

The long and short of short squeezes

November 2013

Research Signals

This report serves as the first in a series of publications surrounding the phenomenon of short squeezes. We begin the series with an academic approach introducing the concept of short squeezes and the complications surrounding their identification. Next phases will provide advanced analytics beginning with unique investigation of transaction-level data examining the percentage of in/out-of-the-money positions to identify when short sellers retreat. We will then dig deeper into events related to short squeezes, such as earnings or other corporate announcements, to better understand their impact on market participants with the ultimate goal to construct a systematic way of identifying short squeezes before they occur. To open up the series and set the foundation for the subsequent presentations, in this report we lay out our detailed definition of a short squeeze and the characteristics of such events with fine points demonstrated by names such as Netflix and Deckers Outdoor. While the resulting collection of short squeeze events is not expansive enough to offset the benefits to short selling, it provides useful underpinnings to enhance the toolsets of both long and short investors. Attribution analysis around the set of names in our base universe reveals expected exposures to high volatility, overvalued names; however, we also identify that short squeezes tend to be biased to small, illiquid stocks.

Introduction

Short selling refers to the sale of a security that the seller does not own, where the delivered security is borrowed by the short seller. The intention is to buy the security at a lower price than that at which the security was sold short. When the price of the security rises, the short seller can incur significant losses as the downside potential due to a price rise is unlimited.

In order to lock-in a profit, or avoid further losses (where the price of the security has gone up), short sellers need to cover a short position. This involves buying securities in the market and returning the borrowed stock to the lender. The short seller may also be forced to cover positions due to failure to meet a margin call or when the security lender recalls the stock. The resulting buying pressure can drive prices higher in a phenomenon known as a short squeeze. According to the Securities Exchange Commission ([SEC](#))

The term “short squeeze” refers to the pressure on short sellers to cover their positions as a result of sharp price increases or difficulty in borrowing the security the sellers are short. The rush by short sellers to cover produces additional upward pressure on the price of the stock, which then can cause an even greater squeeze.

While fears of a short squeeze may act as a constraint on short sale activity, particularly in the event of manipulative short squeezes by original buyers who would benefit from inflated prices, the role of short sellers is considered a vital market practice to keep stock prices in-line with fair value. Indeed, the SEC goes on to state that

Contacts

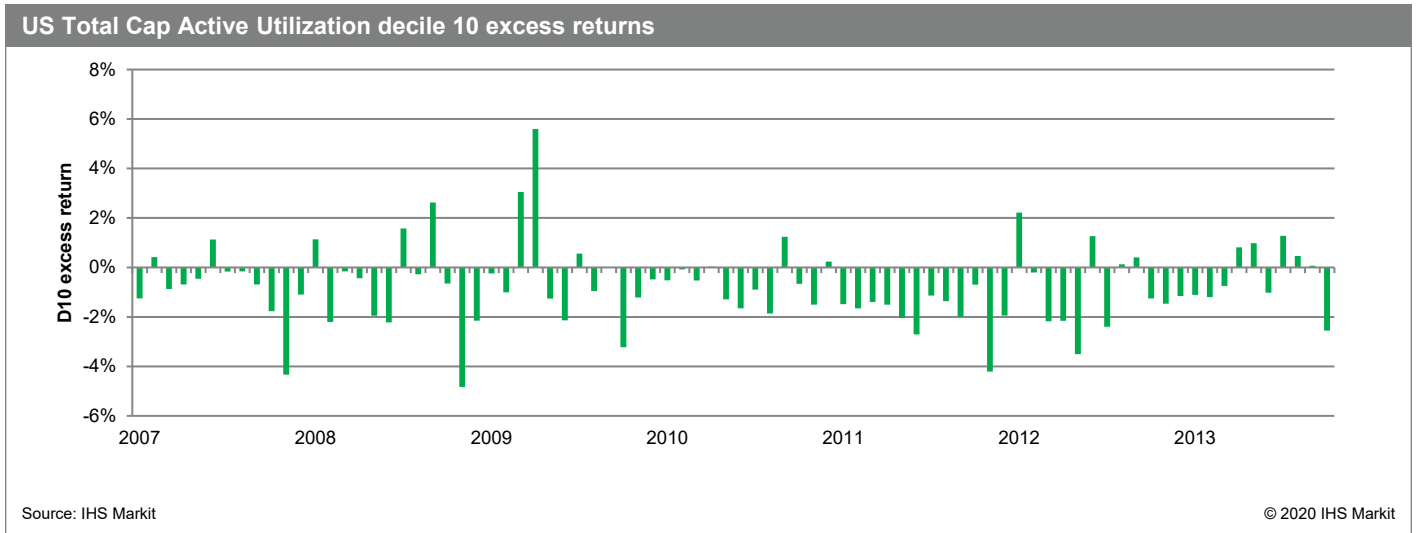
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Although some short squeezes may occur naturally in the market, a scheme to manipulate the price or availability of stock in order to cause a short squeeze is illegal.

In the end, short sellers are considered well informed investors who have the ability to identify overvalued stocks. To be sure, utilizing the Research Signals Short Sentiment factor suite (Shining the Light on Short Interest October 2012), we confirm positive return spreads to measures gauging short sale positioning.

For example, we highlight Active Utilization which represents the percentage of shares currently lent by custodians relative to the amount of stock in their lendable inventory pool. A high score means that a large amount of the company's lendable inventory is out on loan and generally reflects a negative sentiment. Since January 2007, this indicator has recorded an average monthly long-short decile return spread of 1.04% (12.48% annualized) in the US Total Cap universe indicating a negative relationship between high levels of short interest and subsequent return. Focusing on bottom ranked decile 10 names (Figure 1), where we expect relative poor performance given that it consists of stocks with the highest level of Active Utilization, we observe average monthly underperformance of -0.78% with a hit rate (percent of months with underperformance) of 74% and acting as a key driver of results.

Figure 1



We confirm that short selling is an integral component to the dynamics of the markets as investors continually execute trades in an effort to move stocks toward fair value. Thus, having set the stage for the benefits of information gleaned from the securities lending market, we focus on short squeezes, a well-known constraint to short sellers which work against expectations in the extremes, to better understand their implications for both long and short investors. In the remainder of this report which sets the foundation for our subsequent presentations, we introduce our detailed systematic definition of short squeezes, highlight a couple of names which exemplify the phenomenon and summarize general characteristics of stocks satisfying this definition.

Literature review

The term 'short squeeze' is used loosely in the media, while the prevalence of the phenomenon is certainly a debatable topic. Clunie et al. (2007) test for the frequency and nature of short squeezes and contest the belief that short sellers are subject to common and predictable short squeezes. Their results indicate that short squeezes, based on their definition, do not occur as frequently as commonly cited and largely affect smaller capitalization and relatively illiquid stocks.

However, losses associated with the events are statistically significant but not very large and are subsequently followed by a reversal of approximately the same magnitude.

Xu and Liu (2013) focus their study on the price impact of short squeezes. As the recall of shares by stock lenders is unlikely to have a price impact since it is a borrower-specific event and is thus unlikely to create a surge in demand for the stock, they concentrate on squeezes caused by a sharp price increase which affects all short sellers, particularly those squeezes coupled with binding capital and short sale constraints. They find that, after adjusting for risk, heavily shorted stocks which experience a sudden one-day price jump are predisposed to a price reversal whose magnitude is positively correlated with the level of short interest. Furthermore, short squeezes are more severe when combined with large market- and industry-wide returns or high institutional holdings.

Data and methodology

While mathematically only the negative of the other, short and long sales have several distinct market exposures. The most obvious is the risk of unlimited downside loss to short sellers. However, this risk is only theoretical in that short sellers are required to post margin or collateral to cover losses and, in the worst case scenario must cover the short. Yet, this leads to another risk peculiar only to short sellers, namely short squeezes, which is a forced or voluntary covering of a short position due to rising losses. Short squeezes are ultimately caused by capital constraints or lack of inventory in lendable shares, though the former is the more likely scenario.

Short squeezes are widely cited constraints on short sales, but their actual occurrence is a debatable subject. One such issue arises from general informed market trading activity which can easily be misconstrued as a short squeeze. As such, there is a clear need to identify specific characteristics to isolate their existence. However, many differing definitions are utilized in practice, forcing the need for a systematic identification process.

Thus, we outline the following steps in our definition of a short squeeze to systematically isolate their occurrence:

Pre-squeeze: The first requirement of a short squeeze is that short sellers have significant positions in the stock. We identify highly shorted names as those securities ranked in the bottom quintile of Demand Supply Ratio and Implied Loan Rate. Demand Supply Ratio categorizes stocks that are heavily borrowed in the market relative to the lendable inventory of that stock and Implied Loan Rate measures the cost of borrowing which is indicative of the shorting flow. Stocks are ranked in a percentile form (1- 100) on a relative basis by universe. Those securities having the best (worst) factor scores are assigned a 1 (100). Therefore, the closer a rank is to 1 (100), the more (less) prominent is the investment style for that stock.

For robustness, we also apply IHS Markit Securities Finance's proprietary algorithm to filter out positions associated with corporate actions. One well-documented bias in securities lending data is related to dividend activity. Raw securities lending information is affected by this phenomenon and we take special care to remove any bias. The execution of such a transaction ultimately results in a gradual increase in the demand (and cost) to borrow a stock around the dividend record date as firms hedge the associated market risk. This clouds the ability to detect negative sentiment around company prospects. For example, it is prevalent in European stocks as taxation policy there is highly fragmented.

Short Squeeze: The next characteristic of a short squeeze is an abnormal positive return. We identify situations where a stock's price increases significantly as a 3-standard-deviation increase relative to the prior 60 trading days over a 3-day period. We use three days as we know that a surge in price could be staggered and last for a few days depending on the news announcement and the degree of positive sentiment. Also, stock recalls are settled in the same way as stock purchases (i.e., borrowers have 3 business days to return the stock).

Post-squeeze: In a short squeeze, we expect the price increase to be accompanied by a decrease in shorts. This indicates that the short covering is driving the price up. Our definition is that the short loan quantity should decrease by at least 5% over the next five trading days.

We draw attention to several points of interest related to our definition. First, we use Demand Supply Ratio and Implied Loan Rate Short Sentiment indicators rather than the more familiar Short Interest in identifying squeeze candidates. Short squeezes are caused by demand and supply imbalances and both Demand Supply Ratio and Implied Loan Rate, which are unique to our factor library, help identify these disparities. To capture this intuition, we focus on the bottom quintile of Demand Supply Ratio that is found to drive short signal performance historically. To further determine whether shorting demand or the lack of inventory in lendable shares contributes to potential short squeezes, we have found differences in the overlap between Demand Supply Ratio and Short Interest (shorting demand) bottom quintile ranks on average, which suggests that constituents are not common between the two groups. Significant differences in Lending Supply (proxy for institutional ownership) further indicate that the incorporation of lendable inventory, unique to our Demand Supply Ratio metric, is a key differentiator, and can be instrumental in gauging the relative extent of negative sentiment in the market (see Short Suppliers: Does the Difference Matter? April 2013).

Second, one notable exclusion from our short squeeze definition is the requirement for a price reversal. Prior research has cited that short squeezes are often followed by a reversion in share price. The claim is that prices of securities that are short squeezed and experience a large return tend to revert to their fundamental value once the squeeze is over; whereas, the prices of securities that experience a large return but are not short squeezed do not revert. However, another possible explanation is that stocks that experience large returns are typically followed by a reversal that partially offsets the original change, and this is construed as a behavioral bias caused by investors who tend to overreact to news. Thus, researchers are left with apparent short squeezes that are independent of publicly available news and company-specific information.

To avoid such misclassifications, our study does not consider a price reversal and includes any plausible short squeeze that is caused by news announcements, e.g., FDA approvals, mergers and acquisitions, earnings surprises, corporate results, share buyback announcements, change of directors, etc. By including any situation where there has been a news announcement followed by a short squeeze, we do not expect prices to revert as some news related information might have had a long term directional impact on an individual security.

Examples

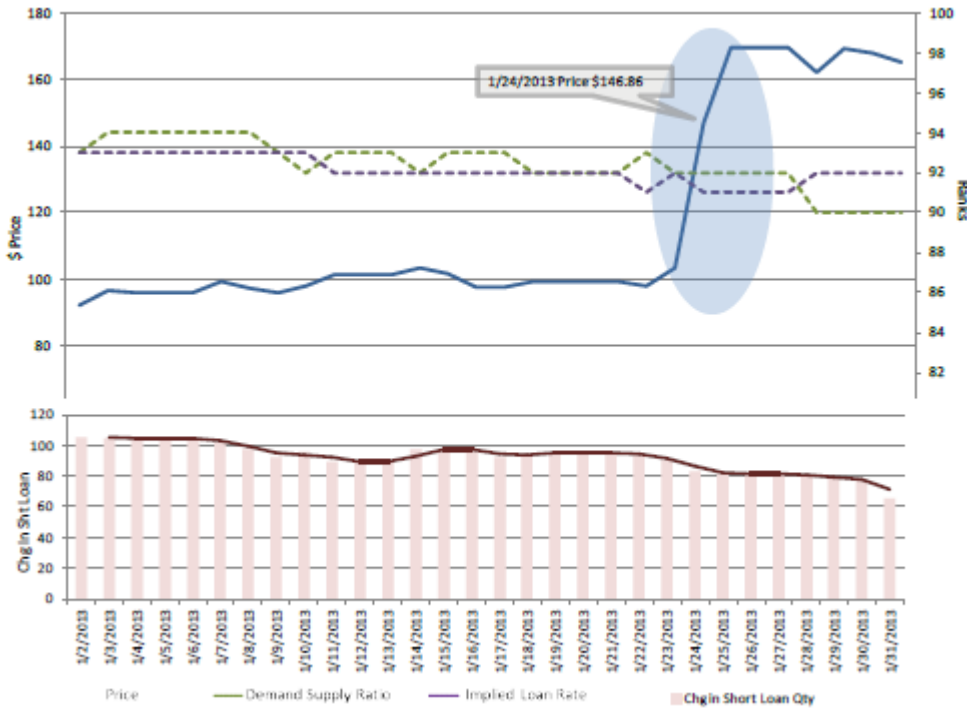
With the above short squeeze definition in place, we now highlight two recent examples, Netflix and Deckers Outdoor, whose trading activity was identified by our filter in 2013.

Netflix, Inc.

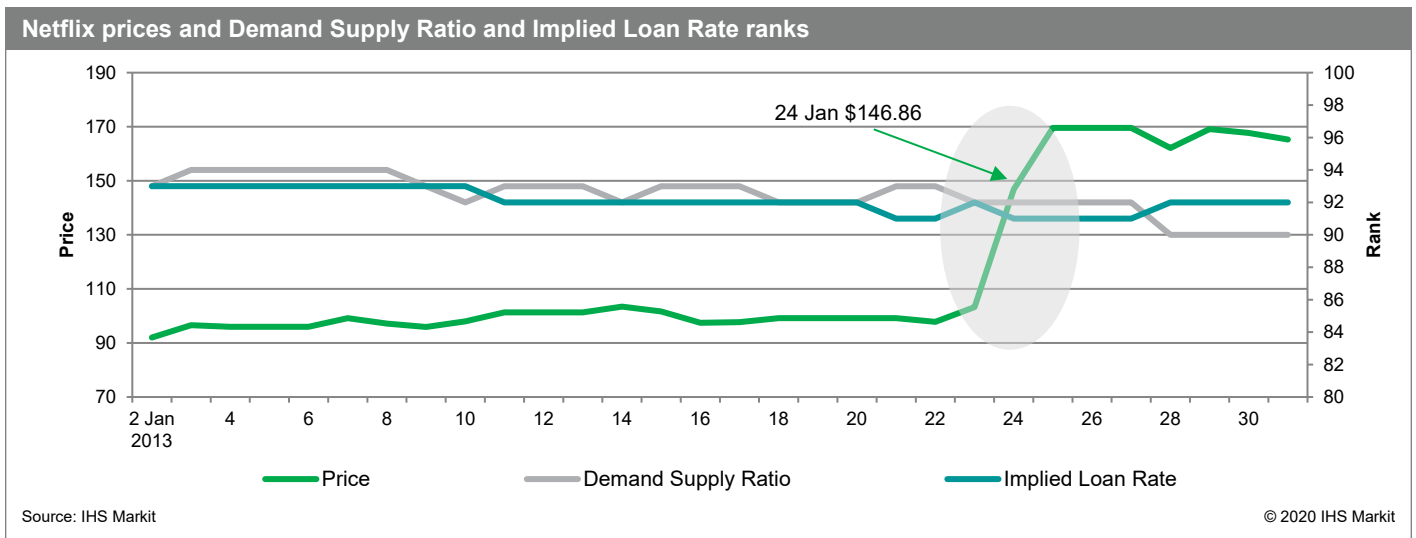
Netflix, a provider of streaming television shows and movies, had its original IPO in 2002 and has since been notorious for its large price swings. For the year, it has seen its stock price rally nearly 250% (as of 31 October) as business has expanded significantly based on new subscribers and expanded regional coverage. However, apprehension abounds as investors recall the stock plunge in 2004 marked by a price decline well in excess of 50% and the 2011 price drop from approximately \$300 to \$60 in less than five months on their unsuccessful price increase which cost them nearly a million subscribers.

Given this history and potential risks from competitors such as Amazon Prime and Hulu Plus, Netflix was a highly shorted name, ranking in the bottom decile of both Demand Supply Ratio and Implied Loan Rate at the start of the year. Yet, on 24 January, the company announced an earnings surprise that resulted in a 3-day price jump from \$99.17 to \$146.86 which resulted in a short squeeze event and sustained elevated prices. Furthermore, in the subsequent 5-day period, stock loan quantity decreased by 21%.

Figure 2



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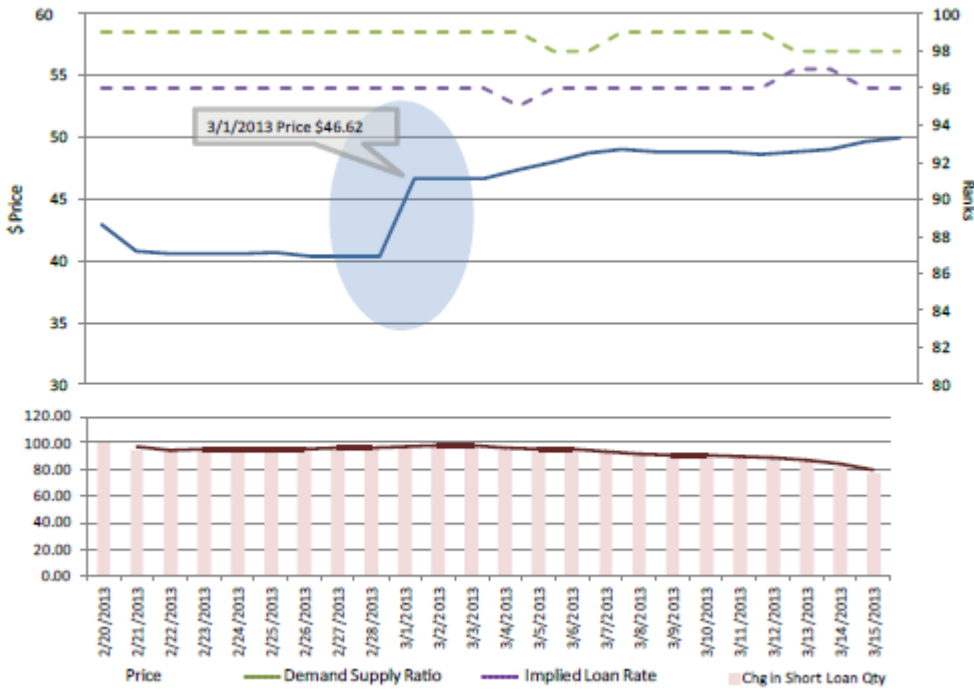
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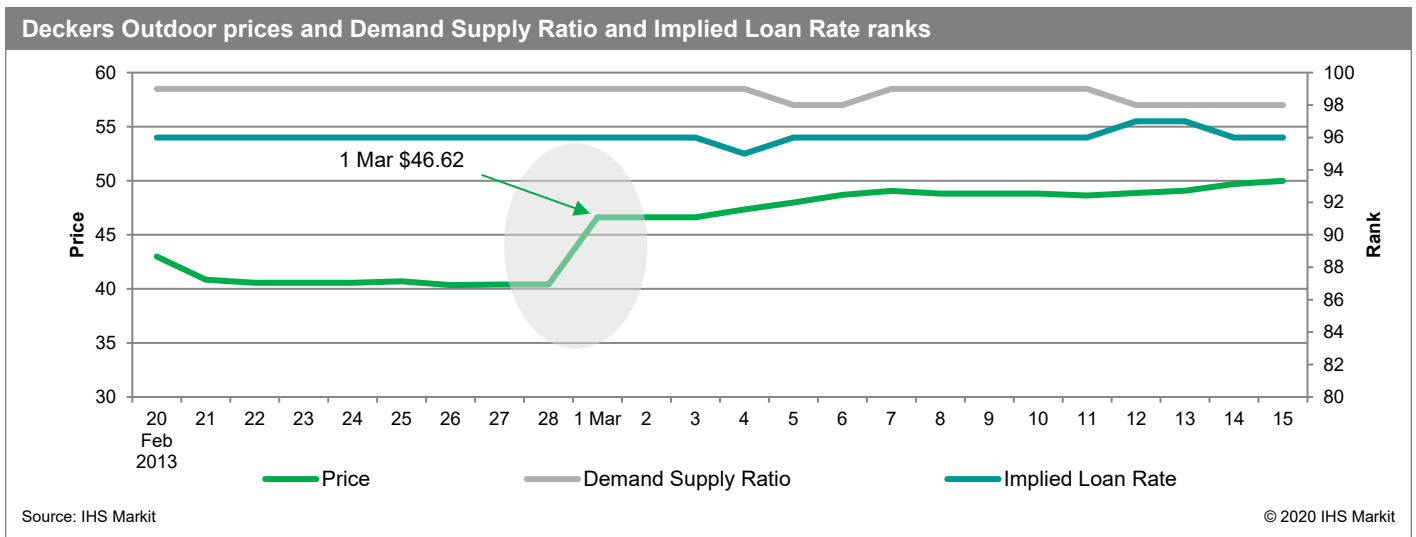
Deckers Outdoor Corp.

Deckers Outdoor, a well-known shoes and apparel retailer, has been a favorite for shorts over fears that its brands, particularly UGG, are considered a fad. The stock price has been volatile over the last two years as it peaked near \$120 in late-2011, fell to under \$30 a year later and more than doubled since then, in anticipation of the long-promised turnaround. As a case in point, on 1 March, Deckers Outdoor announced a positive earnings surprise. While still down year over year, investors rewarded the earnings surprise derived particularly from share repurchases, by pushing the stock price from \$40.35 to \$46.62 in three days, while the stock loan quantity decreased by 7% in the following five days.

Figure 3



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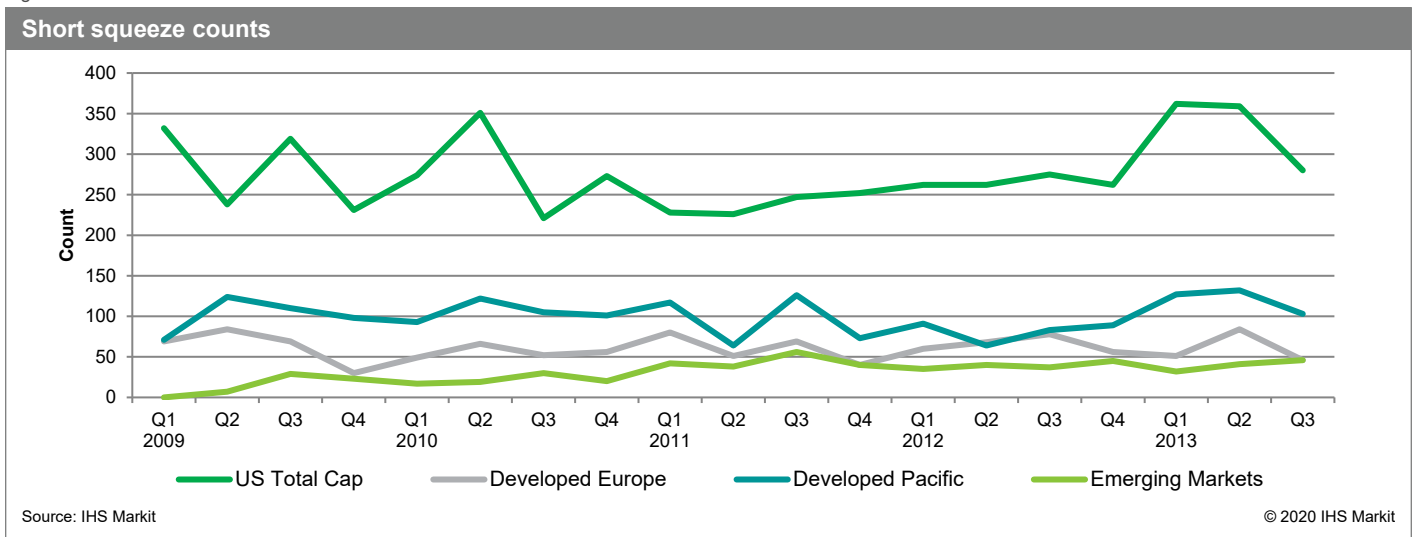
Universe profile

Next, we provide broader characteristics of the universe of stocks which satisfy our short squeeze definition. We present a time series of counts for the number of occurrences of short squeeze events over several regions including US Total Cap, Developed Europe, Developed Pacific and Emerging Markets (Figure 4). Recall that US Total Cap represents 98% of cumulative market cap comprised of approximately 3000 names. The global universes are constructed to represent 95% of cumulative free float market cap of each member country, subject to \$250 million and \$100 million market cap minimums for developed and emerging market securities, respectively. Developed Europe and

Pacific comprise approximately 1800 names while Emerging Markets is approximately 2300, though its coverage is more limited due to availability of Short Sentiment indicators utilized in the short squeeze definition.

The counts are aggregated by quarter to remove the seasonality associated with quarterly earnings announcements which are a common event triggering short squeezes. We further remark that duplicate names may show up in the same quarter, though such occurrences are indeed distinct as we require at least a 5-day time span between events to guaranty that we are capturing new trading activity.

Figure 4

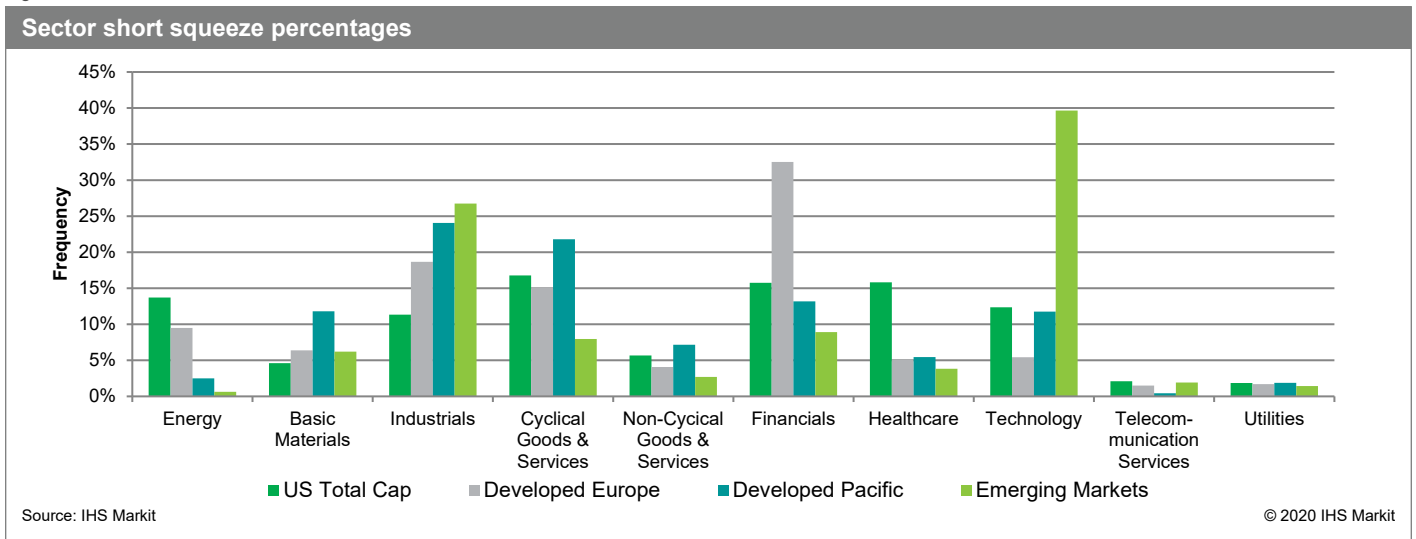


We observe a slight upward trend in the number of short squeezes in Emerging Markets before stabilizing at the end of 2011, while Europe and Asia-Pacific counts tend to fluctuate around the average over the analysis period.

US short squeezes were relatively steadier with a slight upward trend from 2011 through 2012 before picking back up again in 2013. We also note that, in general, the occurrence of short squeezes was higher in the US relative to universe size versus other regions. This is due in part to bans in other regions as well as less frequent shorting activity in Developed Pacific and especially Emerging Markets where shorts are more difficult to implement.

We further breakout the short squeeze counts by sector. Figure 5 displays the percent of short squeezes that occur in each sector by region over the analysis period. In the US and Developed Pacific, short squeezes are fairly evenly distributed across sectors based on respective sizes. Developed Europe recorded the highest frequency of short squeezes (33%) in Financials, though this sector represented approximately 25% of names, partially related to short sale bans on this sector. Emerging Markets short squeezes were clustered in Technology (40%) which represented just under 10% of names in the universe but a favorite among short sellers.

Figure 5



Lastly, we present general attributes of firms that experienced short squeezes. Table 1 summarizes average exposures to several traditional factors including:

- Size - Positive exposure implies bias to large capitalization
- Beta - Positive exposure implies bias to high beta
- Price-to-Earnings - Positive exposure implies bias to overvalued stocks
- Liquidity - Positive exposure implies bias to high liquidity
- Volatility - Positive exposure implies bias to high volatility
- Earnings Revisions - Positive exposure implies bias to positive revisions

The exposures are based on bottom-up analysis of underlying factor scores relative to the respective universe at the time of the short squeeze. As expected, short squeezes are associated with high beta names with increased volatility that are trading at high multiples. We also observe a bias to smaller, illiquid names. Finally, we note that stocks that experience short squeezes tend to have recent negative revisions, which is consistent with negative sentiment that gets caught by unexpected upward price spikes.

Table 1

Average short squeeze exposures relative to the full universe, Jan 2009 – Oct 2013				
	US Total Cap	Developed Europe	Developed Pacific	Emerging Markets
Size	-	-		
Beta	+		+	++
Price-to-Earnings	++	+	+	++
Liquidity	-	-		+
Volatility	+++	+	++	+++
Earnings Revisions	-	-		-

Source: IHS Markit

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To further distinguish the attributes associated with short squeezes, we also present the same exposures relative to the universe of highly shorted names as identified by the bottom quintile of our Short Interest factor. Table 2 presents the results. While exposures for squeezes are similar to those of highly shorted names, some enhanced biases are revealed within the short squeeze subset. In general, we observe expanded exposures to small cap names with increased volatility. Furthermore, US Total Cap and Emerging Markets short squeezes are further exposed to overvaluation, while US Total Cap and Developed Europe short squeezes are much more illiquid relative to the highly shorted universe.

Table 2

Average short squeeze exposures relative to highly shorted names, Jan 2009 – Oct 2013				
	US Total Cap	Developed Europe	Developed Pacific	Emerging Markets
Size	-	--		-
Beta				
Price-to-Earnings	+			+
Liquidity	---	---		
Volatility	++		+	++
Earnings Revisions				

Source: IHS Markit

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Conclusion

In this report we begin a series of publications surrounding the phenomenon of short squeezes. Beginning with an introduction to the concept of short squeezes, our presentations will delve into transaction-level data to identify when short sellers retreat and finally dig deeper into events related to short squeezes to better understand their impact on market participants with the ultimate goal to construct a systematic investment process utilizing our research.

Short selling refers to the sale of a security that the seller does not own, where the delivered security is borrowed by the short seller. The intention is to buy the security at a lower price than that at which the security was sold short. When the price of the security rises, the short seller can incur significant losses as the downside potential due to a price rise is unlimited, giving rise to a risk peculiar only to short sellers, namely short squeezes, which is a forced or voluntary covering of a short position due to rising losses.

Given the complications surrounding its identification that result in varying and loose use of the term, we begin by laying out our systematic definition of a short squeeze which addresses these issues. The conditions that we require for a squeeze include a sudden spike in price (3 standard deviation move relative to the prior 60 trading days) followed by a decrease in the shares on loan (over 5 consecutive days), for names with insufficient supply of shares and high borrowing costs in the securities lending market (bottom decile of Demand Supply Ratio and Implied Loan Rate). We are also careful to filter out activity related to corporate actions such as dividends which may affect the demand for borrowing shares.

With this definition in place, we highlight names which have recently experienced a short squeeze as identified by our methodology. For example, we underscore Netflix, a highly shorted name given its history of large price swings and potential business risks. On 24 January, the company announced an earnings surprise that resulted in a 3-day price jump from \$99.17 to \$146.86 which resulted in a short squeeze event and sustained elevated prices. Furthermore, in the subsequent 5-day period, the quantity of shares on load decreased by 21%.

We round out the analysis with a summary of the characteristics of stocks satisfying our definition. A higher frequency of short squeezes occurs in the US, and high concentrations are detected in Developed Europe Financials and Emerging

Markets Technology sectors. We further identify that short squeezes are focused on high volatility, overpriced names as expected, but also with a bias to small illiquid stocks.

References

Clunie, J., P. Moles and N. Terekhova (2007). “Anatomy of Short Squeezes”, working paper.

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