LikeFolio

Purchase Intent
Predicts Stock Performance

LikeFolio Purchase Intent Strategies Performance Report

TABLE OF CONTENTS
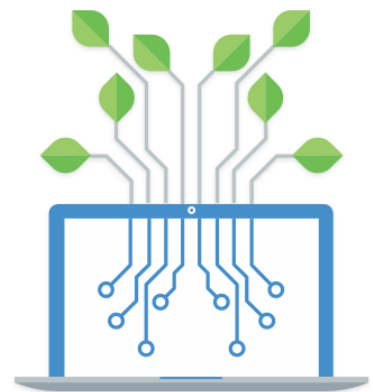
LIKEFOLIO OVERVIEW

LikeFolio analyzes social media data from Twitter to spot shifts and trends in consumer spending behavior on Main Street before it becomes news on Wall Street.

LikeFolio applies its proprietary Brand to Company Database (Appendix I) to the full firehose of Twitter data (Appendix II) to capture and analyze tweets by consumers about the brands and products owned by publicly traded companies. Each tweet is scored on four primary metrics: brand mention, positive sentiment, negative sentiment, and **purchase intent**.

This study focuses solely on the Purchase Intent metric.

PURCHASE INTENT (PI) METRIC & SIGNAL CALCULATION

PURCHASE INTENT (PI) METRIC DEFINITION & EXAMPLES

Purchase Intent Mentions are tweets that indicate the author has either just spent money on the product or is planning to spend money on the product in the near future.

EXAMPLES

"I JUST GOT MY NEW IPHONE"	"RESERVATIONS TONIGHT AT OLIVE GARDEN, CAN'T WAIT!"	"HEADED TO THE MALL TO CHECK OUT THE NEW JORDANS"
"WHY DOES SOUTHWEST MAKE US STAND IN LINE TO BOARD THE PLANE?"	"I CAN'T STOP DRINKING LACROIX"	

A Georgetown University study by Vicki Wei Tang concluded that the LikeFolio Purchase Intent Metric is not only predictive of a company's upcoming sales, but also can account for the unexpected component of sales growth that analysts miss (Appendix III).

Purchase Intent mentions were chosen for this study, in part, because of this conclusion.

PURCHASE INTENT SIGNAL CALCULATION

LikeFolio's Purchase Intent Signal is a score given to a stock based on the change in the 90-day moving average of its purchase intent mention volume minus the change in the 90-day moving average of its stock price.

$$Purchase\ Intent\ Signal = \Delta PI_{90d} - \Delta Stock_{90d}$$

If subtracting $\Delta Stock_{90d}$ from ΔPI_{90d} causes the Signal to flip from bullish to bearish or bearish to bullish, we instead treat it like neutral signal / no-signal.

To correct for business seasonality, the signal is invalidated if the direction of PI mention volume on a quarter over quarter basis (ΔPI_{90d}) is opposite of the direction of PI mention volume on a year over year basis (ΔPI_{1y})

Please see Appendix IV for more detail and examples of the Purchase Intent Signal calculation method.

Thresholds are used to adjust how selective the strategy is. A higher threshold requires a greater Purchase Intent Signal in order to trigger an entry. For more detail, see Appendix V Threshold Application.

TRADING STRATEGIES UTILIZING LIKEFOLIO PI SIGNAL

Each of the following strategies utilizes the LikeFolio Purchase Intent Signal to determine the entry and exit of individual equity positions.

Performance of each strategy is calculated using various thresholds of Purchase Intent Signal – the higher the threshold, the larger the PI Signal must be to initiate a new position. See Appendix VI for information regarding the Annualized Return on Investment (ROI) calculation.

KEY TAKEAWAY:
ACROSS ALL STRATEGIES, THE STRONGER THE PI SIGNAL, THE MORE PROFITABLE THE TRADE IS EXPECTED TO BE. This suggests that more dynamic strategies will produce the better results with less holding time / risk exposure.

DATA SET USED FOR PERFORMANCE EVALUATION:
Jan. 1, 2012 to Dec 31, 2017

ELIGIBLE COMPONENTS:
Stocks listed in the LikeFolio Coverage List (Appendix VII)

ASSUMED TRANSACTION COST:
$0

EARNINGS TRADING STRATEGY

DESCRIPTION:

Uses the Purchase Intent Signal to initiate trades entered on the last day of the fiscal quarter and exited on the first trading day after the company's earnings announcement.

METHOD:

On the last trading day of the fiscal quarter, if the Purchase Intent Signal is positive and above the threshold, the stock is bought at the closing bell. If the Purchase Intent Signal is negative and below the threshold, the stock is shorted. The position is exited at the closing price on the first trading day after the company's earnings report.

RESULTS:

	0% Threshold	25% Threshold	50% Threshold
Number of Signals Generated	1,739	764	241
Percentage Winners	53.4%	54.7%	59.3%
Average Gain per Trade	+1.54%	+2.18%	+3.58%
Avg Gain per Trade: Long only	+2.44%	+2.88%	+3.49%
Avg Gain per Trade: Short only	+0.27%	+1.11%	+3.83%

The Earnings Trading Strategy produced increasing gains per trade as the threshold for signal increased and was most effective when signaling an earnings miss with strong signal.
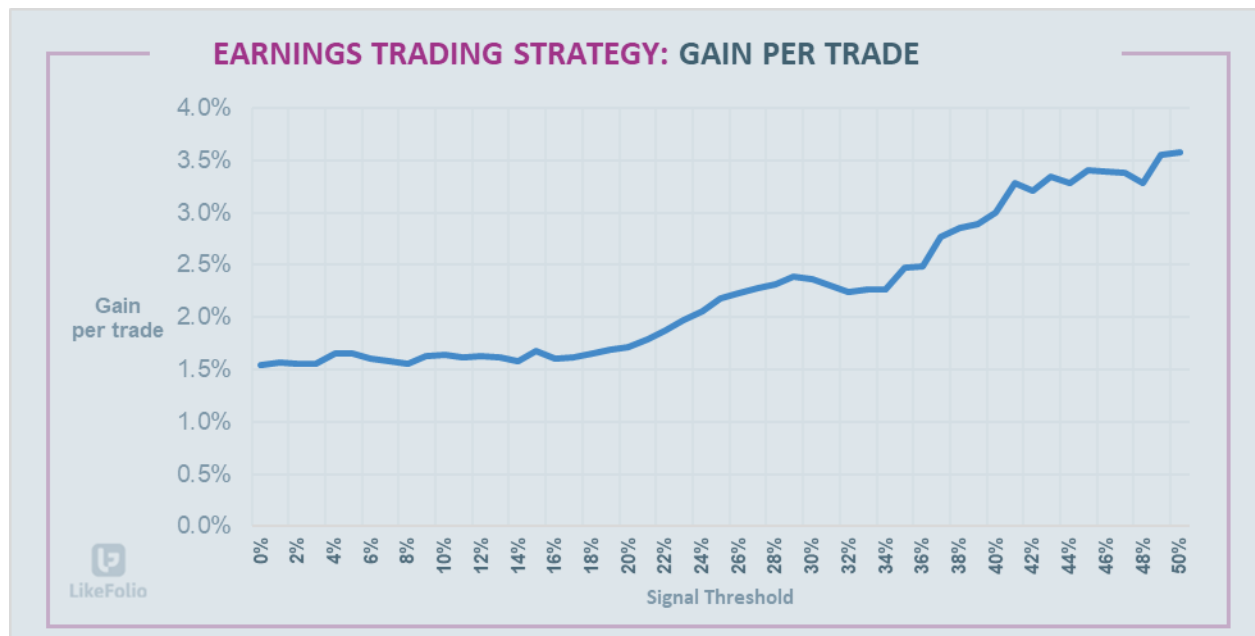
ACTIVE TRADING STRATEGIES

ACTIVE TRADING: LONG ONLY

DESCRIPTION:
Uses the Purchase Intent Signal to initiate and exit trades on any trading day, with no minimum or maximum duration. Only bullish signals are used for entry.

METHOD:

Each day the Purchase Intent Signal is calculated. If it is positive and above the threshold, the strategy initiates a buy at the market close price of the following trading day. If the signal is negative, no trade is initiated. After entry, if the PI signal continues to be bullish and above threshold, the position is held. If the PI signal falls below the threshold, the position is exited to a neutral position.

RESULTS:

	0% Threshold	25% Threshold	50% Threshold
Number of Trades	3,215	1,959	831
Percentage Winners	62.2%	60.9%	58.8%
Annualized ROI	+30.1%	+37.5%	+39.6%

Outperformed SPY (+18.7%) on an annualized basis during the same period.
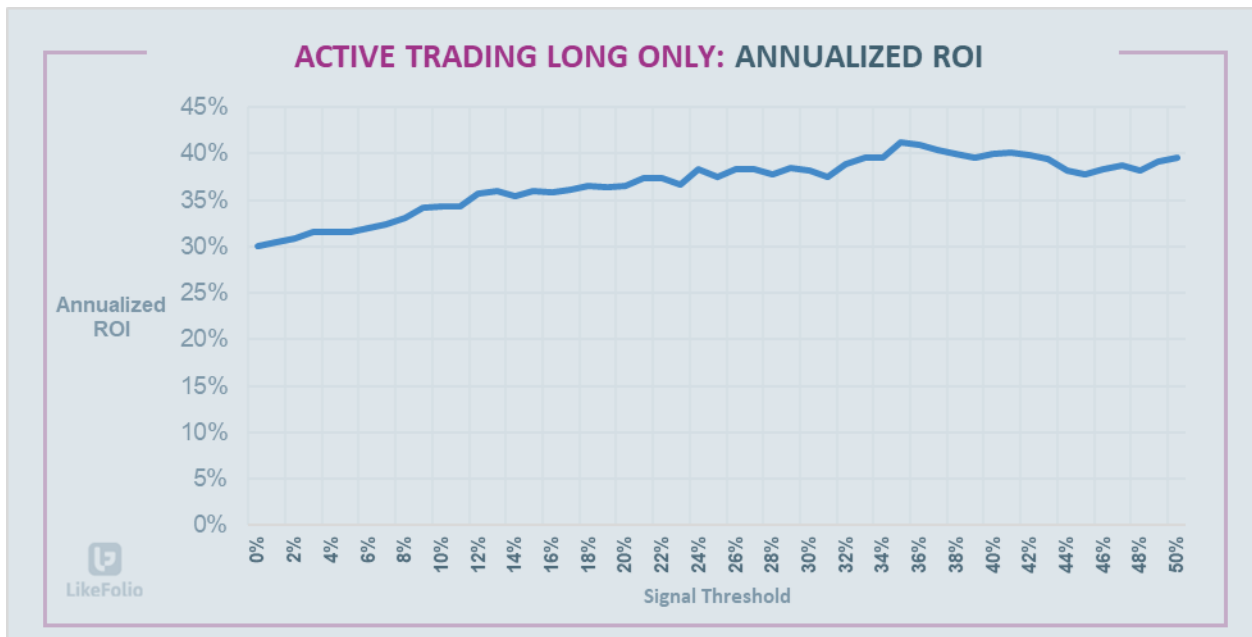
ACTIVE TRADING: LONG ONLY WITH BETA-WEIGHTED SPY HEDGE

DESCRIPTION:
Uses the Purchase Intent Signal to initiate and exit trades on any trading day, with no minimum or maximum duration. Only bullish signals are used for entry and SPY is used as a beta-weighted hedge against down markets. This is a conservative and consistent strategy.

METHOD:
For entries and exits, the method is identical to the Active Trading Strategy – Long Only above. However, any time a new trade is entered, a beta-weighted short of SPY is entered as a hedge.

EXAMPLE:
If the strategy calls for a buy of a stock that has a 2.0 Beta (using 60-month beta calculation), it would also require a short of 2x as much (in dollars) of SPY.

RESULTS:

	0% Threshold	25% Threshold	50% Threshold
Number of Trades	3,215	1,959	831
Percentage Winners	62.2%	60.9%	58.8%
Annualized ROI	+30.1%	+37.5%	+39.6%
Hedge Cost (annualized ROI)	-24.9%	-27.7%	-25.1%
Percentage of Trades that are winners including the profit/loss from their respective hedge trades	55.3%	54.4%	53.2%
Total annualized ROI, market neutral	**+5.2%**	**+9.8%**	**+14.4%**

After hedging, gains are significantly reduced during the bull market test period. It is important to note that these gains should hold up in any market, because the system was essentially selecting stocks that would outperform SPY by more than their beta. The market neutral ROIs listed above are expected to continue, even in bear markets.

ACTIVE TRADING LONG ONLY HEDGED: ANNUALIZED ROI
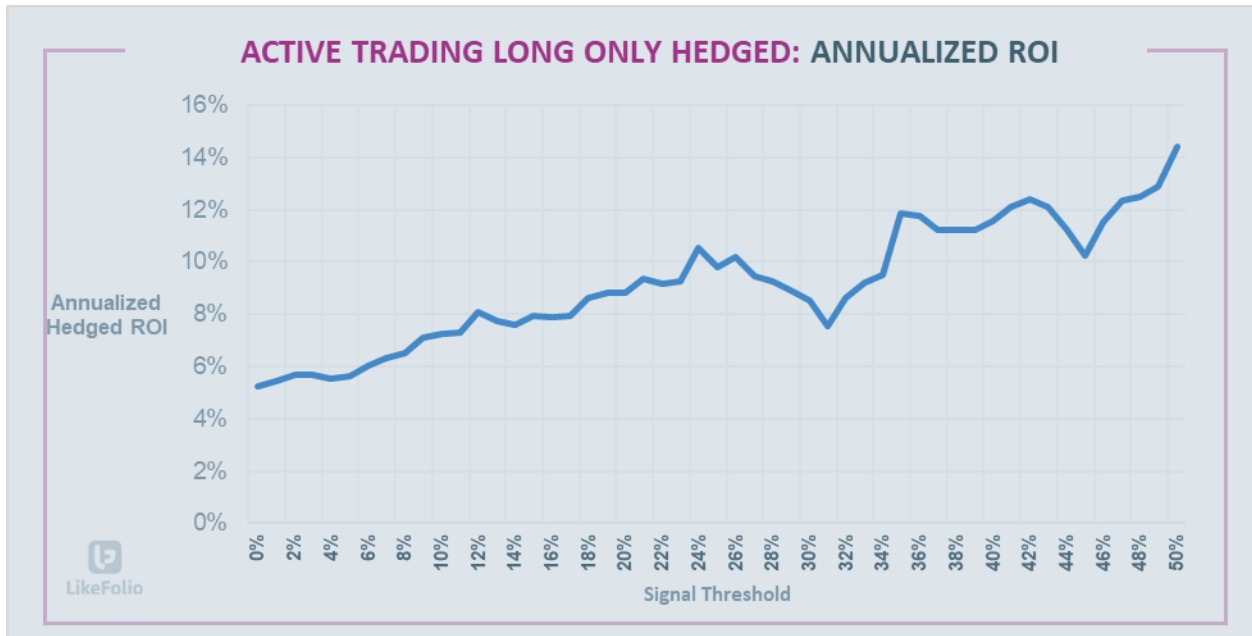
ACTIVE TRADING: LONG/SHORT

DESCRIPTION:
Uses the Purchase Intent Signal to initiate and exit trades on any trading day, with no minimum or maximum duration.

METHOD:
Each day, the Purchase Intent Signal is calculated. If it is positive and above the threshold, the strategy initiates a buy at the market close price of the following trading day. If the signal is negative and below the threshold, the strategy initiates a short at market close the following trading day. After entry, if the PI signal continues to suggest the same direction, the position is held. If the PI signal falls below the threshold, the position is exited to a neutral position. If PI signal flips the opposite direction, the position is exited, and a new entry is triggered in the opposite direction.

RESULTS:

	0% Threshold	25% Threshold	50% Threshold
Number of Trades	5,748	3,602	1,253
Percentage Winners	56.0%	56.5%	57.7%
Annualized ROI	+12.5%	+20.9%	+32.2%

Similar to all other strategies, the higher the PI Signal threshold required, the higher the annualized ROI.

ACTIVE TRADING: LONG/SHORT WITH BETA-WEIGHTED SPY HEDGE

DESCRIPTION:
Uses the Purchase Intent Signal to initiate and exit trades on any trading day, with no minimum or maximum duration, hedged against the S&P 500. This is a more conservative and consistent strategy.

METHOD:

For entries and exits, the method is identical to the Active Trading Strategy above. However, any time a new trade is entered, a beta-weighted trade of SPY in the opposite direction is entered as a hedge.
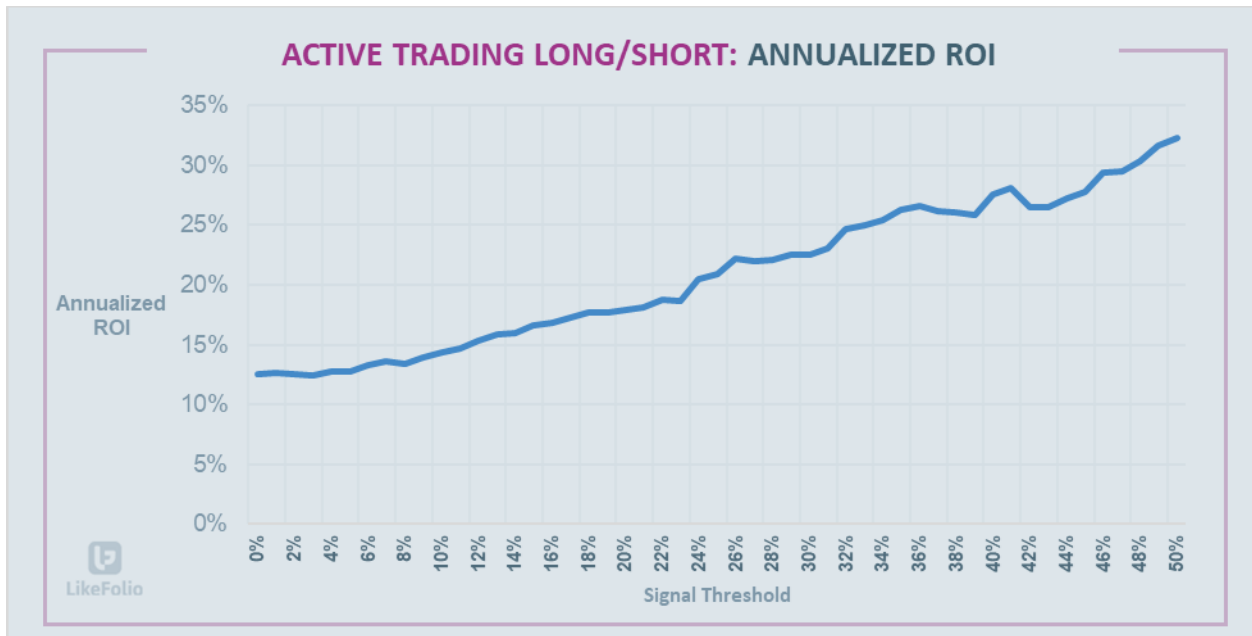
EXAMPLE:
If the strategy calls for a buy of a stock that has a 2.0 Beta (using 60-month beta calculation), it would also require a short of 2x as much (in dollars) of SPY.

A short position entered on a stock with a 1.5 Beta would require a buy of 1.5x as much (in dollars) of SPY.

RESULTS:

	0% Threshold	25% Threshold	50% Threshold
Number of Trades	5,748	3,602	1,253
Percentage Winners	56.0%	56.5%	57.7%
Annualized ROI	+12.5%	+20.9%	+32.2%
Hedge Cost (Annualized ROI)	-5.7%	-9.1%	-13.8%
Percentage of Trades that are winners including the profit/loss from their respective hedge trades	54.8%	55.7%	54.9%
Total Annualized ROI, market neutral	**+6.8%**	**+11.8%**	**+18.4%**

This strategy also yielded increasing gains as the signal threshold increased. However, the performance was lower due to the hedging activity in a bull market. Because of the beta-weighted hedge, these ROI figures are anticipated to be consistent during all market conditions.
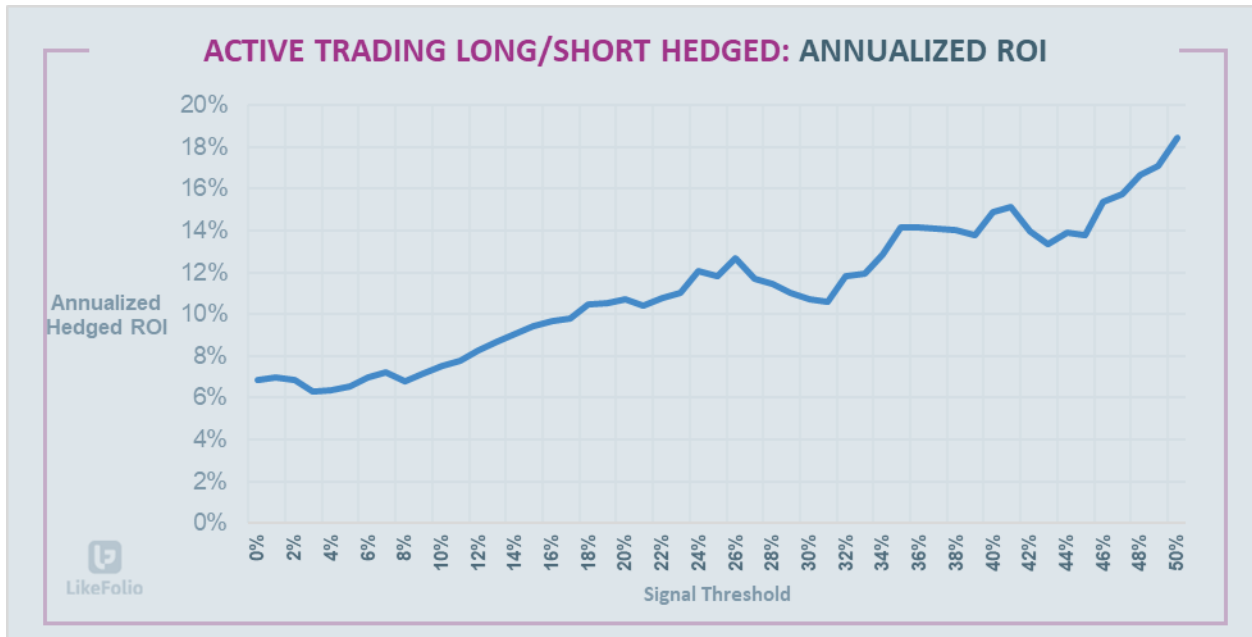
PORTFOLIO STRATEGY – TOP-8 LONG VS BOTTOM-8 SHORT

DESCRIPTION:

An equal weight portfolio approach which buys the 8 covered companies with the highest Purchase Intent Signal in one portfolio and sells short the 8 covered companies with the lowest Purchase Intent Signal in another, rebalanced with new positions on a monthly basis.

METHOD:

On the first of each month, all covered companies are ranked according to their Purchase Intent Signal. A long position is initiated in each of the top 8 (with 12.5% of the Top-8 portfolio buying power in each stock) and a short position is initiated in each of the bottom 8 (with 12.5% of the Bottom-8 portfolio buying power each stock).

RESULTS:

The Top-8 basket of stocks (long positions) vastly outperformed the S&P 500, while the Bottom-8 basket of stocks (short positions) vastly underperformed the S&P 500.

Given the tendency for higher threshold strategies to produce more profitable signals, it is not surprising that the most extreme positive signals produce gains over 3x that of the SPY while the most extreme negative signals are still able to produce profitable short positions even during an incredibly powerful bull market.
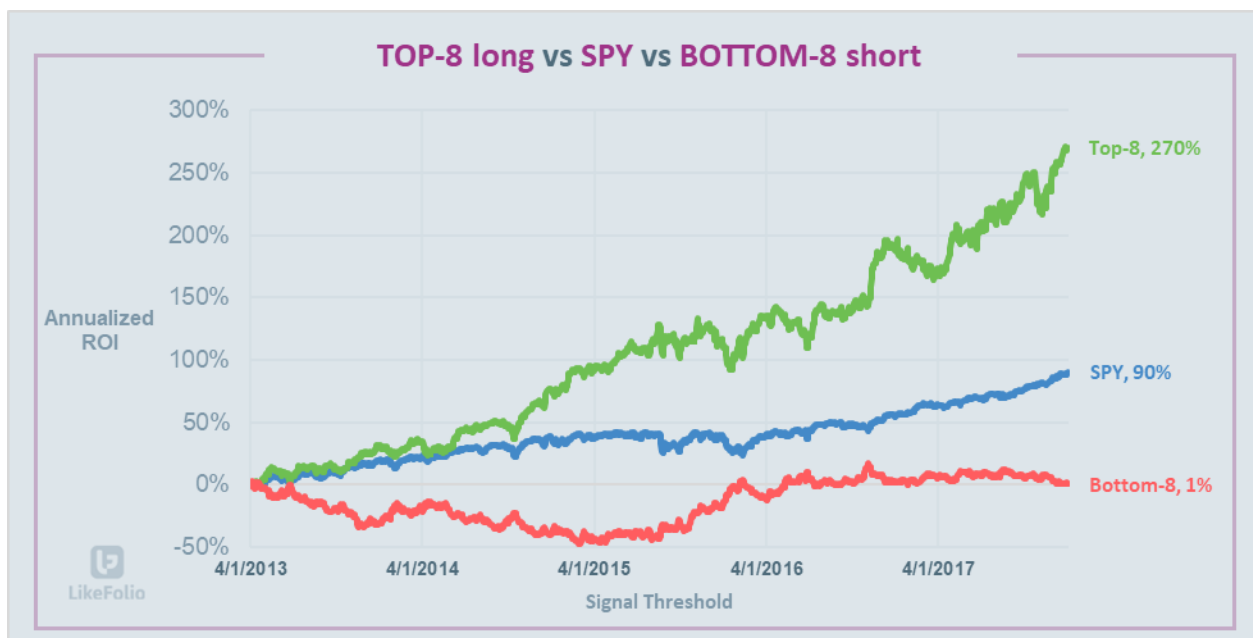
Notes: LikeFolio data begins on 1/1/2012. We compare the current signal to the 90-day moving average 1 year ago, therefore trading can't start until 4/1/2013.
Of the 203 covered companies, 114 were in the top 8 at some point, while 135 were in the bottom 8 at some point. 88 were in top 8 and bottom 8 at one point or another.

COMBINED PORTFOLIO

The Top-8 basket is combined with the Bottom-8 basket into one market neutral portfolio. Now each position uses 1/16th of the portfolio's buying power, with 8 long positions and 8 short positions rebalanced monthly so that upon every rebalance, 50% of the portfolio is long and 50% is short. The combined portfolio does very well when compared to **top market neutral funds, averaging 20.1% annually, in a market neutral portfolio with a maximum drawdown of only -6.2% over 5 years.

MARKET NEUTRAL STRATEGY COMPARISON: TOTAL GAIN

- LikeFolio Top8/Bottom8: +95%
- FLAG - FLAG-Forensic Accounting Long-Short ETF: +74%
- FTLS - First Trust Long/Short Equity ETF: +35%*
- BDMIX - BlackRock Global Long/Short Equity Instl: +18%
- VMNFX - Vanguard Market Neutral Fund: +13%
- QMN - IQ Hedge Market Neutral Tracker ETF: +5%
- CHEP - AGFiQ U.S. Market Neutral Value Fund: +1%
- RALS - ProShares RAFI Long/Short: -2%
- MOM - AGFiQ U.S. Market Neutral Momentum Fund: -2%
- BTAL - AGFiQ U.S. Market Neutral Anti-Beta Fund: -12%
- SIZ - AGFiQ U.S. Market Neutral Size Fund: -21%

Portfolio	Annual Gain	Max Drawdown
LikeFolio Top8/Bottom8	20.1%	-6.2%
FLAG - FLAG-Forensic Accounting Long-Short ETF	15.7%	-19.6%
FTLS - First Trust Long/Short Equity ETF*	10.6%	-9.3%
BDMIX - BlackRock Global Long/Short Equity Instl**	3.8%	-12.4%
VMNFX - Vanguard Market Neutral Fund**	2.8%	-7.2%
QMN - IQ Hedge Market Neutral Tracker ETF	1.1%	-4.4%
CHEP - AGFiQ U.S. Market Neutral Value Fund	0.1%	-21.6%
RALS - ProShares RAFI Long/Short	-0.3%	-10.6%
MOM - AGFiQ U.S. Market Neutral Momentum Fund	-0.5%	-27.8%
BTAL - AGFiQ U.S. Market Neutral Anti-Beta Fund	-2.5%	-20.9%
SIZ - AGFiQ U.S. Market Neutral Size Fund	-4.5%	-25.4%

*FTLS began trading in Sept 2014, and its annual gain has been adjusted accordingly
** BDMIX and VMNFX were added to the top 8 funds listed as market neutral and had trading history dating back to at least 2014,
as per etfdb.com

SUMMARY

LikeFolio Purchase Intent Signal consistently beat the market (during a historic period of index gains) in three distinct trading strategies: Earnings trades, active trading, and portfolio.

Each of these strategy types also performed extremely well while hedged. Even while fully beta-weighted hedged using SPY to create a market-neutral trading approach, each strategy maintained positive per trade and annualized ROI results. This means that each hedged strategy should continue to produce strong gains in any market condition.

THE PREDICTIVE POWER OF LIKEFOLIO PURCHASE INTENT SIGNAL was displayed using the threshold method. In each strategy type, as the threshold increased, so did the average profit per trade and annualized ROI. This is a very strong indication that the LikeFolio Purchase Intent Signal is predictive of future stock price movement.

CONTACT INFORMATION

For more information, please contact one of our founders:

- Andy@LikeFolio.com
- Landon@LikeFolio.com

Additional information available at LikeFolio.com

LEGAL DISCLAIMERS

The material in this presentation is for informational purposes only and does not constitute an offer to sell, a solicitation to buy, a recommendation or endorsement for any security or strategy, nor does it constitute an offer to provide investment advisory or other services by LikeFolio, SwanPowers, LLC, or its employees.

This information is not investment or tax advice. SwanPowers, LLC and LikeFolio is not an investment advisor or a broker dealer. Investing in securities involves risks, and there is always the potential of losing all your money. Before investing in any strategy, consider your investment objectives and speak with a professional.

Past performance does not guarantee future results, and the likelihood of investment outcomes is hypothetical.

APPENDICES

APPENDIX I BRAND TO COMPANY DATABASE

LikeFolio has built and maintains a Brand to Company Database of every brand and product owned by each publicly traded company along with every Product Tag consumers use to talk about that brand.

For example, the company Apple (AAPL) has 80 brands in our database:

AC Wellness	Carpool Karaoke	iPad	OS X
AirPods	Clips	iPhone	Ottocat
AirPort Time Capsule	Compressor	iPhoto	Pages
AirPower	Cue	iPod	Planet of the Apps
Amazing Stories	FaceTime	itunes	Pop Up Archive
Aperture	Filemaker	iWork	PowerbyProxi
Apple	Final Cut	Keynote	QuickTime
Apple Genius Bar	Flyby Media	Logic Pro	Regaind
Apple Podcast	GarageBand	Macintosh	Remote Desktop
Apple Store	Gliimpse	Magic Mouse	Safari
Apple TV	Health	MainStage	SensoMotoric Instruments
Apple Watch	HomeKit	Maps	Shazam
AppleCare	HomePod	Matcha	Siri
Beats by Dre	HopStop	Metaio	SnappyCam
Beats Music	iBeacon	Mog	Spotsetter
Beddit	iBooks	Motion	Swell
BookLamp	iCloud	Music Memos	Swift
BuddyBuild	iMessage	MusicMetric	Vrvana
Business Chat	iMovie	Numbers	Workflow
CarPlay	iOS	Objective C	Xcode

Note: This brand snapshot was taken as of this report's publication date.

For each brand, we have developed a thorough set of Product Tags that users write when talking about a brand. For example, here are the Product Tags for the Apple Watch brand:

Apple watch	#AppleHermesWatch	Apple Exercise Ring
WatchOS	#AppleWatchEdition	Apple Move Ring
#applewatch	apple series 1	Apple Stand Ring
apple smartwatch	apple watch 2	Apples Close your rings
#AppleiWatch	apple watch 3	Apple's Close your rings
iwatch	iwatch 2	Apples Exercise Ring
#iwatch	iwatch 3	Apple's Exercise Ring
#applesmartwatch	watchOS 3	Apples Move Ring
apple watches	watchOS 4	Apple's Move Ring
#applewatches	#AppleWatch4	Apples Stand Ring
#applewatchfans	#AppleWatchOS4	Apple's Stand Ring
#applewatchsport	apple watch LTE	close all Three rings
apple sport watch	apple watch series 3	closed all Three rings
apple sports watch	LTE apple watch	closes all Three rings
apple sportswatch	watchOS4	closing all Three rings
apple sportwatch	#applewatch3	Exercise ring on my
#AppleSportWatch	#applewatch3series	Move ring on my
#AppleSportsWatch	#applewatchLTE	Stand ring on my
apple nike watch	#applewatchseries3	Three rings goal
apple nike+ watch	#LTEAppleWatch	Three rings on Apple
#applenikewatch	#watchOS4	
apple hermes watch	Apple Close your rings	

The process of adding companies and keeping covered companies up to date with new products or variations of existing products, as well as mergers and acquisitions, is an extremely complex process that we have perfected over several years. And although we do use some artificial intelligence to aid our research team, we've found that the most reliable method to ensure accuracy and completeness is a combination of putting human eyes on everything we do along with a strict protocol of quadruple checks.

The LikeFolio Brand to Company Database can be applied to any natural language source. For more information on how it can help your firm better understand data sources, please contact us:

Landon@LikeFolio.com

APPENDIX II TWITTER DATA & ANALYSIS

Through a partnership with Twitter, we have access to 100% of both historical and real time tweets. We apply our Brand to Company Database as a filter to Twitter, then count, track and analyze mentions of brands owned by publicly traded companies. Our historical data begins on Jan. 1, 2012, is available in real-time, and analysis is limited to tweets in the English language. Real time stats operate on a delay of approximately 3 seconds, caused by a slight delay between the time the tweet is published to the time the tweet is delivered to us, and then another slight delay for processing of the tweet by our systems. The data in this study covers Jan. 1, 2012 through Dec. 31, 2017.

With our vast Product Tag → Brand → Company Database, we know any time someone is talking about any brand or product owned by a publicly traded company that we cover.

In addition, we have created a system that uses Consumer Insight Tags to identify language around a brand mention that indicates:

PURCHASE INTENT	POSITIVE SENTIMENT	NEGATIVE SENTIMENT

Each brand has its own set of Consumer Insight Tags to determine sentiment and purchase intent, based on the products sold by the brand. For example, the words that indicate you're buying an iPhone are quite different than those that indicate you're going out to eat at a certain restaurant. Our system has over 30 million Consumer Insight Tags.

APPENDIX III GEORGETOWN UNIVERSITY STUDY

JOURNAL OF ACCOUNTING RESEARCH

Wisdom of Crowds: Cross-Sectional Variation in the Informativeness of Third-Party-Generated Product Information on Twitter

VICKI WEI TANG

First published: Nov. 21, 2017 https://doi.org/10.1111/1475-679X.12183

APPENDIX IV PURCHASE INTENT SIGNAL CALCULATION METHOD

LikeFolio derived a method for calculating the signal behind changes in Purchase Intent Mention Volume and measuring that signal's strength.

This is the process for calculating the LikeFolio Purchase Intent Signal:

	Step	Description	Example
1	Purchase Intent: 90 day moving avg	For each day, find the average PI (purchase intent mentions) over the previous 90 days. This 90-day moving average is the basis of the signal.	90-day moving average for Purchase Intent is 1,000
2	Compare to last quarter	Compare the current 90-day PI moving average to the same 90-day PI moving average 90 days ago. Calculate the change in the moving average over the last 90 days.	It was 800 at this time 90 days ago. This gives us a +25% signal
3	Compare to change in stock price	Calculate the change in the stock price over the same 90-day period, and compare that change to the change in our signal. This allows us to determine if our signal has already been priced into the market. Subtract the change in price from the change in PI. If this subtraction results in the signal flipping from bullish to bearish or bearish to bullish then the signal is invalidated and set to zero. e.g. Change in PI is +8% and change in stock is +10%. This would cause the signal to go from +8% to -2%. While we agree the stock is slightly overbought, because the PI is doing well at +8% we set the signal to 0% instead of -2%. e.g. Change in PI is -10% and change in stock is -12%. This would cause the signal to go from -10% to +2%. While we agree the stock is slightly oversold, because the PI is doing poorly at -10% we set the signal to 0% instead of +2%.	The stock is up 10% over the last 90 days 25% - 10% = 15%
4	Correct for seasonality	Calculate the change in 90-day PI from 1 year ago and compare that the change in 90-day PI from 90 days ago. If they disagree, the signal is zero. This lets us account for product seasonality. Otherwise, for retailers we'd produce a buy signal every Christmas and a sell signal every April. For Home Depot, we'd buy every summer and sell every winter. Instead, this correction for seasonality forces the year-over-year to agree with the quarter-over-quarter in order to produce a signal.	90-day moving average for Purchase Intent was 750 one year ago. It is up, which matches our signal therefor our +15% signal remains.

	Step	Description	Example
5	Apply Threshold	Threshold refers to the amount of signal produced by the steps above. A signal is cancelled/zero if the absolute value of the signal produced is less than the threshold required.	If our threshold is less than 15%, our signal remains. If we used a threshold higher than 15%, then our signal becomes zero, i.e. neutral/no-signal. When looking at bearish signals, we simply look at the absolute value of the signal and compare that to the threshold. So a -15% signal would hold if our threshold was less than 15% and would be zero, i.e. neutral/no-signal if our threshold was greater than 15%. For this example, let's assume that our threshold was less than 15% and our signal remains.
6	Use repeatable entry/exit	For our backtest simulations, we use the final signal from the end of the day and execute at the closing price of tomorrow. That way, the timing of entry or exit is not an issue and our simulations are realistic.	Our signal indicates a bullish position. We will buy at the close price tomorrow.

$$90PI_0 = \ 90 \ day \ moving \ average \ of \ purchase \ intent \ mentions$$
$$90PI_{90d} = 90 \ day \ moving \ average \ of \ purchase \ intent \ mentions \ 90 \ days \ ago$$
$$90PI_{1y} = \ 90 \ day \ moving \ average \ of \ purchase \ intent \ mentions \ 1 \ year \ ago$$
$$Stock_0 = Current \ Stock \ price$$
$$Stock_{90d} = Stock \ price \ 90 \ days \ ago$$
$$\Delta PI_{90d} = \frac{90PI_0 - \ 90PI_{90d}}{90PI_{90d}}$$
$$\Delta PI_{1y} = \frac{90PI_0 - \ 90PI_{1y}}{90PI_{1y}}$$
$$\Delta Stock_{90d} = \frac{Stock_0 - \ Stock_{90d}}{Stock_{90d}}$$
$$* \ Purchase \ Intent \ Signal = \Delta PI_{90d} - \Delta Stock_{90d}$$

* If subtracting $\Delta Stock_{90d}$ from ΔPI_{90d} causes the Signal to flip from bullish to bearish or bearish to bullish, we instead treat it like neutral signal / no-signal.

Finally, to correct for seasonality, we make sure that the direction of the signal is the same as the direction of ΔPI_{1y}. If one is positive and the other negative, it results in a neutral signal / no-signal.

APPENDIX V THRESHOLD APPLICATION

Threshold refers to the amount of signal required to before it becomes actionable in the various models. Threshold is given in percent and can be as low as 0% and as high as the user wishes. Our models use a maximum of 50% threshold.

Before applying threshold, signal is stated in percentage terms and can be positive (bullish) or negative (bearish). When applying threshold, we look at the absolute value of the signal compared to the desired threshold level. If the absolute value of the signal is less than the threshold, we set signal to zero. In other words, we are only interested in making trading decisions on signals that are stronger than our threshold.

$$IF\ abs(Signal) < Threshold\ THEN$$
$$Signal = 0$$
$$ELSE$$
$$Signal = Signal$$
$$END\ IF$$

EXAMPLES:

Signal before Threshold	Threshold	Signal after Threshold	Reasoning
+15%	10%	15%	Absolute value of 15% is 15%. 15% is greater than 10%. Signal holds.
+15%	20%	0%	Absolute value of 15% is 15%. 15% is less than 20%. Signal is cancelled.
-15%	10%	-15%	Absolute value of -15% is 15%. 15% is greater than 10%. Signal holds.
-15%	20%	0%	Absolute value of -15% is 15%. 15% is less than 20%. Signal is cancelled.

A higher threshold will result in:

- Fewer bullish and bearish signals
- Higher expected return on investment per trade

APPENDIX VI ANNUALIZED ROI CALCULATION

Performance Calculation: Because some trades may last 1 day, and others could last years, Annualized Return On Investment (ROI) is calculated using the total percentage gain and is adjusted by the total number of days in a position.

$$ROI = [Total\ Gain] * \frac{365.25}{[Total\ Days\ In\ Position]}$$

EXAMPLE:

If a trade gained 5% while holding for 182 days (half of a year), the annualized gain would be 10%.
If a trade gained 30% while holding for 730 days (2 years), the annualized gain would be 15%.

APPENDIX VII COVERAGE LIST

The LikeFolio coverage list consists of 203 publicly traded companies that are mostly consumer facing:

Ticker	Name	# Brands	# Product Tags
AAL	American Airlines Group	8	44
AAP	Advance Auto Parts Inc	3	35
AAPL	Apple Inc.	80	823
ADBE	Adobe Systems Inc	121	906
ADDYY	Adidas Group	6	729
AEO	American Eagle Outfitters	6	146
AET	Aetna Inc	15	60
ALK	Alaska Air Group, Inc.	4	12
ALL	Allstate Corp	7	101
AMTD	TD Ameritrade Holding Corporation	5	77
AMZN	Amazon.com Inc	307	3,203
ANTM	Anthem Inc	18	257
ASNA	Ascena Retail Group, Inc.	14	1,599
ATZ	Aritzia	16	1,454
BABA	Alibaba Group	32	219
BAC	Bank of America Corp	4	29
BBBY	Bed Bath & Beyond Inc	7	216
BBY	Best Buy Co.	14	91
BEL	Belmond Ltd	41	257
BF.B	Brown-Forman Corporation	23	272
BGS	B&G Foods Holdings Corp.	49	734
BIG	Big Lots Inc.	1	9
BKNG	Booking Holdings Inc.	13	176
BKS	Barnes & Noble, Inc.	7	237
BMWYY	BMW Group	72	697
BUD	Anheuser-Busch Inbev SA	70	1,115
BWLD	Buffalo Wild Wings, Inc.	6	64
CAJ	Canon, Inc.	29	1,224
CAKE	The Cheesecake Factory Incorporated	6	51
CAR	Avis Budget Group, Inc.	8	88
CBRL	Cracker Barrel Old Country Store, Inc.	2	44
CCL	Carnival Corp.	10	641
CHH	Choice Hotels International, Inc.	13	109
CHUY	Chuy's Holdings, Inc.	1	53
CL	Colgate-Palmolive	48	2,472
CLX	The Clorox Company	22	115
CMG	Chipotle Mexican Grill	5	58

Ticker	Name	# Brands	# Product Tags
COST	Costco Co.	3	12
CPB	Campbell Soup Company	34	385
CTXS	Citrix Systems	27	365
CVS	CVS Health	23	186
CVX	Chevron Corp.	5	17
DAL	Delta Air Lines Inc.	5	22
DDAIF	Daimler AG	43	432
DDS	Dillard's, Inc.	9	92
DE	Deere & Co.	11	306
DFS	Discover Financial Services	5	59
DG	Dollar General Corporation	2	9
DISH	DISH Network Corporation	10	153
DLTR	Dollar Tree	3	10
DNKN	Dunkin' Brands	3	161
DPS	Dr Pepper Snapple Group	51	875
DPZ	Domino's Pizza	2	107
EAT	Brinker International	3	18
EBAY	eBay Inc.	16	134
EFX	Equifax Inc.	12	66
EL	Estee Lauder Cos.	35	682
ELY	Callaway Golf Company	9	397
EPC	Edgewell Personal Care	18	2,581
ETFC	E-Trade Financial	6	42
ETH	Ethan Allen Interiors Inc.	1	12
EXPE	Expedia Inc.	22	233
EXPR	Express, Inc.	4	255
F	Ford Motor	35	375
FCAU	Fiat Chrysler Automobiles	82	406
FDX	FedEx Corporation	8	50
FIT	Fitbit Inc	15	248
FITB	Fifth Third Bancorp	1	28
FIZZ	National Beverage Corp.	20	1,264
FL	Footlocker Inc	10	178
FRGI	Fiesta Restaurant Group, Inc.	3	19
FTD	FTD Companies	21	456
FTR	Frontier Communications	6	122
GDDY	Godaddy Inc.	33	269
GES	Guess	5	447
GIII	G-III Apparel Group	12	422
GIS	General Mills	55	769
GM	General Motors Company	72	523
GOOGL	Alphabet	270	1,838

Ticker	Name	# Brands	# Product Tags
GOOS	Canada Goose Holdings	2	128
GPC	Genuine Parts	21	274
GPRO	GoPro, Inc.	11	150
GPS	The Gap Inc	7	491
GRPN	Groupon, Inc.	8	18
H	Hyatt Hotels Corporation	14	134
HA	Hawaiian Holdings	3	24
HAIN	Hain Celestial	70	1,768
HAS	Hasbro Inc.	119	1,518
HBI	Hanesbrands Inc.	23	1,633
HD	The Home Depot	23	213
HENOY	Henkel	70	1,521
HLT	Hilton Worldwide	18	184
HMC	Honda Motor Co.	63	537
HOG	Harley-Davidson Inc	13	177
HRB	H&R Block Inc	5	54
HTZ	Hertz Global Holdings	6	91
HYMTF	Hyundai Motor Company	29	299
IHG	Intercontinental Hotels Group	15	101
INTC	Intel Corp.	21	943
INTU	Intuit Inc.	11	168
JACK	Jack In The Box Inc.	4	78
JBLU	JetBlue Airways Corporation	1	42
JMBA	Jamba Juice	3	100
JWN	Nordstrom Inc	8	60
K	Kellogg Co.	54	551
KHC	Kraft Heinz	57	552
KIMTF	Kia Motors	16	197
KMX	Carmax Inc	1	41
KO	Coca Cola Co.	82	699
KORS	Michael Kors Holdings Limited	2	114
KR	Kroger Co.	59	588
KSS	Kohl's Corp.	7	663
LB	L Brands, Inc.	8	363
LE	Lands' End	6	1,066
LOGI	Logitech International	12	660
LOW	Lowe's Cos.	30	525
LQ	La Quinta Holdings	1	27
LULU	lululemon athletica inc.	3	153
LUV	Southwest Airlines	3	35
M	Macy's Inc.	21	424
MAR	Marriott Int'l.	28	790

Ticker	Name	# Brands	# Product Tags
MAT	Mattel Inc.	72	699
MCD	McDonald's Corp.	2	116
MDLZ	Mondelez International	96	4,345
MIK	Michaels Stores	18	330
MKC	McCormick & Co.	28	501
MO	Altria Group Inc	69	476
MPC	Marathon Petroleum	6	44
MSFT	Microsoft Corp.	358	2,692
NINOY	Nikon Corporation	13	166
NKE	NIKE Inc.	24	1,720
NSRGF	Nestle	101	952
NTGR	Netgear	4	228
NWL	Newell Brands	121	1,198
P	Pandora Media	3	119
PEP	PepsiCo Inc.	99	2,979
PF	Pinnacle Foods	35	1,802
PFG	Principal Financial Group	6	54
PG	Procter & Gamble	69	1,914
PGR	Progressive Corporation	3	19
PII	Polaris Industries	26	316
PIR	Pier 1 Imports	1	1,081
PLCE	The Children's Place Retail Stores	2	10
PSX	Phillips 66 Co	4	39
PYPL	PayPal Holdings	11	160
PZZA	Papa John's	2	27
QSR	Restaurant Brands International	4	184
RAD	Rite Aid Corporation	2	31
RCL	Royal Caribbean Cruises Ltd.	6	84
REV	Revlon, Inc.	28	556
RHT	Red Hat Inc	5	156
RL	Ralph Lauren Corporation	17	144
RLH	Red Lion Hotels Corporation	14	118
ROST	Ross Stores Inc.	2	63
SATS	EchoStar Corporation	6	86
SBUX	Starbucks Corp.	17	546
SCHW	Charles Schwab	4	86
SFS	Smart & Final Stores, Inc.	11	281
SHAK	Shake Shack Inc	4	49
SHW	Sherwin-Williams Company	53	696
SIG	Signet Jewelers Limited	26	348
SIRI	Sirius XM Radio	3	76
SJM	J.M. Smucker	48	963

Ticker	Name	# Brands	# Product Tags
SKX	Skechers USA	4	78
SNA	Snap-On Inc.	6	57
SNAP	Snap Inc	20	373
STAY	Extended Stay America	1	5
STZ	Constellation Brands	101	2,634
SWK	Stanley Black & Decker	17	562
TAP	Molson Coors Brewing Company	102	1,595
TGT	Target Corp.	48	2,768
TIF	Tiffany & Co.	3	208
TJX	TJX Companies	9	209
TM	Toyota Motor Corp	59	574
TPR	Tapestry, Inc.	7	288
TRIP	TripAdvisor Inc	27	160
TRVG	Travel B.V.	4	33
TSLA	Tesla Motors, Inc.	16	118
TWTR	Twitter Inc	5	114
TXRH	Texas Roadhouse	3	25
TZOO	Travelzoo Inc.	2	22
UA	Under Armour Inc	17	539
UAL	United Continental Holdings	8	41
UBNT	Ubiquiti Networks	3	115
UHAL	Amerco	6	54
ULTA	Ulta Salon, Cosmetics & Fragrance	3	14
UPS	United Parcel Service Inc	9	127
URBN	Urban Outfitters Inc	12	260
USB	U.S. Bancorp	1	95
USM	U.S. Cellular	1	10
V	Visa Inc.	6	76
VLKAY	Volkswagen Group	92	705
VVI	Viad Corp	22	85
WBA	Walgreens Boots Alliance	21	276
WEN	The Wendy's Company	1	108
WFC	Wells Fargo & Company	3	47
WHR	Whirlpool Corp.	25	1,325
WING	Wingstop	1	19
WIX	Wix.com	6	70
WMT	Wal-Mart Stores	65	1,693
WYN	Wyndham Worldwide	35	356
YUM	Yum! Brands Inc	9	169
ZOES	Zoes Kitchen	2	118