

# **The FCO Cockpit – Global Bubble Status Report**

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Chair of Entrepreneurial Risk

December 1st, 2016

# The FCO Cockpit – Global Bubble Status December 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 863 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.

<sup>+</sup> 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>)

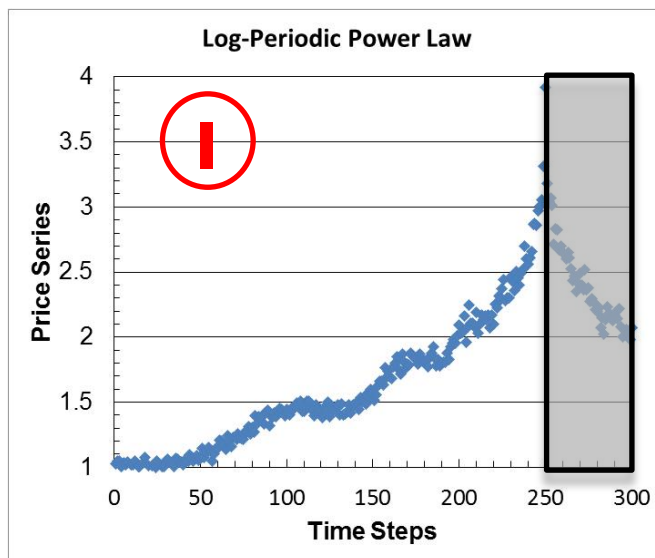
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*How does it work?*

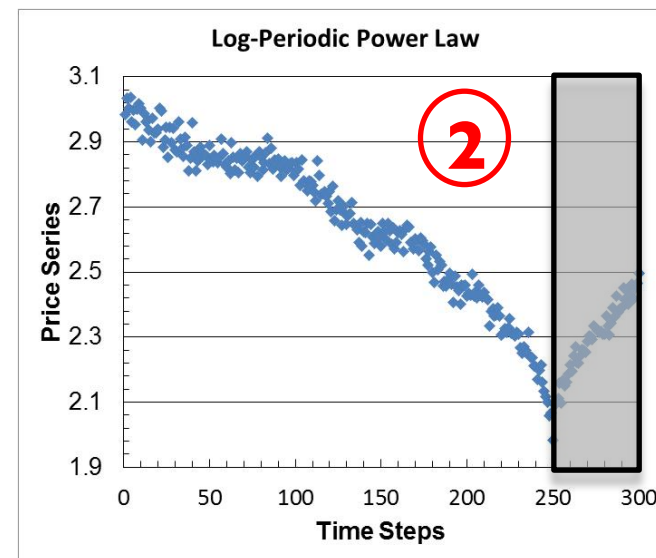
We use the Log-Periodic Power Law Singular (LPPLS) model to hunt for the distinct fingerprint of **Bubbles**:

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**

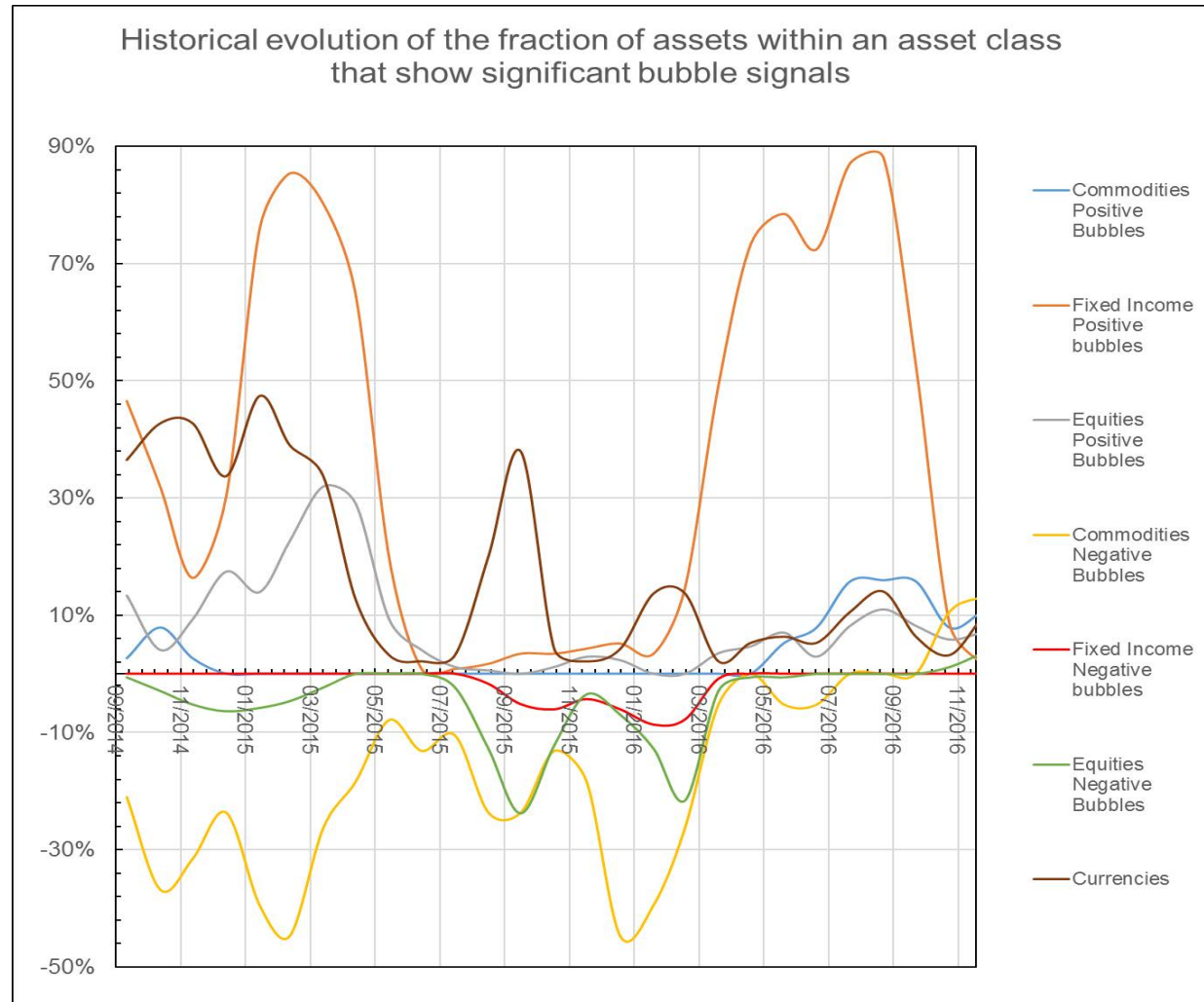


A **negative bubble** when  
there is imitation in **selling**

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## General Result

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## *The big picture*

*For the second month and after nearly eight consecutive months, bonds prices across the majority of sectors and regions STOPPED feeling a strong tail wind. The very strong momentum that has lifted the entire asset class faded away, and the fixed income sector are no more showing a bubble-like behavior.*

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

- Last month we reported that the strong rally in the governments and corporate bonds, that was observed globally over the last year, cooled down and was not showing a bubble signal anymore. This is confirmed in this report;
- For the second consecutive month we see negative bubble signals among commodities indices. Five out of the eight indices that are showing bubble signals this month are negative ones. It is interesting that all of these five indices are agriculture indices;
- There is no general trend in equities. The most interesting result was found in Croatia and Latvia stock market indices which are still showing signs of a positive bubble for the second consecutive month. It is worth mentioning that all the stock market indices that are showing signs of bubbles but one are emerging markets;
- In our analysis of single stocks, the positive bubble signals we reported before in non-cyclical/defensive sectors have turned to negative bubble signals with increasing value scores, showing that recently initiated corrections are continuing. The sector *Telecommunication Services* is detected as a stronger negative bubble score this month, with a strong value score, so we expect the drawdown in this industry will not continue much longer.

*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	13.2%	60.0%	47.0%
iBoxx Asia China Government Index	6.4%	41.7%	6.3%
<b>Negative Bubbles</b>			
None			

Last month we reported that the positive bubble signals in the government bonds are cooling down, this is confirmed in this report. Of the 34 government bond indices that were analyzed, only two are showing positive bubble signals, that is only 6% of the set, down from 15% last month. As shown in the table above, they are both in Asia.

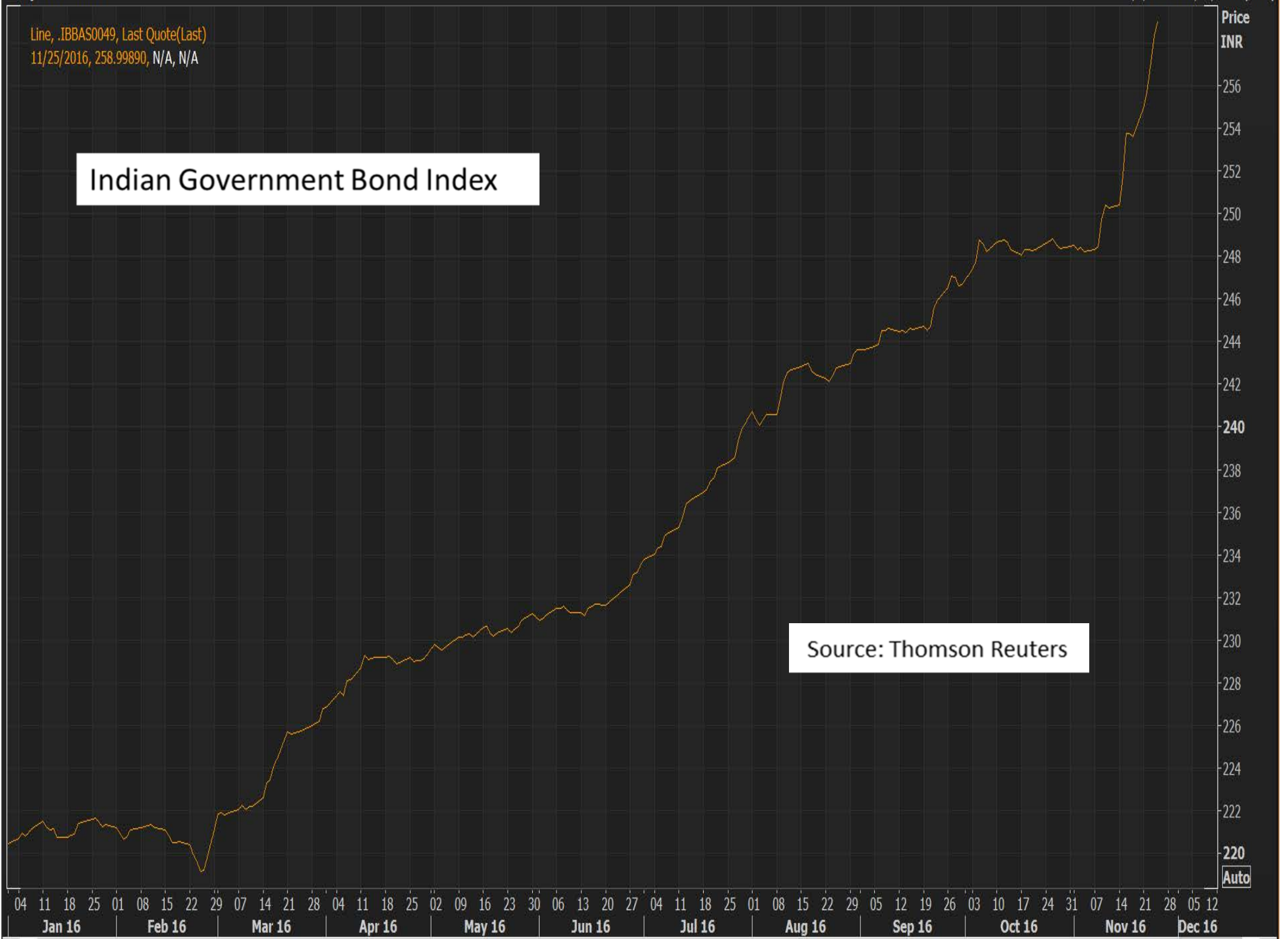
The global bonds selloff that was reported last month continued also for this month. This is triggered by the surprising results of the U.S elections and the higher expectations that the new U.S. administration will increase fiscal spending and drive up inflation.

In the context of this global bonds selloff, the Indian sovereign bonds stand unique. The figure on the next page shows the resumption of the remarkable bubble in the Indian sovereign bonds that was seen in the first two quarters of 2016 and decelerated with increased volatility during the third quarter. The resumption is triggered by the cash-draining move by the Indian government.



Line, .IBBAS0049, Last Quote(Last)  
11/25/2016, 258.99890, N/A, N/A

## Indian Government Bond Index



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## Corporate bonds

The positive bubble signals are not only fading away across government bonds, but also across sector indices: No single index of the 82 corporate bond indices that were analyzed are showing bubble signals, compared to 6% of the set that was showing positive bubble last month. It is worth mentioning that the sharp rise in the global yields effectively erased gains generated by the European Central Bank's policy of buying companies' debt.

The figure on the next page shows the remarkable bubble that started last year in the European banks corporate bonds index, that stopped and then started to take an opposite direction over the last two months.

Line, .IBBEU002A, Last Quote(Last)  
11/25/2016, 222.04290, N/A, N/A

## European Banks Corporate Bond Index



Source: Thomson Reuters

# The FCO Cockpit – Global Bubble Status December 1st, 2016

## Commodities

Commodities Indices	Yearly Return	DS LPPL Trust	DS LPPL Confidence
<b>Positive Bubbles</b>			
Robsta Coffee ER Index	20.2%	30.4%	36.9%
Tin ER Index	45.5%	25.7%	35.0%
Lead ER Index	34.7%	8.9%	31.1%
<b>Negative Bubbles</b>			
Live Stock ER Index	-19.0%	21.7%	14.4%
Lean Hogs ER Index	-19.2%	14.6%	13.1%
Live Cattle ER Index	-17.8%	13.3%	11.6%
Feeder Cattle ER Index	-23.2%	13.0%	13.0%
Cocoa ER Index	-24.1%	5.8%	18.4%

For the second consecutive month, we see negative bubble signals again among commodities indices. There are eight indices showing bubble signals this month, three of them are showing positive bubble signals and five are showing negative ones. It is interesting to see that all the indices that are showing negative bubble signals and one of the three that are showing positive bubble signals are agriculture indices, while the other two are metal indices.

The S&P Goldman Sachs Commodity Index (next page) shows that the remarkable rebound in commodities that started last February seems to converge to a plateau.

1D

3D

1W

1M

6M

1Y

3Y

5Y

Comparisons &gt;

Source: Financial Times

S&P GSCI Index Spot





Date: 2016-11-29

Name: LME-Tin 99.85% Cash 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
Iceland Krona/Euro	17.5%	73.1%	91.5%
Iceland Krona/Swiss Franc	16.4%	35.7%	47.9%
Swedish Krona/Euro	-5.3%	27.9%	40.8%
Swedish Krona/Swiss Franc	-6.2%	12.5%	31.6%
US Dollar/Singapore Dollar	1.5%	10.6%	25.1%
US Dollar/Swedish Krona	5.8%	9.7%	42.3%
US Dollar/Chinese Renminbi	8.3%	9.7%	36.3%
US Dollar/Turkish Lira	18.0%	5.7%	35.1%
Turkish Lira/Swiss Franc	-15.9%	5.1%	28.0%

For the second consecutive month, there are signs of a negative bubble in the Swedish Krona. Three of the nine pairs that are showing bubble signals are crosses with the Swedish Krona. On the other hand and for the eighth consecutive month, there are strong positive bubble signals in the Iceland Krona. Two of the nine pairs that are showing bubble signals are crosses with the Iceland Krona.

For the first month, there are signs of a negative bubble in the Turkish Lira and Chinese Renminbi. Similar to other emerging markets currencies, both have been battered by the U.S. election results and the slow global growth. But in the case of the Lira, it is also plagued by domestic political concerns.

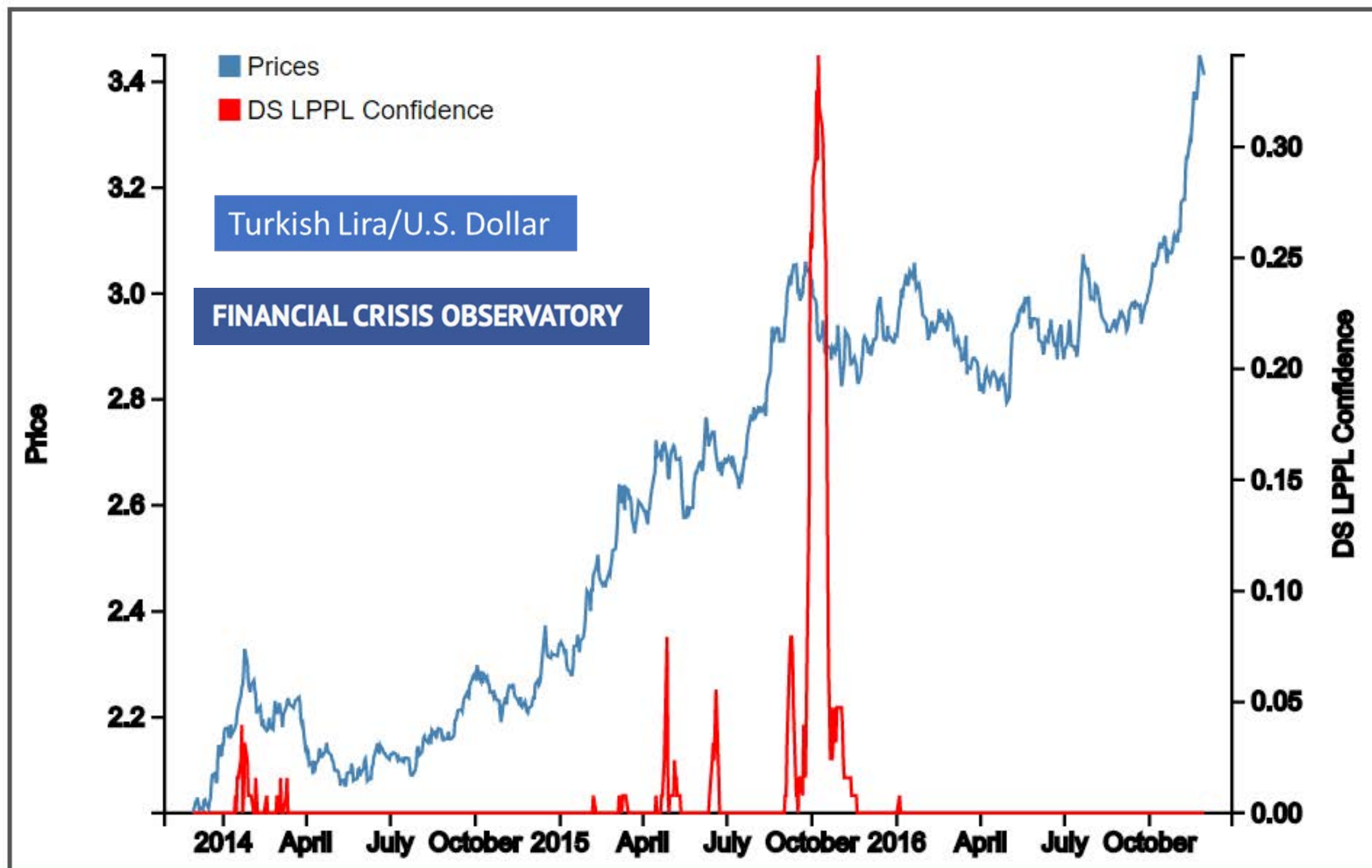
Finally, there is a positive bubble signal on the US Dollar/Singapore Dollar. This can be attributed to output contraction and downgrade of the economic growth forecasts for the trade-reliant city-state amid fresh uncertainty around global trade under the new U.S. administration.

Date: 2016-11-29

Name: NEW TURKISH LIRA TO L

Indicator: DS LPPL Confidence ▼

Bubble end flag - long time scale ▼



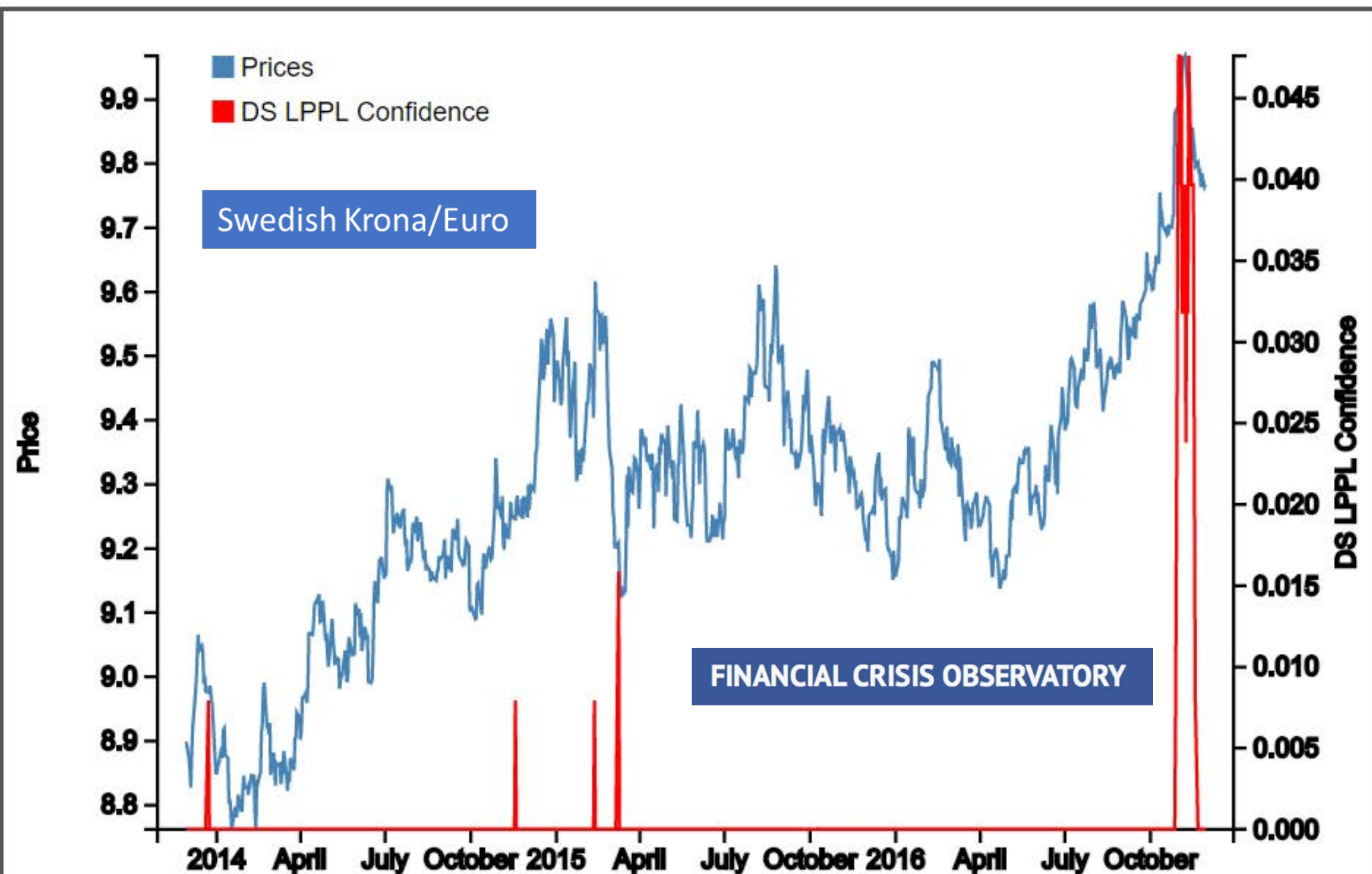


Date: 2016-11-29

Name: SWEDISH KRONA TO EU

Indicator: DS LPPL Confidence ▼

Bubble end flag - long time scale ▼



# The FCO Cockpit –

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### Stocks country indices

Equities Countires Indices	Yearly Return	DS LPPL Trust	DS LPPL Confidence	Country
CROBEX Index	17.7%	38.4%	24.8%	Croatia
PFTS Index	6.4%	19.0%	29.7%	Ukraine
Budapest SE Index	25.8%	13.5%	40.9%	Hungary
OMX Vilnius_GI	14.8%	11.1%	7.6%	Lithuania
OMX Riga_GI	23.0%	10.9%	7.8%	Latvia
Casablanca SE All Share Index	16.8%	10.2%	34.9%	Morocco
IGPA Index	13.9%	6.7%	18.7%	Chile
Karachi SE 100 Index	30.0%	5.2%	11.1%	Pakistan
<b>Negative Bubbles</b>				
Muscat SE General Index	-2.6%	9.2%	17.8%	Oman
Philippine SE Composite Index	-2.5%	6.1%	9.8%	Philippine
OMX Copenhagen 20 Index	-17.4%	5.5%	23.2%	Denmark
<b>Equities Sector Indices</b>				
<b>Positive Bubbles</b>				
S&P 500 Diversf TelecomServ(Ind)	13.7%	16.5%	12.1%	
Private Equity Total Return Index	6.4%	11.3%	11.9%	
STOXX Europe 600 Basic Resources EUR Price Index	39.7%	5.2%	24.4%	
<b>Negative Bubbles</b>				
S&P 500 Personal Products (Industry)	-9.8%	8.4%	23.3%	
STOXX Europe 600 Health Care EUR Price Index	-15.4%	6.4%	7.2%	
S&P 500 - Pharmaceuticals (Industry)	-5.6%	5.6%	6.7%	

There is no general trend in equities. The most interesting result was found in Croatia and Latvia stock market indices which are still showing signs of a positive bubble for the second consecutive month. It is worth mentioning that all the stock market indices that are showing signs of bubbles, except the Denmark stock market index, are emerging markets.

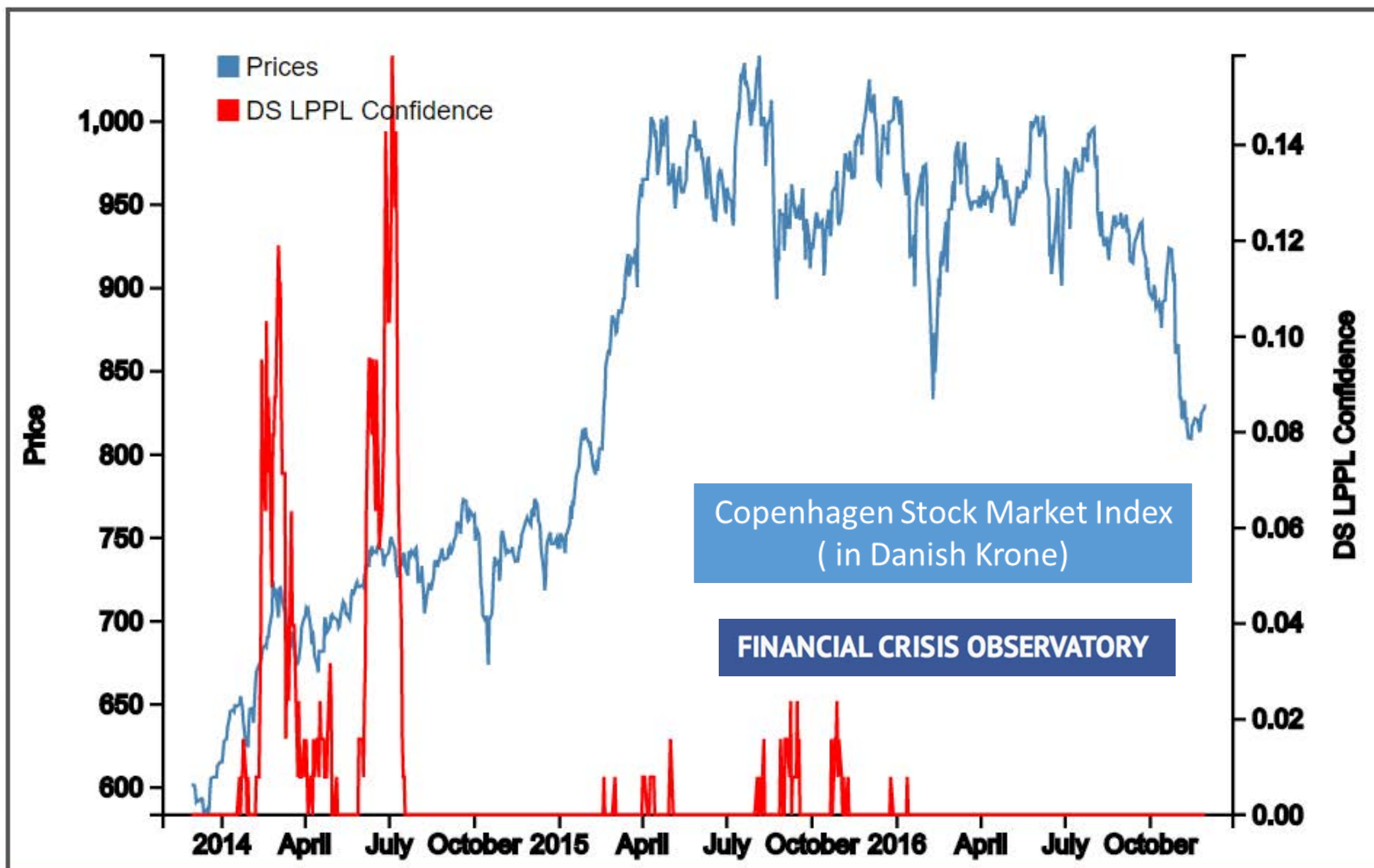
Finally, the positive bubble signals that were shown in Argentina, the U.S Nasdaq Composite, and Finland stock market indices over the last month, disappeared.

Date: 2016-11-29

Name: OMX COPENHAGEN (OM

Indicator: DS LPPL Confidence ▼

Bubble end flag - long time scale ▼



Date: 2016-11-29

Name: CROATIA CROBEX

Indicator: DS LPPL Confidence ▼

Bubble end flag - long time scale ▼



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## Single Stocks



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## *What is this?*

For 863 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.

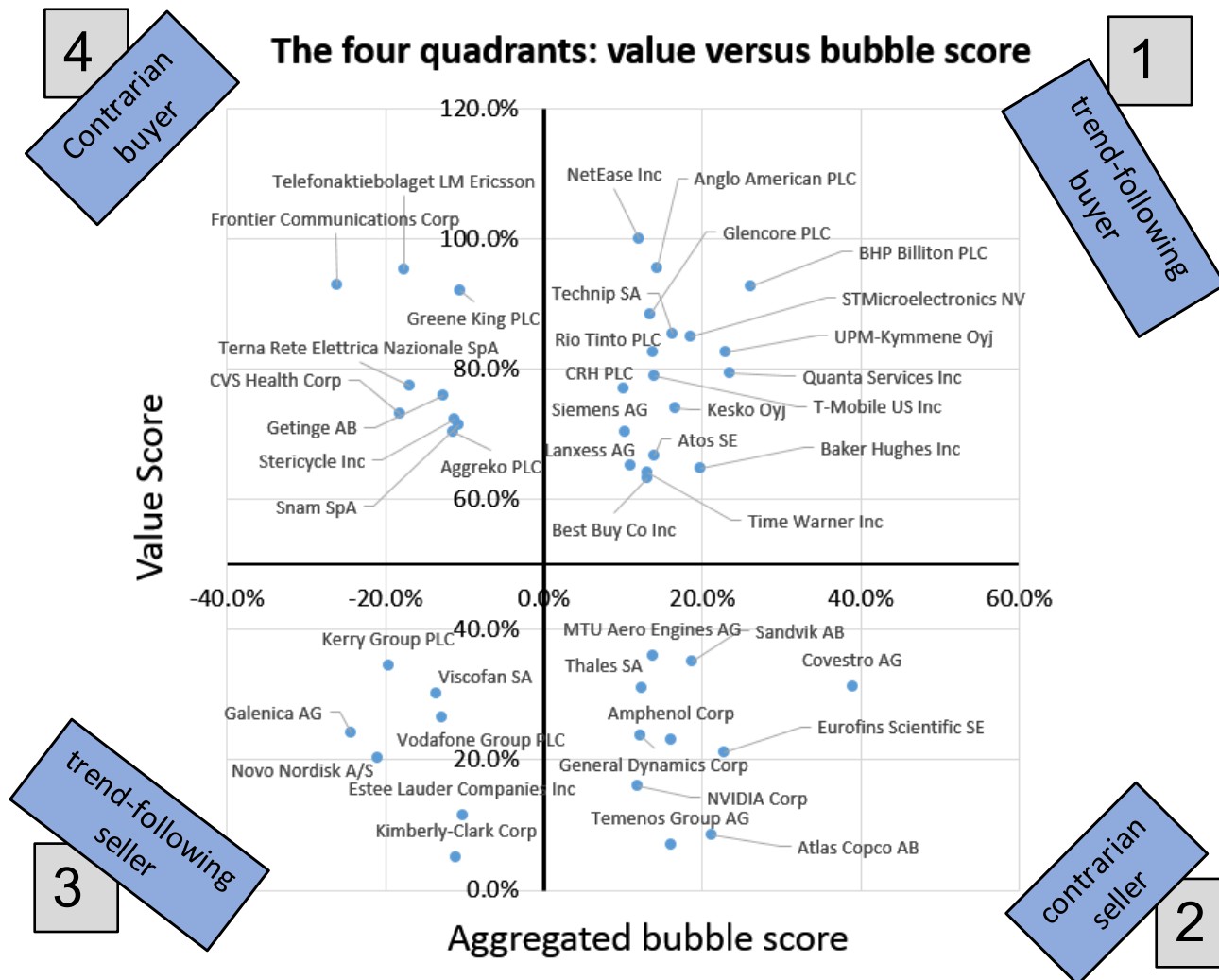
The stocks are the constituents of the Stoxx Europe 600, the S&P 500 and the Nasdaq 100 indices. From these, all doubles and stocks with incomplete data are removed. Because our financial strength indicators are specifically designed for corporates, all financial institutions are taken out of the set 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. CRH PLC);
2. [Quadrant 2](#): Stocks with a strong positive bubble score and a weak value score (e.g. Thales SA);
3. [Quadrant 3](#): Stocks with a strong negative bubble score and a weak value score (e.g. Viscofan SA);
4. [Quadrant 4](#): Stocks with strong negative bubble score and a strong financial strength (e.g. Snam SpA)

\*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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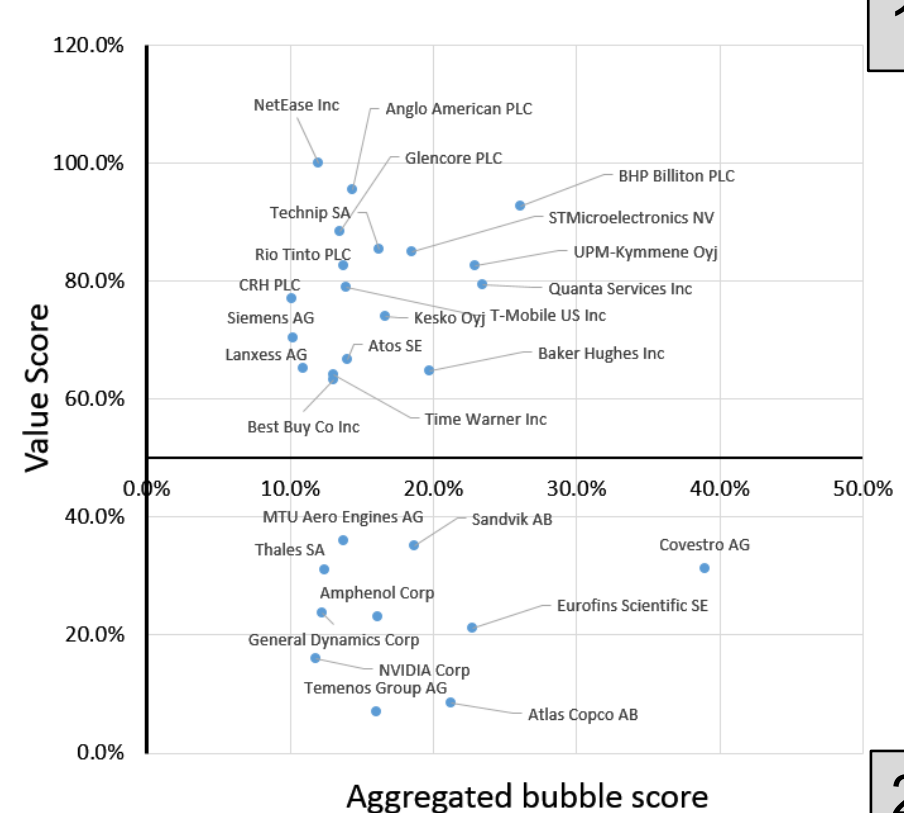
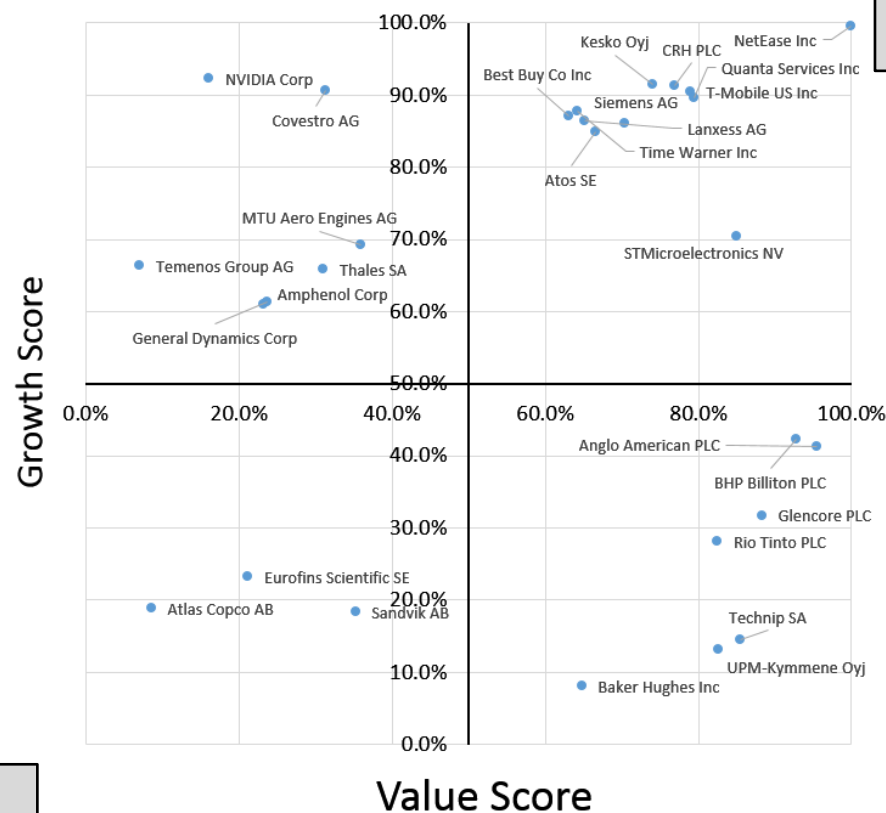
## Each quadrant has its own specs:

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.**



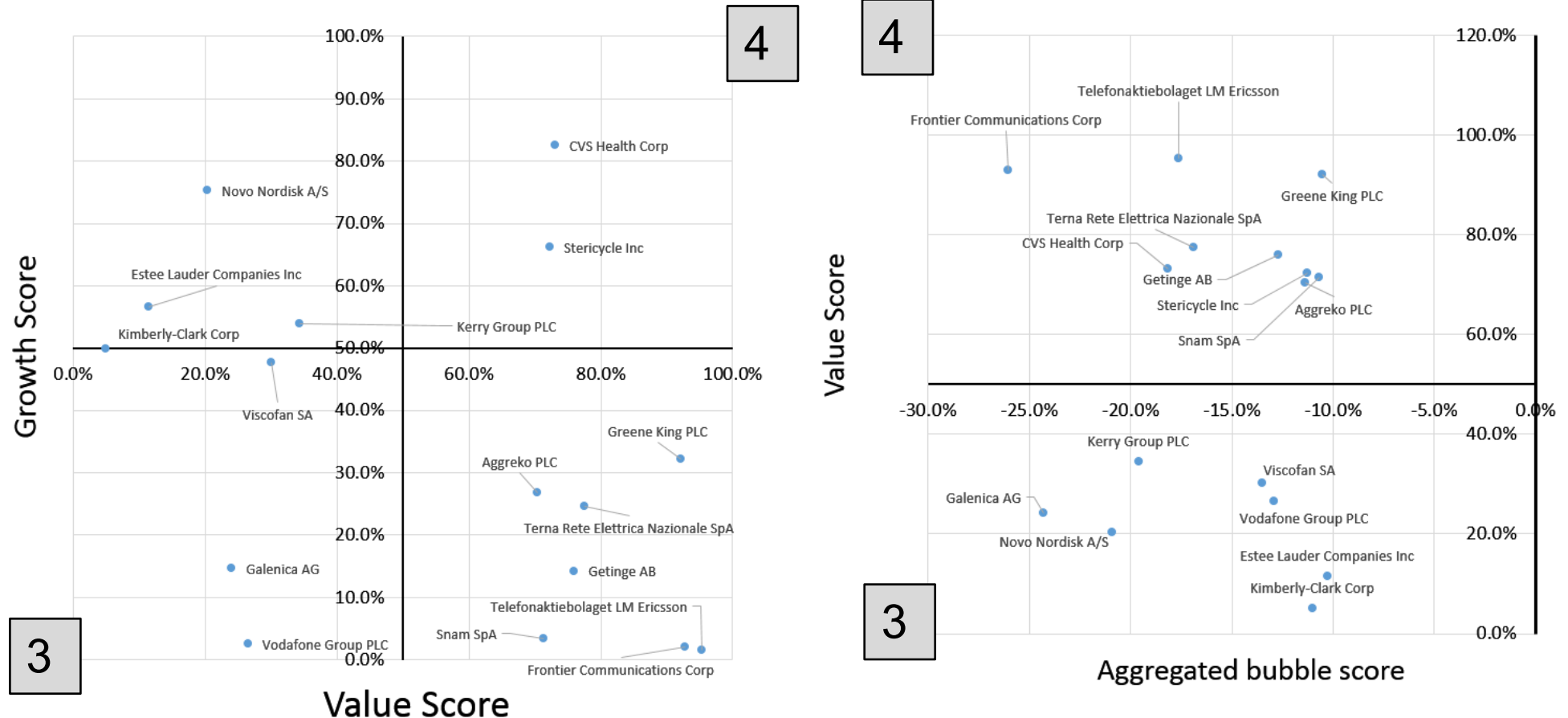
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**Quadrant 1 and 2 stocks:** strong positive bubble signals with strong (respectively weak) fundamentals



# The FCO Cockpit – Global Bubble Status December 1st, 2016

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



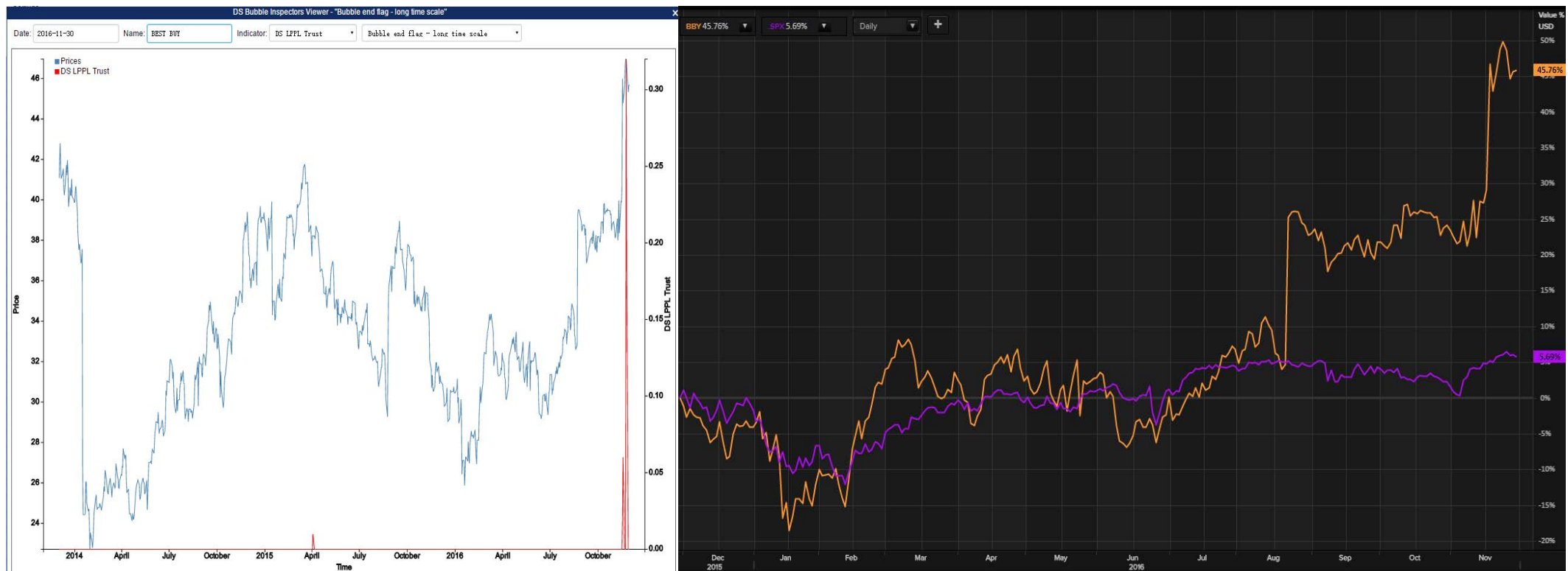
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**Quadrant 1 stocks:** strong positive bubble signals with strong fundamentals

Company Name	Country of Headquarters	GICS Sector Name	GICS Industry Group Name	Yearly Return	Bubble Score	Value Score	Growth Score
NetEase Inc	China	Information Technology	Software & Services	36.3%	12.0%	100.0%	99.5%
T-Mobile US Inc	United States of America	Telecommunication Services	Telecommunication Services	49.8%	13.9%	78.9%	90.4%
Anglo American PLC	United Kingdom	Materials	Materials	191.7%	14.4%	95.5%	41.3%
BHP Billiton PLC	United Kingdom	Materials	Materials	61.6%	26.1%	92.7%	42.3%
CRH PLC	Ireland; Republic of	Materials	Materials	12.7%	10.1%	76.9%	91.3%
Lanxess AG	Germany	Materials	Materials	22.3%	10.9%	65.1%	86.4%
Siemens AG	Germany	Industrials	Capital Goods	10.0%	10.2%	70.3%	86.1%
Atos SE	France	Information Technology	Software & Services	26.0%	14.0%	66.6%	84.9%
Technip SA	France	Energy	Energy	32.9%	16.2%	85.4%	14.5%
Glencore PLC	Switzerland	Materials	Materials	195.6%	13.5%	88.3%	31.7%
STMicroelectronics NV	Switzerland	Information Technology	Semiconductors & Semiconductor Equipment	40.3%	18.5%	85.1%	70.3%
Kesko Oyj	Finland	Consumer Staples	Food & Staples Retailing	47.4%	16.7%	74.0%	91.5%
UPM-Kymmene Oyj	Finland	Materials	Materials	20.3%	23.0%	82.6%	13.2%
Rio Tinto PLC	United Kingdom	Materials	Materials	35.0%	13.7%	82.5%	28.2%
Best Buy Co Inc	United States of America	Consumer Discretionary	Retailing	45.7%	13.1%	63.2%	87.0%
Baker Hughes Inc	United States of America	Energy	Energy	17.5%	19.7%	64.8%	8.1%
Quanta Services Inc	United States of America	Industrials	Capital Goods	49.5%	23.4%	79.4%	89.6%
Time Warner Inc	United States of America	Consumer Discretionary	Media	29.3%	13.1%	64.2%	87.8%
John Wood Group PLC	United Kingdom	Energy	Energy	46.6%	26.4%	82.4%	25.4%

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**Quadrant 1 stocks:** strong positive bubble signals with strong fundamentals, example Best Buy Co Inc.



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&P 500 benchmark (purple), it is almost 40%.

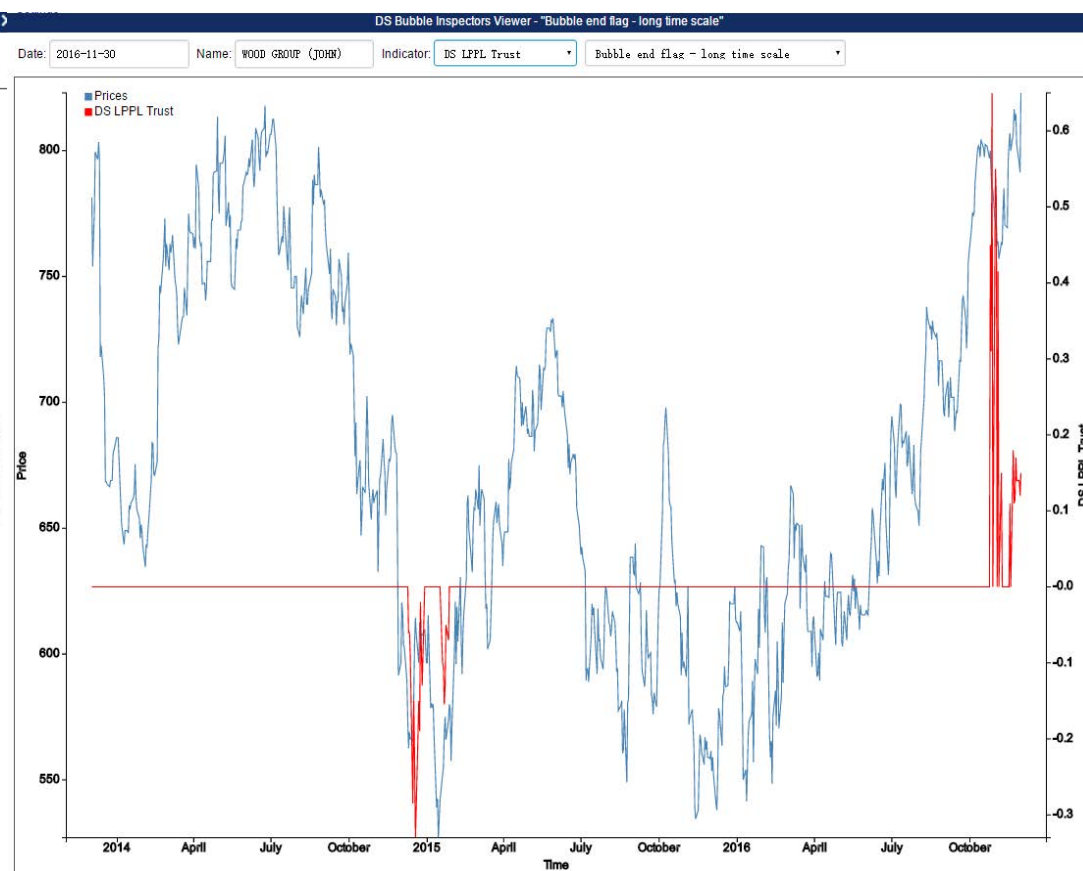
**Last month example:** strong positive bubble signals with strong fundamentals, John Wood Group PLC.

Note that a rebound has started after a small correction. The small correction in the short term is in synchrony with our DS LPPL trust indicator, while a clear rebound happened afterwards, in synchrony with the strong fundamentals.

Last month signal (1<sup>st</sup> Nov. 2016)



This month signal (1<sup>st</sup> Dec. 2016)



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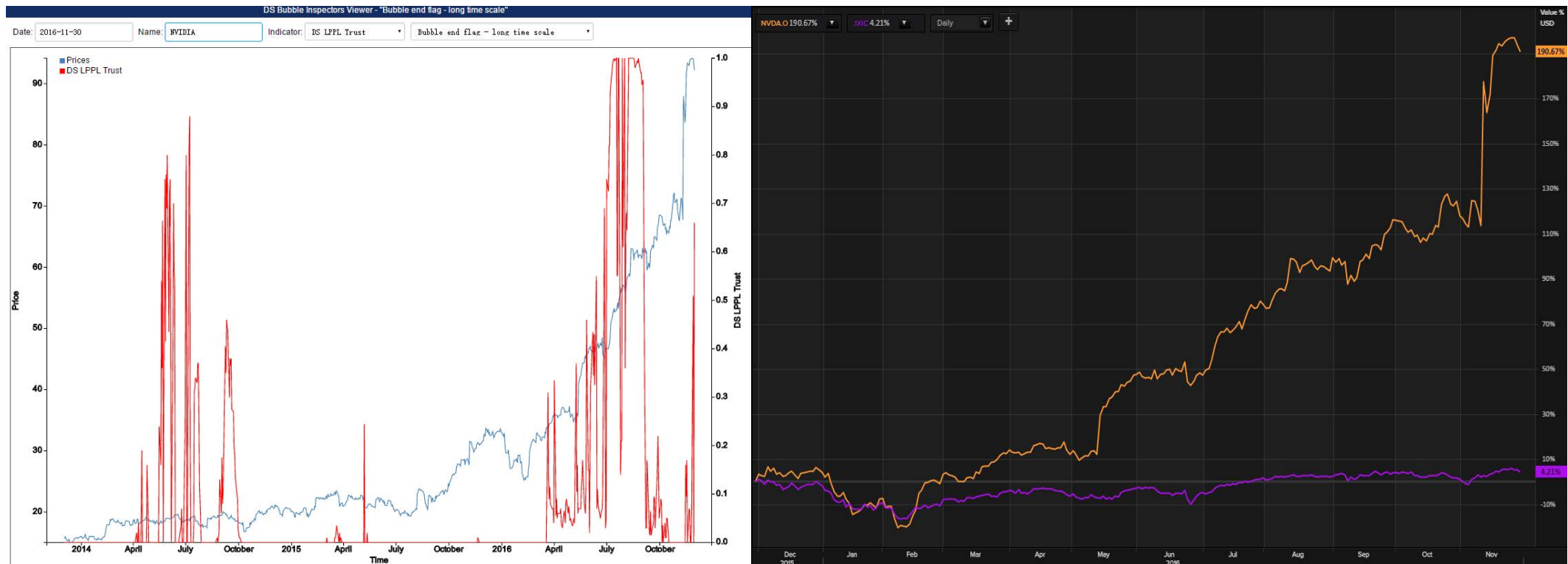
**Quadrant 2 stocks:** strong positive bubble signals with weak fundamentals

Company Name	Country of Headquarters	GICS Sector Name	GICS Industry Group Name	Yearly Return	Bubble Score	Value Score	Growth Score
NVIDIA Corp	United States of America	Information Technology	Semiconductors & Semiconductor Equipment	181.5%	11.8%	16.1%	92.4%
Covestro AG	Germany	Materials	Materials	76.7%	39.0%	31.3%	90.6%
MTU Aero Engines AG	Germany	Industrials	Capital Goods	6.8%	13.7%	35.9%	69.3%
Thales SA	France	Industrials	Capital Goods	31.4%	12.4%	31.1%	65.8%
Eurofins Scientific SE	Luxembourg	Health Care	Pharmaceuticals, Biotechnology & Life Sciences	17.7%	22.8%	21.2%	23.3%
Temenos Group AG	Switzerland	Information Technology	Software & Services	38.0%	16.0%	7.1%	66.4%
Amphenol Corp	United States of America	Information Technology	Technology Hardware & Equipment	23.0%	16.1%	23.2%	61.1%
General Dynamics Corp	United States of America	Industrials	Capital Goods	18.8%	12.2%	23.6%	61.3%
Sandvik AB	Sweden	Industrials	Capital Goods	25.1%	18.7%	35.2%	18.4%
Atlas Copco AB	Sweden	Industrials	Capital Goods	20.9%	21.3%	8.6%	18.9%



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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 S&P500 benchmark (purple), it is almost 185% up. The strong positive bubble signals and weak fundamentals indicate a high probability of correction.

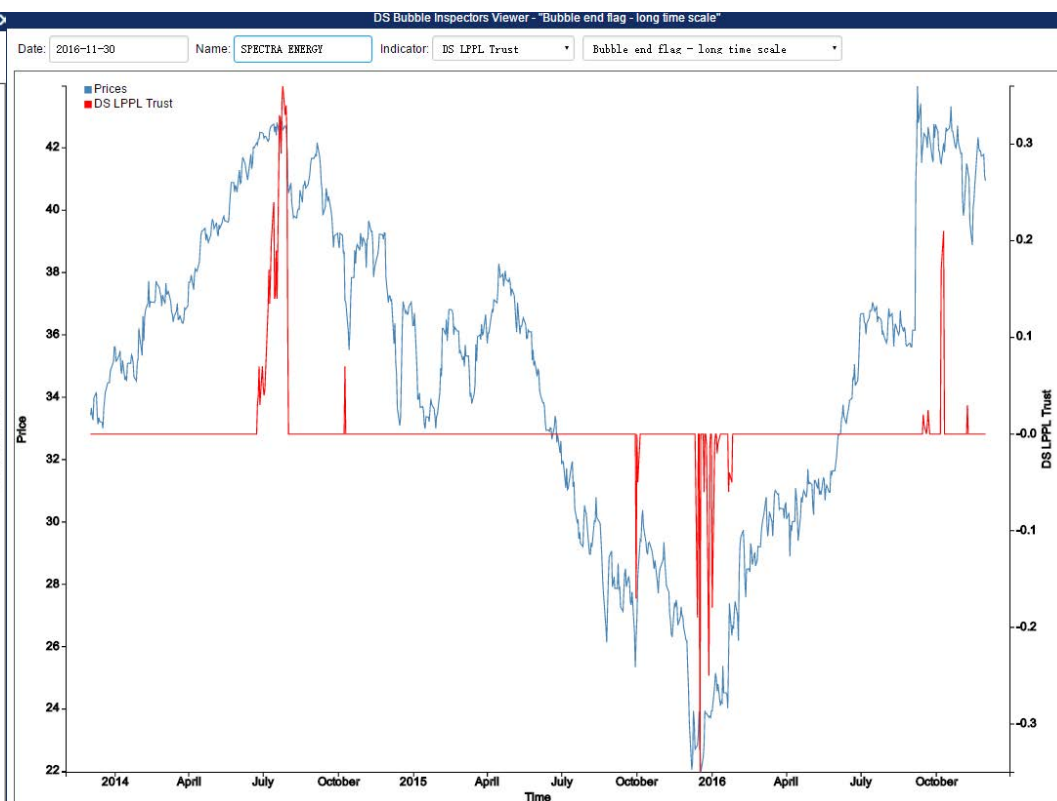
**Last month example:** strong positive bubble signals with weak fundamentals, Spectra Energy Corp.

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

Last month signal (1<sup>st</sup> Nov. 2016)



This month signal (1<sup>st</sup> Dec. 2016)





# The FCO Cockpit – Global Bubble Status December 1st, 2016

**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
Vodafone Group PLC	United Kingdom	Telecommunication Services	Telecommunication Services	-27.0%	-12.9%	26.5%	2.5%
Novo Nordisk A/S	Denmark	Health Care	Pharmaceuticals, Biotechnology & Life Sciences	-39.5%	-20.9%	20.4%	75.3%
Viscofan SA	Spain	Consumer Staples	Food, Beverage & Tobacco	-21.0%	-13.5%	30.1%	47.7%
Kerry Group PLC	Ireland; Republic of	Consumer Staples	Food, Beverage & Tobacco	-11.8%	-19.6%	34.4%	53.9%
Galenica AG	Switzerland	Health Care	Pharmaceuticals, Biotechnology & Life Sciences	-27.7%	-24.3%	24.1%	14.7%
Estee Lauder Companies Inc	United States of America	Consumer Staples	Household & Personal Products	-8.6%	-10.3%	11.5%	56.5%
Kimberly-Clark Corp	United States of America	Consumer Staples	Household & Personal Products	-4.6%	-11.0%	5.0%	49.9%

# The FCO Cockpit – Global Bubble Status December 1st, 2016

**Quadrant 3 stocks:** strong negative bubble signals with weak fundamentals, example Viscofan SA.

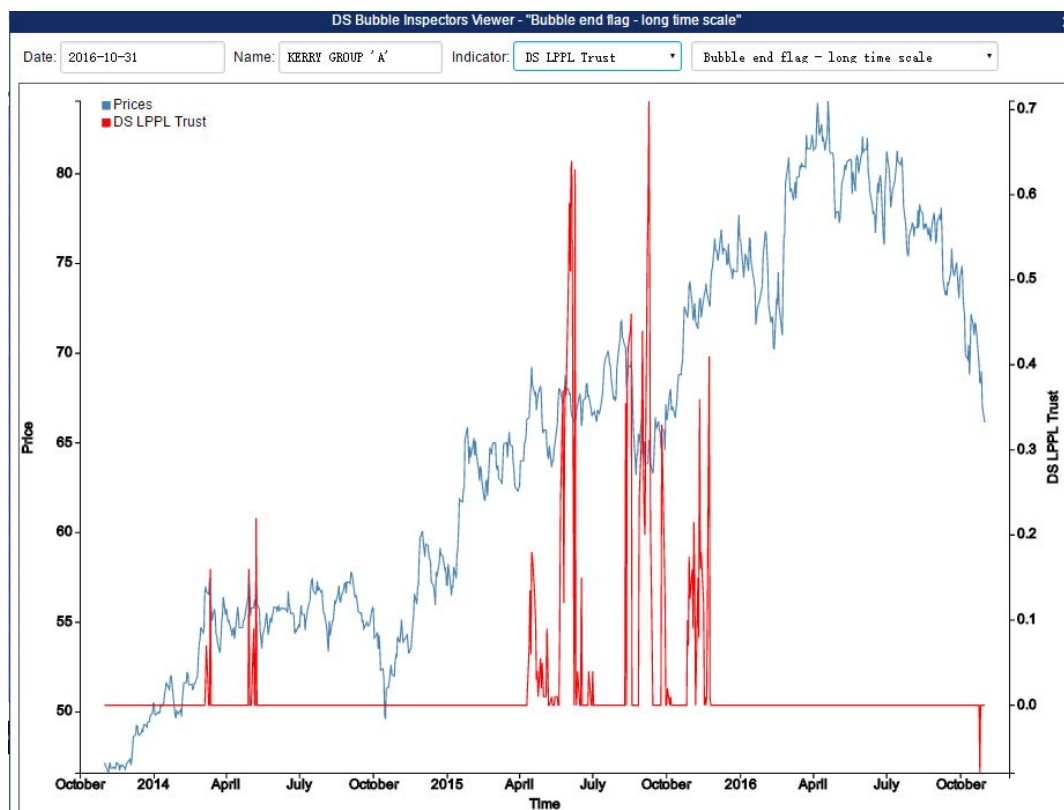


Left graph is a standard output from the Financial Crisis Observatory. It shows the historical price evolution of the stock in blue (left hand scale) and the calculated bubble warning index DS LPPL Trust in red (right hand scale). We can see a clearly spiking warning of the negative bubble. The right graph shows the performance of the stock over the last year (orange) with respect to the IBEX benchmark (purple), it is roughly -5%. Together with our diagnostic of a negative bubble signal with weak fundamentals, we expect a further drawdown.

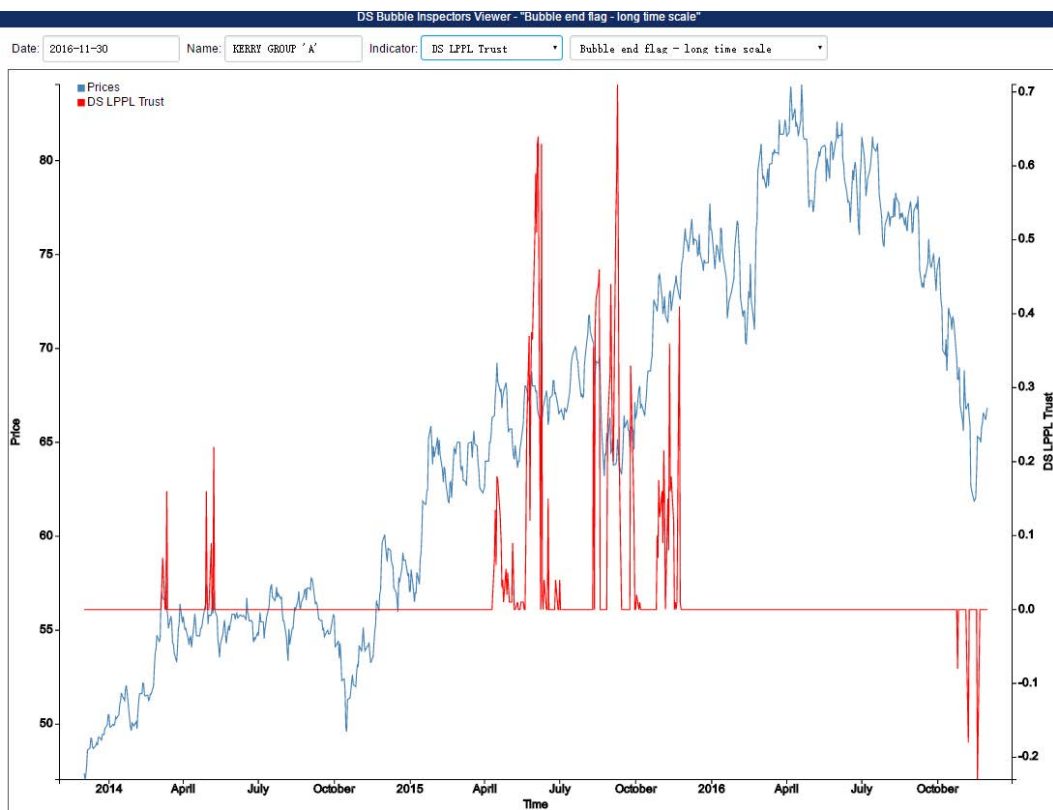
**Last month example:** strong negative bubble signals with weak fundamentals, Kerry Group PLC.

Note that the correction has started to occur after a further drawdown since last month. This is in synchrony with our DS LPPL trust indicator, and the weak fundamentals we identified. One should remain cautious as this stock is still identified with strong negative bubble signals and weak fundamentals this month.

Last month signal (1<sup>st</sup> Nov. 2016)



This month signal (1<sup>st</sup> Dec. 2016)



# The FCO Cockpit – Global Bubble Status December 1st, 2016

**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
Frontier Communications Corp	United States of America	Telecommunication Services	Telecommunication Services	-28.1%	-26.0%	92.8%	2.0%
Stericycle Inc	United States of America	Industrials	Commercial & Professional Services	-39.5%	-11.3%	72.3%	66.2%
Aggreko PLC	United Kingdom	Industrials	Commercial & Professional Services	-18.3%	-11.4%	70.5%	26.8%
Greene King PLC	United Kingdom	Consumer Discretionary	Consumer Services	-19.4%	-10.5%	92.1%	32.2%
Snam SpA	Italy	Energy	Energy	-7.7%	-10.7%	71.4%	3.4%
Terna Rete Elettrica Nazionale SpA	Italy	Utilities	Utilities	-12.0%	-16.9%	77.5%	24.7%
CVS Health Corp	United States of America	Consumer Staples	Food & Staples Retailing	-19.4%	-18.1%	73.1%	82.5%
Getinge AB	Sweden	Health Care	Health Care Equipment & Services	-36.7%	-12.7%	76.0%	14.3%
Telefonaktiebolaget LM Ericsson	Sweden	Information Technology	Technology Hardware & Equipment	-42.7%	-17.6%	95.2%	1.6%

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**Quadrant 4 stocks:** strong negative bubble signals with strong fundamentals, example Terna Rete Elettrica Nazionale SpA.



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 STOXX 600 benchmark (purple), it is roughly the same. We expect a following rebound, which is due to our diagnostic of a negative bubble signal with strong fundamentals, calling for a contrarian buyer position.



**Last month example:** strong negative bubble signals with strong fundamentals, Frontier Communications Corp.

Note that the rebound 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 (1<sup>st</sup> Nov. 2016)

This month signal (1<sup>st</sup> Dec. 2016)



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## Sectors

# The FCO Cockpit – Global Bubble Status December 1st, 2016

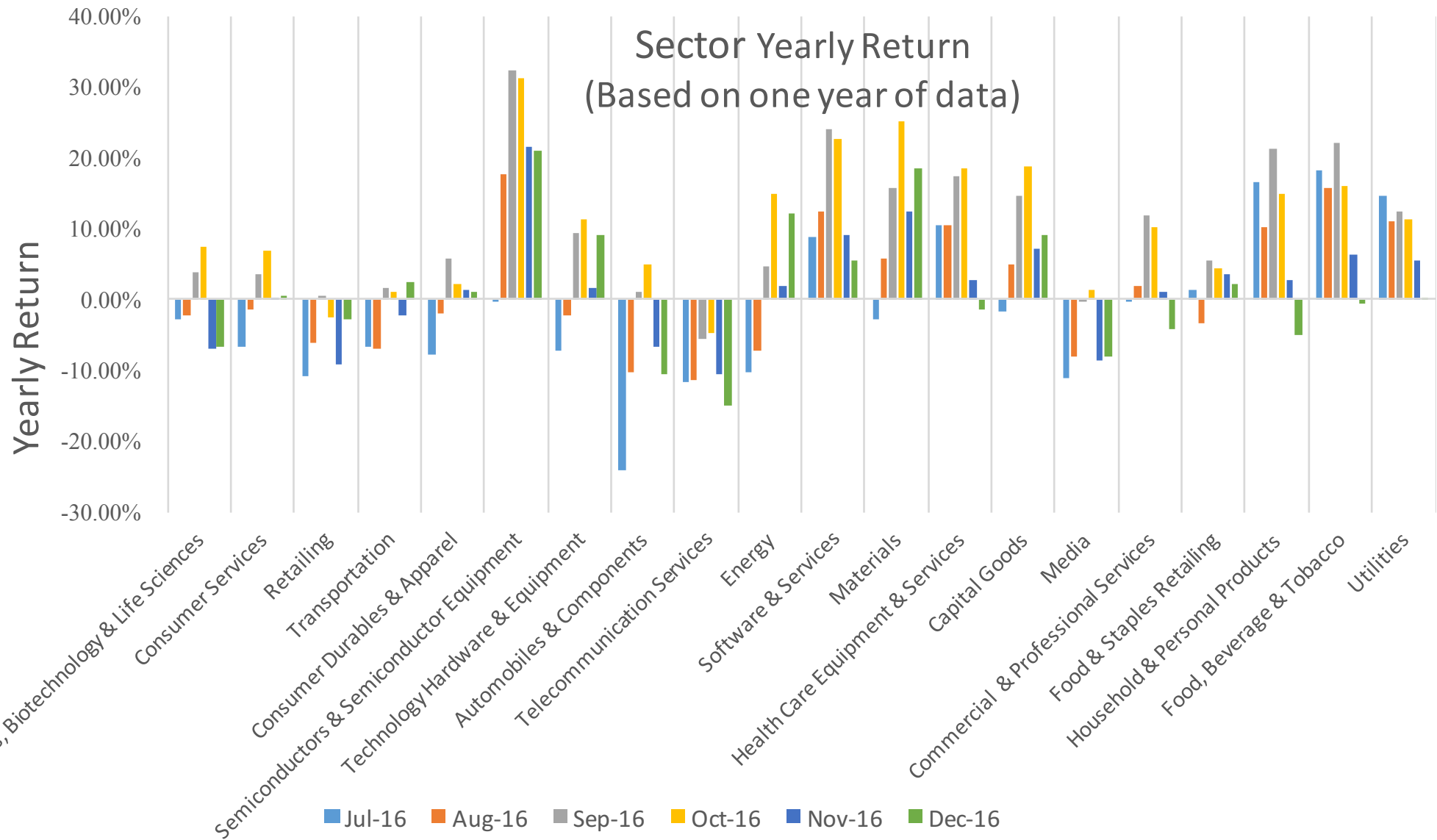
GICS Industry Group Name	Yearly Return		Bubble Score		Value Score		Growth Score	
	Dec 1st	Nov 1st	Dec 1st	Nov 1st	Dec 1st	Nov 1st	Dec 1st	Nov 1st
Pharmaceuticals, Biotechnology & Life Sciences	-6.8%	-6.9%	-0.9%	0.2%	39.6%	39.2%	55.7%	56.2%
Consumer Services	0.5%	0.3%	-0.4%	1.4%	41.6%	41.1%	51.4%	54.1%
Retailing	-2.9%	-9.1%	0.0%	0.2%	38.2%	39.2%	49.3%	47.3%
Transportation	2.4%	-2.2%	1.1%	0.3%	56.7%	57.7%	45.6%	45.9%
Consumer Durables & Apparel	1.1%	1.3%	-0.1%	0.8%	49.0%	48.5%	58.8%	59.9%
Semiconductors & Semiconductor Equipment	21.1%	21.5%	3.6%	5.0%	49.0%	47.6%	64.1%	60.0%
Technology Hardware & Equipment	9.1%	1.6%	0.9%	1.7%	53.0%	56.5%	54.5%	54.4%
Automobiles & Components	-10.5%	-6.6%	0.3%	0.4%	71.0%	69.1%	70.3%	68.0%
Telecommunication Services	-15.1%	-10.6%	-2.5%	-1.2%	64.2%	64.9%	52.8%	54.8%
Energy	12.0%	1.9%	1.5%	1.5%	58.7%	61.4%	24.9%	23.7%
Software & Services	5.4%	9.0%	1.4%	2.8%	39.2%	38.4%	60.9%	61.2%
Materials	18.5%	12.4%	2.6%	2.0%	55.5%	56.9%	49.3%	46.7%
Health Care Equipment & Services	-1.4%	2.7%	-0.8%	0.7%	43.4%	42.0%	61.0%	64.4%
Capital Goods	9.1%	7.1%	2.1%	2.2%	46.8%	48.4%	45.0%	46.8%
Media	-8.1%	-8.5%	-1.2%	0.4%	55.9%	54.8%	50.8%	51.3%
Commercial & Professional Services	-4.2%	0.9%	-1.3%	2.0%	40.2%	38.8%	42.6%	43.8%
Food & Staples Retailing	2.1%	3.5%	0.0%	-0.9%	55.6%	52.7%	45.1%	46.3%
Household & Personal Products	-5.0%	2.6%	-2.4%	3.0%	25.3%	23.5%	47.0%	46.5%
Food, Beverage & Tobacco	-0.6%	6.4%	-1.3%	1.3%	37.7%	35.0%	51.5%	52.3%
Utilities	0.3%	5.5%	-0.1%	0.3%	78.8%	76.7%	47.8%	45.3%

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.

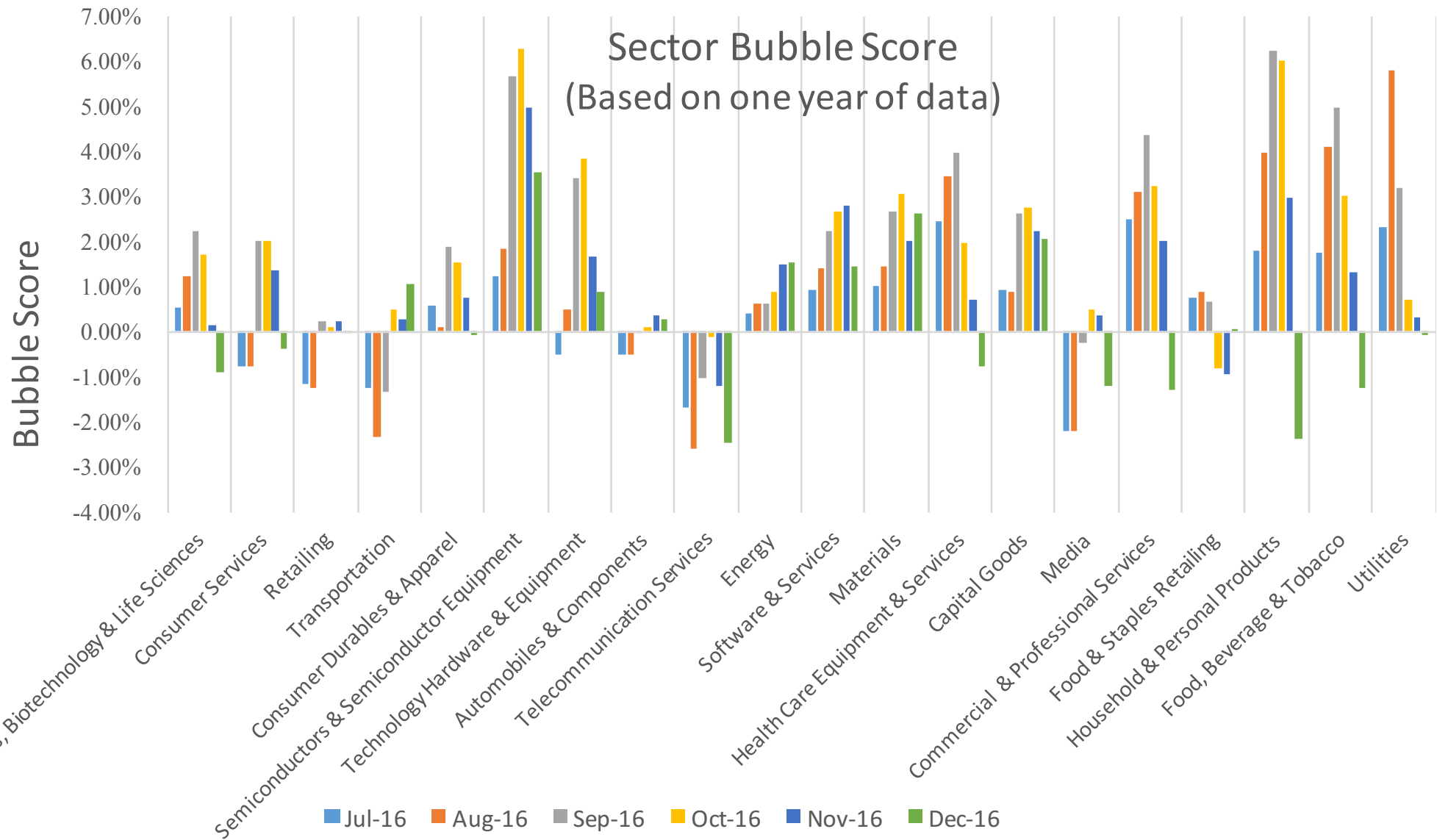
- The sector *Telecommunication Services* detected with a negative bubble score last month has a stronger negative bubble signal, with strong value score, so we expect the drawdown in this industry is not sustainable in the future.
- This month, defensive sectors such as Commercial & Professional Services, Food & Staples Retailing, Household & Personal Products and Food, Beverage & Tobacco, all have negative bubble scores, with increasing value scores. It shows that these bubbles we reported in the past months continue their corrections, as uncertainty of global economics is decreasing.



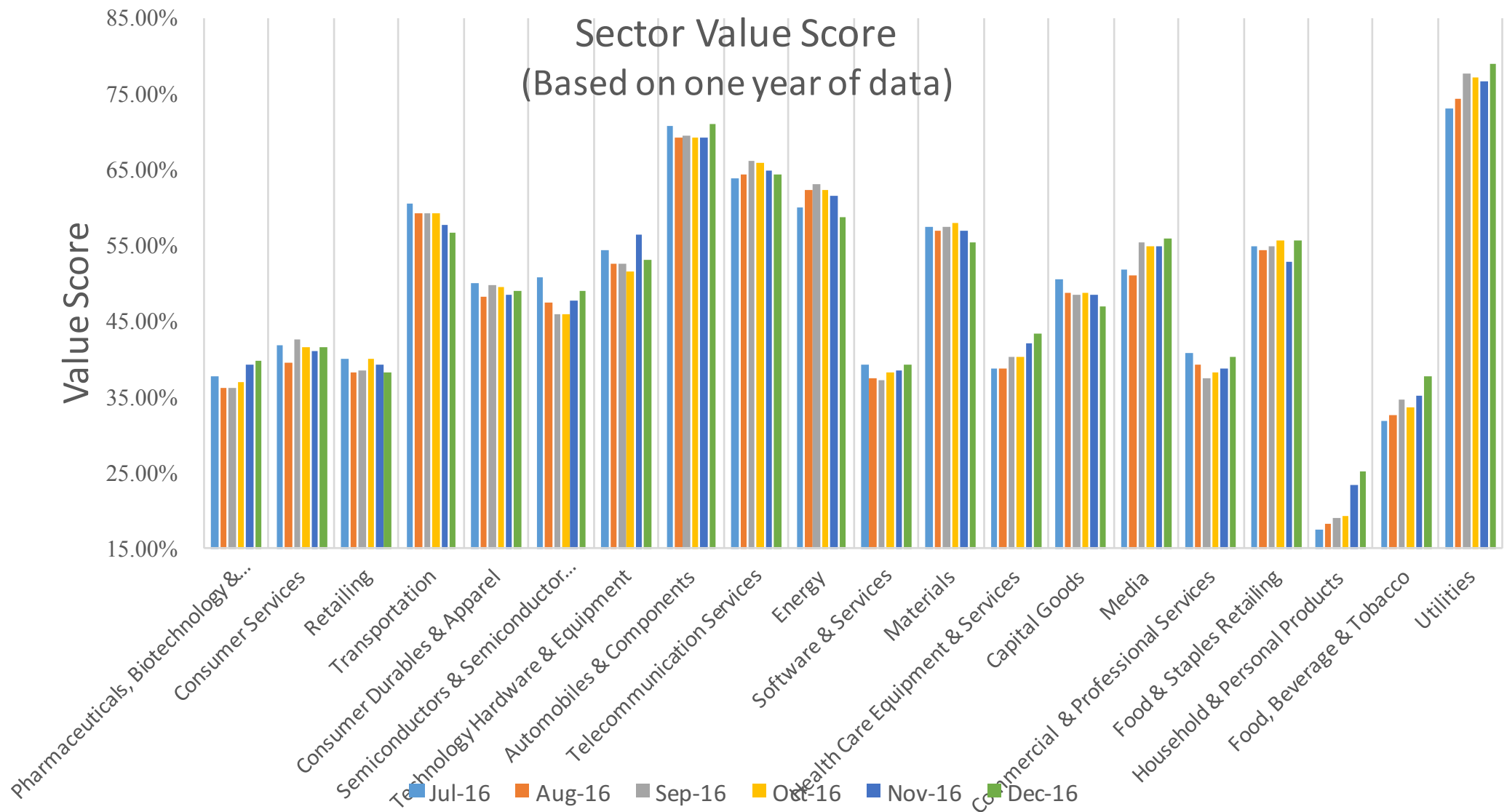
# The FCO Cockpit – Global Bubble Status December 1st, 2016



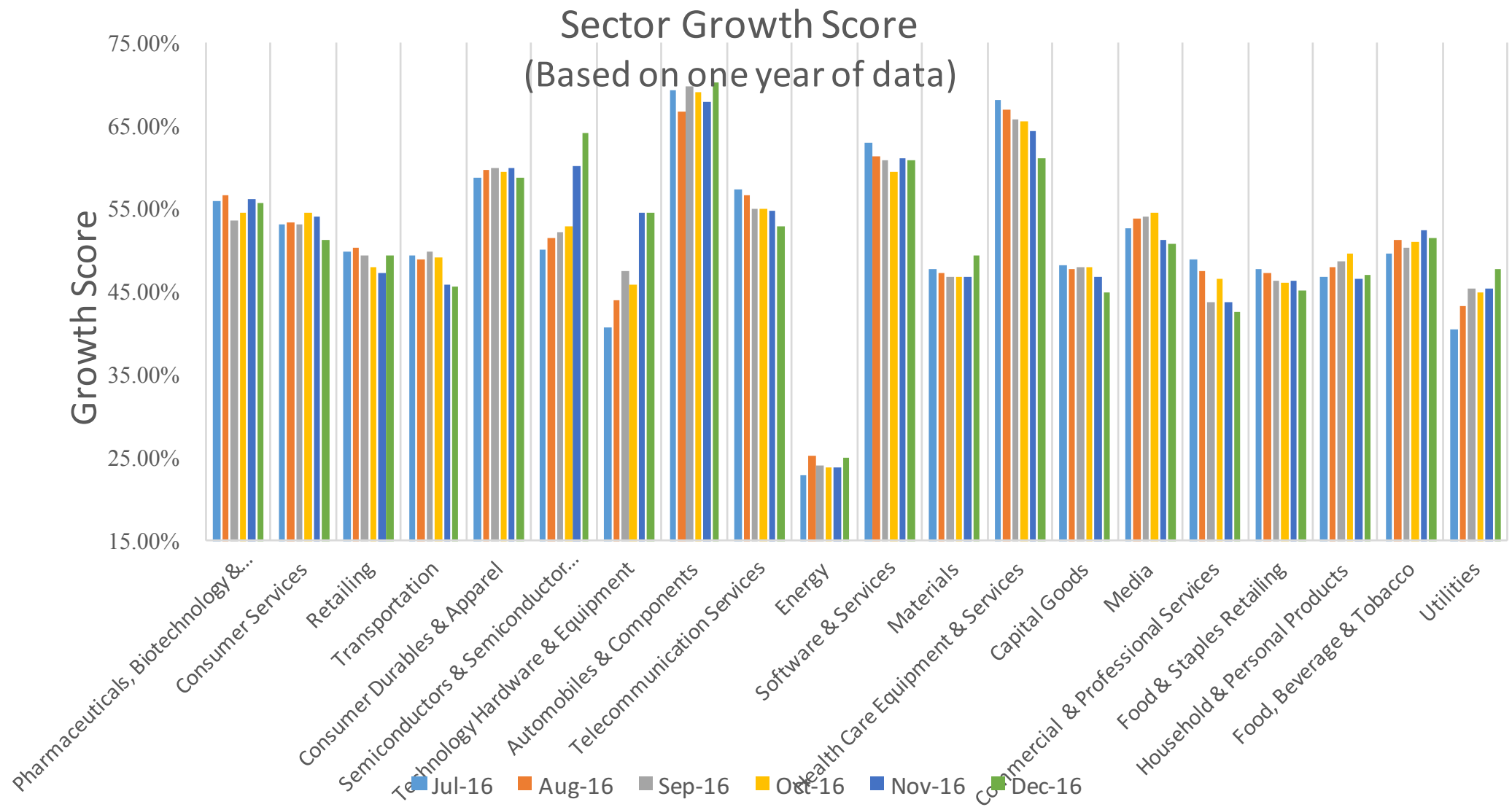
# The FCO Cockpit – Global Bubble Status December 1st, 2016



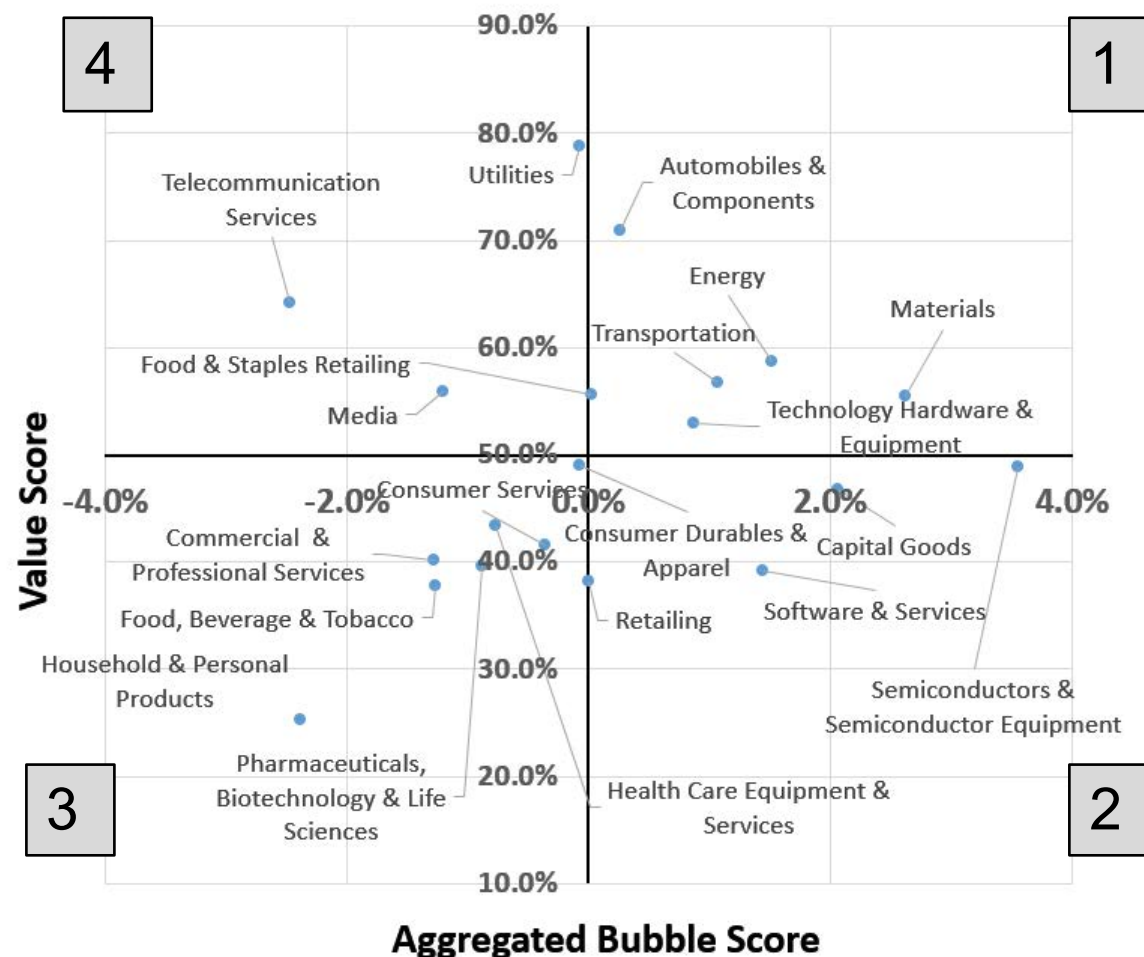
# The FCO Cockpit – Global Bubble Status December 1st, 2016



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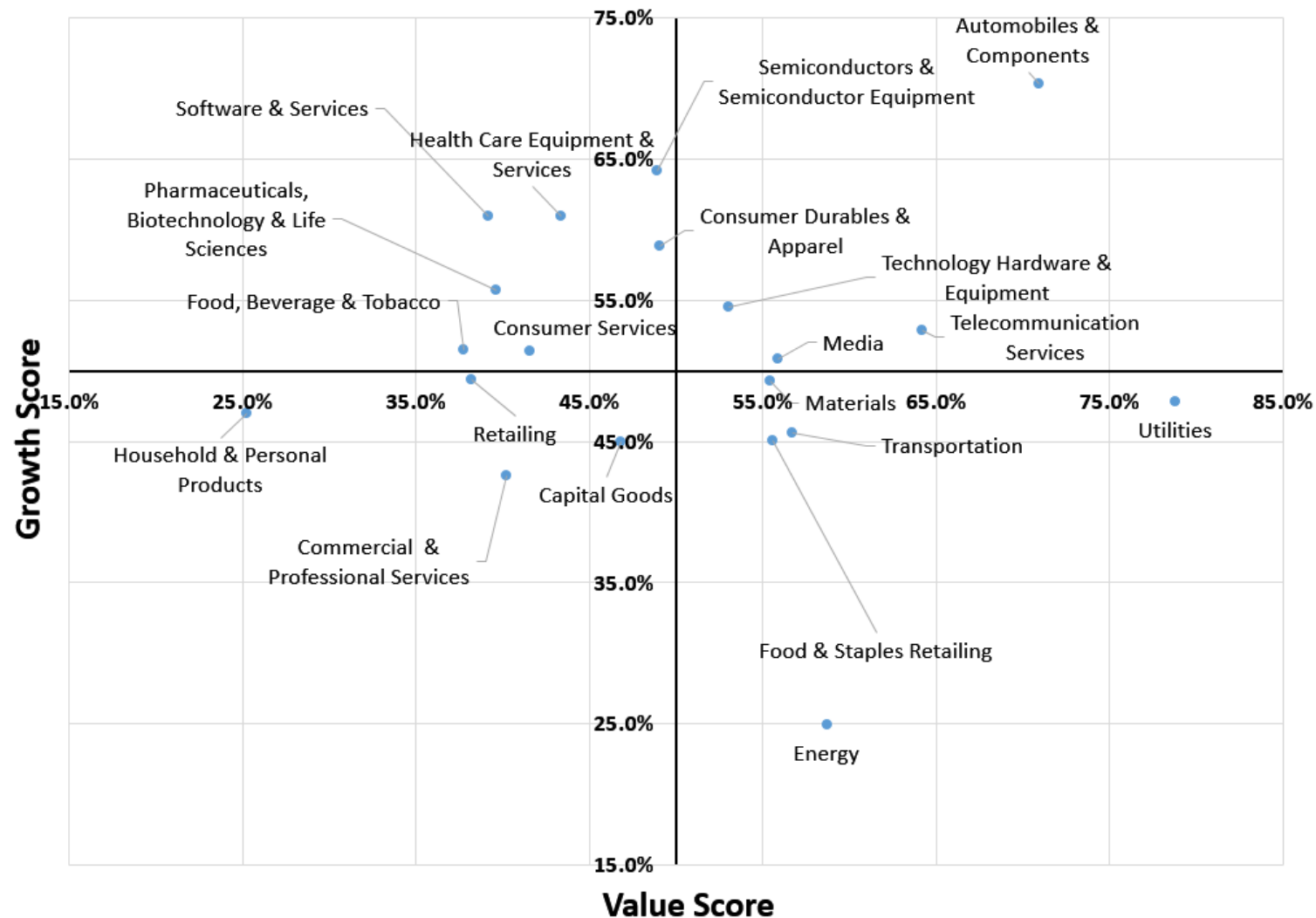


By plotting the value score versus the aggregated bubble score, we can also divide the sectors into four quadrants\*:

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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# The FCO Cockpit – Global Bubble Status December 1st, 2016

## Portfolio Construction and Performance

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

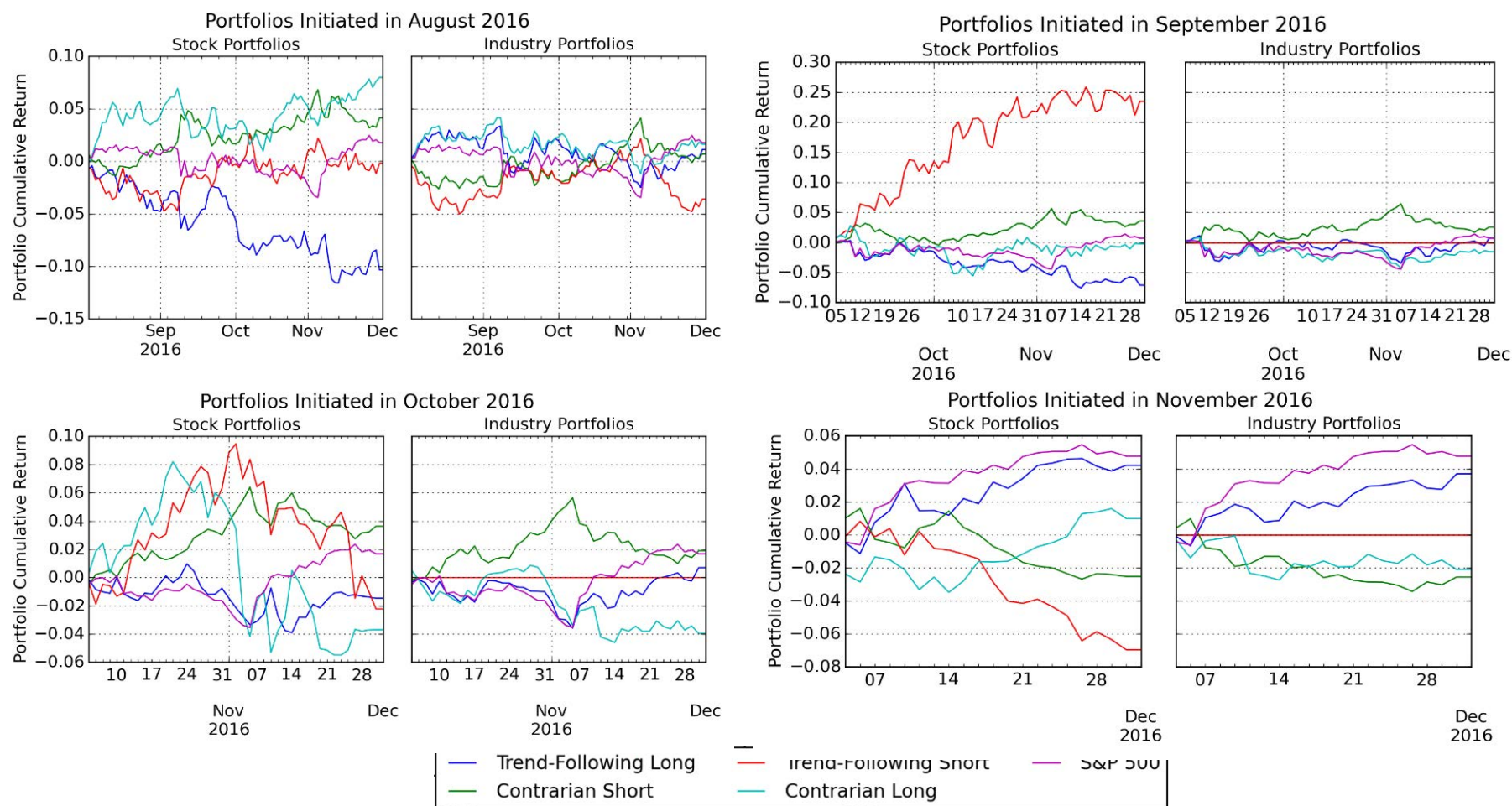
For individual stocks that we identified in the 4 quadrants, we constructed 4 portfolios based on the 4 quadrants defined in the last report. Each portfolio consists of all the stocks listed in the corresponding quadrant.

- (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 Short portfolios play out and outperform the market in most portfolios initiated in August, September and October. While in November, only Long portfolios have better performances as markets are increasing during the whole month. Contrarian Portfolios are more delicate to use due to their sensitivity to timing the expected reversal and exhibit very volatile performances, indicating that most of bubbles in the market are still dominating and that fundamentals have not yet played out. We expect trend-following positions to perform in the months following the position set-up and then contrarian positions to over-perform over longer time scales as the predicted corrections play out.

# The FCO Cockpit – Global Bubble Status December 1st, 2016

For information, see

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