

The FCO Cockpit – Global Bubble Status Report

Ahmed Ahmed, Didier Sornette & Ke Wu
Chair of Entrepreneurial Risk

March 1st, 2017

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What is this?

This 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 431 systemic assets and 791 single stocks^{\$}. The systemic assets are bond, equity and commodity indices and 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 individual stocks, we use the constituents of the Stoxx Europe 600, the S&P 500 and the Nasdaq 100 indices. From these, all stocks with incomplete data are removed. All stocks in financial institutions are taken out of the set as well. This explains that there are some small changes in the total number of stocks each month.

^{*} 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>)

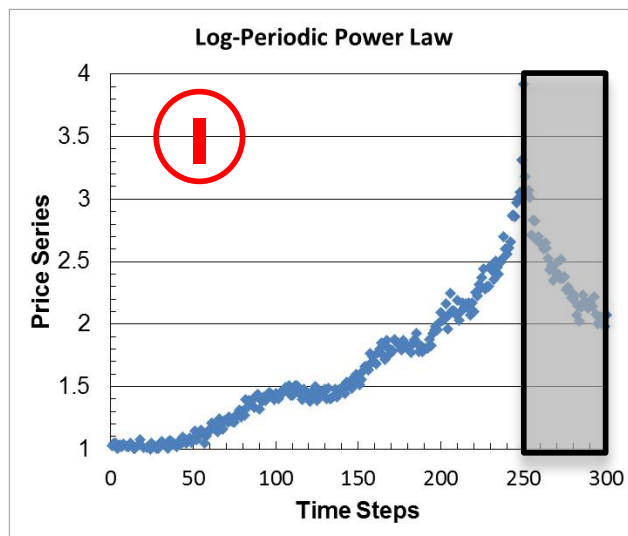
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How does it work?

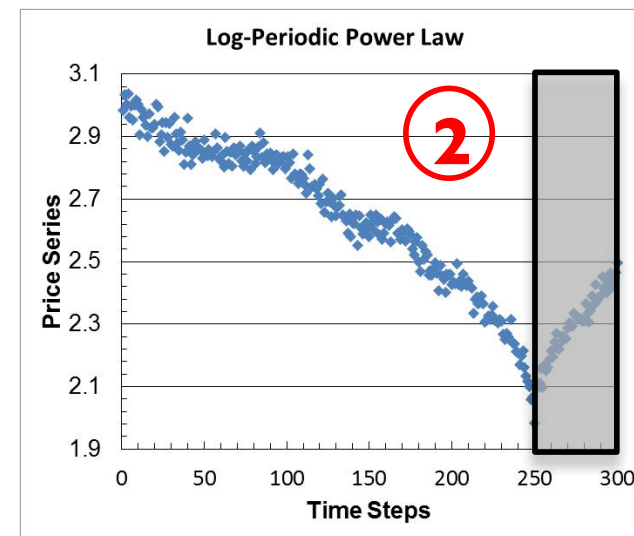
We use the Log-Periodic Power Law Singular (LPPLS) model to hunt for the distinct fingerprint of **Bubbles**:

1. The price rises **faster than exponentially**, so the logarithm of the price rises faster than linearly;
2. There are **accelerating oscillations**, with a distinct characteristic.

A bubble signal is identified if both of our bubble indicators, LPPL-Confidence and LPPL-Trust, are larger than 5%.



A **positive bubble** when
there is imitation in **buying**

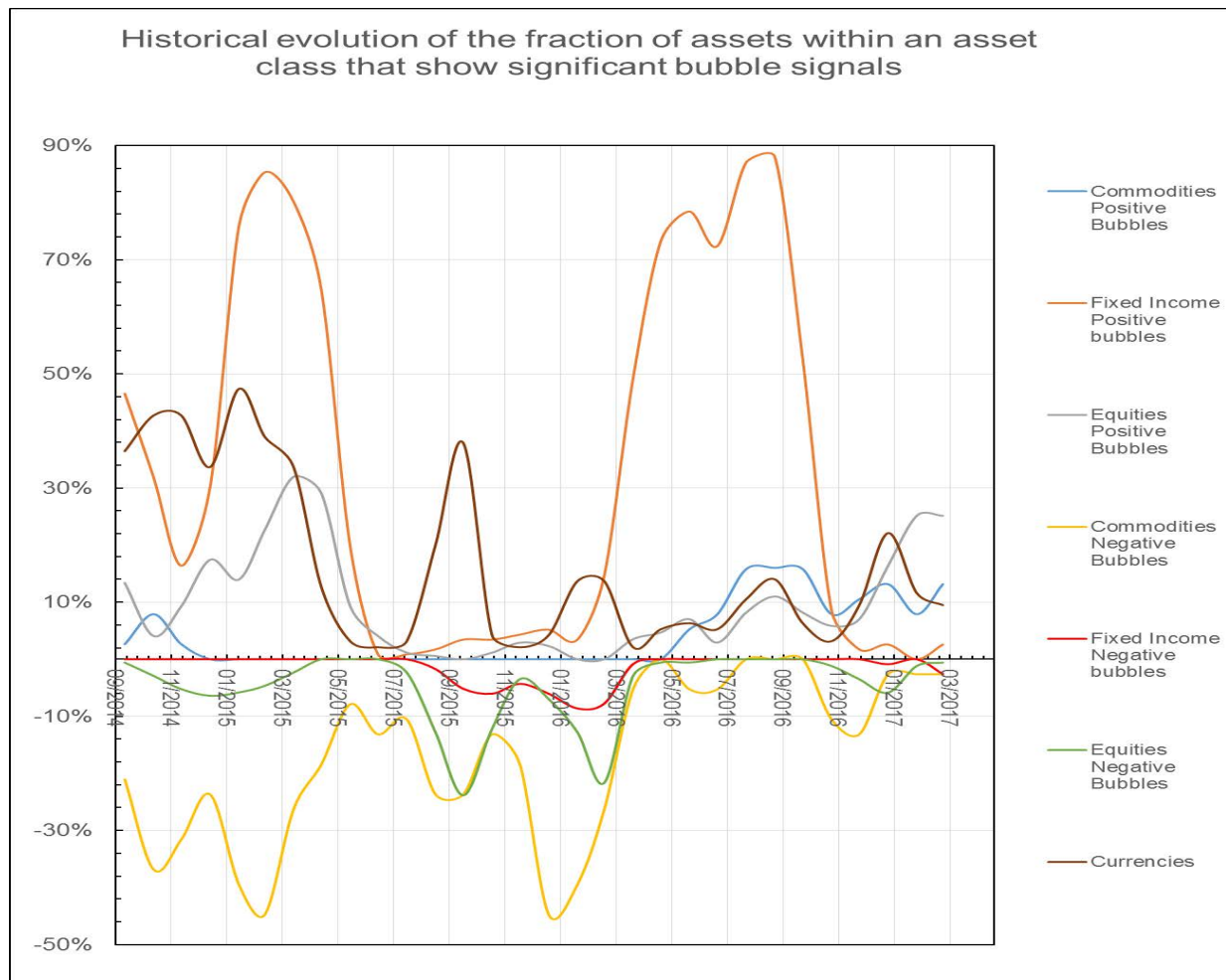


A **negative bubble** when
there is imitation in **selling**

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General Result

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The big picture

We see mixed bubble signals in just a few government bond indices; confirming that the very strong momentum that has lifted the entire asset class faded away, and the fixed income sector ended showing a bubble-like behavior.

For the third month one, can observe the beginning of a trend in the growth of positive equity bubbles.

There is no current general trend in commodities after nearly two years of strong negative bubble signals in the asset class and in its related stocks and currencies. Mixed bubble signals are now seen in a few commodities indices.

*A positive bubble signal is an indication of herding when people start buying because prices go up.
A negative bubble signal is an indication of herding when people start selling because prices go down.*

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Other interesting highlights from this report

- Over the last four months, we reported that the strong rally in the governments and corporate bonds, that was observed globally over the last year, cooled down and did not show a bubble signal anymore. This is confirmed in this report;
- For the fifth consecutive month, we see mixed bubble signals among a few commodities indices. Five out of the six indices that are showing bubble signals this month are positive ones. It is interesting that all of these five indices are metal indices, like last month;
- There is a significant increase in positive bubble signals in equities. The most interesting result was found in Pakistan, Morocco, and Hungary stock market indices that are showing signs of a positive bubble for the fourth consecutive month. It is worth mentioning that now around 57% of the indices that are showing signs of bubbles are developed markets indices;
- In our analysis of single stocks, we find a stronger bubble score (doubled) in the sector Semiconductors & Semiconductor Equipment than that we reported in last two month, which demonstrates the very strong momentums in this industry recently. In addition, technology sectors including Technology Hardware & Equipment, Telecommunication Services, Software & Services are experiencing rebounds with positive bubble scores, with a strong fourth quarter earnings season coming.

A positive bubble signal is an indication of herding when people start buying because prices go up.

A negative bubble signal is an indication of herding when people start selling because prices go down.

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Results per Asset Class

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Government & Corporate bonds

Country Indices	Yearly Return	DS LPPL Trust		DS LPPL Confidence	
Positive Bubbles					
iBoxx EUR Belgium Index	0.2%	<div><div></div></div>	7.8%	<div><div></div></div>	11.2%
iBoxx EUR Ireland Index	0.8%	<div><div></div></div>	5.8%	<div><div></div></div>	11.9%
iBoxx EUR Netherlands Index	0.6%	<div><div></div></div>	5.3%	<div><div></div></div>	5.5%
Negative Bubbles					
iBoxx EUR France Index	-1.56%	<div><div></div></div>	11.6%	<div><div></div></div>	23.9%
iBoxx Asia Thailand Government Index	-0.5%	<div><div></div></div>	8.0%	<div><div></div></div>	5.7%
iBoxx Sovereign Japan local currency Index	-0.4%	<div><div></div></div>	6.3%	<div><div></div></div>	22.2%

For the first month, we see mixed bubble signals among a few government bond indices. There are six indices showing bubble signals this month, three of them are showing positive bubble signals and three are showing negative bubble signals. It is interesting to see that all the indices that are showing positive bubble signals are in Europe, while two of the three indices that are showing the negative ones are in Asia and the remaining one is also in Europe;

The figure on the next page shows the downward pressure on the French government bonds, as investors became focused on the upcoming French presidential election and the risk of a Marine Le Pen win;

Finally, for the fourth consecutive month, no single index of the 82 corporate bond indices that were analyzed is showing bubble signals.

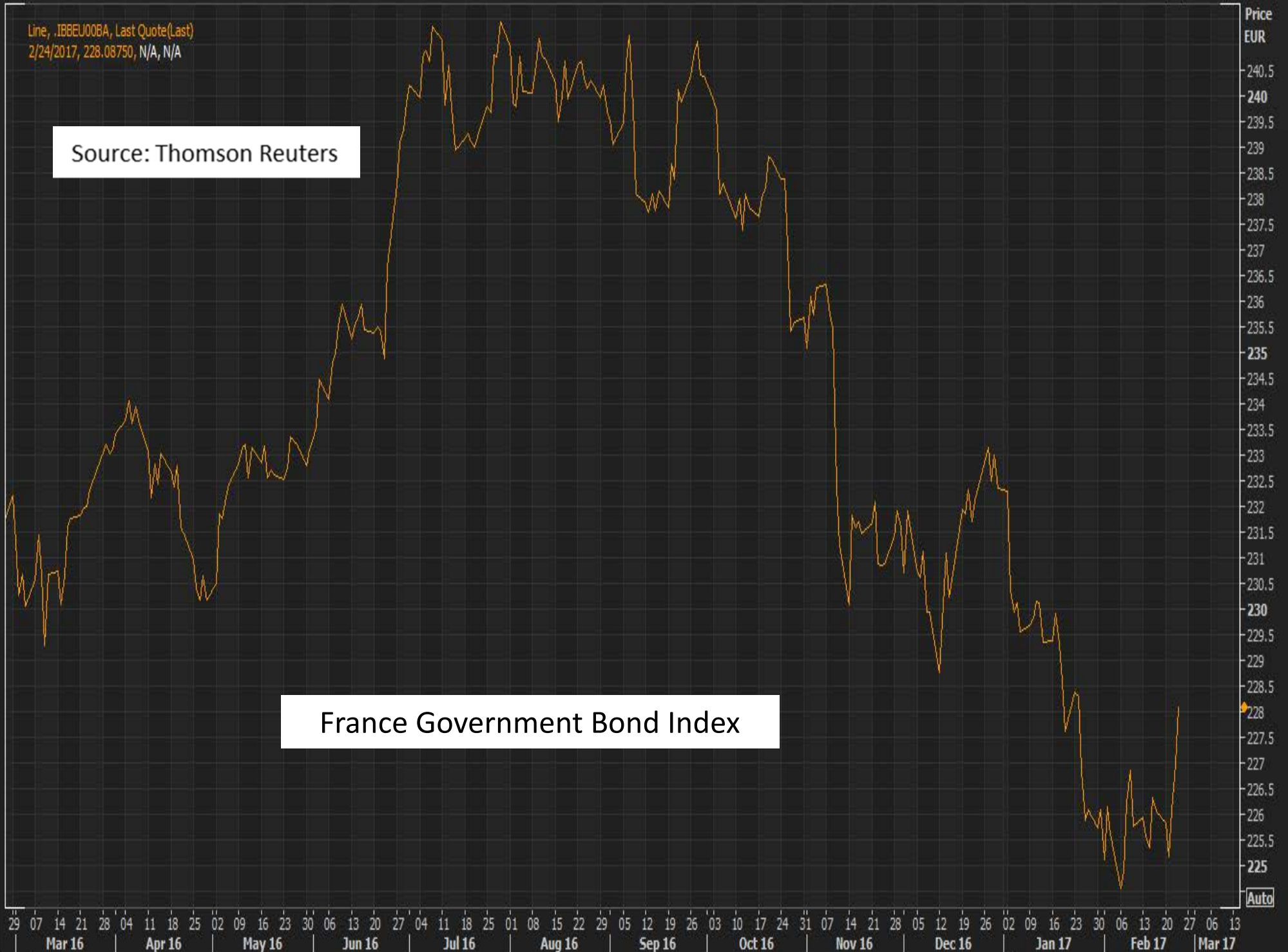
Daily .IBBEU00BA

2/27/2016 - 3/15/2017 (GMT)

Line, .IBBEU00BA, Last Quote(Last)
2/24/2017, 228.08750, N/A, N/A

Source: Thomson Reuters

France Government Bond Index



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Commodities

Commodities Indices	Yearly Return	DS LPPL Trust	DS LPPL Confidence
Positive Bubbles			
Zinc ER Index	61.6%	10.6%	14.0%
HG Copper ER Index	27.1%	9.0%	8.0%
Copper ER Index	27.8%	8.4%	7.5%
Indtr Mtls ER Index	28.4%	8.2%	14.8%
Indtr Mtls ER Index	19.1%	6.7%	16.4%
Negative Bubbles			
Cocoa ER Index	-30.6%	21.3%	21.8%

We see mixed bubble signals among a few commodity indices. There are six indices showing bubble signals this month, five of them are showing positive bubble signals and one is showing a negative bubble signal. It is interesting to see that all the indices that are showing positive bubble signals are still metal indices, and the only index that is showing a negative bubble signal is still in the agriculture sector as last month.

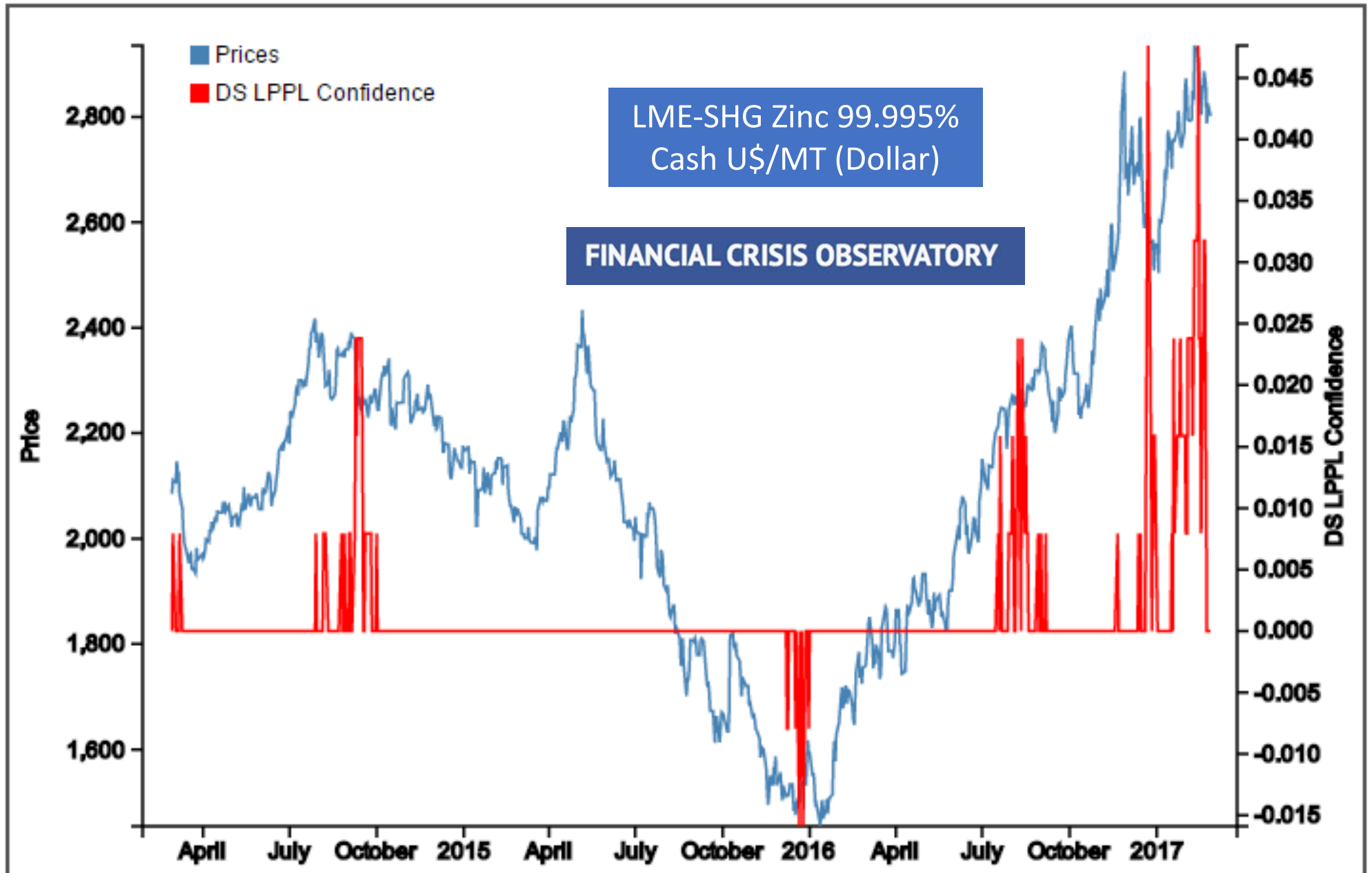
It is worth stressing that Cocoa is showing negative bubble signals for the fourth consecutive month. In addition, the positive bubble signals that were seen in the Gold and Precious Metal indices over the last month disappeared.

Date: 2017-02-27

Name: LME-SHG Zinc 99.995% Cas

Indicator: DS LPPL Confidence ▼

Bubble end flag - long time scale ▼

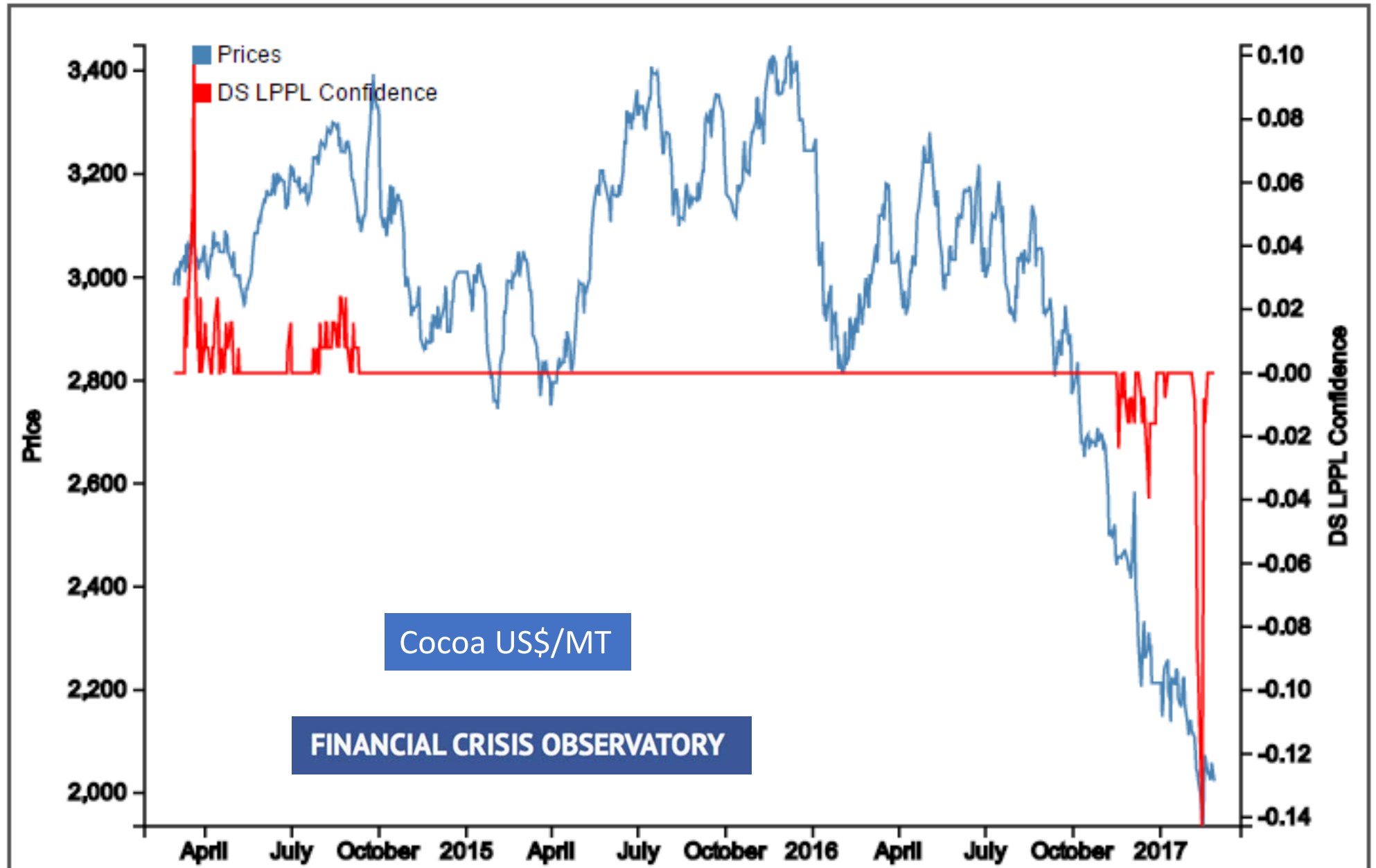


Date: 2017-02-27

Name: Cocoa-ICCO Daily Price US\$

Indicator: DS LPPL Confidence ▼

Bubble end flag - long time scale ▼



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Currencies

FX	Yearly Return	DS LPPL Trust	DS LPPL Confidence
Turkish Lira/Euro	-15.3%	33.8%	31.2%
Turkish Lira/Swiss Franc	-17.4%	31.5%	26.5%
Russian Rouble/Euro	34.4%	16.0%	18.4%
US Dollar/Turkish Lira	23.2%	12.2%	6.8%
Russian Rouble/Swiss Franc	30.9%	11.8%	11.5%
Taiwan Dollar/Euro	13.3%	10.4%	9.3%
US Dollar/Russian Rouble	-22.3%	7.5%	17.1%
New Zealand Dollar/Euro	11.8%	6.1%	17.1%
South African Rand/Euro	25.4%	5.5%	7.9%

For the fourth consecutive month, there are signs of a negative bubble in the Turkish Lira. Three of the 9 pairs that are showing bubble signals are crosses with the Lira. The FCO LPPL confidence indicator shown in the next slide suggests that this bubble has started correcting, with a quasi-perfect timing of the peak given last month.

On the other hand, the Russian Rouble is showing positive bubble signals for the second consecutive month. Three of the 9 pairs that are showing bubble signals are crosses with the Rouble ;

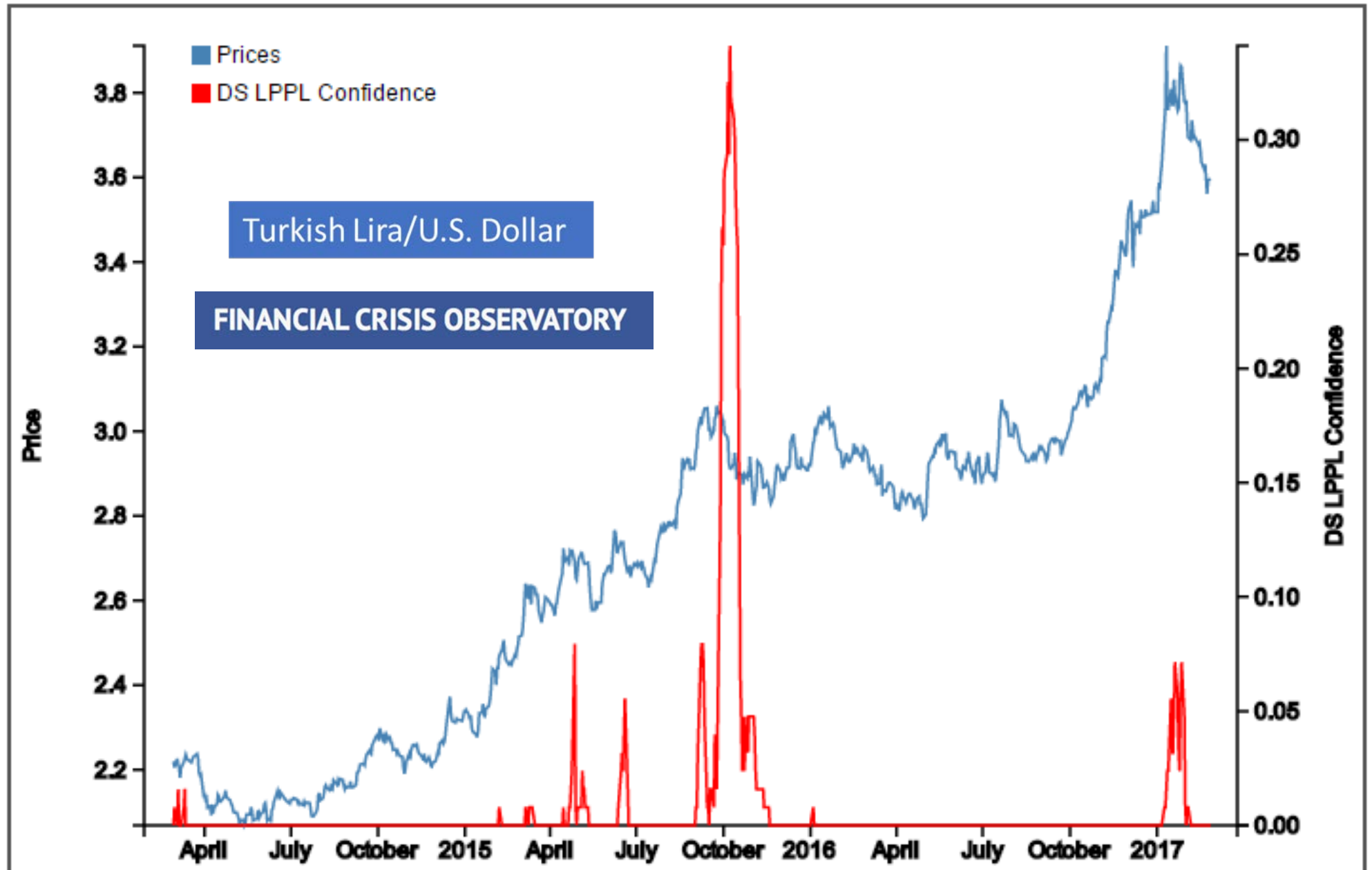
Finally, the positive bubble signals that were shown in the Indian Rupee over the last month, the negative bubble signals that were shown in the Mexican Peso over the last two months, and in the Argentinian Peso over the last month, disappeared. As illustrated in the slide below for the Mexican Peso showing the FCO LPPL confidence indicator, the timing of the peak of the negative bubble on the Mexican Peso was excellent (see last month report) and the depreciation of the Mexican currency in USD has started a reverse course.

Date: 2017-02-27

Name: NEW TURKISH LIRA TO US

Indicator: DS LPPL Confidence ▼

Bubble end flag - long time scale ▼



DS Bubble Inspectors Viewer - "Bubble end flag - long time scale"



Date: 2017-02-27

Name: RUSSIAN ROUBLE TO US \$

Indicator: DS LPPL Confidence

Bubble end flag - long time scale

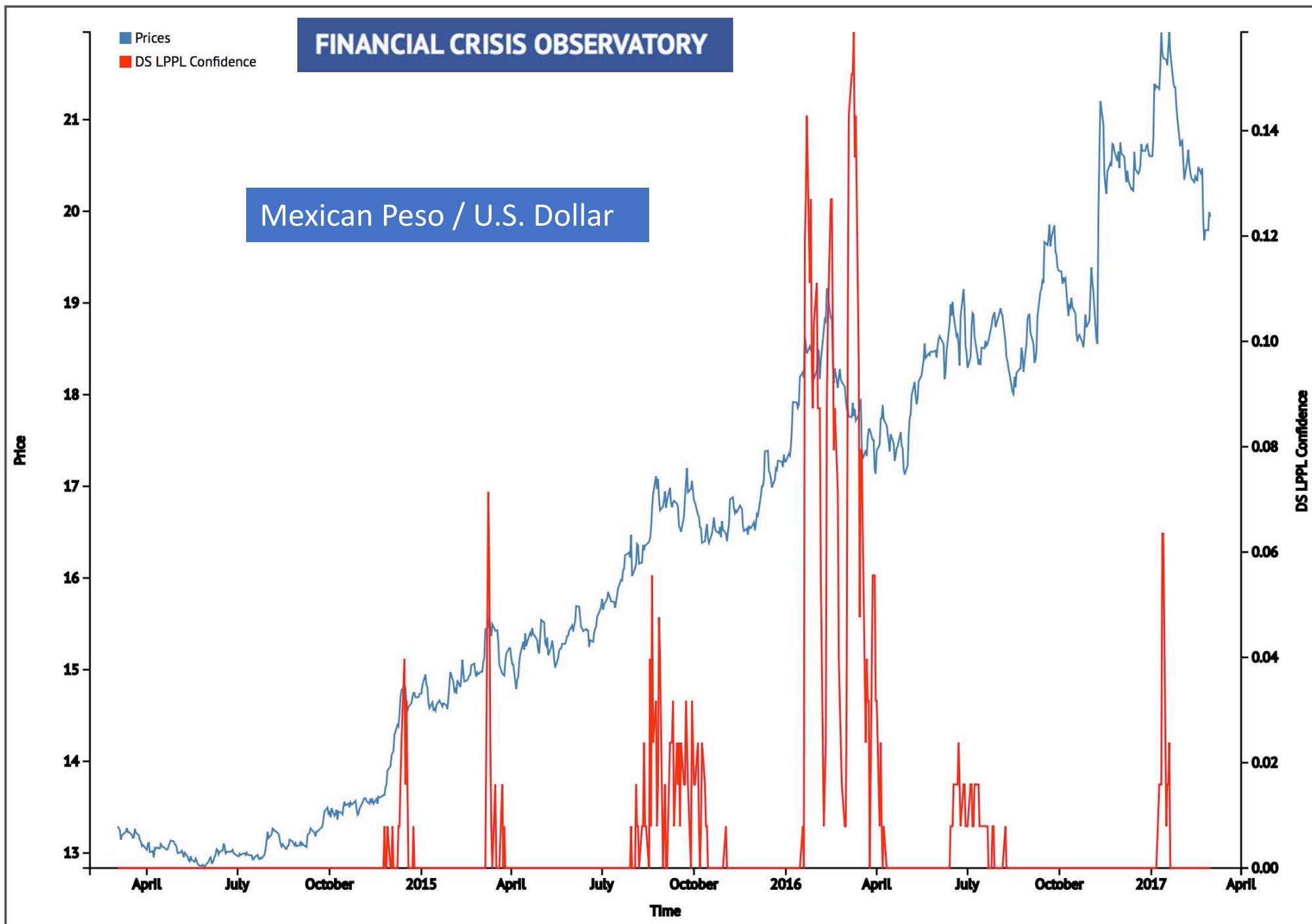


Date: 2017-03-01

Name: MEXICAN PESO TO U

Indicator: DS LPPL Confidence

Bubble end flag - long time scale



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Stocks country indices

Equities Countires Indices	Yearly Return	DS LPPL Trust	DS LPPL Confidence	Country
Karachi SE 100 Index	59.1%	42.8%	12.3%	Pakistan
Budapest SE Index	41.0%	38.5%	32.8%	Hungary
Casablanca SE All Share Index	29.7%	33.6%	13.4%	Morocco
RTS Index	51.4%	29.7%	12.6%	Russia
OMX Tallinn_GI	21.2%	27.7%	32.0%	Estonia
Warsaw SE WIG Poland Index	28.9%	27.0%	57.2%	Poland
TSX-Toronto Stock Exchange 300 Composite Index	21.8%	26.0%	16.7%	Canada
Austrian Traded Index	29.9%	24.2%	21.8%	Austria
Oslo Stock Exchange Equity Index	23.8%	19.5%	7.7%	Norway
Dow Jones Composite Index	22.8%	15.4%	8.6%	United States
Dow Jones Industrial Average Index	24.7%	13.5%	8.8%	United States
Kuwait Main Index	31.6%	13.4%	29.3%	Kuwait
CROBEX Index	40.1%	13.3%	29.4%	Croatia
OMX Helsinki 25 Index	19.5%	13.2%	20.5%	Finland
Deutsche Boerse DAX Index	26.5%	12.0%	19.2%	Germany
OMX Stockholm 30 Index	15.3%	11.7%	12.6%	Sweden
NASDAQ Composite Index	27.6%	11.7%	42.7%	United States
Bucharest SE BET Index	25.0%	9.6%	47.9%	Romania
EURO STOXX INDEX	15.5%	9.5%	19.0%	EU
CAC 40 Index	14.0%	9.3%	10.1%	France
EURO STOXX 50 EUR Price Index	14.8%	8.4%	11.8%	EU
Amsterdam Exchanges Index	19.1%	6.9%	11.6%	Netherlands
Negative Bubbles				
CSE All Share Index	-1.0%	11.5%	8.1%	Sri Lanka

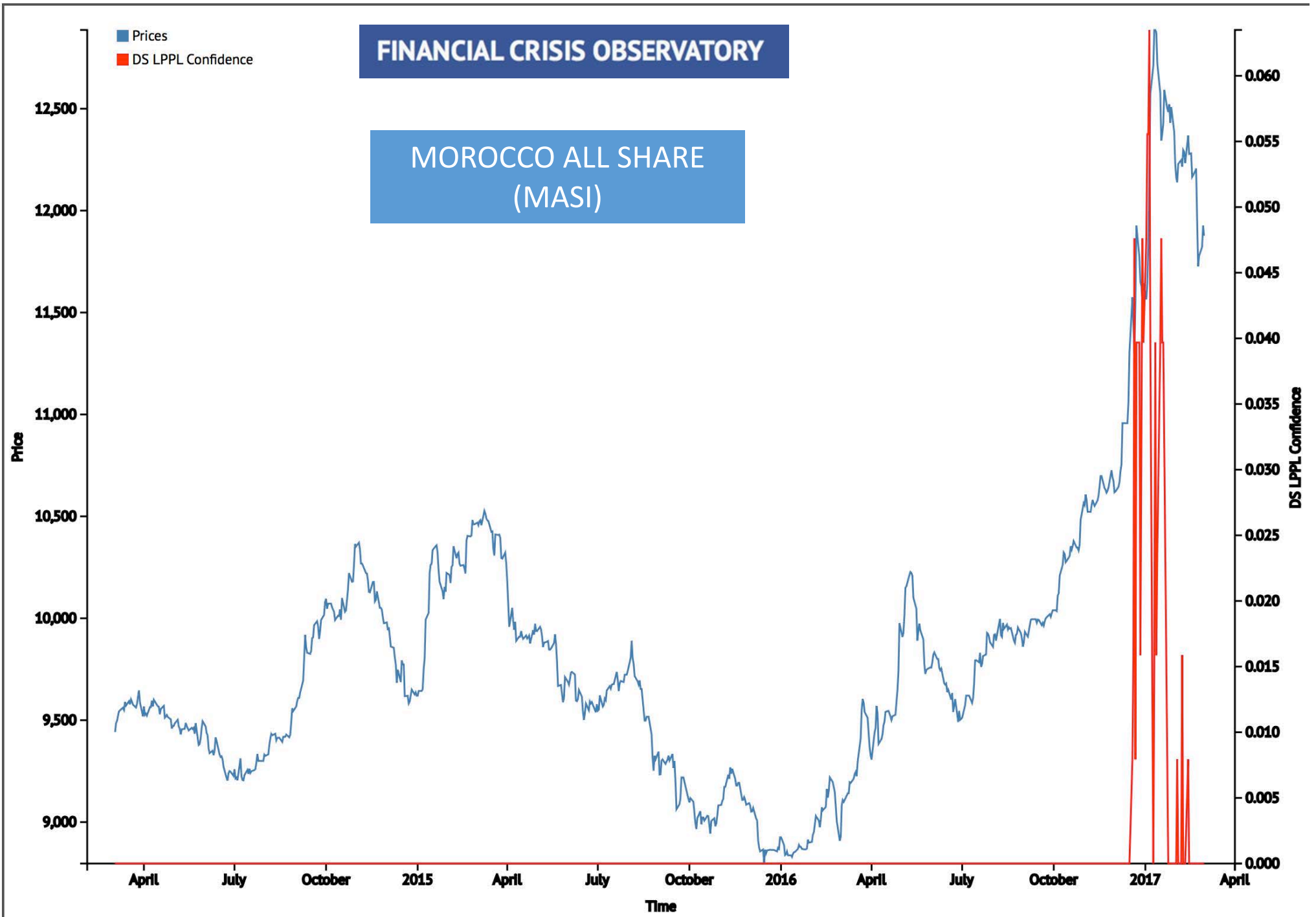
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Stocks country indices

There is a tendency for the appearance of new positive bubble in equities. The strongest signals are found for Pakistan, Morocco, and Hungary stock market indices. However, there are signs of exhaustion, especially for Morocco (see following slide where the correction has started) and to a lesser degree for Pakistan.

It is worth mentioning that around 57% of the indices that are showing signs of bubbles are still developed markets indices.

The positive bubble signals that were found in Egypt and Estonia stock market indices over the last two months, Greece and Japanese TOPIX over the last month, disappeared.



Date: 2017-02-27

Name: ATX - AUSTRIAN TRADED

Indicator: DS LPPL Confidence

Bubble end flag - long time scale



Date: 2017-02-27

Name: WARSAW GENERAL INDEX

Indicator: DS LPPL Confidence ▼

Bubble end flag - long time scale ▼



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Single Stocks

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What is this?

For 791 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.

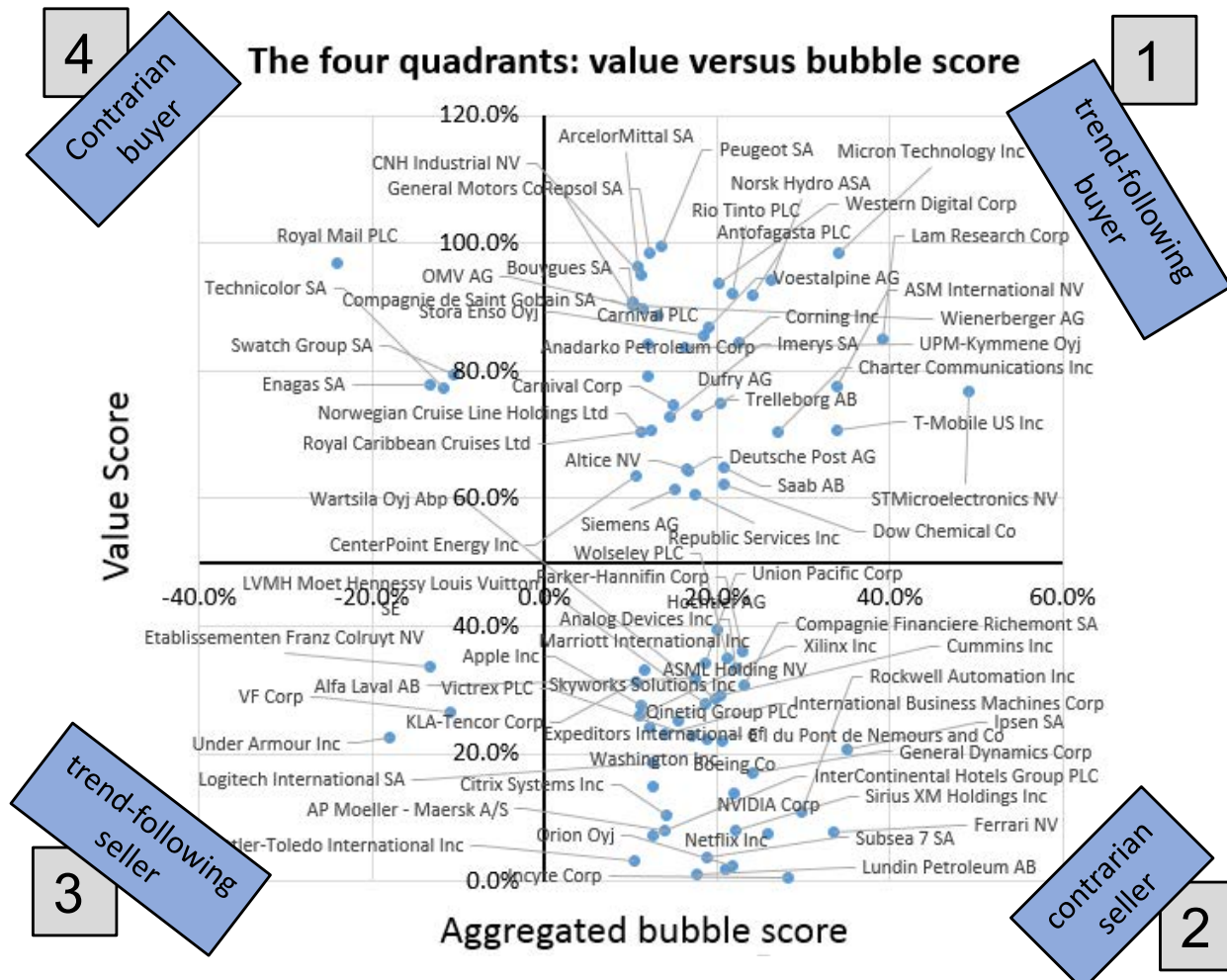
The stocks are the constituents of the Stoxx Europe 600, the S&P 500 and the Nasdaq 100 indices. From these, all doubles and stocks with incomplete data are removed. Because our financial strength indicators are specifically designed for corporates, all financial institutions are taken out of the set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

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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. T-Mobile US Inc);
2. [Quadrant 2](#): Stocks with a strong positive bubble score and a weak value score (e.g. Subsea 7 SA);
3. [Quadrant 3](#): Stocks with a strong negative bubble score and a weak value score (e.g. VF Corp);
4. [Quadrant 4](#): Stocks with strong negative bubble score and a strong financial strength (e.g. Enagas 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%.

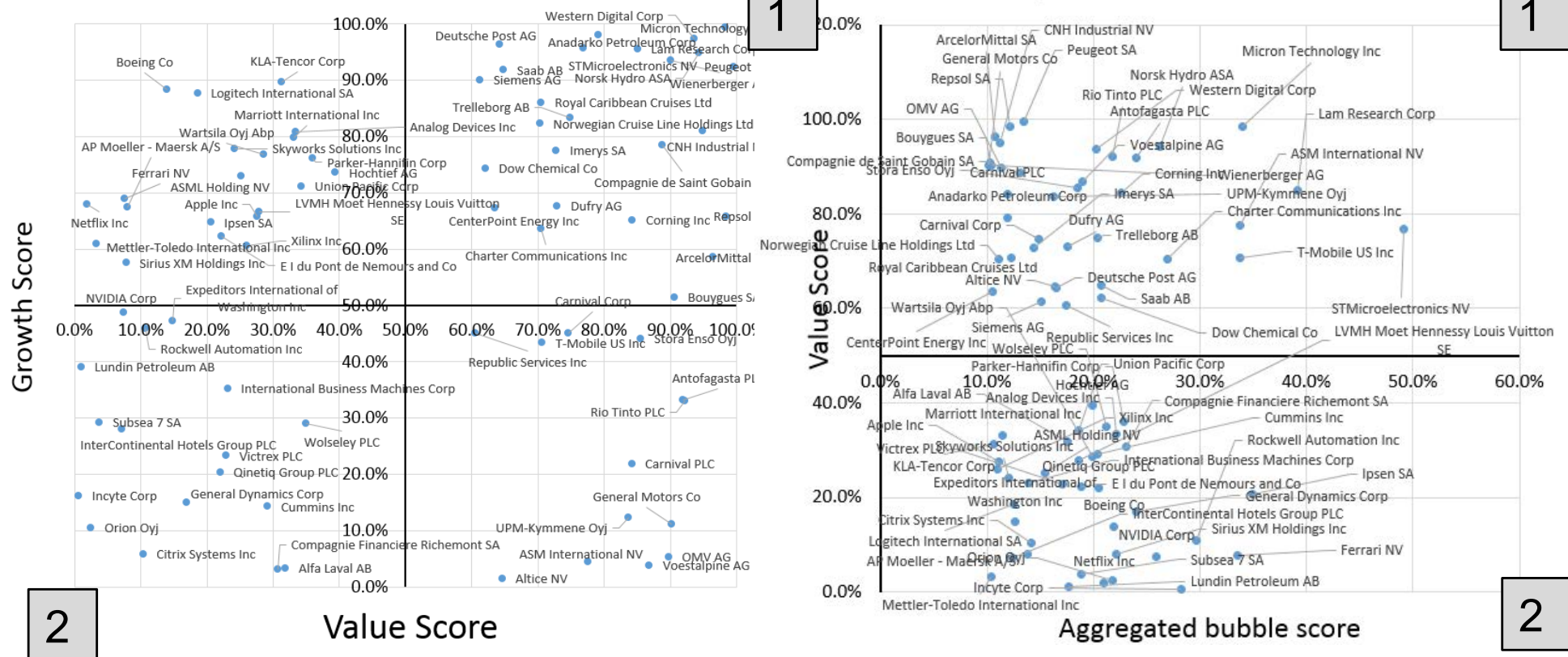
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Each quadrant has its own specs:

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.**

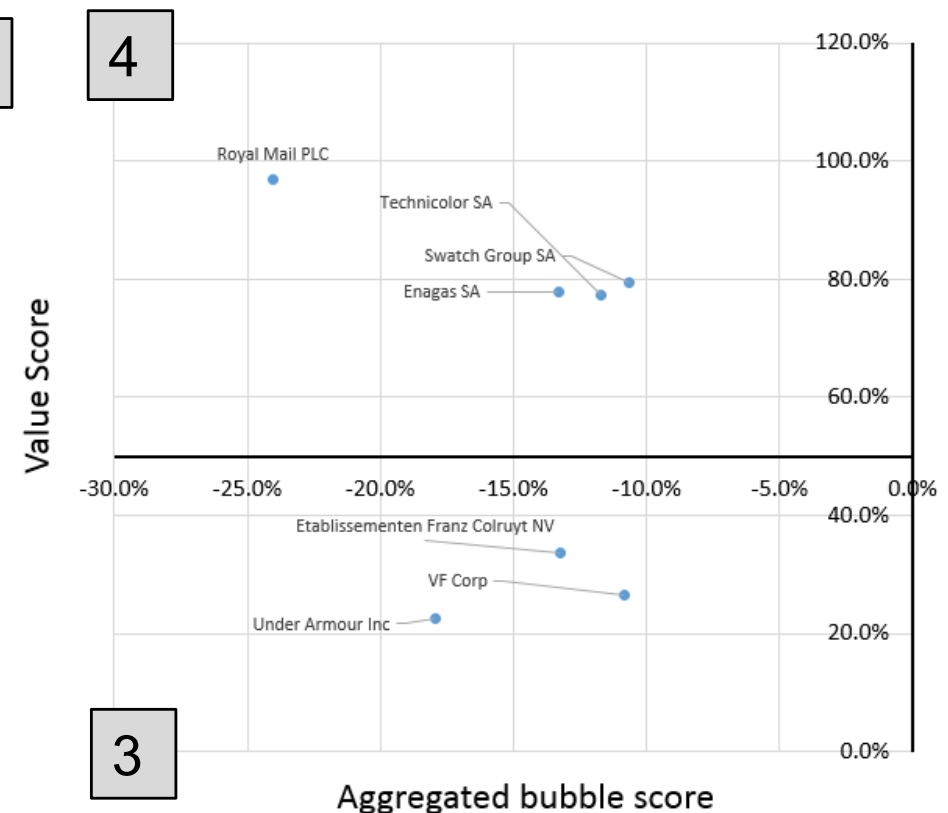
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Quadrant 1 and 2 stocks: strong positive bubble signals with strong (respectively weak) fundamentals



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Quadrant 3 and 4 stocks: strong negative bubble signals with weak respectively strong fundamentals



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Quadrant 1 stocks: strong positive bubble signals with strong fundamentals

Company Name	Country of Headquarters	GICS Sector Name	GICS Industry Group Name	Yearly Return	Bubble Score	Value Score	Growth Score
Charter Communications Inc	United States of America	Consumer Discretionary	Media	62.7%	27.0%	70.4%	63.6%
Lam Research Corp	United States of America	Information Technology	Semiconductors & Semiconductor Equipment	61.7%	39.1%	85.1%	95.6%
Micron Technology Inc	United States of America	Information Technology	Semiconductors & Semiconductor Equipment	120.5%	34.0%	98.4%	99.4%
Norwegian Cruise Line Holdings Ltd	United States of America	Consumer Discretionary	Consumer Services	3.2%	11.1%	70.3%	82.3%
T-Mobile US Inc	United States of America	Telecommunication Services	Telecommunication Services	68.5%	33.8%	70.7%	43.4%
Western Digital Corp	United States of America	Information Technology	Technology Hardware & Equipment	76.6%	20.2%	93.7%	97.3%
Antofagasta PLC	United Kingdom	Materials	Materials	64.4%	24.0%	91.9%	33.2%
Carnival PLC	United Kingdom	Consumer Discretionary	Consumer Services	22.9%	11.9%	84.2%	21.9%
Deutsche Post AG	Germany	Industrials	Transportation	47.6%	16.6%	64.2%	96.3%
Siemens AG	Germany	Industrials	Capital Goods	43.7%	15.1%	61.3%	90.0%
Repsol SA	Spain	Energy	Energy	54.7%	12.2%	98.5%	65.9%
Bouygues SA	France	Industrials	Capital Goods	0.8%	10.3%	90.6%	51.5%
Imerys SA	France	Materials	Materials	36.6%	14.4%	72.8%	77.5%
Peugeot SA	France	Consumer Discretionary	Automobiles & Components	29.4%	13.4%	99.6%	92.4%
Compagnie de Saint Gobain SA	France	Industrials	Capital Goods	26.4%	13.1%	88.7%	78.5%
ASM International NV	Netherlands	Information Technology	Semiconductors & Semiconductor Equipment	23.2%	33.8%	77.6%	4.4%
Altice NV	Netherlands	Consumer Discretionary	Media	50.2%	16.4%	64.6%	1.5%
ArcelorMittal SA	Luxembourg	Materials	Materials	199.8%	10.7%	96.5%	58.5%

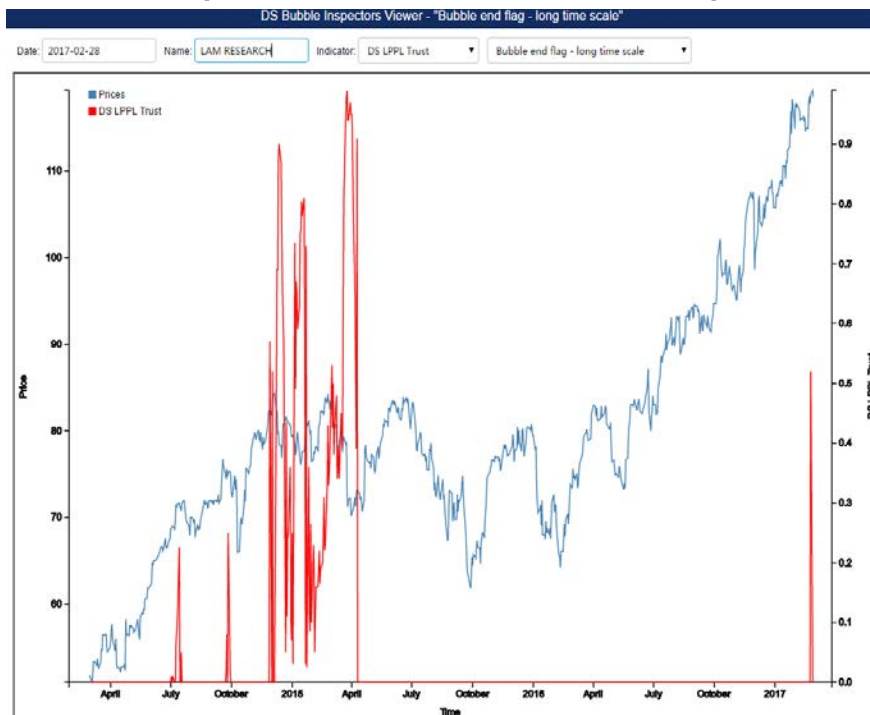
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Quadrant 1 stocks: strong positive bubble signals with strong fundamentals
(cont'd)

Company Name	Country of Headquarters	GICS Sector Name	GICS Industry Group Name	Yearly Return	Bubble Score	Value Score	Growth Score
CNH Industrial NV	United Kingdom	Industrials	Capital Goods	42.8%	11.3%	94.9%	81.0%
STMicroelectronics NV	Switzerland	Information Technology	Semiconductors & Semiconductor Equipment	171.5%	49.2%	76.9%	95.7%
Stora Enso Oyj	Finland	Materials	Materials	33.1%	18.5%	85.6%	44.1%
UPM-Kymmene Oyj	Finland	Materials	Materials	43.3%	16.2%	83.7%	12.4%
Norsk Hydro ASA	Norway	Materials	Materials	36.9%	26.3%	94.3%	94.8%
OMV AG	Austria	Energy	Energy	49.1%	11.3%	89.8%	5.3%
Voestalpine AG	Austria	Materials	Materials	48.8%	18.9%	86.9%	3.8%
Wienerberger AG	Austria	Materials	Materials	14.4%	10.4%	90.1%	93.6%
Rio Tinto PLC	United Kingdom	Materials	Materials	73.2%	21.7%	92.2%	33.0%
Dufry AG	Switzerland	Consumer Discretionary	Retailing	38.3%	17.6%	72.9%	67.6%
Anadarko Petroleum Corp	United States of America	Energy	Energy	70.4%	11.9%	79.1%	98.1%
Carnival Corp	United States of America	Consumer Discretionary	Consumer Services	16.7%	14.9%	74.6%	45.0%
CenterPoint Energy Inc	United States of America	Utilities	Utilities	46.6%	10.5%	63.5%	67.3%
Dow Chemical Co	United States of America	Materials	Materials	28.1%	20.7%	62.1%	74.3%
Corning Inc	United States of America	Information Technology	Technology Hardware & Equipment	50.9%	22.6%	84.3%	65.1%
General Motors Co	United States of America	Consumer Discretionary	Automobiles & Components	25.1%	10.1%	90.3%	11.1%
Royal Caribbean Cruises Ltd	United States of America	Consumer Discretionary	Consumer Services	29.2%	12.3%	70.5%	86.1%
Republic Services Inc	United States of America	Industrials	Commercial & Professional Services	35.6%	17.4%	60.6%	45.1%
Saab AB	Sweden	Industrials	Capital Goods	30.3%	20.7%	64.9%	91.8%
Trelleborg AB	Sweden	Industrials	Capital Goods	29.8%	20.3%	74.8%	83.3%

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Quadrant 1 stocks: strong positive bubble signals with strong fundamentals, example Lam Research Corp.

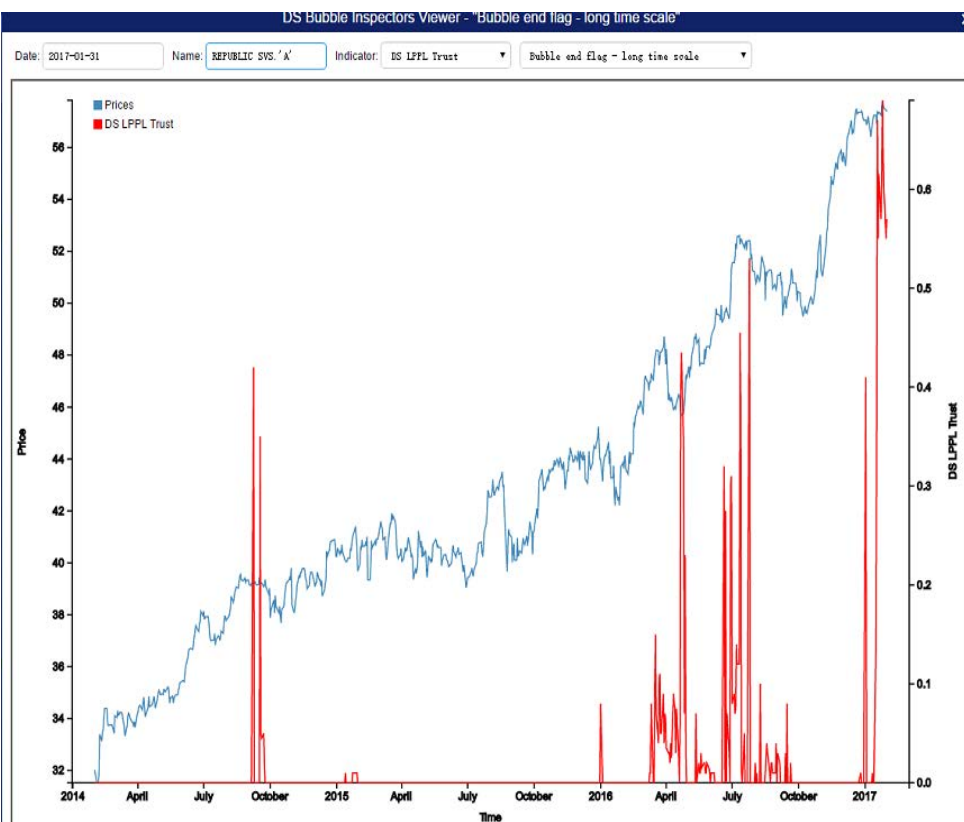


The left graph is a standard output from the Financial Crisis Observatory. It shows the historical price evolution of the stock in blue (left hand scale) and the calculated bubble warning index DS LPPL Trust in red (right hand scale). We can see a clearly spiking warning, indicating the convergence towards the end of a bubble-like regime. The right graph shows the outperformance of the stock over the last year (orange) with respect to the S&P 500 benchmark (purple), it is almost 39%.

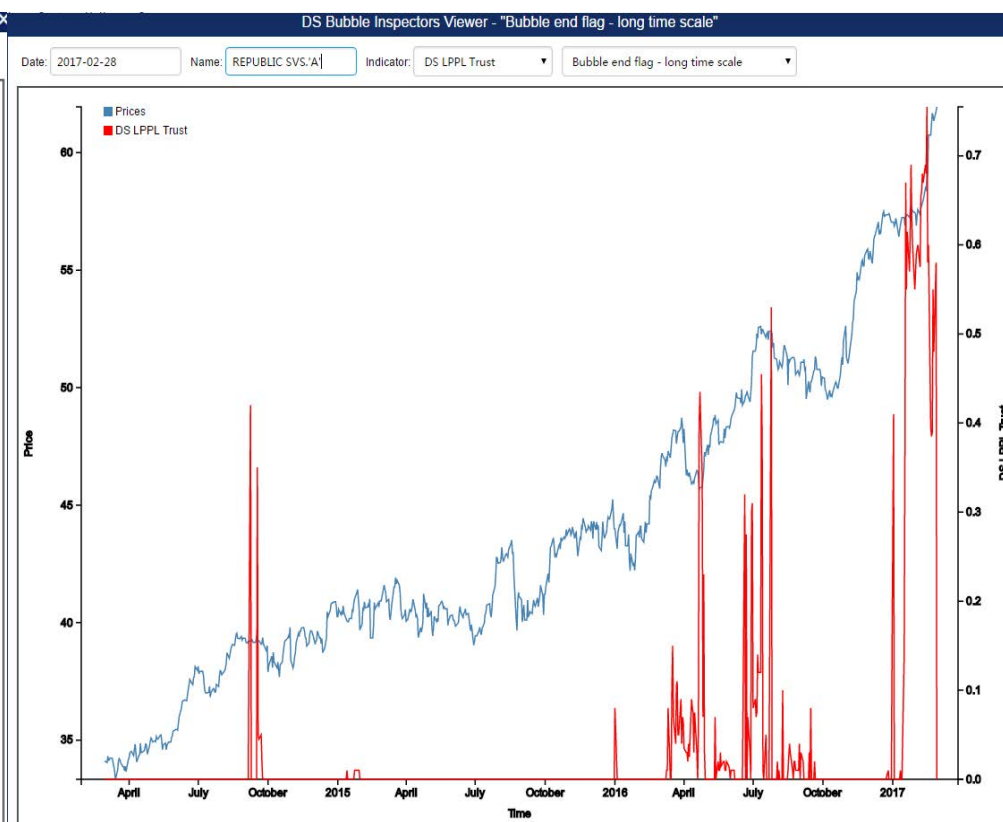
Last month example: strong positive bubble signals with strong fundamentals, Republic Services Inc.

Note that the stock has gone up again by 8 percent, which is in synchrony with the strong fundamentals, while in contradiction with our DS LPPL trust indicator. One should remain cautious as this stock is still identified with strong bubble signal this month.

Last month signal (1st Feb. 2017)



This month signal (1st Mar. 2017)



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Quadrant 2 stocks: strong positive bubble signals with weak fundamentals

Company Name	Country of Headquarters	GICS Sector Name	GICS Industry Group Name	Yearly Return	Bubble Score	Value Score	Growth Score
Apple Inc	United States of America	Information Technology	Technology Hardware & Equipment	41.7%	11.1%	27.6%	65.7%
Analog Devices Inc	United States of America	Information Technology	Semiconductors & Semiconductor Equipment	54.6%	22.2%	33.4%	80.9%
Citrix Systems Inc	United States of America	Information Technology	Software & Services	40.3%	14.2%	10.4%	5.8%
Expeditors International of Washington Inc	United States of America	Industrials	Transportation	23.2%	12.6%	14.8%	47.2%
Incyte Corp	United States of America	Health Care	Pharmaceuticals, Biotechnology & Life Sciences	81.1%	28.3%	0.6%	16.2%
KLA-Tencor Corp	United States of America	Information Technology	Semiconductors & Semiconductor Equipment	33.0%	10.7%	31.4%	89.6%
Marriott International Inc	United States of America	Consumer Discretionary	Consumer Services	27.6%	11.5%	33.1%	79.8%
Netflix Inc	United States of America	Consumer Discretionary	Retailing	52.2%	21.0%	1.9%	68.0%
NVIDIA Corp	United States of America	Information Technology	Semiconductors & Semiconductor Equipment	223.6%	25.9%	7.5%	48.8%
Sirius XM Holdings Inc	United States of America	Consumer Discretionary	Media	36.8%	22.1%	7.8%	57.5%
Skyworks Solutions Inc	United States of America	Information Technology	Semiconductors & Semiconductor Equipment	42.7%	12.1%	24.1%	77.9%
Xilinx Inc	United States of America	Information Technology	Semiconductors & Semiconductor Equipment	24.6%	11.0%	26.0%	60.7%
Hochtief AG	Germany	Industrials	Capital Goods	43.7%	19.9%	39.4%	73.6%
AP Moeller - Maersk A/S	Denmark	Industrials	Transportation	26.6%	13.9%	8.0%	67.5%
Ipsen SA	France	Health Care	Pharmaceuticals, Biotechnology & Life Sciences	58.1%	35.0%	20.6%	64.7%
LVMH Moët Hennessy Louis Vuitton SE	France	Consumer Discretionary	Consumer Durables & Apparel	23.2%	18.7%	27.8%	66.6%
ASML Holding NV	Netherlands	Information Technology	Semiconductors & Semiconductor Equipment	35.3%	15.5%	25.2%	72.9%
Ferrari NV	Italy	Consumer Discretionary	Automobiles & Components	72.8%	33.5%	7.6%	68.9%

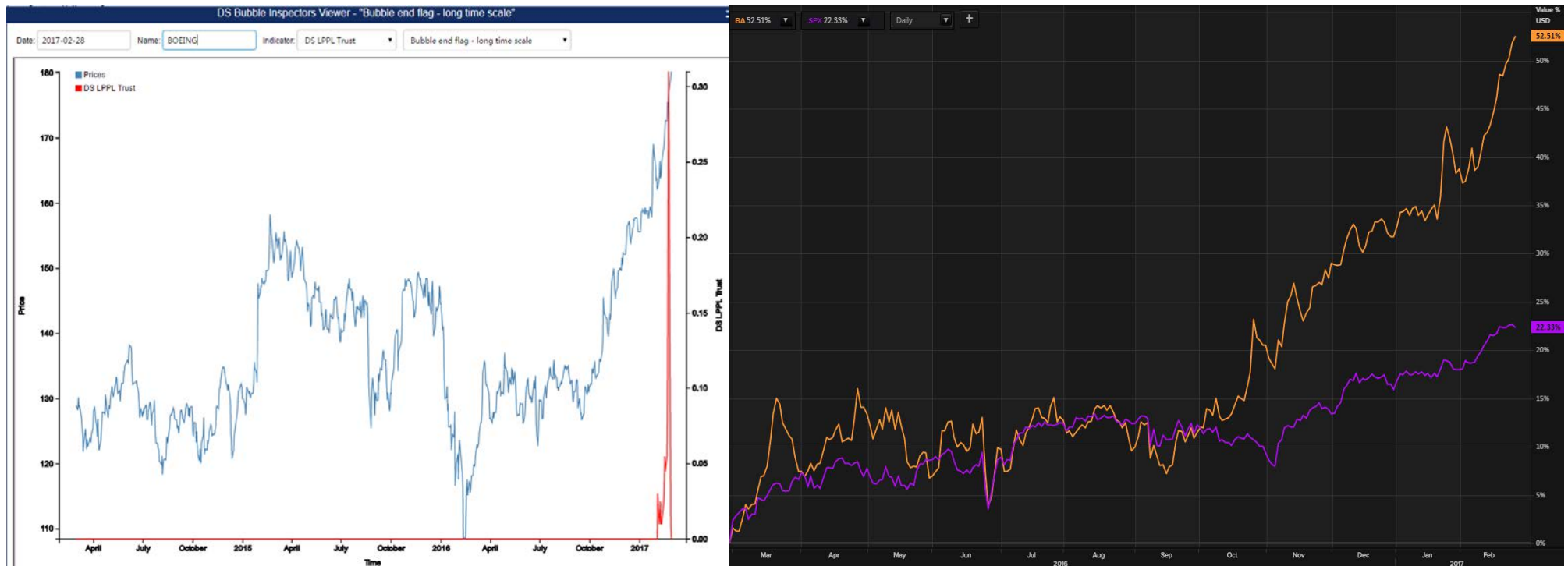
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Quadrant 2 stocks: strong positive bubble signals with weak fundamentals
(cont'd)

Company Name	Country of Headquarters	GICS Sector Name	GICS Industry Group Name	Yearly Return	Bubble Score	Value Score	Growth Score
InterContinental Hotels Group PLC	United Kingdom	Consumer Discretionary	Consumer Services	38.8%	12.5%	7.1%	28.1%
Orion Oyj	Finland	Health Care	Pharmaceuticals, Biotechnology & Life Sciences	49.2%	21.8%	2.5%	10.5%
Wartsila Oyj Abp	Finland	Industrials	Capital Goods	30.7%	19.9%	28.6%	76.9%
Subsea 7 SA	United Kingdom	Energy	Energy	114.7%	18.8%	3.8%	29.2%
Qinetiq Group PLC	United Kingdom	Industrials	Capital Goods	18.9%	20.5%	22.0%	20.4%
Compagnie Financiere Richemont SA	Switzerland	Consumer Discretionary	Consumer Durables & Apparel	16.0%	23.1%	30.7%	3.0%
Logitech International SA	United States of America	Information Technology	Technology Hardware & Equipment	87.4%	12.5%	18.6%	87.7%
Boeing Co	United States of America	Industrials	Capital Goods	52.5%	21.9%	13.9%	88.4%
Cummins Inc	United States of America	Industrials	Capital Goods	52.2%	20.4%	29.2%	14.3%
E I du Pont de Nemours and Co	United States of America	Materials	Materials	29.0%	18.9%	22.3%	62.3%
General Dynamics Corp	United States of America	Industrials	Capital Goods	39.3%	24.1%	16.9%	14.9%
International Business Machines Corp	United States of America	Information Technology	Software & Services	37.2%	14.0%	23.1%	35.3%
Mettler-Toledo International Inc	United States of America	Health Care	Pharmaceuticals, Biotechnology & Life Sciences	51.2%	10.4%	3.3%	60.9%
Parker-Hannifin Corp	United States of America	Industrials	Capital Goods	53.0%	22.8%	35.9%	76.2%
Rockwell Automation Inc	United States of America	Industrials	Capital Goods	45.2%	29.7%	10.7%	45.9%
Union Pacific Corp	United States of America	Industrials	Transportation	36.9%	18.6%	34.3%	71.2%
Victrex PLC	United Kingdom	Materials	Materials	23.1%	17.0%	22.9%	23.3%
Alfa Laval AB	Sweden	Industrials	Capital Goods	21.0%	17.5%	31.9%	3.3%
Lundin Petroleum AB	Sweden	Energy	Energy	38.2%	17.6%	1.0%	39.1%
Wolseley PLC	Switzerland	Industrials	Capital Goods	32.6%	21.2%	35.0%	29.1%

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Quadrant 2 stocks: strong positive bubble signals with weak fundamentals,
example Boeing Co.



The left graph is a standard output from the Financial Crisis Observatory. It shows the historical price evolution of the stock in blue (left hand scale) and the calculated bubble warning index DS LPPL Trust in red (right hand scale). We can see a clearly spiking warning. The right graph shows the outperformance of the stock over the last year (orange) with respect to the S&P500 benchmark (purple), it is almost 30% up. The strong positive bubble signals and weak fundamentals indicate a high probability of correction in the future.

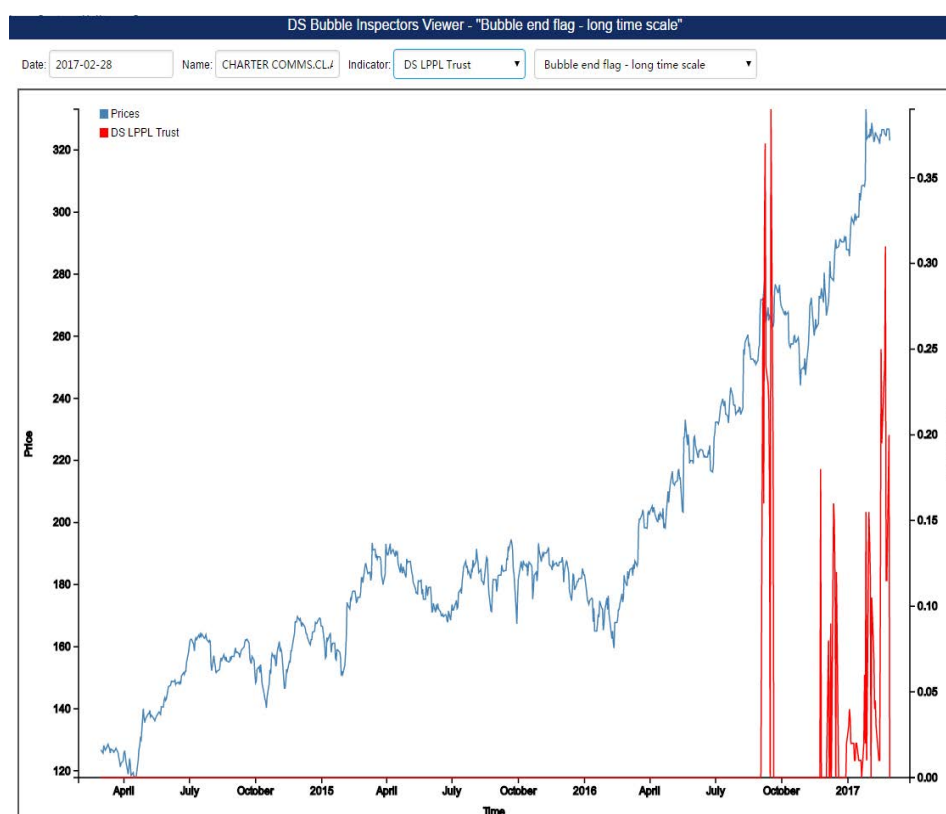
Last month example: strong positive bubble signals with weak fundamentals, Charter Communications Inc.

Note that the stock has reached a small plateau, in synchrony with our DS LPPL trust indicator and weak fundamentals. At the same time, this stock is still identified with a strong positive bubble signal, suggesting to continue shorting or getting out of a long position on this stock.

Last month signal (1st Feb. 2017)



This month signal (1st Mar. 2017)



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Quadrant 3 stocks: strong negative bubble signals with weak fundamentals

Company Name	Country of Headquarters	GICS Sector Name	GICS Industry Group Name	Yearly Return	Bubble Score	Value Score	Growth Score
Etablissements Franz Colruyt NV	Belgium	Consumer Staples	Food & Staples Retailing	-10.5%	-13.2%	33.5%	37.4%
Under Armour Inc	United States of America	Consumer Discretionary	Consumer Durables & Apparel	-52.3%	-17.9%	22.5%	12.6%
VF Corp	United States of America	Consumer Discretionary	Consumer Durables & Apparel	-19.4%	-10.8%	26.5%	14.0%

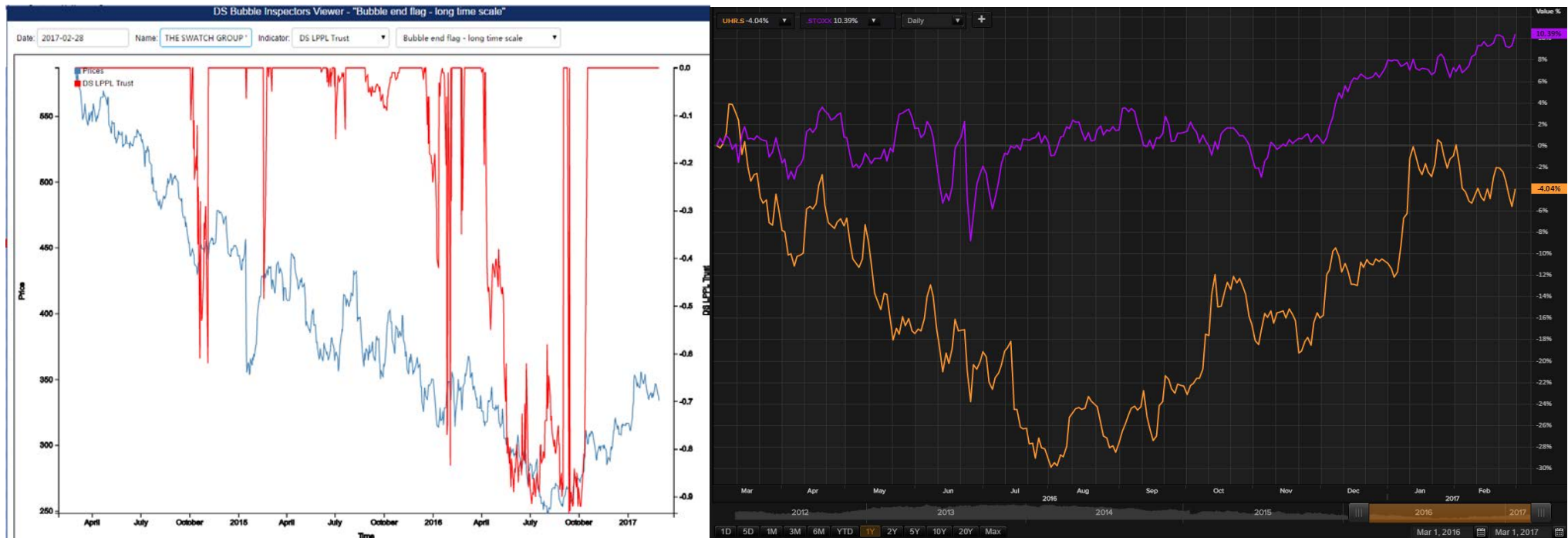
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Quadrant 4 stocks: strong negative bubble signals with strong fundamentals

Company Name	Country of Headquarters	GICS Sector Name	GICS Industry Group Name	Yearly Return	Bubble Score	Value Score	Growth Score
Enagas SA	Spain	Energy	Energy	-10.7%	-13.3%	77.7%	58.7%
Technicolor SA	France	Consumer Discretionary	Media	-29.6%	-11.7%	77.2%	2.7%
Royal Mail PLC	United Kingdom	Industrials	Transportation	-8.8%	-24.0%	96.8%	18.6%
Swatch Group SA	Switzerland	Consumer Discretionary	Consumer Durables & Apparel	-3.9%	-10.6%	79.5%	89.9%

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Quadrant 4 stocks: strong negative bubble signals with strong fundamentals, example Swatch Group SA.



Left graph is a standard output from the Financial Crisis Observatory. It shows the historical price evolution of the stock in blue (left hand scale) and the calculated bubble warning index DS LPPL Trust in red (right hand scale). We can see a clearly spiking warning of the negative bubble three months ago. The right graph shows the performance of the stock over the last year (orange) with respect to the STOXX 600 benchmark (purple), it is -14%. We can see a clear rebound started in recent months, and 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.

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Sectors

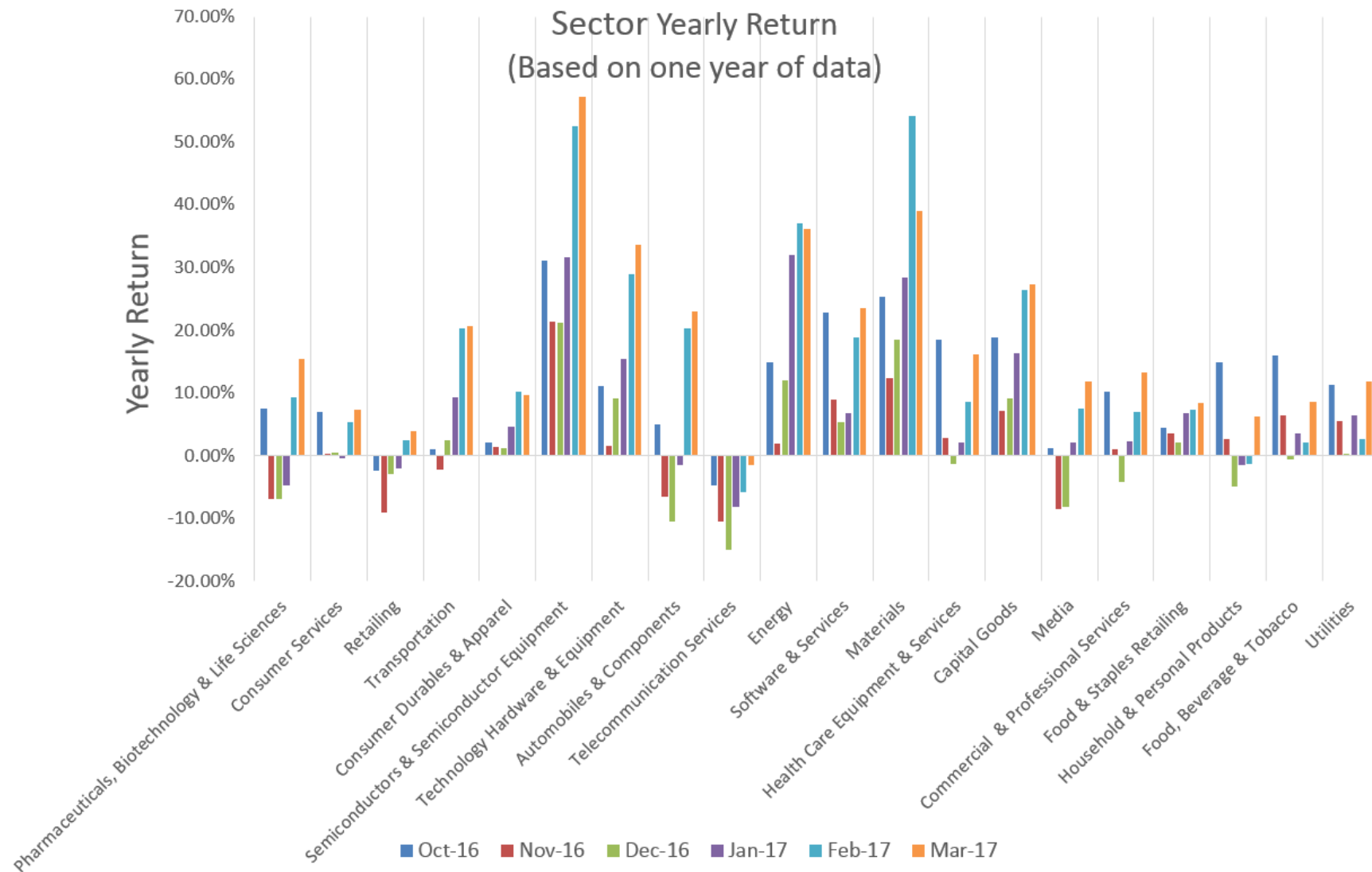
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GICS Industry Group Name	Yearly Return		Bubble Score		Value Score		Growth Score	
	Mar 1st	Feb 1st	Mar 1st	Feb 1st	Mar 1st	Feb 1st	Mar 1st	Feb 1st
Pharmaceuticals, Biotechnology & Life Sciences	15.4%	9.2%	2.2%	1.4%	39.0%	41.8%	51.0%	52.3%
Consumer Services	7.4%	5.4%	3.0%	0.7%	43.0%	40.1%	50.9%	45.1%
Retailing	4.0%	2.4%	0.8%	0.4%	43.2%	42.6%	49.4%	49.3%
Transportation	20.6%	20.3%	5.4%	4.6%	54.9%	56.0%	45.1%	45.6%
Consumer Durables & Apparel	9.6%	10.3%	0.2%	0.7%	51.5%	49.4%	54.1%	59.0%
Semiconductors & Semiconductor Equipment	57.3%	52.6%	14.1%	8.6%	47.1%	49.0%	64.9%	67.1%
Technology Hardware & Equipment	33.6%	28.9%	5.7%	5.0%	53.7%	54.9%	52.4%	54.7%
Automobiles & Components	23.0%	20.3%	5.3%	4.2%	67.4%	69.3%	62.1%	70.2%
Telecommunication Services	-1.5%	-5.7%	0.5%	0.0%	65.2%	66.9%	35.2%	58.5%
Energy	36.2%	37.1%	3.0%	5.3%	73.3%	62.5%	72.1%	33.7%
Software & Services	23.5%	18.8%	2.0%	1.3%	32.4%	36.3%	47.9%	56.2%
Materials	39.0%	54.1%	5.3%	5.8%	57.8%	54.7%	55.0%	49.6%
Health Care Equipment & Services	16.1%	8.5%	1.1%	-0.3%	39.8%	43.8%	56.2%	61.8%
Capital Goods	27.4%	26.4%	6.1%	4.6%	45.9%	45.4%	47.1%	46.1%
Media	11.7%	7.5%	3.0%	2.2%	53.5%	52.7%	43.6%	48.2%
Commercial & Professional Services	13.2%	6.9%	1.2%	1.1%	37.1%	40.6%	40.5%	42.3%
Food & Staples Retailing	8.4%	7.3%	0.9%	1.3%	55.3%	53.7%	39.7%	50.3%
Household & Personal Products	6.2%	-1.4%	-0.1%	-1.8%	19.7%	25.9%	45.4%	49.1%
Food, Beverage & Tobacco	8.6%	2.0%	0.8%	-0.6%	36.3%	36.7%	48.6%	48.3%
Utilities	11.8%	2.6%	0.0%	-0.5%	77.7%	78.1%	32.8%	43.8%

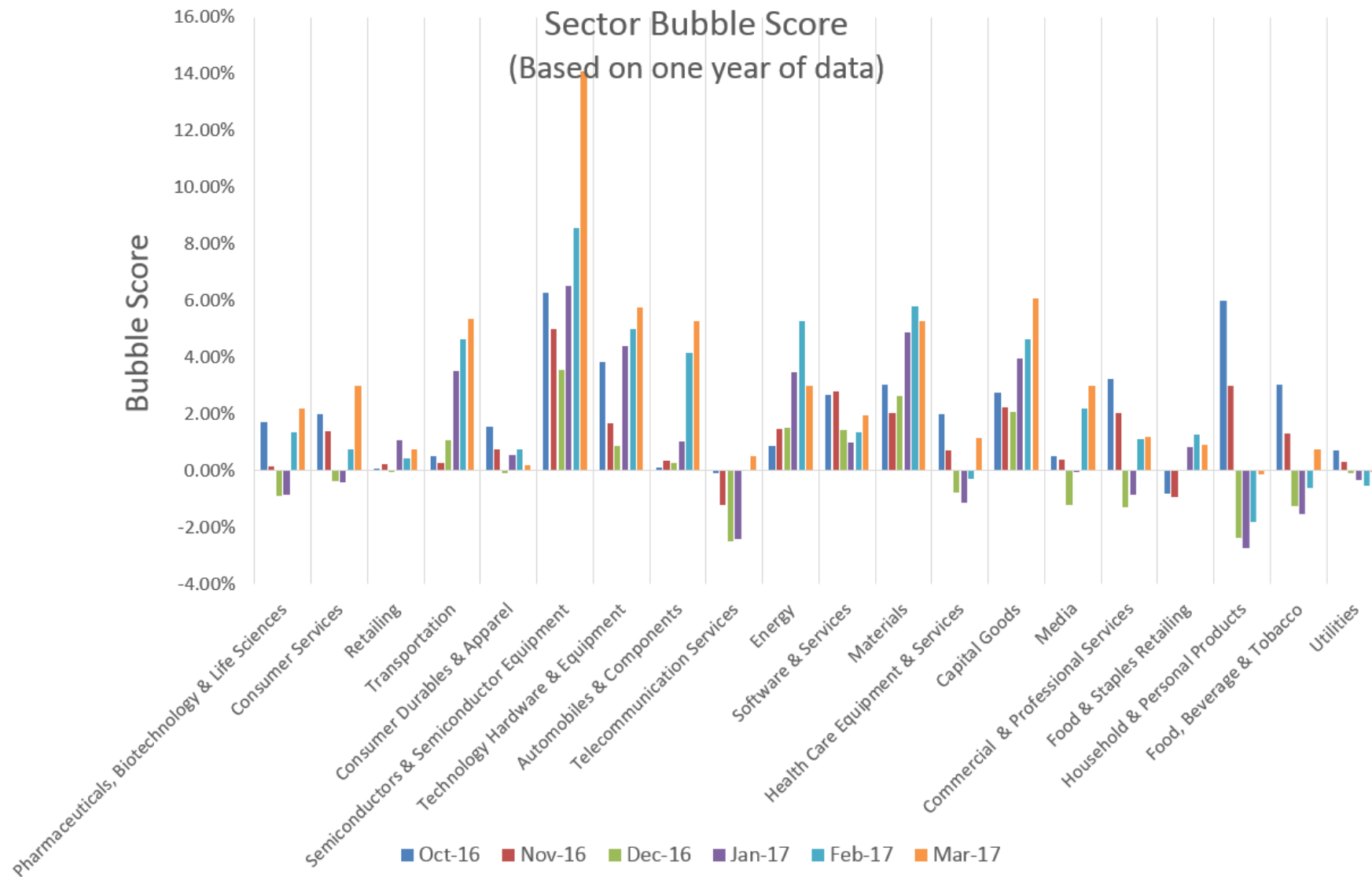
By aggregating the calculations that were done at the single stock level in the previous section, we can see the bubble, value and growth score at the sector level. The results in the previous report are also presented here for comparison.

- The sector *Semiconductors & Semiconductor Equipment* we reported last two month has a stronger bubble score (doubled), which demonstrates the very strong momentums in this industry recently.
- In addition to Semiconductor sector, technology sectors including Technology Hardware & Equipment, Telecommunication Services, Software & Services are experiencing rebounds with positive bubble scores, with a strong fourth quarter earnings season coming.

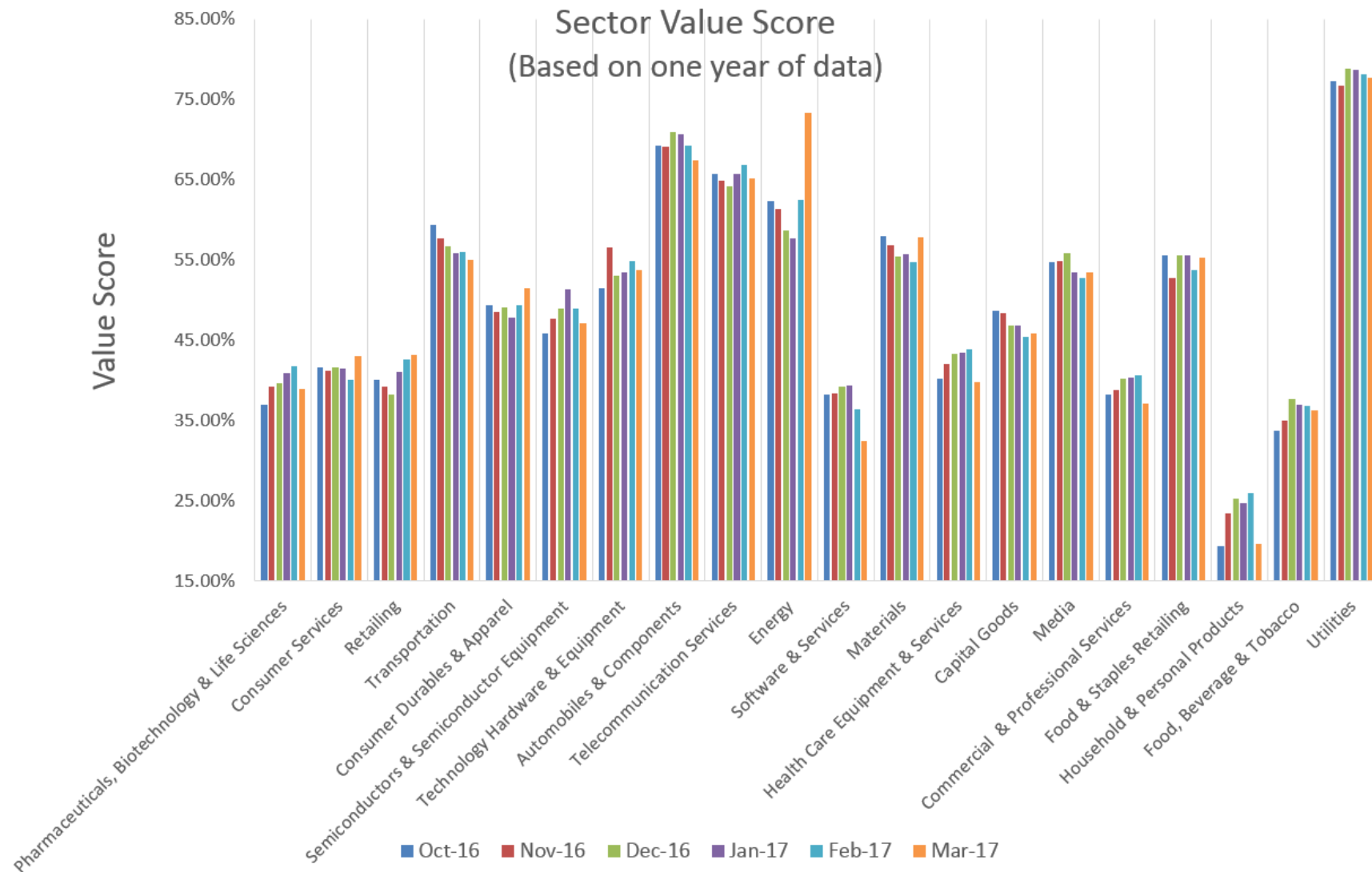
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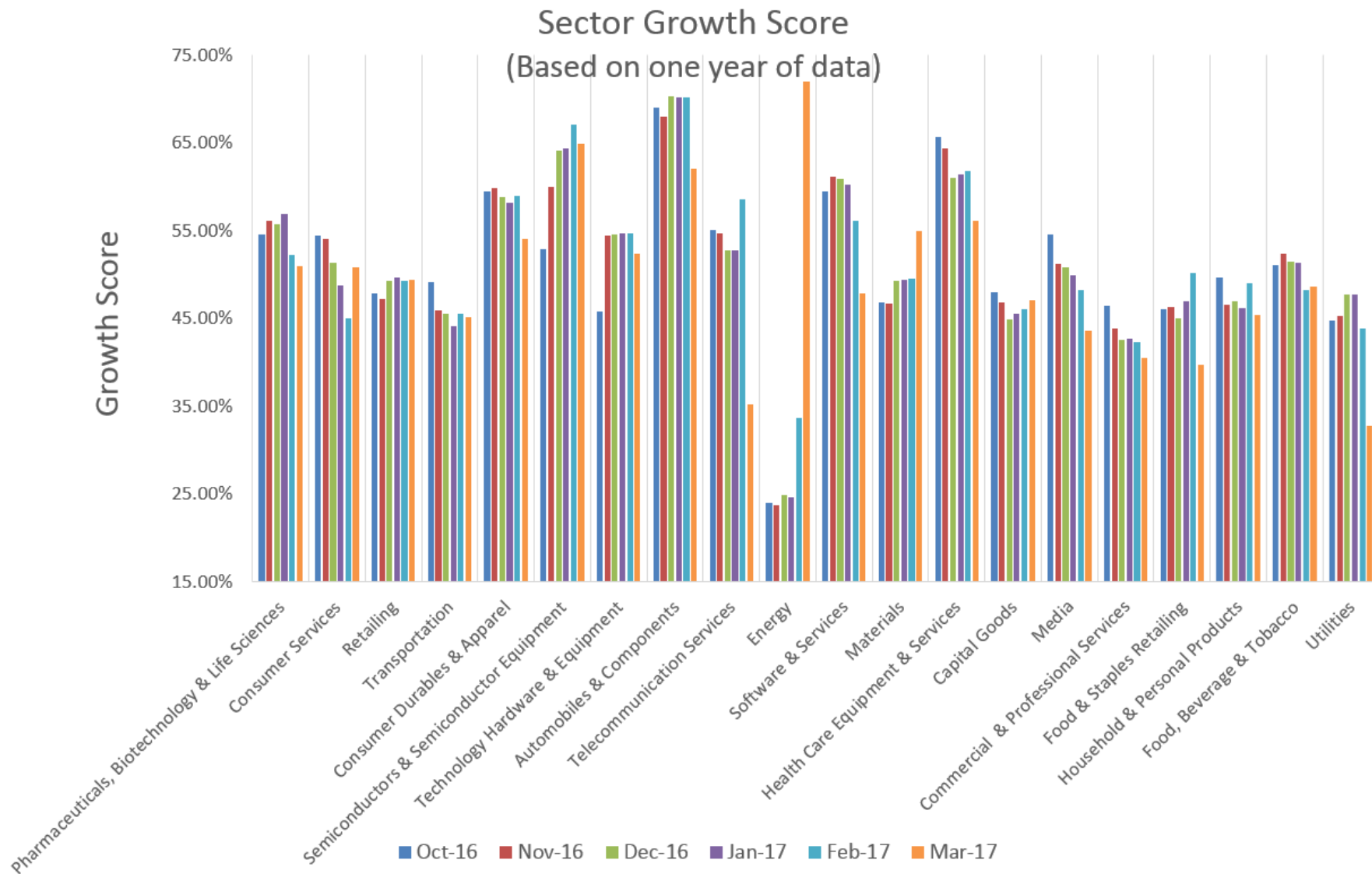
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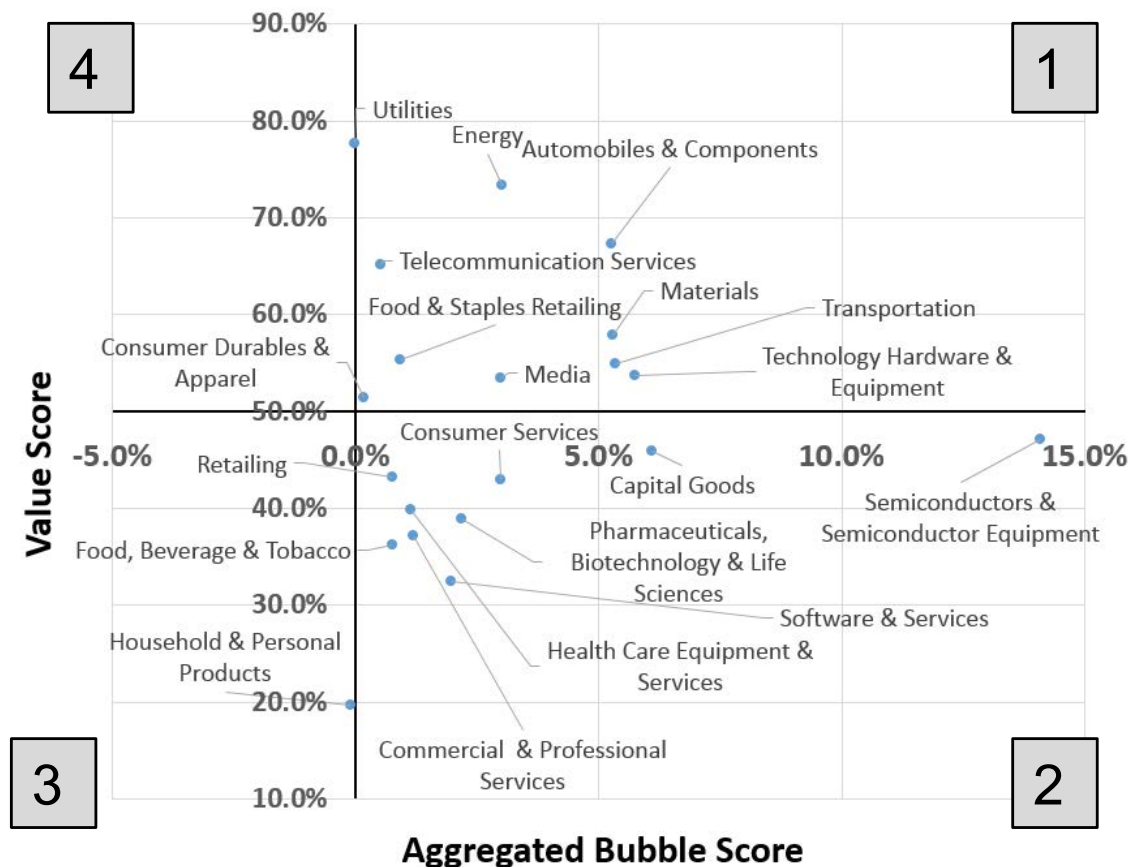
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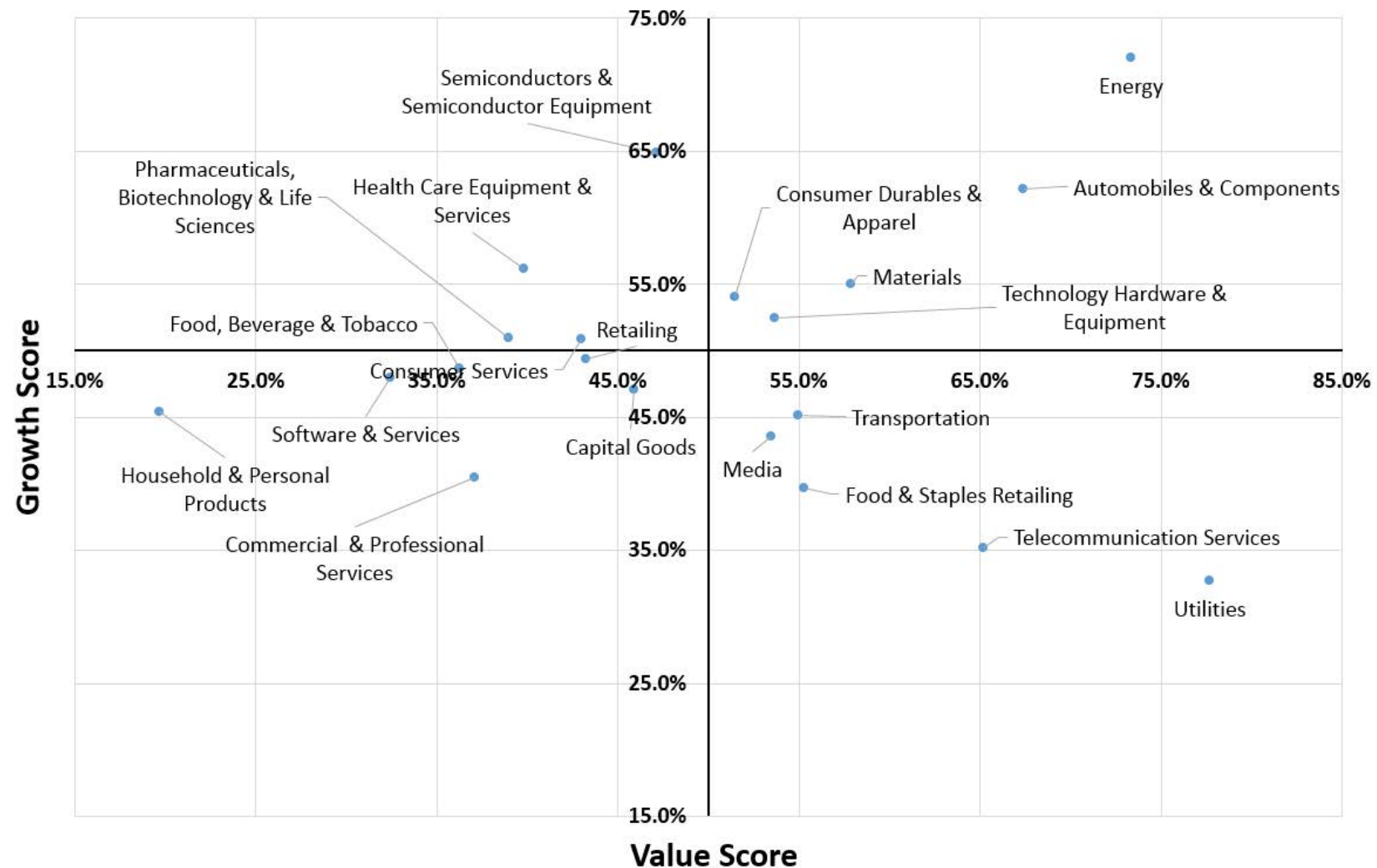


By plotting the value score versus the aggregated bubble score, we can also divide the sectors into four quadrants*:

1. [Quadrant 1](#): Sectors with an average positive bubble score and a strong value score;
2. [Quadrant 2](#): Sectors with an average positive bubble score and a weak value score;
3. [Quadrant 3](#): Sectors with an average negative bubble score and a weak value score;
4. [Quadrant 4](#): Sectors with an average negative bubble score and a strong value score.

*For sectors, a strong value score is identified if value score is larger than 50%, and a weak value score is identified if else.

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Portfolio Construction and Performance

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

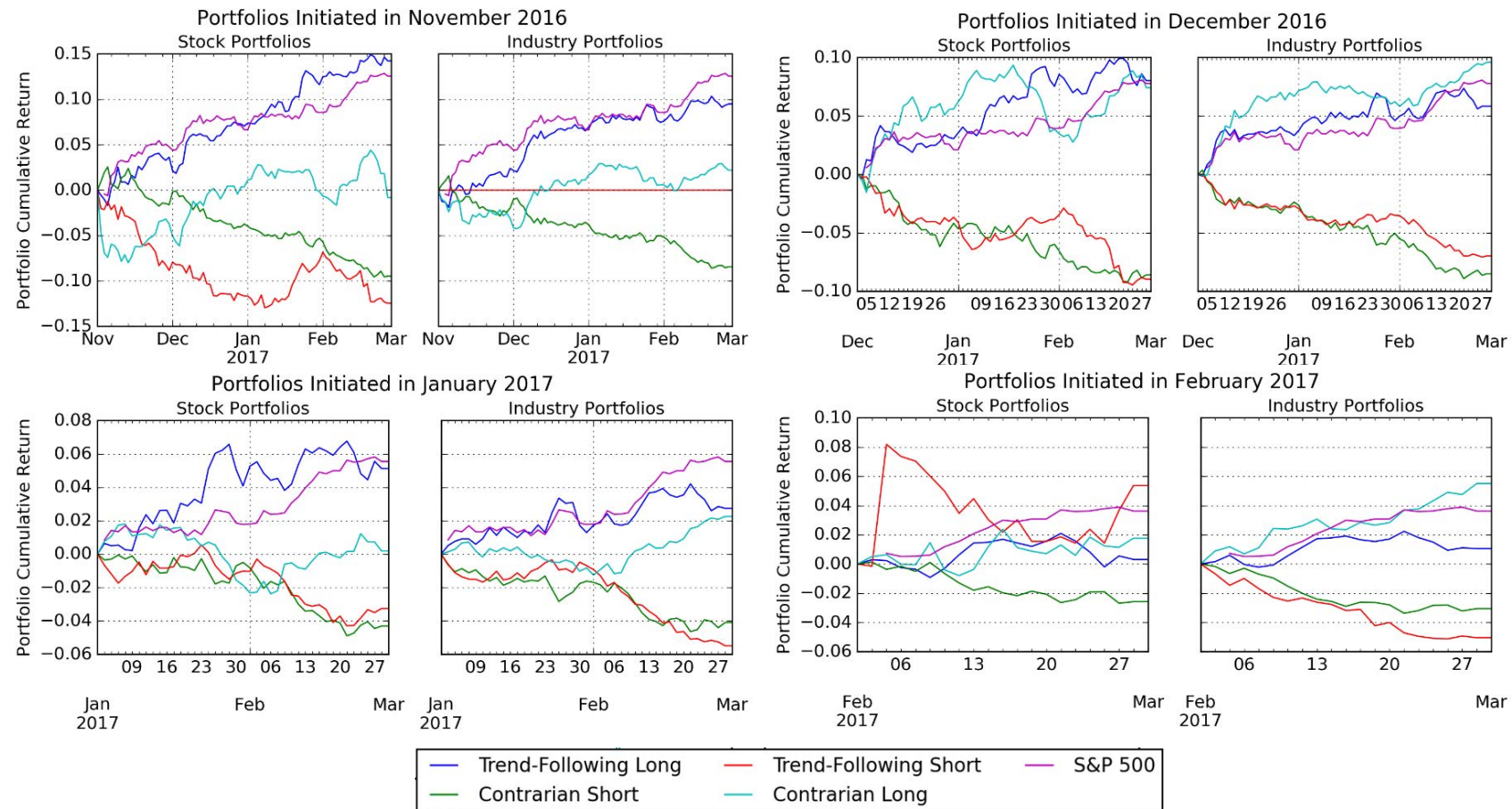
For individual stocks that we identified in the 4 quadrants, we constructed 4 portfolios based on the 4 quadrants defined in the last report. Each portfolio consists of all the stocks listed in the corresponding quadrant.

- (1) Trend-Following Long Stock Portfolio (TFLSP) is made of the stocks that have a **strong** bubble signal as well as a **strong** value score. For instance, TFLSP June consists of all the stocks listed in quadrant 1, identified in slide 25 of June FCO Report.
- (2) Trend-Following Short Stock Portfolio (TFSSP) is made of the stocks that have a **strong** bubble signal as well as a **weak** value score.
- (3) Contrarian Long Stock Portfolio (CLSP) is made of the stocks that have a **weak** bubble signal as well as a **strong** value score.
- (4) and Contrarian Short Stock Portfolio (CSSP) is made of the stocks that have a **weak** bubble signal as well as a **weak** value score.

At the same time, we also classified 20 industries into 4 quadrants. We also 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). For example, Trend-Following Long Industry Portfolio June consists of all the stocks in the industries listed in quadrant 1, identified in slide 39 of the June 2016 FCO Report.

In each month, we initiated 8 new portfolios based on the updated results. The performance of every 8 portfolios we initiated in each month since April 2016 are presented in the next slide. All of the stocks in our portfolios have the same weights and we don't consider transaction cost in the portfolio performance.

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This month, we find that Long portfolios still play out and outperform the market in most portfolios initiated in November, December 2016, January and February 2017. This is due to the continuation of the US post-election rally. 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.

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For information, see

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