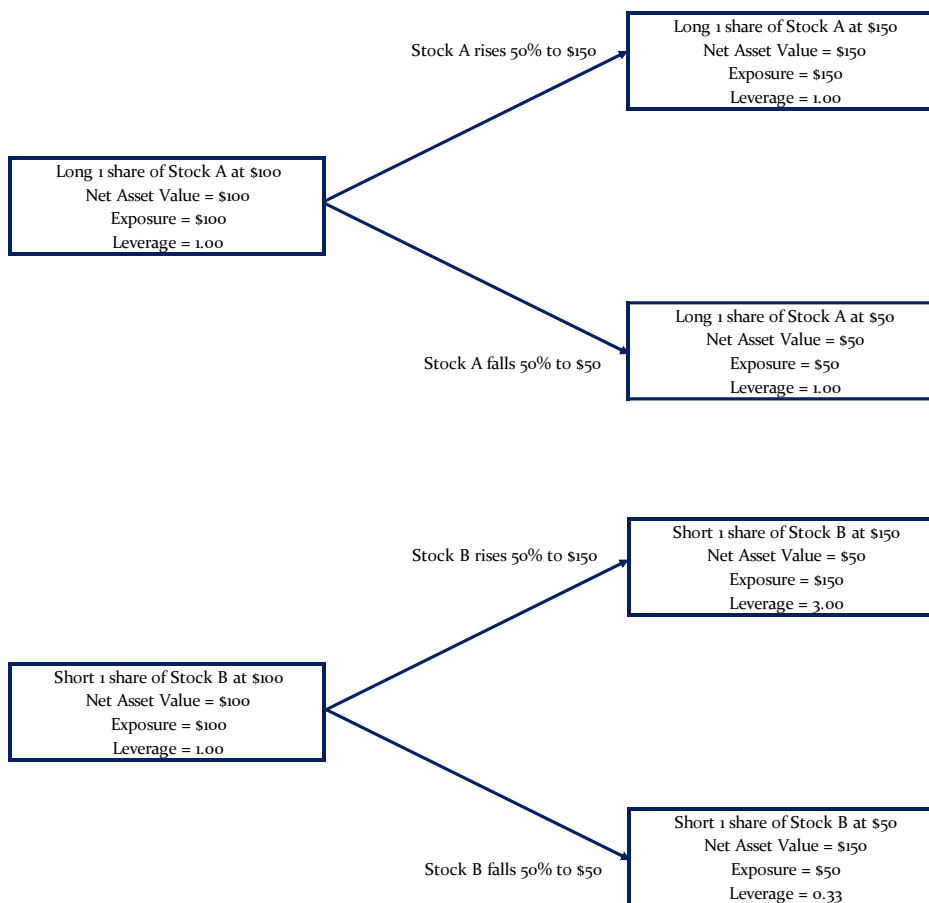
Historically, retail investor order flow and positioning were analyzed for measures of market sentiment. This analysis looked for signals to predict future equity returns based on extreme optimism or pessimism in retail positioning, not because the activity of retail investors could move a particular stock. But January 2021 showed the power of crowdsourcing as it relates to investing. Pooling smaller resources of individuals into a strength that scales is not new; we have seen it on social media (Twitter), video games

(Roblox), and data analysis (Kaggle). In January 2021, equity markets saw the power of this combinatory effect on certain small and mid-cap names as the combined concentrated buying of specific stocks moved prices dramatically. Almost overnight, the scraping of message board data was not being analyzed for sentiment but rather profit and survival, looking for the next company to see its stock price double or triple.

Long-Short Equity Hedge Funds

The institutional asset managers most affected by these large moves were long-short equity hedge funds. Long-short equity hedge funds are typically fundamentally focused, seeking to buy shares of undervalued or underappreciated growth stories while shorting shares of overvalued or over-anticipated prospects. While the long side of these portfolios frequently receives the most attention, the short book is an important tool for hedging the market beta of longs and capturing alpha from these short positions.

Shorting stocks has different risk dynamics than buying stocks as share prices move. Here we look at two simple portfolios, each with only one position. The first portfolio is long 100% of equity in Stock A while the second portfolio is 100% short in Stock B. Let's consider the result of an instantaneous move of 50% on the stock in each portfolio both higher and lower.



Net asset value and asset notional move in tandem for a fully invested long position.

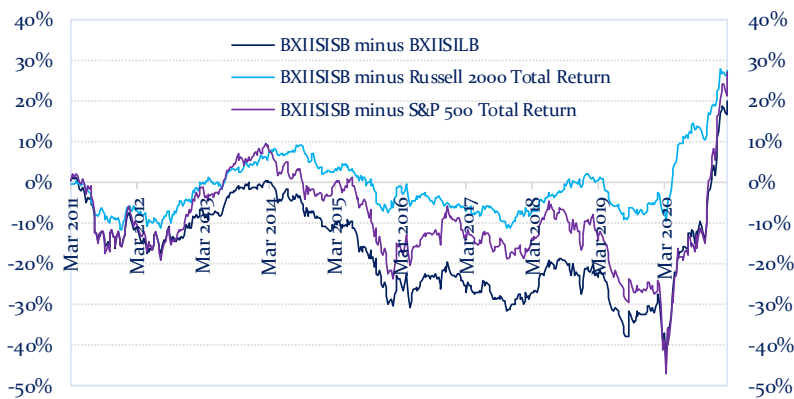
Net asset value and asset notional move in opposite directions for fully invested short positions.

The same 50% move leads to vastly different results for leverage ratios in the case of shorts versus longs. In a fully invested constant share long position, the fund's net asset value equity moves dollar for dollar with the position value, keeping leverage at 1.0 over all scenarios. In a constant share short position, the fund's net asset value moves opposite to notional value of the stock position. That is, a decline in the stock price leads to increased fund net asset values even as the notional value of the stock position is declining. This causes variability in leverage ratios, with lower fund leverage as mark-to-market gains accrue and higher fund leverage with mark-to-market losses.

Imagine what a 200% or 300% stock price increase does to leverage ratios, risk management, and other portfolio characteristics. This is exactly what happened in January 2021 to some long-short equity hedge funds. While not every short position was squeezed to this extent, the rallies in some stocks were large enough that pronounced mark-to-market losses were recorded and the resulting increase in fund leverage led to de-risking. In some cases, managers were required to raise new capital.

Some media reports have even suggested that the message boards focused on stocks with larger short interest in a concerted effort to hasten this unwind cycle. While this narrative reached a crescendo in early 2021, high short interest names outperformed equity benchmarks and low short interest names throughout 2020 as well.

Short Interest Relative Performance



Stocks with larger short interest rallied stronger than broad equity benchmarks in 2020.

Direct and Indirect Visibility of Positions

The investment positions of large institutions are visible to the investing public in several ways. Some disclosures, such as SEC Form 13F, will show the asset manager's positions directly. Other methods, such as short interest, option volume, and open interest statistics are unattributable to the asset manager specifically.

Section 13(f) of the Securities Exchange Act was passed by Congress to provide transparency of holdings of large institutional investors. On a quarterly basis, institutional investment managers must file the Form with the SEC to disclose holdings in US exchange-traded stocks, shares of closed-end investment companies, and exchange-traded funds (ETFs). Certain convertible debt securities, equity options,

and warrants may also be reported if they are on the “Official List” which is published and updated by the SEC shortly after the end of each quarter. Form 13Fs can be accessed by the public at the SEC’s Edgar website (www.sec.gov/edgar.shtml). The general interpretation is that most publicly traded equity positions that are owned by an investment manager would be filed with the SEC in its Form 13F.

While short stock positions would not be filed in Form 13F as they are not “owned” by the asset manager, aggregate short positions can be tracked and analyzed through other publicly available sources: short interest, option volume, and option open interest. Short interest is published twice monthly as each FINRA member is required to report its total short stock positions in customer and proprietary accounts. A large short interest position relative to shares outstanding could be the result of a number of strategies, including: an investment manager shorting shares on expectation of a stock decline, a relative value position to hedge moves in another instrument such as a convertible bond, or a dealer hedging a position in a derivative such as sold puts or total return swaps. Regardless of the reason for short sales, the total short interest of a stock hints if a large number of shares are positioned short to benefit from a decline on a stock. This statistic was a focus in early 2021 as message boards concentrated conversations on stocks with a large amount of short interest.

Short positions can be expressed through other instruments such as purchased puts. Exchange-traded puts would be considered an “owned” position and thus filed in an institutional manager’s Form 13F. Additionally, exchange-listed option volume and exchange-listed option open interest are reported daily by the exchanges and The Options Clearing Corporation, respectfully. When put option volume and put option open interest is outsized relative to history, market participants might speculate that a significant long put position is being purchased in the market – signaling a large short position. While the option volume and open interest statistics are not directly attributable to a specific manager until its Form 13F is disclosed, the information is publicly available and is a tool that can be used to search for short positioning.

Between 13F filings, short interest statistics, option volume, and option open interest statistics, there are sources to determine if, and potentially who, is building a short position in a specific stock. These clues could adversely affect investment managers with short positions if the events of January 2021 repeat.

Structuring Shorts

The losses on short stock positions in January 2021 necessitate changes in short selling strategies. Not only will there be a higher bar for returns to initiate single name shorts, but the need to protect the visibility of positions will become an important consideration for how positions are constructed. In particular, the use of derivatives to limit open-ended investment risk will be a more common discussion. With these structures also come increased costs. Understanding the cost-benefit tradeoff of how to structure short positions will become a more important skill for the long-short hedge fund manager.

This section will focus on ways to structure shorts using shares of common equity as well as equity derivatives. While there are unlimited combinations of derivatives to tailor a payoff to a specific expected stock distribution, this paper will limit instruments to a handful of building blocks that generate high delta-short positions.

We will explore the cost-benefit of each structure not only from an economic perspective but also for visibility to the investing public. Positions that are not explicitly disclosed publicly are preferred to those that are disclosed. However, even if a position is not included on Form 13F, there may be signs of the risk through short interest, option volume, and option open interest statistics. There are tradeoffs among all structures and the optimal choice will depend on the relative need for low visibility, cheapest cost, and level of economic protection to a short squeeze.

Short stock^{1,2}

The simplest method is quite often the best. Short stock will not be directly visible via a manager's Form 13F but will be indirectly visible in aggregate short interest statistics. The delta-one route is the most direct to establish shorts but will leave the manager with unlimited economic risk in the case of a squeeze and with open-ended borrow risk (cost and availability).

¹ We include all delta-one short structures in this category.

² We leave the discussion and estimation of equity market impact to others.

Short stock with a long out-of-the-money exchange-listed call option

The addition of an out-of-the-money call option will limit the open-ended risk of the outright short stock but comes with additional cost from the price of the call option, visibility of the call option from a manager-filed Form 13F, and does not mitigate the borrow risk. Additionally, the volume and open interest of the exchange-listed call will be visible to the market.

Short stock with a long out-of-the-money over the counter (OTC) call option

Replacing the exchange-listed call option with an OTC version will reduce the visibility of the position, but at potentially higher cost and reduced trading flexibility compared to the exchange-listed version. If the dealer selling the OTC call option hedges with listed options, the resulting hedges would be visible to the market through option volume and option open interest reporting.

Long in-the-money exchange-listed put option

Replacing the short stock with a high delta in-the-money put not only limits the economic loss of the short position in the event of squeeze, but also locks in a borrow cost and availability to the maturity of the option. The cost and liquidity of finding market makers willing to price the embedded call options and price and accept the borrow risk to maturity might limit the attractiveness and scale of this structure. Additionally, the put position would be visible via the manager's 13F filing, option volume and open interest statistics, and in short interest statistics via market makers' delta hedges.

Long in-the-money over the counter put option

Replacing the exchange-traded listed put with an OTC version will also limit losses compared to short stock but finding a dealer or dealers willing to price the embedded call option efficiently and to price and take borrow risk could limit the scaling potential of the strategy. Using an over-the-counter put would reduce visibility of Form 13F, but dealers' hedging activity in shares (short interest) and listed options could be visible to the public.

Conclusion

The extraordinary rallies of certain stocks in January 2021 will change the view of short selling. The result will be an increase in the use of derivative strategies that limit the economic risk and visibility of short exposure to the investing public. The choice of a particular structure will depend on the relative trade-offs of visibility, cost, and level of economic protection to a short squeeze. This cost-benefit tradeoff of how to structure short positions will become a more important skill for the long-short equity hedge fund manager.

| Strategy | Visibility to the investing public | Benefit | Tradeoff decision |
|----------------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| Short stock | Indirect; only through aggregate short interest statistics | Cheapest, most direct method to short | Unlimited economic loss profile; manager retains borrow cost and risk |
| With long OTM calls listed | Directly via 13F (calls); indirectly via option volume and open interest | Limits economic loss potential in the event of a short squeeze | Cost of calls; limits of market liquidity; manager retains borrow risk; direct visibility of calls |
| With long OTM calls OTC | Indirect; potentially in option volume and open interest via dealer hedging | Limits economic loss potential in the event of a short squeeze; reduced position visibility | Cost of calls; limits of dealer liquidity; manager retains borrow risk |
| Long ITM puts listed | Directly via 13F | Limits economic loss potential in the event of a short squeeze; transfers borrow risk to the market | Cost of borrow protection; cost of synthetic calls; limits of market liquidity; direct visibility of puts |
| Long ITM puts OTC | Not direct; potentially in option open interest via dealer hedging | Limits economic loss potential in the event of a short squeeze; transfers borrow risk to the dealer | Cost of borrow protection; cost of synthetic calls; limits of dealer liquidity |

Frequently Asked Questions About Form 13F

(excerpted from <https://www.sec.gov/divisions/investment/13ffaq.htm>)

February 24, 2020

What Is Form 13F and Who Files It?

Question 1

Q: What is Form 13F?

A: Form 13F is the reporting form filed by institutional investment managers pursuant to Section 13(f) of the Securities Exchange Act of 1934.

Congress passed Section 13(f) of the Securities Exchange Act in 1975 in order to increase the public availability of information regarding the securities holdings of institutional investors. See Section 13(f) of the Securities Exchange Act. Congress believed that this institutional disclosure program would increase investor confidence in the integrity of the United States securities markets.

Question 2

Q: Who must file Form 13F?

A: Institutional investment managers that use the United States mail (or other means or instrumentality of interstate commerce) in the course of their business and that exercise investment discretion over \$100 million or more in Section 13(f) securities must file Form 13F. See Section 13(f)(1) of the Securities Exchange Act.

Question 3

Q: What is an "institutional investment manager"?

A: See Securities Exchange Act Section 3(a)(9) and Section 13(f)(6)(A).

An institutional investment manager is an entity that either invests in, or buys and sells, securities for its own account. For example, banks, insurance companies, and broker/dealers are institutional investment managers. So are corporations and pension funds that manage their own investment portfolios.

An institutional investment manager is also a natural person or an entity that exercises investment discretion over the account of any other natural person or entity. For example, an investment adviser that manages private accounts, mutual fund assets, or pension plan assets is an institutional investment manager. So is the trust department of a bank.

A trustee is an institutional investment manager, but a natural person who exercises investment discretion over his or her own account is not an institutional investment manager.

Question 7

Q: What are "Section 13(f) securities"?

A: These are securities that may be reported on Form 13F. A list of these securities - called the Official List of Section 13(f) Securities - is available shortly after the end of each calendar quarter on the SEC's website, at <http://www.sec.gov/divisions/investment/13flists.htm>. Section 13(f) securities are equity securities of a class described in Section 13(d)(1) of the Securities Exchange Act. See Section 13(d)(1) of the Securities Exchange Act.

The Official List of Section 13(f) Securities primarily includes U.S. exchange-traded stocks (e.g., NYSE, AMEX, NASDAQ), shares of closed-end investment companies, and shares of exchange-traded funds (ETFs). Certain convertible debt securities, equity options, and warrants are on the Official List and may be reported. But see Section 13(f)(4) (referring to equity securities of a class referred to in Exchange Act section 13(d)(1)) and exemptive rules 12a-4 and 12a-9 under the Exchange Act.

Securities that are not on the Official List should not be reported on Form 13F. See, e.g., Rule 13f-1(c) under the Securities Exchange Act. For example, shares of open-end investment companies, i.e., mutual funds, are not included on the list and, therefore, should not be reported on Form 13F.

Question 8

Q: What information must institutional investment managers report on Form 13F?

A: Among other things, Form 13F filings must include:

the issuer name of all Section 13(f) securities (which should be listed in alphabetical order);
a description of the class of security listed (e.g., common stock, put/call option, class A shares, convertible debenture);
the number of shares owned; and
the fair market value of the securities listed, as of the end of the calendar quarter.

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