

# The FCO Cockpit Global Bubble Status Report

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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.

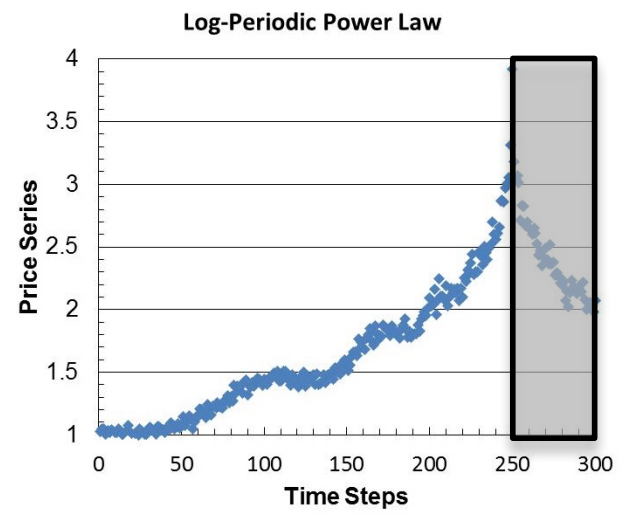
In the first part of this report, we present the state of the world, based on the analysis of the systemic assets. In the second part, we zoom in on the bubble behavior of single stocks and discuss some specific cases.

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>

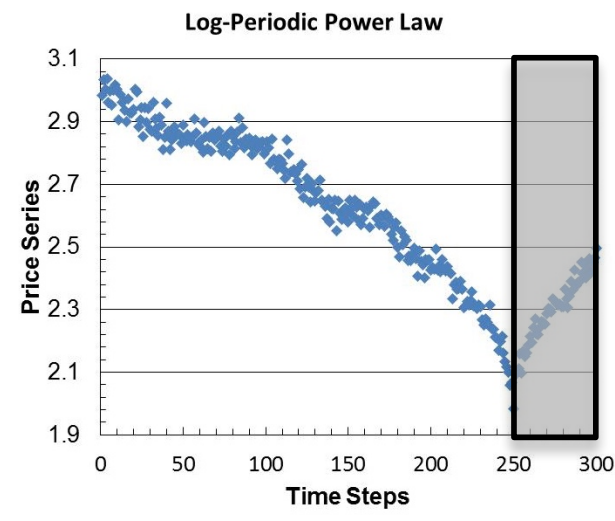
We use the Log-Periodic Power Law Singularity (LPPLS) model to hunt for the distinct fingerprint of **Bubbles**:

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

# Announcements

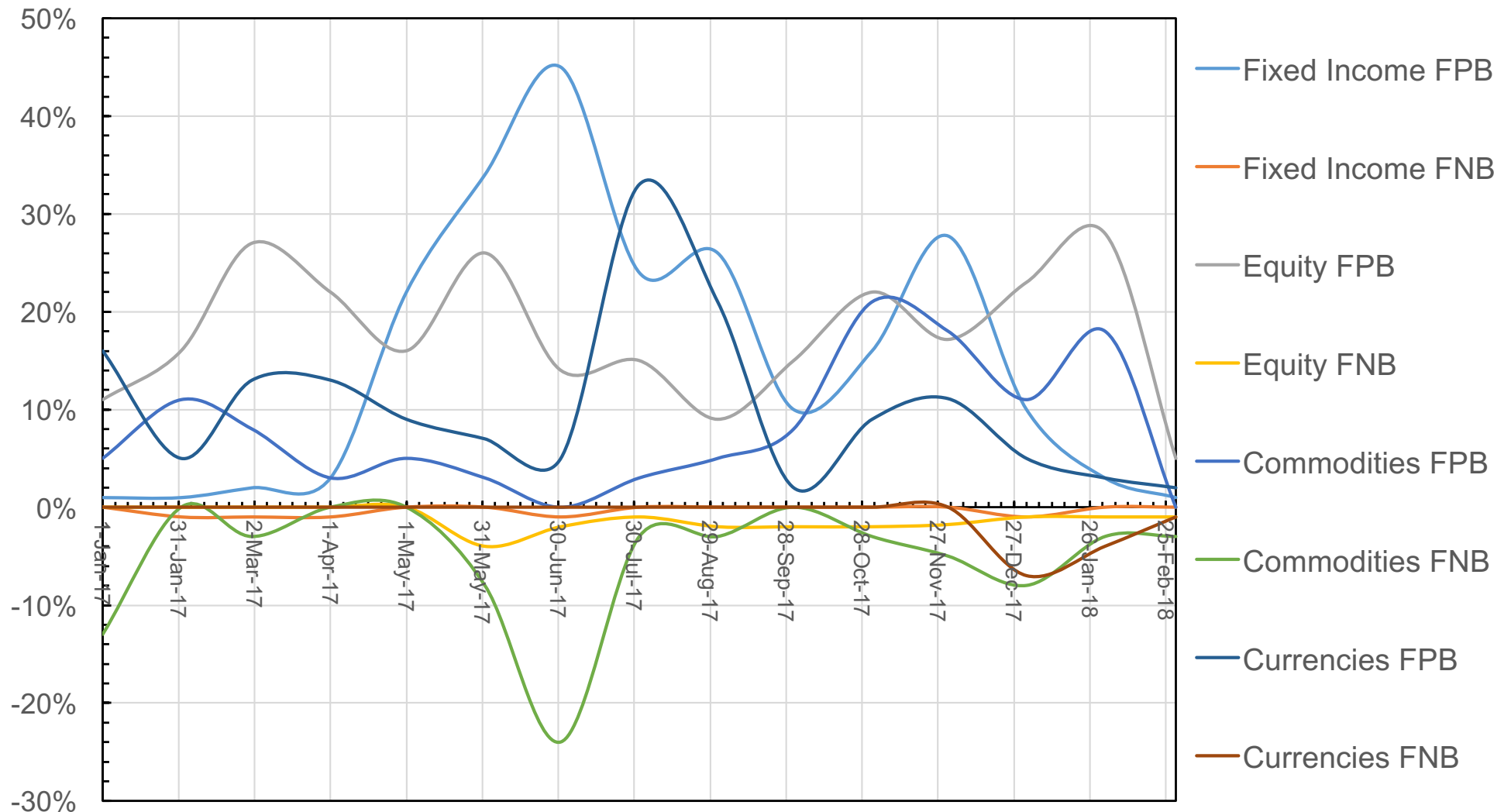
In this month's report, in its first part, we revise the tabular representation of bubble asset data. We no longer list the YOY-Return for assets, and rather focus on the bubble size.

In order to use the bubble size into the data ranking, we compute the geometric mean of the DS LPPL Confidence Indicator and of the identified bubble size. We then rank assets according to these geometric means. This gives us a more realistic picture of the order of importance of listed assets in terms of detected signals.

In order to improve the readability of the Confidence Indicator time series plots, we have changed the labelling of the left scale to show the cumulative return.

# 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	Category	Analyzed Assets	FPB [%]	FNB [%]
<b>Fixed Income</b>		<b>155</b>	<b>1</b>	<b>0</b>
	Government Bonds	55	2	0
	Finance and Insurance	21	0	0
	Corporate Bonds	79	0	0
<b>Equity</b>		<b>169</b>	<b>5</b>	<b>-1</b>
	Country Indices	73	5	0
	Europe	36	0	0
	US	60	7	-2
<b>Commodities</b>		<b>38</b>	<b>0</b>	<b>-3</b>
<b>Forex</b>		<b>108</b>	<b>2</b>	<b>-1</b>

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

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

Overall, during February we have observed 'record' low bubble activity, both in the positive as well as the negative bubble domains. A major reason for the decreased positive bubble activity lies in the recent slump of the US and world markets.

The fixed income sector exhibits similar activity levels as in the previous month.

There is significantly decreased activity in the equities sectors.

The same holds for the commodities sector, which also is impacted by the US market correction.

The forex sector remains at low bubble values, as well.

Name	Bubble Size [%]	DS LPPL Confidence [%]	Geometric Average [%]
<b>Positive Bubbles</b>			
iBoxx GEMX South Africa Index	13	52	26
<b>Negative Bubbles</b>			
-	-	-	-

The fixed income sector exhibits near-zero bubble activity during February, as measured in the month before (3%,0%), as well.

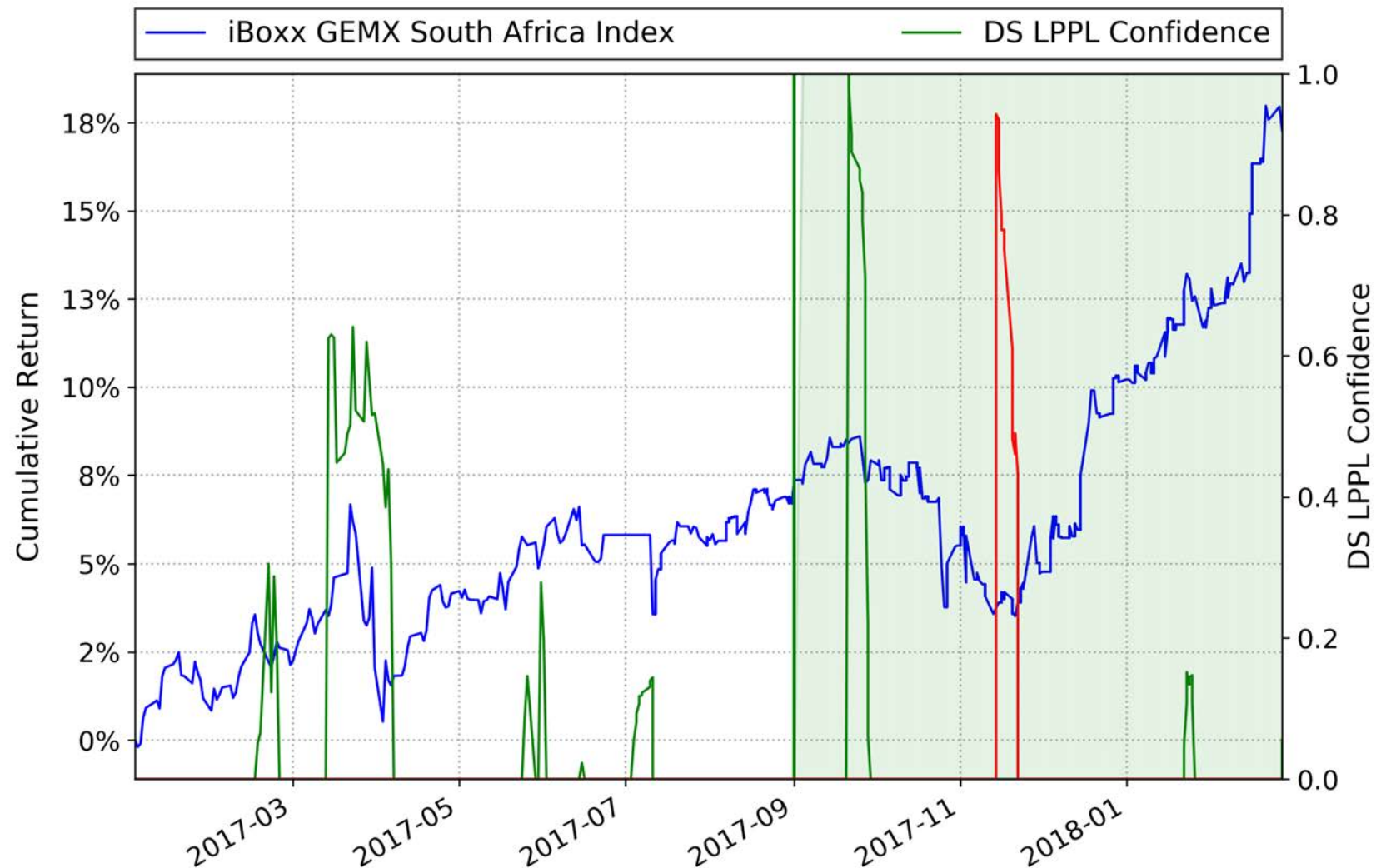
## **Government Bonds:**

The South Africa Index (next slide) is the only asset amongst the Government bonds sector showing positive bubble signals at a fairly high value of the Confidence Indicator.

We depict again also the Nigerian Index that we listed in the previous report. It can be seen that the index has experienced a sideward movement during the last thirty days, leading to vanishing bubble signals.

## **Corporate Bonds, Finance and Insurance:**

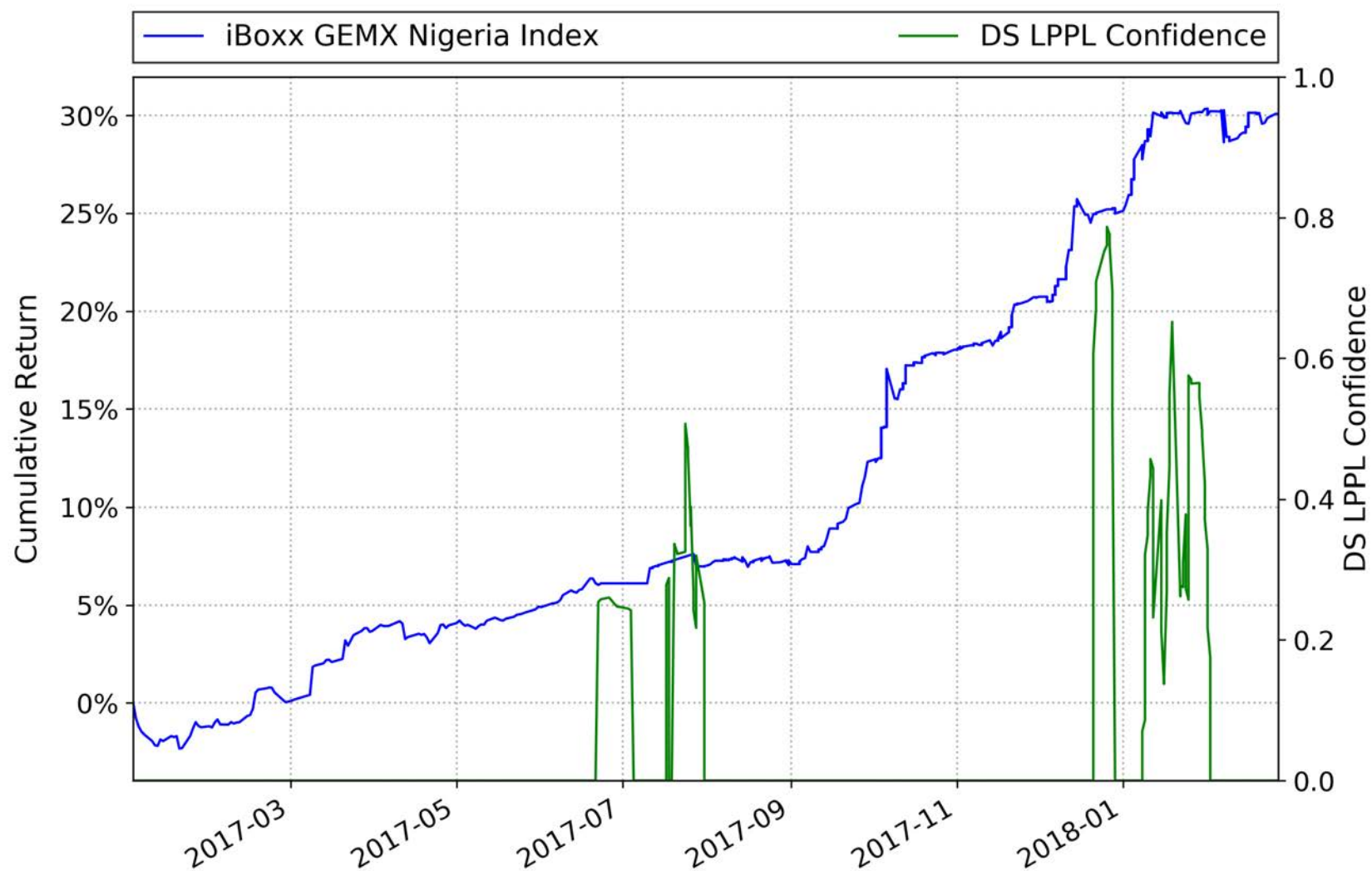
Repeatedly, there are no signs of bubble dynamics in the sector.



Green: positive bubble signal, indicating a coming plateau or correction

Red: negative bubble signal, indicating a coming rebound

Remark: the green and red indicators are causal.



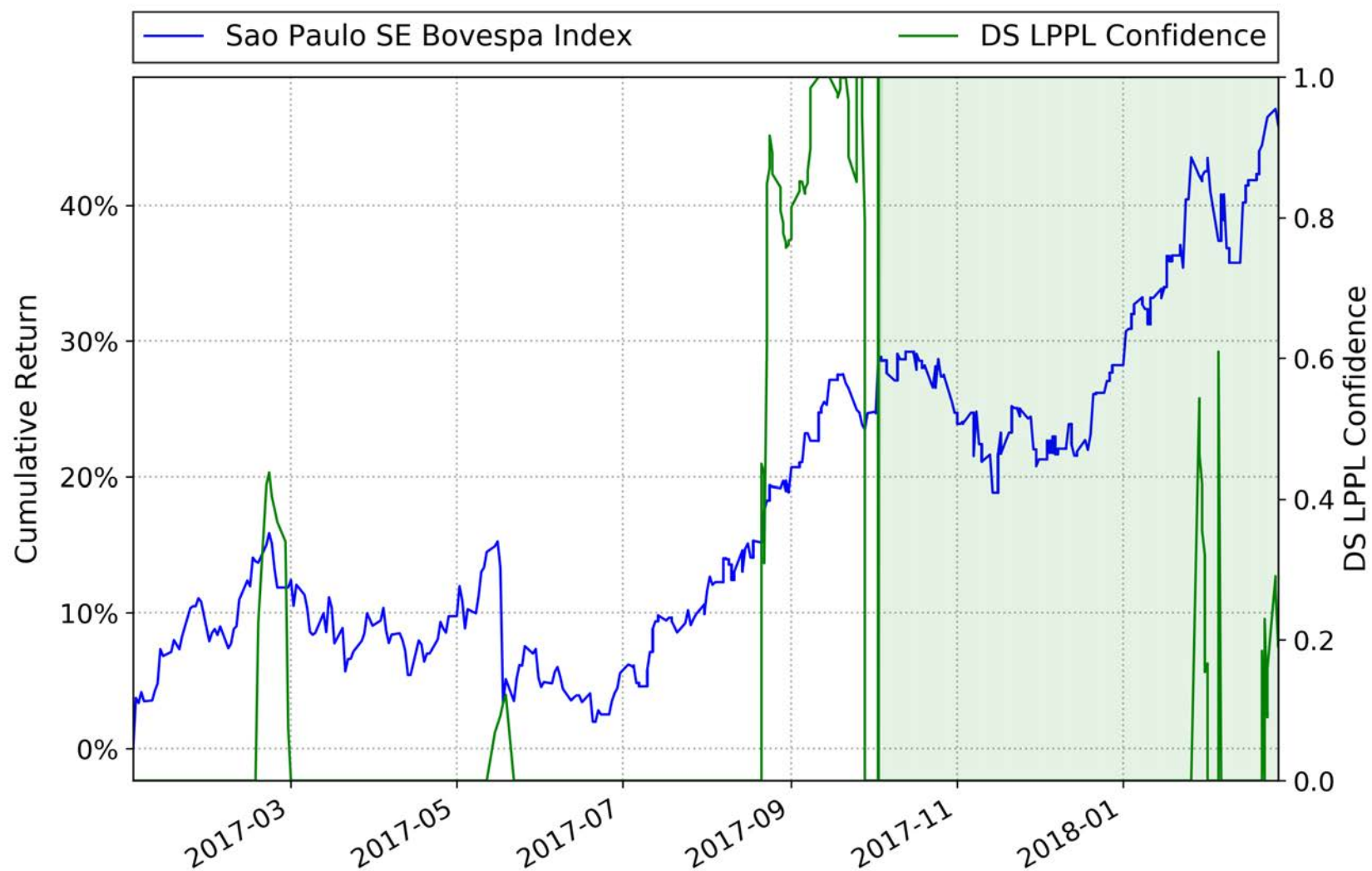
# Equities - Country Performance

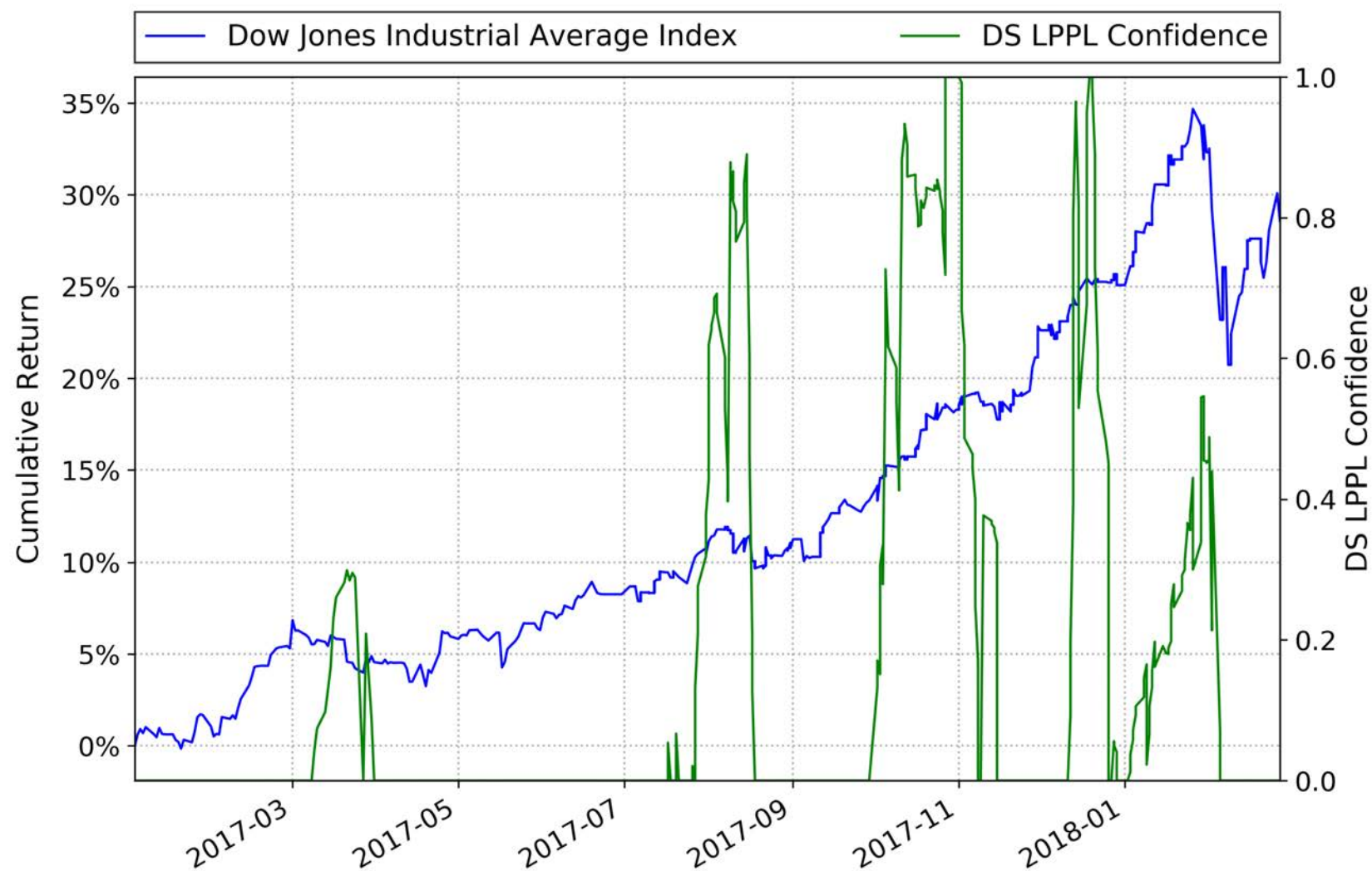
Name	Bubble Size [%]	DS LPPL Confidence [%]	Geometric Average [%]
<b>Positive Bubbles</b>			
Bursatil Index	2438	79	440
Sao Paulo SE Bovespa Index	41	66	52
RTS Index	19	21	20
SET Index	17	16	17
<b>Negative Bubbles</b>			
-	-	-	-

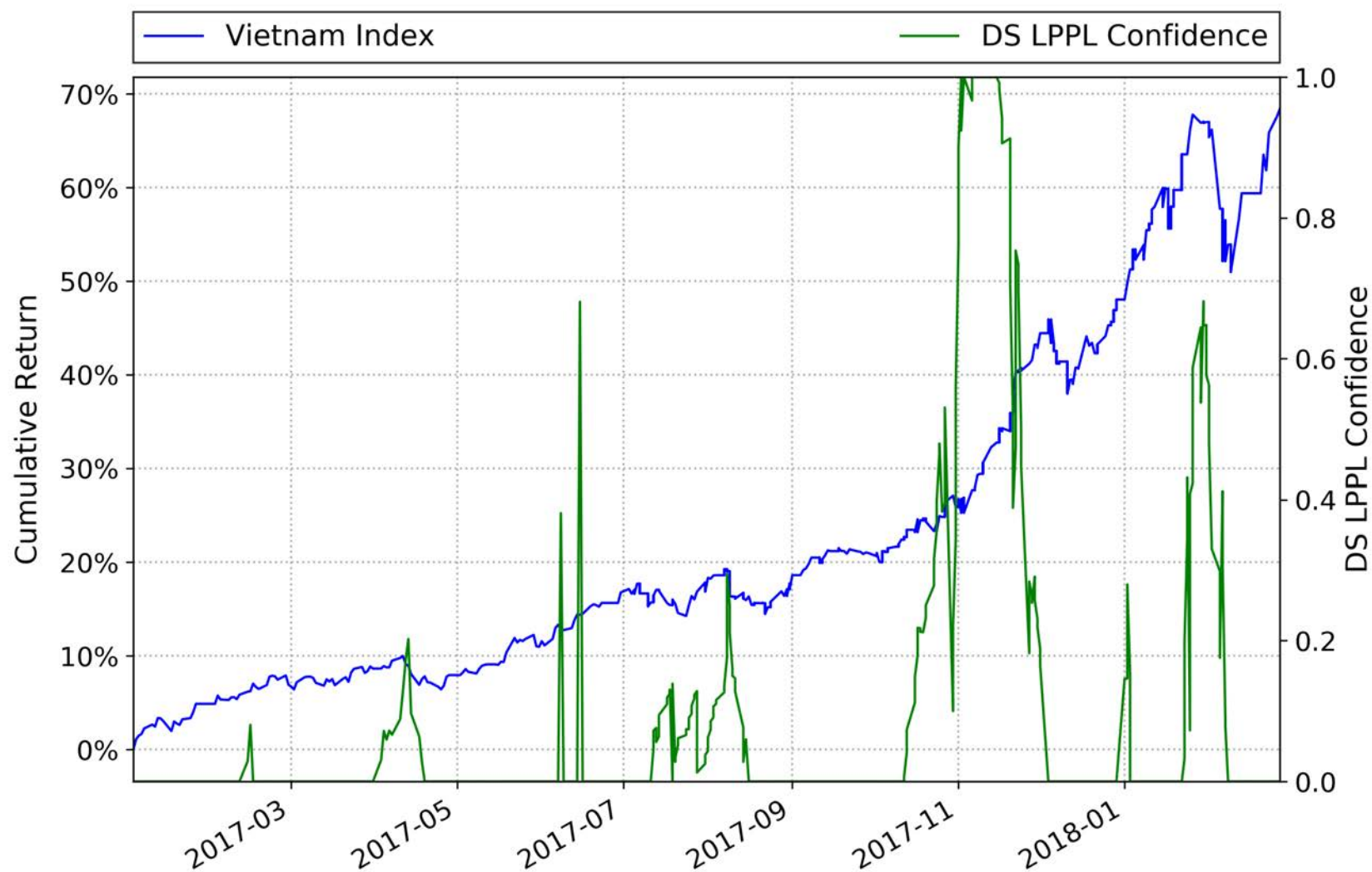
In the Equity sector, amongst the country stock indices, we see much reduced positive bubble activity (one quarter of last month's value). Zero negative bubbles are identified.

Due to its immense growth as a result of the ongoing hyperinflation in the country, the Venezuelan Bursatil Index is located once more at the top of our list of positive bubble indices. In February, the country's currency, Bolivar, dropped by at least 80%, as a consequence of a currency auction held by the Venezuelan central bank in which the money was sold at a much lower price than in previous cases [bloomberg].

On the next slide, we show the Brazilian Bovespa Index which has surged by about 15% since the beginning of the year. We furthermore emphasize the correction of the DJIA (slide afterwards) which took place in February and had been predicted by our Indicator in advance, as pointed out in the last report. The Vietnam index, which was also identified to be in a bubble state has obviously been forced into a minor correction due to the impact of the Dow Jones crash, as well.





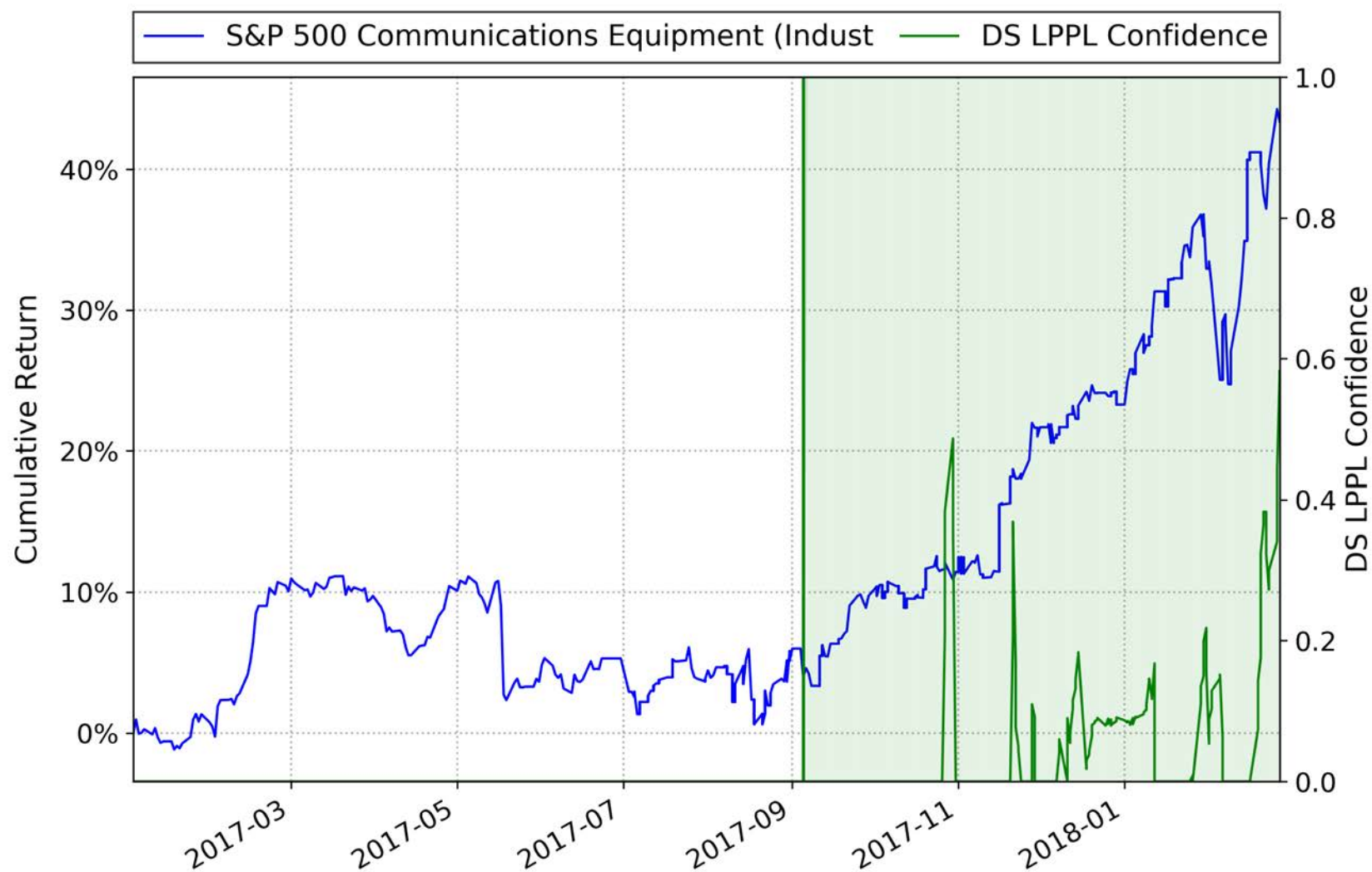


# Equities - United States and Europe

Name	Bubble Size [%]	DS LPPL Confidence [%]	Geometric Average [%]
<b>Positive Bubbles</b>			
S&P 500 Communications Equipment (Industry)	38	81	56
S&P 500 Internet & Direct Marketing Retail (Industry)	48	47	47
S&P 500 Health Care Equipment & Supplies (Industry)	21	17	19
S&P 500 Software (Industry)	21	14	17
<b>Negative Bubbles</b>			
S&P 500 Industrial Conglomerates (Industry)	-15	19	17

In the US and European Equities asset class, we detect no bubbles on European Indices and a much lower fraction of US Indices in positive bubble state (7%) compared to last month (50%). This comes as no surprise, as the recent correction of the American Market has caused asset prices which had previously surged on optimistic sentiment to normalize again. Most likely, this correction is not yet to be interpreted as the transition into a new (bear) market regime. For one, asset prices are already increasing, again. However, at the historically low market volatility and ever-increasing market prices seen since the trough of the financial crisis in 2008/9, suspicion amongst investors whether this trend will be sustained much longer is growing.

A sector of the S&P500 which has quickly recovered from the market correction is the Industrial Communications Equipment branch, as depicted on the next slide. We currently determine it to be in a 38% positive bubble at high confidence.



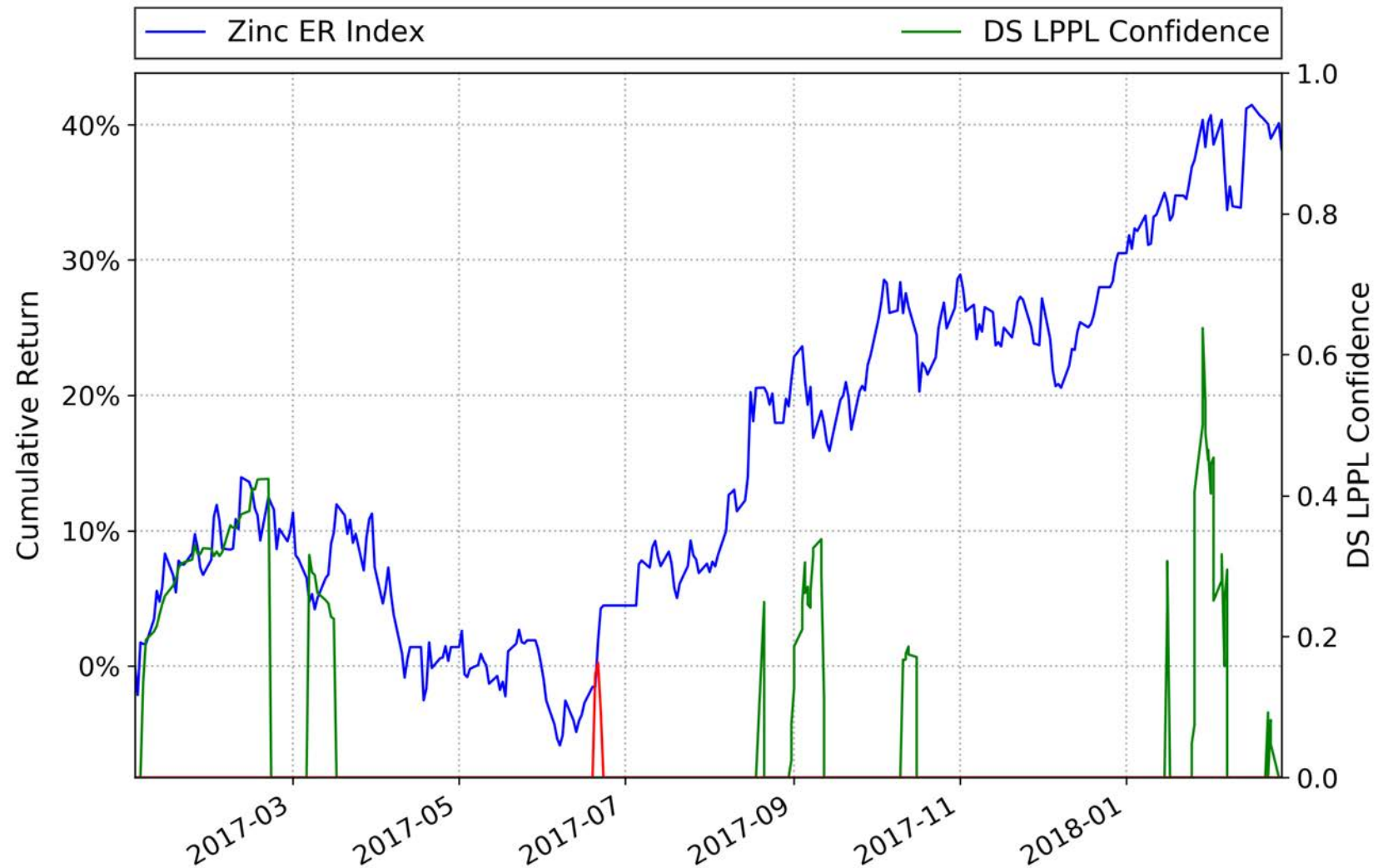
# Commodities

Name	Bubble Size [%]	DS LPPL Confidence [%]	Geometric Average [%]
<b>Positive Bubbles</b>			
-	-	-	-
<b>Negative Bubbles</b>			
Coffee ER Index	-23	12	17

In the commodities sector, after six turbulent months, we finally see a relaxation in bubble activity (0% positive, 3% negative signals) compared to the month before (18%,3%), due to corrections in most of the commodities named in previous reports. The origin of the corrections bringing a decrease in indicator signals can be traced also to the market correction of the U.S. market.

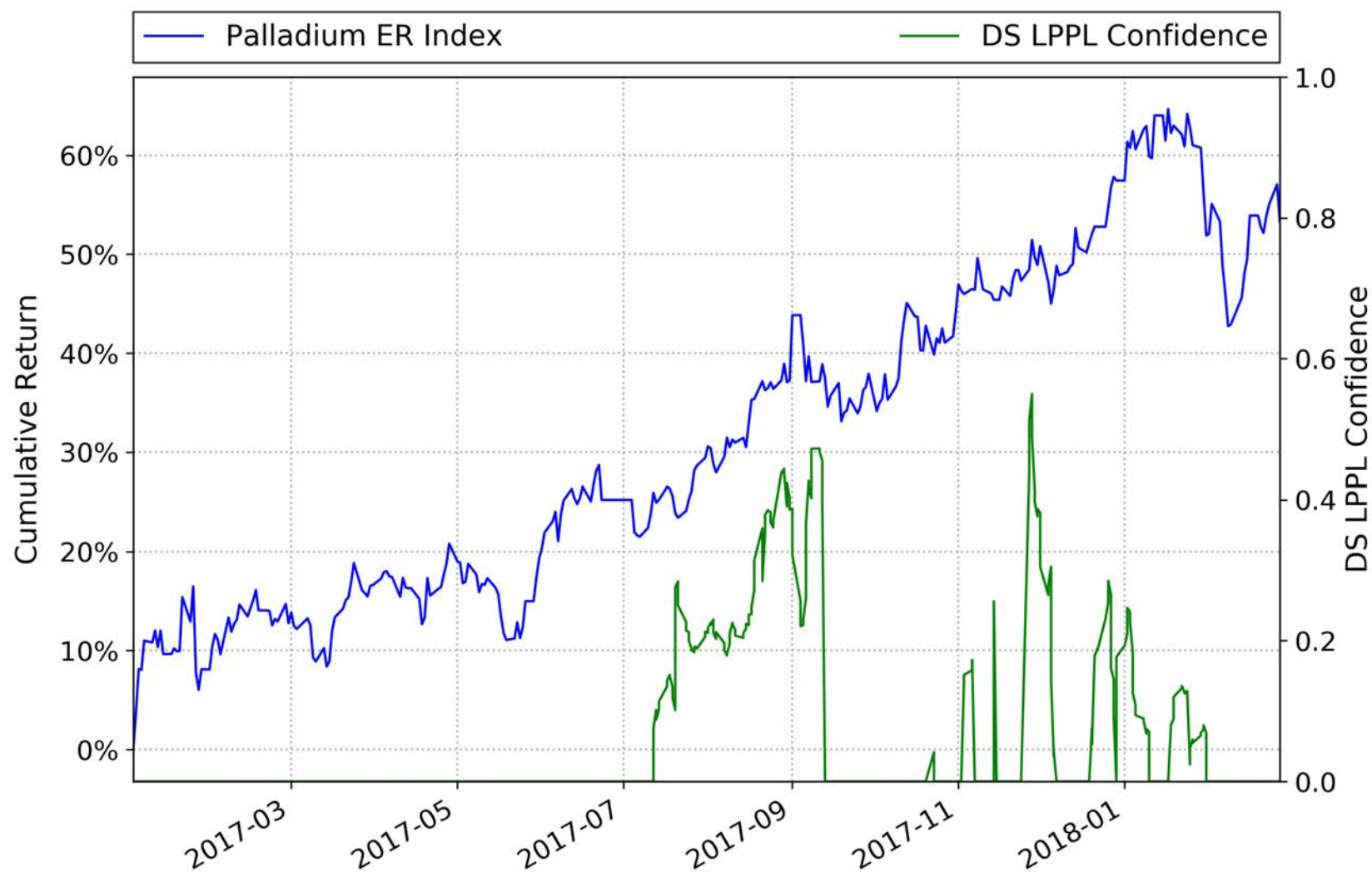
In the focus of our recent observations were always Palladium, as well as Oil and Zinc which are depicted in the following. Minor index declines correlated to the U.S. market crash can be seen in all of the plots underscoring the wide impact of a general correction of the US Market reaching out to many different sectors.

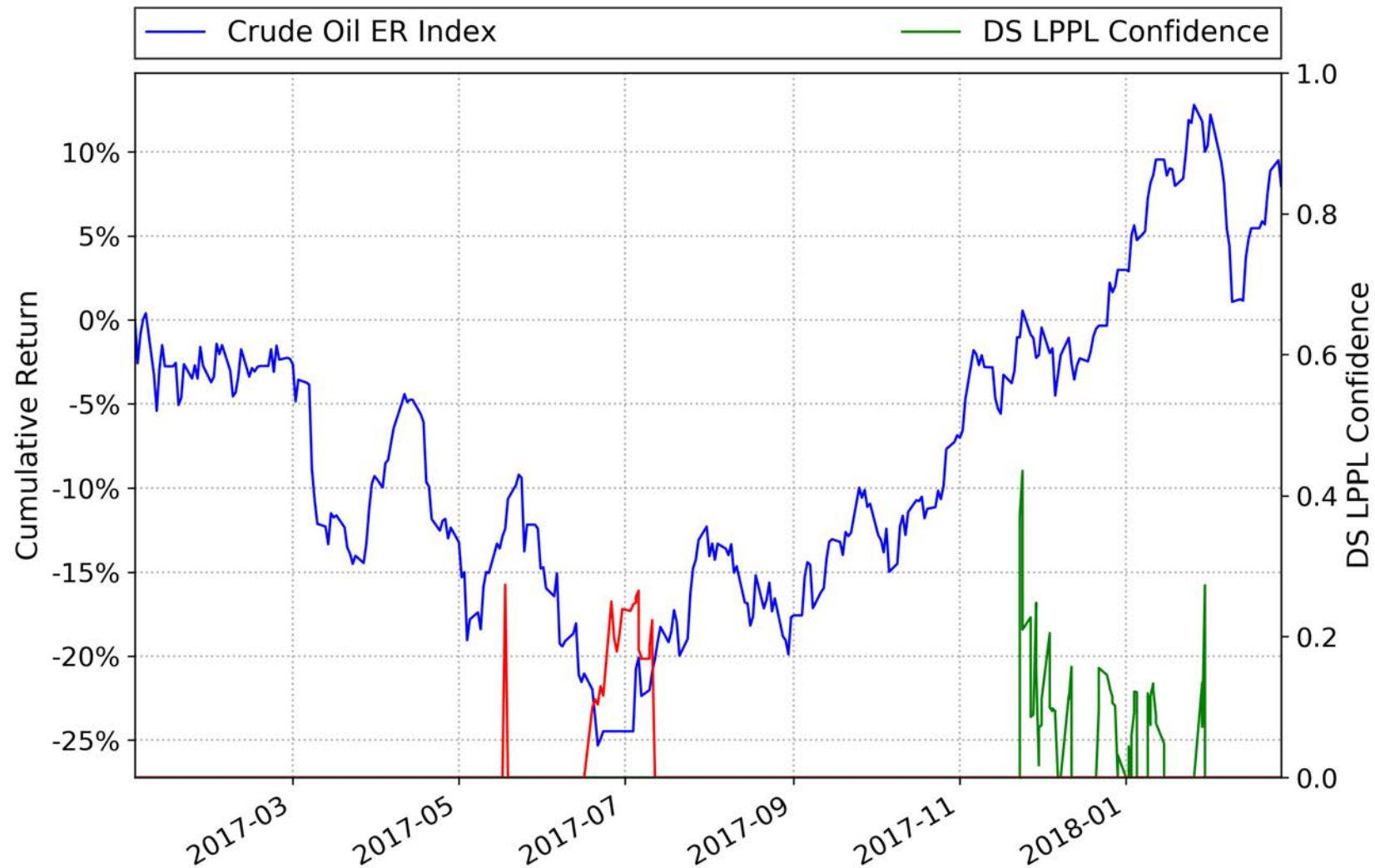
Still identified to be in a negative bubble this month is the Coffee Index. We can observe its continuing downtrend, leading to a bubble size of now estimated -23%. In total, we however only detect weak bubble activity so far, which suggests possible temporary continuation of the trend.



Green: positive bubble signal, indicating a coming plateau or correction

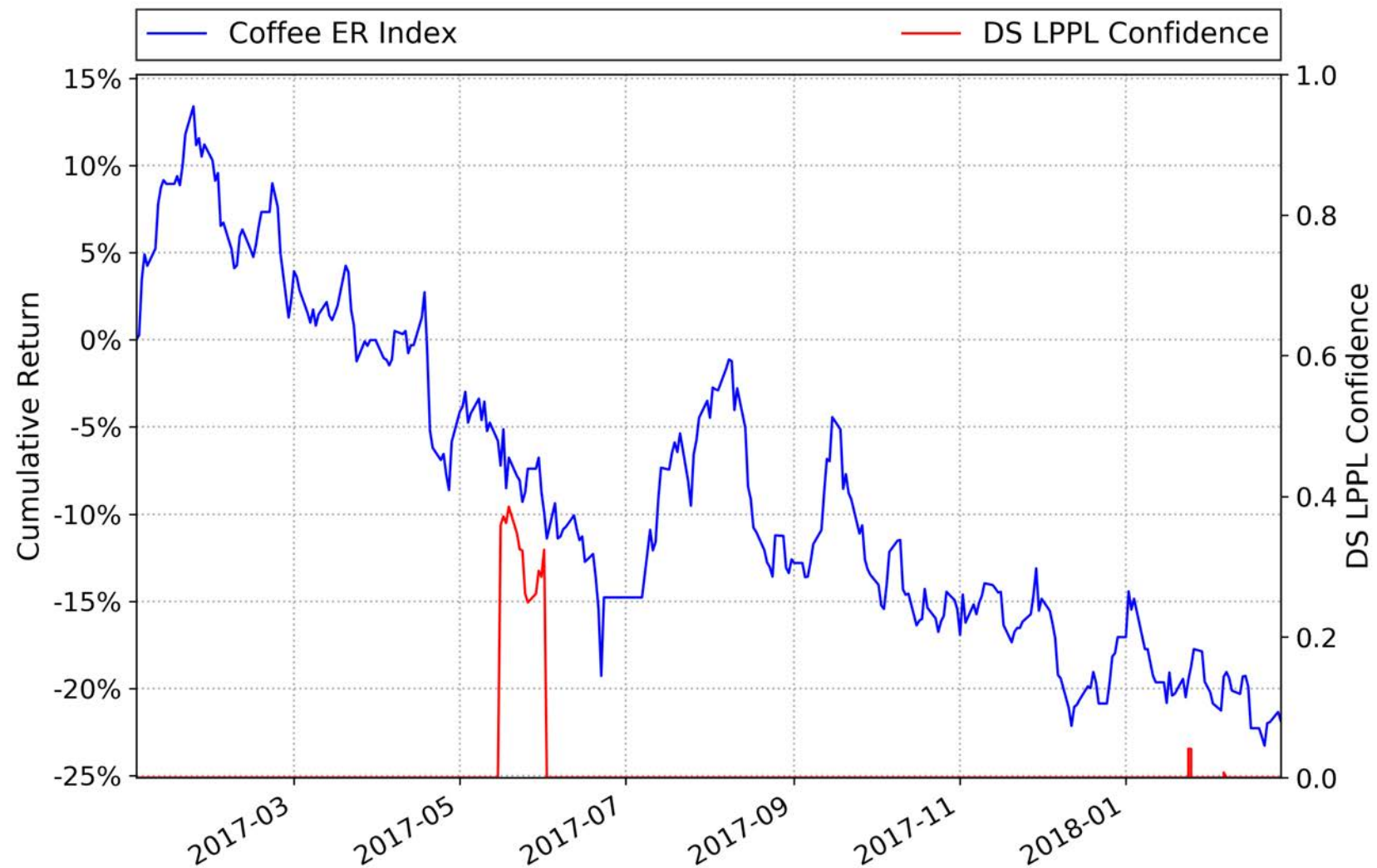
Red: negative bubble signal, indicating a coming rebound





Green: positive bubble signal, indicating a coming plateau or correction

Red: negative bubble signal, indicating a coming rebound



Red: negative bubble signal, indicating a coming rebound

Name	Bubble Size [%]	DS LPPL Confidence [%]	Geometric Average [%]
<b>Positive Bubbles</b>			
REER Index Chile	15	17	16
REER Index South Africa	11	16	13
<b>Negative Bubbles</b>			
REER Index Australia	-14	47	26

The forex sector exhibits low bubble activity this month, as in previous months.

## Real Effective Exchange Rate Indices:

We obtain positive bubble indicator values for the Chilean and South African Index. South Africa therefore does not only appear in the fixed income, but also in this sector, which increases confidence in the identified signals. Both indices are shown in the following.

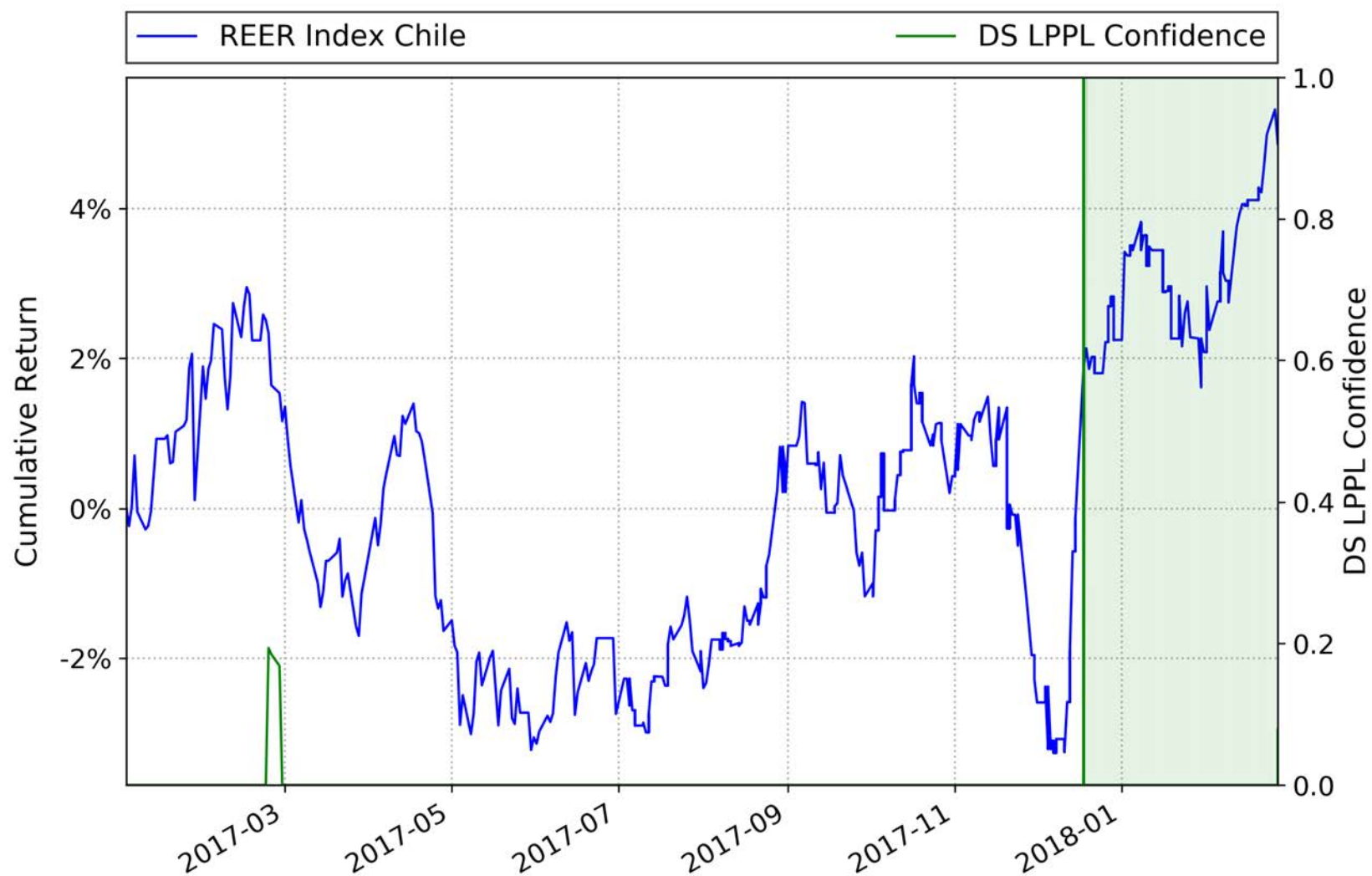
The Australian Index is furthermore again amongst the currency indices showing negative bubble signs, at a current half-magnitude indicator value.

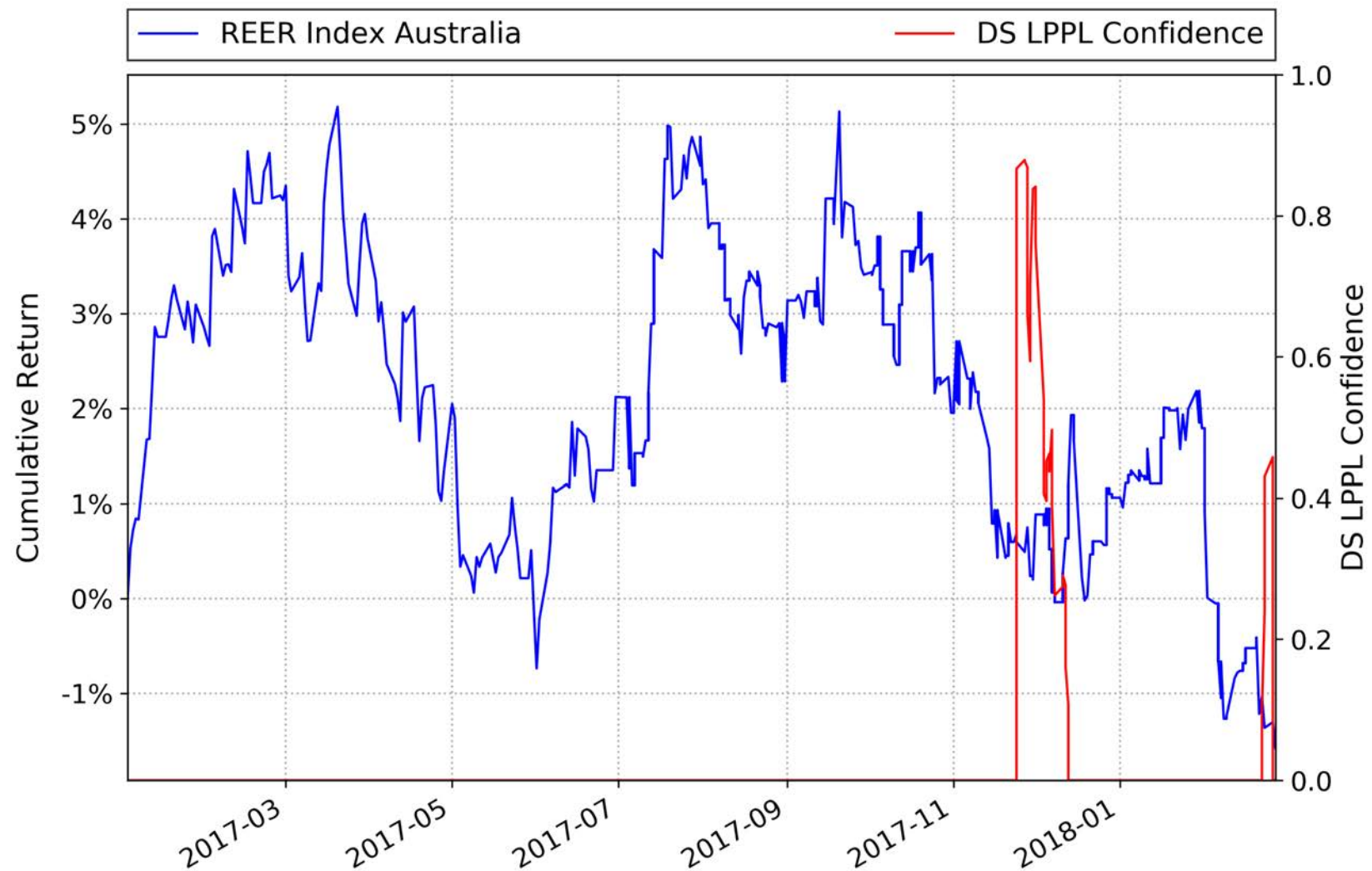
## Principal Component Analysis:

We do not see any bubble activity on the principal components of the analysed major currencies.

## Cryptocurrencies:

None of the five largest Cryptocurrencies in terms of market capitalization show signals for emerging bubble dynamics, currently. As pointed out in the previous reports, this is most likely still connected to the recent massive crypto-market correction following mid of December '17.





Red: negative bubble signal, indicating a coming rebound

For 748 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:

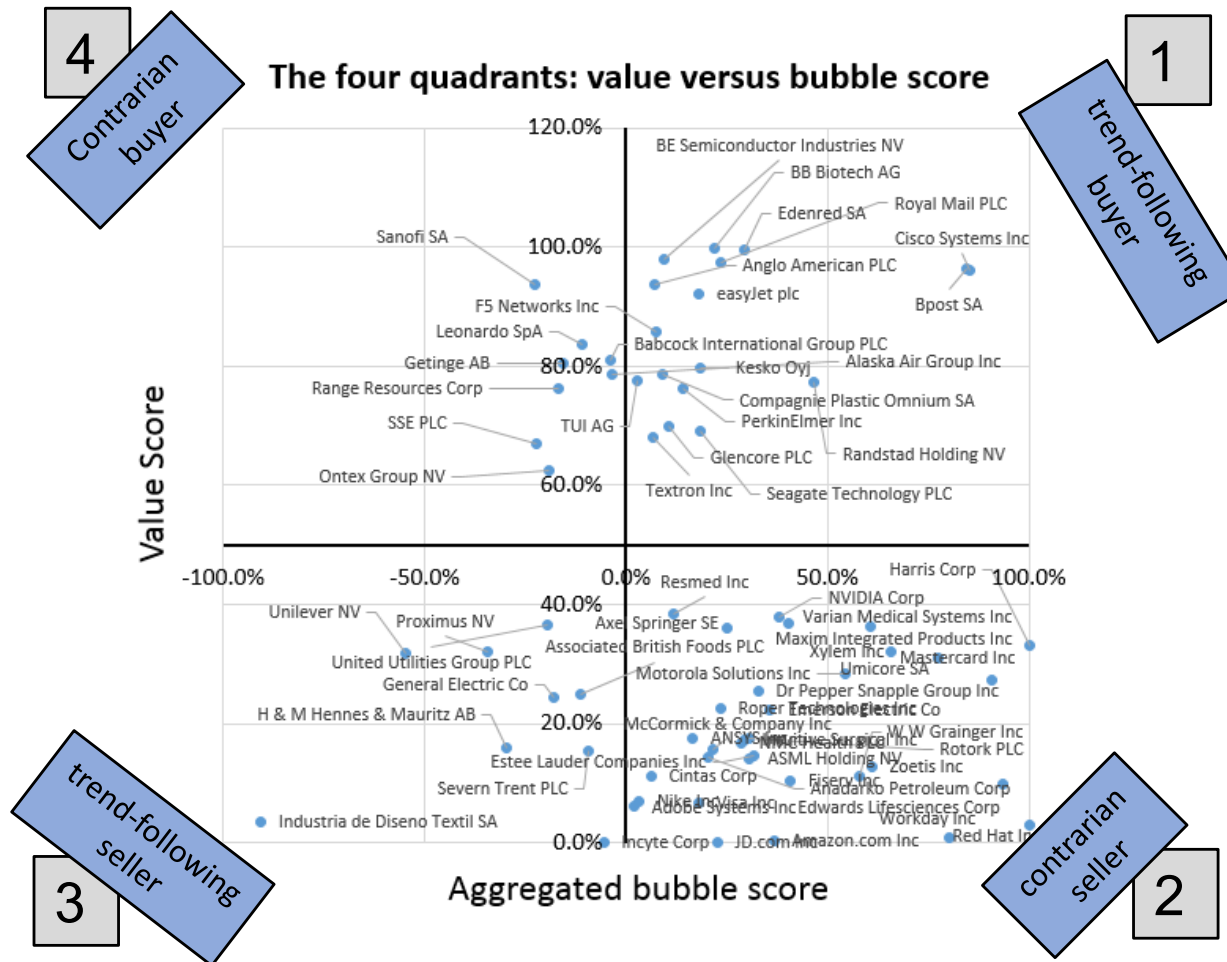
A value score that is based on the ROIC (Return on Invested Capital) taking into account the EV (Enterprise Value) to normalize for high/low market valuations and/or high/low debt;

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



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. Bpost SA);
2. [Quadrant 2](#): Stocks with a strong positive bubble score and a weak value score (e.g. NVIDIA Corp);
3. [Quadrant 3](#): Stocks with a strong negative bubble score and a weak value score (e.g. Unilever NV);
4. [Quadrant 4](#): Stocks with strong negative bubble score and a strong financial strength (e.g. SSE PLC)

\*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%.

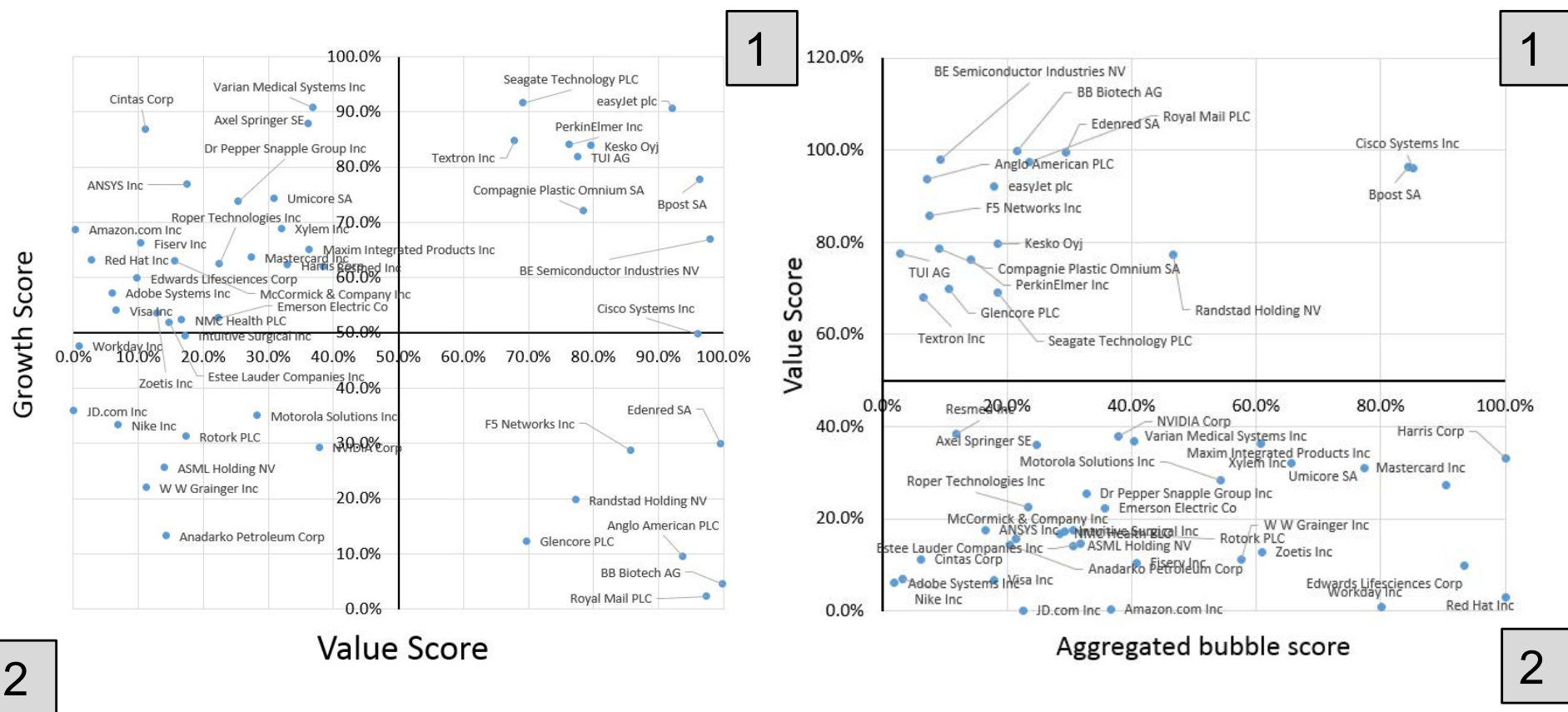
Each quadrant has its own specs:

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

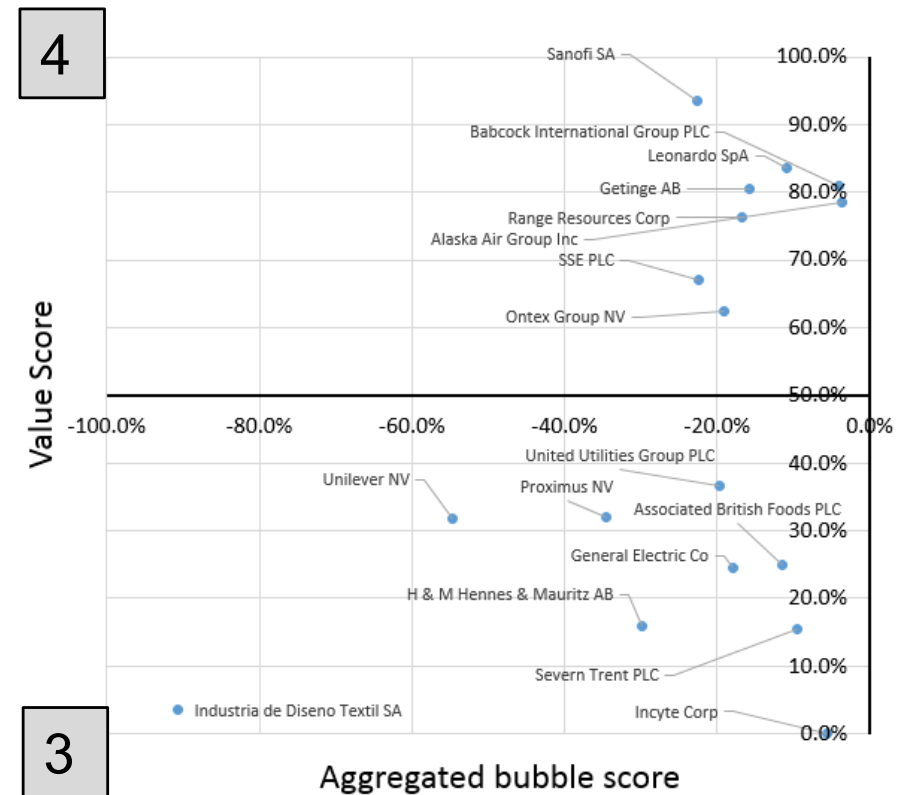
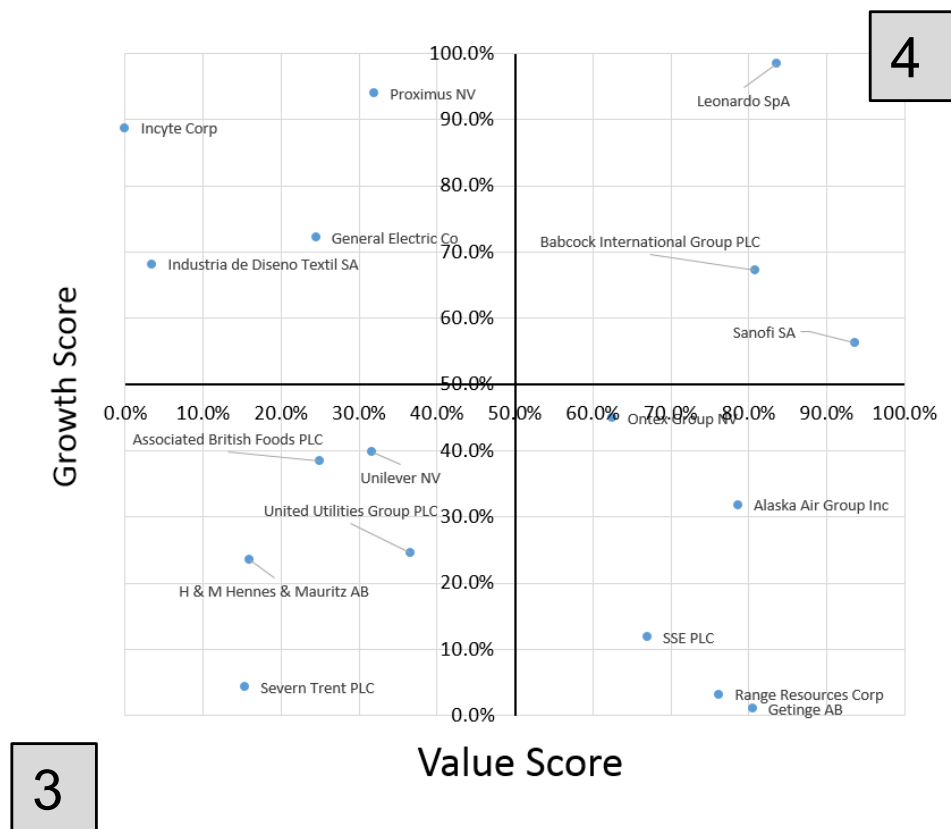
Strong positive bubble signals with strong (respectively weak) fundamentals



# Single Stocks

## Quadrant 3 and 4 stocks

Strong negative bubble signals with weak (respectively strong) fundamentals



# Single Stocks

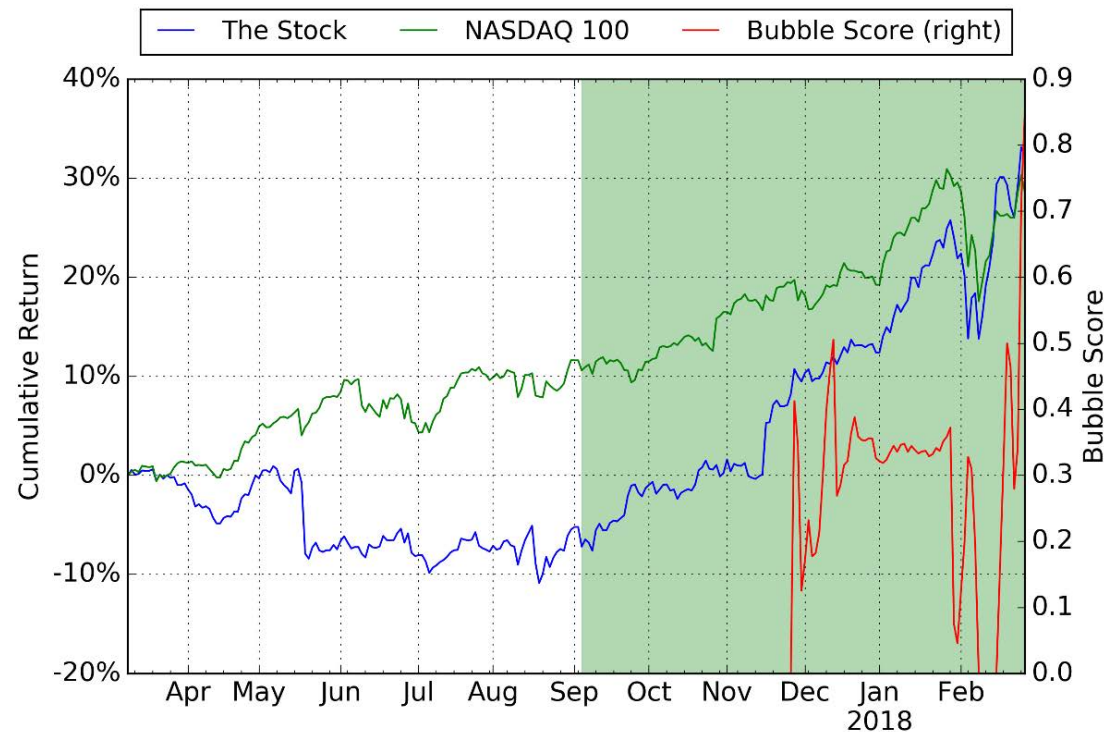
## Quadrant 1 stocks: strong positive bubble signals with strong fundamentals

Company Name	Country of Headquarters	GICS Industry Group Name	Yearly Return	Bubble Size	Bubble Start	Bubble Score	Value Score	Growth Score
Cisco Systems Inc	United States of America	Technology Hardware & Equipment	32.1%	42.4%	Sep-17	85.2%	96.1%	49.9%
F5 Networks Inc	United States of America	Technology Hardware & Equipment	3.1%	29.5%	Sep-17	7.6%	85.7%	28.6%
Seagate Technology PLC	Ireland; Republic of	Technology Hardware & Equipment	11.1%	63.5%	Jul-17	18.4%	69.1%	91.6%
Anglo American PLC	United Kingdom	Materials	55.2%	85.1%	Jun-17	7.2%	93.7%	9.5%
Bpost SA	Belgium	Transportation	21.7%	20.1%	Aug-17	84.4%	96.4%	77.8%
easyJet plc	United Kingdom	Transportation	70.5%	40.2%	Sep-17	18.0%	92.1%	90.6%
Edenred SA	France	Commercial & Professional Services	34.7%	27.1%	Aug-17	29.5%	99.6%	29.8%
Compagnie Plastic Omnium SA	France	Automobiles & Components	13.3%	13.4%	May-17	9.1%	78.5%	72.1%
Glencore PLC	Switzerland	Materials	25.9%	20.1%	Mar-17	10.7%	69.8%	12.3%
BE Semiconductor Industries NV	Netherlands	Semiconductors & Semiconductor Equipment	117.5%	40.9%	Sep-17	9.2%	98.0%	67.0%
Randstad Holding NV	Netherlands	Commercial & Professional Services	5.6%	18.3%	Aug-17	46.7%	77.3%	19.8%
Kesko Oyj	Finland	Food & Staples Retailing	11.1%	9.7%	Jul-17	18.5%	79.7%	83.8%
Royal Mail PLC	United Kingdom	Transportation	38.2%	40.5%	Jul-17	23.6%	97.5%	2.3%
BB Biotech AG	Switzerland	Pharmaceuticals, Biotechnology & Life Sciences	19.0%	21.4%	Mar-17	21.7%	99.9%	4.5%
TUI AG	Germany	Consumer Services	34.3%	34.3%	Mar-17	2.8%	77.7%	81.8%
PerkinElmer Inc	United States of America	Pharmaceuticals, Biotechnology & Life Sciences	37.8%	13.6%	Jun-17	14.2%	76.3%	84.1%
Textron Inc	United States of America	Capital Goods	27.2%	25.4%	Jul-17	6.6%	67.9%	84.8%

# Single Stocks - Quadrant 1 stocks

**Quadrant 1 stocks:** strong positive bubble signals with strong fundamentals

Example: Cisco Systems Inc.

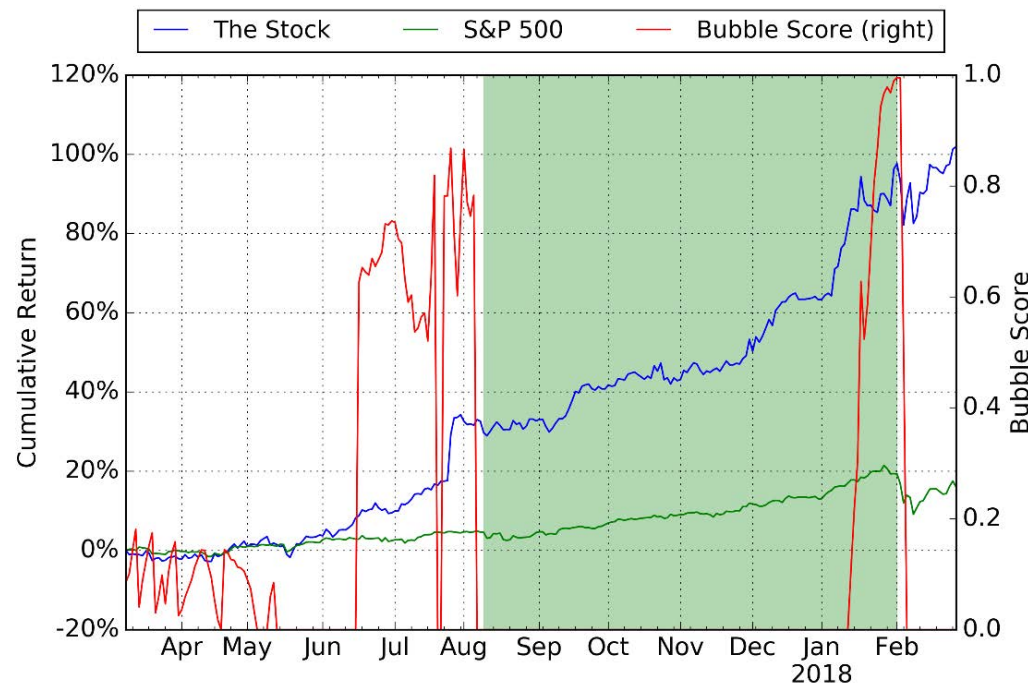


The above graph shows the one year cumulative return of the stock in blue (left hand scale), S&P 500 in green (left hand scale) and the calculated DS LPPLS Bubble Score in red (right hand scale). The green shaded period is the strong positive bubble we identified. The Bubble Score of this six month bubble has reached 85.2% with a bubble size 42.4%.

# Single Stocks - Quadrant 1 stocks

**Last month example:** strong positive bubble signals with strong fundamentals, Boeing Co.

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 after a small correction recently, which is in agreement with the DS LPPLS indicator and the strong fundamentals.



# Single Stocks - Quadrant 2 stocks

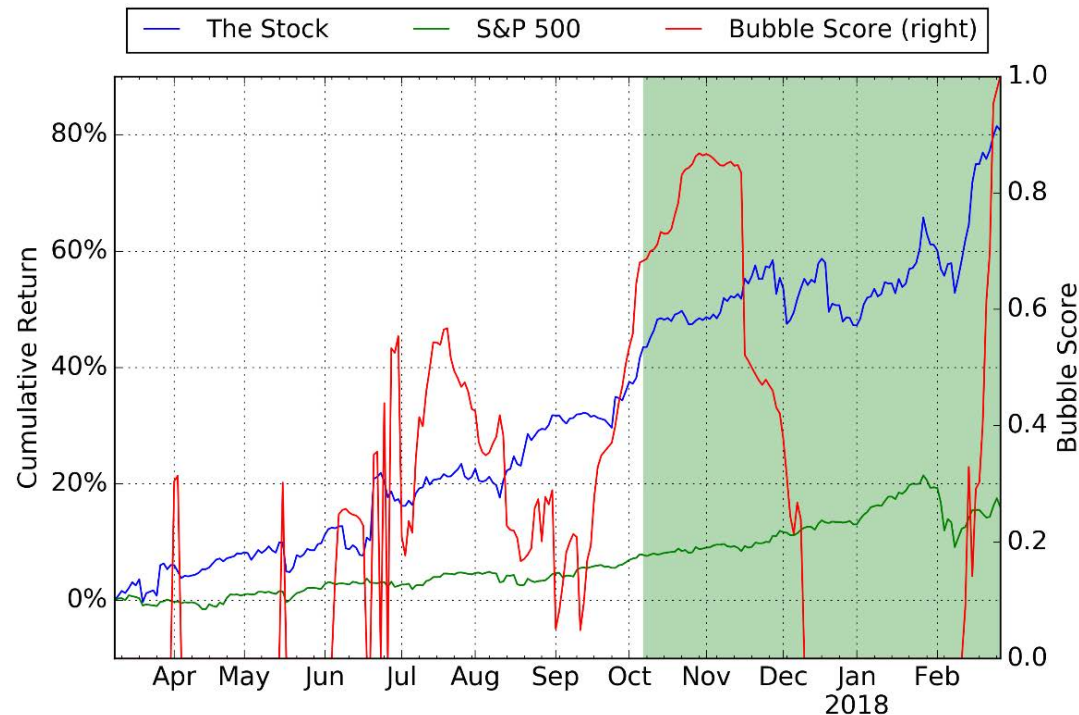
## Quadrant 2 stocks: strong positive bubble signals with weak fundamentals

Company Name	Country of Headquarters	GICS Industry Group Name	Yearly Return	Bubble Size	Bubble Start	Bubble Score	Value Score	Growth Score
Adobe Systems Inc	United States of America	Software & Services	71.4%	44.4%	Sep-17	1.9%	6.0%	57.2%
Amazon.com Inc	United States of America	Retailing	76.9%	54.0%	Aug-17	36.6%	0.4%	68.7%
ANSYS Inc	United States of America	Software & Services	51.0%	35.0%	May-17	16.5%	17.5%	76.9%
ASML Holding NV	Netherlands	Semiconductors & Semiconductor Equipment	59.0%	53.9%	Mar-17	30.7%	14.0%	25.5%
Cintas Corp	United States of America	Commercial & Professional Services	43.5%	38.8%	Apr-17	6.2%	11.1%	86.9%
Fiserv Inc	United States of America	Software & Services	22.3%	16.3%	Aug-17	40.8%	10.4%	66.2%
Intuitive Surgical Inc	United States of America	Health Care Equipment & Services	76.2%	38.1%	Jun-17	29.3%	17.2%	49.5%
JD.com Inc	China	Retailing	48.4%	48.4%	Mar-17	22.5%	0.1%	35.8%
Maxim Integrated Products Inc	United States of America	Semiconductors & Semiconductor Equipment	35.8%	33.8%	Sep-17	60.7%	36.4%	65.1%
NVIDIA Corp	United States of America	Semiconductors & Semiconductor Equipment	141.6%	43.9%	Sep-17	37.9%	37.8%	29.3%
Workday Inc	United States of America	Software & Services	51.7%	23.5%	Sep-17	80.2%	0.9%	47.6%
Umicore SA	Belgium	Materials	79.7%	42.3%	Aug-17	77.3%	30.9%	74.3%
Axel Springer SE	Germany	Media	44.8%	37.4%	May-17	24.9%	36.1%	87.8%
NMC Health PLC	United Kingdom	Health Care Equipment & Services	88.4%	61.0%	Jun-17	28.5%	16.7%	52.3%
Rotork PLC	United Kingdom	Capital Goods	15.9%	24.7%	May-17	30.6%	17.4%	31.3%
Anadarko Petroleum Corp	United States of America	Energy	-6.9%	26.3%	Jun-17	20.4%	14.3%	13.2%
Dr Pepper Snapple Group Inc	United States of America	Food, Beverage & Tobacco	22.8%	32.7%	Oct-17	32.7%	25.4%	73.8%
Estee Lauder Companies Inc	United States of America	Household & Personal Products	63.7%	50.9%	May-17	31.8%	14.7%	51.9%
Emerson Electric Co	United States of America	Capital Goods	21.6%	25.6%	May-17	35.7%	22.3%	52.7%
Edwards Lifesciences Corp	United States of America	Health Care Equipment & Services	44.5%	22.3%	Sep-17	93.5%	9.9%	59.9%
W W Grainger Inc	United States of America	Capital Goods	7.5%	63.3%	Jul-17	57.7%	11.2%	21.9%
Harris Corp	United States of America	Capital Goods	43.5%	17.2%	Oct-17	100.0%	33.0%	62.3%
Mastercard Inc	United States of America	Software & Services	57.7%	27.0%	Sep-17	90.6%	27.4%	63.6%
McCormick & Company Inc	United States of America	Food, Beverage & Tobacco	6.2%	11.8%	Jun-17	21.5%	15.6%	63.0%
Motorola Solutions Inc	United States of America	Technology Hardware & Equipment	30.6%	22.6%	Aug-17	54.2%	28.3%	35.0%
Nike Inc	United States of America	Consumer Durables & Apparel	20.0%	31.3%	May-17	3.2%	7.0%	33.3%
Red Hat Inc	United States of America	Software & Services	77.9%	26.0%	Oct-17	100.0%	2.8%	63.2%
Resmed Inc	United States of America	Health Care Equipment & Services	33.2%	23.1%	Aug-17	11.9%	38.5%	61.9%
Roper Technologies Inc	United States of America	Capital Goods	32.8%	19.2%	Jul-17	23.3%	22.5%	62.4%
Visa Inc	United States of America	Software & Services	36.9%	32.2%	May-17	17.9%	6.7%	54.0%
Varian Medical Systems Inc	United States of America	Health Care Equipment & Services	37.9%	17.1%	Aug-17	40.4%	36.9%	90.8%
Xylem Inc	United States of America	Capital Goods	56.1%	20.7%	Sep-17	65.6%	32.1%	68.9%
Zoetis Inc	United States of America	Pharmaceuticals, Biotechnology & Life Sciences	52.5%	25.9%	Sep-17	60.9%	12.8%	53.5%

# Single Stocks - Quadrant 2 stocks

**Quadrant 2 stocks:** strong positive bubble signals with weak fundamentals

Example: Red Hat Inc.

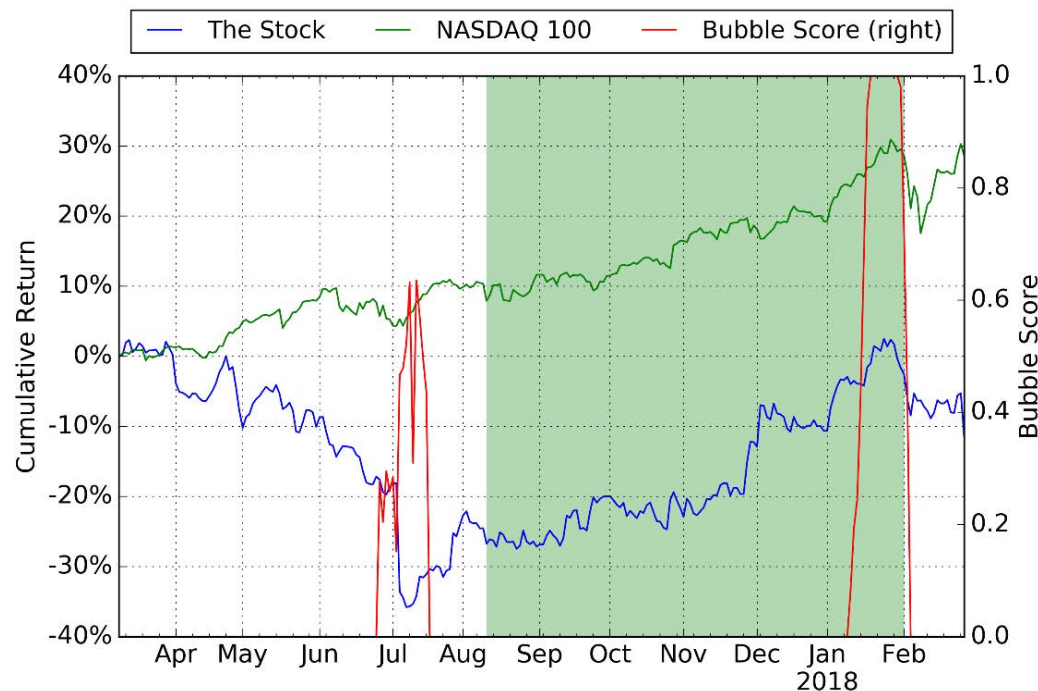


The above graph shows the one year cumulative return of the stock in blue (left hand scale), NASDAQ 100 in green (left hand scale) and the calculated DS LPPLS Bubble Score in red (right hand scale). The green shaded period is the strong positive bubble we identified. The Bubble Score of this five month bubble has reached 100% with a bubble size 26%. The strong positive bubble signals and weak fundamentals indicate a high probability of correction in the future.

# Single Stocks - Quadrant 2 stocks

**Last month example:** strong positive bubble signals with weak fundamentals, O'Reilly Automotive Inc.

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 went into a plateau after a 10% drawdown at the end of January, in agreement with our DS LPPLS indicator and the weak fundamentals.



# Single Stocks - Quadrant 3 stocks

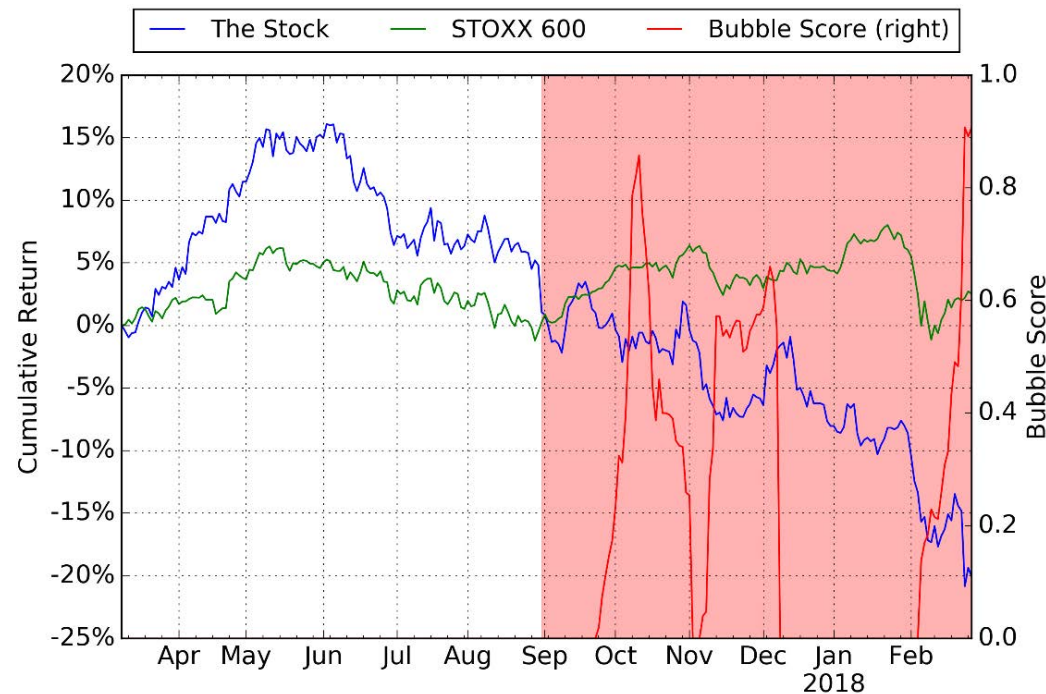
## Quadrant 3 stocks: strong negative bubble signals with weak fundamentals

Company Name	Country of Headquarters	GICS Industry Group Name	Yearly Return	Bubble Size	Bubble Start	Bubble Score	Value Score	Growth Score
Incyte Corp	United States of America	Pharmaceuticals, Biotechnology & Life Sciences	-42.7%	-33.7%	May-17	-5.6%	0.0%	88.8%
Associated British Foods PLC	United Kingdom	Food, Beverage & Tobacco	1.1%	-15.6%	Aug-17	-11.5%	25.0%	38.5%
Proximus NV	Belgium	Telecommunication Services	-8.4%	-14.6%	Jun-17	-34.5%	32.0%	94.0%
Industria de Diseno Textil SA	Spain	Retailing	-19.3%	-20.9%	Aug-17	-90.7%	3.5%	68.2%
Unilever NV	Netherlands	Household & Personal Products	-4.6%	-12.5%	Jul-17	-54.6%	31.7%	39.8%
Severn Trent PLC	United Kingdom	Utilities	-24.9%	-24.9%	Mar-17	-9.5%	15.4%	4.3%
General Electric Co	United States of America	Capital Goods	-51.4%	-51.5%	Mar-17	-17.9%	24.5%	72.2%
United Utilities Group PLC	United Kingdom	Utilities	-30.3%	-24.1%	Jun-17	-19.8%	36.6%	24.6%
H & M Hennes & Mauritz AB	Sweden	Retailing	-43.2%	-36.0%	Oct-17	-29.8%	15.9%	23.5%

# Single Stocks - Quadrant 3 stocks

**Quadrant 3 stocks:** strong negative bubble signals with weak fundamentals

Example: Industria de Diseno Textil SA.

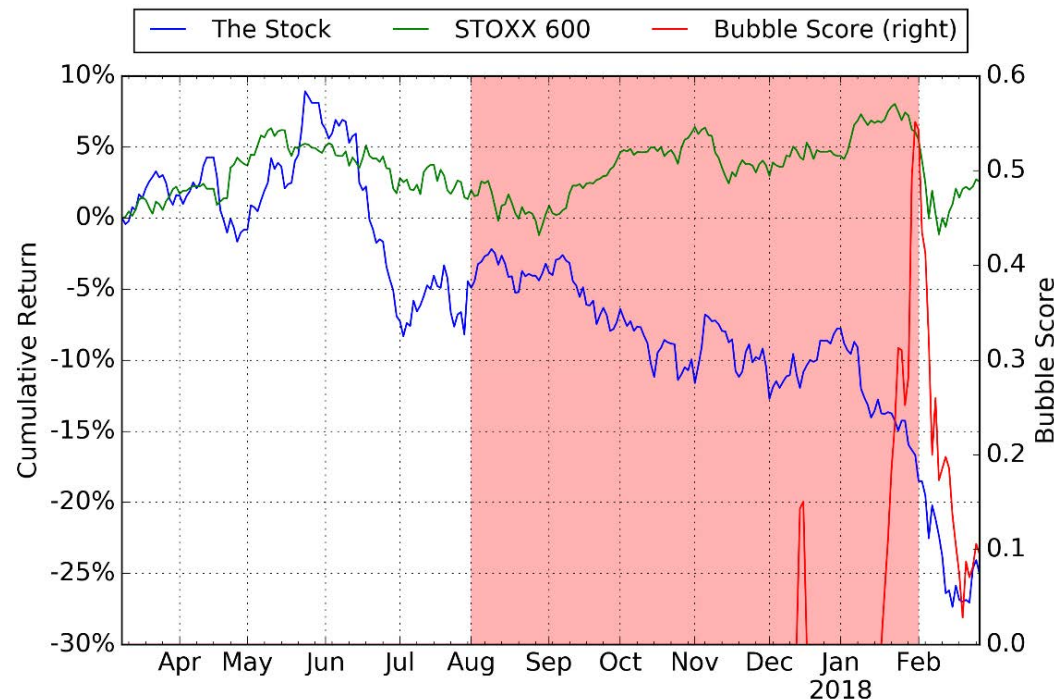


The above graph shows the one year cumulative return of the stock in blue (left hand scale), STOXX 600 in green (left hand scale) and the calculated DS LPPLS Bubble Score in red (right hand scale). The red shaded period is the strong negative bubble we identified. The Bubble Score of this six month bubble has reached 90.7% with a bubble size -20.9%.

# Single Stocks - Quadrant 3 stocks

**Last month example:** strong negative bubble signals with weak fundamentals, Severn Trent 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 started a small rebound recently after a large drawdown following the market, which is in synchrony with our DS LPPLS indicator, together with the weak fundamentals.



# Single Stocks - Quadrant 4 stocks

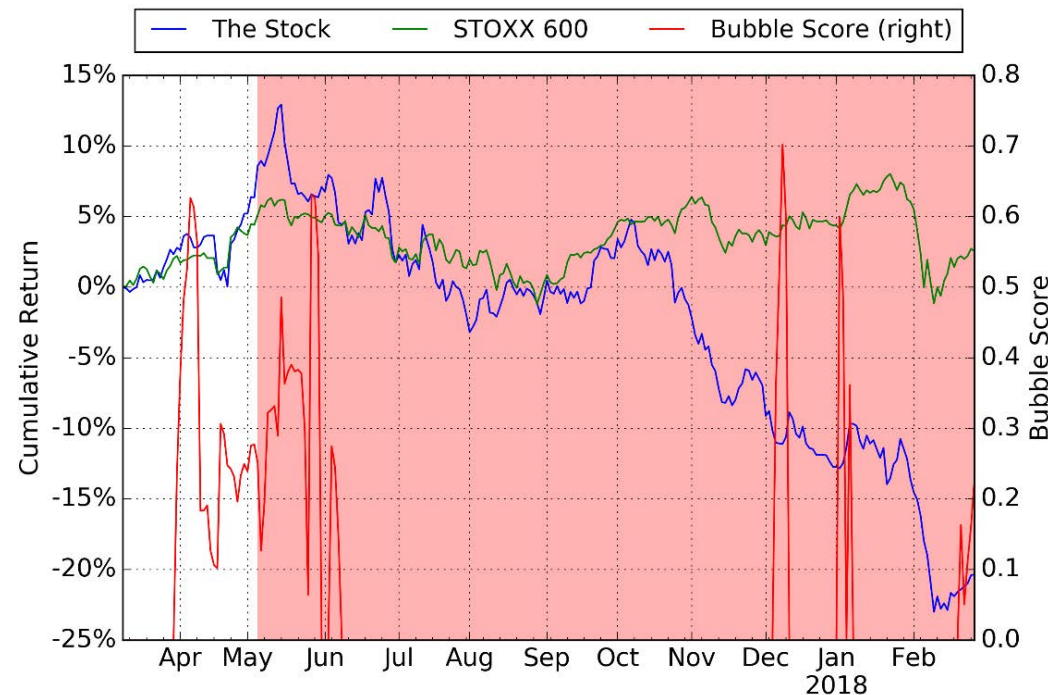
## Quadrant 4 stocks: strong negative bubble signals with strong fundamentals

Company Name	Country of Headquarters	GICS Industry Group Name	Yearly Return	Bubble Size	Bubble Start	Bubble Score	Value Score	Growth Score
Ontex Group NV	Belgium	Household & Personal Products	-22.2%	-19.2%	Jul-17	-19.2%	62.4%	44.9%
Babcock International Group PLC	United Kingdom	Commercial & Professional Services	-26.8%	-27.8%	Jun-17	-4.0%	80.9%	67.2%
Sanofi SA	France	Pharmaceuticals, Biotechnology & Life Sciences	-20.1%	-26.6%	May-17	-22.6%	93.6%	56.3%
Leonardo SpA	Italy	Capital Goods	-32.2%	-42.9%	May-17	-11.0%	83.6%	98.5%
SSE PLC	United Kingdom	Utilities	-17.8%	-16.4%	Jun-17	-22.4%	67.0%	11.9%
Alaska Air Group Inc	United States of America	Transportation	-32.8%	-32.8%	Mar-17	-3.7%	78.6%	31.8%
Range Resources Corp	United States of America	Energy	-53.1%	-24.9%	Aug-17	-16.8%	76.2%	3.2%
Getinge AB	Sweden	Health Care Equipment & Services	-17.6%	-17.0%	Sep-17	-15.7%	80.5%	1.1%

# Single Stocks - Quadrant 4 stocks

**Quadrant 4 stocks:** strong negative bubble signals with strong fundamentals

Example: Sanofi SA.

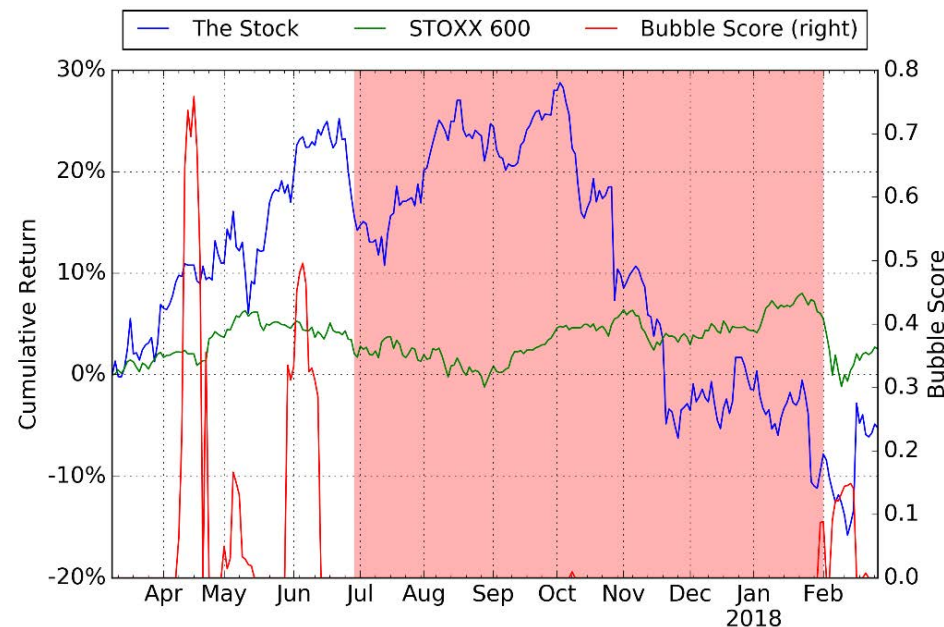


The above graph shows the one year cumulative return of the stock in blue (left hand scale), STOXX 600 in green (left hand scale) and the calculated DS LPPLS Bubble Score in red (right hand scale). The red shaded period is the strong negative bubble we identified. The Bubble Score of this seven month bubble has reached 22.6% with a bubble size -26.6%. We expect a further rebound, which is due to our diagnostic of a negative bubble signal with strong fundamentals, calling for a contrarian buyer position.

# Single Stocks - Quadrant 4 stocks

**Last month example:** strong negative bubble signals with strong fundamentals, Eutelsat Communications SA.

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 had a strong rebound in the middle of February, which is in synchrony with our DS LPPLS indicator and the strong fundamentals. We expect this stock to further appreciate in the future due to the strong fundamentals and following its neglect by investors in previous months.



# Sectors

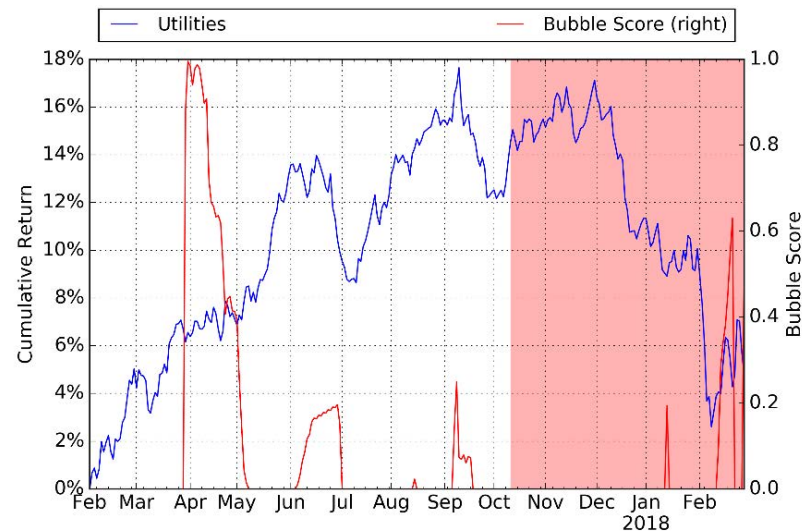
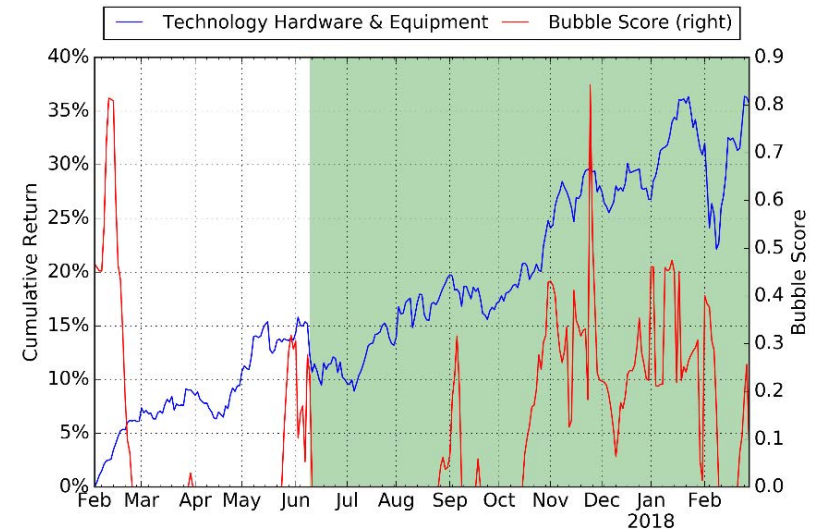
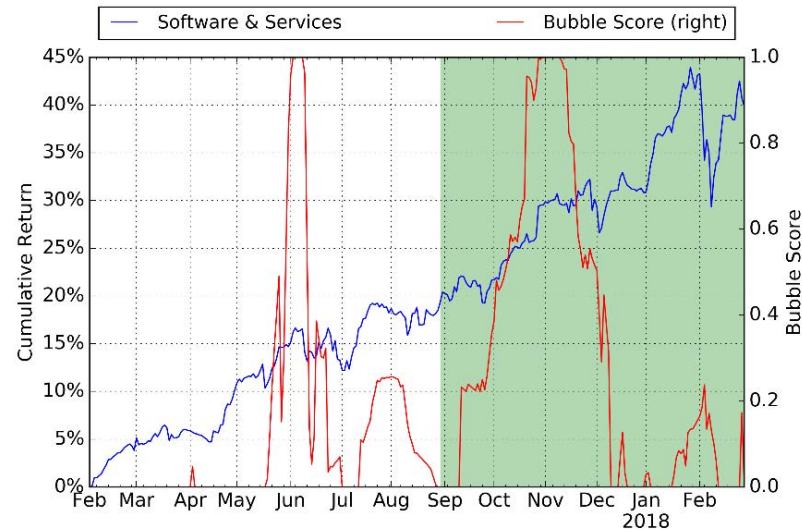
GICS Industry Group Name	Yearly Return		Bubble Size		Bubble Score		Value Score		Growth Score	
	Mar 1st	Feb 1st	Mar 1st	Feb 1st	Mar 1st	Feb 1st	Mar 1st	Feb 1st	Mar 1st	Feb 1st
Pharmaceuticals, Biotechnology & Life Sciences	4.6%	13.9%	0.0%	0.0%	0.0%	0.0%	62.7%	55.6%	57.8%	58.5%
Consumer Services	24.8%	30.2%	0.0%	15.2%	0.0%	68.5%	28.6%	31.4%	46.9%	54.4%
Retailing	33.5%	36.9%	0.0%	32.8%	0.0%	44.1%	16.3%	15.9%	57.4%	55.2%
Transportation	17.0%	23.2%	0.0%	15.1%	0.0%	54.6%	55.7%	56.0%	57.8%	60.2%
Consumer Durables & Apparel	22.1%	30.7%	0.0%	14.6%	0.0%	56.7%	42.7%	35.2%	50.3%	54.2%
Semiconductors & Semiconductor Equipment	39.9%	43.7%	0.0%	0.0%	0.0%	0.0%	67.2%	95.1%	29.7%	28.7%
Technology Hardware & Equipment	27.0%	25.8%	20.8%	19.0%	8.4%	1.4%	69.8%	89.5%	39.9%	39.0%
Automobiles & Components	18.2%	24.5%	0.0%	0.0%	0.0%	0.0%	76.9%	68.2%	50.2%	52.7%
Telecommunication Services	-2.8%	5.4%	0.0%	0.0%	0.0%	0.0%	57.3%	51.6%	39.4%	44.2%
Energy	2.9%	8.0%	0.0%	19.4%	0.0%	16.4%	49.5%	46.0%	47.1%	49.9%
Software & Services	32.9%	39.1%	17.2%	39.1%	1.4%	15.4%	37.3%	95.2%	47.3%	48.4%
Materials	19.6%	23.2%	0.0%	0.0%	0.0%	0.0%	50.0%	43.0%	49.1%	52.5%
Health Care Equipment & Services	19.9%	29.0%	0.0%	16.5%	0.0%	48.5%	61.2%	55.9%	58.7%	62.9%
Capital Goods	19.0%	25.3%	0.0%	17.1%	0.0%	6.7%	46.1%	45.0%	55.4%	50.8%
Media	-2.4%	4.6%	0.0%	0.0%	0.0%	0.0%	42.6%	38.0%	56.1%	59.5%
Commercial & Professional Services	12.5%	19.7%	0.0%	10.2%	0.0%	24.5%	28.0%	20.8%	53.0%	57.4%
Food & Staples Retailing	6.1%	13.7%	0.0%	14.8%	0.0%	48.4%	56.0%	54.7%	58.1%	54.1%
Household & Personal Products	1.3%	16.4%	0.0%	0.0%	0.0%	0.0%	36.6%	38.0%	49.2%	43.4%
Food, Beverage & Tobacco	1.5%	12.2%	0.0%	0.0%	0.0%	0.0%	43.2%	37.0%	55.5%	56.2%
Utilities	0.8%	8.4%	-8.5%	0.0%	-50.7%	0.0%	52.4%	47.5%	43.1%	51.3%
Insurance	12.7%	19.0%	0.0%	16.4%	0.0%	29.8%	-	-	-	-
Real Estate	4.1%	9.7%	0.0%	0.0%	0.0%	0.0%	-	-	-	-
Diversified Financials	19.7%	24.9%	0.0%	19.6%	0.0%	61.4%	-	-	-	-
Banks	14.7%	21.1%	0.0%	16.3%	0.0%	36.3%	-	-	-	-

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 2 industry groups with positive bubble scores: *Technology Hardware & Equipment*, *Software & Services*, and 1 industry group with negative bubble score: *Utilities*.

After a strong correction in the US market at the beginning of February, most of the strong positive bubble signals in many industries have disappeared this month. The figures in the next slide 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 (resp. red) shaded period is the positive (resp. negative) bubbles we identified.

# Sectors



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.

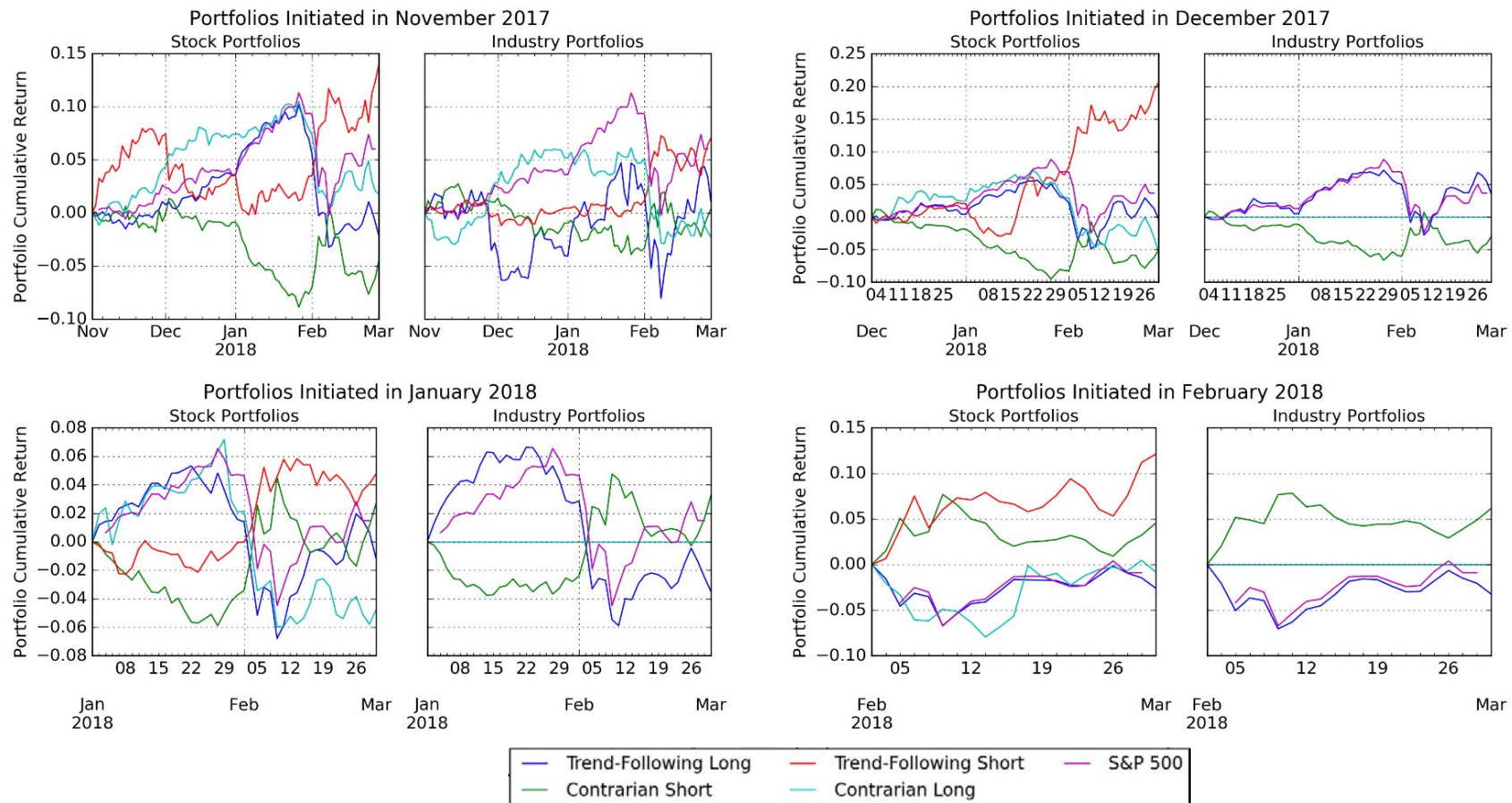
# Portfolio Construction & Performance

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 since 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 and later.

# Portfolio Construction & Performance



This month, we find that Short Portfolios initiated in November, December 2017, January and February 2018 have good performances, due to the big correction 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>