

Social Market Analytics



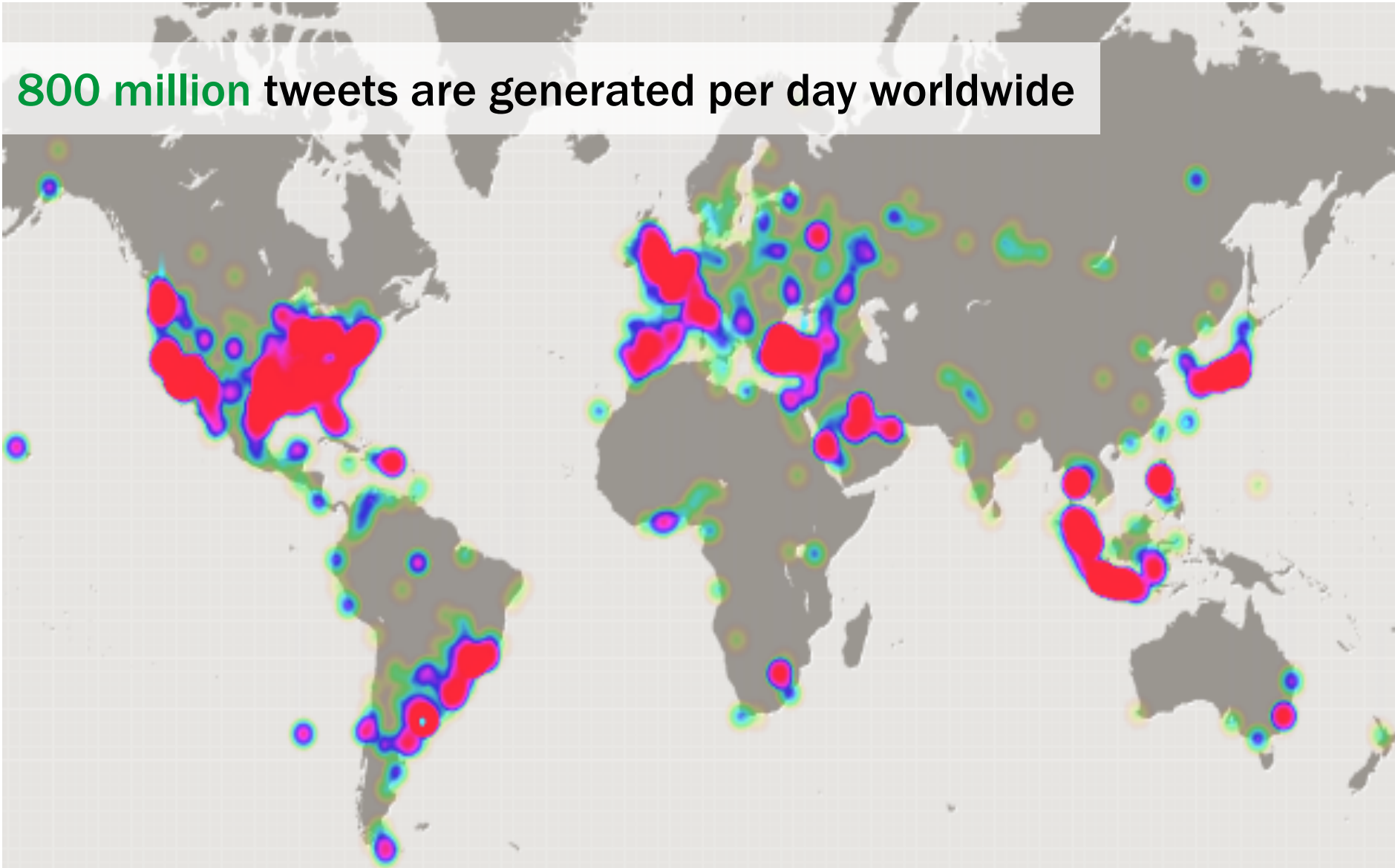
An Uncorrelated Source of Predictive Data

Predictive Analytics is at the SMA

- Social Market Analytics' team has been in data warehousing and normalization before AI, Machine Learning, and Natural Language Processing (NLP) became part of the daily lexicon
- SMA was founded in 2011. Joe Gits, one of SMA's founders, co-founded Quantitative Analytics Inc (QA Direct) in 1997, which was acquired by Thomson Reuters in 2007 and remains widely used
- SMA is used in Systemic Trading, Indices, Algo Execution, Market Making, Risk, Research, and Credit, across Equities, FX, ETF, Futures, Crypto Currencies and Macro Economic data.
- SMA can Tag and Provide Sentiment on any Alternative or Traditional data source.
SMA is a Twitter preferred partner listening to the full Twitter firehose 24/7 through U.S. Patented IP and SMA's ML Financial NLP and Account Rating Algo

Tweets Originate From Financial Centers

800 million tweets are generated per day worldwide



SMA Partnerships With Industry Leaders



- SMA has partnered with Barclays on a family of Structured Products based solely on SMA Data



- The CME Group has partnered with SMA to provide Sentiment across 6 Asset Classes and 40 Financial and Commodity Futures



- SMA's sentiment metrics is available to Fidelity's retail clients through their Active Trader platform and the Mobile App



- IHS Markit delivers SMA S-Factors in Daily, 15 Minute, and 1 Minute Feeds as a part of the Research Signals
- IHS Markit Develops New Innovative Factors From SMA Content



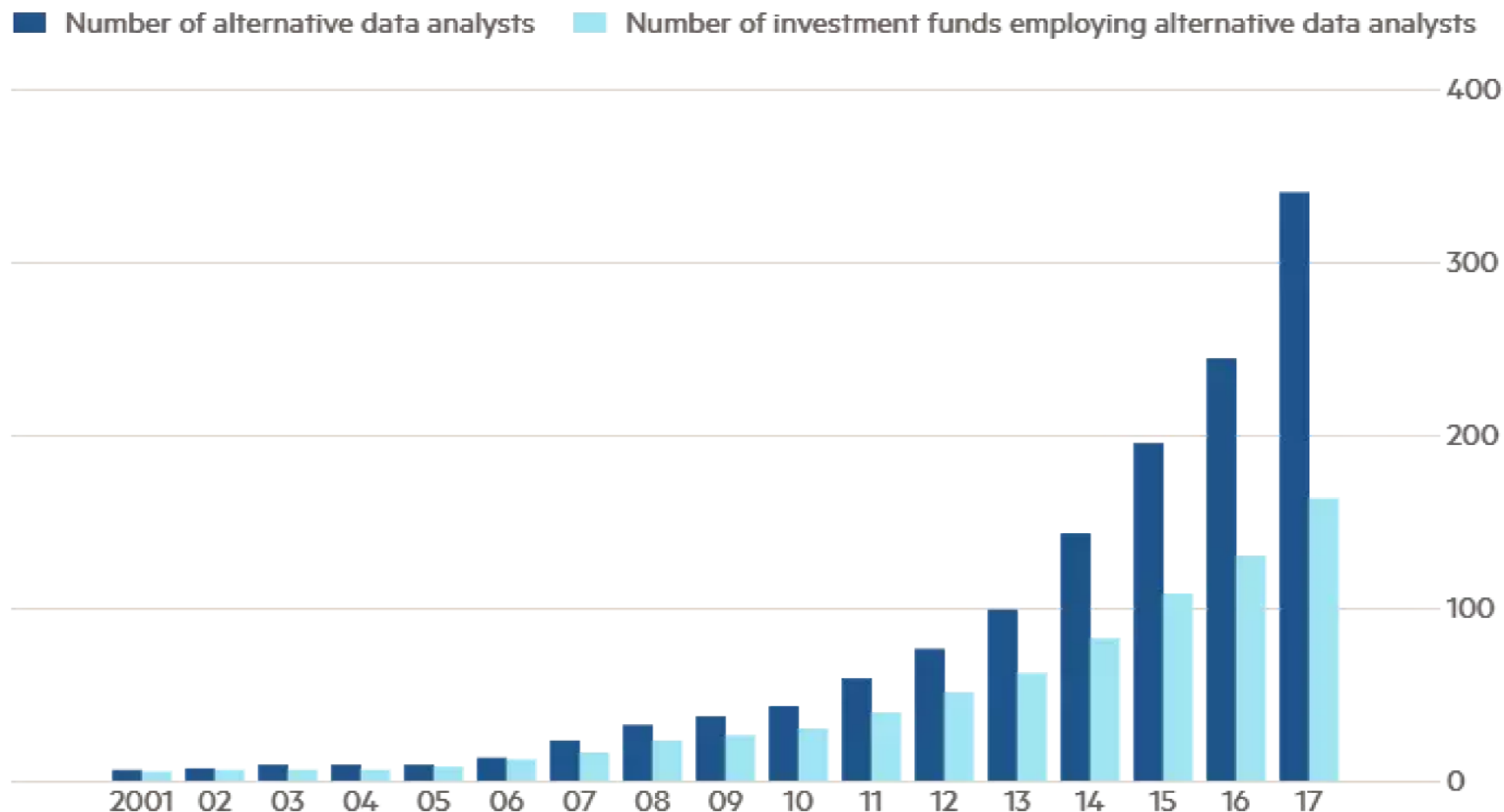
- Partnership to build a family of SMA Sentiment Based Indices
- SMLCW went live in January 2017



- SMA is a licensed Twitter Partner Warehousing the full Firehose
- SMA receives the Twitter stream from GNIP, Twitter's data division
- SMA has been designated as a "Plugged In" Twitter partner

The Growth of Alternative Data

Alternative data goes mainstream



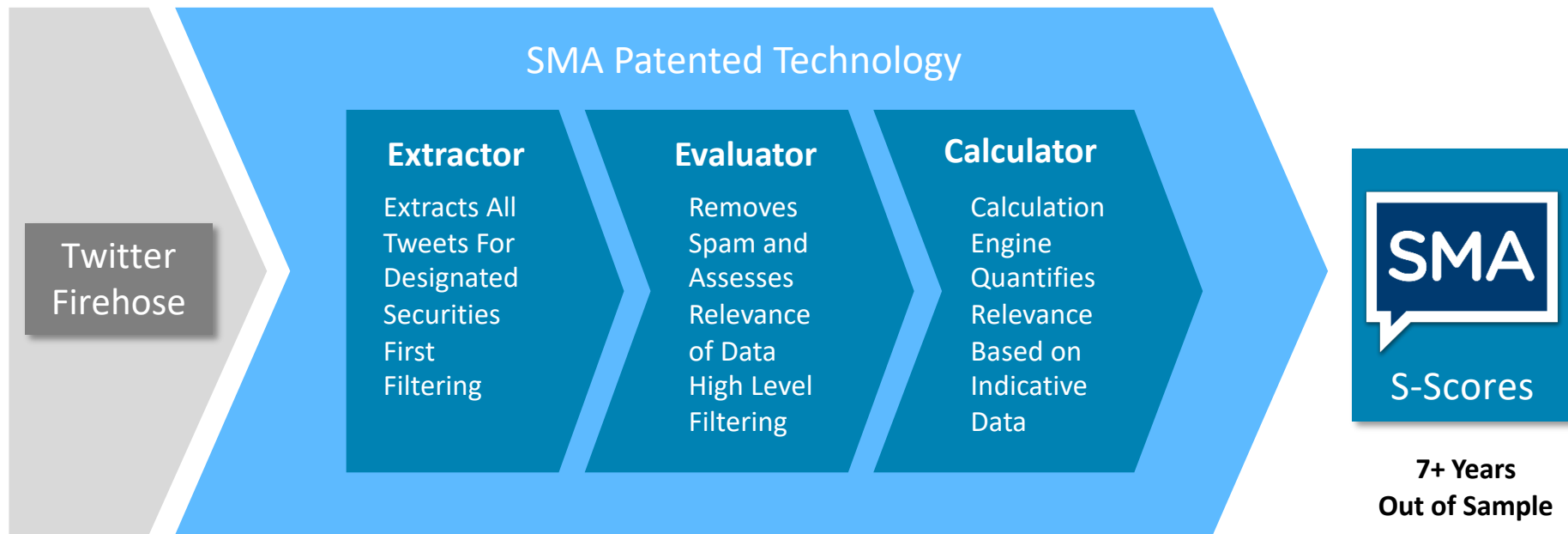
Source: AlternativeData.org

© FT

SMA Predictive Data is Used Across Finance



SMA Patented Social Media Framework



SMA has two U.S. Patents behind our Process:

- Aggregates the intentions of professional investors as expressed on Twitter and StockTwits and other inputs such as earnings call reports, 10K & 10Qs
- Calculates Sentiment metrics characterizing the current conversation relative to historical benchmarks

Extractor - Evaluator - Calculator

- SMA is the leader in Predictive Analytics behind AI, Machine Learning algorithms and a custom-built finance Natural Language Processor (NLP)
- SMA scrubs nearly 1 Billion Textual, Structured and Unstructured Data points daily and Processes, Tags, and Scores as quickly as $3/10^{\text{th}}$ of a second
- SMA has warehoused and normalized this data out-of-sample for seven years at the Topic and Security level
- SMA eliminates spam. SMA knows the difference between good and bad bots and a good actor and bad actor
- SMA's Topic identification knows the difference between similarly named securities. For example: Ethan Allen Furniture and Ethereum Crypto currency. Both ticker ETH
- SMA's Financial NLP has been developed over seven years of supervised and unsupervised machine learning and uses fine grain scoring
- With our patented engine, SMA can turn unused stores of unstructured data into structured data that can be used to enhance Alpha, build Indexes, monitor competitive positioning and Investor Relations

SMA Intellectual Property Advantages

Natural Language Processing

- › Scores calculated in real-time 24X7
- › Fine grain scoring at the Tweet level
- › Proprietary phrase and word financial dictionary built over seven years
- › Multi pass approach used in evaluation of each Tweet increases scoring accuracy



Out of Sample

- › SMA has 7+ years of out-of-sample data
- › Ability to delete accounts and Tweets can lead to survivorship bias in other datasets
- › Account and dictionary changes are applied on a go-forward basis



Investor Universe

- › Proprietary algorithms rate and identify professional investors



Research


- › Independent Research
 - IHS Markit,
 - Deutsche Bank
 - ITG Research
 - CBOE




Four SMA Data Feeds and Security Coverage

SMA delivers data through RESTful JSON APIs 24/7
The data is available in 4 different formats


Securities are identified using multiple identifiers through
our NLP developed over the past seven years




The S-Factor data feed aggregates tweets and makes a comparison to baseline to deliver 19 metrics every minute. Snapshots can be requested at different cycles (*5m, 15m, Hourly, Daily, etc.*) Based on a 24H lookback with a 20D baseline with decay




The Activity data feed isolates and aggregates information every minute and allows clients to create their own baselines and metrics. Ideal for both HFT for m/m and algo execution and longer baselines for both trading and indices (Weekly, Monthly, Quarterly, Yearly)




The Tweet Level data feed is tweet level analysis and delivers SMA metrics from our NLP and Account Rating algorithm in 300 milliseconds after receiving the tweet from Twitter




The Lexical data feed is an enhanced version of the Tweet Level feed. In addition to the sentiment rating and account rating of the tweet, the feed also contains a phrase level break down of tweet along with the sentiment from SMA's dictionary. This data is delivered in 300 milliseconds after receiving the tweet from Twitter




4,800
US Equities




106
Commodities




47
Currency Pairs



3000
ETF



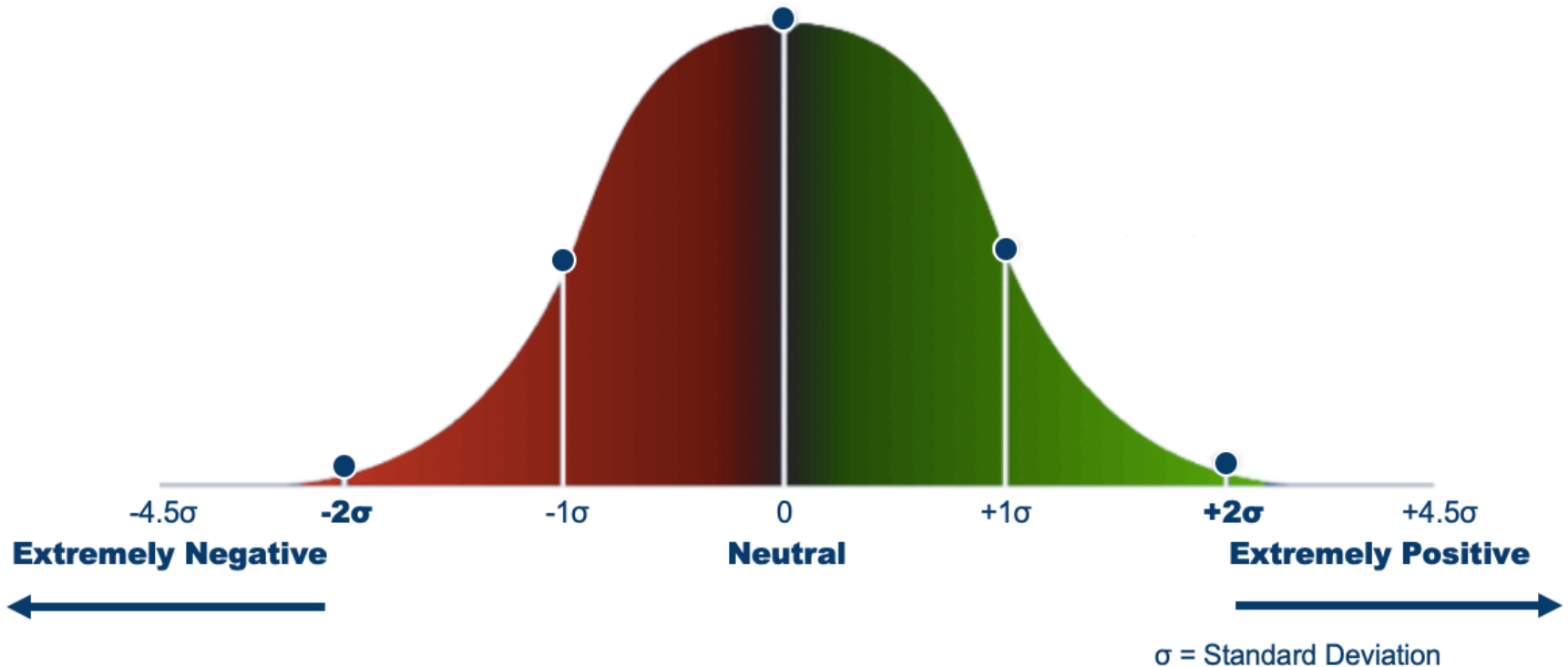
1000
LSE: FTSE



450+
Crypto Currencies

Understanding SMA S-Score

S-SCORE VISUALIZED



SMA S-Score is one of 15 primary S-Factors delivered through APIs to SMA's quantitative systemic trading clients. An $| \text{S-Score} | > 2$ represents a Z-Score with a 98.6% probability that the security will subsequently move in the direction of the Sentiment. The standard S-Score is a 24H lookback over a 20D period with decay. Baselines are then created across customized predictive forward periods W, M, Q

SMA S-Score API Provides 15 Data Fields Metrics

S-Score™

- The Normalized Representation Of A Security's Sentiment Time Series Over A Look Back Period

S-Mean™

- The Average Level Of A Security's Sentiment Time Series Over A Look Back Period

S-Delta™

- The Change In A Security's S-Score™ Level At An Observation Time Relative To An Earlier Time

S-Volume™

- The Volume Of Indicative Tweets Contributing To A Security's S-Score™ At An Observation Time

SV-Score™

- The Normalized Representation Of A Stock's Indicative Tweet Volume Time Series Over A Look Back Period

S-Volatility™

- A Measure Of The Variability Of A Stock's Sentiment Time Series Over A Look Back Period

S-Dispersion™

- A Measure Of The Diversity Of Twitter Sources Contributing To A Security's S-Score™

Independent verification of uncorrelated nature Social Market Analytics. White Paper:
#Alpha-Extracting Market Sentiment From 140 Characters

- Extremely Low Correlation With Top Momentum Indicators Indicate SMA S-Factors Are A New And Unique Data Set for Alpha

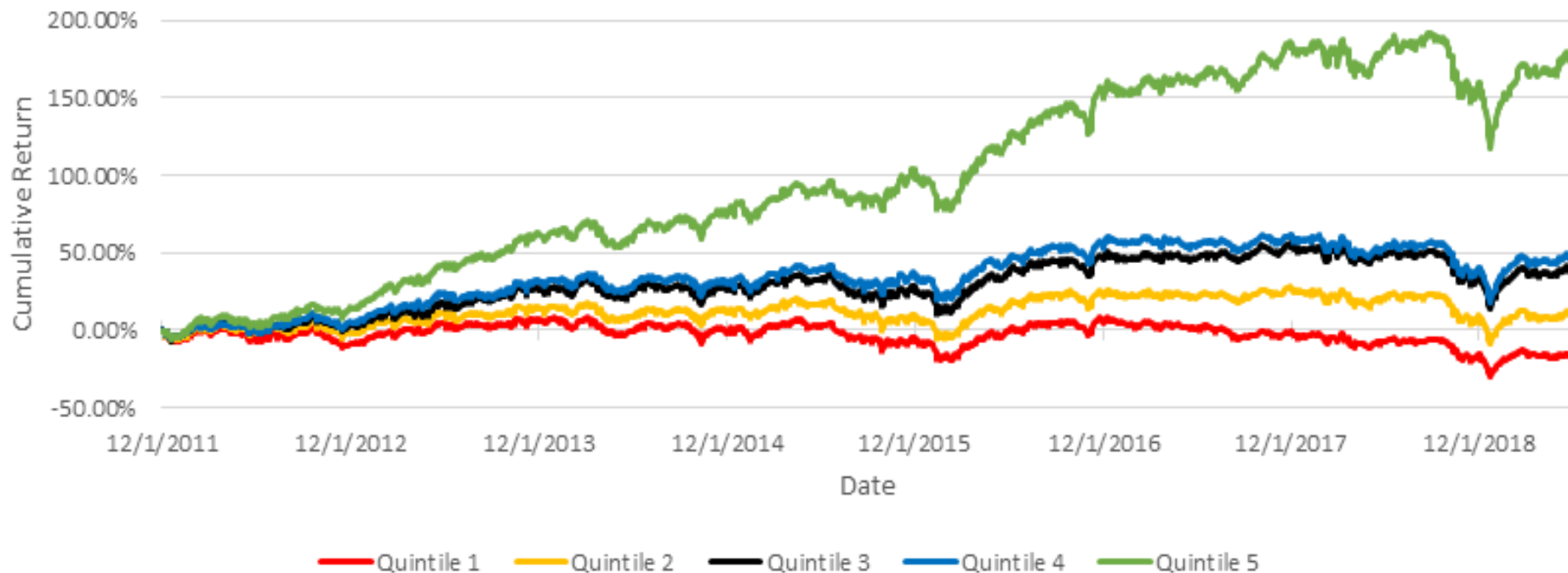
Factor	Correlation
60-Month Beta	0.00
5-Day Industry Relative Return	-0.08
Most Recent Earnings Surprise	-0.01
Net Number of Revisions for Fiscal Year 1	0.00
ATM Put Volatility – ATM Call Volatility	-0.02
Implied Volatility	0.06
Short Interest	0.00
1-Month Change in Short Interest	0.01

Annualized Returns by Nasdaq Sectors 2011 - 2018

Sector	S-Score > 2	All Stocks	S-Score < -2
Basic Industries	20.14%	-0.52%	-16.14%
Capital Goods	27.03%	7.11%	0.67%
Consumer Durables	16.33%	8.52%	-1.88%
Consumer Non-Durables	29.19%	4.53%	-18.34%
Consumer Services	17.82%	5.53%	-2.35%
Energy	13.91%	-3.92%	-14.52%
Finance	25.16%	8.10%	3.54%
Health Care	20.34%	3.89%	-13.68%
Miscellaneous	29.92%	3.17%	-17.26%
Public Utilities	8.41%	4.77%	-10.02%
Technology	28.75%	9.57%	4.01%
Transportation	26.93%	2.44%	-19.13%
SPY	---	5.57%	---
SMA Universe	22.11%	6.80%	-8.41%
NA	20.19%	2.80%	-5.49%

Twitter Quintile: Price > \$5 SMA Universe O to C

Twitter Open-to-Close Quintiles Full History
Equal Weighted 9:10 AM S-Score : Price > \$5 Universe
12-01-2011 to 05-31-2019



Quintile	Ann. Ret.	Sharpe Ratio	Avg. Stocks	Avg. Score
Quintile 1	-1.8%	-0.13	316	-1.53
Quintile 2	2.0%	0.15	316	-0.37
Quintile 3	5.1%	0.40	315	0.03
Quintile 4	5.8%	0.45	315	0.59
Quintile 5	14.2%	1.11	316	2.10

Providing Long and Short Alpha

- Start with the universe of stocks in SMA Universe with Price > \$5
- Filter stocks into portfolio – Long, Short and Long Short based on the basis of 09:10 AM S-Scores on the starting universe
- S-Score >= positive filter are longs, S-Score <= negative filters are shorts, Combination is long short
- All trades entered at Market On Open (MOC) and exited at Market on Close (MOC) price
- Return on Stock i at time t is

$$R_{i,t} = \frac{P_{i,t}^{MOC}}{P_{i,t}^{MOO}} - 1$$

- Average return on portfolio p , on day t for N stocks in the decile is calculated as

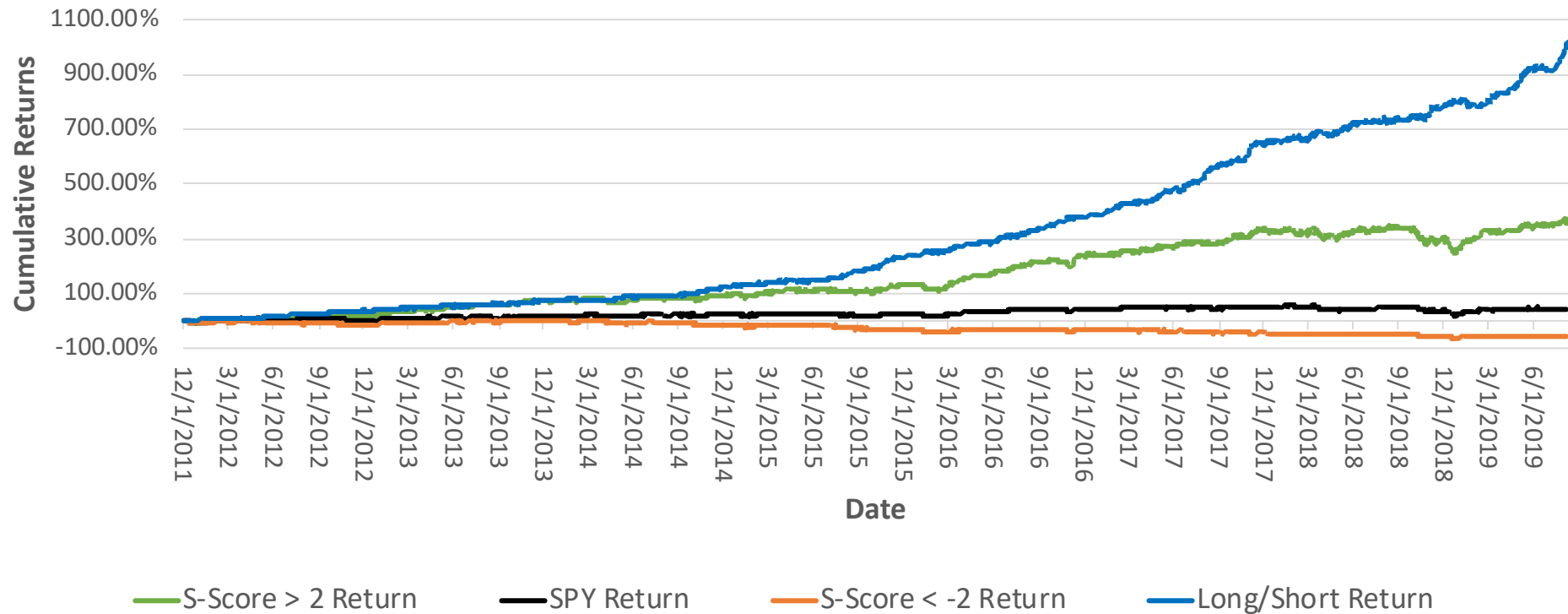
$$R_t^p = \frac{1}{N} \sum_{i=1}^N R_{i,t}$$

- Cumulative Return over series at Time T for portfolio p is calculated as,

$$Cum. Retn.^p_T = \prod_{t=1}^T (1 + R_t^p) - 1$$

Full History - Long/Short

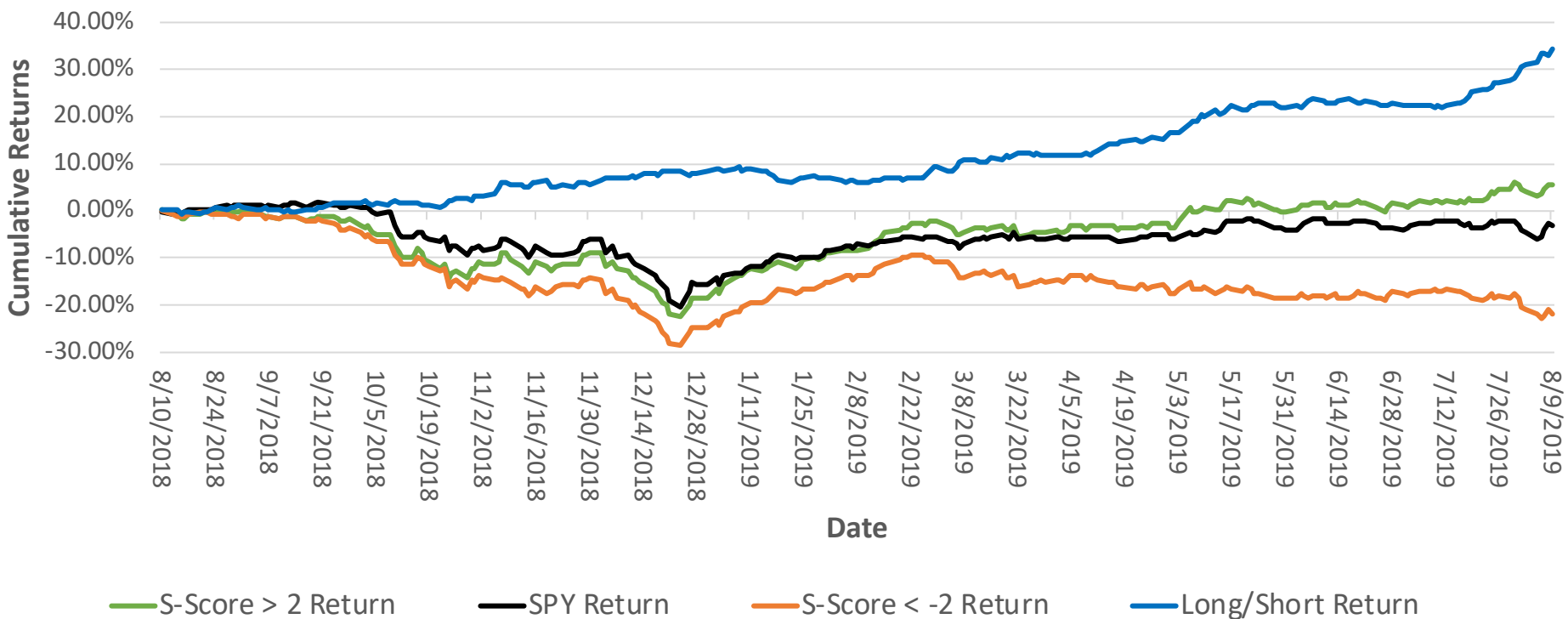
|S-Score| > 2 and Price > 5 Long and Long Short Portfolio O-C Returns
Twitter Derived 09:10 AM Sentiment
12/01/2011-08/09/2019



S-Score	Cum. Rtn.	Sharpe Ratio	Sortino Ratio
S-Score > 2	368.53%	1.62	2.69
SPY	43.94%	0.51	0.78
S-Score < -2	-59.47%	-0.77	-1.21
Long/Short	1016.59%	4.08	8.27

Rolling 1 Year - Long/Short

|S-Score| > 2 and Price > 5 Long and Long Short Portfolio O-C Returns
Twitter Derived 09:10 AM Sentiment
08/10/2018-08/09/2019



S-Score	Cum. Rtn.	Sharpe Ratio	Sortino Ratio
S-Score > 2	5.71%	0.46	0.77
SPY	-3.16%	-0.18	-0.28
S-Score < -2	-21.69%	-1.50	-2.29
Long/Short	34.37%	4.38	9.35

