The FCO Cockpit
Global Bubble Status Report

Jan-Christian Gerlach, Didier Sornette & Ke Wu

Chair of Entrepreneurial Risks
Department of Management, Technology and Economics
ETH Zurich
Scheuchzerstrasse 7
8092 Zurich, Switzerland

February 1st , 2018

Contents

About

Methodology

General Results

Results per Asset Class

Single Stocks

Sectors

Final Remarks

About

The Financial Crisis Observatory (FCO) monthly report discusses the historical evolution of bubbles in and between different asset classes and geographies.

It is the result of an extensive analysis done on the historical time series of about 450 systemic assets and about 850 single stocks. The systemic assets are bond, equity and commodity indices, as well as a selection of currency pairs. The single stocks are mainly US and European equities. The data is from Thomson Reuters.

In the first part of this report, we present the state of the world, based on the analysis of the systemic assets. In the second part, we zoom in on the bubble behavior of single stocks and discuss some specific cases.

For an intuitive explanation of the methodology and the specifics of the indicators that are used in this report, we refer to: D. Sornette and P. Cauwels, Financial bubbles: mechanisms and diagnostics. Review of Behavioral Economics 2 (3), 279- 305 (2015)
http://arxiv.org/abs/1404.2140 and http://ssrn.com/abstract=2423790

Methodology

We use the Log-Periodic Power Law Singularity (LPPLS) model to hunt for the distinct fingerprint of Bubbles:

1. Price rises faster than exponentially, therefore the logarithm of the price rises faster than linearly;

2. There are accelerating oscillations, with a distinct characteristic.

Starting Nov 2017, we have a major upgrading of our LPPLS bubble warning signals. The new method significantly increases the prediction power of the signal, and better normalizes the signal values. A bubble signal is identified if our new bubble indicator is larger than 0%. Bubble Size is the cumulative return since the starting point of the bubble we identified.
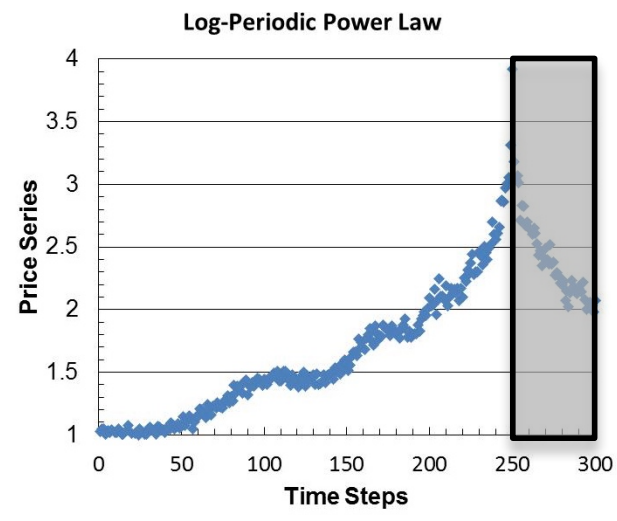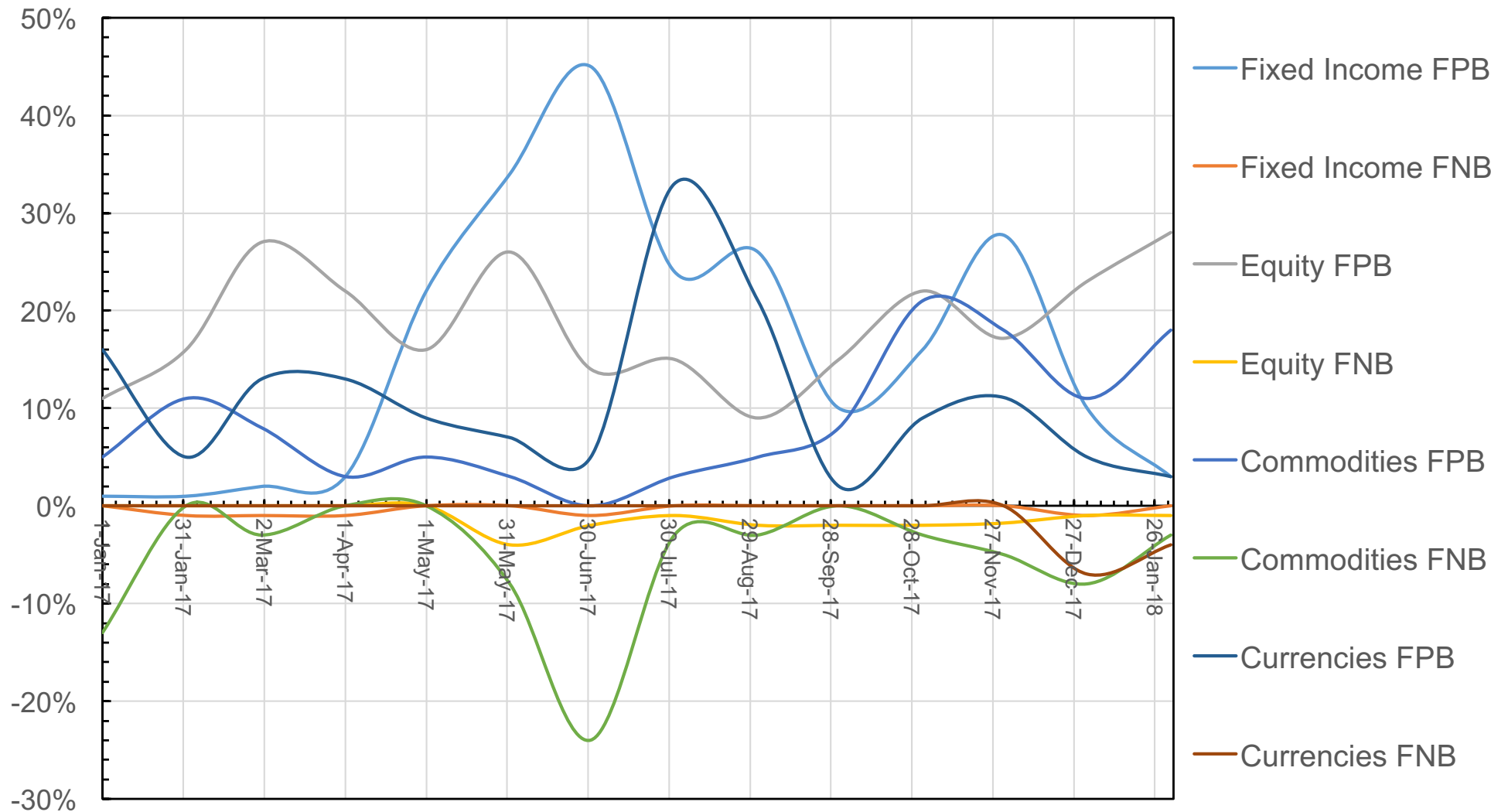

Positive bubble: imitation in **buying**
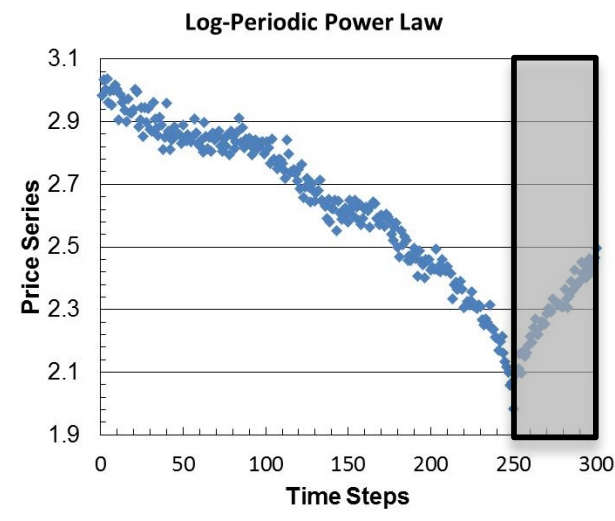
Negative bubble: imitation in **selling**

General Results – The Big Picture

Historical evolution of the fraction of assets within an asset class that show significant bubble signals

General Results – This Month's Overview

Asset Class	Subtype	Analyzed Assets	FPB	FNB
Fixed Income		**155**	**3%**	**0%**
	Government Bonds	55	7%	0%
	Finance and Insurance	21	0%	0%
	Corporate Bonds	79	0%	0%
Equity		**169**	**28%**	**1%**
	Country Indices	73	22%	0%
	Europe	36	6%	3%
	United States	60	50%	0%
Commodities		**38**	**18%**	**3%**
Forex		**108**	**3%**	**4%**

FPB – Fraction of assets in asset class showing positive bubble signals
FNB – Fraction of assets in asset class showing negative bubble signals

The results summarized above are similar to the outcomes of the previous month. Overall, positive bubble activity resides at a low to medium level and negative bubble activity at a near zero niveau amongst all asset classes.

In Equities and Commodities Indices, a slight increase in positive bubble signals is determined. A remarkable increase in the positive bubble signals can be observed amongst US Equities.

Currencies, as well as the cryptocurrency sector, remain at very low bubble activity.

Fixed Income

Name	YOY-Return	Bubblesize	DS LPPL Confidence
iBoxx GEMX Nigeria Index	30%	25%	65%

In the fixed income sector, in January 2018, we find similar trends as in December 2017. A low fraction of assets of about 7% of all analyzed Government Bond Indices exhibit positive bubble activity. The only relevant index in terms of identified bubble size and Confidence Indicator values is the Nigerian Index, which already appeared in the previous report. Meanwhile, however, the determined bubblesize has increased to 25% (from 18%) due to a further increase of the index throughout the month. The corresponding value of the Confidence Indicator has dramatically increased to 65% (from 13%), as confirmed by the plot on the next slide. Therefore, investors should keep a close eye on this index in the coming time.

In the Corporate Bond, as well as the Financial and Insurance Company Bond Sector, again, we do not detect any signals this month. However, it must be emphasized that this statement is only valid with respect to the bond sector, as will be seen later on.
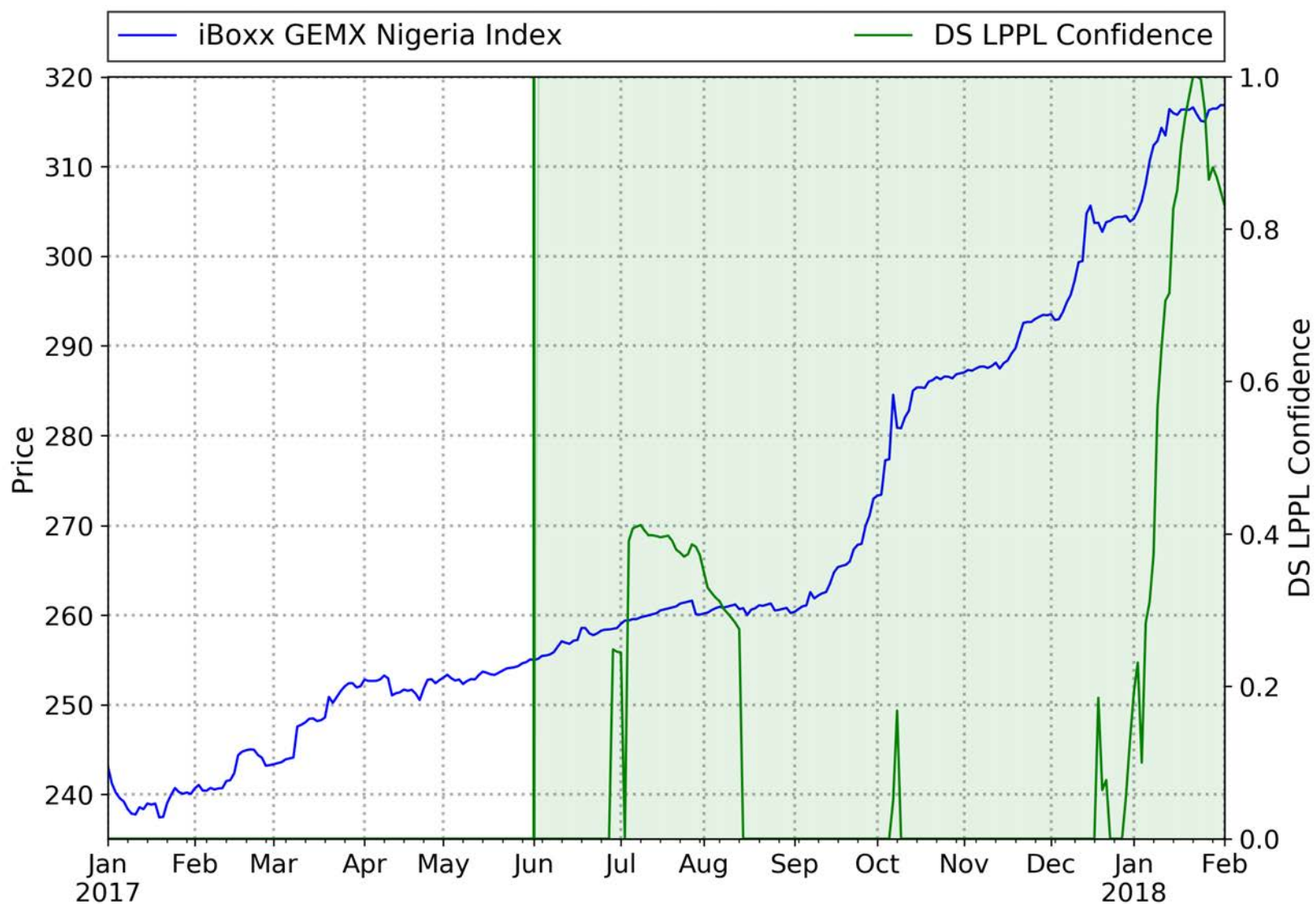
Equities - Country Performance

Name	YOY-Return	Bubblesize	DS LPPL Confidence
Vietnam Index	56%	44%	91%
Dow Jones Composite Index	20%	15%	82%
Dow Jones Industrial Average Index	27%	18%	77%
TOPIX Stock Price Index	20%	20%	49%
FTSE Straits Times Index	14%	14%	46%
EGX 30 Index	19%	11%	36%
S&P BSE Sensex Index	24%	11%	34%
Bursatil Index	9024%	806%	23%
Shanghai SE 50 Index	33%	27%	22%
PX Prague SE Index	17%	17%	17%
PFTS Index	23%	20%	13%

At the end of January, our list of positive bubble assets again comprises several indices that appeared already in previous reports. Total positive bubble activity over the country equity index sector amounts to 22% of all analyzed assets while no negative bubbles were detected. At the top of our list, we still recognize the Vietnamese Country Index, at a slightly larger bubble size (44%/41%), but a significantly larger indicator value of 91% (53%). In fact, when regarding the price trajectory of the index on the following slide, the change of regime from a phase of normal growth (up to the beginning of the green shaded region) to an ongoing period of accelerating price growth can be observed. It can be seen that our indicator peaked in advance to a previous minor setback which, considering the current indicator values, is a warning for what might happen in the coming time. Additionally, we provide a graphic depicting the DJIA which has experienced an ongoing price surge and has continued to regularly mark new all time highs.
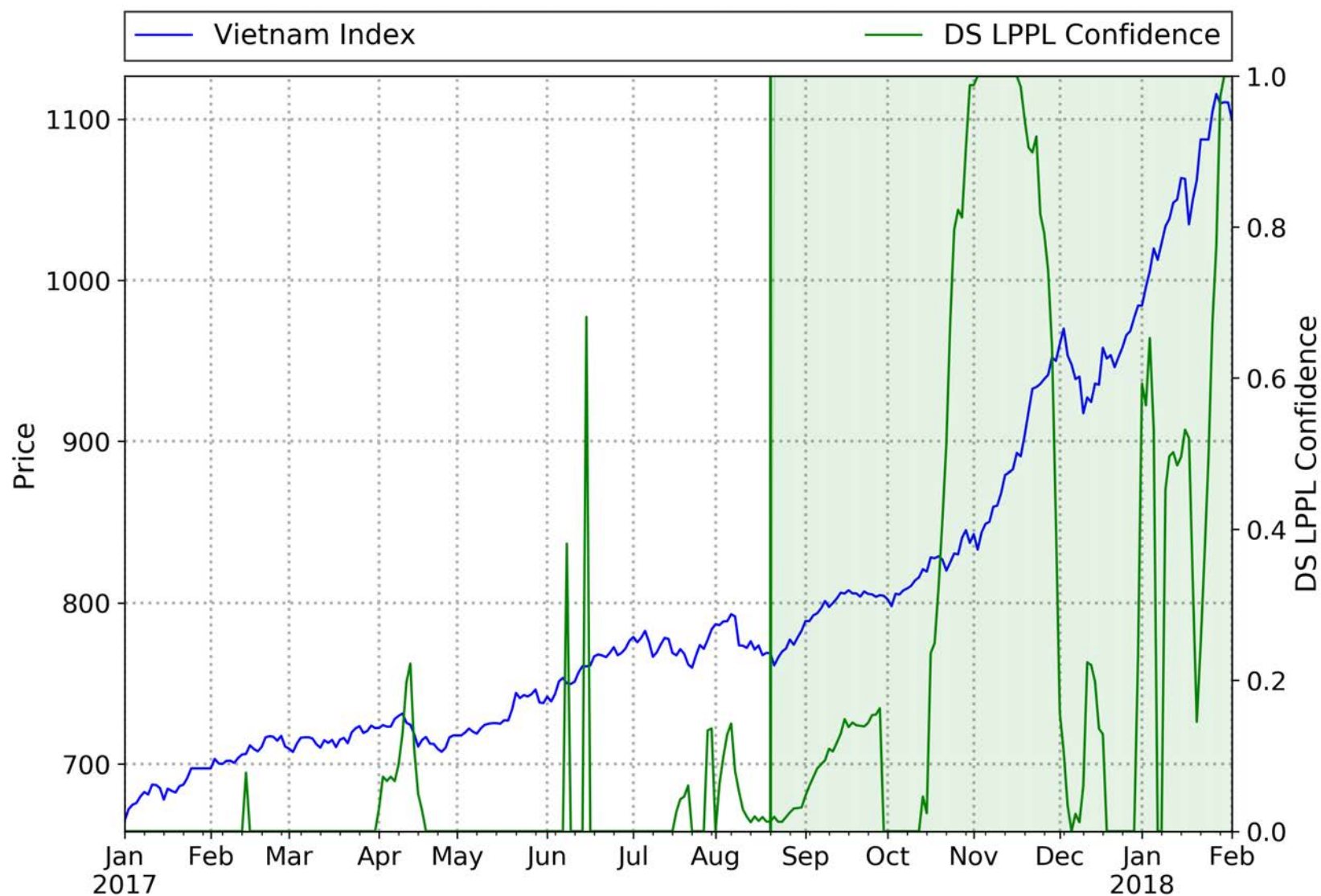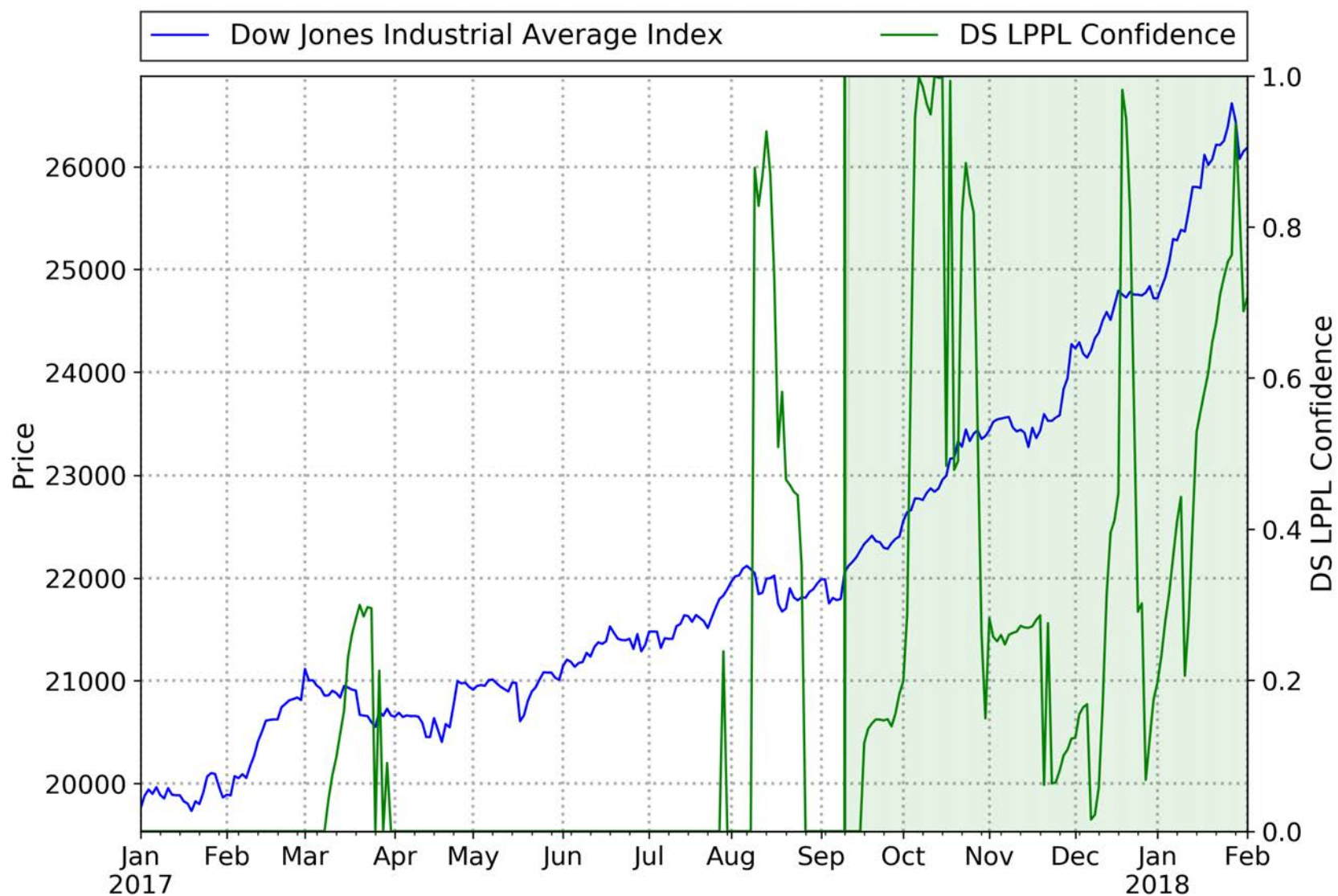
Equities - United States and Europe

Name	YOY-Return	Bubblesize	DS LPPL Confidence
STOXX Europe 600 Basic Materials EUR Price Index	10%	12%	11%

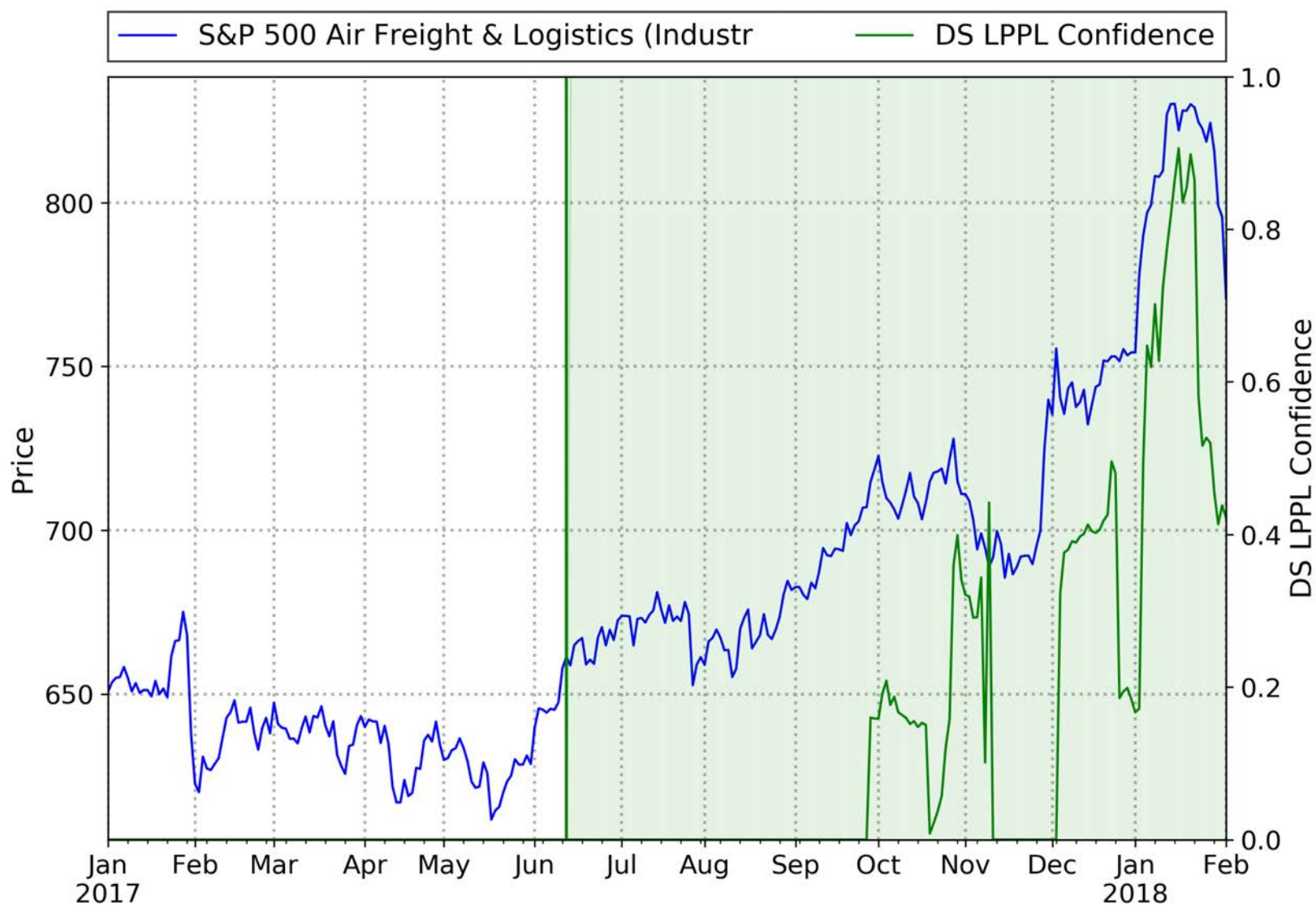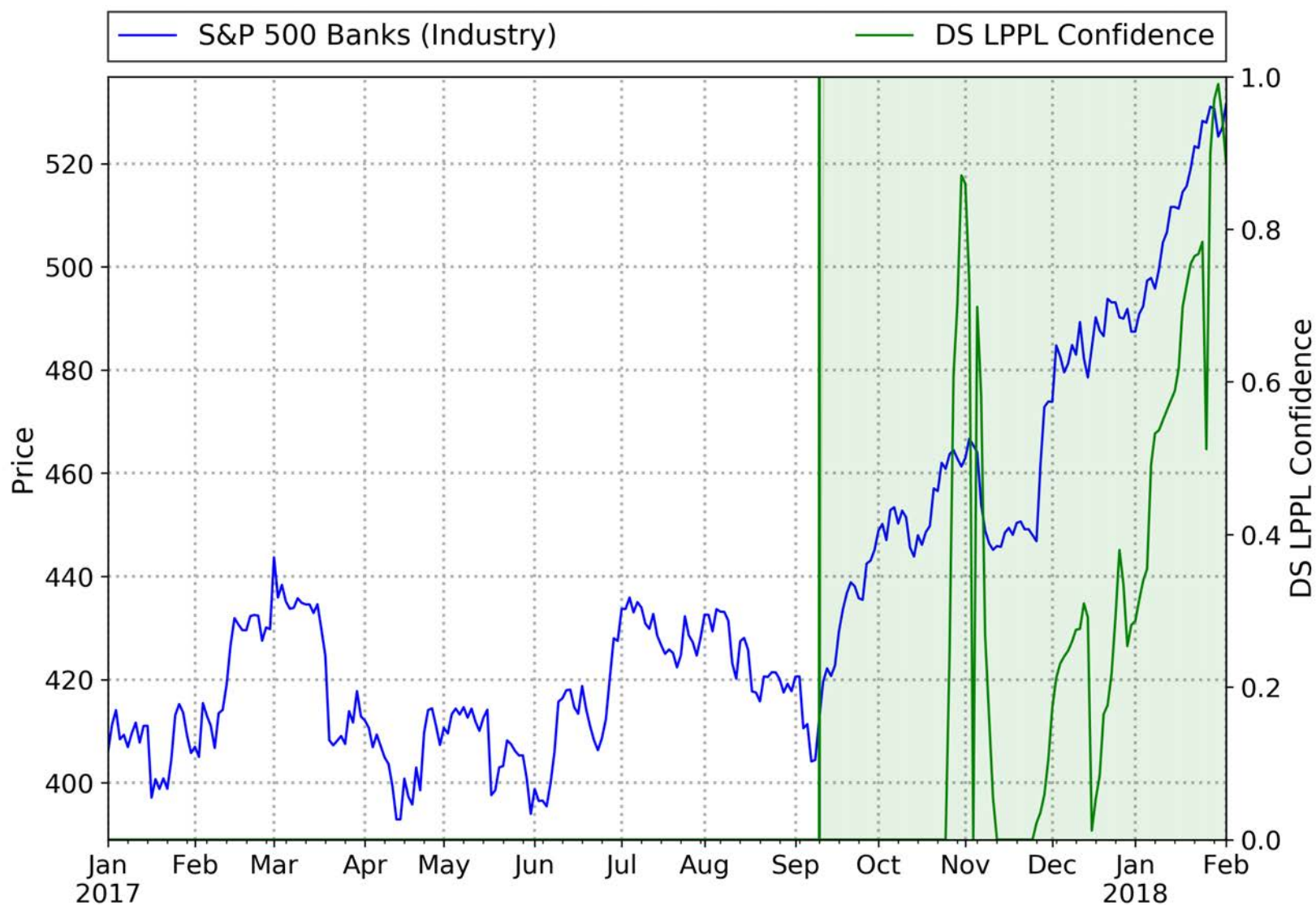| Name	YOY-Return	Bubblesize	DS LPPL Confidence
S&P 500 Containers & Packaging (Industry)	17%	11%	90%
S&P 500 Banks (Industry)	23%	29%	84%
S&P 500 Distributors (Industry)	15%	26%	84%
S&P 500 Diversified Financial Services (Industry)	29%	23%	80%
S&P 500 Auto Components (Industry)	36%	21%	75%
S&P 500 Machinery (Industry)	36%	31%	62%
S&P 500 Aerospace & Defense (Industry)	46%	29%	61%
S&P 500 Capital Markets (Industry)	28%	23%	59%
S&P 500 Construction & Engineering (Industry)	9%	36%	51%
S&P 500 - Professional Services (Industry)	1%	12%	44%
S&P 500 Multiline Retail (Industry)	24%	38%	43%
S&P 500 Food & Staples Retailing (Industry)	16%	16%	40%
S&P 500 Internet Software & Services (Industry)	42%	21%	37%
S&P 500 Air Freight & Logistics (Industry)	20%	16%	36%
S&P 500 Insurance (Industry)	14%	14%	36%
S&P 500 - Commercial Services & Supplies (Industry)	20%	17%	36%
S&P 500 Trading Companies & Distributors (Industry)	15%	47%	35%
S&P 500 Technology Hardware, Storage & Peripherals (Industry)	24%	19%	26%
S&P 500 -Real Estate Management & Development (Industry)	31%	40%	24%
S&P 500 Internet & Direct Marketing Retail (Industry)	57%	38%	23%
S&P 500 Electrical Equipment (Industry)	19%	17%	22%
S&P 500 Communications Equipment (Industry)	23%	28%	20%
S&P 500 Personal Products (Industry)	42%	30%	20%
S&P 500 Software (Industry)	42%	42%	17%
S&P 500 Oil, Gas & Consumable Fuels (Industry)	9%	14%	15%
S&P 500 - Electronic Equipment, Instruments & Components (Industry)	29%	32%	14%

Equities – Europe and United States

Continuing with the close-up analysis of the European and United States Equity Markets, as represented here by Indices of the STOXX, respectively S&P500 families, we find large differences in potential bubble activity between the two markets this month. While European Markets remain at low activity levels regarding positive and negative bubble presence, a strong increase in the fraction of positive bubble signals to 50% (35%) can be observed for US Equity Indices.

A positive development of the US markets may not come as a surprising fact, as recent decisions on US corporate tax reduction (in the second half of December 2017) has lifted market sentiment amongst investors. Additionally, President Trump's attendance of the World Economic Forum in Davos, Switzerland, and his optimistic announcements there might have strenghtened investor's views. However, the strong positive bubble activity that is identified in US Equities is to be principally interpreted as a warning that this optimism might transition into exuberant behaviour, ultimately leading to unsustainable price growth.

In the plots supplied on the next few pages, we firstly present one index that already appeared in the previous report, the Air Freights & Logistics Index. Recently, it experienced a drawdown after values of the DS LPPL Confidence saw a peak. Secondly, the S&P500 Banks Index has moved up in the table with more than doubled indicator values of 84% (36%), at an increased bubblesize of 29% (23%) compared to the previous month.

The FCO Cockpit - Global Bubble Status Report 1st February 2018

Commodities

Name	YOY-Return	Bubblesize	DS LPPL Confidence
Zinc ER Index	27%	18%	80%
Energy ER Index	18%	39%	42%
Petroleum ER Index	21%	44%	41%
Palladium ER Index	33%	37%	34%
Crude Oil ER Index	15%	39%	34%
Heating Oil ER Index	26%	35%	28%
Gasoil ER Index	26%	35%	23%
Coffee ER Index	-25%	-25%	13%

In the commodities sector, a slight rise in total positive bubble signals to 18% (11%) is detected. Palladium, as well as various Oil-related indices, all at grown bubble sizes, appear in the list, as seen already in previous reports. Palladium has undergone a recent minor correction, as visible in the plot below. Newly, at the top of the list we find the Zinc Index which was not listed in previous reports, implying only recent formation of bubble dynamics in this commodity. Indeed, as visible in the corresponding plot on the next slide, a sharp rise of the Zinc index, which approximately begun in December, can be observed.

The only identified negative bubble this month is on the Coffee ER Index, however at a small indicator signal.
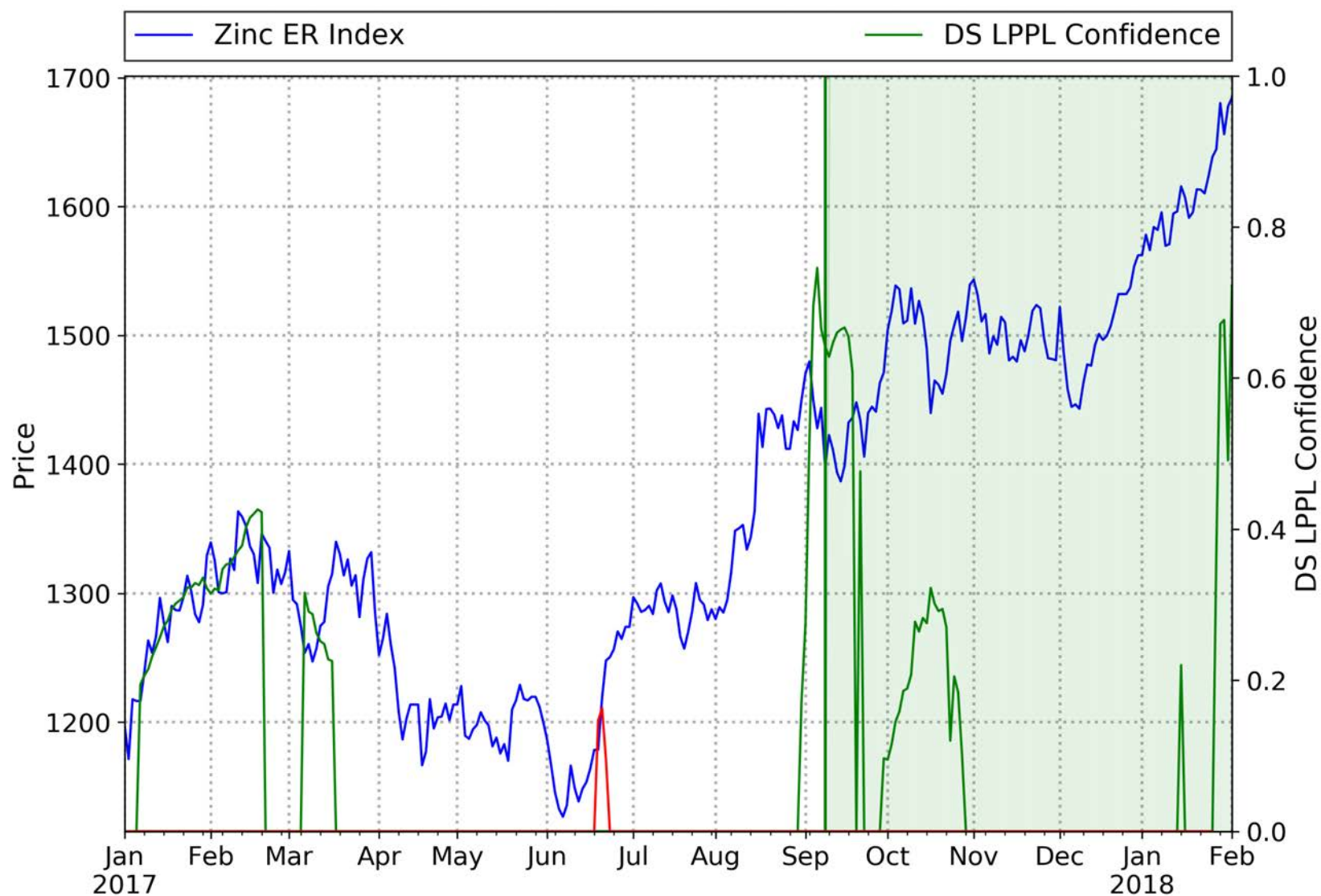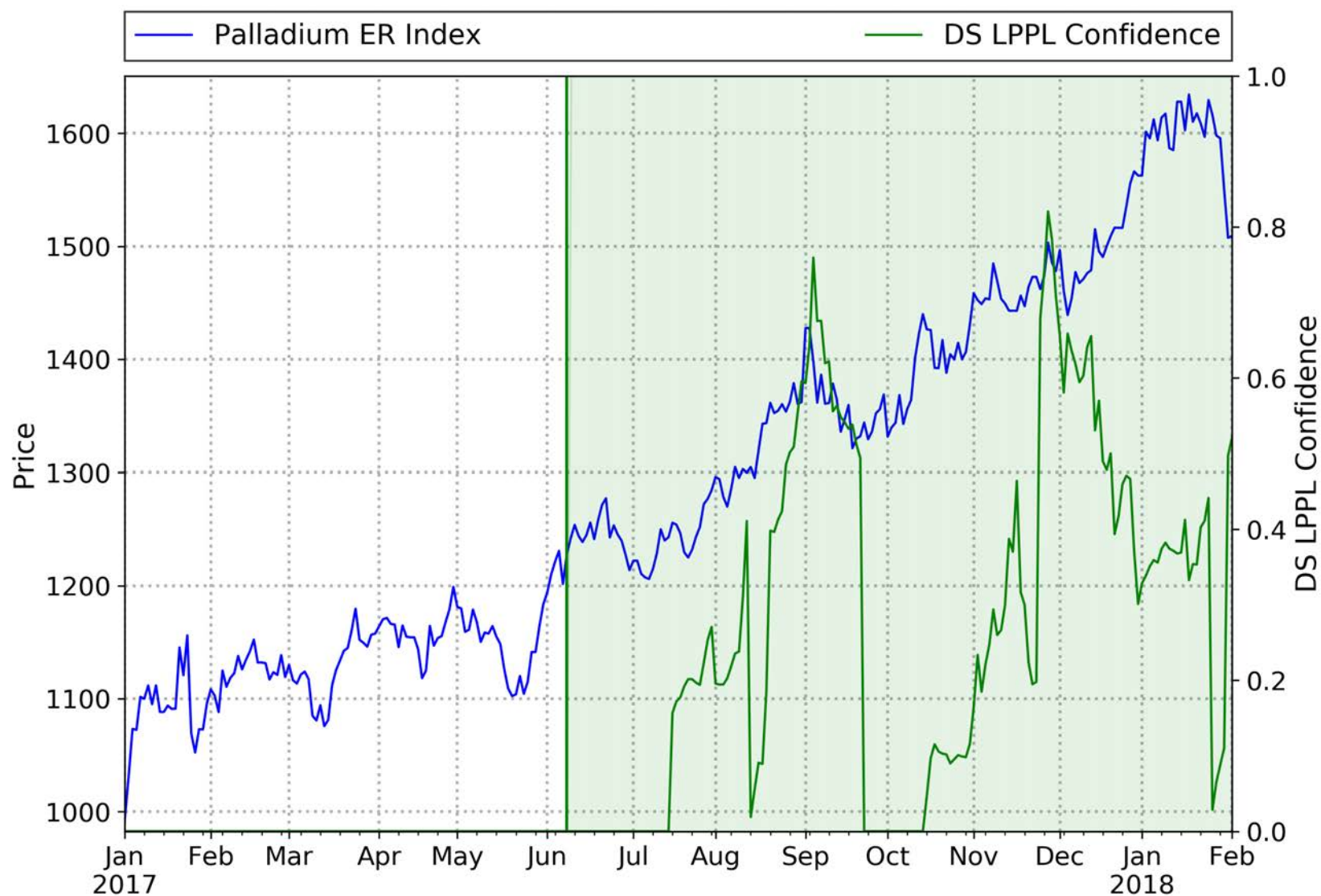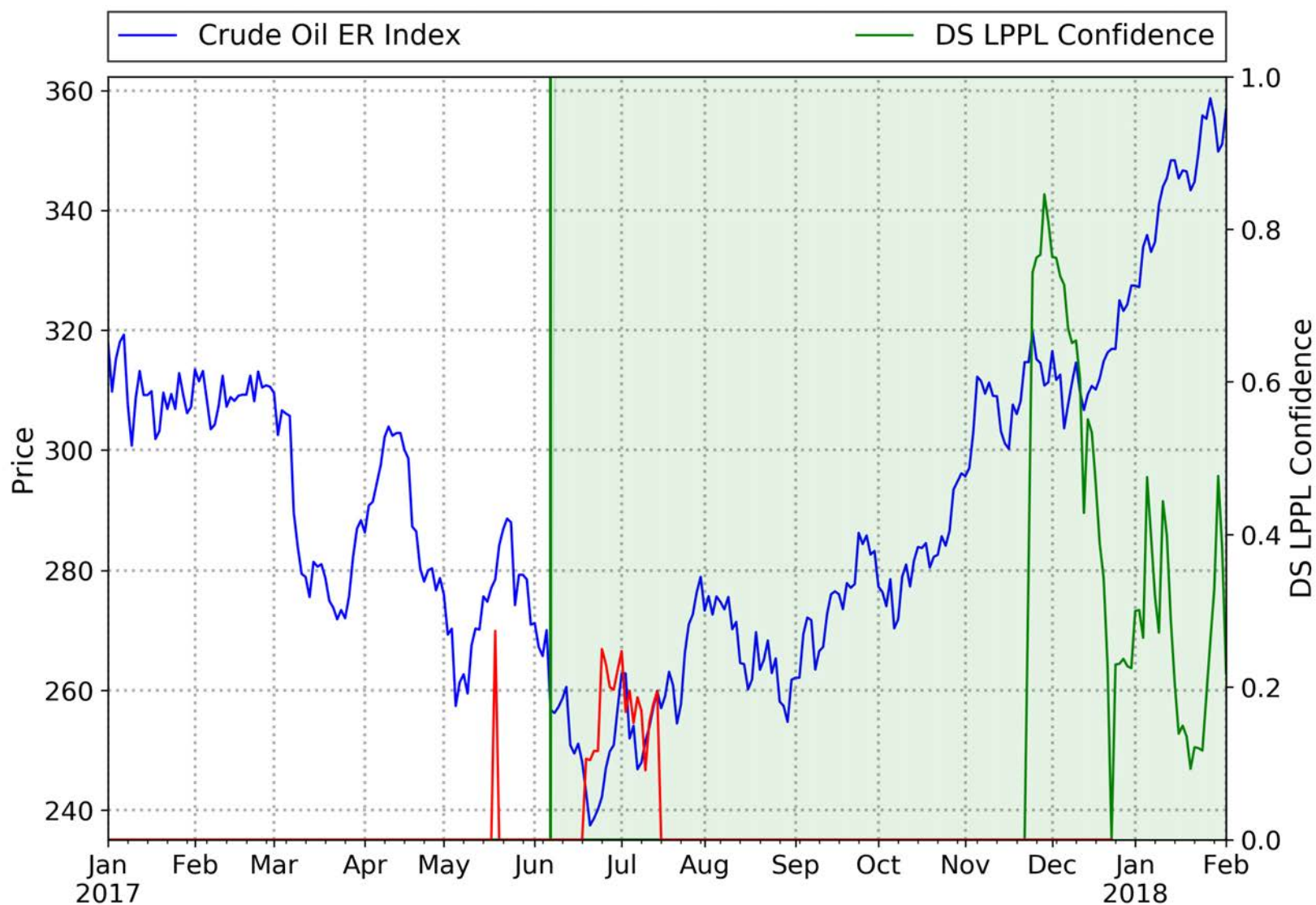
Currencies – Real Effective Exchange Rates, PCA

Name	YOY-Return	Bubblesize	DS LPPL Confidence
REER Index Pakistan	-12%	-12%	25%

The foreign exchange sector seems to have recovered from weak negative bubble size signals in several currency pairs one month ago, and now shows signals only in the REER Pakistan Index. Furthermore, no signals were detected in the monthly Principal Component Analysis of currencies.
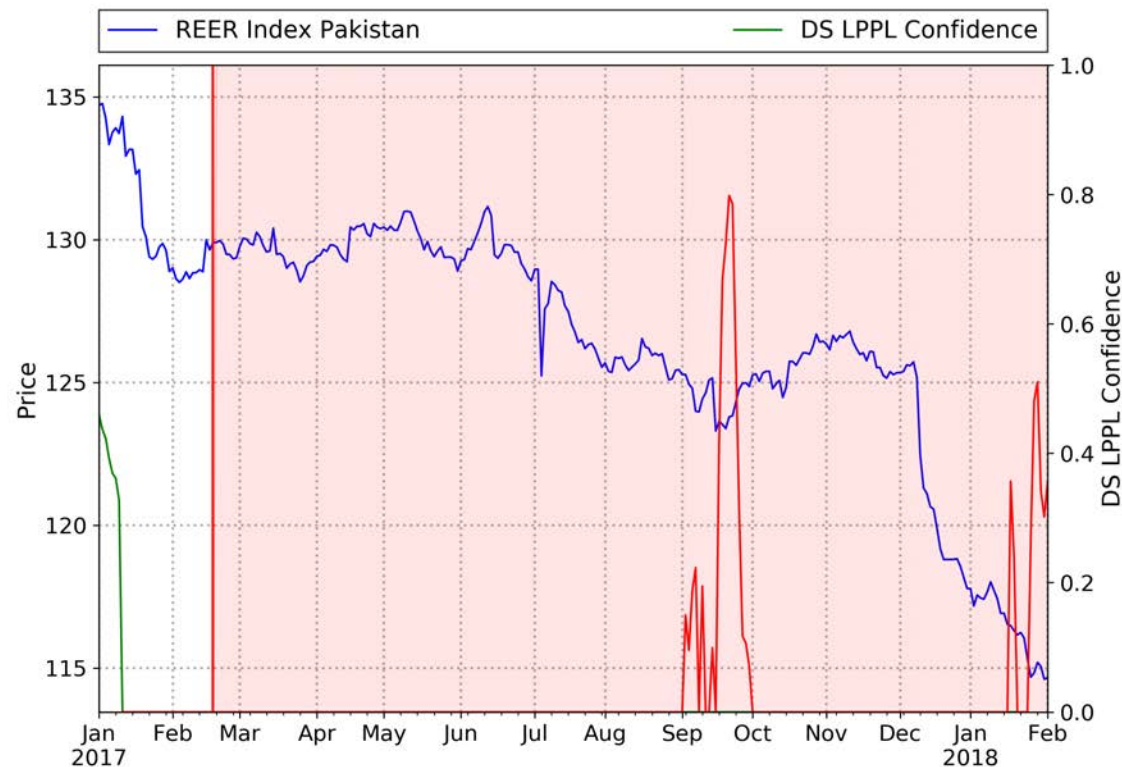
Currencies – Cryptocurrencies

This month, in the cryptocurrency sector, our indicator has been silent, as a result of the ongoing strong correction of the whole market. Bitcoin has dropped by more than 50% since its peak on Dec. 17 2017. In the course of this turbulent downtrend, the whole crypto-market has lost about 400 Billion US Dollars in ("paper") value since its peak date in early January, when total market capitalization amounted to more than 800 Billion US Dollars. As a comparison, at its peak in December, Bitcoin alone had reached a total ("paper") market capitalization of 336B US$, which has now shrunk to 144BUS$ according to data from coinmarketcap.com, an incredible development!

One can only speculate how long it will take for the crypto-market to recover from this most recent disruptive quake. When taking a look at past crashes of Bitcoin, it can be seen that there have been crashes of comparable magnitudes in the past, a hint that this recent development may be just an episode on the longer scheme of things.

Single Stocks

For 752 stocks, we calculate the bubble warning indicators as well as two financial strength indicators, which indicate the fundamental value of the stock and the growth capability respectively.

The stocks are the constituents of the Stoxx Europe 600, the S&P 500 and the Nasdaq 100 indices. From these, all doubles and stocks with incomplete data are removed. Because our financial strength indicators are specifically designed for corporates, all financial institutions are taken out of the set as well.

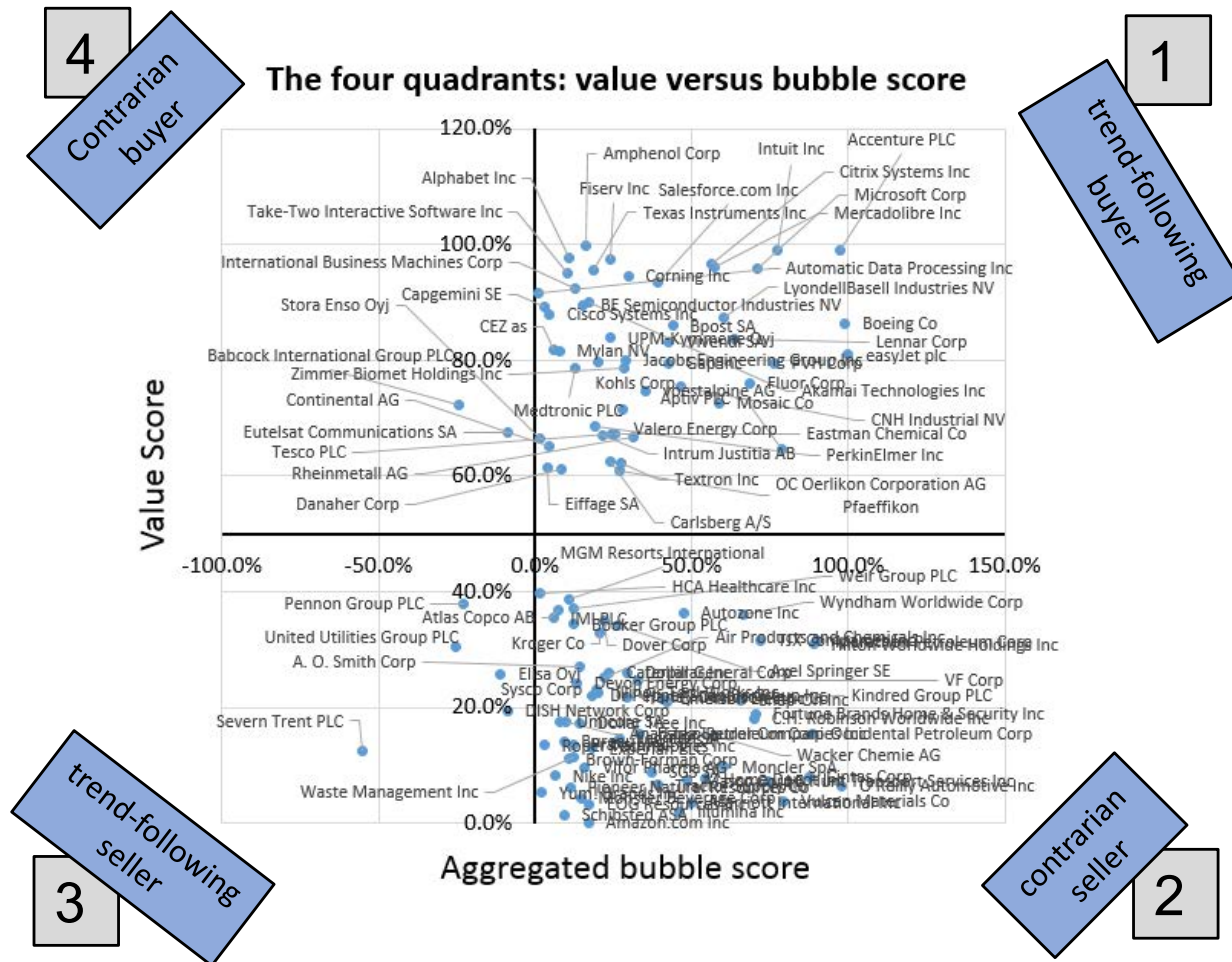The two financial strength indicators are:

A value score that is based on the ROIC (Return on Invested Capital) taking into account the EV (Enterprise Value) to normalize for high/low market valuations and/or high/low debt;

A growth score that has characteristics similar to the PEG ratio, which is the Price to Earnings ratio normalized for expected EPS-growth (Earnings per Share).

Both scores give a value between zero and one, one being the best of the set and zero the worst, so the higher the score, the higher the financial strength.

We upgrade the calculation method of the value score, which takes into account the ROIC heterogeneity among different industries.

Single Stocks

The four quadrants: value versus bubble score

4 — Contrarian buyer

1 — trend-following buyer

3 — trend-following seller

2 — contrarian seller

By plotting the value score against the aggregated bubble score, we can divide the stocks into four quadrants*:

1. Quadrant 1: Stocks with a strong positive bubble score and a strong value score (e.g. Eiffage SA);

2. Quadrant 2: Stocks with a strong positive bubble score and a weak value score (e.g. HCA Healthcare Inc);

3. Quadrant 3: Stocks with a strong negative bubble score and a weak value score (e.g. Severn Trent PLC);

4. Quadrant 4: Stocks with strong negative bubble score and a strong financial strength (e.g. Eutelsat Communications SA)

*A strong positive bubble signal is identified if bubble score is larger than 10%, and a strong negative bubble signal is identified if bubble score is smaller than -10%.
A strong value score is identified if value score is larger than 60%, and a weak value score is identified if value score is smaller than 40%.

Single Stocks

Each quadrant has its own specs:

1. Quadrant 1: Stocks with a strong value score are cheap relative to their earnings potential. The strong positive bubble signal should be interpreted as a momentum indicator possibly the consequence of a repricing based on the fundamentals. As an investor, one could be a trend-following buyer.

2. Quadrant 2: Stocks with a weak value score are expensive relative to their earnings potential. The strong positive bubble signal is an indication of sentiment and herding increasing the price until it is not linked to fundamentals anymore. As an investor, one could be a contrarian seller.

3. Quadrant 3: These stocks are expensive relative to their earnings potential. On top of that, there are clear negative bubble signals. Such stocks should be considered as falling knives. As an investor, one could be a trend-following seller.

4. Quadrant 4: These stocks are cheap relative to their financial performance. The strong negative bubble signal is an indication of sentiment and herding. These stocks can be considered as over-sold. As an investor, one could be a contrarian buyer.
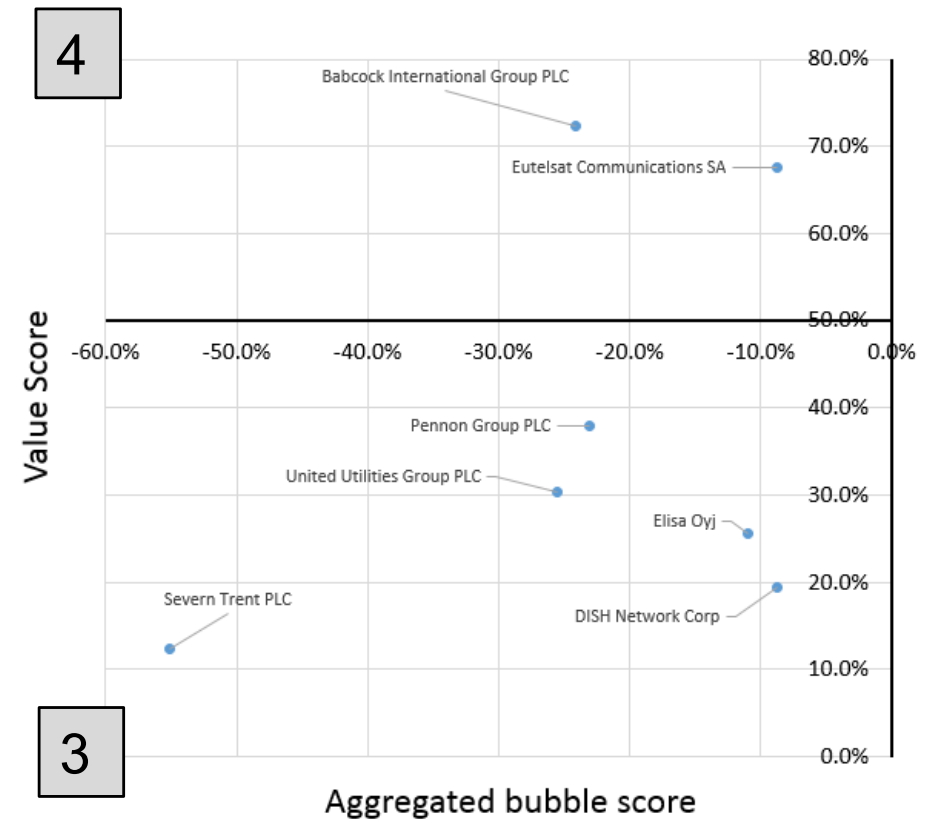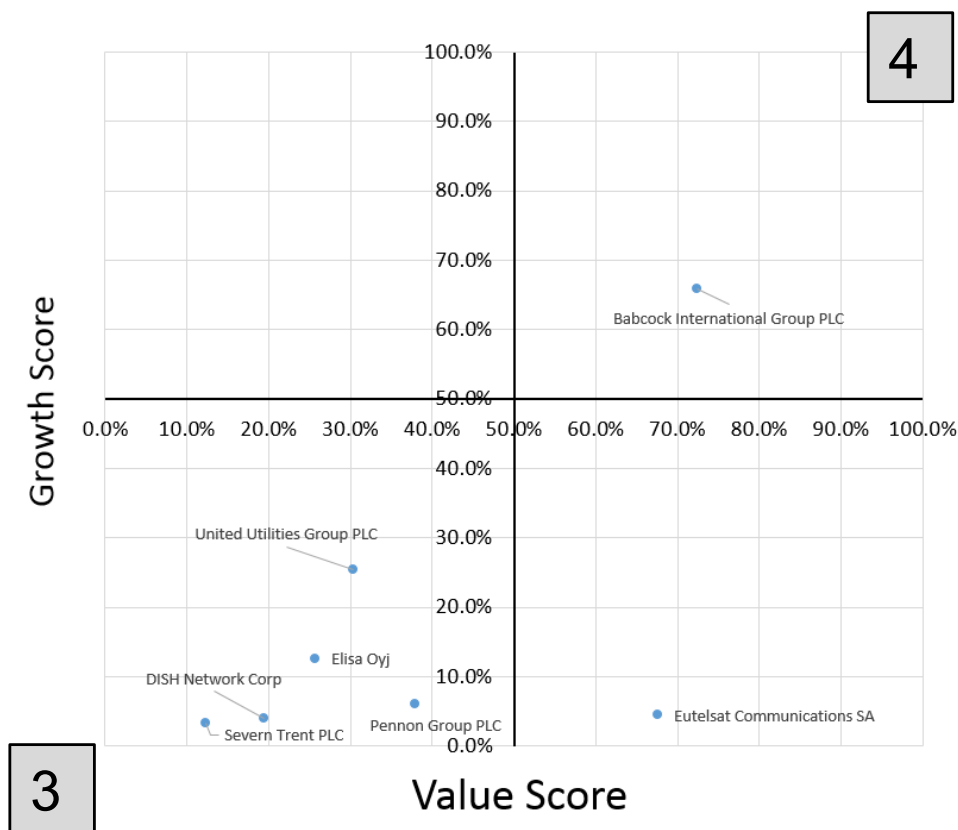
Single Stocks

Quadrant 1 and 2 stocks

Strong positive bubble signals with strong (respectively weak) fundamentals
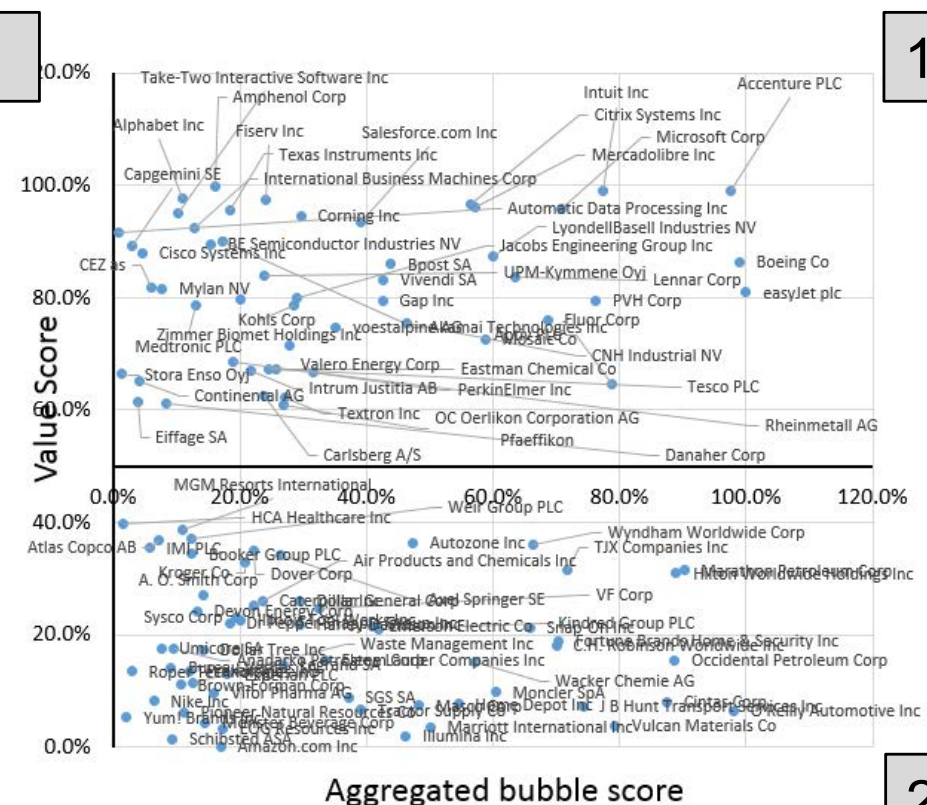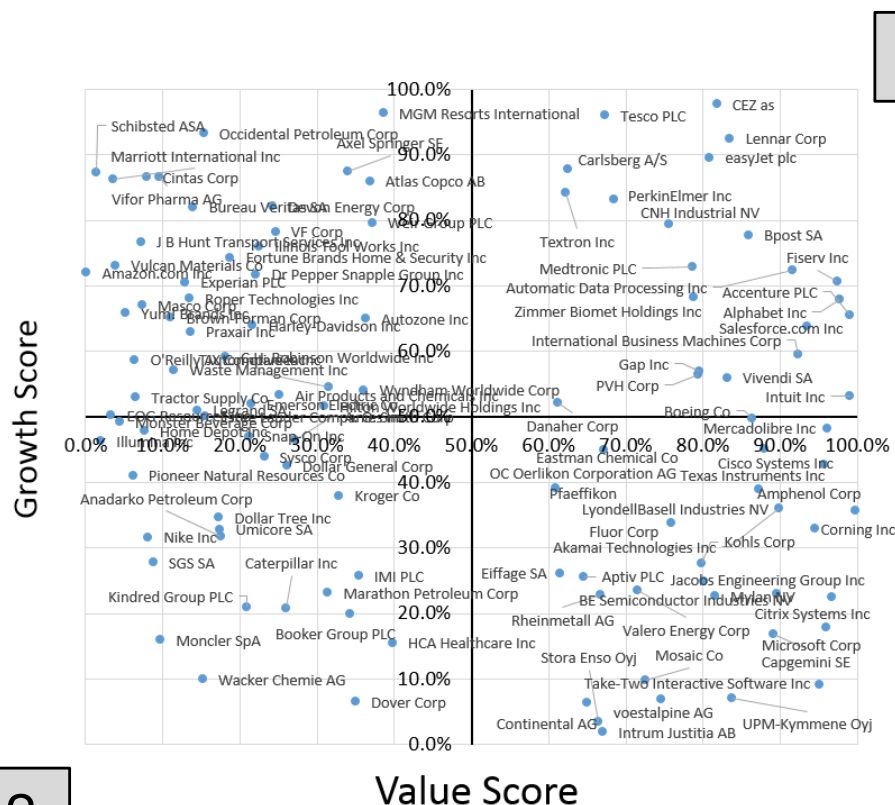
Single Stocks

Quadrant 3 and 4 stocks
Strong negative bubble signals with weak (respectively strong) fundamentals

Single Stocks

Quadrant 1 stocks: strong positive bubble signals with strong fundamentals

| Company Name	Country of Headquarters	GICS Industry Group Name	Yearly Return	Bubble Size	Bubble Start	Bubble Score	Value Score	Growth Score
Automatic Data Processing Inc	United States of America	Software & Services	24.3%	24.3%	May-17	0.8%	91.6%	72.3%
Akamai Technologies Inc	United States of America	Software & Services	5.4%	47.3%	Jul-17	17.4%	89.9%	36.0%
Cisco Systems Inc	United States of America	Technology Hardware & Equipment	28.6%	31.4%	Sep-17	4.6%	87.9%	45.2%
Citrix Systems Inc	United States of America	Software & Services	17.5%	18.4%	Jun-17	56.5%	96.7%	22.5%
Fiserv Inc	United States of America	Software & Services	27.9%	13.6%	Aug-17	24.2%	97.3%	70.7%
Alphabet Inc	United States of America	Software & Services	40.7%	21.9%	Jun-17	11.0%	97.7%	68.0%
Intuit Inc	United States of America	Software & Services	41.3%	33.7%	Apr-17	77.3%	99.1%	53.2%
Mercadolibre Inc	Argentina	Software & Services	96.4%	66.4%	Aug-17	57.3%	96.1%	48.3%
Microsoft Corp	United States of America	Software & Services	47.1%	27.1%	Sep-17	70.9%	95.9%	17.8%
Mylan NV	United Kingdom	Pharmaceuticals, Biotechnology & Life Sciences	5.2%	30.2%	Aug-17	7.7%	81.5%	22.6%
Take-Two Interactive Software Inc	United States of America	Software & Services	117.4%	42.2%	Aug-17	10.1%	95.1%	9.2%
Texas Instruments Inc	United States of America	Semiconductors & Semiconductor Equipment	45.0%	36.9%	Apr-17	18.5%	95.6%	42.8%
Bpost SA	Belgium	Transportation	17.6%	14.4%	Aug-17	43.9%	85.9%	77.8%
CEZ as	Czech Republic	Utilities	21.0%	18.5%	Mar-17	6.1%	81.8%	97.7%
Continental AG	Germany	Automobiles	25.5%	26.1%	Jul-17	4.3%	65.0%	6.4%
Rheinmetall AG	Germany	Capital Goods	59.8%	46.6%	Mar-17	31.5%	66.8%	22.9%
Carlsberg A/S	Denmark	Food, Beverage & Tobacco	26.7%	10.9%	Jun-17	24.0%	62.5%	87.9%
easyJet plc	United Kingdom	Transportation	73.8%	36.7%	Aug-17	100.0%	80.9%	89.6%
Capgemini SE	France	Software & Services	36.0%	36.0%	Feb-17	2.9%	89.1%	16.9%
Vivendi SA	France	Media	37.9%	22.1%	Aug-17	42.7%	83.1%	56.0%
Eiffage SA	France	Capital Goods	40.7%	26.5%	Apr-17	4.0%	61.4%	26.2%
BE Semiconductor Industries NV	Netherlands	Semiconductors & Semiconductor Equipment	128.6%	61.3%	Apr-17	15.4%	89.5%	23.0%
CNH Industrial NV	United Kingdom	Capital Goods	32.1%	22.6%	Jul-17	46.4%	75.5%	79.4%
Stora Enso Oyj	Finland	Materials	38.1%	26.6%	Apr-17	1.4%	66.4%	3.5%
UPM-Kymmene Oyj	Finland	Materials	21.6%	15.4%	Jul-17	24.0%	83.8%	7.0%
voestalpine AG	Austria	Materials	28.5%	20.2%	Sep-17	35.2%	74.6%	6.9%

Single Stocks

Quadrant 1 stocks: strong positive bubble signals with strong fundamentals

Company Name	Country of Headquarters	GICS Industry Group Name	Yearly Return	Bubble Size	Bubble Start	Bubble Score	Value Score	Growth Score
OC Oerlikon Corporation AG Pfaeffikon	Switzerland	Capital Goods	43.8%	17.4%	Jul-17	26.9%	60.9%	39.1%
Tesco PLC	United Kingdom	Food & Staples Retailing	6.1%	15.2%	Apr-17	24.5%	67.3%	96.0%
Accenture PLC	Ireland; Republic of	Software & Services	33.9%	29.5%	Jul-17	97.5%	98.9%	65.6%
Amphenol Corp	United States of America	Technology Hardware & Equipment	34.2%	26.0%	May-17	16.2%	99.7%	35.6%
Aptiv PLC	United Kingdom	Automobiles & Components	49.1%	24.6%	Jul-17	78.8%	64.5%	25.5%
Boeing Co	United States of America	Capital Goods	110.3%	51.2%	Aug-17	99.0%	86.3%	49.9%
Salesforce.com Inc	United States of America	Software & Services	40.8%	40.8%	Feb-17	39.1%	93.5%	63.8%
Danaher Corp	United States of America	Health Care Equipment & Services	20.4%	19.0%	Feb-17	8.3%	61.2%	52.1%
Eastman Chemical Co	United States of America	Materials	23.1%	24.1%	May-17	25.7%	67.2%	44.9%
Fluor Corp	United States of America	Capital Goods	5.8%	51.5%	Aug-17	68.6%	75.9%	33.9%
Corning Inc	United States of America	Technology Hardware & Equipment	14.6%	13.4%	Apr-17	29.7%	94.5%	33.0%
Gap Inc	United States of America	Retailing	37.4%	41.1%	May-17	42.5%	79.5%	57.0%
International Business Machines Corp	United States of America	Software & Services	-9.1%	11.0%	Jul-17	12.8%	92.3%	59.6%
Jacobs Engineering Group Inc	United States of America	Capital Goods	20.7%	32.6%	Jul-17	29.0%	80.1%	25.0%
Kohls Corp	United States of America	Retailing	51.9%	69.9%	Aug-17	20.2%	79.8%	27.7%
Lennar Corp	United States of America	Consumer Durables & Apparel	38.0%	22.9%	Aug-17	63.5%	83.5%	92.6%
LyondellBasell Industries NV	United States of America	Materials	28.7%	48.4%	May-17	60.1%	87.2%	39.0%
Medtronic PLC	Ireland; Republic of	Health Care Equipment & Services	11.5%	7.7%	Aug-17	13.0%	78.6%	73.0%
Mosaic Co	United States of America	Materials	-19.8%	32.5%	Aug-17	58.8%	72.5%	9.8%
PerkinElmer Inc	United States of America	Pharmaceuticals, Biotechnology & Life Sciences	47.4%	41.1%	Mar-17	18.9%	68.5%	83.2%
PVH Corp	United States of America	Consumer Durables & Apparel	71.8%	22.2%	Aug-17	76.3%	79.4%	56.5%
Textron Inc	United States of America	Capital Goods	19.2%	22.1%	Jul-17	27.2%	62.2%	84.3%
Valero Energy Corp	United States of America	Energy	41.9%	42.3%	Aug-17	27.9%	71.5%	23.5%
Zimmer Biomet Holdings Inc	United States of America	Health Care Equipment & Services	8.5%	12.6%	Aug-17	28.7%	78.7%	68.4%
Intrum Justitia AB	Sweden	Commercial & Professional Services	-5.4%	14.9%	Aug-17	21.7%	67.0%	1.9%

Quadrant 1 stocks: strong positive bubble signals with strong fundamentals
Example: Boeing Co.
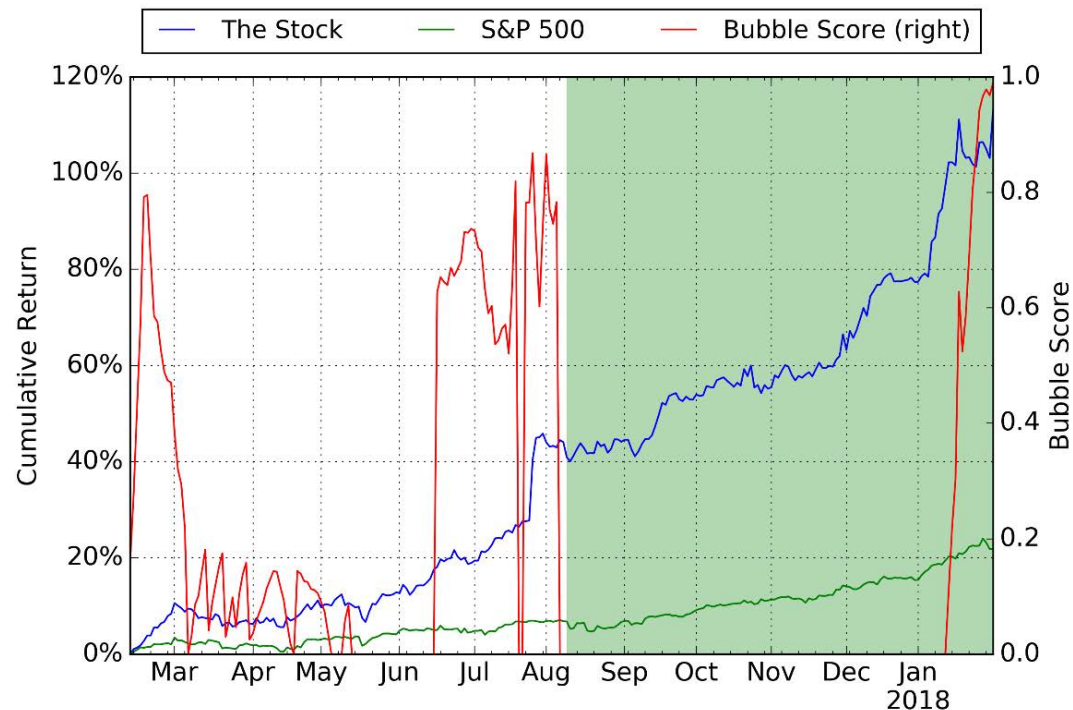
The above graph shows the one year cumulative return of the stock in blue (left hand scale), S&P 500 in green (left hand scale) and the calculated DS LPPLS Bubble Score in red (right hand scale). The green shaded period is the strong positive bubble we identified. The Bubble Score of this six month bubble has reached 99% with a bubble size 51.2%.

Last month example: strong positive bubble signals with strong fundamentals, Valero Energy Corp.

The figure below plots the one year cumulative return of the stock (blue), S&P 500 (green) and LPPLS Bubble Score (red lines on the right y-axis). The green shaded period is the strong positive bubble we identified and reported last month. Note that the stock continued to appreciate and started a correction recently, which is in agreement with the DS LPPLS indicator and the strong fundamentals.
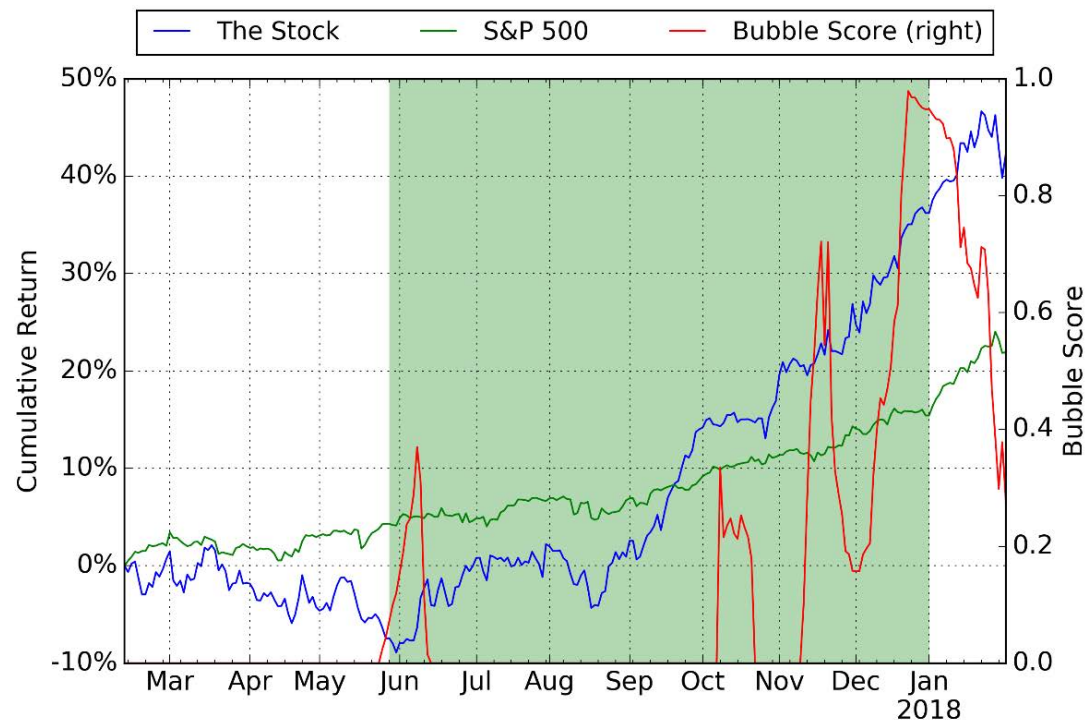
Single Stocks - Quadrant 2 stocks

Quadrant 2 stocks: strong positive bubble signals with weak fundamentals

Company Name	Country of Headquarters	GICS Industry Group Name	Yearly Return	Bubble Size	Bubble Start	Bubble Score	Value Score	Growth Score
Amazon.com Inc	United States of America	Retailing	73.5%	45.6%	Jul-17	17.0%	0.1%	72.1%
C.H. Robinson Worldwide Inc	United States of America	Transportation	18.5%	26.5%	Sep-17	70.0%	18.1%	59.2%
Cintas Corp	United States of America	Commercial & Professional Services	43.9%	21.7%	Jul-17	87.5%	8.0%	86.6%
Dollar Tree Inc	United States of America	Retailing	44.1%	51.5%	Mar-17	14.2%	17.3%	34.7%
Illumina Inc	United States of America	Pharmaceuticals, Biotechnology & Life Sciences	41.5%	40.5%	Mar-17	46.2%	2.0%	46.3%
J B Hunt Transport Services Inc	United States of America	Transportation	21.4%	33.0%	Jul-17	74.2%	7.2%	76.7%
Marriott International Inc	United States of America	Consumer Services	67.6%	45.8%	Jun-17	50.1%	3.6%	86.3%
Monster Beverage Corp	United States of America	Food, Beverage & Tobacco	57.3%	38.0%	May-17	14.6%	4.4%	49.2%
O'Reilly Automotive Inc	United States of America	Retailing	-1.8%	34.2%	Aug-17	98.0%	6.4%	58.8%
Tractor Supply Co	United States of America	Retailing	3.9%	32.1%	May-17	39.1%	6.5%	53.1%
Umicore SA	Belgium	Materials	66.8%	62.0%	Apr-17	7.7%	17.4%	32.8%
Booker Group PLC	United Kingdom	Food & Staples Retailing	9.5%	16.9%	Apr-17	12.4%	34.3%	19.9%
Axel Springer SE	Germany	Media	48.7%	30.0%	Aug-17	26.4%	34.0%	87.5%
Wacker Chemie AG	Germany	Materials	48.0%	59.5%	Aug-17	57.1%	15.2%	10.0%
Experian PLC	Ireland; Republic of	Commercial & Professional Services	3.7%	5.9%	Jul-17	18.1%	12.9%	70.6%
Bureau Veritas SA	France	Commercial & Professional Services	25.8%	12.1%	Apr-17	9.2%	14.0%	82.0%
Legrand SA	France	Capital Goods	24.1%	13.4%	Aug-17	26.8%	14.5%	51.1%
Moncler SpA	Italy	Consumer Durables & Apparel	49.1%	26.9%	Jun-17	60.4%	9.7%	16.0%
IMI PLC	United Kingdom	Capital Goods	8.8%	10.0%	Jul-17	5.7%	35.4%	25.8%
Schibsted ASA	Norway	Media	10.6%	27.3%	Aug-17	9.4%	1.3%	87.4%
SGS SA	Switzerland	Commercial & Professional Services	18.2%	18.9%	Mar-17	37.2%	8.8%	27.8%
Vifor Pharma AG	Switzerland	Pharmaceuticals, Biotechnology & Life Sciences	24.2%	30.5%	Mar-17	16.0%	9.6%	86.7%
A. O. Smith Corp	United States of America	Capital Goods	34.4%	24.7%	May-17	14.2%	27.1%	46.5%
Anadarko Petroleum Corp	United States of America	Energy	-12.1%	28.8%	Jun-17	9.6%	17.6%	31.8%
Air Products and Chemicals Inc	United States of America	Materials	18.5%	24.8%	Mar-17	22.3%	25.1%	53.3%
Autozone Inc	United States of America	Retailing	4.0%	50.0%	Aug-17	47.3%	36.3%	65.0%
Brown-Forman Corp	United States of America	Food, Beverage & Tobacco	47.0%	40.7%	Jun-17	10.6%	11.0%	65.2%
Caterpillar Inc	United States of America	Capital Goods	65.9%	78.1%	Mar-17	23.6%	25.9%	20.9%
Dollar General Corp	United States of America	Retailing	33.7%	42.1%	Aug-17	29.4%	26.1%	42.6%
Dover Corp	United States of America	Capital Goods	33.2%	33.8%	Mar-17	22.2%	35.0%	6.5%
Dr Pepper Snapple Group Inc	United States of America	Food, Beverage & Tobacco	28.2%	28.6%	Jun-17	18.3%	22.1%	71.8%

Single Stocks - Quadrant 2 stocks

**Quadrant 2 stocks:** strong positive bubble signals with weak fundamentals (cont'd)

Company Name	Country of Headquarters	GICS Industry Group Name	Yearly Return	Bubble Size	Bubble Start	Bubble Score	Value Score	Growth Score
Devon Energy Corp	United States of America	Energy	-9.9%	33.0%	Jul-17	13.3%	24.2%	82.2%
Estee Lauder Companies Inc	United States of America	Household & Personal Products	62.1%	45.7%	May-17	33.4%	15.4%	50.1%
Emerson Electric Co	United States of America	Capital Goods	12.6%	21.9%	May-17	40.9%	21.4%	52.0%
EOG Resources Inc	United States of America	Energy	13.6%	20.2%	Apr-17	17.3%	3.3%	50.3%
Fortune Brands Home & Security Inc	United States of America	Capital Goods	24.7%	13.3%	Aug-17	70.4%	18.8%	74.3%
HCA Healthcare Inc	United States of America	Health Care Equipment & Services	20.8%	27.6%	Aug-17	1.6%	39.8%	15.6%
Home Depot Inc	United States of America	Retailing	42.1%	36.2%	Aug-17	54.5%	7.6%	47.9%
Hilton Worldwide Holdings Inc	United States of America	Consumer Services	46.5%	37.6%	Jun-17	89.0%	30.9%	51.6%
Harley-Davidson Inc	United States of America	Automobiles & Components	-16.1%	1.4%	Aug-17	29.4%	21.7%	64.0%
Illinois Tool Works Inc	United States of America	Capital Goods	34.0%	22.1%	Jun-17	20.1%	22.5%	76.1%
Kroger Co	United States of America	Food & Staples Retailing	-8.2%	36.2%	Jun-17	20.8%	32.8%	38.0%
Masco Corp	United States of America	Capital Goods	34.9%	16.6%	Jul-17	48.3%	7.3%	67.0%
MGM Resorts International	United States of America	Consumer Services	27.2%	16.5%	Jun-17	10.9%	38.6%	96.4%
Marathon Petroleum Corp	United States of America	Energy	35.9%	39.4%	Aug-17	90.2%	31.4%	23.1%
Nike Inc	United States of America	Consumer Durables & Apparel	20.9%	31.7%	May-17	6.4%	8.1%	31.6%
Occidental Petroleum Corp	United States of America	Energy	11.6%	25.6%	Aug-17	88.7%	15.3%	93.4%
Praxair Inc	United States of America	Materials	37.6%	21.5%	Jun-17	12.1%	13.6%	63.0%
Pioneer Natural Resources Co	United States of America	Energy	-8.0%	35.4%	Aug-17	11.1%	6.1%	41.1%
Roper Technologies Inc	United States of America	Capital Goods	36.6%	35.9%	Mar-17	2.9%	13.4%	68.1%
Snap-On Inc	United States of America	Capital Goods	-0.9%	18.2%	Aug-17	65.8%	21.1%	47.1%
Sysco Corp	United States of America	Food & Staples Retailing	19.2%	22.5%	Aug-17	19.4%	23.1%	43.9%
TJX Companies Inc	United States of America	Retailing	2.9%	16.9%	Jul-17	71.8%	31.5%	54.5%
VF Corp	United States of America	Consumer Durables & Apparel	59.5%	48.5%	Apr-17	32.6%	24.6%	78.3%
Vulcan Materials Co	United States of America	Materials	10.3%	14.4%	Aug-17	79.3%	3.9%	73.1%
Waste Management Inc	United States of America	Commercial & Professional Services	24.8%	16.4%	Sep-17	12.5%	11.4%	57.2%
Wyndham Worldwide Corp	United States of America	Consumer Services	51.7%	24.3%	Sep-17	66.4%	36.0%	54.1%
Yum! Brands Inc	United States of America	Consumer Services	23.3%	23.9%	May-17	2.1%	5.2%	65.8%
Kindred Group PLC	Malta	Consumer Services	52.7%	45.9%	Jul-17	42.0%	20.9%	21.0%
Atlas Copco AB	Sweden	Capital Goods	25.8%	25.8%	Feb-17	7.3%	36.8%	86.0%
Weir Group PLC	United Kingdom	Capital Goods	9.7%	25.4%	Jun-17	12.4%	37.1%	79.7%

Single Stocks - Quadrant 2 stocks

Quadrant 2 stocks: strong positive bubble signals with weak fundamentals
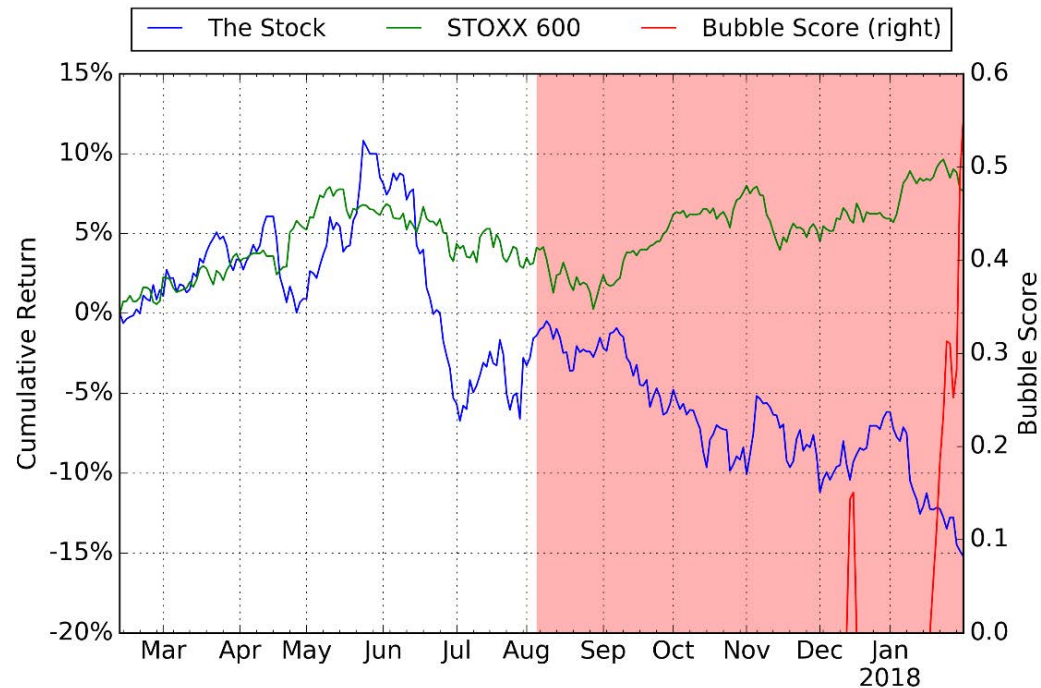Example: O'Reilly Automotive Inc.
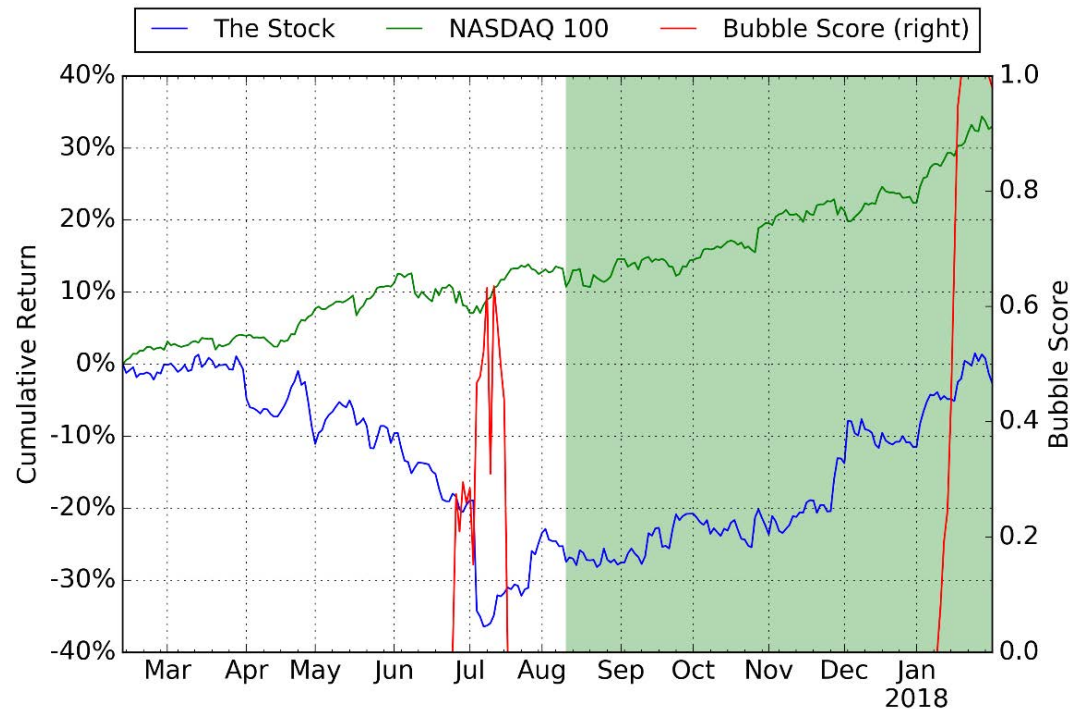
The above graph shows the one year cumulative return of the stock in blue (left hand scale), NASDAQ 100 in green (left hand scale) and the calculated DS LPPLS Bubble Score in red (right hand scale). The green shaded period is the strong positive bubble we identified. The Bubble Score of this six month bubble has reached 98% with a bubble size 34.2%. The strong positive bubble signals and weak fundamentals indicate a high probability of correction in the future.

Last month example: strong positive bubble signals with weak fundamentals, Wynn Resorts Ltd.

The figure below plots the one year cumulative return of the stock (blue), NASDAQ 100 (green) and LPPLS Bubble Score (red lines on the right y-axis). The green shaded period is the strong positive bubble we identified and reported in last month. Note that the stock continued to appreciate and then had a large correction, in agreement with our DS LPPLS indicator and the weak fundamentals. The large drawdown may be in part attributed to the report published by the Wall Street Journal on the sexual misconducts by Mr. Wynn.
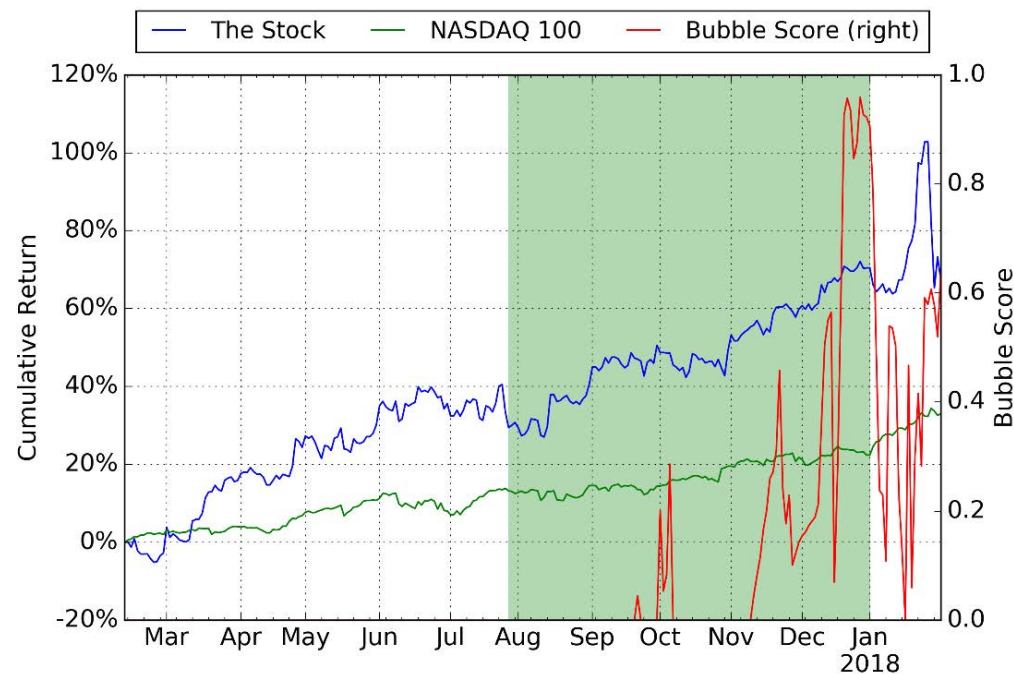
Single Stocks - Quadrant 3 stocks

Quadrant 3 stocks: strong negative bubble signals with weak fundamentals

Company Name	Country of Headquarters	GICS Industry Group Name	Yearly Return	Bubble Size	Bubble Start	Bubble Score	Value Score	Growth Score
DISH Network Corp	United States of America	Media	-24.3%	-19.4%	Aug-17	-8.8%	19.4%	4.0%
Elisa Oyj	Finland	Telecommunication Services	10.5%	-5.3%	Aug-17	-10.9%	25.7%	12.6%
Pennon Group PLC	United Kingdom	Utilities	-14.8%	-14.8%	Feb-17	-23.1%	37.9%	6.1%
Severn Trent PLC	United Kingdom	Utilities	-14.9%	-14.0%	Aug-17	-55.1%	12.4%	3.3%
United Utilities Group PLC	United Kingdom	Utilities	-22.0%	-23.4%	Feb-17	-25.5%	30.3%	25.4%

Single Stocks - Quadrant 3 stocks

Quadrant 3 stocks: strong negative bubble signals with weak fundamentals
Example: Severn Trent PLC.

The above graph shows the one year cumulative return of the stock in blue (left hand scale), STOXX 600 in green (left hand scale) and the calculated DS LPPLS Bubble Score in red (right hand scale). The red shaded period is the strong negative bubble we identified. The Bubble Score of this six month bubble has reached 55.1% with a bubble size -14%.

Single Stocks - Quadrant 3 stocks

Last month example: strong negative bubble signals with weak fundamentals, Genmab A/S.

The figure below plots the one year cumulative return of the stock (blue), STOXX 600 (green) and LPPLS Bubble Score (red line on the right y-axis). The red shaded period is the strong negative bubble we identified and reported in last month. Note that the stock started a strong correction at the beginning of this month, which is in synchrony with our DS LPPLS indicator, notwithstanding with the weak fundamentals.
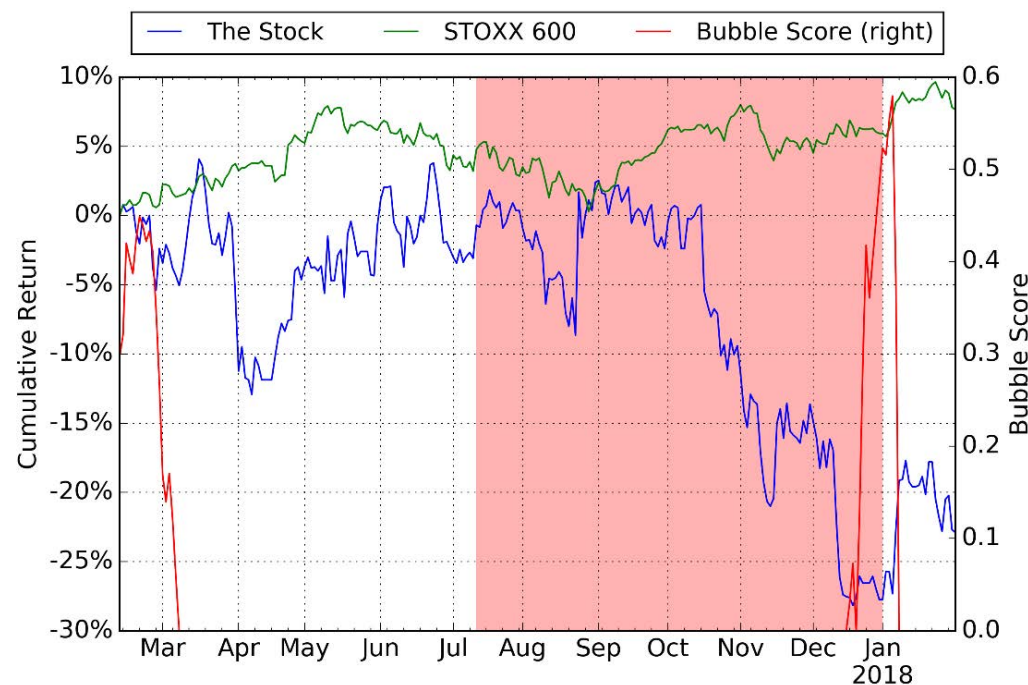
Single Stocks - Quadrant 4 stocks

Entrepreneurial Risks
ETH *zürich*

Quadrant 4 stocks: strong negative bubble signals with strong fundamentals

Company Name	Country of Headquarters	GICS Industry Group Name	Yearly Return	Bubble Size	Bubble Start	Bubble Score	Value Score	Growth Score
Babcock International Group PLC	United Kingdom	Commercial & Professional Services	-23.8%	-24.0%	Feb-17	-24.2%	72.3%	66.0%
Eutelsat Communications SA	France	Media	1.7%	-21.7%	Jun-17	-8.8%	67.6%	4.5%

Quadrant 4 stocks: strong negative bubble signals with strong fundamentals
Example: Eutelsat Communications SA.
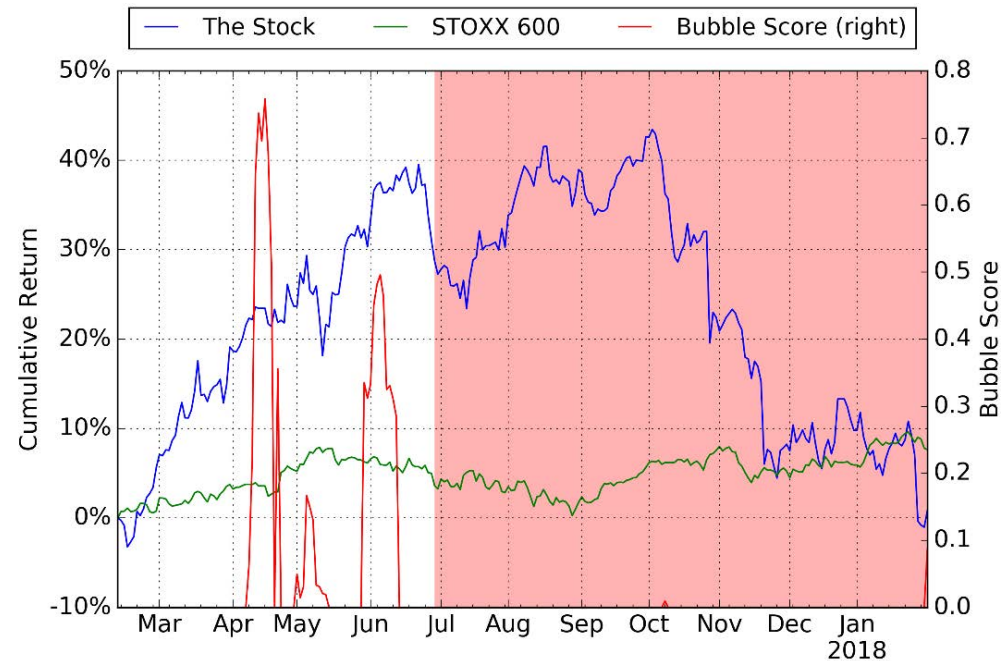
The above graph shows the one year cumulative return of the stock in blue (left hand scale), STOXX 600 in green (left hand scale) and the calculated DS LPPLS Bubble Score in red (right hand scale). The red shaded period is the strong negative bubble we identified. The Bubble Score of this seven month bubble has reached 8.8% with a bubble size -21.7%. We expect a future rebound, which is due to our diagnostic of a negative bubble signal with strong fundamentals, calling for a contrarian buyer position.

Last month example: strong negative bubble signals with strong fundamentals, SSE PLC.

The figure below plots the one year cumulative return of the stock (blue), STOXX 600 (green) and LPPLS Bubble Score (red line on the right y-axis). The red shaded period is the strong negative bubble we identified and reported in last month. Note that the stock went down again after a small rebound at the beginning of this month, which is in synchrony with our DS LPPLS indicator, notwithstanding the strong fundamentals. We expect this stock to appreciate in the future due to the strong fundamentals and following its neglect by investors in previous months.
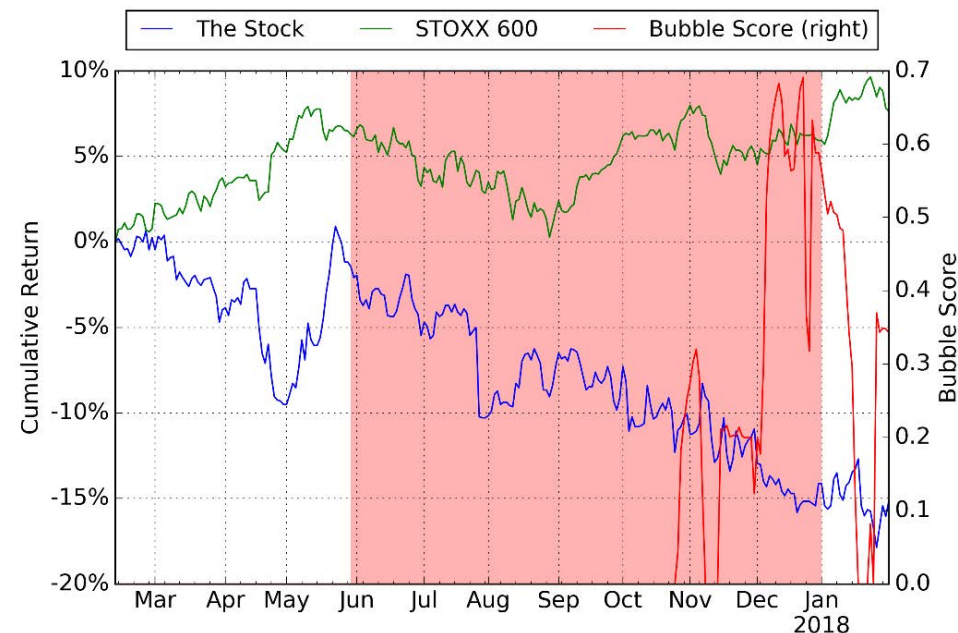
Sectors

| GICS Industry Group Name	Yearly Return		Bubble Size		Bubble Score		Value Score		Growth Score	
	Feb 1st	Jan 1st	Feb 1st	Jan 1st	Feb 1st	Jan 1st	Feb 1st	Jan 1st	Feb 1st	Jan 1st
Pharmaceuticals, Biotechnology & Life Sciences	13.9%	12.2%	0.0%	0.0%	0.0%	0.0%	55.6%	61.2%	58.5%	61.1%
Consumer Services	30.2%	28.0%	15.2%	0.0%	68.5%	0.0%	31.4%	29.2%	54.4%	54.9%
Retailing	36.9%	22.7%	32.8%	0.0%	44.1%	0.0%	15.9%	18.7%	55.2%	53.5%
Transportation	23.2%	21.7%	15.1%	18.3%	54.6%	28.5%	56.0%	65.1%	60.2%	63.4%
Consumer Durables & Apparel	30.7%	25.7%	14.6%	15.8%	56.7%	80.4%	35.2%	39.5%	54.2%	59.1%
Semiconductors & Semiconductor Equipment	43.7%	36.7%	0.0%	0.0%	0.0%	0.0%	95.1%	62.5%	28.7%	30.4%
Technology Hardware & Equipment	25.8%	32.7%	19.0%	14.5%	1.4%	22.3%	89.5%	76.7%	39.0%	36.3%
Automobiles & Components	24.5%	16.8%	0.0%	16.8%	0.0%	10.3%	68.2%	76.2%	52.7%	48.8%
Telecommunication Services	5.4%	0.9%	0.0%	0.0%	0.0%	0.0%	51.6%	58.4%	44.2%	53.3%
Energy	8.0%	2.5%	19.4%	6.3%	16.4%	26.8%	46.0%	51.4%	49.9%	58.2%
Software & Services	39.1%	31.9%	39.1%	0.0%	15.4%	0.0%	95.2%	34.9%	48.4%	45.9%
Materials	23.2%	21.7%	0.0%	0.0%	0.0%	0.0%	43.0%	50.2%	52.5%	52.5%
Health Care Equipment & Services	29.0%	22.8%	16.5%	0.0%	48.5%	0.0%	55.9%	64.5%	62.9%	60.9%
Capital Goods	25.3%	20.8%	17.1%	17.0%	6.7%	7.6%	45.0%	47.9%	50.8%	50.7%
Media	4.6%	2.9%	0.0%	0.0%	0.0%	0.0%	38.0%	43.0%	59.5%	59.5%
Commercial & Professional Services	19.7%	18.5%	10.2%	7.1%	24.5%	94.1%	20.8%	24.9%	57.4%	58.9%
Food & Staples Retailing	13.7%	8.6%	14.8%	0.0%	48.4%	0.0%	54.7%	59.9%	54.1%	51.4%
Household & Personal Products	16.4%	20.4%	0.0%	0.0%	0.0%	0.0%	38.0%	36.6%	43.4%	41.9%
Food, Beverage & Tobacco	12.2%	14.2%	0.0%	0.0%	0.0%	0.0%	37.0%	42.6%	56.2%	58.3%
Utilities	8.4%	10.4%	0.0%	0.0%	0.0%	0.0%	47.5%	52.8%	51.3%	52.3%
Insurance	19.0%	17.3%	16.4%	12.2%	29.8%	27.5%	-	-	-	-
Real Estate	9.7%	10.2%	0.0%	0.0%	0.0%	0.0%	-	-	-	-
Diversified Financials	24.9%	20.9%	19.6%	14.7%	61.4%	20.0%	-	-	-	-
Banks	21.1%	16.6%	16.3%	13.2%	36.3%	32.7%	-	-	-	-

Sectors

Since Dec 2017, we start to use MSCI World Industry Group Indices and to calculate bubble size and bubble score of the corresponding sectors. To determine the value scores and growth scores of the sectors, we average over the corresponding values for each stock of a given sector, weighted by market cap.

As we can see from the results showed in the previous slide, we found 14 industry groups with significant positive bubble scores: *Banks, Capital Goods, Commercial & Professional Services, Consumer Durables & Apparel, Consumer Services, Diversified Financials, Energy, Insurance, Retailing, Software & Services, Health Care Equipment & Services, Food & Staples Retailing, Technology Hardware & Equipment, Transportation*.

The strong bubbles in many industries reflect the strong rallies of the US market recently. The figures below and in the next three slides show the one year cumulative return of each industry index in blue (left hand scale), and the calculated DS LPPLS Bubble Score in red (right hand scale). The green shaded period is the strong positive bubbles we identified.
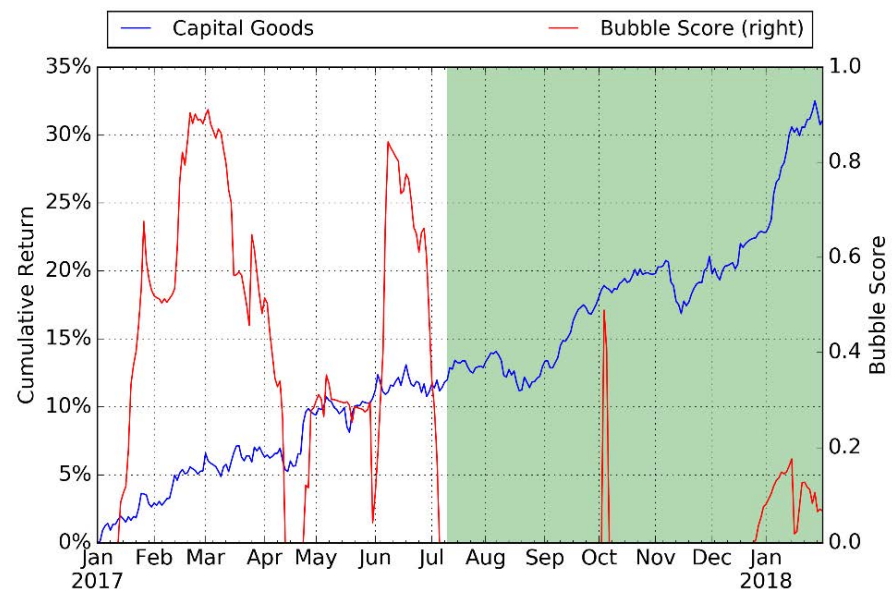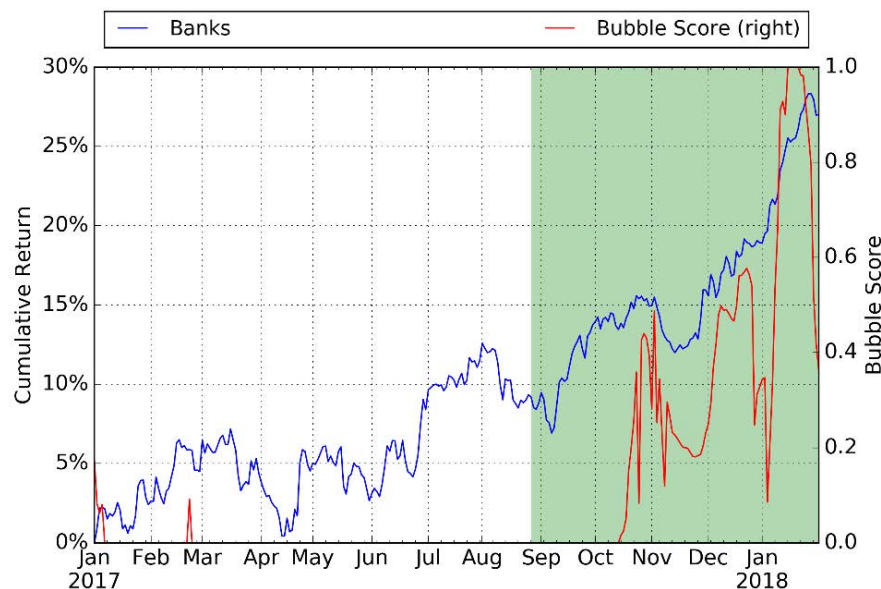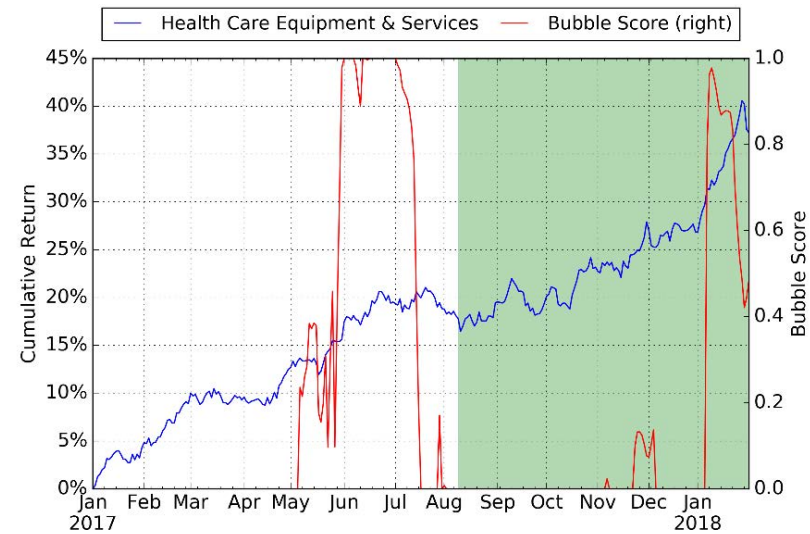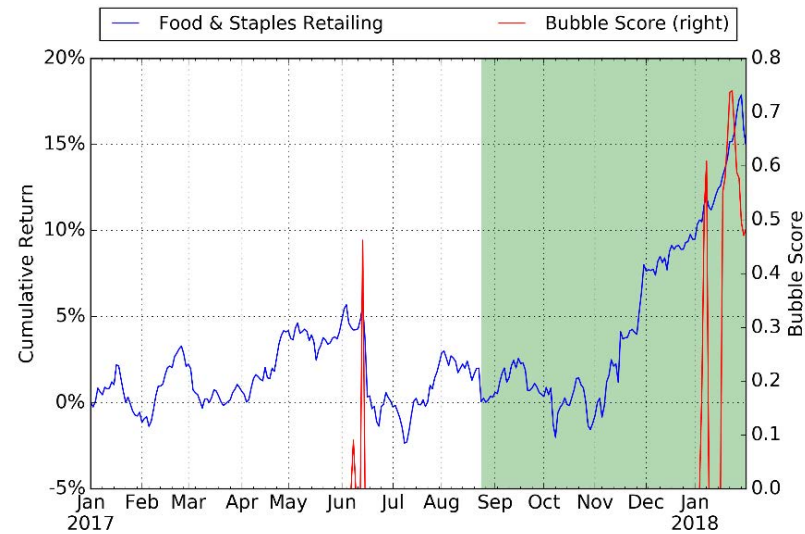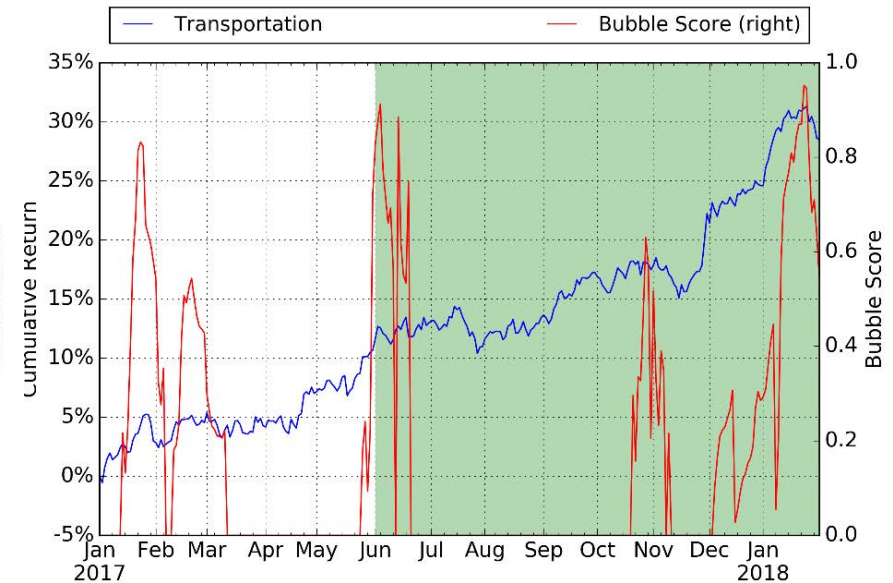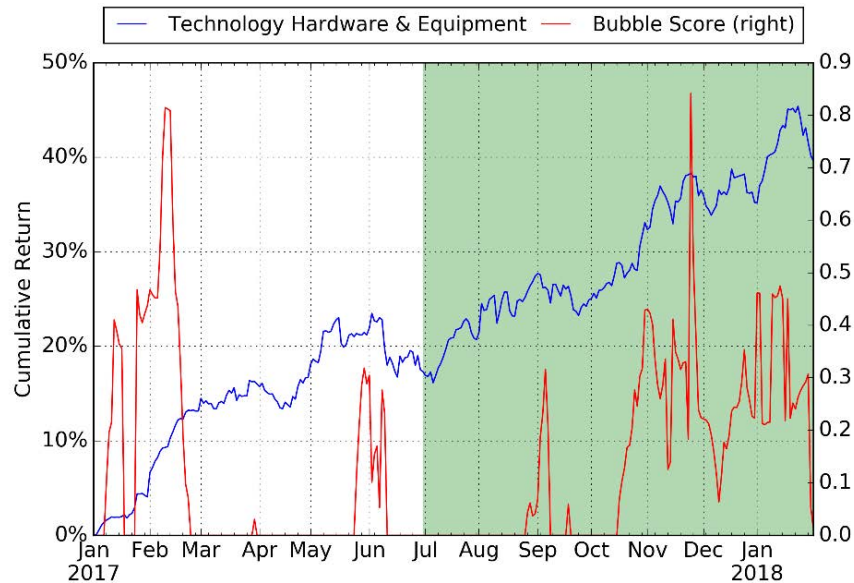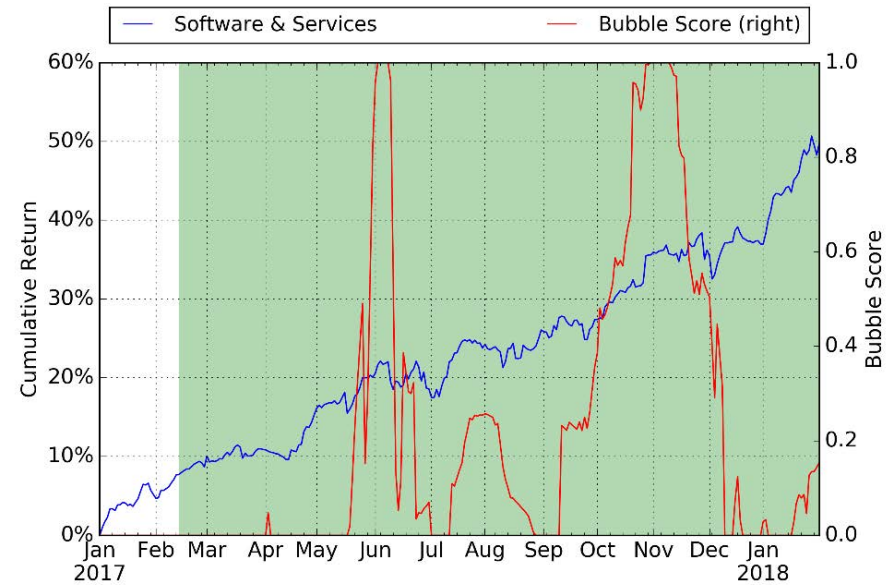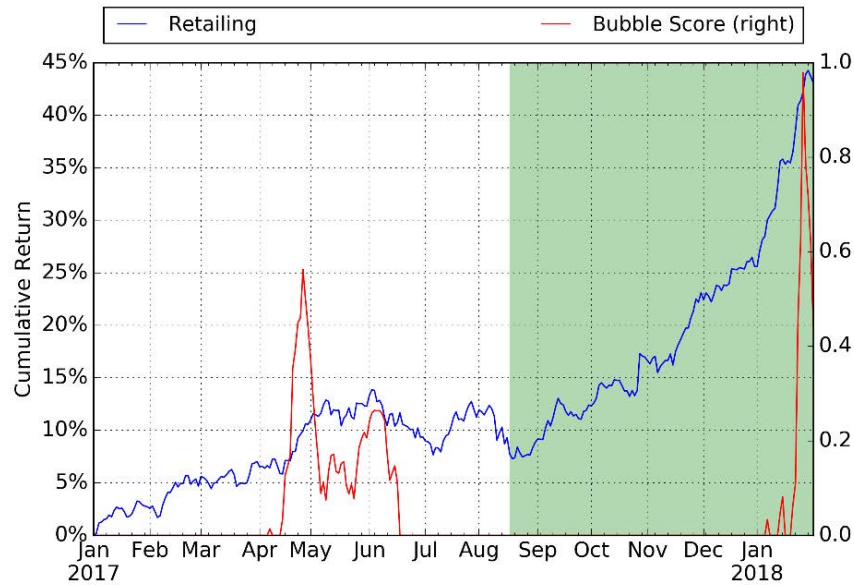
Sectors

Sectors

Sectors

Portfolio Construction & Performance
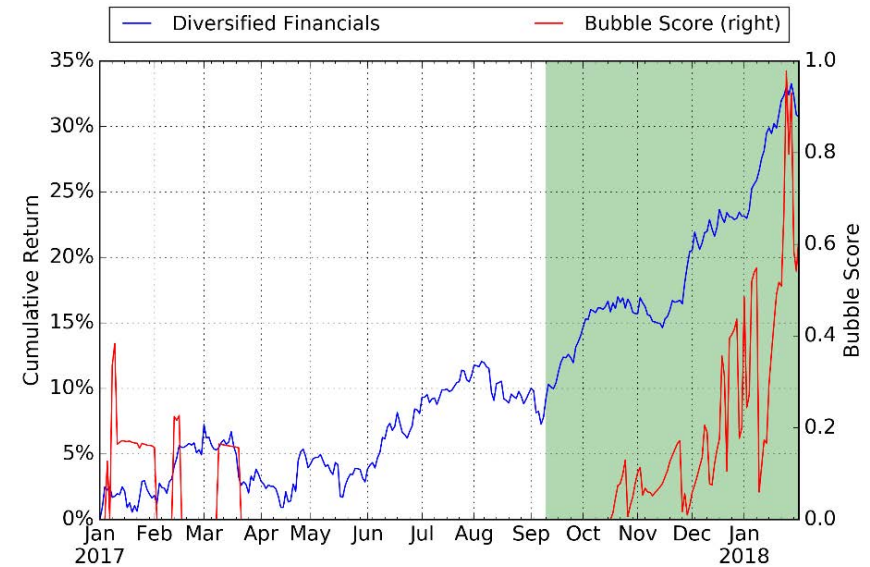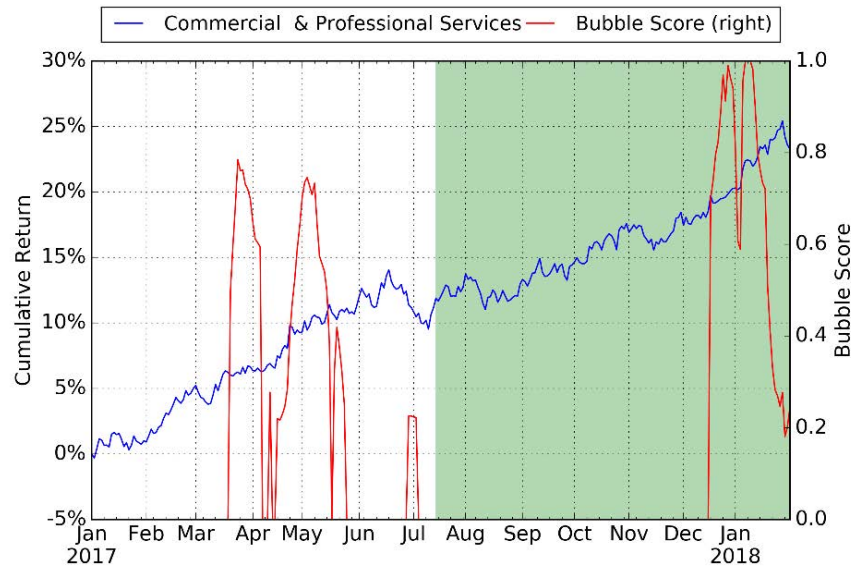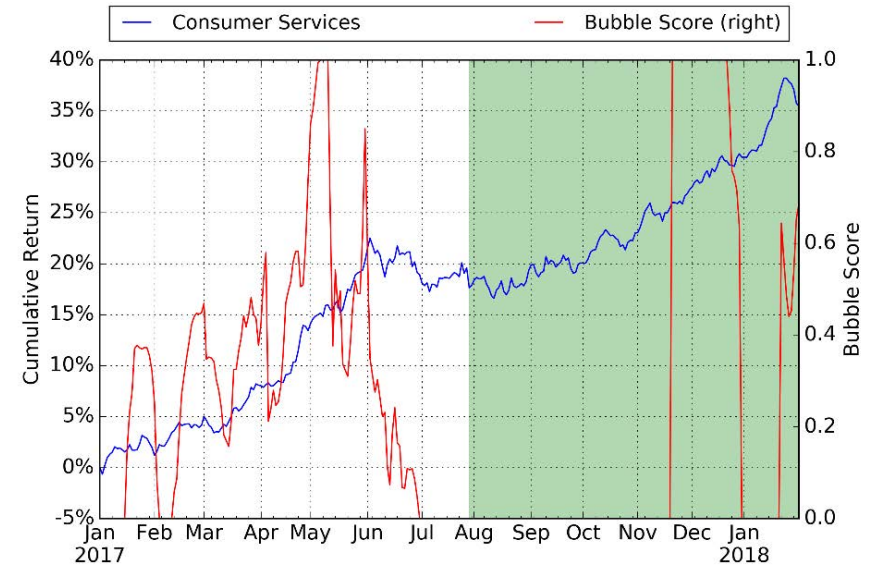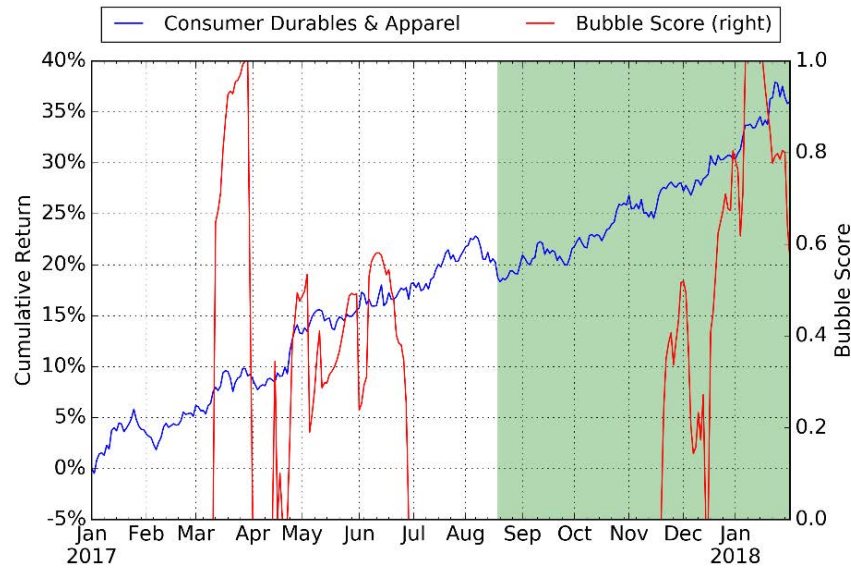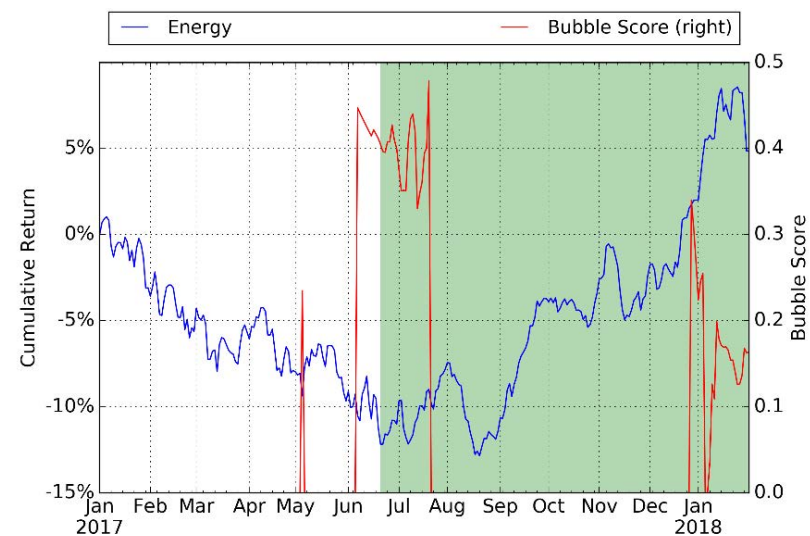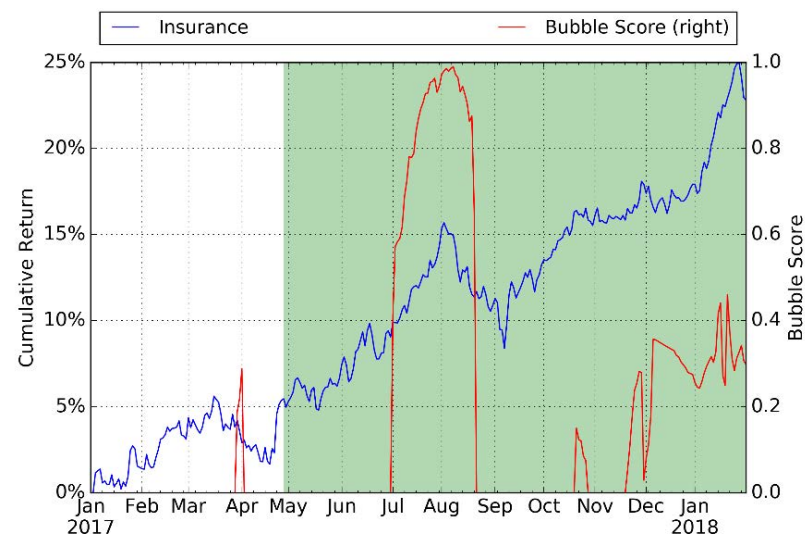
Here we illustrate the methodology of the portfolio construction process based on the results of our previous analyses.

For individual stocks that we identified in the 4 quadrants, we constructed 4 portfolios based on the 4 quadrants defined in the last report. Each portfolio consists of all the stocks listed in the corresponding quadrant.

(1)Trend-Following Long Stock Portfolio (TFLSP) is made of the stocks that have a positive bubble signal as well as a strong value score. For instance, TFLSP November consists of all the stocks listed in quadrant 1, identified in slide 37 of November 2017 FCO Report.

(2)Trend-Following Short Stock Portfolio (TFSSP) is made of the stocks that have a negative bubble signal as well as a weak value score.

(3)Contrarian Long Stock Portfolio (CLSP) is made of the stocks that have a negative bubble signal as well as a strong value score.

(4)and Contrarian Short Stock Portfolio (CSSP) is made of the stocks that have a positive bubble signal as well as a weak value score.

Portfolio Construction & Performance

At the same time, we also classified 20 industries into 4 quadrants, and constructed 4 type of industry portfolios based on the 4 industry quadrants. Each portfolio consists of all the stocks in the industries listed in the corresponding quadrant. Following the same definitions as above, we have Trend-Following Long Industry Portfolio (TFLIP), Trend-Following Short Industry Portfolio (TFSIP), Contrarian Long Industry Portfolio (CLIP), and Contrarian Short Industry Portfolio (CSIP).

In each month, we initiated 8 new portfolios based on the updated results. The performance of every 8 portfolios we initiated in November 2017 are presented in the next slide. All of the stocks in our portfolios are weighted by their market capitalizations and we don't consider transaction cost in the portfolio performance.

Since we started to use a new version of bubble signals and algorithm last month, we only present the portfolios we initiated in November 2017.

Portfolio Construction & Performance
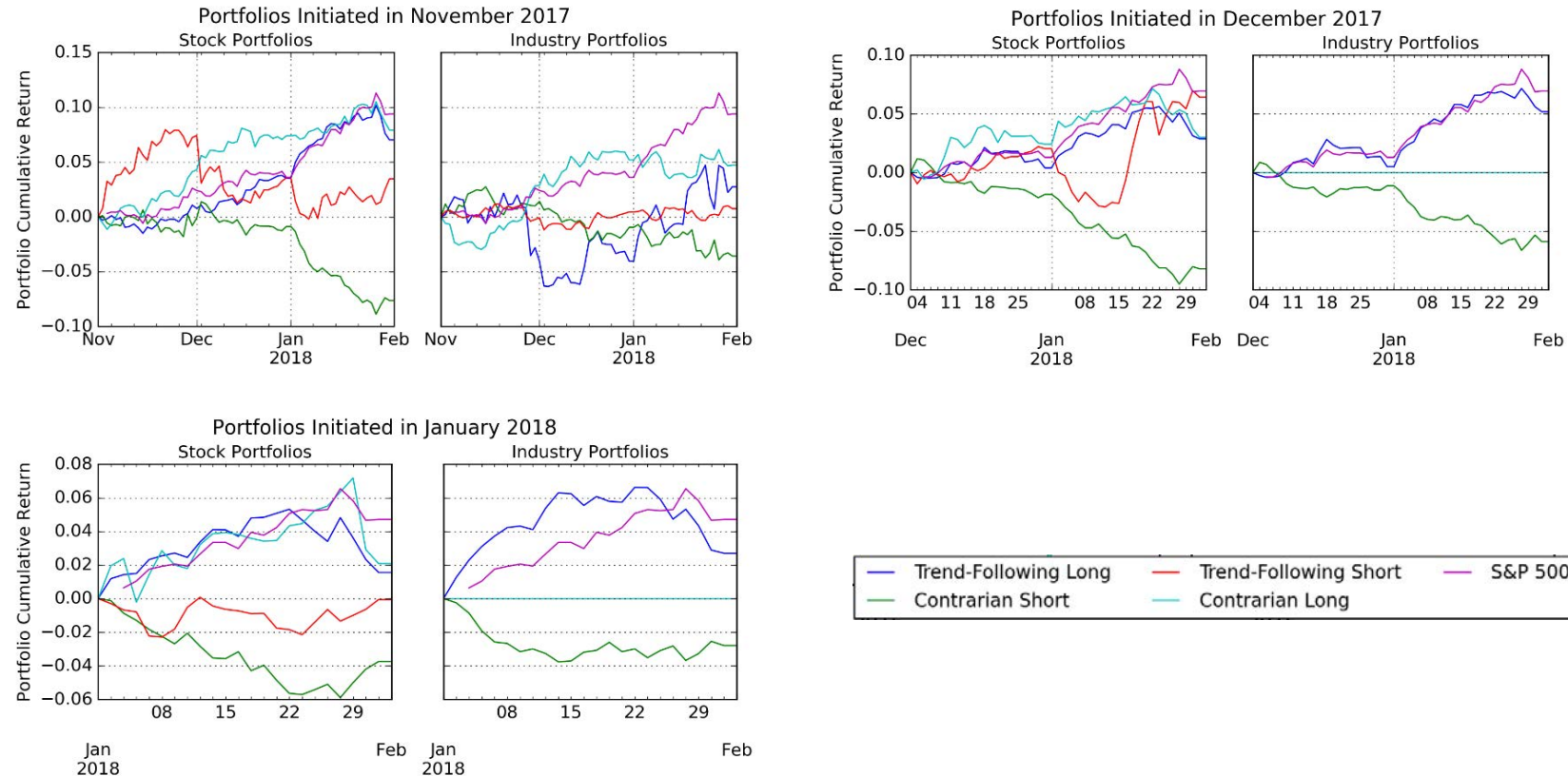
This month, we find that Long Portfolios initiated in November, December 2017 and January 2018 have good performances, due to the strong rally of the market in the recent month. Contrarian Portfolios are more delicate to use due to their sensitivity to timing the expected reversal and exhibit very volatile performances, indicating that most of bubbles in the market are still dominating and that fundamentals have not yet played out. We expect trend-following positions to perform in the months following the position set-up and then contrarian positions to over-perform over longer time scales as the predicted corrections play out.

Visit the Financial Crisis Observatory for more information

http://www.er.ethz.ch/financial-crisis-observatory.html