

The FCO Cockpit – Global Bubble Status Report

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Chair of Entrepreneurial Risk

July 1st, 2016

The FCO Cockpit – Global Bubble Status July 1st, 2016

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 856 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>)

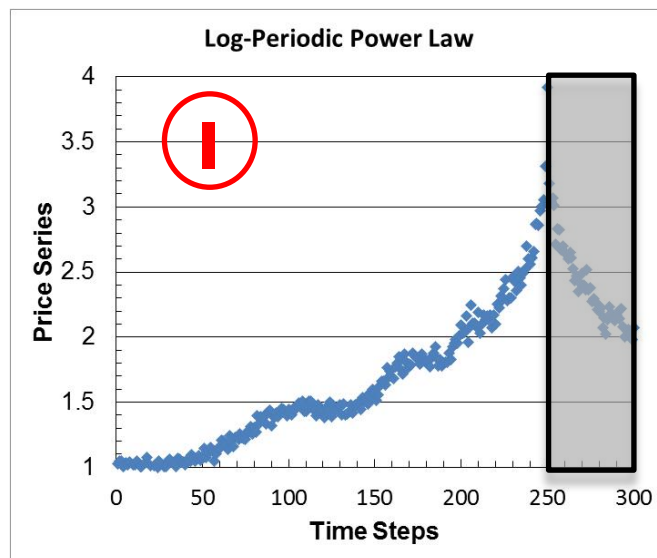
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How does it work?

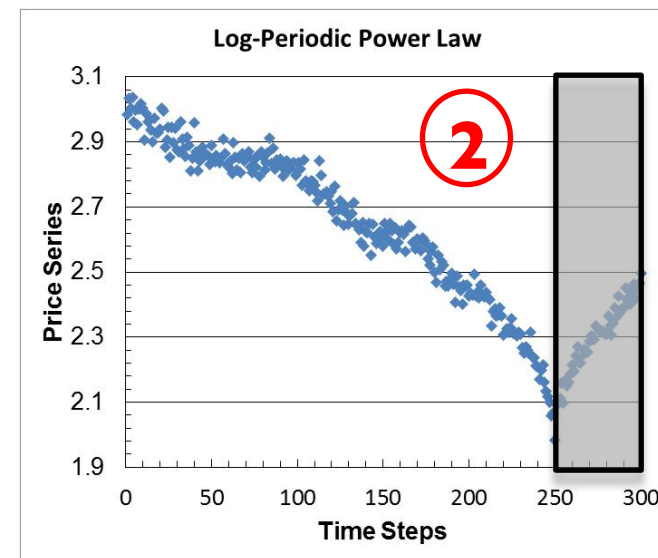
We use the Log-Periodic Power Law Singular (LPPLS) model to hunt for the distinct fingerprint of **Bubbles**:

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**

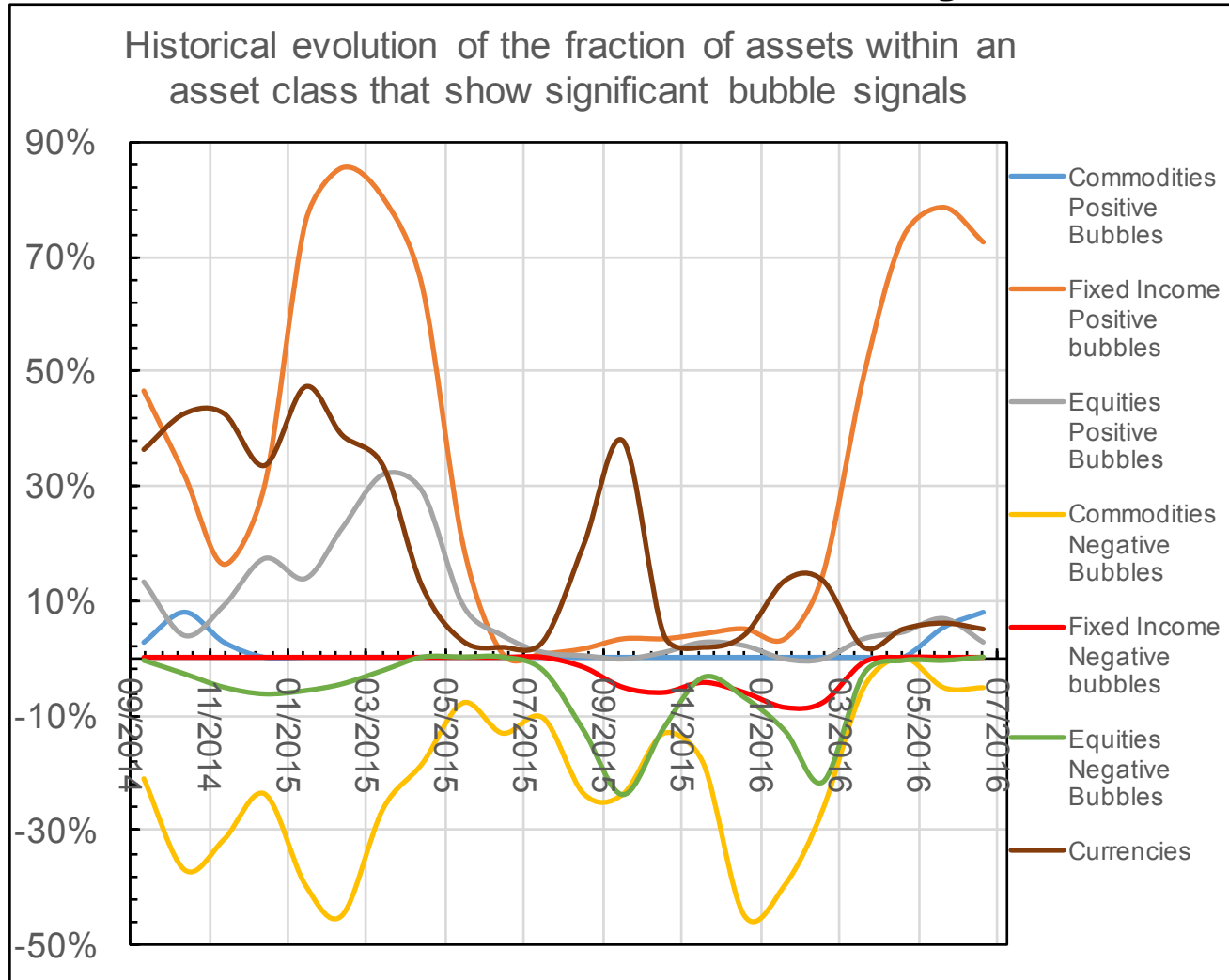


A **negative bubble** when
there is imitation in **selling**

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General Result

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The big picture

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

A global shift is seen. The very strong negative bubble signals in commodities and in related stocks and currencies that was seen over the past half year have disappeared. In addition, for the second consecutive month and for the first time since November 2014, we see positive bubble signals in commodities indices.

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 three 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, 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 three 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 three commodity indices for the second consecutive month and for the first time in more than a year and a half;
- There is no general trend in equities. The most interesting result was found in Lithuania stock market index which is showing sign of a positive bubble for the second consecutive month. In addition, New Zealand, Hungary, Estonia, and Morocco stock market indices, which were showing signs of a positive bubble over the last two months disappeared;
- In our analysis of single stocks, the positive bubble signals we reported last time in non-cyclical/defensive sectors become stronger due to unexpected result of EU Referendum. The significant drop of Media and Entertainment stocks are detected in our report via the strong negative bubble scores, which is due to the expectations of weaker economy and advertising momentum after UK decided to leave EU.

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			
iBoxx Asia India Government Index	11.22%	28.3%	14.08%
iBoxx EUR Public Banks Index	3.45%	22.72%	13.62%
iBoxx EUR Agencies Index	3.81%	17.78%	7.14%
iBoxx GBP Sovereigns Index	7.04%	15.17%	34.4%
iBoxx EUR Finland Index	7.30%	13.41%	12.67%
iBoxx Asia Korea Government Index	8.36%	12.70%	8.03%
iBoxx EUR Sovereigns Index	9.02%	11.61%	7.54%
Negative Bubbles			
None			

Of the 34 government bond indices that were analyzed, 16 show positive bubble signals, that is 47% of the set;

The table above shows the indices with the seven strongest signals, all are in Asia, Japan and Europe;

The slowing positive bubble signal in the Japanese sovereign bond index that was shown till last month disappeared;

The figure on the next page shows the remarkable bubble in the UK sovereign bonds. The fast growing price trajectory that was seen in the second quarter of 2016 spiked after the Brexit vote.

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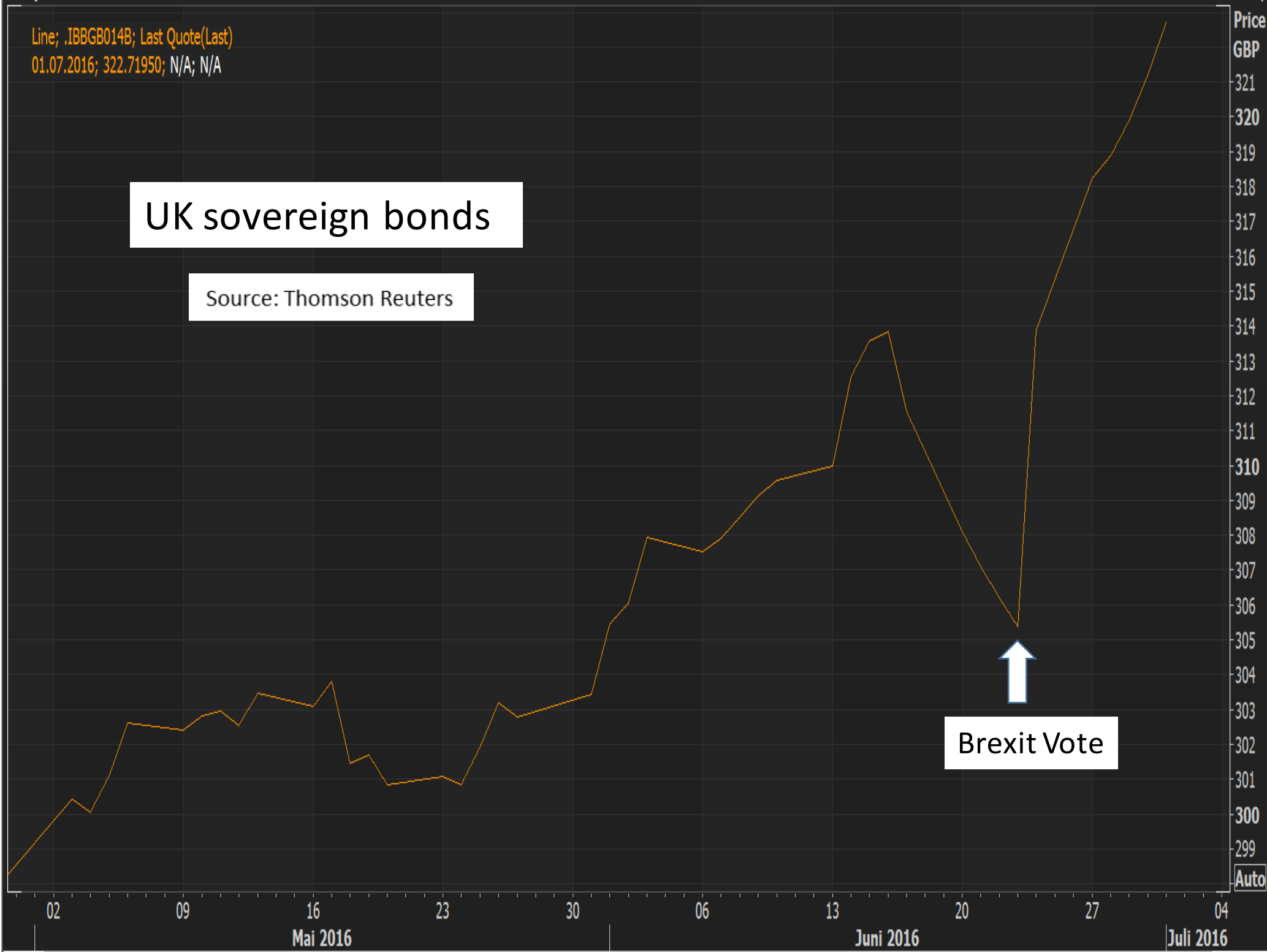
30.04.2016 - 04.07.2016 (GMT)

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01.07.2016; 322.71950; N/A; N/A

UK sovereign bonds

Source: Thomson Reuters



Date: 2016-07-02

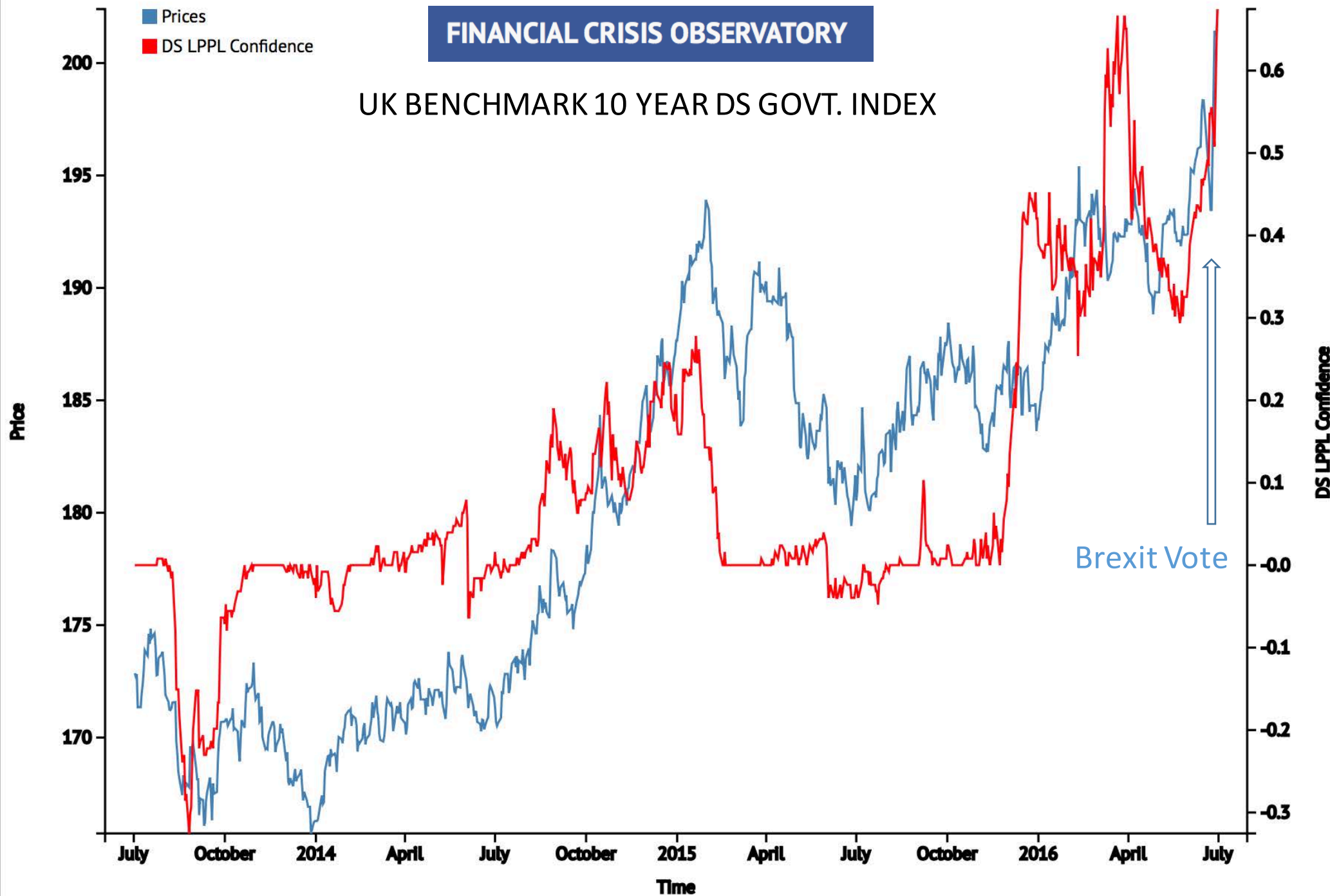
Name: UK BENCHMARK 10 \

Indicator: DS LPPL Confidence

Early bubble warning - long time scale

FINANCIAL CRISIS OBSERVATORY

UK BENCHMARK 10 YEAR DS GOVT. INDEX



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Corporate bonds

Sector Indices	Yearly Return	DS LPPL Trust	DS LPPL Confidence
Positive Bubbles			
iBoxx EUR Financial Services Subordinated Index	11.4%	42.0%	44.7%
iBoxx USD Support Services Index	10.5%	41.1%	45.4%
iBoxx USD Personal Goods Index	10.1%	39.9%	23.2%
iBoxx USD Electronic & Electrical Equipment Index	8.8%	38.8%	35.0%
iBoxx USD Real Estate Index	8.4%	38.7%	38.6%
iBoxx EUR Financial Services Senior Index	4.7%	37.9%	29.6%
iBoxx EUR Financial Services Index	5.1%	35.7%	34.9%
iBoxx USD Pharmaceuticals & Biotechnology Index	10.3%	34.8%	8.2%
Negative Bubbles			
None			

The strong momentum is not only in government bonds. It can be seen across all sectors and regions: 68 of the 82 corporate bond indices that were analyzed, that is 83% of the set, give bubble warning signals.

The negative bubble signal in the oil equipment sector that was shown till March 2016 disappeared due to the very strong rebound in commodities.

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Commodities

Commodities Indices	Yearly Return	DS LPPL Trust	DS LPPL Confidence
Positive Bubbles			
Soybean ER Index	13.6%	20.8%	30.3%
White Sugar ER Index	53.0%	14.4%	38.2%
Agriculture ER Index	0.1%	14.2%	29.5%
Negative Bubbles			
Grains ER Index	4.4%	14.7%	27.2%
Heating Oil ER Index	30.5%	5.7%	9.5%

For the second consecutive month and for the first time since November 2014, we see a positive bubble signals among commodities indices. The Soybean and White Sugar indices for the second month are showing positive bubble signals. In addition, Agriculture index joined them in showing signs of a positive bubble during this month.

Over the last three 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. Only two indices of the 38 analyzed show bubble signals. The two are the Grains and Heating Oil indices. In addition, the negative bubble signals in the Platinum and Silver indices that were shown last month disappeared.

The S&P Goldman Sachs Commodity Index (next page) shows that the remarkable rebound in commodities that started last February is continuing but slowing down.

Period 1D 3D 5D 10D 1M 3M 6M 1Y 3Y 5Y

Comparisons 

Source: Financial Times



Jul 01	-5.40%	+4.03%	+3.83%	+13.91%	+3.12%	+1.29%
	Jan 2016	Feb 2016	Mar 2016	Apr 2016	May 2016	Jun 2016

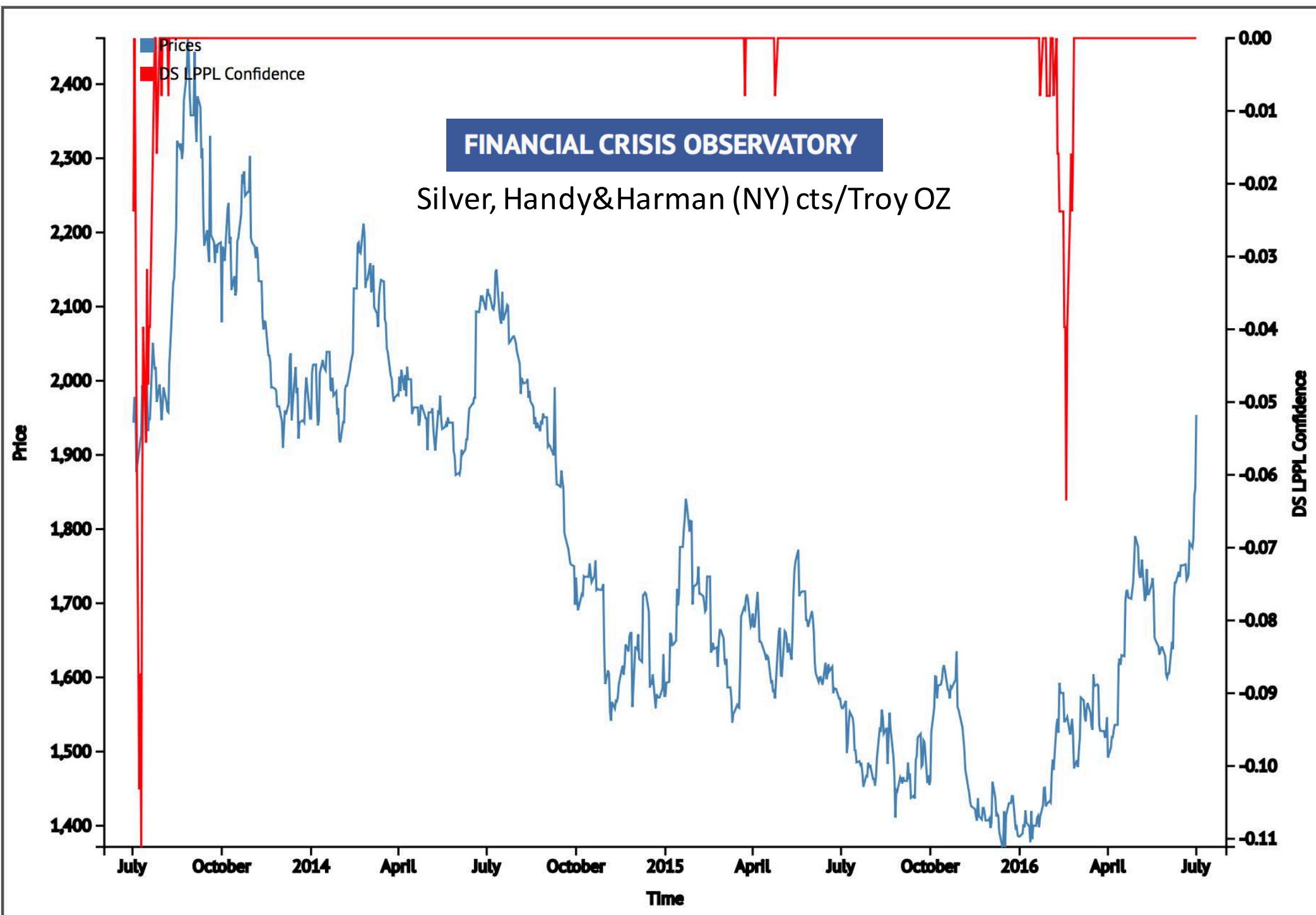
S&P GSCI Index Spot summary

Date: 2016-07-02

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
Danish Krone/Euro	0.2%	25.4%	15.2%
Romanian New Leu/Euro	-0.9%	13.7%	14.0%
Japanese Yen/Swiss Franc	23.8%	10.2%	21.2%
Iceland Krona/Euro	7.9%	9.2%	31.6%
Japanese Yen/Euro	19.4%	5.6%	17.6%

For the fourth consecutive month, there is a strong positive bubble signal in the Japanese yen. Only five currency pairs out of 95 analyzed show bubble signals, two of them are crosses with the Japanese Yen. This may be contributed to the “safe-heaven” status of the Japanese Yen, which increased even further in the aftermath of the Brexit vote.

For the third consecutive month, a strengthening bubble signal on the Danish Krone/Euro exchange rate is still continuing. This clearly explains the motivation behind the Danish Central Bank intervention in the currency markets for the third consecutive month and for the first time since February 2015 to preserve the Krone to Euro peg.

Finally, the signs of a bubble on the USD/Norwegian Krone exchange rate that was reported last month disappeared. This can further confirm the results on commodities. In the last three reports, we clearly saw that the bubble signals in the currencies of commodities exporting countries disappeared. This is confirmed by this report.

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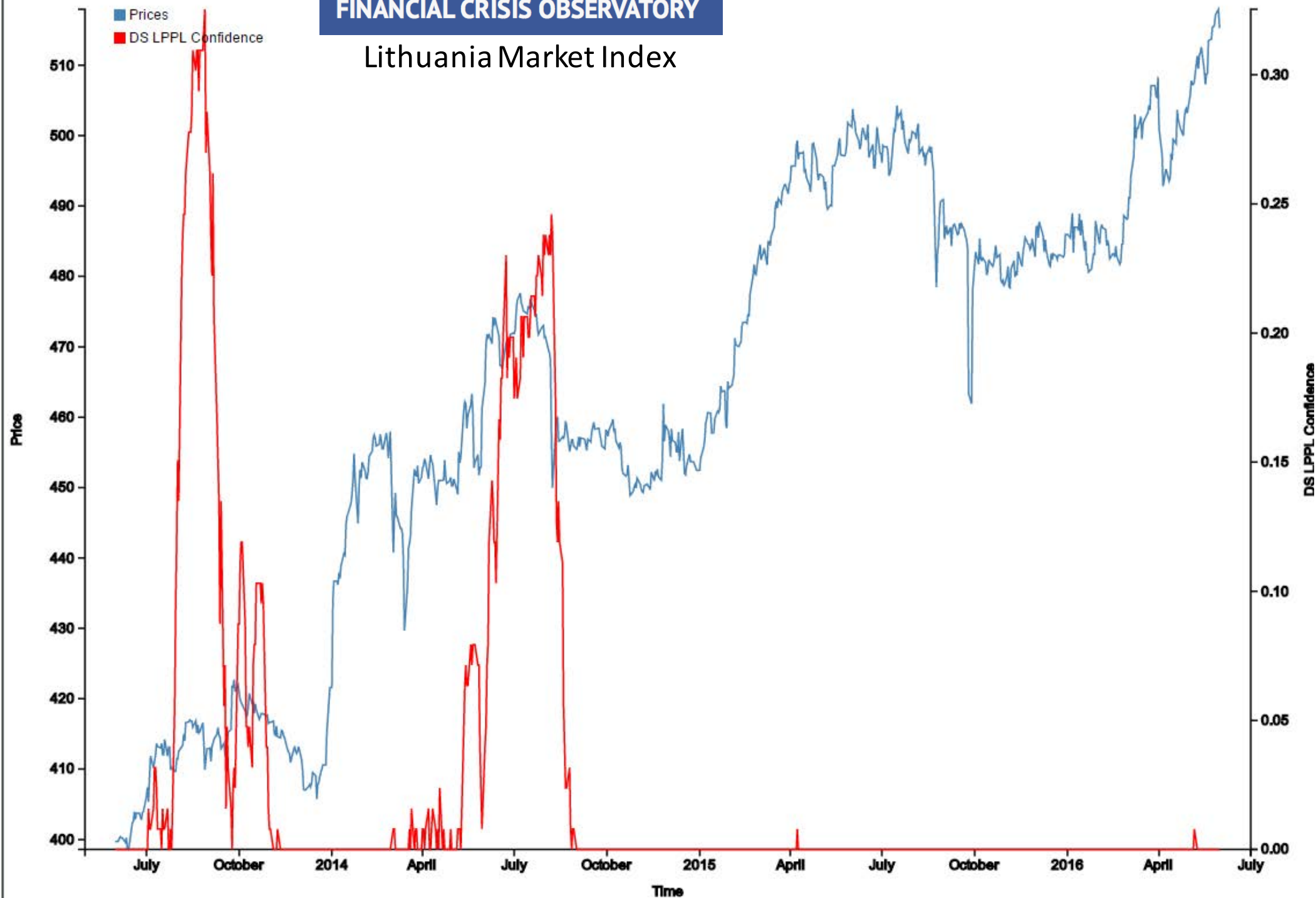
Stocks country indices

Equities Countries Indices	Yearly Return	DS LPPL Trust	DS LPPL Confidence	Country
OMX Vilnius_GI	2.03%	23.9%	17.02%	Lithuania
Karachi SE 100 Index	7.38%	13.1%	20.5%	Pakistan
Vietnam Index	5.71%	9.8%	11.72%	Vietnam
Negative Bubbles				
None				
Equities Sector Indices	Yearly Return	DS LPPL Trust	DS LPPL Confidence	
Positive Bubbles				
DAXsubsector All Private Equity & Venture Capital Index	14.75%	8.4%	12.9%	
S&P 500 Food Products (Industry)	18.38%	7.09%	9.30%	
Negative Bubbles				
None				

There is no general trend in equities. The most interesting result was found in the Lithuania stock market index, which is showing sign of a positive bubble for the second consecutive month. In addition, New Zealand, Hungary, Estonia, and Morocco stock market indices, which were showing signs of a positive bubble over the last two months disappeared.

FINANCIAL CRISIS OBSERVATORY

Lithuania Market Index



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Single Stocks

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What is this?

For 856 stocks, we calculate the bubble warning indicators as well as two newly-developed financial strength indicators, which indicate the fundamental value of the stock and the growth capability respectively.

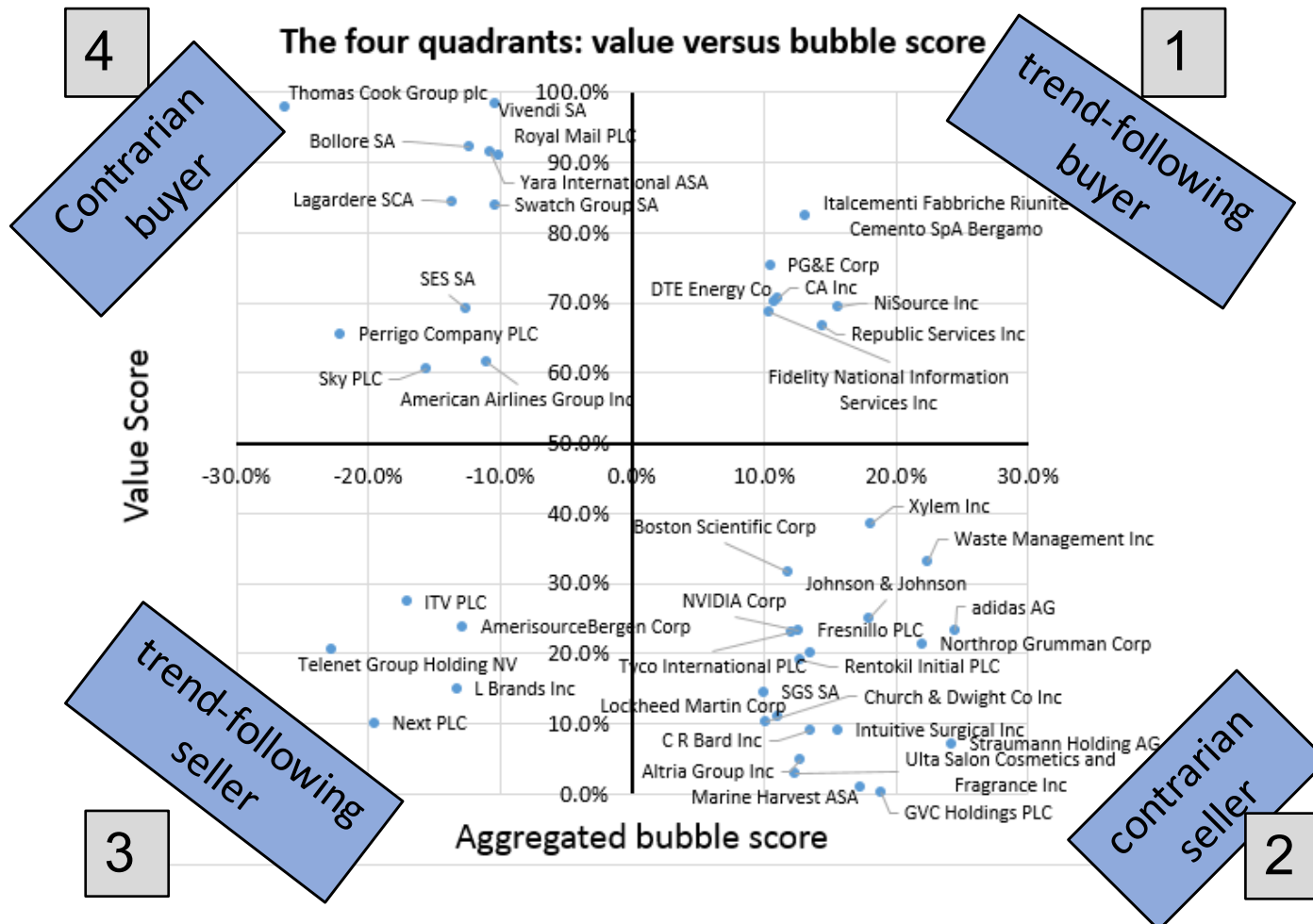
The stocks are the constituents of the Stoxx Europe 600, the S&P 500 and the Nasdaq 100 indices. From these, all doubles and stocks with incomplete data are removed. Because our financial strength indicators are specifically designed for corporates, all financial institutions are taken out of the set 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. PG&E Corp);
2. [Quadrant 2](#): Stocks with a strong positive bubble score 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. ITV PLC);
4. [Quadrant 4](#): Stocks with strong negative bubble score and a strong financial strength (e.g. Thomas Cook Group 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%.

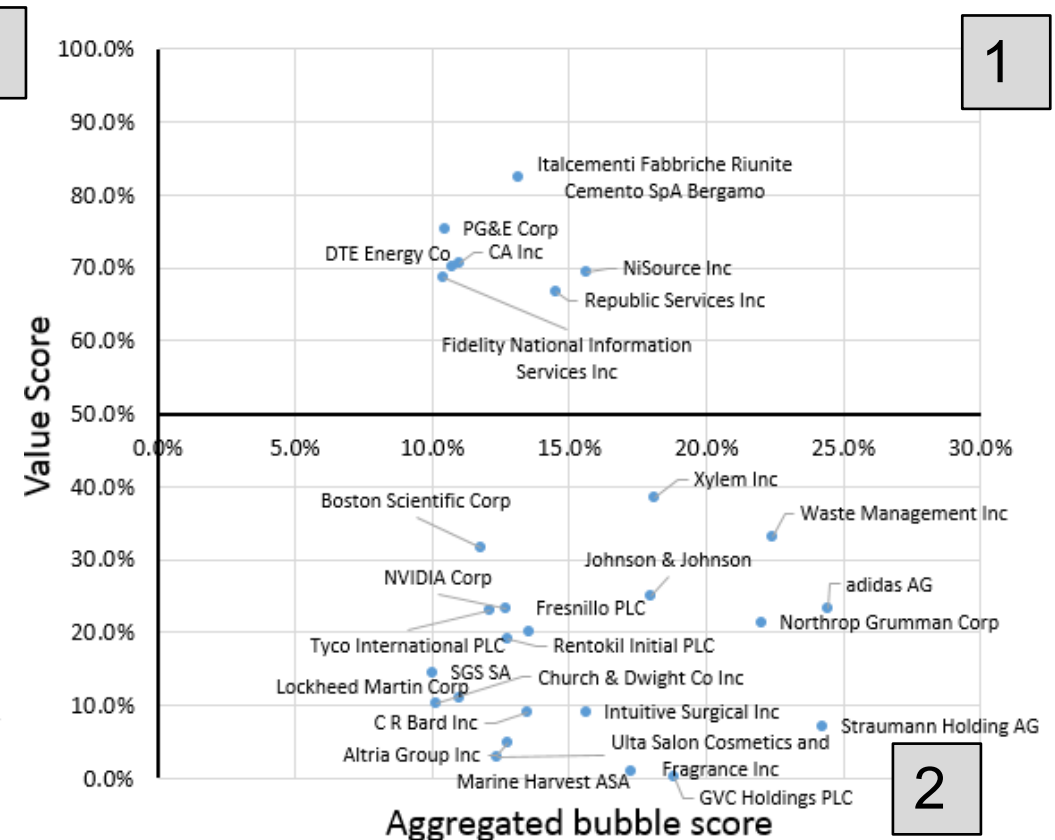
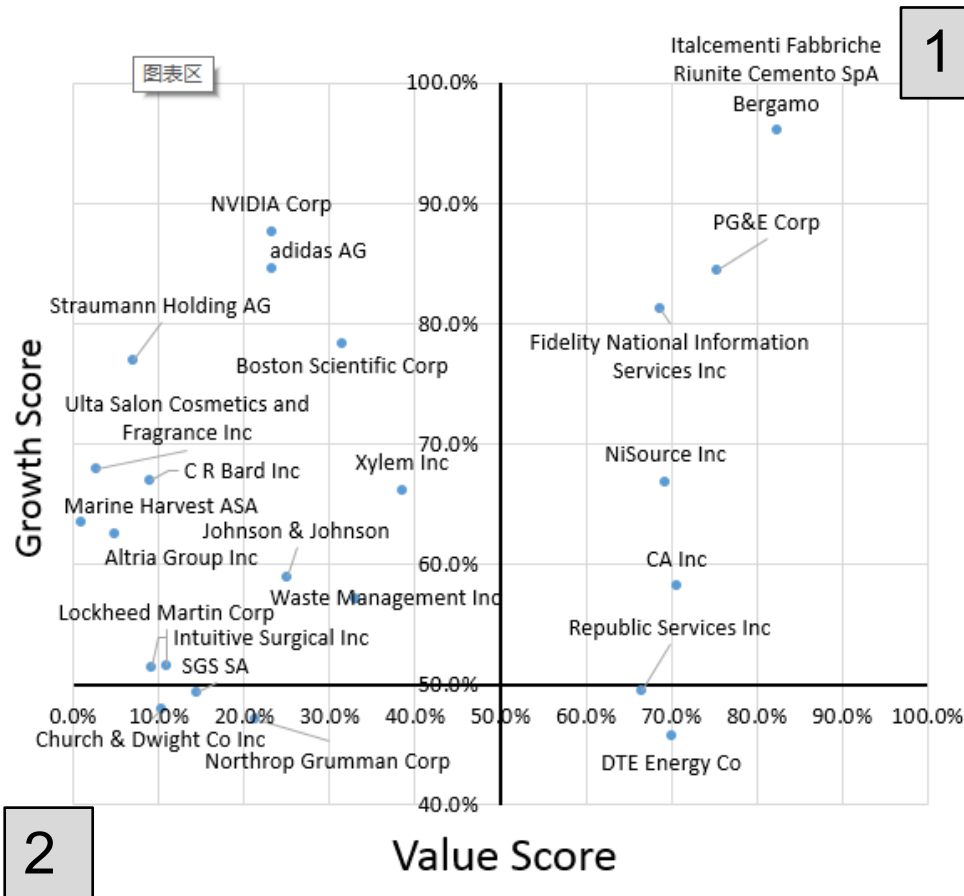
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Each quadrant has its own specs:

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.**

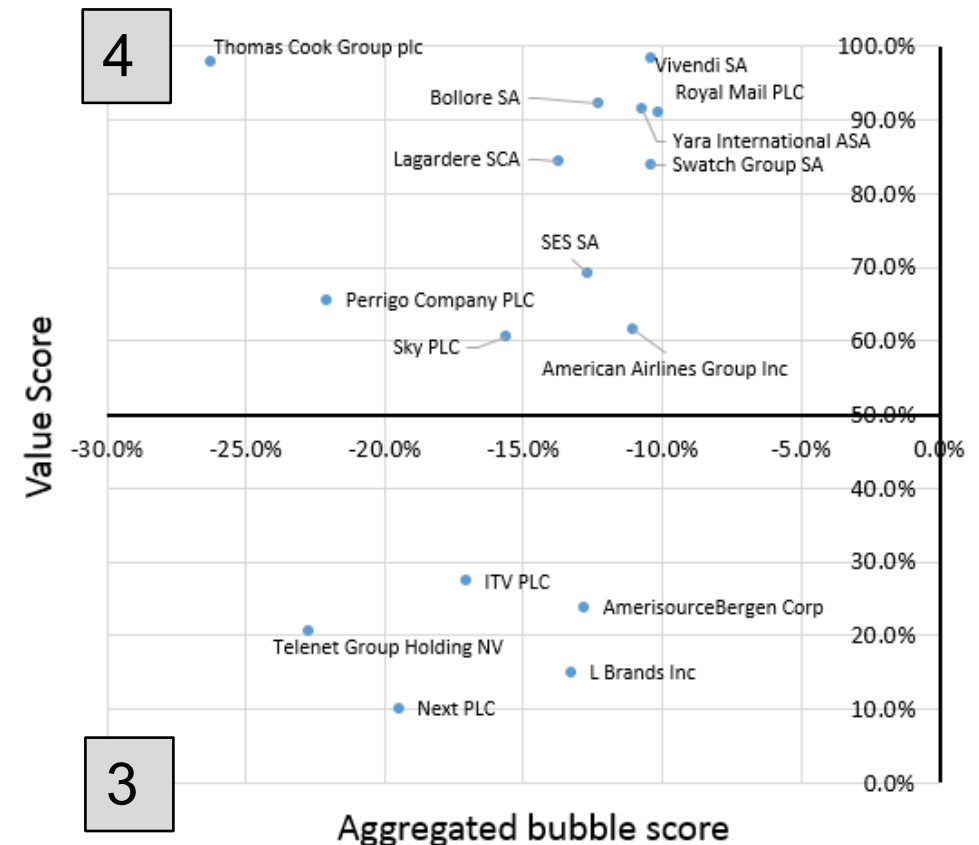
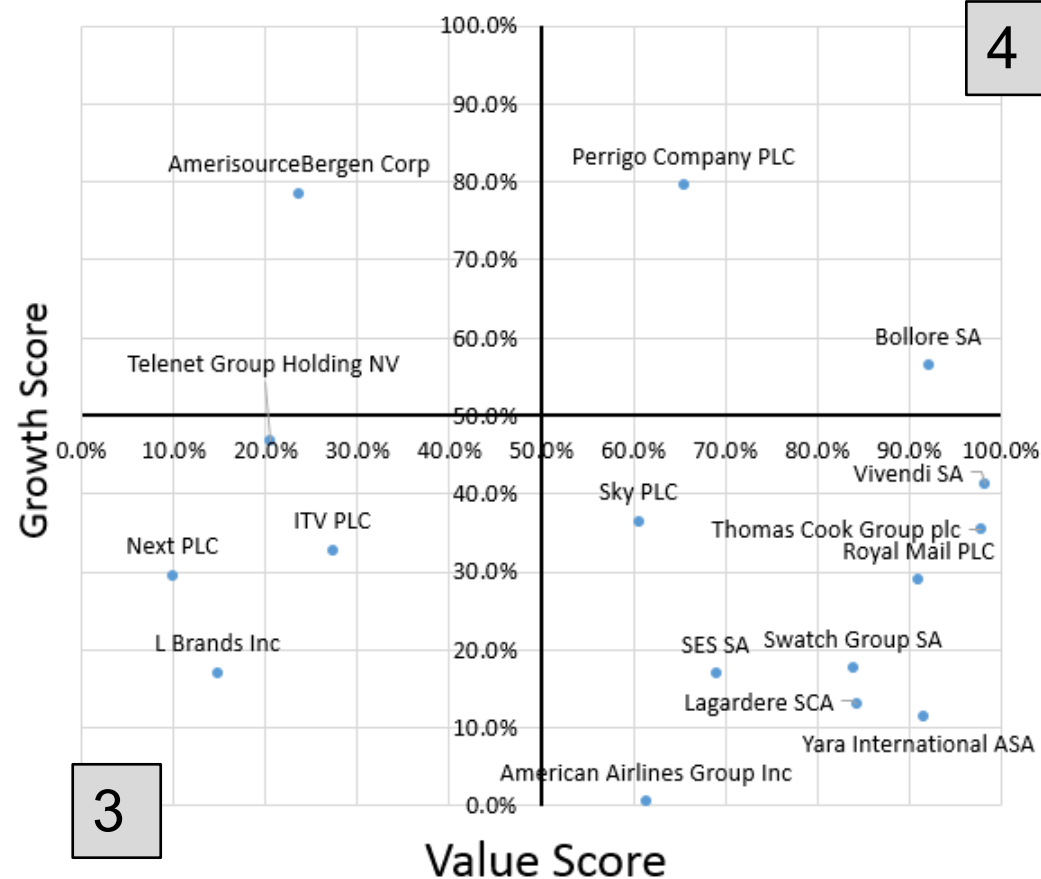
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Quadrant 1 and 2 stocks: strong positive bubble signals with strong respectively weak fundamentals



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



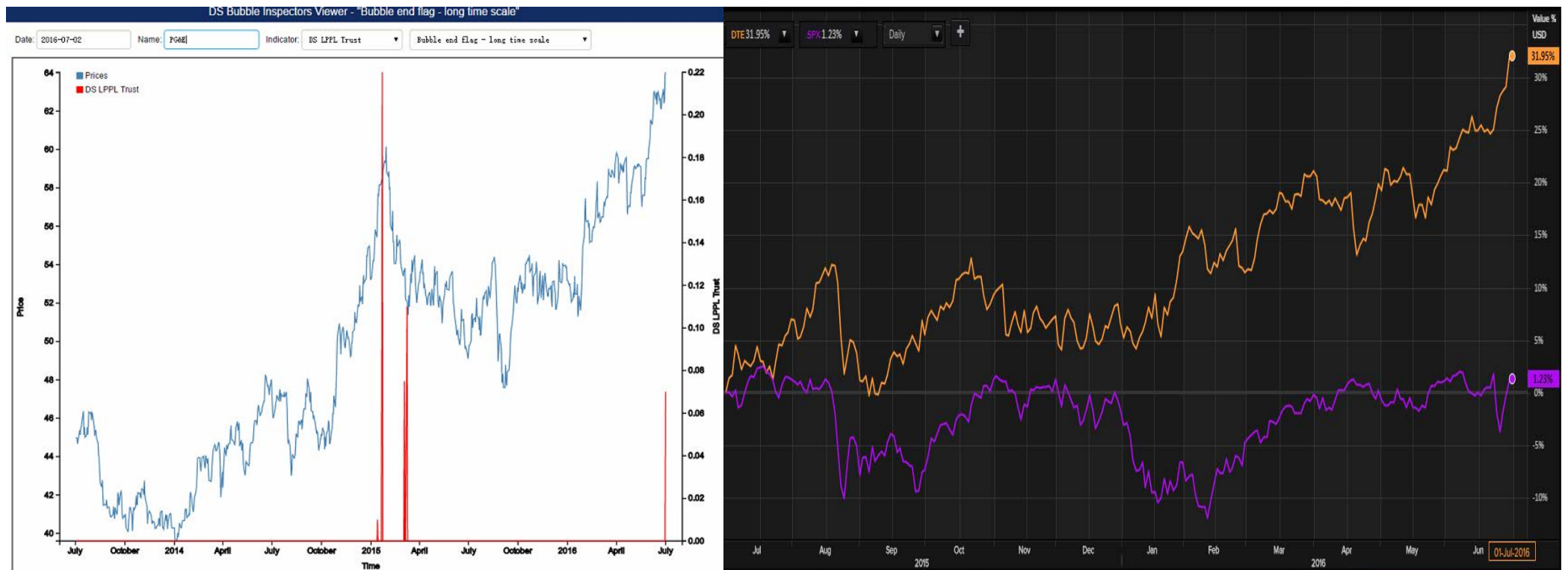
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Quadrant 1 stocks: strong positive bubble signals with strong fundamentals

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	11.3%	11.0%	70.7%	58.2%
Italcementi Fabbriche Riunite Cemento SpA Bergamo	Italy	Materials	Materials	73.8%	13.2%	82.4%	96.0%
DTE Energy Co	United States of America	Utilities	Utilities	31.7%	10.8%	70.1%	45.7%
Fidelity National Information Services Inc	United States of America	Information Technology	Software & Services	18.2%	10.4%	68.7%	81.2%
NiSource Inc	United States of America	Utilities	Utilities	48.5%	15.6%	69.4%	66.8%
PG&E Corp	United States of America	Utilities	Utilities	29.4%	10.5%	75.4%	84.5%
Republic Services Inc	United States of America	Industrials	Commercial & Professional Services	30.1%	14.5%	66.6%	49.4%

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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 30%.

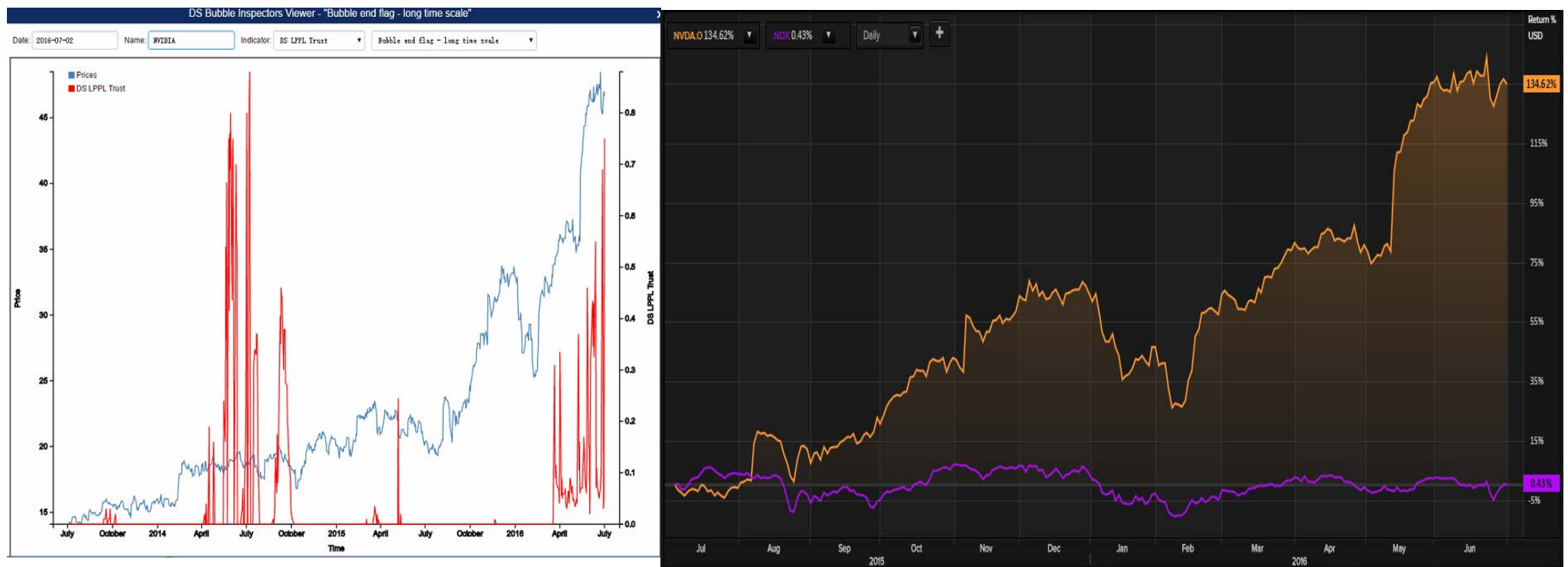
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Quadrant 2 stocks: strong positive bubble signals with weak fundamentals

Company Name	Country of Headquarters	GICS Sector Name	GICS Industry Group Name	Yearly Return	Bubble Score	Value Score	Growth Score
Intuitive Surgical Inc	United States of America	Health Care	Health Care Equipment & Services	36.1%	15.6%	9.1%	51.4%
NVIDIA Corp	United States of America	Information Technology	Semiconductors & Semiconductor Equipment	130.4%	12.7%	23.2%	87.6%
Ulta Salon Cosmetics and Fragrance Inc	United States of America	Consumer Discretionary	Retailing	56.8%	12.3%	2.8%	67.9%
adidas AG	Germany	Consumer Discretionary	Consumer Durables & Apparel	82.4%	24.4%	23.4%	84.6%
Fresnillo PLC	Mexico	Materials	Materials	138.1%	13.5%	20.1%	39.1%
GVC Holdings PLC	Isle of Man	Consumer Discretionary	Consumer Services	24.4%	18.8%	0.1%	23.9%
Marine Harvest ASA	Norway	Consumer Staples	Food, Beverage & Tobacco	54.1%	17.3%	0.9%	63.4%
Rentokil Initial PLC	United Kingdom	Industrials	Commercial & Professional Services	29.4%	12.7%	19.0%	36.3%
SGS SA	Switzerland	Industrials	Commercial & Professional Services	29.9%	10.0%	14.4%	49.3%
Straumann Holding AG	Switzerland	Health Care	Health Care Equipment & Services	47.6%	24.3%	7.0%	77.0%
C R Bard Inc	United States of America	Health Care	Health Care Equipment & Services	36.1%	13.5%	9.0%	66.9%
Boston Scientific Corp	United States of America	Health Care	Health Care Equipment & Services	31.3%	11.8%	31.5%	78.3%
Church & Dwight Co Inc	United States of America	Consumer Staples	Household & Personal Products	24.4%	10.1%	10.3%	47.9%
Johnson & Johnson	United States of America	Health Care	Pharmaceuticals, Biotechnology & Life Sciences	23.2%	18.0%	25.0%	58.9%
Lockheed Martin Corp	United States of America	Industrials	Capital Goods	31.9%	11.0%	11.0%	51.5%
Altria Group Inc	United States of America	Consumer Staples	Food, Beverage & Tobacco	40.4%	12.7%	4.9%	62.5%
Northrop Grumman Corp	United States of America	Industrials	Capital Goods	38.8%	22.0%	21.4%	47.1%
Tyco International PLC	Ireland; Republic of	Industrials	Commercial & Professional Services	9.7%	12.1%	22.9%	16.8%
Waste Management Inc	United States of America	Industrials	Commercial & Professional Services	42.5%	22.4%	33.1%	57.1%
Xylem Inc	United States of America	Industrials	Capital Goods	21.3%	18.1%	38.6%	66.1%

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Quadrant 2 stocks: strong positive bubble signals with weak fundamentals, example NVIDIA 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. The right graph shows the outperformance of the stock over the last year (orange) with respect to the Nasdaq 100 benchmark (purple), it is almost 134% up. The extremely high return with strong positive bubble signals and weak fundamentals indicate a high probability of correction in the following time periods.

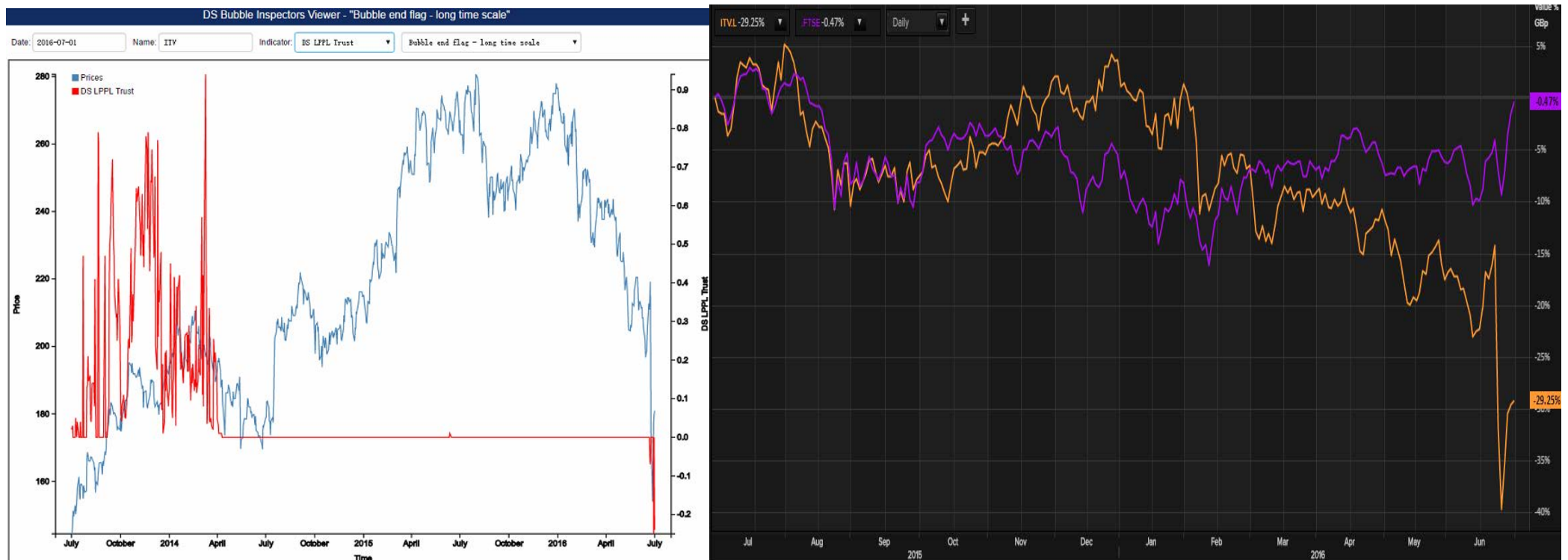
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Quadrant 3 stocks: strong negative bubble signals with weak fundamentals

Company Name	Country of Headquarters	GICS Sector Name	GICS Industry Group Name	Yearly Return	Bubble Score	Value Score	Growth Score
Telenet Group Holding NV	Belgium	Consumer Discretionary	Media	-17.7%	-22.7%	20.6%	46.7%
ITV PLC	United Kingdom	Consumer Discretionary	Media	-32.7%	-17.0%	27.3%	32.7%
Next PLC	United Kingdom	Consumer Discretionary	Retailing	-34.4%	-19.5%	9.9%	29.4%
AmerisourceBergen Corp	United States of America	Health Care	Health Care Equipment & Services	-26.4%	-12.8%	23.7%	78.5%
L Brands Inc	United States of America	Consumer Discretionary	Retailing	-22.1%	-13.3%	14.8%	17.1%

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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 FTSE index benchmark (purple), it is almost -29% down. We can see that a clear correction started recently. However this correction may not be sustainable due to the weak fundamentals.

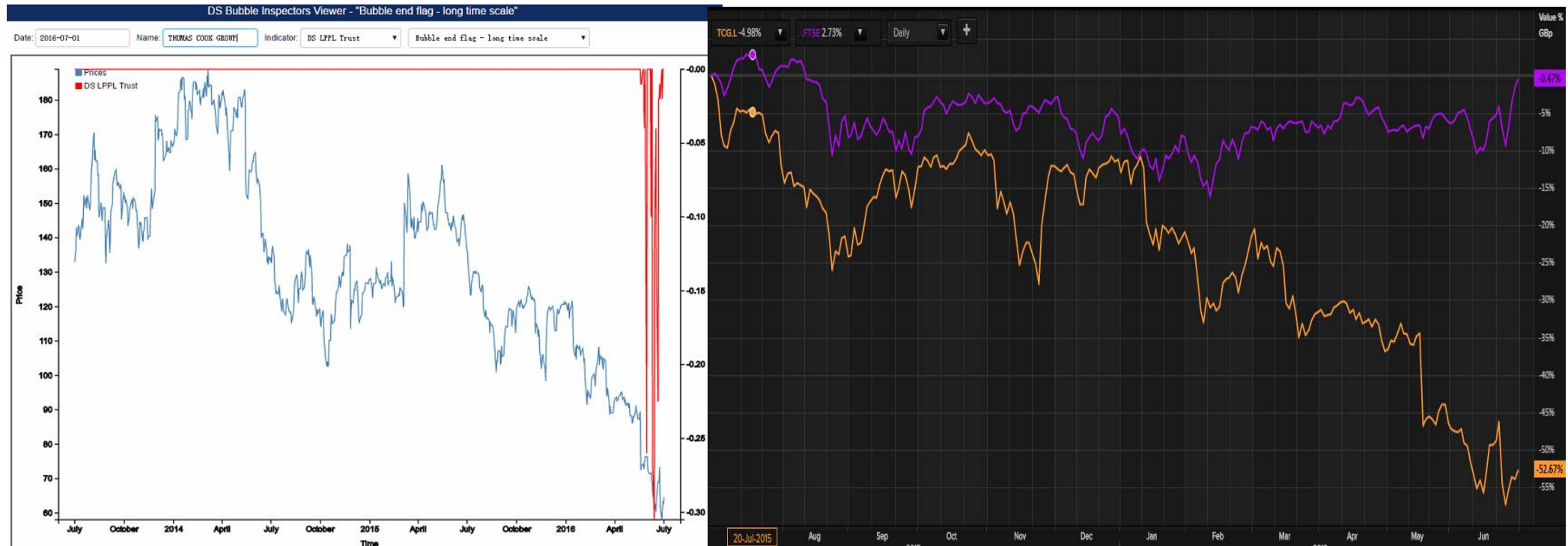
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Quadrant 4 stocks: strong negative bubble signals with strong fundamentals

Company Name	Country of Headquarters	GICS Sector Name	GICS Industry Group Name	Yearly Return	Bubble Score	Value Score	Growth Score
American Airlines Group Inc	United States of America	Industrials	Transportation	-27.0%	-11.1%	61.4%	0.5%
Vivendi SA	France	Consumer Discretionary	Media	-27.1%	-10.4%	98.2%	41.2%
Bollore SA	France	Industrials	Transportation	-36.5%	-12.3%	92.2%	56.4%
Lagardere SCA	France	Consumer Discretionary	Media	-26.7%	-13.7%	84.3%	13.1%
SES SA	Luxembourg	Consumer Discretionary	Media	-36.2%	-12.7%	69.0%	16.9%
Yara International ASA	Norway	Materials	Materials	-35.8%	-10.7%	91.6%	11.4%
Royal Mail PLC	United Kingdom	Industrials	Transportation	-3.2%	-10.1%	91.1%	28.9%
Swatch Group SA	Switzerland	Consumer Discretionary	Consumer Durables & Apparel	-23.0%	-10.4%	84.0%	17.6%
Sky PLC	United Kingdom	Consumer Discretionary	Media	-19.9%	-15.6%	60.6%	36.4%
Thomas Cook Group plc	United Kingdom	Consumer Discretionary	Consumer Services	-54.0%	-26.3%	97.9%	35.4%
Perrigo Company PLC	Ireland; Republic of	Health Care	Pharmaceuticals, Biotechnology & Life Sciences	-51.0%	-22.1%	65.5%	79.6%

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Quadrant 4 stocks: strong negative bubble signals with strong fundamentals, example Thomas Cook Group 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 -52%. We expect a following correction, 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

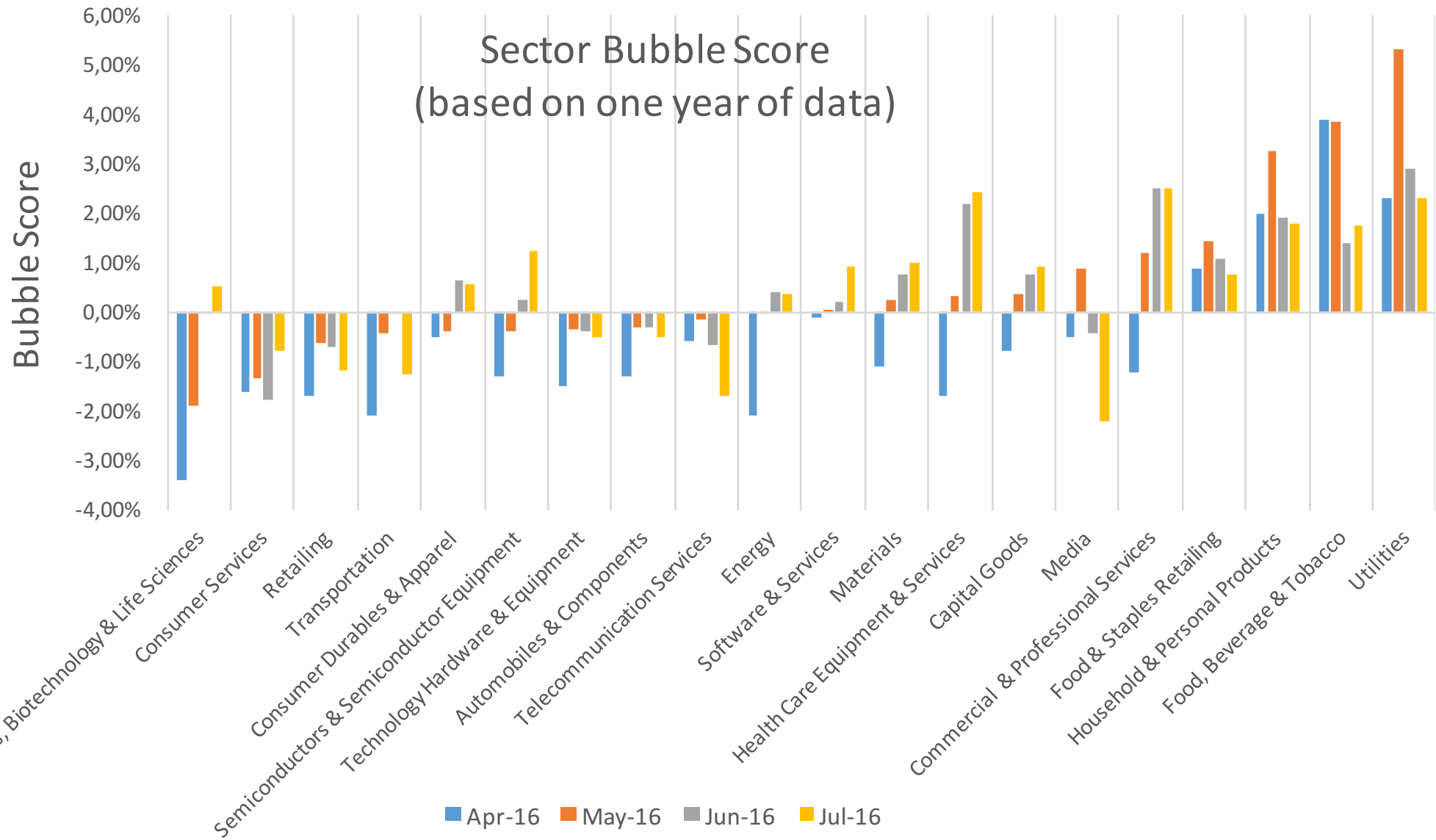
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GICS Industry Group Name	Yearly Return		Bubble Score		Value Score		Growth Score	
	July 1st	June 1st	July 1st	June 1st	July 1st	June 1st	July 1st	June 1st
Pharmaceuticals, Biotechnology & Life Sciences	-2.9%	-2.5%	0.5%	0.0%	37.8%	38.5%	55.9%	54.5%
Consumer Services	-6.8%	-4.6%	-0.8%	-1.8%	41.7%	44.5%	53.2%	49.0%
Retailing	-10.9%	-8.1%	-1.2%	-0.7%	40.0%	42.6%	49.9%	50.1%
Transportation	-6.8%	-4.3%	-1.3%	0.0%	60.4%	61.2%	49.3%	51.3%
Consumer Durables & Apparel	-7.8%	-0.7%	0.6%	0.7%	50.1%	52.1%	58.6%	60.0%
Semiconductors & Semiconductor Equipment	-0.3%	-6.1%	1.2%	0.2%	50.8%	52.5%	50.0%	50.8%
Technology Hardware & Equipment	-7.3%	-12.3%	-0.5%	-0.4%	54.3%	55.5%	40.8%	39.3%
Automobiles & Components	-24.2%	-17.1%	-0.5%	-0.3%	70.8%	72.4%	69.2%	71.0%
Telecommunication Services	-11.6%	-10.6%	-1.7%	-0.7%	63.8%	63.5%	57.3%	56.3%
Energy	-10.4%	-18.1%	0.4%	0.4%	60.0%	54.6%	22.8%	22.1%
Software & Services	8.8%	9.9%	0.9%	0.2%	39.3%	37.7%	63.0%	61.4%
Materials	-2.9%	-7.7%	1.0%	0.8%	57.4%	57.0%	47.8%	47.2%
Health Care Equipment & Services	10.5%	7.5%	2.4%	2.2%	38.7%	37.4%	68.0%	70.3%
Capital Goods	-1.6%	-3.0%	0.9%	0.8%	50.6%	50.6%	48.1%	47.4%
Media	-11.3%	-7.3%	-2.2%	-0.4%	51.8%	48.7%	52.7%	57.1%
Commercial & Professional Services	-0.3%	0.4%	2.5%	2.5%	40.9%	38.2%	48.9%	48.0%
Food & Staples Retailing	1.3%	0.0%	0.7%	1.1%	54.8%	55.8%	47.8%	48.8%
Household & Personal Products	16.5%	9.8%	1.8%	1.9%	17.4%	17.2%	46.9%	49.9%
Food, Beverage & Tobacco	18.3%	11.1%	1.7%	1.4%	31.8%	34.2%	49.6%	47.9%
Utilities	14.7%	3.8%	2.3%	2.9%	73.1%	73.0%	40.5%	41.2%

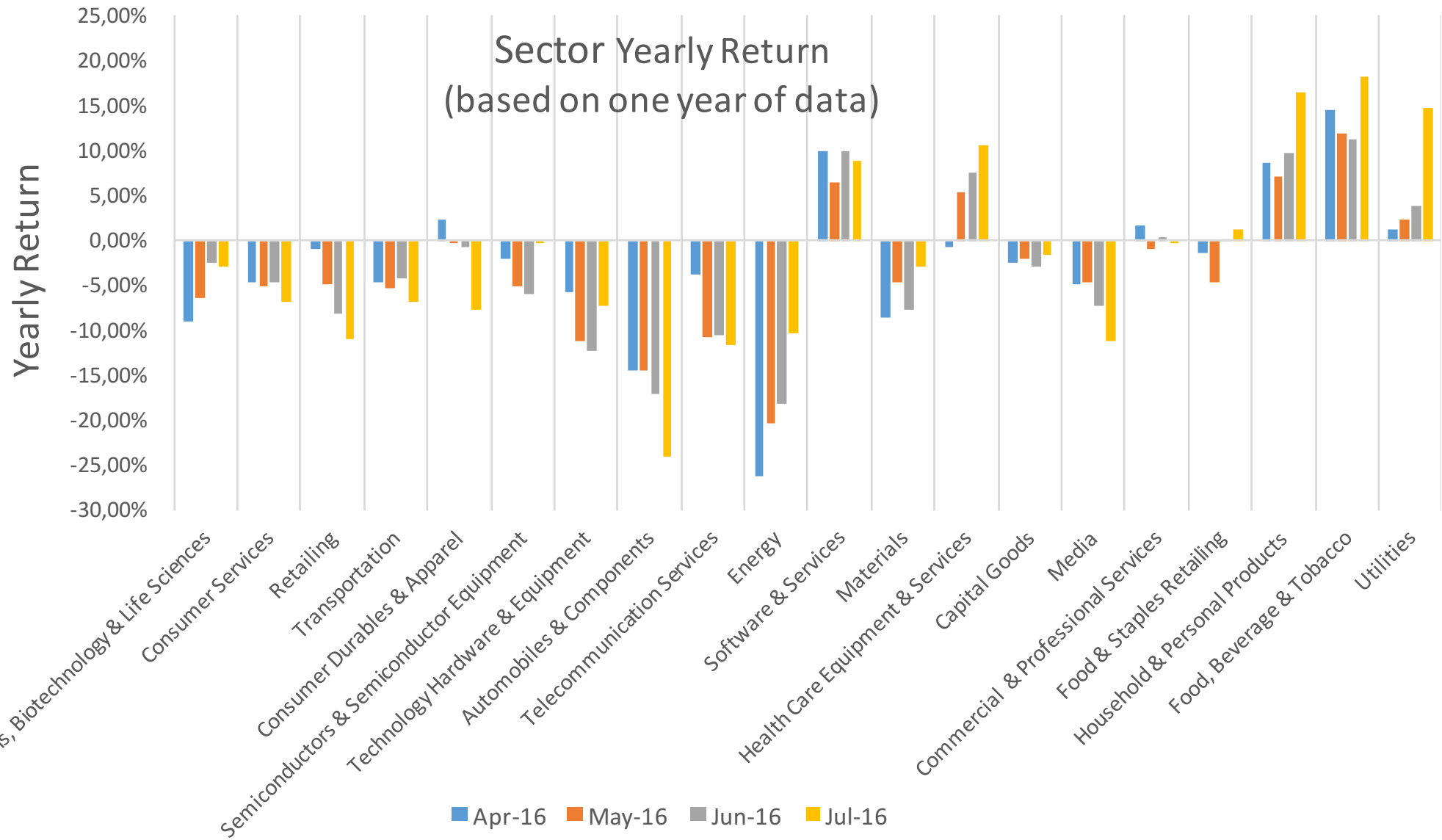
By aggregating the calculations that were done at the single stock level in the previous section, we can see the bubble, value and growth score at the sector level. The results in the previous report are also presented here for comparison.

- The sector *Automobiles & Components* we recommended in last two months still maintain a very strong value score with a negative bubble score, hence the investment opportunity still exists; The sector *Telecommunication Services* has a significant increase in negative bubble score, while the value score is still at a high level, showing a great contrarian long opportunity in this sector.
- The sector *Media*, *Retailing*, *Transportation* have high negative bubble scores with the drop of stock prices, due to the weak economic expectations due to Brexit.

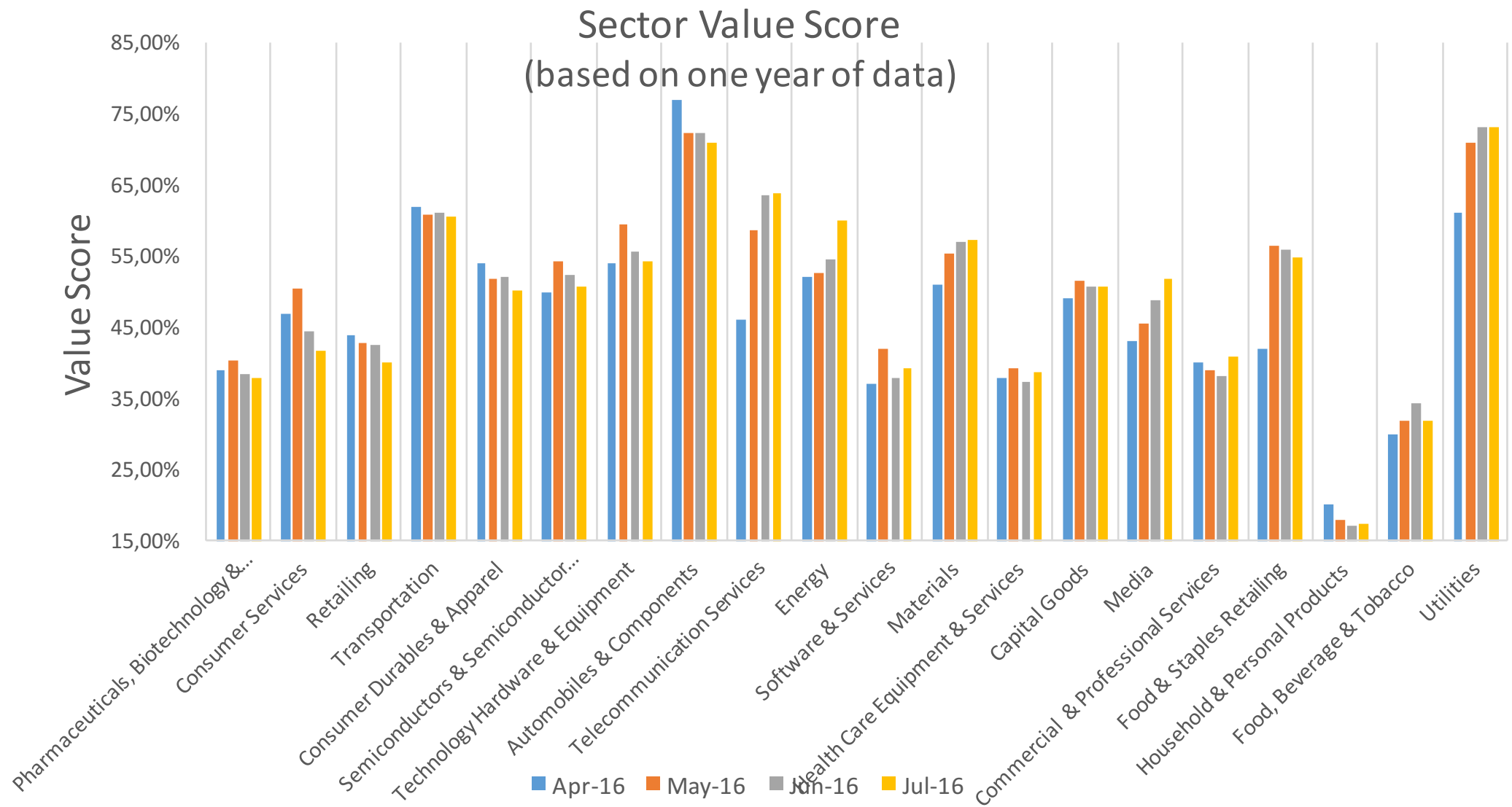
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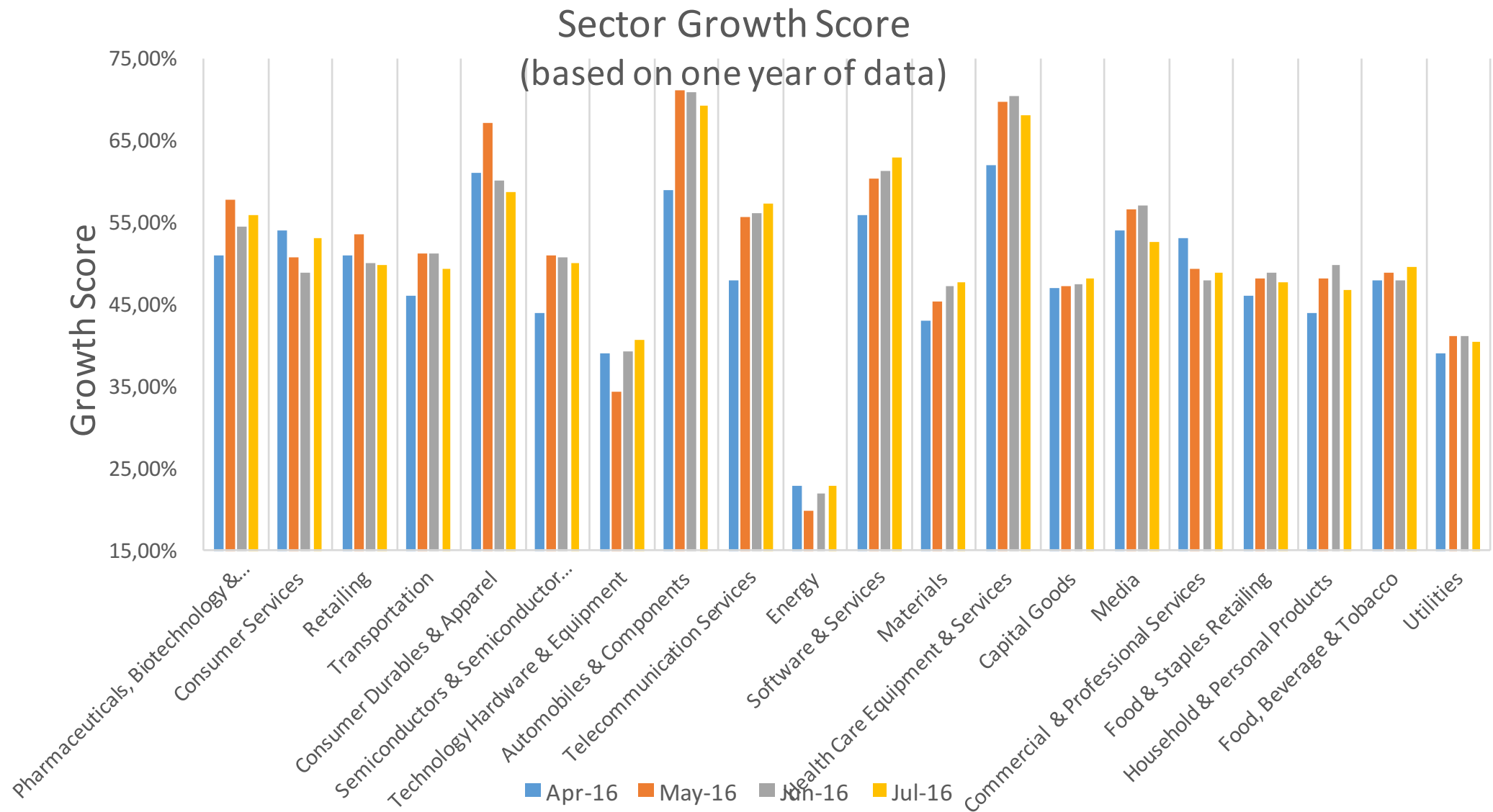
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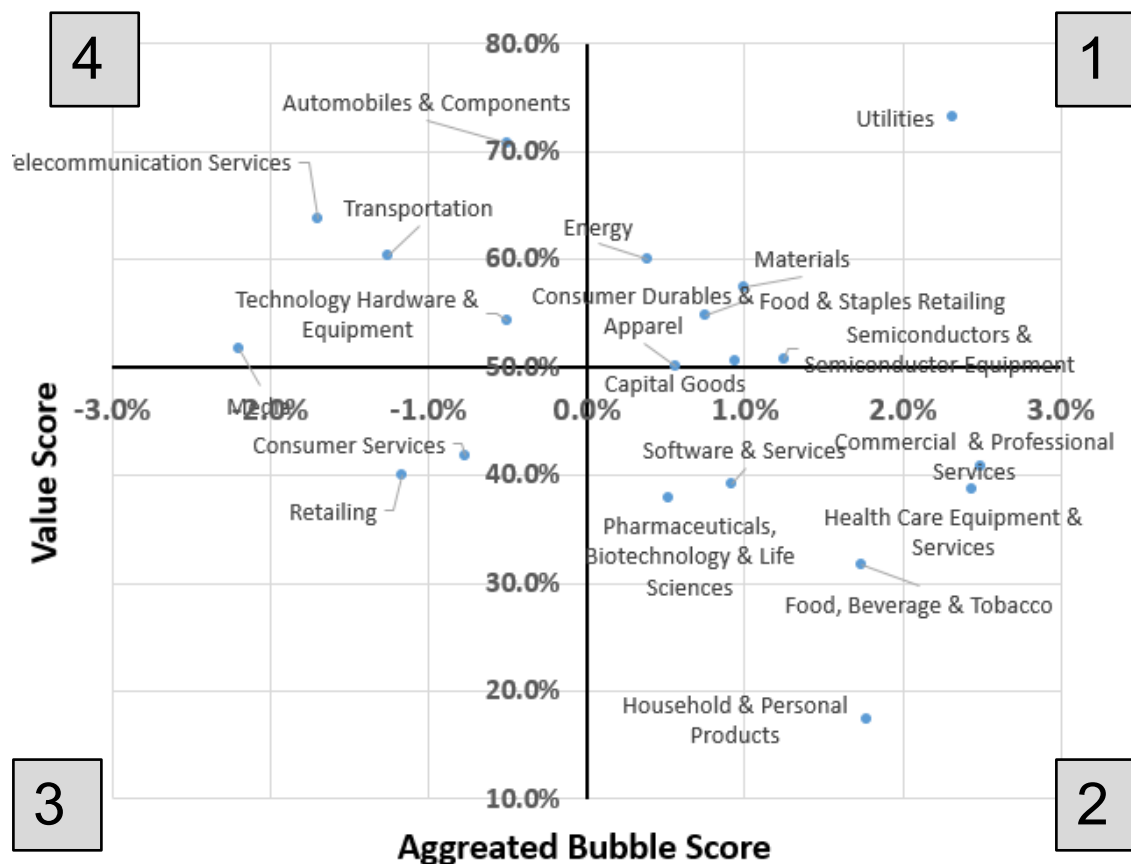
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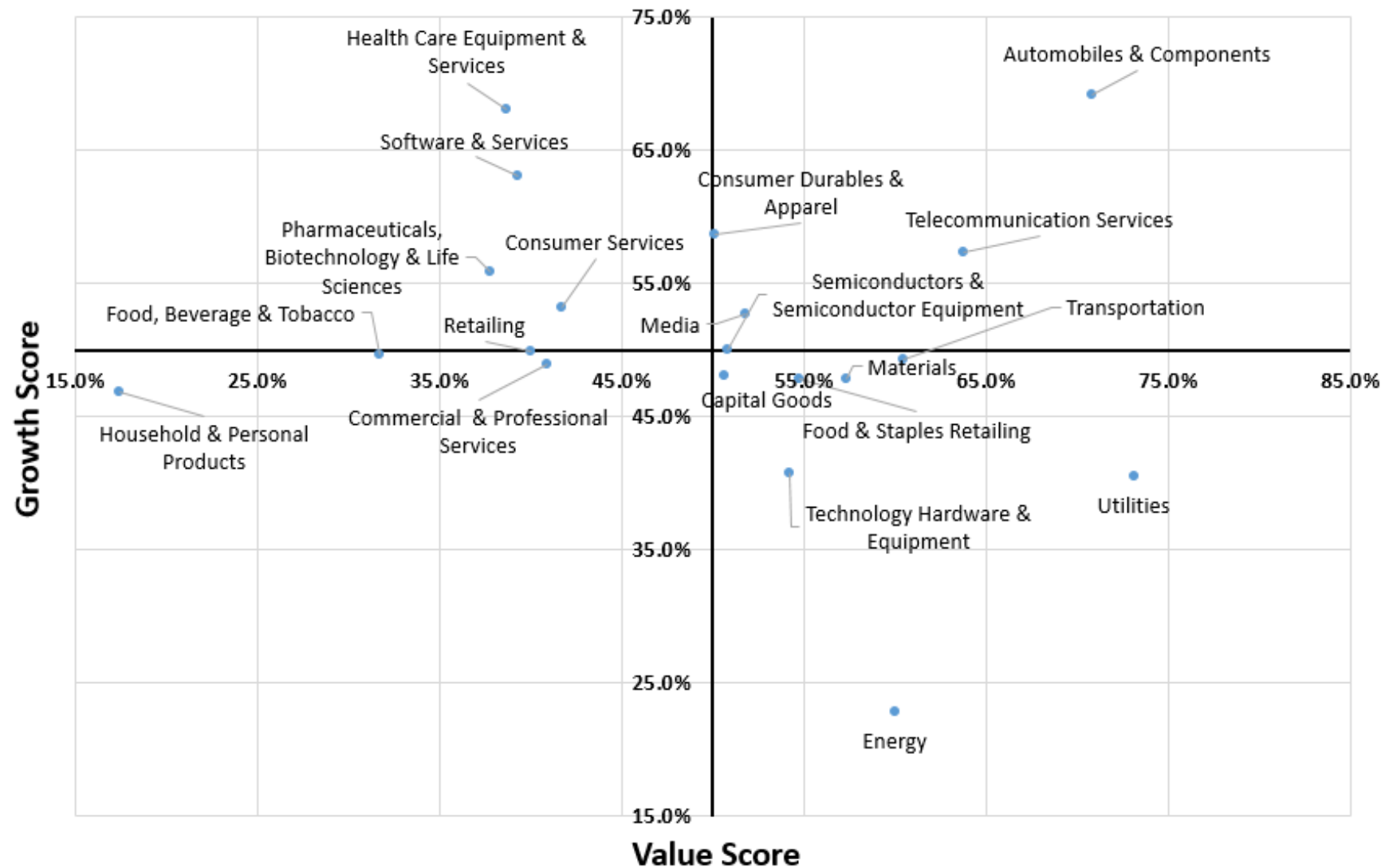


By plotting the value score versus the aggregated bubble score, we can also divide the sectors into four quadrants*:

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.

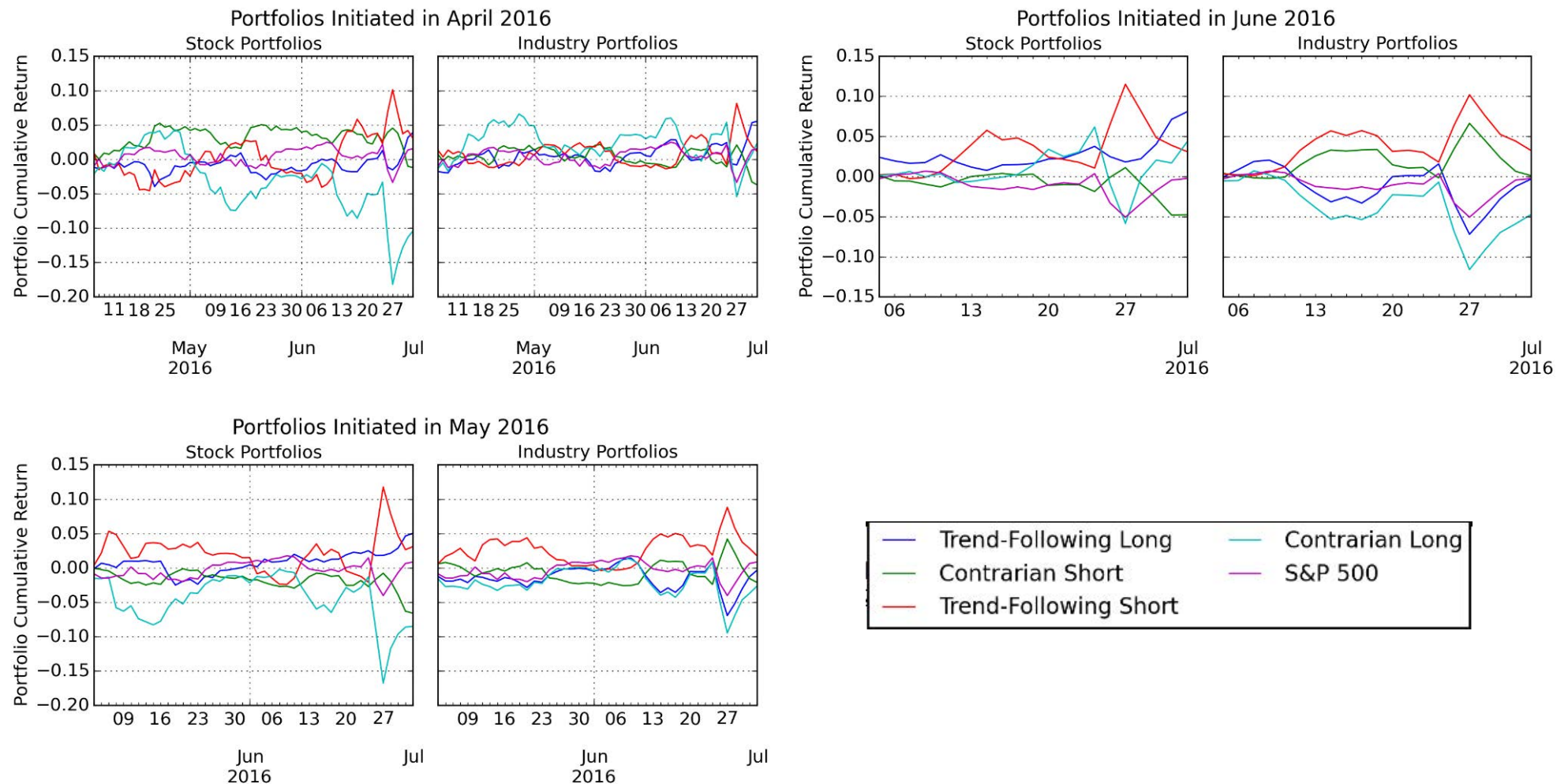
For individual stocks that we identified in the 4 quadrants, we constructed 4 portfolios based on the 4 quadrants defined in the last report. Each portfolio consists of all the stocks listed in the corresponding quadrant.

- (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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We find that Trend-Following Short portfolios perform very well among all type of portfolios, due to the recent drawdown of the market. At the same time, Trend-Following Long portfolios also have a good performance among Stock Portfolios, while most of Contrarian portfolios under-perform compared to others, which indicates 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>