

The FCO Cockpit – Global Bubble Status Report

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Chair of Entrepreneurial Risk

September 1st, 2016

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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 898 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 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>)

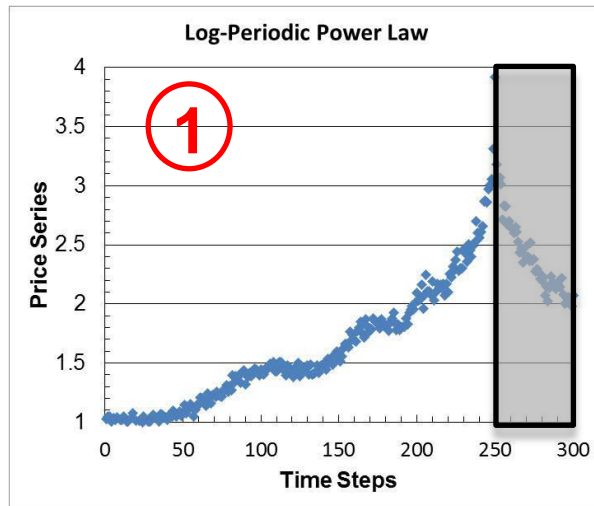
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How does it work?

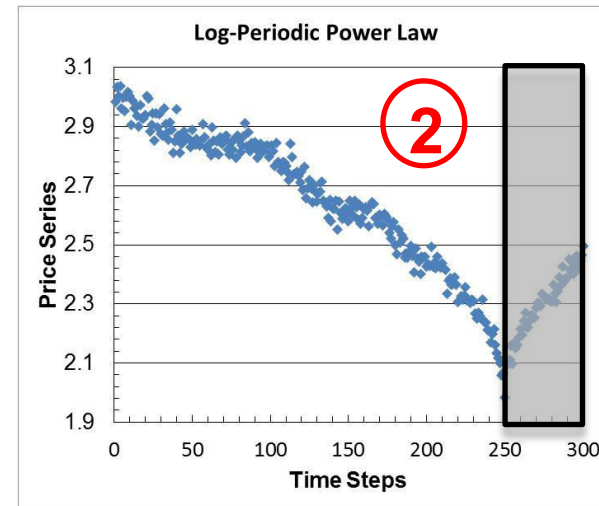
We use the Log-Periodic Power Law Singular (LPPLS) model to hunt for the distinct fingerprint of **Bubbles**:

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**



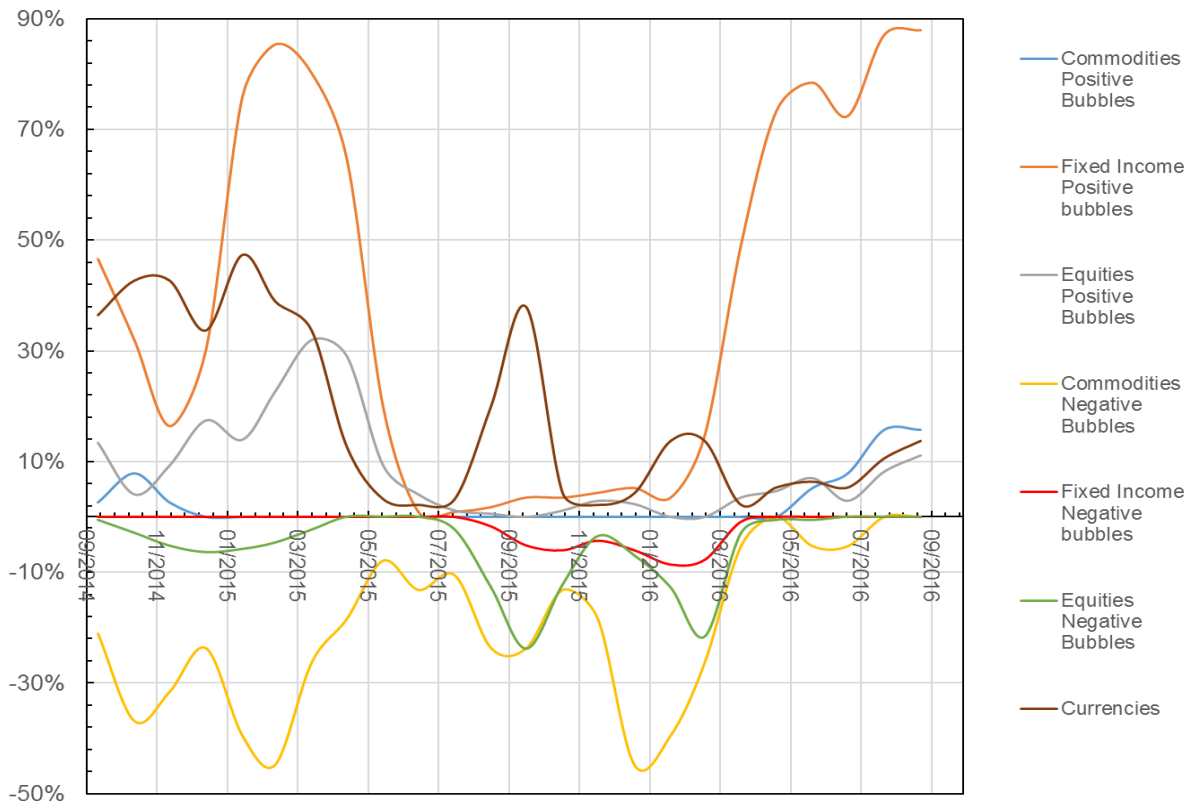
A **negative bubble** when
there is imitation in **selling**

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General Result

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



The big picture

Bonds prices across all sectors and regions are still feeling a strong growing tail wind. A very strong momentum has lifted the entire asset class. Looking at the very significant increase in warning signals, the fixed income sector is showing a bubble-like behavior.

For the fourth consecutive month, we see positive bubble signals in commodities indices. Also, positive bubbles on currencies are strengthening.

But, market focus is still on bonds.

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 five months, we reported that there was a strong rally in Japanese government bonds and in ¥ cross rates, and the results suggested that this process was not sustainable. The rally in Japanese government bond cooled down this month and does not show a bubble signal anymore, however, it is still continuing in ¥ cross rates. The results in this report suggest that this process in ¥ cross rates is still also not sustainable;
- Over the last five months, we reported that the strong negative sentiment in commodities was turning and that the asset class was touching bottom. This is further confirmed in this report by having positive bubble signals in six commodity indices for the second consecutive month and for the first time in nearly two years;
- There is no still general trend in equities. The most interesting result was found in Lithuania and Vietnam stock market indices, which are showing sign of a positive bubble for the fourth consecutive month and in India and Philippine stock market indices, which are showing sign of a positive bubble for the second consecutive month. In addition, Thailand, Indonesia, Canada, Chile, Croatia, United Kingdom and New Zealand stock market indices joined them this month;
- In our analysis of single stocks, the positive bubble signals we reported before in non-cyclical/defensive sectors are still stronger, but they might not be sustainable as a result of weak fundamentals. We also spot recent increase of sector *Semiconductors & Semiconductor Equipment*, which is due to recent high expectation of sector revenues and development of new technology such as virtual reality.

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 bonds

Positive Bubbles	Yearly Return	DS LPPL Trust	DS LPPL Confidence
iBoxx Asia India Government Index	13.7%	51.3%	62.6%
iBoxx Asia Malaysia Government Index	8.0%	36.5%	42.76%
iBoxx EUR Public Banks Index	3.6%	36.5%	59.2%
iBoxx EUR Finland Index	7.1%	34.4%	50.0%
iBoxx Asia Korea Government Index	7.1%	34.1%	30.55%
iBoxx Asia Philippines Government Index	7.2%	34.0%	34.49%
iBoxx EUR Sovereigns Index	8.5%	29.7%	49.35%
Negative Bubbles			
None			

Exactly like in last month report, of the 34 government bond indices that were analyzed, 29 show positive bubble signals, that is 85% of the set;

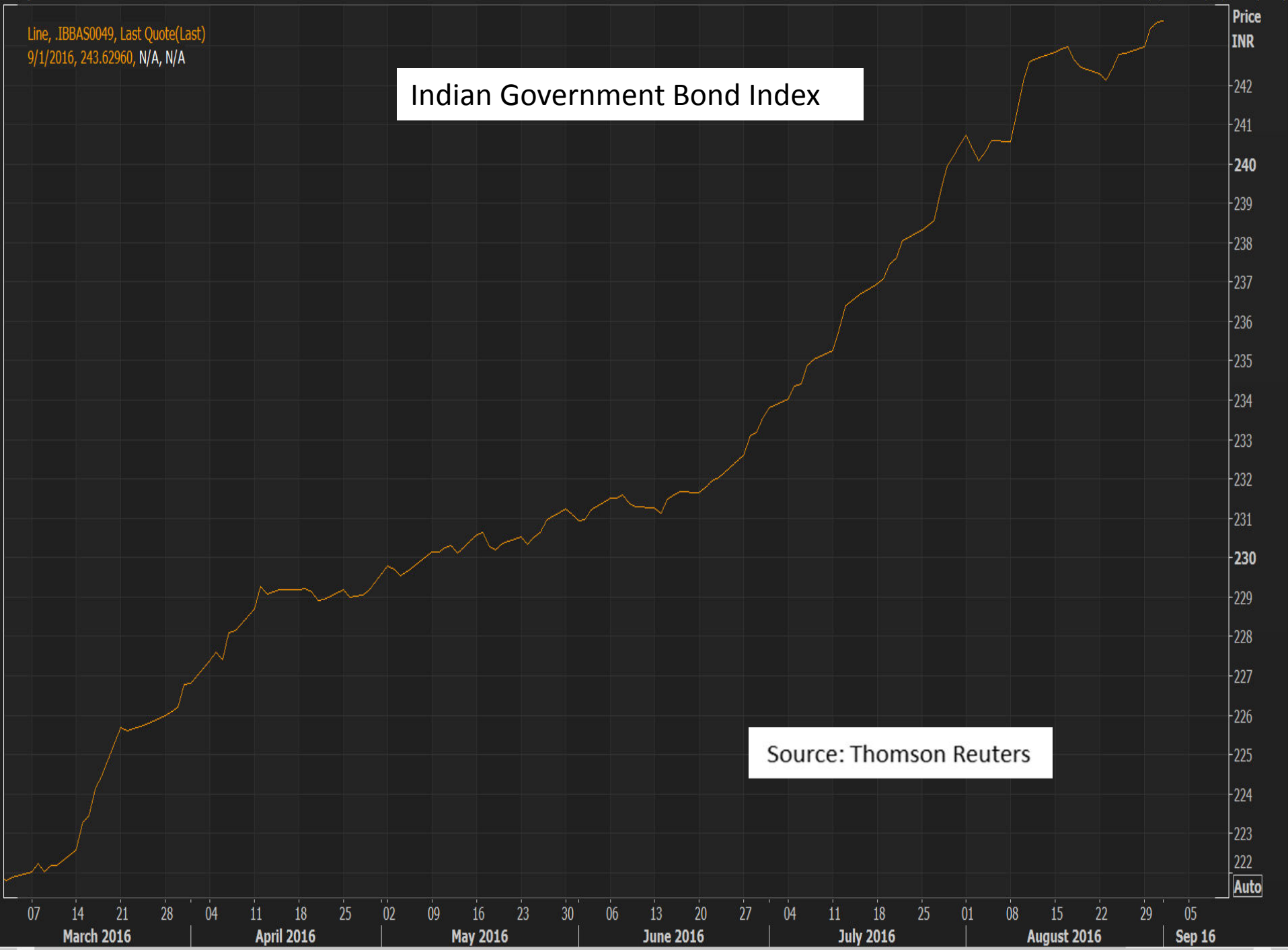
The table above shows the indices with the seven strongest signals, all are in Asia and Europe, as found last month;

The figure on the next page shows the remarkable bubble in the Indian sovereign bonds. The fast growing price trajectory that was seen in the first quarter of 2016 is still growing, but with some sign of deceleration and increased volatility.

Line, .IBBAS0049, Last Quote(Last)

9/1/2016, 243.62960, N/A, N/A

Indian Government Bond Index



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Corporate bonds

Sector Indices	Yearly Return	DS LPPL Trust	DS LPPL Confidence
Positive Bubbles			
iBoxx EUR Financial Services Index	6.3%	68.8%	84.1%
iBoxx EUR Financial Services Senior Index	5.8%	64.5%	84.0%
iBoxx EUR Chemicals Index	6.5%	57.7%	62.9%
iBoxx EUR Banks Senior Index	5.2%	54.7%	78.9%
iBoxx USD Electronic & Electrical Equipment Index	9.0%	53.8%	58.4%
iBoxx EUR Industrial Goods & Services Index	7.5%	53.1%	58.6%
iBoxx USD Support Services Index	10.0%	51.5%	37.0%
iBoxx USD General Financial Index	8.2%	51.2%	47.8%
Negative Bubbles			
None			

The strong momentum is not only in government bonds. It can be seen across all sectors and regions: 73 of the 82 corporate bond indices that were analyzed, that is 89% of the set, give positive bubble warning signals;

The table above shows the indices with the eight strongest signals, four of them are in the financial services sector.

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Commodities

Commodities Indices	Yearly Return	DS LPPL Trust	DS LPPL Confidence
Positive Bubbles			
Zinc ER Index	25.7%	30.3%	30.3%
Silver ER Index	25.9%	17.4%	22.9%
Robsta Coffee ER Index	2.9%	10.7%	16.8%
Prcls Mtls ER Index	16.0%	10.3%	18.9%
Metals ER Index	6.9%	8.0%	15.8%
Cotton ER Index	5.7%	6.6%	15.0%
Negative Bubbles			
None			

For the second consecutive month and nearly for the first time in two years, we see a positive bubble signals among six commodities indices. It is interesting to see that all the indices that are showing the bubble signals are either metals or agriculture indices. In addition, the positive bubble signals in the White Sugar index over the last two months and in the Sugar and Softs indices last month disappeared;

Over the last four reports, we reported that the strong negative momentum in commodities was turning and that the asset class was touching bottom. This is further confirmed in this report. No single index of the of 38 analyzed show negative bubble signals;

The S&P Goldman Sachs Commodity Index (next page) shows that the remarkable rebound in commodities that started last February stopped and started to an opposite direction.

1D 3D 1W 1M 6M 1Y 3Y 5Y

Comparisons >

Source: Financial Times

S&P GSCI Index Spot

13/3 27/3 10/4 24/4 8/5 22/5 5/6 19/6 3/7 17/7 31/7 14/8 28/8
March 2016 April May June July August

380.00

360.00

340.00

320.00

Date: 2016-09-01 Name: Silver, Handy&Harman Indicator: DS LPPL Confidence Bubble end flag - long time scale



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Currencies

FX	Yearly Return	DS LPPL Trust	DS LPPL Confidence
Iceland Krona/Euro	11.5%	34.5%	34.4%
Brazilian Real/Swiss Franc	17.5%	29.2%	22.0%
Brazilian Real/Euro	16.1%	27.7%	18.7%
US Dollar/Japanese Yen	-13.3%	20.4%	19.9%
US Dollar/Brazilian Real	-12.7%	16.0%	13.8%
Iceland Krona/Swiss Franc	12.8%	14.0%	37.0%
Japanese Yen/Euro	17.0%	11.2%	5.3%
New Zealand Dollar/US Dollar	14.5%	8.6%	8.8%
New Zealand Dollar/Euro	16.1%	7.2%	8.4%
US Dollar/Iceland Krona	-9.1%	6.9%	29.2%
US Dollar/Taiwan Dollar	-2.1%	6.3%	26.2%
UK Pound Sterling/Euro	-13.0%	5.5%	22.3%
UK Pound Sterling/Swiss Franc	-11.9%	5.5%	20.6%

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Currencies

For the second consecutive month, there is a strong positive bubble signal in the Brazilian Real. Only thirteen currency pairs out of 95 analyzed show bubble signals, three of them are crosses with the Real. This may be due to signs of a small rebound of Brazil's economy from rock bottom;

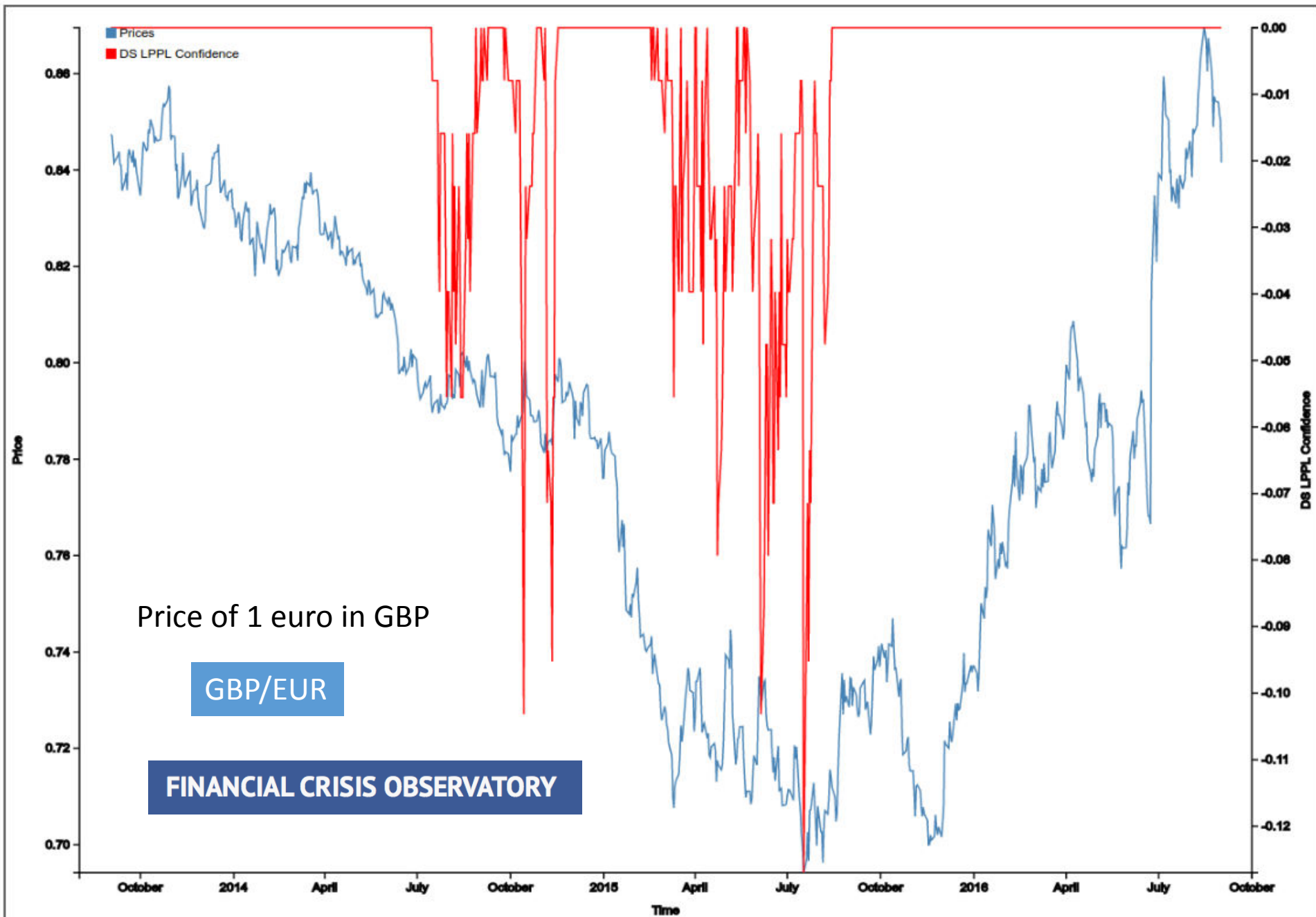
For the fifth consecutive month, there are strong positive bubble signals in the Iceland Krona and Japanese yen. Three of the thirteen pairs that are showing bubble signals are crosses with the Krona and two with the Yen. In case of the Iceland Krona, it is mainly attributed to higher interest rate, outperforming economy and phasing out of the last traces of capital controls. While in the case of Japanese yen, this may be contributed by the “safe-heaven” status of the Japanese Yen, which increased even further in the aftermath of the Brexit vote and also to the Japanese central bank that delivered a smaller-than-expected round of additional stimulus;

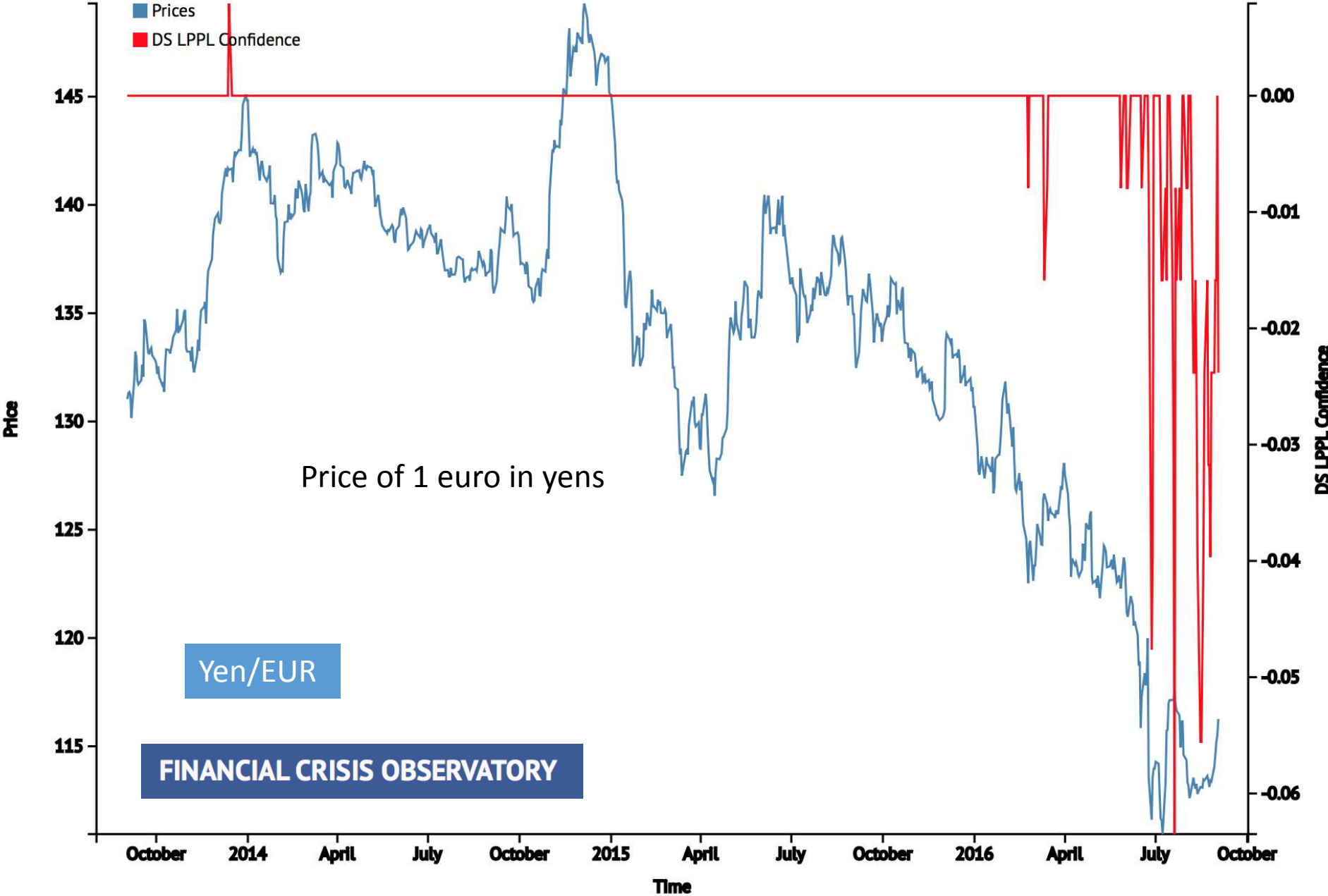
For the second month, there are signs of a strong positive bubble in the New Zealand Dollar. This can further confirm the results on commodities. In the last four reports, we clearly saw that the bubble signals in the currencies of commodities exporting countries disappeared. This is confirmed by this report;

For the first month, there are signs of a negative bubble on the GBP/EUR and GBP/CHF exchange rates, undoubtedly this is related to the Brexit vote;

Finally, the strengthening bubble signal on Russian Rouble/Euro exchange rate that was shown over the last month disappeared.

Date: 2016-09-01 Name: UK £ TO EURO (WMR&) 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
OMX Vilnius_GI	10.1%	18.6%	40.5%	Lithuania
SET Index	13.7%	16.5%	35.9%	Thailand
Jakarta SE Composite Index	22.1%	12.7%	30.5%	Indonesia
CNX Nifty Index	12.8%	12.09%	18.0%	India
Vietnam Index	20.0%	9.65%	5.4%	Vietnam
TSX-Toronto Stock Exchange 300 Composite Index	8.3%	9.54%	18.6%	Canada
IGPA Index	10.4%	9.5%	15.9%	Chile
Philippine SE Composite Index	9.9%	9.5%	15.5%	Philippine
S&P BSE Sensex Index	10.7%	9.5%	13.9%	India
CROBEX Index	4.7%	6.4%	36.4%	Croatia
FTSE 100 Index	11.9%	5.5%	23.1%	United Kingdom
New Zealand Se Top50 Free Index	30.8%	5.2%	18.7%	New Zealand
Negative Bubbles				
None				
Equities Sector Indices	Yearly Return	DS LPPL Trust	DS LPPL Confidence	
Positive Bubbles				
Solactive Social Networks Index	41.2%	17.1%	38.3%	
S&P 500 Health Care Equip&Spls(Ind)	23.1%	16.7%	25.3%	
S&P 500 Food Products (Industry)	21.4%	13.3%	7.3%	
S&P 500 - Pharmaceuticals (Industry)	7.4%	10.9%	9.8%	
S&P 500 Semicond&Semicond Equip(Ind)	37.8%	7.6%	25.7%	
S&P 500 Aerospace&Defense(Industry)	18.3%	6.6%	10.2%	
S&P 500 Building Products (Industry)	32.9%	5.0%	8.3%	
Negative Bubbles				
None				

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Stocks country indices

There is no general trend in equities. The most interesting result was found in Lithuania and Vietnam stock market indices, which are showing sign of a positive bubble for the third consecutive month and in India and Philippine stock market indices, which are showing sign of a positive bubble for the second consecutive month;

In addition, Thailand, Indonesia, Canada, Chile, Croatia, United Kingdom and New Zealand stock market indices joined them this month. In the case of the UK, the sign of a positive bubble can likely be attributed to the stimulus package offered by the Bank of England in the aftermath of the Brexit vote. It is interesting to see that half of the indices that are showing signs of a positive bubble are in Asia ;

Finally, Pakistan stock market index, which was showing sign of a positive bubble over the last two months, disappeared.

Date: 2016-09-01 Name: FTSE 100 Indicator: DS LPPL Confidence Bubble end flag - long time scale



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Single Stocks

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What is this?

For 857 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.

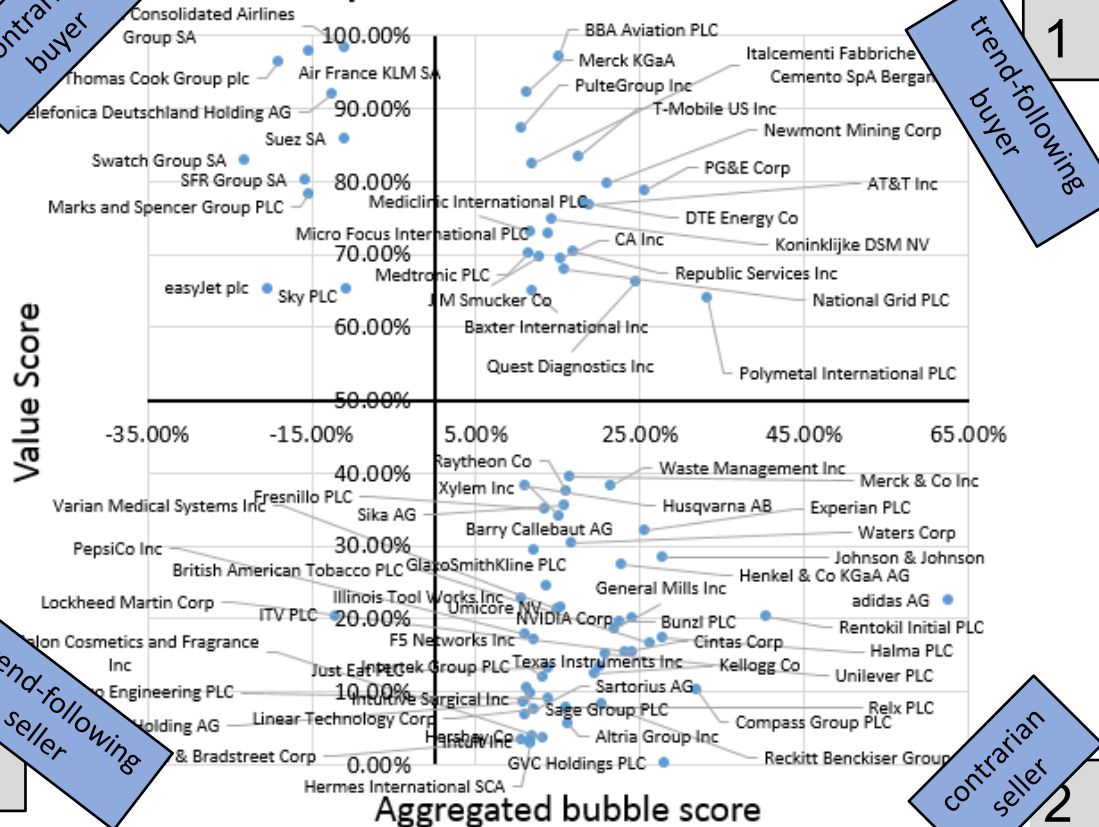
The two financial strength indicators are:

- 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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The four quadrants: value versus bubble score



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. AT&T Inc);
2. [Quadrant 2](#): Stocks with a strong positive bubble score and a weak value score (e.g. adidas AG);
3. [Quadrant 3](#): Stocks with a strong negative bubble score and a weak value score (e.g. ITV PLC);
4. [Quadrant 4](#): Stocks with strong negative bubble score and a strong financial strength (e.g. Sky 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%.

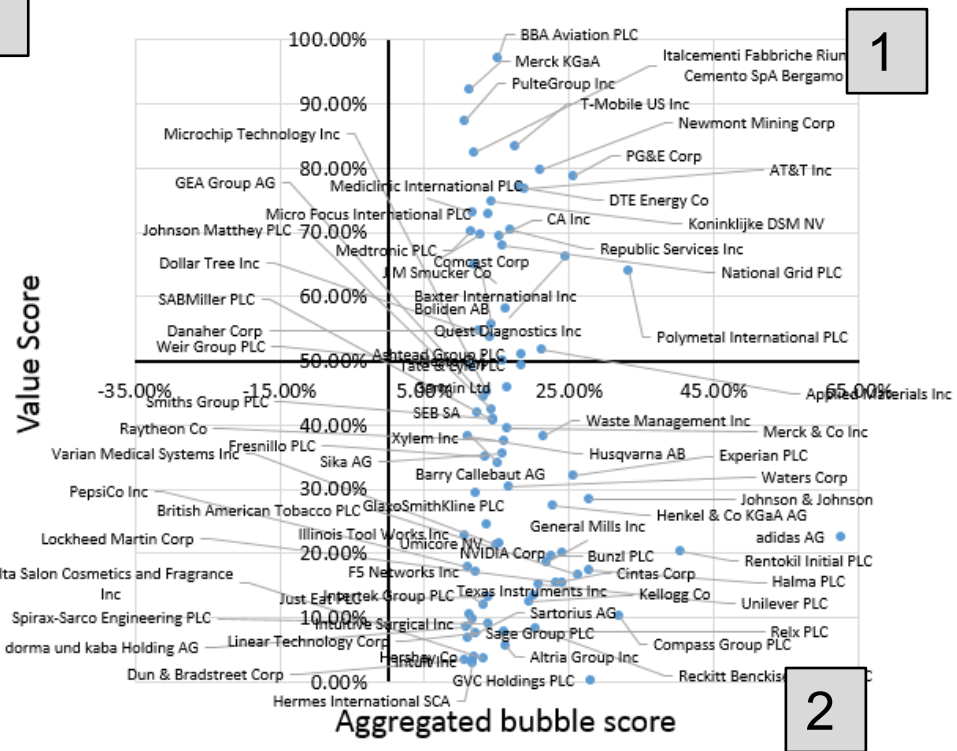
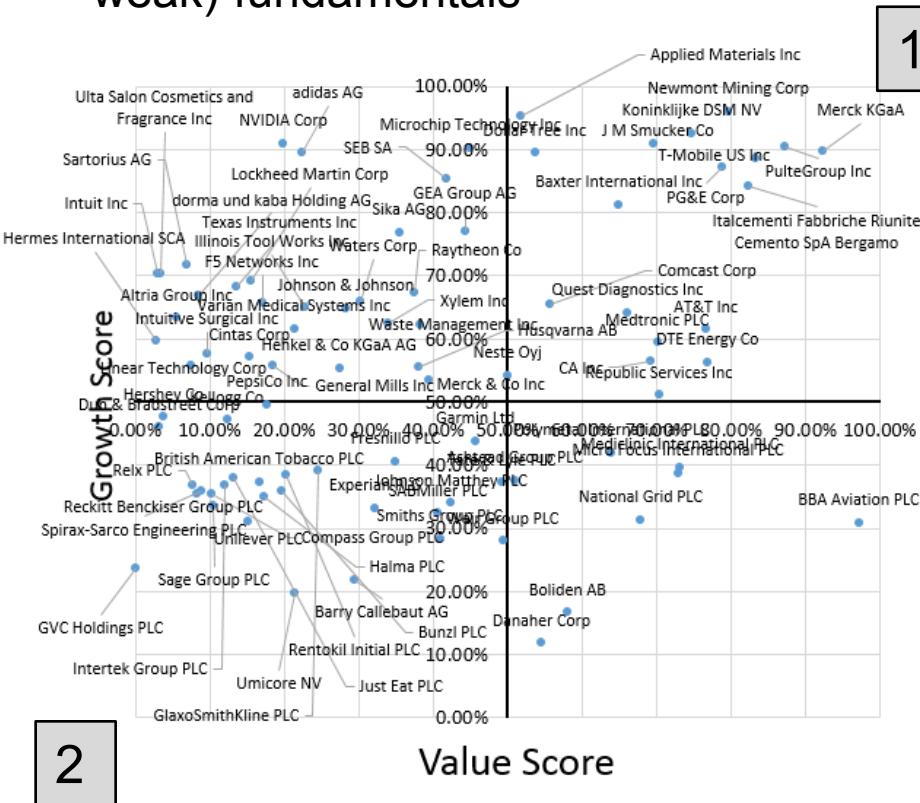
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Each quadrant has its own specs:

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.**

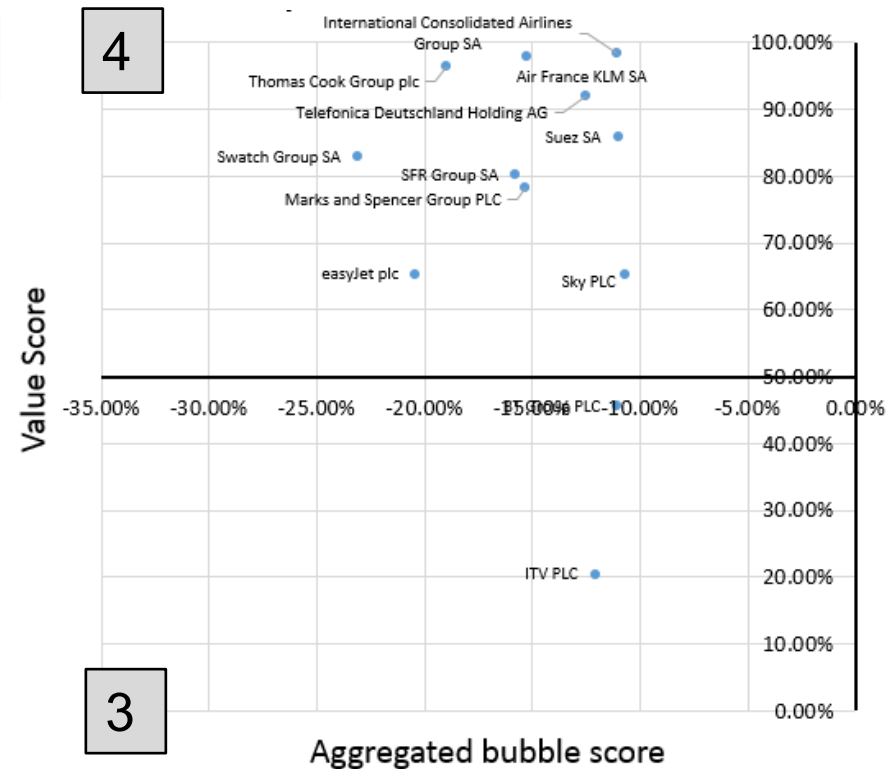
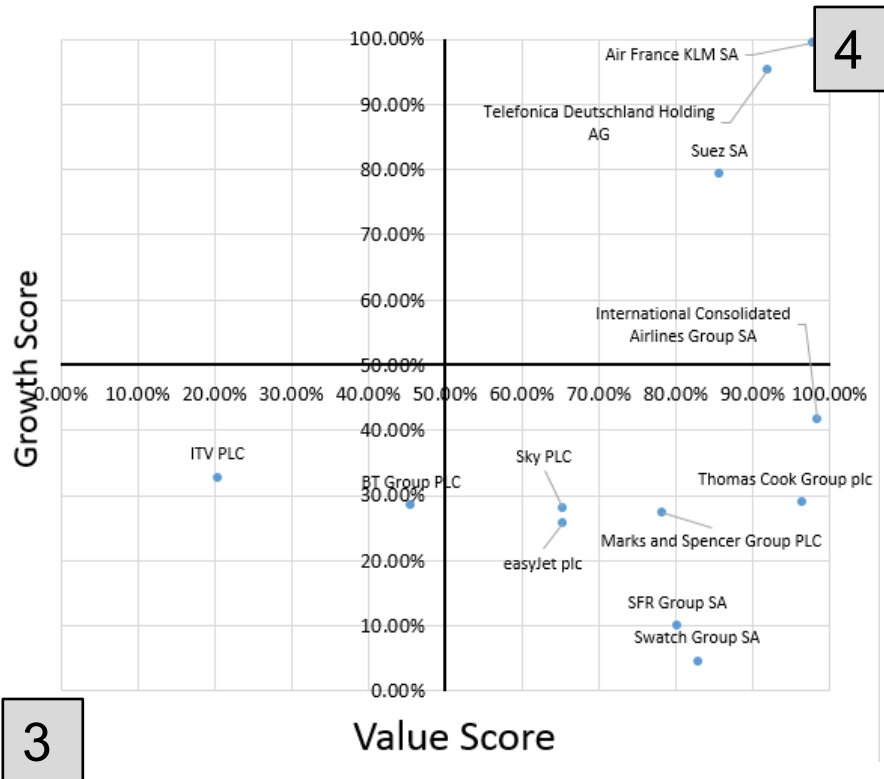
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Quadrant 1 and 2 stocks: strong positive bubble signals with strong (respectively weak) fundamentals



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



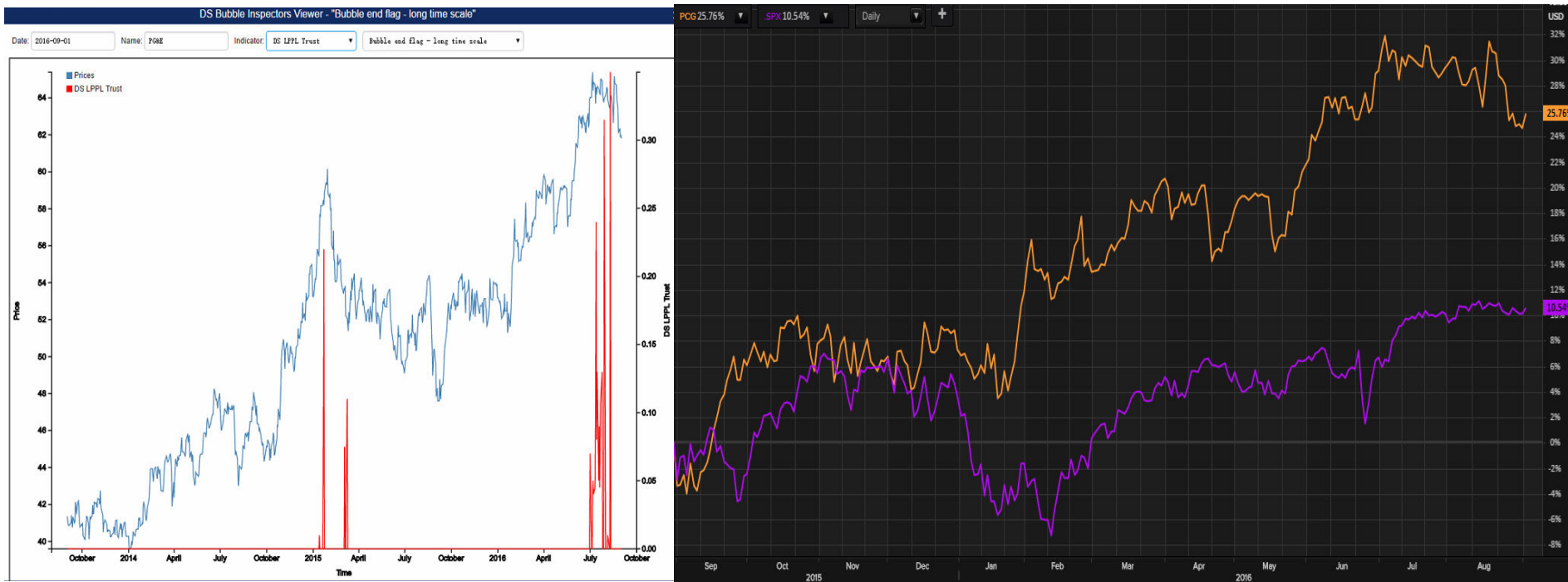
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Quadrant 1 stocks: strong positive bubble signals with strong fundamentals

Company Name	Country of Headquarters	GICS Sector Name	GICS Industry Group Name	Yearly Return	Bubble Score	Value Score	Growth Score
CA Inc	United States of America	Information Technology	Software & Services	27.87%	15.27%	69.31%	56.48%
T-Mobile US Inc	United States of America	Telecommunication Services	Telecommunication Services	18.94%	17.51%	83.43%	88.68%
BBA Aviation PLC	United Kingdom	Industrials	Transportation	16.98%	15.15%	97.20%	30.92%
Merck KGaA	Germany	Health Care	Pharmaceuticals, Biotechnology & Life Sciences	13.57%	11.19%	92.30%	89.73%
Koninklijke DSM NV	Netherlands	Materials	Materials	37.60%	14.24%	74.80%	92.53%
Italcementi Fabbriche Riunite Cemento SpA Bergamo	Italy	Materials	Materials	5.91%	11.82%	82.38%	84.25%
Micro Focus International PLC	United Kingdom	Information Technology	Software & Services	56.46%	13.79%	72.93%	38.74%
Mediclinic International PLC	South Africa	Health Care	Health Care Equipment & Services	67.38%	11.74%	73.16%	39.67%
National Grid PLC	United Kingdom	Utilities	Utilities	23.20%	15.87%	67.91%	31.39%
Polymetal International PLC	United Kingdom	Materials	Materials	117.92%	33.18%	63.94%	42.01%
Baxter International Inc	United States of America	Health Care	Health Care Equipment & Services	25.52%	11.87%	64.99%	81.21%
Quest Diagnostics Inc	United States of America	Health Care	Health Care Equipment & Services	26.06%	24.55%	66.16%	64.18%
DTE Energy Co	United States of America	Utilities	Utilities	22.04%	18.12%	76.90%	56.24%
Medtronic PLC	Ireland; Republic of	Health Care	Health Care Equipment & Services	25.17%	11.33%	70.13%	59.39%
Newmont Mining Corp	United States of America	Materials	Materials	128.57%	20.98%	79.70%	96.03%
PG&E Corp	United States of America	Utilities	Utilities	29.37%	25.50%	78.76%	87.16%
PulteGroup Inc	United States of America	Consumer Discretionary	Consumer Durables & Apparel	7.39%	10.63%	87.28%	90.32%
Republic Services Inc	United States of America	Industrials	Commercial & Professional Services	26.24%	16.89%	70.36%	51.11%
J M Smucker Co	United States of America	Consumer Staples	Food, Beverage & Tobacco	24.36%	12.63%	69.54%	90.78%
AT&T Inc	United States of America	Telecommunication Services	Telecommunication Services	26.49%	18.90%	76.66%	61.49%

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Quadrant 1 stocks: strong positive bubble signals with strong fundamentals, example PG&E Corp.



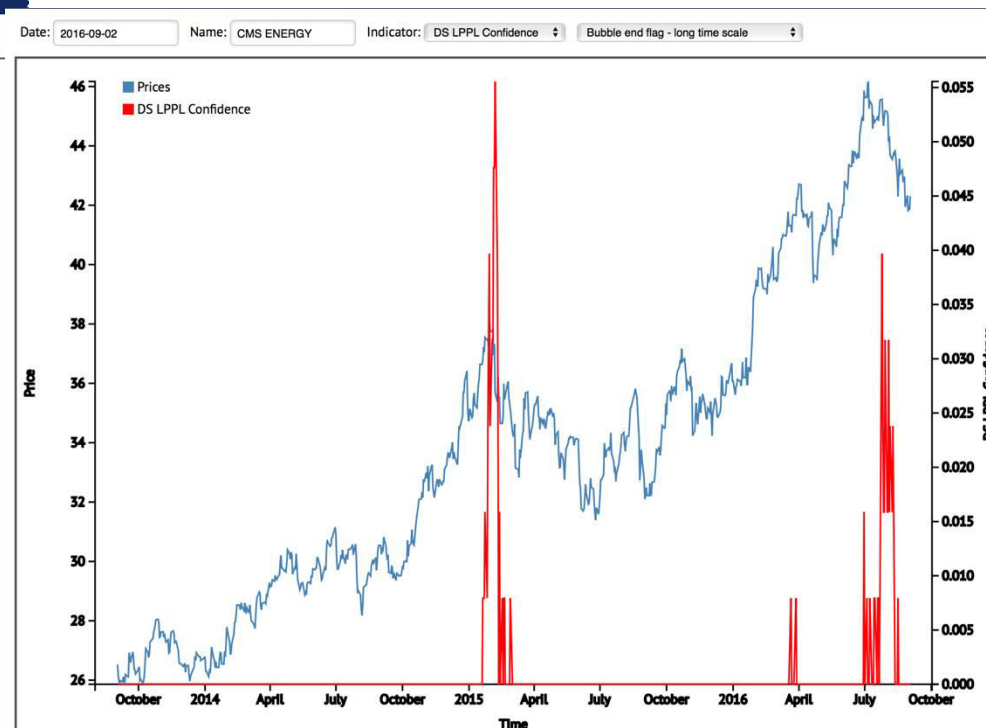
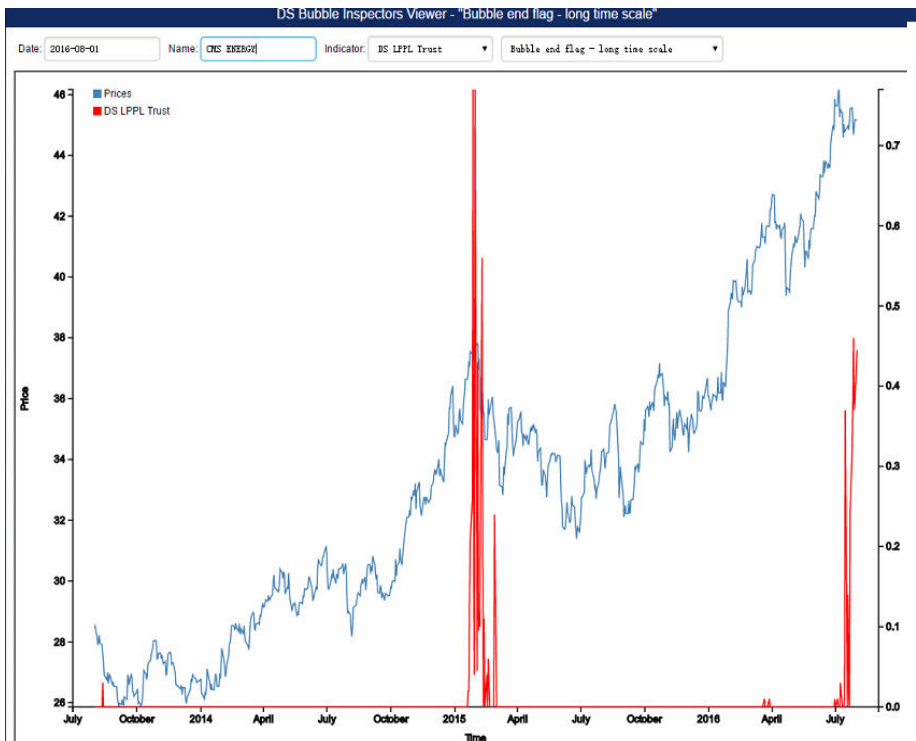
Left graph is a standard output from the Financial Crisis Observatory. It shows the historical price evolution of the stock in blue (left hand scale) and the calculated bubble warning index DS LPPL Trust in red (right hand scale). We can see a clearly spiking warning, indicating the end of a bubble-like regime. The right graph shows the outperformance of the stock over the last year (orange) with respect to the S&P500 benchmark (purple), it is almost 15%.

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

Note that the correction has occurred, in synchrony with our DS LPPL trust indicator, notwithstanding the strong fundamentals. This suggests a tactical buy as the stock is expected to rebound after further correcting.

Last month signal (1st Aug. 2016)

This month signal (1st Sept. 2016)



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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
Cintas Corp	United States of America	Industrials	Commercial & Professional Services	41.48%	23.08%	15.40%	57.06%
F5 Networks Inc	United States of America	Information Technology	Technology Hardware & Equipment	3.67%	12.07%	17.04%	65.81%
Intuit Inc	United States of America	Information Technology	Software & Services	32.52%	11.67%	3.03%	70.36%
Intuitive Surgical Inc	United States of America	Health Care	Health Care Equipment & Services	36.35%	11.59%	9.68%	57.53%
Linear Technology Corp	United States of America	Information Technology	Semiconductors & Semiconductor Equipment	51.43%	12.13%	7.47%	55.78%
NVIDIA Corp	United States of America	Information Technology	Semiconductors & Semiconductor Equipment	184.51%	24.03%	19.95%	90.90%
Texas Instruments Inc	United States of America	Information Technology	Semiconductors & Semiconductor Equipment	50.06%	20.24%	13.54%	68.14%
Ulta Salon Cosmetics and Fragrance Inc	United States of America	Consumer Discretionary	Retailing	60.78%	13.07%	3.50%	70.25%
Umicore NV	Belgium	Materials	Materials	51.93%	15.29%	21.47%	19.72%
British American Tobacco PLC	United Kingdom	Consumer Staples	Food, Beverage & Tobacco	39.34%	26.18%	16.69%	37.34%
Bunzl PLC	United Kingdom	Industrials	Capital Goods	37.25%	22.53%	19.60%	35.94%
Compass Group PLC	United Kingdom	Consumer Discretionary	Consumer Services	41.51%	31.85%	10.27%	35.36%
adidas AG	Germany	Consumer Discretionary	Consumer Durables & Apparel	127.86%	62.60%	22.40%	89.50%
Henkel & Co KGaA AG	Germany	Consumer Staples	Household & Personal Products	28.05%	22.85%	27.42%	55.31%
Sartorius AG	Germany	Health Care	Health Care Equipment & Services	53.47%	11.09%	6.88%	71.65%
Experian PLC	Ireland; Republic of	Industrials	Commercial & Professional Services	40.84%	25.50%	32.21%	33.14%
Hermes International SCA	France	Consumer Discretionary	Consumer Durables & Apparel	22.46%	11.67%	2.80%	59.74%
Fresnillo PLC	Mexico	Materials	Materials	167.00%	13.39%	35.01%	40.61%
GlaxoSmithKline PLC	United Kingdom	Health Care	Pharmaceuticals, Biotechnology & Life Sciences	26.56%	13.61%	24.50%	39.21%
GVC Holdings PLC	Isle of Man	Consumer Discretionary	Consumer Services	52.71%	27.99%	0.12%	23.57%
Halma PLC	United Kingdom	Information Technology	Technology Hardware & Equipment	43.15%	27.79%	17.27%	34.89%
Intertek Group PLC	United Kingdom	Industrials	Commercial & Professional Services	43.07%	13.24%	12.02%	36.76%
Just Eat PLC	United Kingdom	Information Technology	Software & Services	39.97%	13.92%	13.19%	37.92%

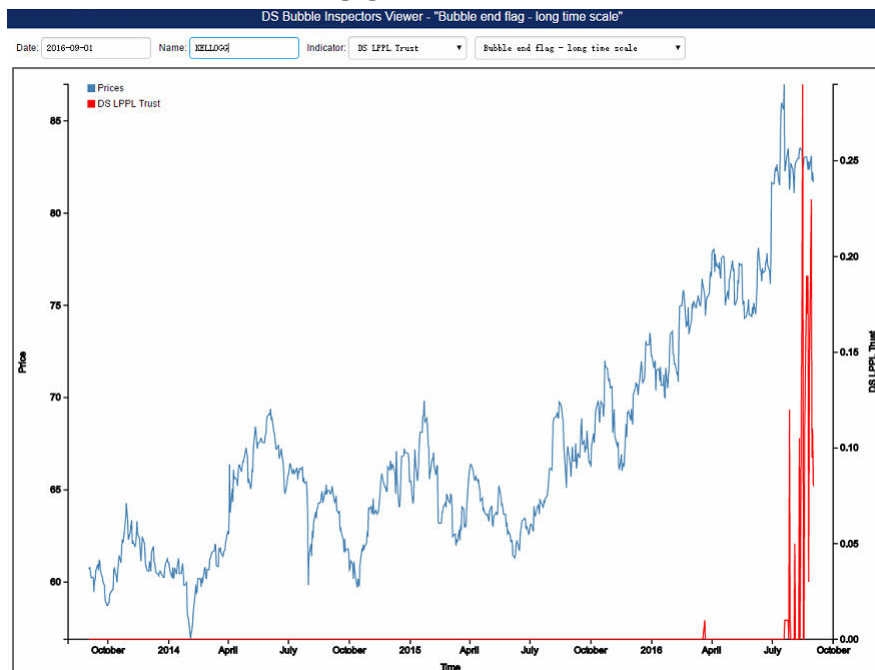
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Quadrant 2 stocks: strong positive bubble signals with weak fundamentals (con't)

Company Name	Country of Headquarters	GICS Sector Name	GICS Industry Group Name	Yearly Return	Bubble Score	Value Score	Growth Score
Reckitt Benckiser Group PLC	United Kingdom	Consumer Staples	Household & Personal Products	30.04%	20.36%	8.28%	35.47%
Relx PLC	United Kingdom	Industrials	Commercial & Professional Services	41.81%	16.06%	7.82%	36.87%
Rentokil Initial PLC	United Kingdom	Industrials	Commercial & Professional Services	41.00%	40.46%	20.30%	38.39%
Barry Callebaut AG	Switzerland	Consumer Staples	Food, Beverage & Tobacco	22.01%	11.98%	29.40%	21.70%
dorma und kaba Holding AG	Switzerland	Industrials	Capital Goods	23.42%	10.87%	8.52%	66.74%
Sika AG	Switzerland	Materials	Materials	48.29%	15.70%	35.47%	76.78%
Sage Group PLC	United Kingdom	Information Technology	Software & Services	43.85%	11.15%	10.39%	33.49%
Spirax-Sarco Engineering PLC	United Kingdom	Industrials	Capital Goods	41.73%	13.88%	8.98%	35.82%
Dun & Bradstreet Corp	United States of America	Industrials	Commercial & Professional Services	34.86%	10.61%	3.27%	45.97%
General Mills Inc	United States of America	Consumer Staples	Food, Beverage & Tobacco	27.53%	21.87%	18.55%	55.66%
Hershey Co	United States of America	Consumer Staples	Food, Beverage & Tobacco	14.71%	11.88%	3.85%	47.61%
Illinois Tool Works Inc	United States of America	Industrials	Capital Goods	45.22%	10.66%	22.87%	65.11%
Johnson & Johnson	United States of America	Health Care	Pharmaceuticals, Biotechnology & Life Sciences	29.59%	27.82%	28.35%	64.88%
Kellogg Co	United States of America	Consumer Staples	Food, Beverage & Tobacco	25.11%	19.41%	12.37%	47.14%
Lockheed Martin Corp	United States of America	Industrials	Capital Goods	22.95%	24.05%	15.52%	69.19%
Altria Group Inc	United States of America	Consumer Staples	Food, Beverage & Tobacco	27.02%	16.24%	5.60%	63.36%
Merck & Co Inc	United States of America	Health Care	Pharmaceuticals, Biotechnology & Life Sciences	19.53%	16.35%	39.56%	53.56%
PepsiCo Inc	United States of America	Consumer Staples	Food, Beverage & Tobacco	16.88%	10.90%	17.74%	49.59%
Raytheon Co	United States of America	Industrials	Capital Goods	40.07%	15.93%	37.46%	67.33%
Varian Medical Systems Inc	United States of America	Health Care	Health Care Equipment & Services	22.07%	14.88%	21.35%	61.61%
Waters Corp	United States of America	Health Care	Pharmaceuticals, Biotechnology & Life Sciences	32.91%	16.69%	30.34%	65.93%
Waste Management Inc	United States of America	Industrials	Commercial & Professional Services	29.67%	21.54%	38.27%	62.31%
Xylem Inc	United States of America	Industrials	Capital Goods	63.38%	15.09%	34.07%	62.43%
Unilever PLC	United Kingdom	Consumer Staples	Household & Personal Products	37.69%	20.70%	15.17%	31.16%
Husqvarna AB	Sweden	Consumer Discretionary	Consumer Durables & Apparel	38.41%	11.00%	38.16%	55.54%

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



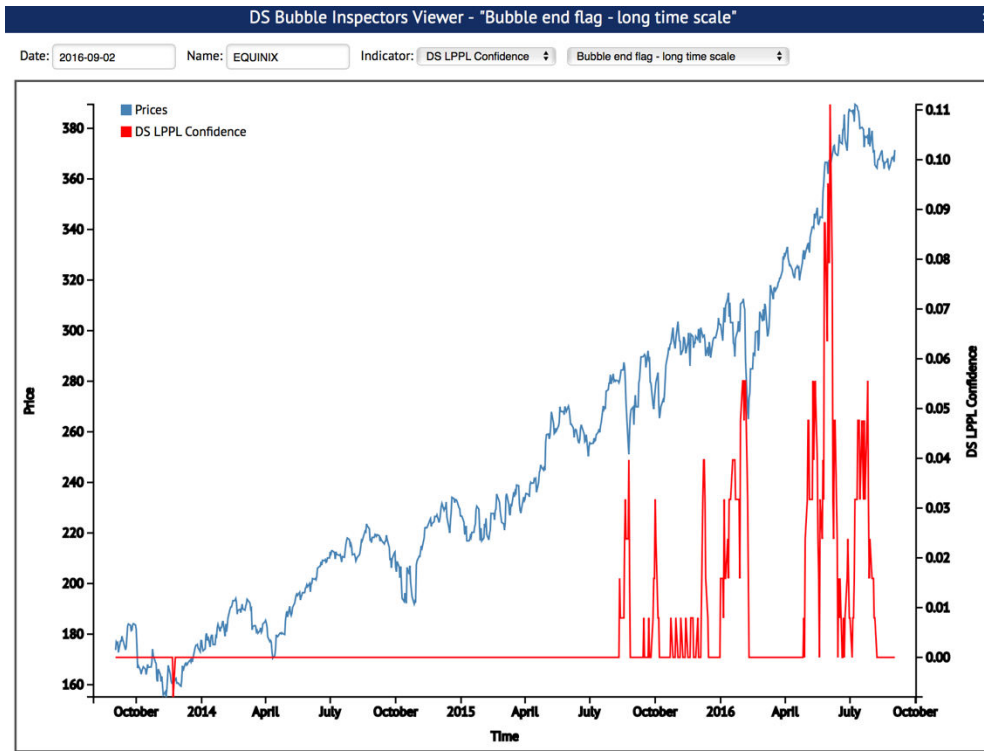
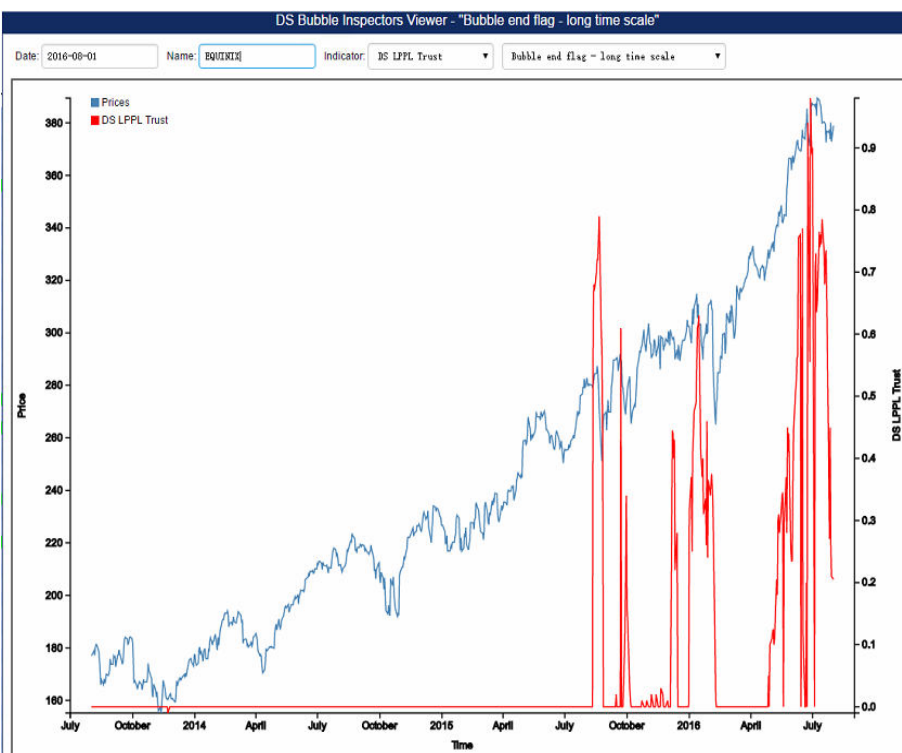
Left graph is a standard output from the Financial Crisis Observatory. It shows the historical price evolution of the stock in blue (left hand scale) and the calculated bubble warning index DS LPPL Trust in red (right hand scale). We can see a clearly spiking warning. The right graph shows the outperformance of the stock over the last year (orange) with respect to the S&P500 benchmark (purple), it is almost 13% up. The strong positive bubble signals and weak fundamentals indicate a high probability of correction, which already started recently.

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

Note that the correction has started to occur, in synchrony with our DS LPPL trust indicator. This suggests continuing to short or get out of a long position on this stock.

Last month signal (1st Aug. 2016)

This month signal (1st Sept. 2016)



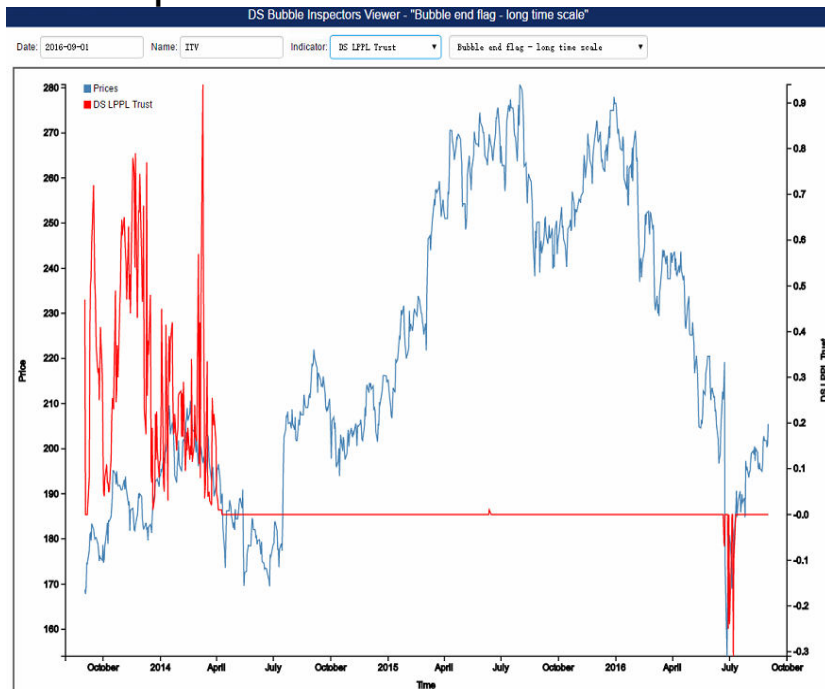
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Quadrant 3 stocks: strong negative bubble signals with weak fundamentals

Company Name	Country of Headquarters	GICS Sector Name	GICS Industry Group Name	Yearly Return	Bubble Score	Value Score	Growth Score
ITV PLC	United Kingdom	Consumer Discretionary	Media	-16.03%	-12.07%	20.42%	32.67%

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Quadrant 3 stocks: strong negative bubble signals with weak fundamentals, example ITV PLC.



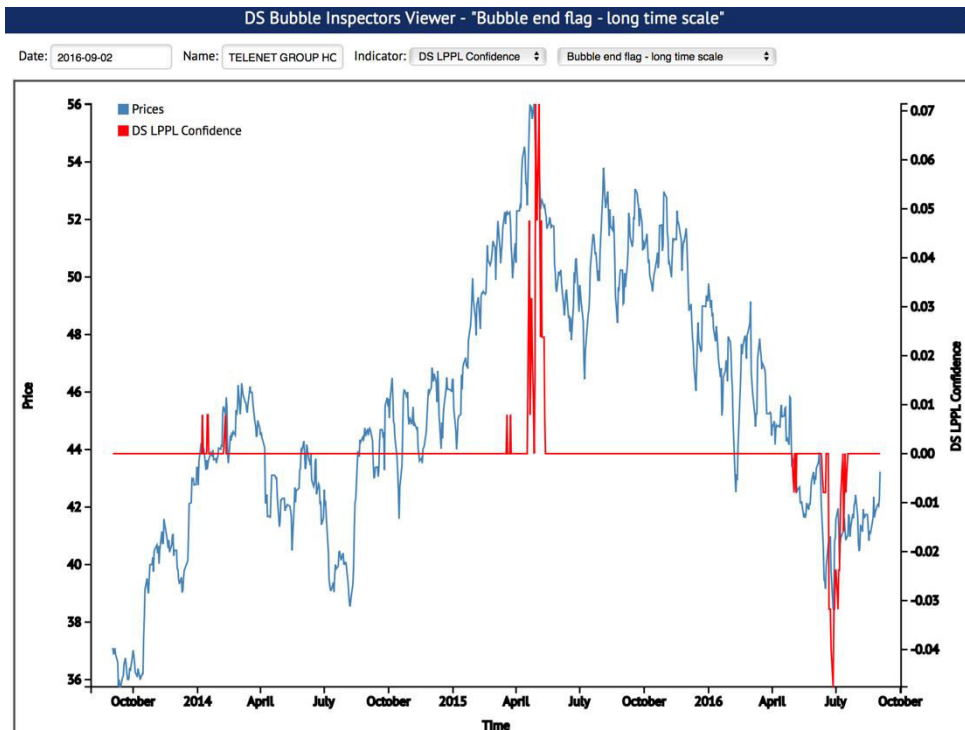
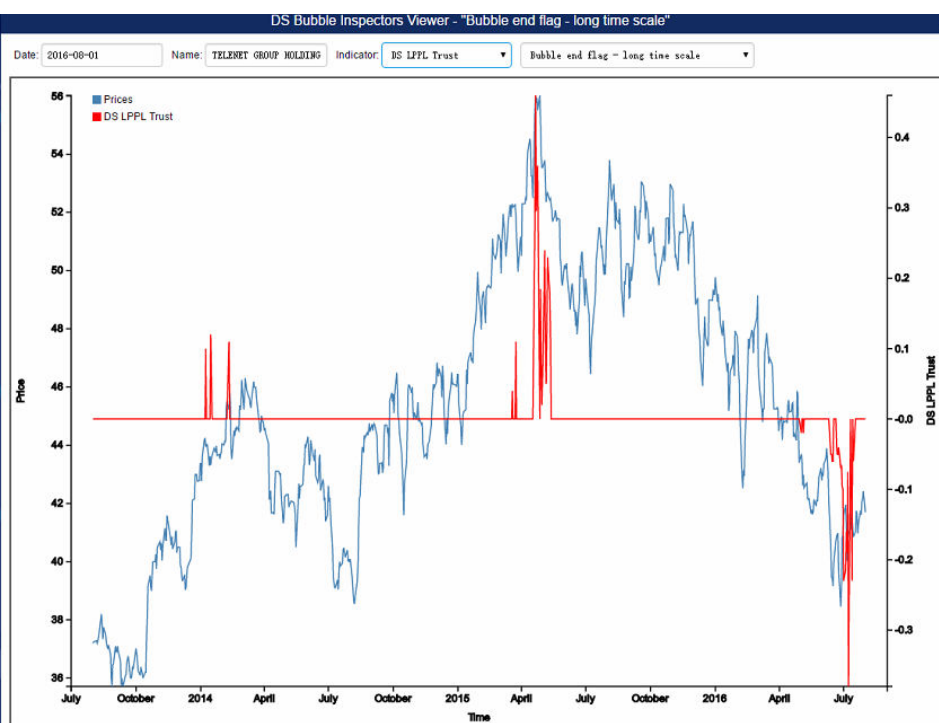
Left graph is a standard output from the Financial Crisis Observatory. It shows the historical price evolution of the stock in blue (left hand scale) and the calculated bubble warning index DS LPPL Trust in red (right hand scale). The right graph shows the underperformance of the stock over the last year (orange) with respect to the FSTE benchmark (purple), it is almost -22% down. We can see that a clear correction started two months ago. However this correction may not be sustainable due to the weak fundamentals.

Last month example: strong negative bubble signals with weak fundamentals, Telenet Group Holding NV.

Note that the correction has started to occur, in synchrony with our DS LPPL trust indicator, but in contradiction with the weak fundamentals. This is an example illustrating the power of market psychology over fundamentals. However, one should remain cautious as there is significant downward risks for this stock.

Last month signal (1st Aug. 2016)

This month signal (1st Sept. 2016)



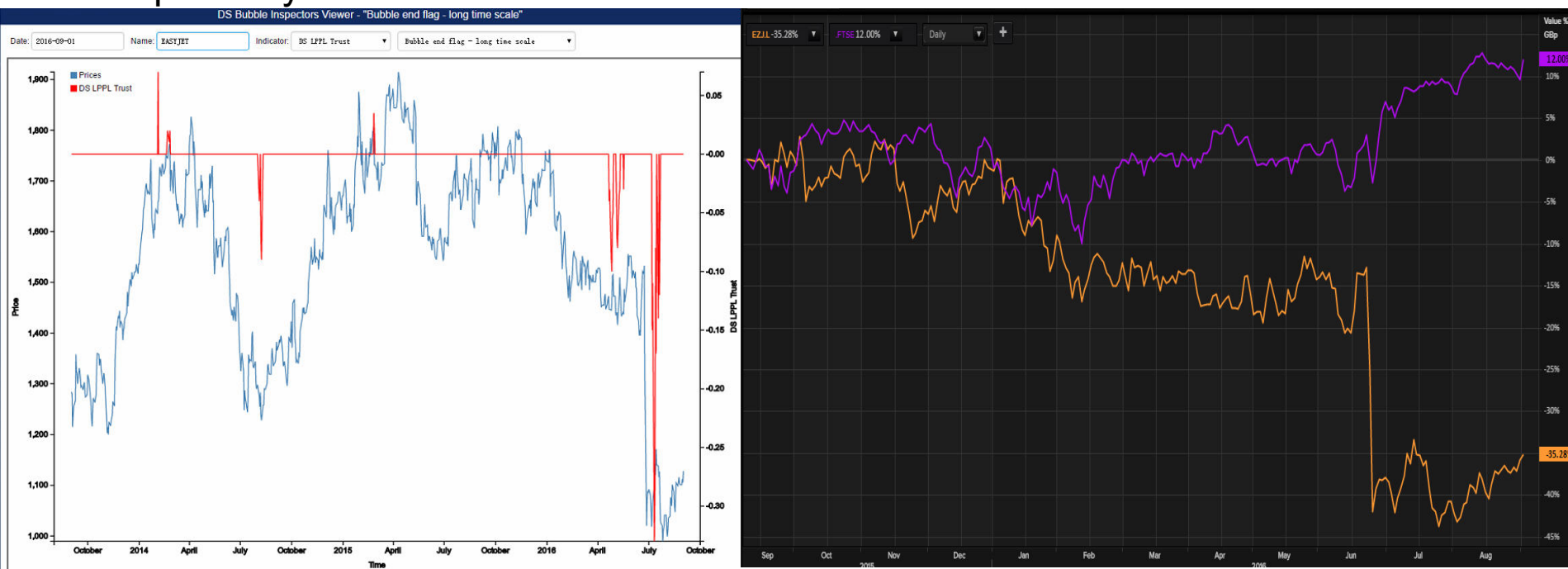
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Quadrant 4 stocks: strong negative bubble signals with strong fundamentals

Company Name	Country of Headquarters	GICS Sector Name	GICS Industry Group Name	Yearly Return	Bubble Score	Value Score	Growth Score
Telefonica Deutschland Holding AG	Germany	Telecommunication Services	Telecommunication Services	-30.79%	-12.53%	91.95%	95.33%
easyJet plc	United Kingdom	Industrials	Transportation	-33.19%	-20.39%	65.34%	25.67%
Suez SA	France	Utilities	Utilities	-13.07%	-11.00%	85.76%	79.23%
SFR Group SA	France	Telecommunication Services	Telecommunication Services	-36.16%	-15.75%	80.28%	9.92%
Air France KLM SA	France	Industrials	Transportation	-17.59%	-15.26%	97.78%	99.53%
International Consolidated Airlines Group SA	United Kingdom	Industrials	Transportation	-27.46%	-11.04%	98.37%	41.77%
Marks and Spencer Group PLC	United Kingdom	Consumer Discretionary	Retailing	-31.81%	-15.35%	78.30%	27.30%
Swatch Group SA	Switzerland	Consumer Discretionary	Consumer Durables & Apparel	-30.58%	-23.08%	82.85%	4.55%
Sky PLC	United Kingdom	Consumer Discretionary	Media	-16.76%	-10.68%	65.23%	28.12%
Thomas Cook Group plc	United Kingdom	Consumer Discretionary	Consumer Services	-32.69%	-18.97%	96.50%	28.94%

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Quadrant 4 stocks: strong negative bubble signals with strong fundamentals, example easyJet PLC.



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. The right graph shows the performance of the stock over the last year (orange) with respect to the FTSE benchmark (purple), it is -47%. This airline sector stock crashes recently due to Brexit and we can see a following correction, which is confirming our diagnostic of a negative bubble signal with strong fundamentals.

Last month example: strong negative bubble signals with strong fundamentals, Marks and Spencer Group PLC.

Note that the correction has started to occur, in synchrony with our DS LPPL trust indicator, and in agreement with the strong fundamentals. We expect this stock to continue appreciating. This suggests a strong buy opportunity.

Last month signal (1st Aug. 2016)

This month signal (1st Sept. 2016)



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Sectors

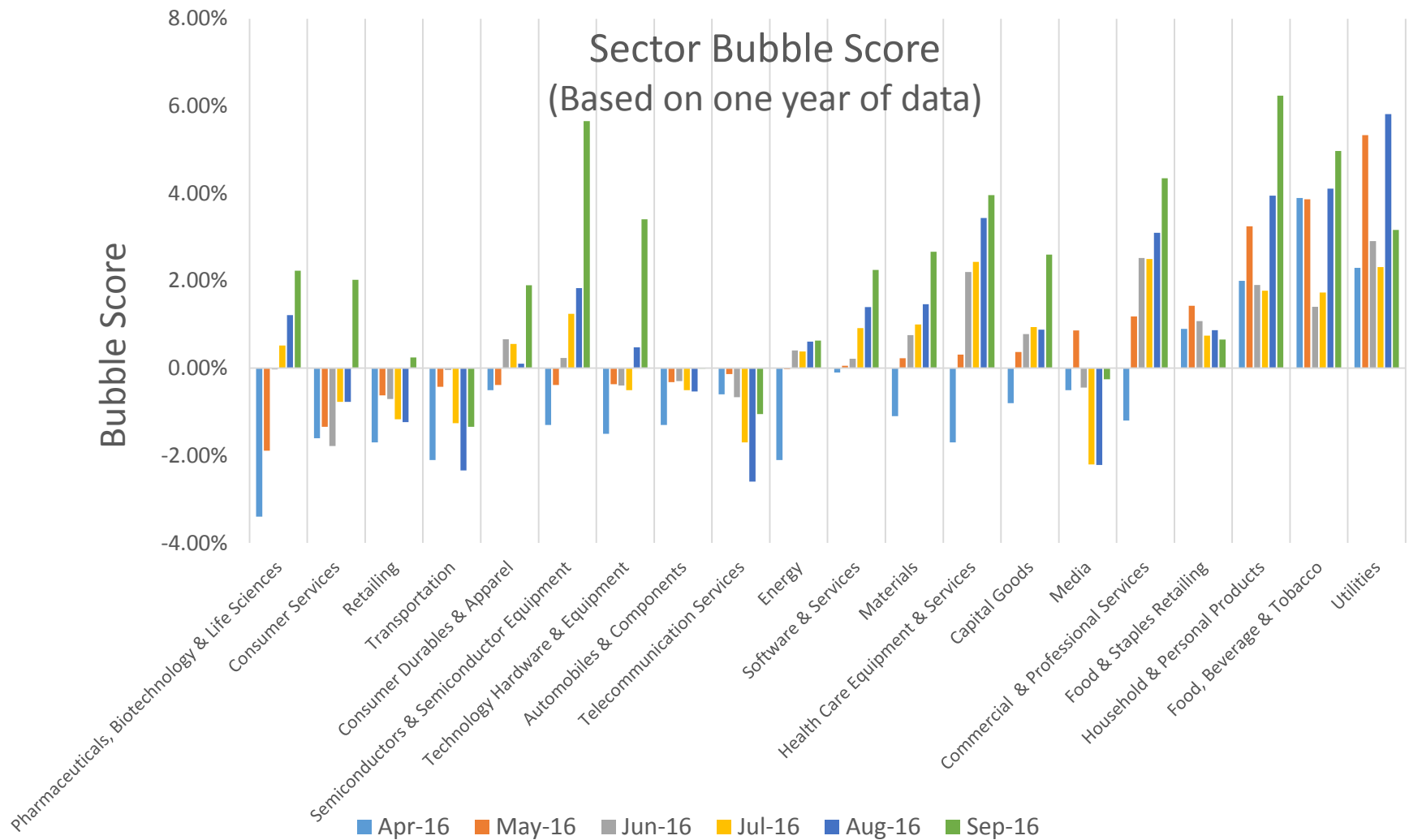
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GICS Industry Group Name	Yearly Return		Bubble Score		Value Score		Growth Score	
	Sep 1st	Aug 1st	Sep 1st	Aug 1st	Sep 1st	Aug 1st	Sep 1st	Aug 1st
Pharmaceuticals, Biotechnology & Life Sciences	3.9%	-2.2%	2.2%	1.2%	36.2%	36.2%	53.7%	56.7%
Consumer Services	3.7%	-1.5%	2.0%	-0.8%	42.7%	39.6%	53.2%	53.3%
Retailing	0.4%	-6.0%	0.2%	-1.2%	38.5%	38.1%	49.4%	50.2%
Transportation	1.6%	-7.0%	-1.3%	-2.3%	59.2%	59.1%	49.7%	48.9%
Consumer Durables & Apparel	5.7%	-1.9%	1.9%	0.1%	49.8%	48.1%	59.9%	59.7%
Semiconductors & Semiconductor Equipment	32.5%	17.6%	5.7%	1.8%	45.8%	47.3%	52.3%	51.6%
Technology Hardware & Equipment	9.5%	-2.2%	3.4%	0.5%	52.6%	52.5%	47.6%	44.1%
Automobiles & Components	1.0%	-10.2%	0.0%	-0.5%	69.5%	69.3%	69.8%	66.8%
Telecommunication Services	-5.7%	-11.5%	-1.0%	-2.6%	66.1%	64.4%	55.0%	56.6%
Energy	4.6%	-7.4%	0.6%	0.6%	63.1%	62.3%	24.0%	25.2%
Software & Services	24.0%	12.5%	2.3%	1.4%	37.2%	37.5%	60.9%	61.2%
Materials	15.7%	5.8%	2.7%	1.5%	57.5%	57.0%	46.7%	47.2%
Health Care Equipment & Services	17.4%	10.4%	4.0%	3.4%	40.3%	38.7%	65.8%	66.8%
Capital Goods	14.7%	5.0%	2.6%	0.9%	48.6%	48.8%	48.1%	47.8%
Media	-0.2%	-8.0%	-0.3%	-2.2%	55.3%	51.1%	54.0%	53.9%
Commercial & Professional Services	11.7%	1.9%	4.3%	3.1%	37.3%	39.4%	43.8%	47.5%
Food & Staples Retailing	5.5%	-3.5%	0.7%	0.9%	54.9%	54.3%	46.2%	47.3%
Household & Personal Products	21.2%	10.3%	6.2%	4.0%	19.0%	18.2%	48.7%	47.9%
Food, Beverage & Tobacco	22.0%	15.7%	5.0%	4.1%	34.5%	32.7%	50.2%	51.3%
Utilities	12.4%	11.1%	3.2%	5.8%	77.6%	74.3%	45.3%	43.3%

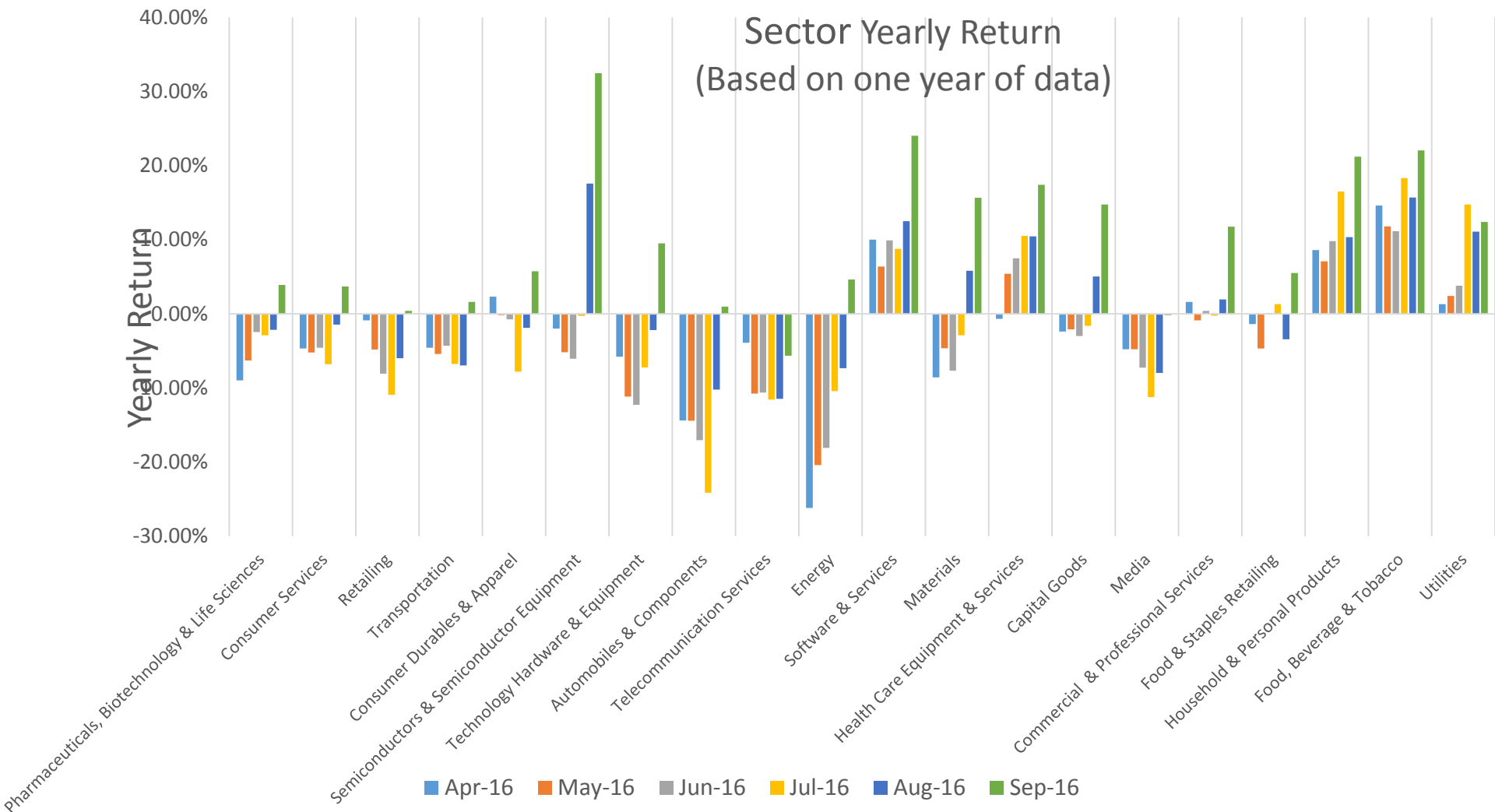
By aggregating the calculations that were done at the single stock level in the previous section, we can see the bubble, value and growth score at the sector level. The results in the previous report are also presented here for comparison.

- The sector *Telecommunication Services* we recommended in last month still maintain a strong value score with a negative bubble score, hence the investment opportunity still exists; The sector *Semiconductors & Semiconductor Equipment* has a significant increase in positive bubble score, which is due to recent high expectation of sector revenues and development of new technologies such as virtual reality.
- The sector *Household & Personal Products*, *Food, Beverage & Tobacco* have even higher bubble scores compared to last months, due to weak expectations of economic growth. This continuing growth might not be sustainable as a result of weak fundamentals.

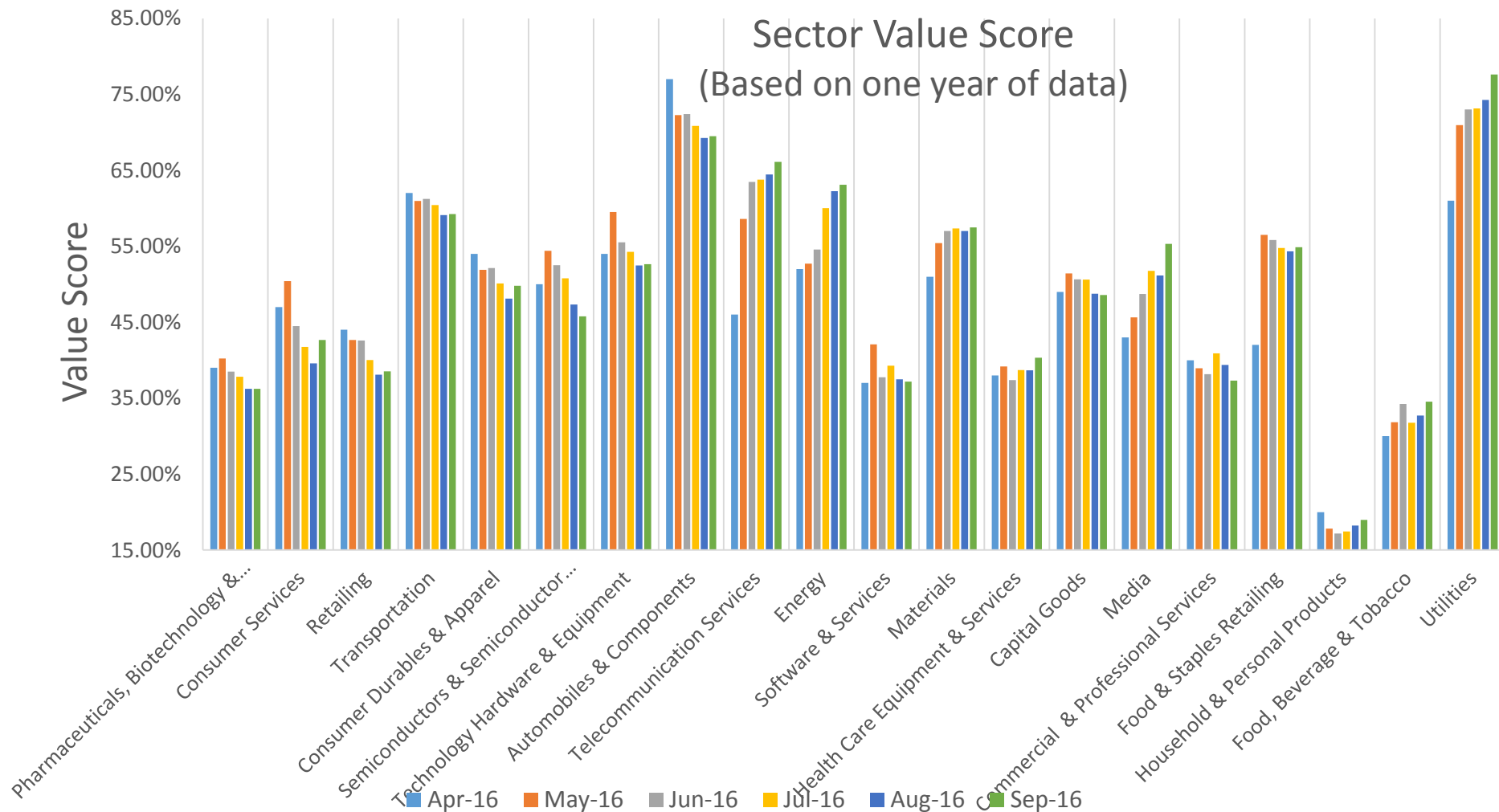
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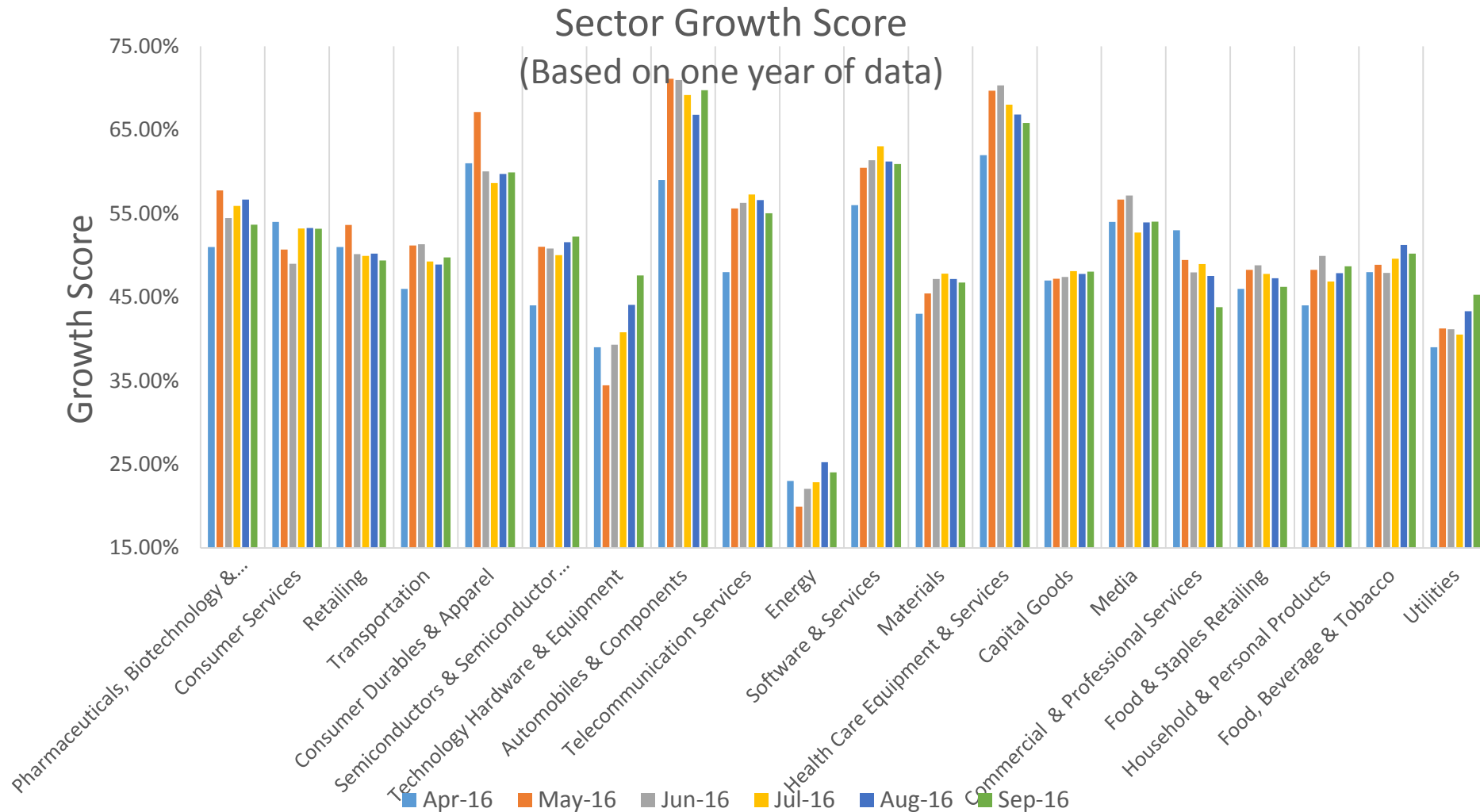
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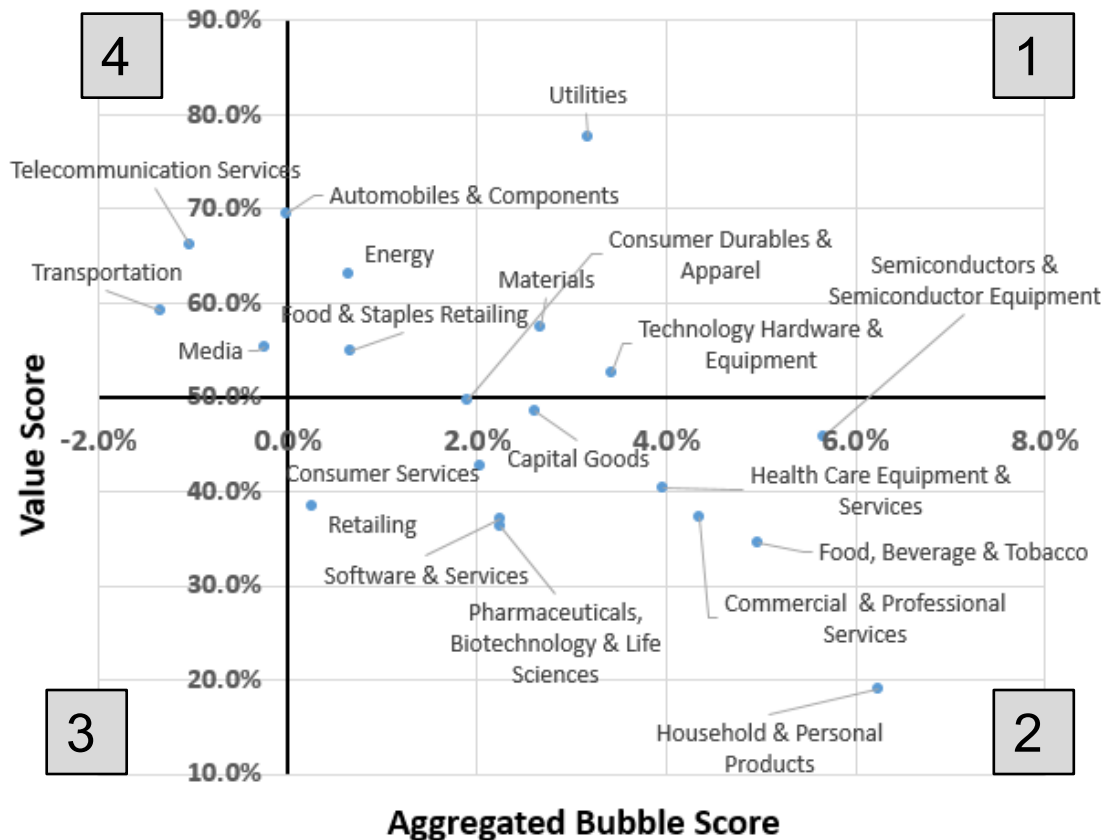
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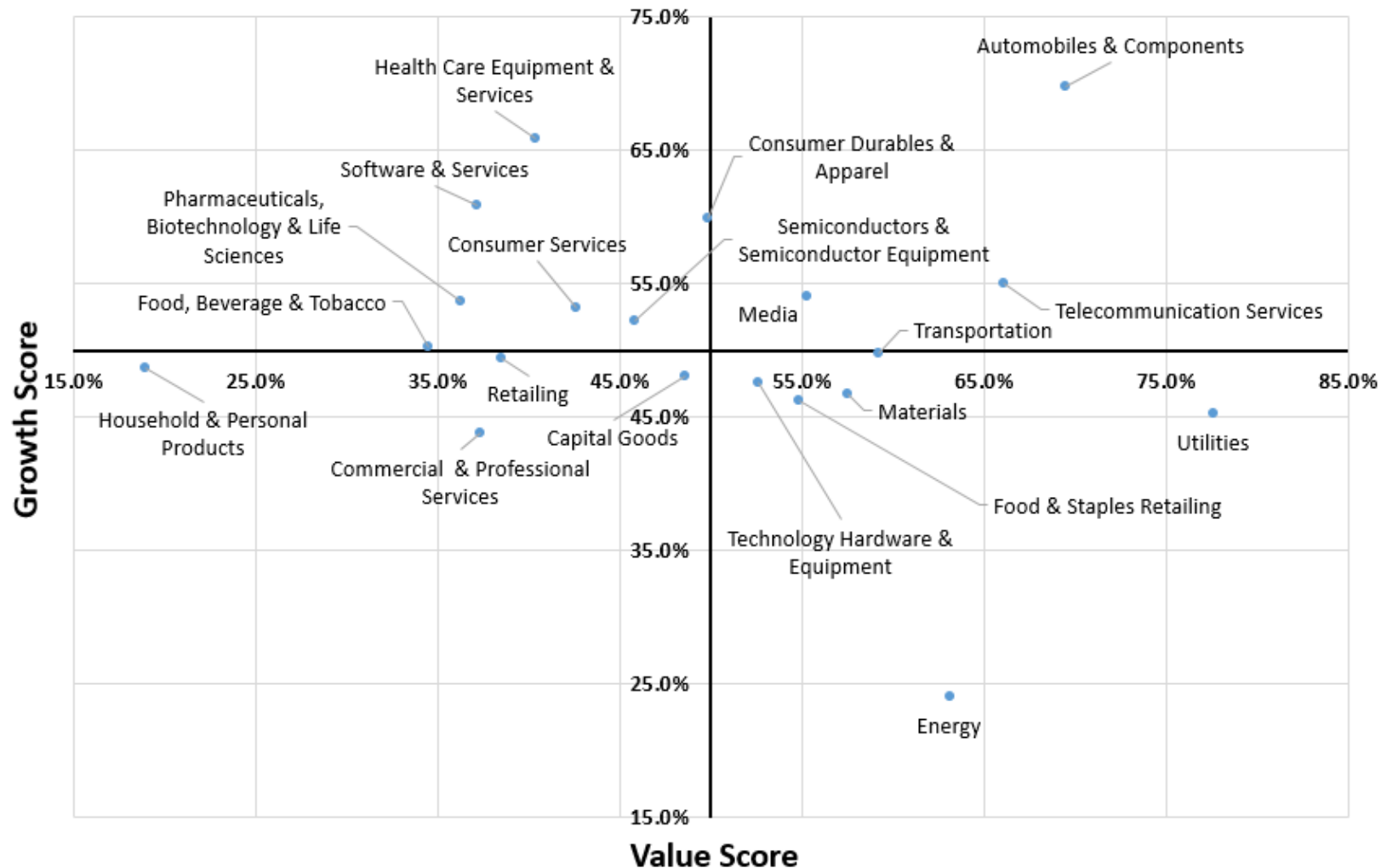


By plotting the value score versus the aggregated bubble score, we can also divide the sectors into four quadrants*:

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.

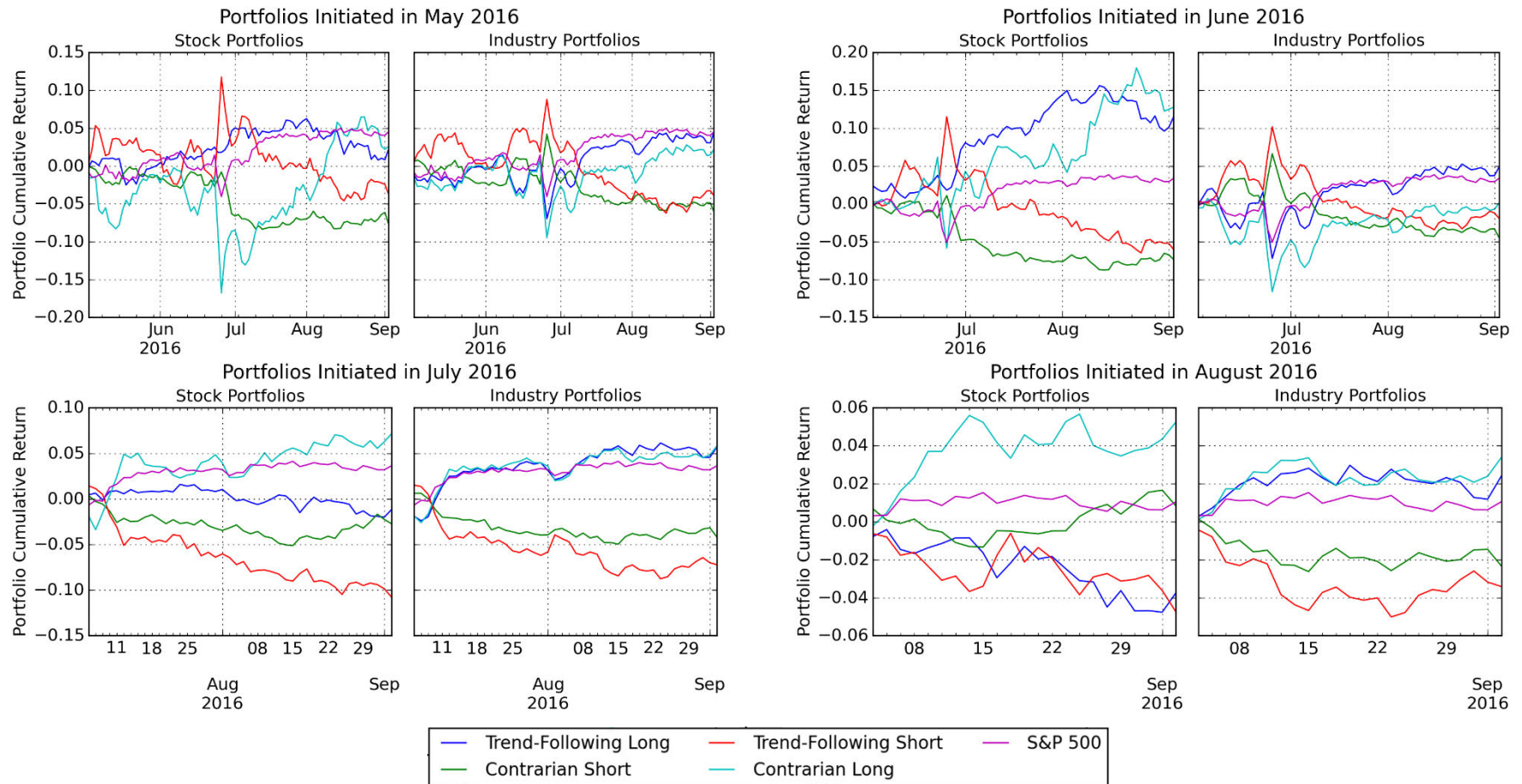
For individual stocks that we identified in the 4 quadrants, we constructed 4 portfolios based on the 4 quadrants defined in the last report. Each portfolio consists of all the stocks listed in the corresponding quadrant.

- (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 Contrarian Long portfolios start to play out and outperform the market in most portfolios initiated in May, June, July and August. By contrast, all portfolios with short positions are under-performing due to the bull US market in the last two months. 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 fundamentals have not yet played out.

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For information, see

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