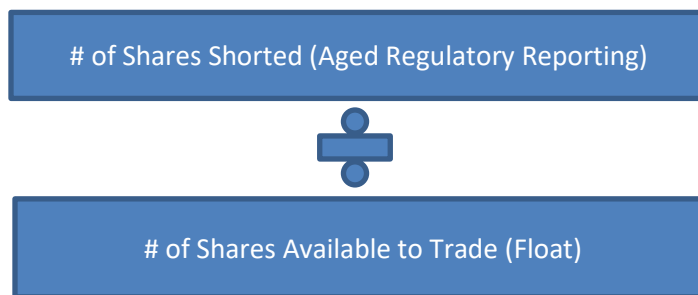




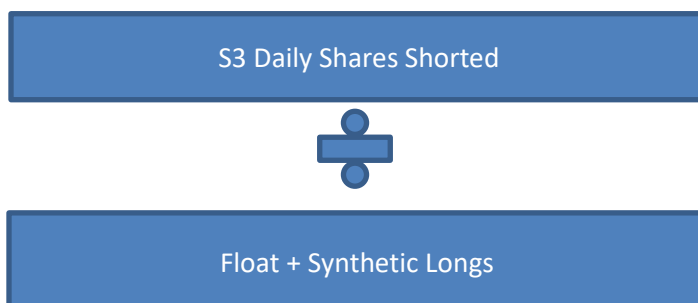
Short Interest as a Percentage of Float is a popular metric used to gage the sentiment or “crowdedness” of short trading in a particular security and the possibility of a future short squeeze. The calculation is the number of shares shorted in a stock divided by the number of shares of a company’s stock that are available to trade.



While the basic premise for this metric has validity, the calculation is flawed because the inputs are flawed. U.S. investors are required to mark their shares shorted and regulators report these aggregated figures twice a month, with approximately a 10 day delay. Float is a readily available figure provided by data vendors but does not accurately represent the number of shares available to trade on a daily basis.

We at S3 calculate Shares Shorted for over 40,000 securities worldwide on a daily basis providing up-to-date short side data which is much more relevant than 10 day old stale data. Using the S3 Shares Shorted number makes the numerator in the SI % Float calculation more accurate.

Using Float as the proxy for shares that are available to be traded on a daily basis misses out on one very important factor in calculating tradable shares. The general definition of float is a company’s outstanding shares less any stock restricted from trading such as insider holdings, IPO lock-ups and other beneficial owners. What is missing are the “synthetic longs” that are created as a result of a short sale which, in some stocks, can be a very significant number and should be added to the denominator.



What are “Synthetic Longs” and why aren’t they included in the classic Float calculation? In order to define what a synthetic long is we need to understand the short selling process.

In its most basic form an investor asks for a locate from their broker\prime broker; the broker\PB determines they can borrow the stock for the short sale and provides the stock locate; the investor can then short the stock; on settlement date the broker\PB borrows the stock from an agency lender\custody bank and settles the short trade by delivering the stock borrow to the stock buyer on the other side of the short sale.

The physical stock movement and participant activities to settle a short trade in AAA stock are:

Institutional beneficial owner is long AAA stock in a lending program or
Retail investor or Hedge Fund is long AAA stock in a margin\rehypothecatable account

Short seller gets a stock borrow locate from their broker\prime broker and executes a short sale in
AAA stock

Long buyer executes a long buy in AAA stock and is the “other side” of the short sale

Agency lender\custody bank or broker\prime broker lends out the original beneficial owner’s AAA
shares to the short seller’s broker\prime broker

Short seller’s broker\prime broker borrows the AAA shares and delivers them to satisfy the short
sale settlement

Long Buyer is now long AAA in their broker\prime broker account

The end result of these stock movements is:

- Beneficial owner is still long AAA stock but has lent out their AAA shares.
 - They still accrue the daily mark-to-market profits\losses due to price fluctuations.
 - They no longer receive direct dividends but receive “manufactured dividend payments” from the broker\prime broker that borrowed their stock.
 - They no longer get to vote their shares since they no longer are in possession of the “stock certificate” they lent out and are not “owners of record”.
 - They are earning stock loan fee income as compensation for lending their shares.
 - They have the ability to sell their AAA stock at any time and recall their stock loan.
- The short seller is now short AAA stock and has borrowed AAA shares.
 - They are accruing daily mark-to-market profits\losses due to price fluctuations.
 - They owe “manufactured dividend payments” to the lender of their stock borrow.
 - They are short so they have no voting participation.
 - They are paying stock borrow fee expense as payment for their stock borrow.
 - They have the ability to buy-to-cover their short position at any time and return their stock borrow.
- The long buyer on the other side of the short sale is now long AAA stock.
 - They are accruing daily mark-to-market profits\losses due to price fluctuations.
 - They receive direct dividends from AAA company.
 - They are able to vote their shares as they are the “owners of record”.
 - They have no knowledge that they were the “other side” of a short sale and are not involved in any way in the stock borrow\loan process.
 - They have the ability to sell their AAA stock at any time and settle their transaction in the normal settlement process.

Before the short sale there was just one long shareholder of AAA stock but after the short sale there are now two long shareholders of AAA stock and one short seller of AAA stock. All three investors have the right and ability to buy and sell their shares at any time so while AAA’s float has not changed, the amount of AAA tradable shares has increased. The short sale has created a “synthetic long” which does not affect AAA’s market capitalization or shareholder structure but has increased the potential tradable quantity of shares in the market.

The issues with the original\classic calculation for Short Interest as a % of Float are twofold, the number in the numerator is stale and the number in the denominator is incomplete. The reason for both these shortcomings is that the investing public has not had access to daily short interest numbers. By providing this short interest data we can calculate the S3 SI % Float and produce a timely and accurate metric to quantify short side market sentiment, qualify the short crowding in a stock and the potential short squeeze possibilities of a stock.

To see the difference between the original SI % calculation and the S3 SI % Float calculation we can look at the difference between the two metrics in the stocks with the highest original SI % Float in the market for equities and ETFs using FactSet’s float numbers in our denominator.

U.S. Equities with Highest Difference in SI % Float vs S3 SI % Float	Ticker	Short Interest	Fee	SI % Float	S3 SI % Float	Difference
SUNPOWER CORP	SPWR	\$370,564,359	0.58%	376.76%	79.03%	297.73%
GAMESTOP CORP	GME	\$651,723,926	32.83%	133.75%	57.22%	76.53%
NATIONAL BEVERAGE CORP	FIZZ	\$501,502,721	1.71%	61.54%	38.09%	23.45%
LIGAND PHARMA	LGND	\$915,824,514	0.70%	61.08%	37.92%	23.16%
BED BATH & BEYOND	BBBY	\$1,053,208,387	1.21%	61.00%	37.89%	23.11%
THE MACERICH COMPANY	MAC	\$553,539,923	6.08%	59.38%	37.26%	22.12%
MALLINCKRODT PLC	MNK	\$55,675,110	27.33%	58.50%	36.91%	21.59%
GOGO INC	GOGO	\$196,147,713	18.58%	54.07%	35.10%	18.97%
TANGER FACTORY OUTLET CENTERS	SKT	\$279,084,148	6.58%	52.50%	34.43%	18.07%
ACCELERATE DIAGNOSTICS	AXDX	\$172,618,726	25.08%	51.62%	34.05%	17.57%

U.S. ETFs with Highest Difference in SI % Float vs S3 SI % Float	Ticker	Short Interest	Fee	SI % Float	S3 SI % Float	Difference
SPDR S&P RETAIL ETF	XRT	\$879,704,162	1.71%	290.28%	74.38%	215.90%
SPDR S&P BIOTECH ETF	XBI	\$5,334,032,824	2.08%	98.19%	49.54%	48.65%
SPDR S&P REGIONAL BANKING ETF	KRE	\$1,026,950,138	0.83%	92.10%	47.94%	44.16%
IPATH SERIES B S&P 500 VIX ST FUT ETN	VXX	\$803,825,298	3.58%	78.27%	43.91%	34.36%
VVECTORS SEMICONDUCTOR ETF	SMH	\$1,957,187,996	0.70%	71.30%	41.62%	29.68%
ISHS MSCI MEXICO ETF	EWV	\$373,680,633	2.33%	57.41%	36.47%	20.94%
ISHS CHINA LARGE CAP ETF	FXI	\$1,164,492,934	1.46%	36.89%	26.95%	9.94%
ISHS RUSSELL 2000 ETF	IWM	\$14,209,568,675	0.83%	36.64%	26.81%	9.83%
SPDR MATERIALS ETF	XLB	\$751,362,383	0.30%	36.07%	26.51%	9.56%
SPIDER S&P OIL & GAS EXP & PROD ETF	XOP	\$624,664,551	0.58%	34.47%	25.63%	8.84%

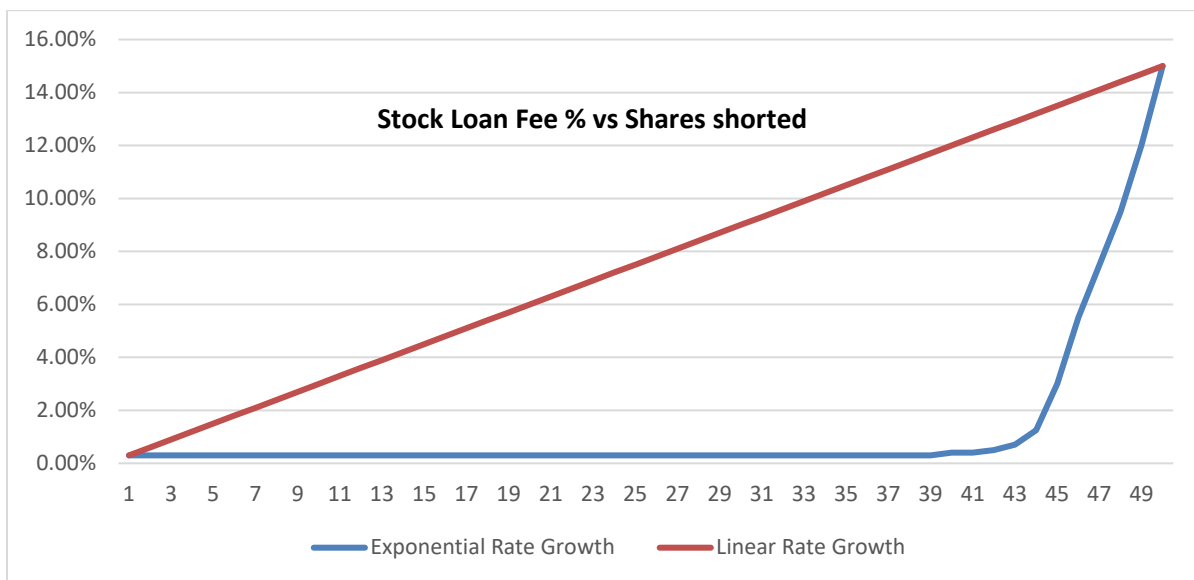
As you can see, the equities and ETFs with SI % Float over 50% become much more reasonable when adding the “synthetic longs” created by short selling into the denominator. While SPWR, GME and XRT still have a S3 SI % Float over 50% they are no longer over 100%.

Logically, it is not possible to get five quarts of milk out of a gallon jug, and it is also not possible to short more shares than exist. But if the jug can expand to 2 gallons, and we add in the “synthetic” longs created by short selling to the stock lending pool, both scenarios are not only possible but also logically acceptable. We no longer need to rely on the skillfulness of magicians

or the nefariousness of “naked short sellers” to explain why the milk pour is overflowing the glass or there is so much short selling in a security relative to its float.

The ability of “synthetic longs” via margin, rehypothecation or lending programs to increase the overall lending pool in a security is why there is more liquidity for short sellers to access. As short selling increases, it in fact increases the ability to get stock locates as long share ownership expands and some of those shares are used in the stock loan market. It is also the reason why stock loan rates do not increase at a linear rate, but rather at an exponential rate as rates stay low until more and more of the “synthetic longs” settle outside margin, rehypothecatable or lending program accounts and no longer expand the lending supply universe.

This also explains why true stock loan based short squeezes are so rare, as short selling in a security increases the lending and keeps stock borrow rates relatively stable or growing at a slower rate for longer than if there was no “synthetic long” lending pool replenishment. But once we reach a tipping point where there is minimal or no replenishment due to new “synthetic longs” stock borrow rates skyrocket; stock locates become harder to get and recalls start hitting the street.



The S3 Short Interest as a Percentage of Float is a metric based on up to date short interest numbers and a truer reflection of shares available to trade on a given day. For mega cap names both numbers are fairly close since the float number or denominator is quite large (AAPL SI % Float is 0.51% & S3 SI % Float is 0.51%; TSLA SI % Float is 7.67% & S3 SI % Float is 7.12%) but for lesser capitalized companies the differences can be substantial.

When looking at a stock such as Gamestop Corp (GME) the SI % of Float is 133.75% while the S3 SI % of Float is 57.22%. A number over 100% is illogical and can only be explained by improper

activity on the short side such as “naked shorting” since there are not enough long shares to supply the stock borrows needed to support the reported short selling activity. But when using the S3 SI % of Float of 57.22% we can make logical conclusions based on a more realistic number.

First, we are nearing the top end of SI % of Float as it is very rare to have more than 60% of Float + Synthetic Longs in a stock’s lending pool. Second, at a 57.22% S3 SI % Float coupled with a logically correlated 33% stock borrow fee we can make the assumption that there is not much stock borrow supply left in the stock and if the S3 SI % of Float increases, rates will increase at an exponential rate on the relatively small amount of new stock borrows that are still available to take down. And third, the chances of a short squeeze in the name is very high. If long lenders or long margined\rehypothecated shareholders sell their stock, there is very little stock borrow to replace the shares being removed from the lending pool.

The S3 SI % of Float provides greater insight into short crowding, stock borrow rate volatility on both the upside and downside and potential short squeeze risk. Both long shareholders and short sellers in a security need to know how potential short activity will affect daily trading liquidity and stock price pressure. If future short selling activity is limited due to lack of borrow supply or short exposure is forced to shrink due to recalls both longs and shorts can act with more accurate market awareness and trade to maximize profits and minimize losses.

Our Blacklight SaaS platform and Black App provides an up to date view of short selling and short covering on an equity, sector, index, or country-wide basis allowing investors\traders to better manage their existing long and short positions.

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