The FCO Cockpit
Global Bubble Status Report

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About

The Financial Crisis Observatory (FCO) monthly report discusses the historical evolution of bubbles in and between different asset classes and geographies.

It is the result of an extensive analysis done on the historical time series of about 450 systemic assets and 850 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

Methodology

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

1. Price rises faster than exponentially, therefore the logarithm of the price rises faster than linearly;

2. There are accelerating oscillations, with a distinct characteristic.

A bubble signal is identified if both of our bubble indicators, LPPL-Confidence and LPPL-Trust, are larger than 5%.
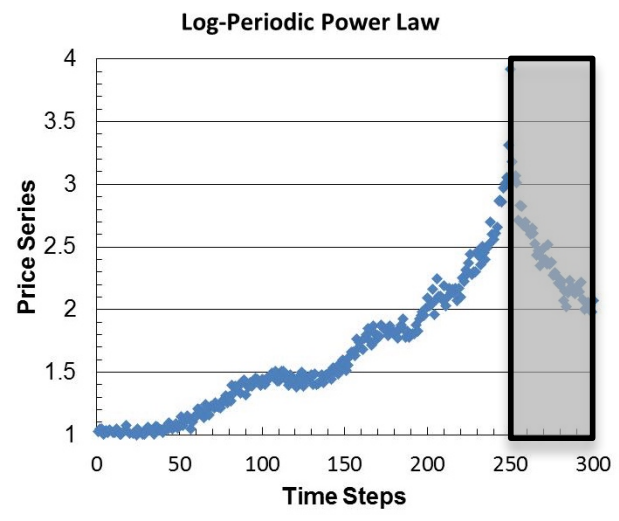
Positive bubble: imitation in **buying**
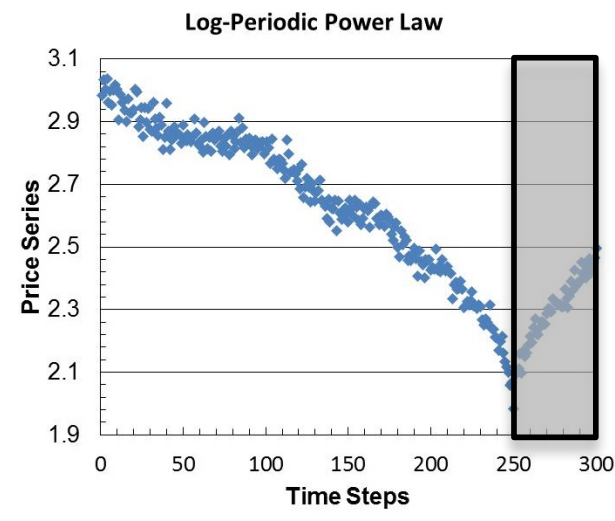
Negative bubble: imitation in **selling**

General Results - Highlights

Announcement: During the previous weeks, the first section of this report has been renewed and extended. In addition to the big picture bubble overview, we provide a new table presenting the different analyzed asset classes and corresponding numbers for the fraction of positive and negative bubble singles occurring amongst those. Furthermore, the Fixed Income and Equity Sections were further subdivided into new categories which, due to their special relevance, we will continue to separately highlight in each month.
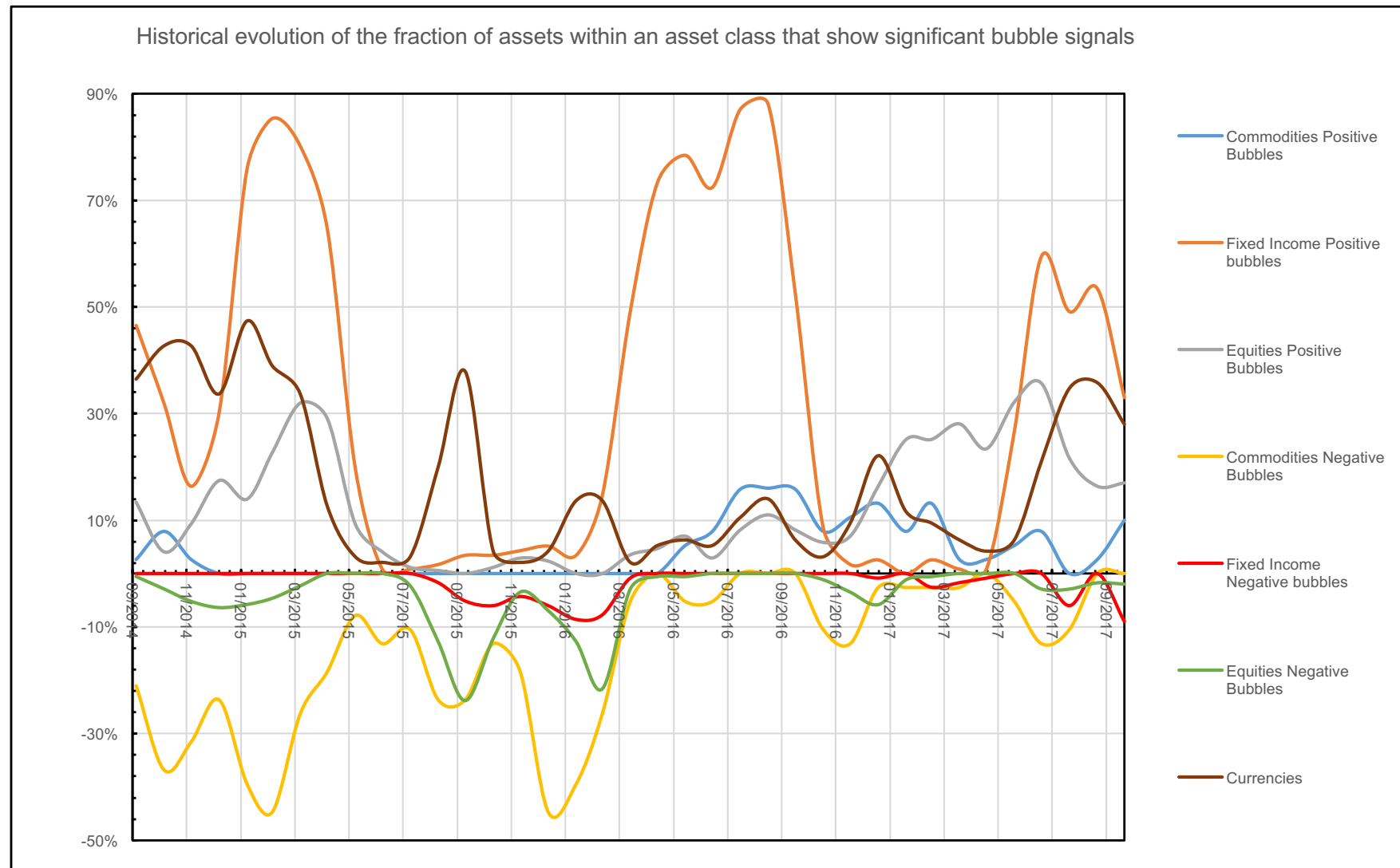
Fixed Income: After the stabilization of positive bubble growth in the fixed income sector in the previous month, one can now observe a decline in the same by -20% accompanied by a rise of 10% in negative bubble signals. As mentioned, from this report on, the fixed income sector is analyzed in greater detail because of a split into government bonds, as well as general, financial and insurance sector corporate bonds. As a result of this separation, we can observe a remarkably high fraction of positive bubble indices in the financial sector amounting to 85% compared to lower values in other sectors.

Commodities: The fraction of bubbles in the sector remains low, as in the past months. However, the magnitudes of the indicators for the few identified assets with bubbles should be considered. Palladium is in a positive bubble state for another month, which reinforces the confidence in its bubble state.

Forex: With a fraction of about 30%, the observed bubble activity in currency pairs is slightly lower than during the last month. However, there are still more than ten pairs that exhibit a DS LPPL Trust value of more than 30%. As mentioned in the last report, the Euro remains a highlight due to many bubble relations. Additionally, amongst all identified bubble pairs, eight pairs are formed with the Swiss Franc which has decreased in value lately.

Equity: Few negative bubble signs were detected in the equity stock markets. The fraction of positive bubbles follows last month's trend. The newly introduced split of the equity analysis now allows us to look at general government indices, as well as separately the European (STOXX) and US Markets (S&P500). This month, a higher fraction of bubble signals is identified in US Markets.

General Results – The Big Picture

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

Legend:
- Commodities Positive Bubbles
- Fixed Income Positive bubbles
- Equities Positive Bubbles
- Commodities Negative Bubbles
- Fixed Income Negative bubbles
- Equities Negative Bubbles
- Currencies

General Results – This Month's Overview

Asset Class	Subtype	Assets	FPB	FNB
Fixed Income	Government Bonds	34	17%	17%
	Corporate Bonds General	60	33%	8%
	Financial Sector Bonds	13	85%	0%
	Insurance Sector Bonds	5	40%	20%
Commodities	-	38	10%	0%
FX	-	92	28%	
Equity (Stock Markets)	Country Indices	75	28%	1%
	United States S&P500 Indices	59	14%	2%
	Europe STOXX Indices	34	0%	3%
Number of Assets		410	79	29

* FPB – Fraction of positive Bubble Signals, FNB – Fraction of negative Bubble Signals

At the beginning of October, the financial sector exhibits a fairly high share of positive bubble assets, with signals identified in about 85% of all financial corporate bond indices compared to only about one third in the general corporate bond sector. The largest fraction of negative bubbles could be observed in currencies. Overall, approximately 20% of all assets show signs for a positive bubble state while about 7% are diagnosed to be in a negative bubble state.

Results per Asset Class - Government Bonds

Contrary to the beginning of September, when only one index, the USD US Agencies Index (September, Trust: 12.3%, Confidence: 7.0%), showed significant bubble signals exceeding the indicator threshold of 5%, in October, increased bubble activity can be observed in a variety of Government bonds. An emphasis thereby seems to be on Southeast Asia countries. In total, about one third of the 34 monitored Indices shows signs for a bubble state, about half of them being negative and half positive. The top five for each category, sorted according to their DS LPPL Trust value, are listed in the table below.

Government Bond Indices	Yearly Return	DS LPPL Trust	DS LPPL Confidence
Positive Bubbles			
iBoxx Asia Thailand Government Index	1,4%	62%	58%
iBoxx Asia Malaysia Government Index	1,9%	37%	20%
iBoxx GBP Sovereigns Index	0,2%	29%	21%
iBoxx Asia Indonesia Government Index	9,9%	27%	23%
iBoxx USD Sovereigns Index	1,5%	22%	22%
Negative Bubbles			
iBoxx Asia Taiwan Government Index	-1,6%	41%	42%
iBoxx USD Supranationals Index	-0,2%	23%	27%
iBoxx USD US Agencies Index	-0,4%	22%	25%
iBoxx USD Local governments Index	-0,3%	11%	16%
iBoxx USD Treasuries Index	-2,0%	11%	16%

Results per Asset Class - Government Bonds

iBoxx Asia Taiwan Government Index, showing first negative bubble signals.

[Source: Thomson Reuters]

Results per Asset Class - Corporate Bonds

At the start of October, positive bubble signals are detected in one third of the sixty analyzed corporate bond indices, excluding the financial and insurance sectors. Negative bubble signs are obtained for only about 8% of all indices. Therefore, and additionally due to the remarkably high magnitude of positive signals, the corporate bond sector seems biased towards positive bubble signs. Highlighted in the following slides are the USD Industrial Metals Index, as well as the EUR Utilities Index.

Corporate Bonds - General Overview	Yearly Return	DS LPPL Trust	DS LPPL Confidence
Positive Bubbles			
iBoxx USD Industrial Metals Index	7,3%	59%	63%
iBoxx USD Basic Resources Index	5,8%	45%	66%
iBoxx USD Mining Index	6,2%	43%	68%
iBoxx USD Real Estate Index	1,6%	40%	43%
iBoxx USD Gas, Water & Multiutilities Index	1,7%	40%	39%
Negative Bubbles			
iBoxx EUR Utilities Index	-0,1%	23%	26%
iBoxx EUR Non-Financials Index	-0,6%	7%	15%
iBoxx EUR Media Index	-0,6%	7%	14%
iBoxx EUR Construction & Materials Index	-0,1%	6%	19%
iBoxx EUR Travel & Leisure Index	0,0%	4%	14%

Results per Asset Class - Corporate Bonds

Positive Bubble Signals: iBoxx USD Industrial Metals Index

[Source: Thomson Reuters]

Results per Asset Class - Corporate Bonds

Bubble Signals in the iBoxx EUR Utilities Index (2Y-chart)

[Source: Thomson Reuters]

Results per Asset Class
Financial Sector Corporate Bonds

On 1st October 2017, 11 out of 13 analyzed indices from the financial sector show positive bubble signals, while still none of them show signs for the formation of negative bubbles. As pointed out already in last month's report, by now, for the 7th consecutive month, the EUR Financial Services Subordinated Index continues to be in a positive bubble state which has further increased in magnitude during the last thirty days, moving it to the top of the list. This is in accordance with the presence of additional bubble signals in two other European Financial Indices, as depicted in the table below.

Corporate Bonds - Financial Sector	Yearly Return	DS LPPL Trust	DS LPPL Confidence
Positive Bubbles			
iBoxx EUR Financial Services Subordinated Index	3,4%	53%	51%
iBoxx USD Financial Services Index	1,5%	24%	17%
iBoxx USD General Financial Index	1,5%	24%	17%
iBoxx EUR Banks Subordinated Index	4,5%	18%	17%
iBoxx EUR Banks Senior Index	0,4%	14%	18%
Negative Bubbles			
None			

Results per Asset Class
Financial Sector Corporate Bonds

Ongoing Positive Bubble Signals in the iBoxx EUR Financial Services Subordinated Index

[Source: Thomson Reuters]

Results per Asset Class
Insurance Sector Corporate Bonds

The results for six Corporate Bond Indices in the Insurance Sector are summarized in the table below. The table reveals that only two of the indices (EUR Insurance and USD Life Insurance) show positive bubble signals on both indicators, while one is in a negative bubble state. Compared to last month, positive bubble signals detected in the EUR Insurance Subordinated Index (September, Trust: 33.7%, Confidence: 28.3%) have relaxed, again, which is justified from a chart analysis perspective by the sideward movement experienced during the previous months, as shown on the following slide.

Corporate Bonds - Insurance Sector	Yearly Return	DS LPPL Trust	DS LPPL Confidence
Positive Bubbles			
iBoxx EUR Insurance Index	6,7%	39%	13%
iBoxx USD Insurance Index	3,4%	18%	3%
iBoxx EUR Insurance Subordinated Index	10,5%	16%	2%
iBoxx USD Insurance Senior Index	2,6%	15%	4%
iBoxx USD Life Insurance Index	3,4%	14%	6%
Negative Bubbles			
iBoxx EUR Insurance Senior Index	-0,7%	11%	24%

Results per Asset Class
Insurance Sector Corporate Bonds

Positive bubble signals in the iBoxx EUR Insurance Subordinated Index have relaxed again due to the sidewards correction experienced in the past months.

[Source: Thomson Reuters]

Results per Asset Class - Commodities

Compared to the beginning of September, in the commodities asset class, positive bubble signals were obtained for a fraction of indices which is just slightly larger than before and amounts to about 10% of all analyzed assets. Notice that the bubble signals in Palladium which were detected in the previous month (September, Trust: 8.0%, Confidence: 32.5%) are still present. Additionally, indicator values suggesting positive bubbles in the making are seen in Copper and Zinc which both exhibit a yearly return similar to that of Palladium of close to 30%. Continuing the trend of last month, currently, no more negative bubble signs are obtained.

Commodities	Yearly Return	DS LPPL Trust	DS LPPL Confidence
Positive Bubbles			
Palladium ER Index	30,2%	20%	23%
Zinc ER Index	31,9%	9%	8%
HG Copper ER Index	30,0%	9%	10%
Copper ER Index	30,8%	9%	12%
Negative Bubbles			
None			

Results per Asset Class - Commodities
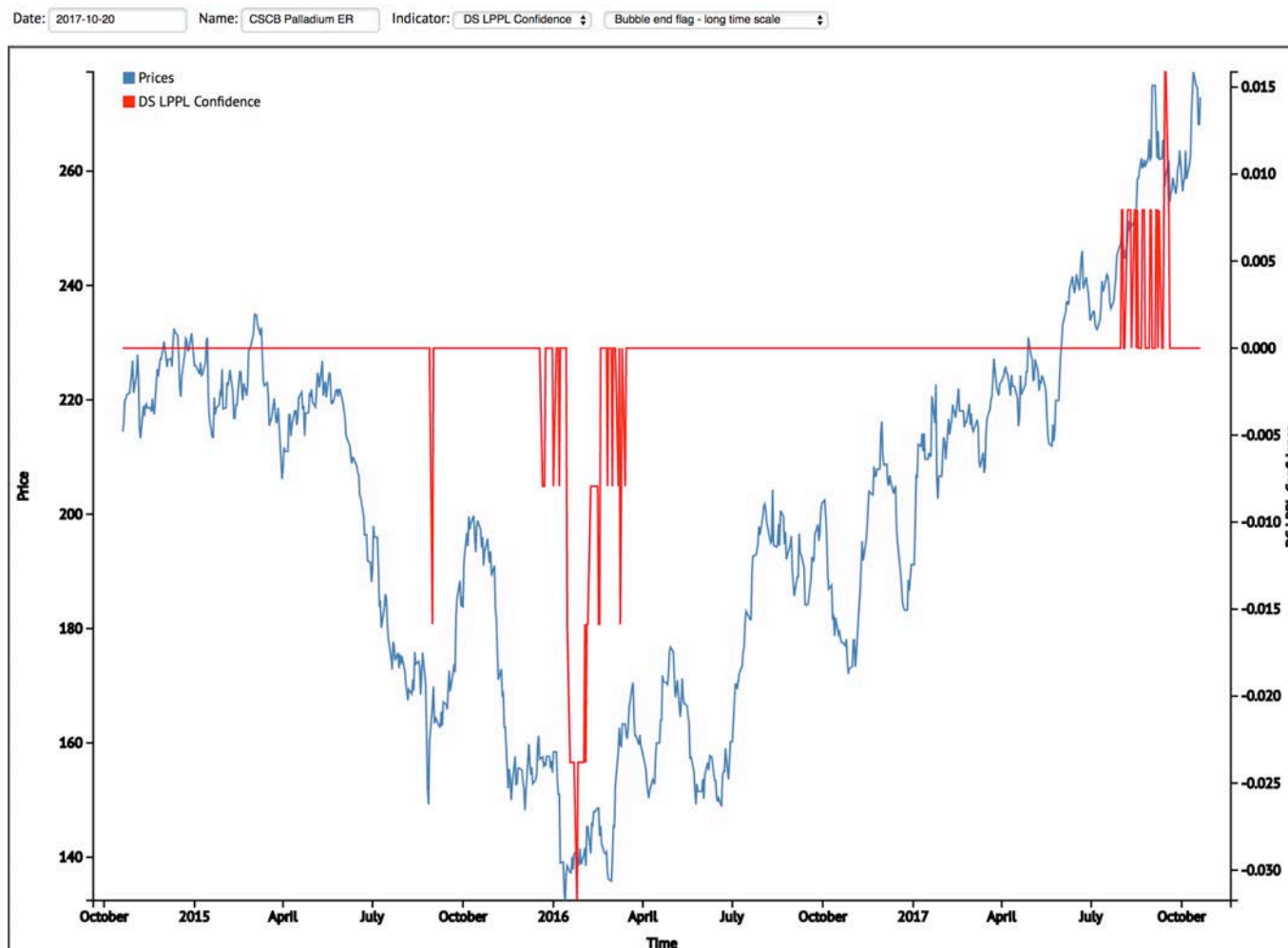
Palladium ER Index

Source: Financial Crisis Observatory

Results per Asset Class - Currencies

Currencies	Yearly Return	DS LPPL Trust	DS LPPL Confidence
Czech Koruna/Swiss Franc FX Cross Rate	9,0%	51%	15%
Hong Kong Dollar/Euro FX Cross Rate	-5,5%	49%	8%
Saudi Arabian Riyal/Euro FX Cross Rate	-4,8%	46%	8%
US Dollar/Danish Krone FX Spot Rate	-4,9%	45%	8%
US Dollar/Bulgarian Lev FX Spot Rate	-4,8%	44%	8%
Euro/US Dollar FX Spot Rate	5,1%	42%	8%
Qatar Rial/Euro FX Cross Rate	-6,3%	37%	7%
Danish Krone/Swiss Franc FX Cross Rate	4,8%	36%	8%
Polish Zloty/Swiss Franc FX Cross Rate	4,3%	36%	21%
Hungarian Forint/Swiss Franc FX Cross Rate	3,5%	35%	7%
Euro/Swiss Franc FX Cross Rate	4,7%	32%	7%
US Dollar/Egyptian Pound FX Spot Rate	98,4%	20%	11%
Romanian New Leu/Swiss Franc FX Cross Rate	1,2%	18%	8%
US Dollar/Canadian Dollar FX Spot Rate	-5,0%	18%	15%
US Dollar/Chilean Peso FX Spot Rate	-2,7%	17%	20%
Chilean Peso/Swiss Franc FX Cross Rate	2,4%	14%	9%
South African Rand/Euro FX Cross Rate	-3,6%	12%	9%
Canadian Dollar/Swiss Franc FX Cross Rate	4,9%	8%	10%
Romanian New Leu/Euro FX Cross Rate	-3,4%	5%	15%
New Zealand Dollar/Euro FX Cross Rate	-5,9%	5%	10%

Results per Asset Class - Currencies
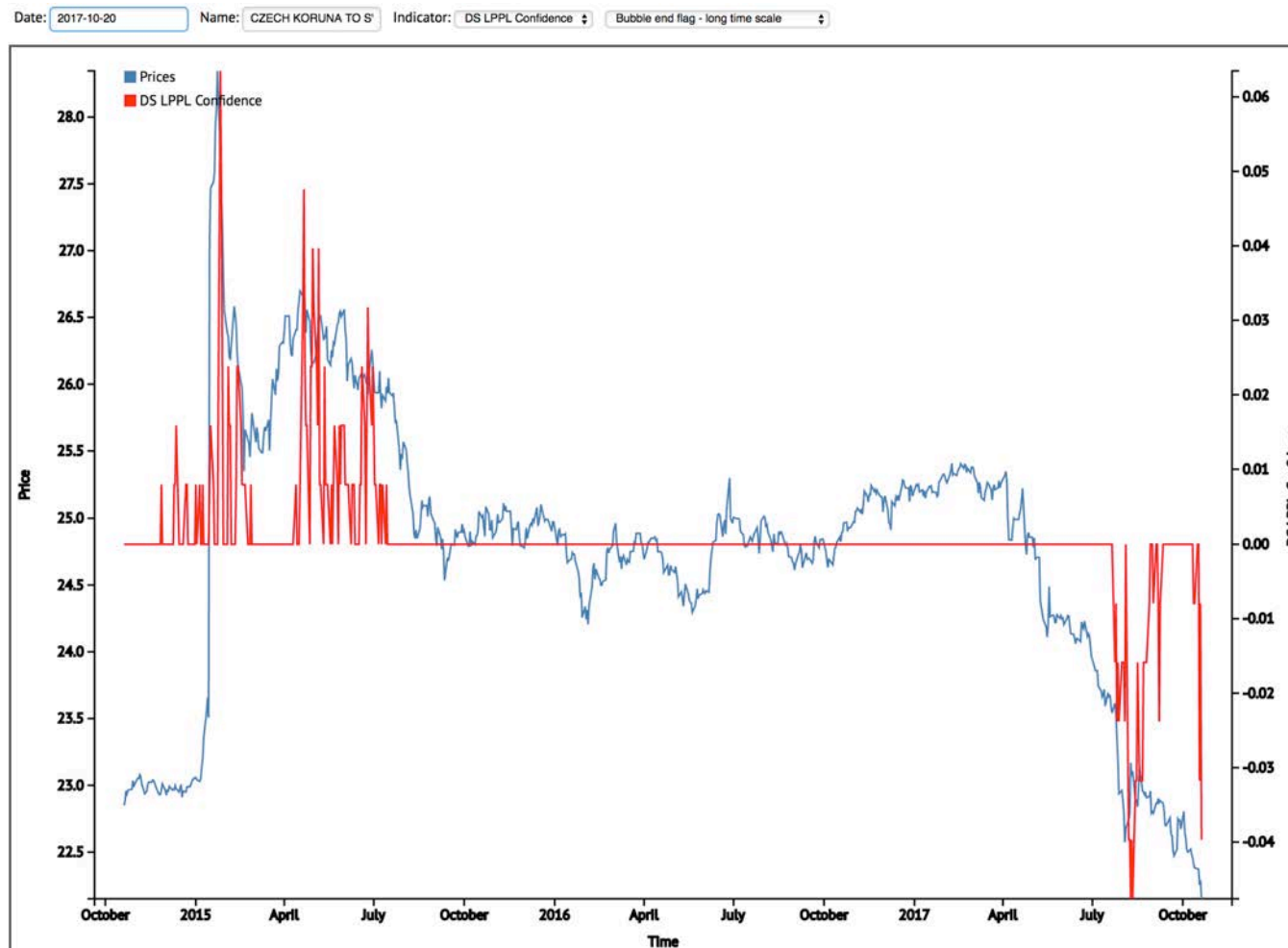
Czech Koruna/Swiss Franc FX Cross Rate

[Source: Financial Crisis Observatory]

Results per Asset Class - Currencies

Euro/Swiss Franc FX Cross Rate

[Source: Financial Crisis Observatory]

Results per Asset Class - Currencies
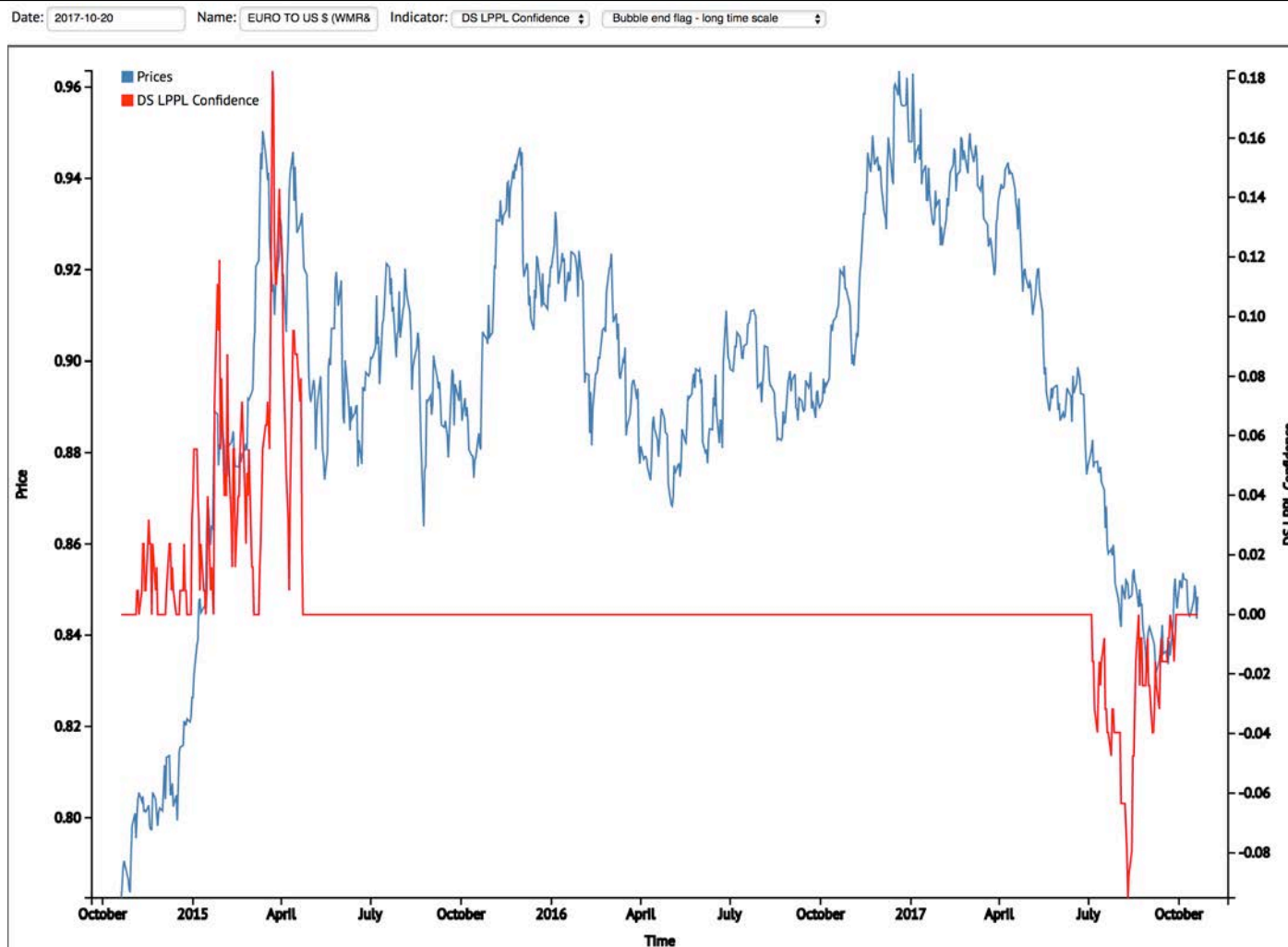
Euro/US Dollar FX Spot Rate

[Source: Financial Crisis Observatory]

Results per Asset Class - Country Performance General Overview

Equities - Country Indices	Yearly Return	DS LPPL Trust	DS LPPL Confidence	Country
Positive Bubbles				
Bursatil Index	3676,6%	84%	79%	Venezuela
OMX Vilnius_GI	18,1%	52%	25%	Lithuania
Hang Seng Index	18,3%	44%	33%	Hong Kong
Budapest SE Index	34,8%	41%	39%	Hungary
FTSE China 50 Index	17,7%	25%	29%	China
SZSE 100 Index	17,5%	23%	29%	China
Dow Jones Industrial Average Index	22,4%	20%	19%	United States
Warsaw SE WIG Poland Index	36,5%	11%	29%	Poland
Oslo Stock Exchange Equity Index	29,2%	8%	24%	Norway
Buenos Aires SE Merval Index	56,4%	7%	27%	Argentinia
Negative Bubbles				
Qatar Exchange General Index	-20,3%	14%	23%	Qatar

At the beginning of October, about 30% of all analyzed country indices show positive bubble trends. Most striking are the extremely strong positive bubble signals in the Venezuelan Government Index which has risen more than thirtyfold since the beginning of the year, as a result of the – since 2012 – ongoing Venezuelan Economic Crisis, leading to galloping inflation. As mentioned in a previous report, the signal on the Venezualian market is dominated by the accelerating inflation rate. Negative bubble signs could only be detected in the Qatar General Index which has decreased by -20.3% this year.

Results per Asset Class - Country Performance
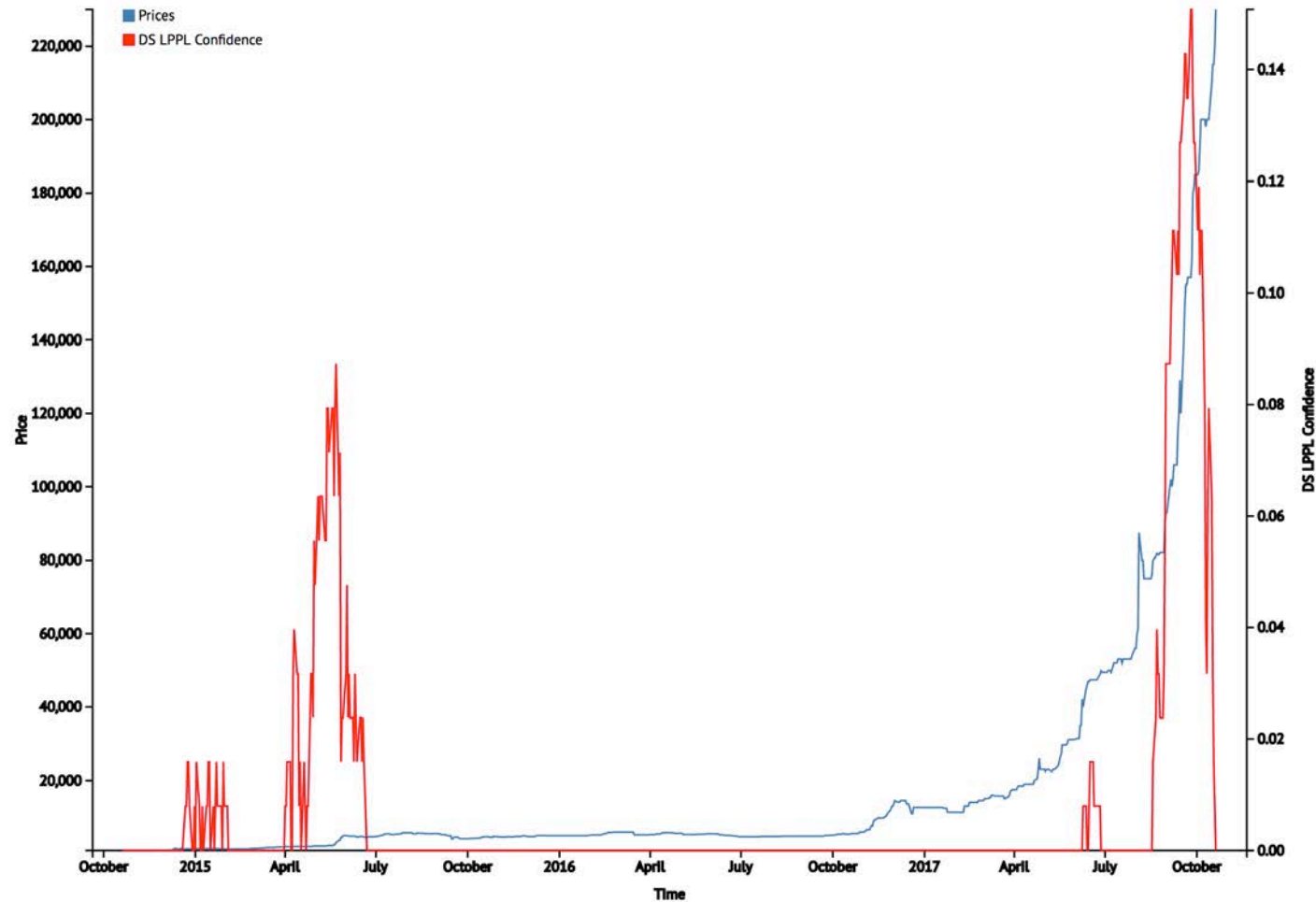
Bursatil Index

[Source: Financial Crisis Observatory]

Results per Asset Class - Country Performance
United States and Europe

Commodities	Yearly Return	DS LPPL Trust	DS LPPL Confidence
Positive Bubbles			
S&P 500 Aerospace & Defense (Industry)	40,5%	47%	31%
S&P 500 IT Services (Industry)	21,2%	36%	46%
S&P 500 - Biotechnology (Industry)	20,2%	15%	37%
S&P 500 - Commercial Services & Supplies (Industry)	18,9%	7%	21%
S&P 500 - Life Sciences Tools & Services (Industry)	20,9%	6%	6%
S&P 500 Diversified Financial Services (Industry)	27,0%	6%	11%
S&P 500 Air Freight & Logistics (Industry)	16,1%	6%	15%
S&P 500 Chemicals (Industry)	22,1%	5%	17%
Negative Bubbles			
S&P 500 Food Products (Industry)	-9,2%	10%	32%

Close-Up: European Markets	Yearly Return	DS LPPL Trust	DS LPPL Confidence
Positive Bubbles			
STOXX Europe 600 Oil & Gas EUR Price Index	8,4%	11%	1%
Negative Bubbles			
STOXX Europe 600 Media EUR Price Index	-3,0%	12%	

When comparing the European to the United States market, we see differing behavior this month. While the US S&P500 Sub-Indices show positive bubble activity in various sectors, in the European market the activity is much lower with only one index showing signals on a single indicator. Furthermore, both markets show no significant signs of negative bubble development.

Single Stocks

For 847 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.

Single Stocks

The four quadrants: value versus bubble score
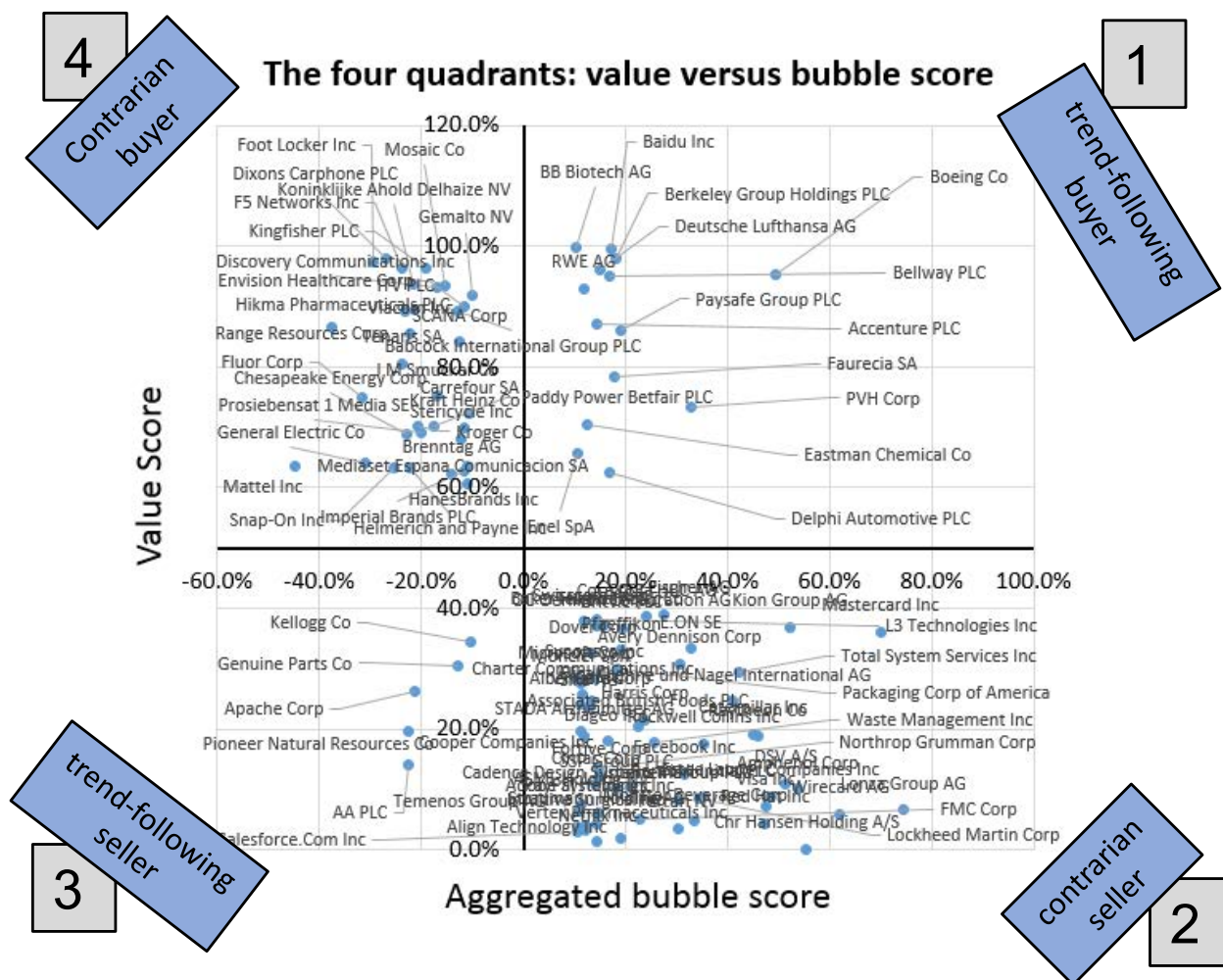
By plotting the value score against the aggregated bubble score, we can divide the stocks into four quadrants*:

1. **Quadrant 1:** Stocks with a strong positive bubble score and a strong value score (e.g. RWE AG);
2. **Quadrant 2:** Stocks with a strong positive bubble score and a weak value score (e.g. FMC Corp);
3. **Quadrant 3:** Stocks with a strong negative bubble score and a weak value score (e.g. AA PLC);
4. **Quadrant 4:** Stocks with strong negative bubble score and a strong financial strength (e.g. Mattel Inc)

*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%.

Single Stocks

Each quadrant has its own specs:

1. Quadrant 1: Stocks with a strong value score are cheap relative to their earnings potential. The strong positive bubble signal should be interpreted as a momentum indicator possibly the consequence of a repricing based on the fundamentals. As an investor, one could be a trend-following buyer.

2. Quadrant 2: Stocks with a weak value score are expensive relative to their earnings potential. The strong positive bubble signal is an indication of sentiment and herding increasing the price until it is not linked to fundamentals anymore. As an investor, one could be a contrarian seller.

3. Quadrant 3: These stocks are expensive relative to their earnings potential. On top of that, there are clear negative bubble signals. Such stocks should be considered as falling knives. As an investor, one could be a trend-following seller.

4. Quadrant 4: These stocks are cheap relative to their financial performance. The strong negative bubble signal is an indication of sentiment and herding. These stocks can be considered as over-sold. As an investor, one could be a contrarian buyer.

Single Stocks

Quadrant 1 and 2 stocks
Strong positive bubble signals with strong (respectively weak) fundamentals
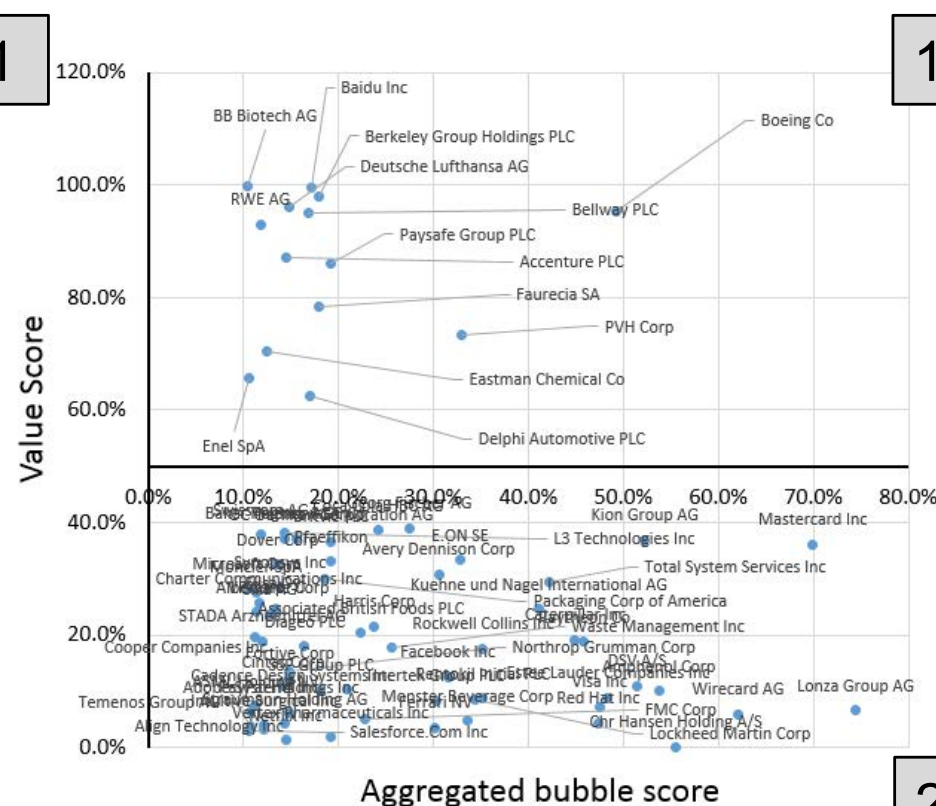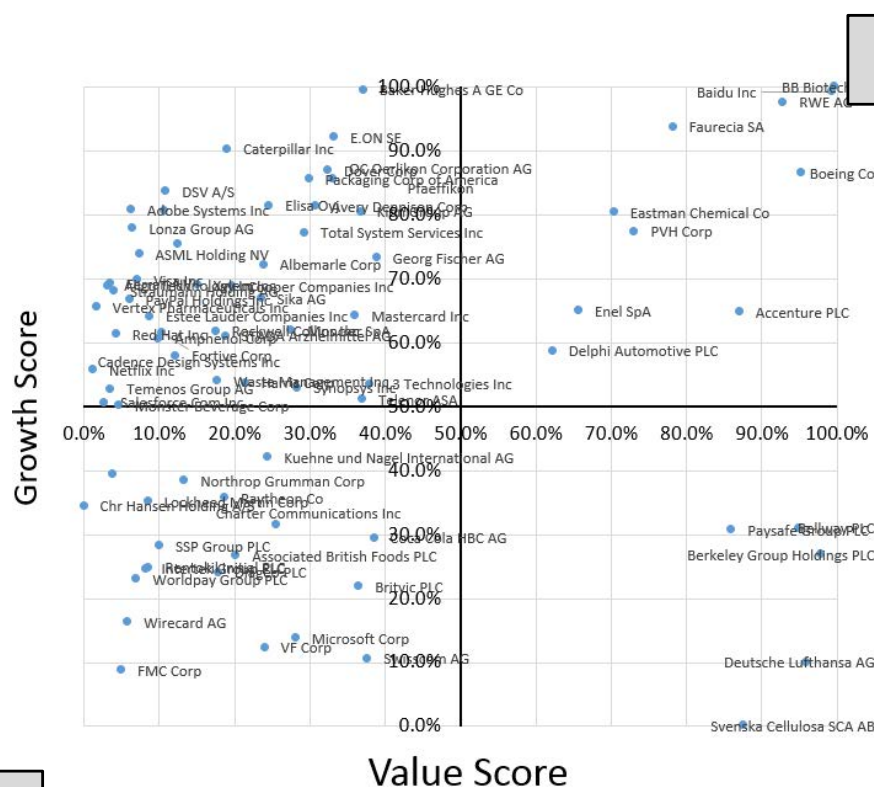
Single Stocks

Quadrant 3 and 4 stocks
Strong negative bubble signals with weak respectively strong fundamentals
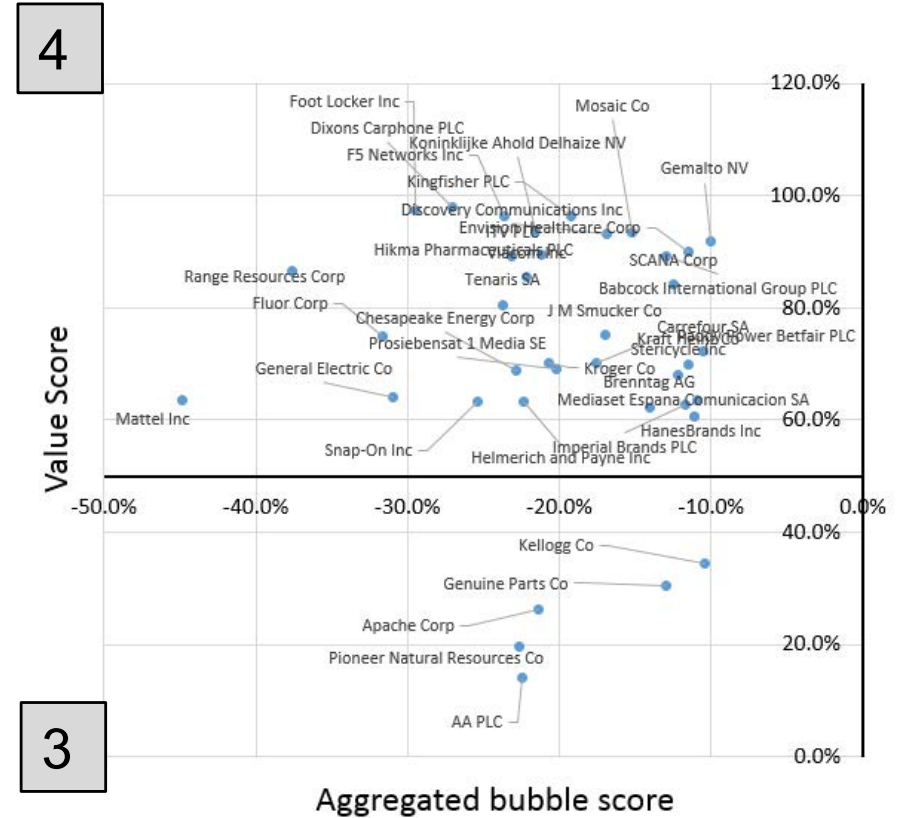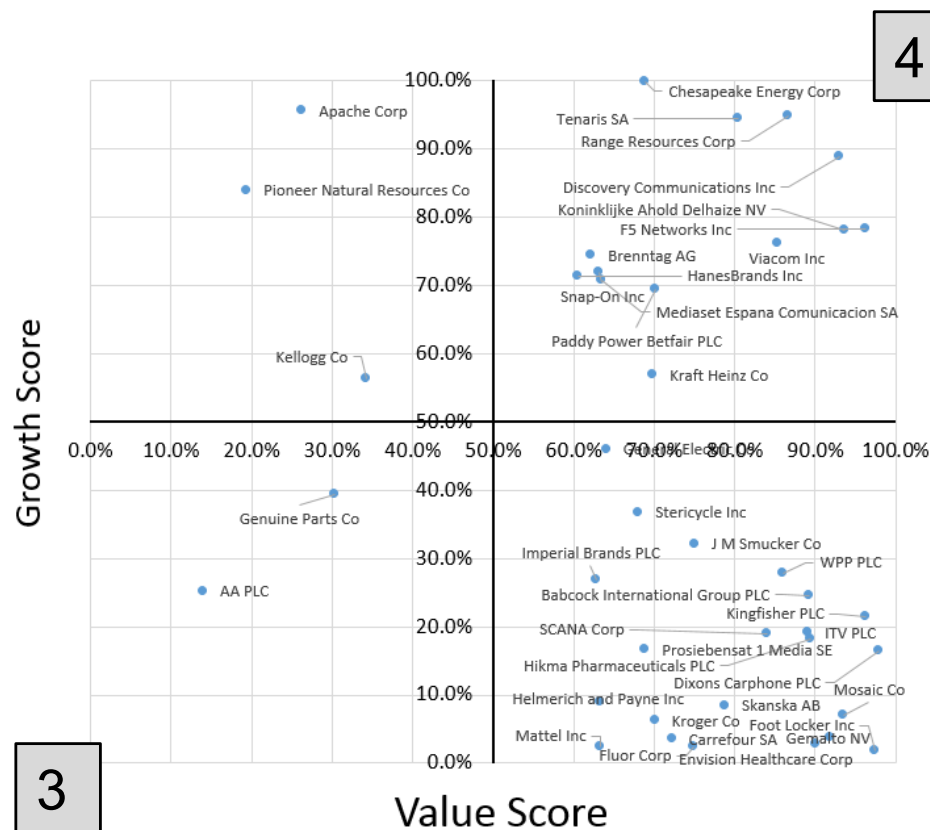
Single Stocks - Quadrant 1 stocks

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
Baidu Inc	China	Information Technology	Software & Services	35.5%	17.1%	99.4%	99.2%
Berkeley Group Holdings PLC	United Kingdom	Consumer Discretionary	Consumer Durables & Apparel	46.4%	18.0%	97.9%	26.8%
Bellway PLC	United Kingdom	Consumer Discretionary	Consumer Durables & Apparel	41.8%	16.8%	95.0%	30.9%
Deutsche Lufthansa AG	Germany	Industrials	Transportation	145.5%	14.9%	96.0%	9.9%
RWE AG	Germany	Utilities	Utilities	27.5%	11.8%	92.9%	97.5%
Faurecia SA	France	Consumer Discretionary	Automobiles & Components	68.9%	17.9%	78.3%	93.6%
Enel SpA	Italy	Utilities	Utilities	30.7%	10.6%	65.8%	64.9%
Paysafe Group PLC	Isle of Man	Information Technology	Software & Services	27.8%	19.2%	86.1%	30.7%
BB Biotech AG	Switzerland	Health Care	Pharmaceuticals, Biotechnology & Life Sciences	31.5%	10.4%	99.6%	99.9%
Accenture PLC	Ireland; Republic of	Information Technology	Software & Services	12.1%	14.5%	87.1%	64.7%
Boeing Co	United States of America	Industrials	Capital Goods	93.4%	49.3%	95.3%	86.4%
Delphi Automotive PLC	United Kingdom	Consumer Discretionary	Automobiles & Components	40.3%	17.0%	62.3%	58.7%
Eastman Chemical Co	United States of America	Materials	Materials	35.4%	12.5%	70.5%	80.3%
PVH Corp	United States of America	Consumer Discretionary	Consumer Durables & Apparel	13.9%	32.9%	73.2%	77.3%
Svenska Cellulosa SCA AB	Sweden	Materials	Materials	53.1%	16.1%	87.7%	0.0%

Single Stocks - Quadrant 1 stocks

Quadrant 1 stocks: strong positive bubble signals with strong fundamentals
Example: Eastman Chemical Co.

The left graph is a standard output from the Financial Crisis Observatory. It shows the historical price evolution of the stock in blue (left hand scale) and the calculated bubble warning index DS LPPL Trust in red (right hand scale). We can see a clearly spiking warning, indicating the convergence towards the end of a bubble-like regime. The right graph shows the outperformance of the stock over the last year (orange) with respect to the S&P 500 benchmark (purple), which is almost 18%.

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Single Stocks - Quadrant 1 stocks

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

Note that a 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. One should remain cautious as this stock is still identified with strong bubble signal this month.

Last month signal (1st Sep. 2017)

This month signal (1st Oct. 2017)

Single Stocks - Quadrant 2 stocks

Quadrant 2 stocks: strong positive bubble signals with weak fundamentals

This month we again observe an abnormally large number of stocks in this Quadrant.

This suggests that the fundamentals are still dominantly weak while there is a general positive investment sentiment, possibly in denial of the weakness of the existing recovery.

Single Stocks - Quadrant 2 stocks

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
Adobe Systems Inc	United States of America	Information Technology	Software & Services	36.4%	10.8%	6.4%	80.6%
Align Technology Inc	United States of America	Health Care	Health Care Equipment & Services	107.5%	12.1%	3.3%	68.8%
Cadence Design Systems Inc	United States of America	Information Technology	Software & Services	56.2%	20.9%	10.4%	61.4%
Charter Communications Inc	United States of America	Consumer Discretionary	Media	35.8%	11.6%	25.6%	31.4%
Cintas Corp	United States of America	Industrials	Commercial & Professional Services	29.4%	14.2%	10.7%	80.5%
Facebook Inc	United States of America	Information Technology	Software & Services	31.6%	31.5%	12.5%	75.3%
Intuitive Surgical Inc	United States of America	Health Care	Health Care Equipment & Services	47.7%	12.1%	3.9%	39.3%
Monster Beverage Corp	United States of America	Consumer Staples	Food, Beverage & Tobacco	13.5%	33.6%	4.7%	50.1%
Microsoft Corp	United States of America	Information Technology	Software & Services	29.9%	10.3%	28.2%	13.7%
Netflix Inc	United States of America	Consumer Discretionary	Retailing	72.5%	14.4%	1.3%	55.6%
PayPal Holdings Inc	United States of America	Information Technology	Software & Services	58.1%	14.8%	6.1%	66.6%
Synopsys Inc	United States of America	Information Technology	Software & Services	37.8%	13.9%	28.5%	52.9%
Vertex Pharmaceuticals Inc	United States of America	Health Care	Pharmaceuticals, Biotechnology & Life Sciences	75.4%	19.1%	1.8%	65.5%
Associated British Foods PLC	United Kingdom	Consumer Staples	Food, Beverage & Tobacco	23.2%	22.4%	20.3%	26.6%
Britvic PLC	United Kingdom	Consumer Staples	Food, Beverage & Tobacco	22.5%	19.2%	36.6%	21.8%
Coca Cola HBC AG	Switzerland	Consumer Staples	Food, Beverage & Tobacco	41.3%	24.2%	38.6%	29.4%
E.ON SE	Germany	Utilities	Utilities	53.4%	32.8%	33.3%	92.0%
Kion Group AG	Germany	Industrials	Capital Goods	41.3%	52.2%	36.8%	80.4%
STADA Arzneimittel AG	Germany	Health Care	Pharmaceuticals, Biotechnology & Life Sciences	67.8%	12.0%	18.9%	60.9%
Wirecard AG	Germany	Information Technology	Software & Services	68.9%	62.0%	5.9%	16.2%
Diageo PLC	United Kingdom	Consumer Staples	Food, Beverage & Tobacco	9.8%	16.4%	17.9%	24.0%

Single Stocks - Quadrant 2 stocks

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

Company Name	Country of Headquarters	GICS Sector Name	GICS Industry Group Name	Yearly Return	Bubble Score	Value Score	Growth Score
Chr Hansen Holding A/S	Denmark	Materials	Materials	36.2%	55.5%	0.1%	34.4%
DSV A/S	Denmark	Industrials	Transportation	46.5%	51.4%	11.0%	83.6%
ASML Holding NV	Netherlands	Information Technology	Semiconductors & Semiconductor Equipment	49.5%	11.3%	7.4%	73.8%
Moncler SpA	Italy	Consumer Discretionary	Consumer Durables & Apparel	63.3%	11.3%	27.6%	61.9%
Ferrari NV	Italy	Consumer Discretionary	Automobiles & Components	106.5%	30.2%	3.5%	69.2%
Intertek Group PLC	United Kingdom	Industrials	Commercial & Professional Services	42.6%	30.3%	8.3%	24.6%
Elisa Oyj	Finland	Telecommunication Services	Telecommunication Services	12.0%	13.3%	24.7%	81.3%
Telenor ASA	Norway	Telecommunication Services	Telecommunication Services	23.3%	15.5%	37.1%	51.0%
Rentokil Initial PLC	United Kingdom	Industrials	Commercial & Professional Services	34.3%	35.2%	8.7%	24.8%
Georg Fischer AG	Switzerland	Industrials	Capital Goods	39.3%	27.5%	39.0%	73.2%
Kuehne und Nagel International AG	Switzerland	Industrials	Transportation	27.9%	41.1%	24.6%	42.0%
Lonza Group AG	Switzerland	Health Care	Pharmaceuticals, Biotechnology & Life Sciences	49.2%	74.4%	6.6%	77.8%
Swisscom AG	Switzerland	Telecommunication Services	Telecommunication Services	8.1%	11.8%	37.8%	10.5%
Sika AG	Switzerland	Materials	Materials	53.1%	12.8%	23.6%	66.8%
Straumann Holding AG	Switzerland	Health Care	Health Care Equipment & Services	65.4%	14.4%	4.1%	68.0%
Temenos Group AG	Switzerland	Information Technology	Software & Services	47.3%	10.7%	3.7%	52.7%
OC Oerlikon Corporation AG Pfaeffikon	Switzerland	Industrials	Capital Goods	55.7%	19.2%	33.2%	85.6%
SSP Group PLC	United Kingdom	Consumer Discretionary	Consumer Services	69.4%	18.2%	10.2%	28.1%
Albemarle Corp	United States of America	Materials	Materials	61.1%	13.1%	24.0%	72.1%
Amphenol Corp	United States of America	Information Technology	Technology Hardware & Equipment	31.6%	53.7%	10.0%	60.6%
Avery Dennison Corp	United States of America	Materials	Materials	27.4%	30.5%	30.8%	81.2%
Baker Hughes A GE Co	United States of America	Energy	Energy	5.8%	14.4%	37.2%	99.4%

Single Stocks - Quadrant 2 stocks

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

Company Name	Country of Headquarters	GICS Sector Name	GICS Industry Group Name	Yearly Return	Bubble Score	Value Score	Growth Score
Caterpillar Inc	United States of America	Industrials	Capital Goods	41.3%	44.9%	19.1%	90.2%
Rockwell Collins Inc	United States of America	Industrials	Capital Goods	56.9%	35.2%	17.6%	61.7%
Cooper Companies Inc	United States of America	Health Care	Health Care Equipment & Services	35.3%	11.2%	19.7%	68.7%
Salesforce.Com Inc	United States of America	Information Technology	Software & Services	33.2%	10.5%	2.8%	50.5%
Dover Corp	United States of America	Industrials	Capital Goods	25.8%	13.6%	32.5%	86.8%
Estee Lauder Companies Inc	United States of America	Consumer Staples	Household & Personal Products	22.9%	48.4%	8.9%	64.0%
FMC Corp	United States of America	Materials	Materials	84.7%	22.9%	5.1%	8.7%
Fortive Corp	United States of America	Industrials	Capital Goods	39.2%	14.9%	12.3%	57.9%
Harris Corp	United States of America	Information Technology	Technology Hardware & Equipment	45.1%	23.8%	21.5%	53.6%
L3 Technologies Inc	United States of America	Industrials	Capital Goods	26.8%	14.4%	38.0%	53.5%
Lockheed Martin Corp	United States of America	Industrials	Capital Goods	29.4%	34.3%	8.6%	35.1%
Mastercard Inc	United States of America	Information Technology	Software & Services	39.2%	69.9%	36.1%	64.1%
Northrop Grumman Corp	United States of America	Industrials	Capital Goods	34.8%	14.8%	13.5%	38.4%
Packaging Corp of America	United States of America	Materials	Materials	44.1%	18.6%	30.0%	85.5%
Red Hat Inc	United States of America	Information Technology	Software & Services	39.9%	47.3%	4.4%	61.3%
Raytheon Co	United States of America	Industrials	Capital Goods	36.8%	45.9%	18.8%	35.7%
Total System Services Inc	United States of America	Information Technology	Software & Services	37.1%	42.1%	29.4%	77.1%
Visa Inc	United States of America	Information Technology	Software & Services	27.3%	47.5%	7.2%	69.7%
VF Corp	United States of America	Consumer Discretionary	Consumer Durables & Apparel	13.8%	11.3%	24.1%	12.3%
Waste Management Inc	United States of America	Industrials	Commercial & Professional Services	24.1%	25.7%	17.8%	54.0%
Xylem Inc	United States of America	Industrials	Capital Goods	20.7%	42.1%	15.1%	68.9%
Worldpay Group PLC	United Kingdom	Information Technology	Software & Services	35.6%	28.1%	7.1%	22.9%

Single Stocks - Quadrant 2 stocks

Quadrant 2 stocks: strong positive bubble signals with weak fundamentals
Example: Vertex Pharmaceuticals Inc.

The left graph is a standard output from the Financial Crisis Observatory. It shows the historical price evolution of the stock in blue (left hand scale) and the calculated bubble warning index DS LPPL Trust in red (right hand scale). We can see a clearly spiking warning. The right graph shows the outperformance of the stock over the last year (orange) with respect to the S&P500 benchmark (purple), it is almost 63% up. The strong positive bubble signals and weak fundamentals indicate a high probability of correction, which already started recently.

Single Stocks - Quadrant 2 stocks

Last month example: strong positive bubble signals with weak fundamentals, Microsoft Corp.

Note that the stock went up and then down, closing almost at the same value at the end of September. This volatility, together with our DS LPPL trust indicator and weak fundamentals, suggests continuing to get out of a long position on this stock.

Last month signal (1st Sep. 2017)

This month signal (1st Oct. 2017)

Single Stocks - Quadrant 3 stocks

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
AA PLC	United Kingdom	Consumer Discretionary	Consumer Services	-44.1%	-22.4%	14.0%	25.1%
Apache Corp	United States of America	Energy	Energy	-28.5%	-21.3%	26.3%	95.5%
Genuine Parts Co	United States of America	Consumer Discretionary	Retailing	-3.5%	-13.0%	30.3%	39.4%
Kellogg Co	United States of America	Consumer Staples	Food, Beverage & Tobacco	-18.8%	-10.4%	34.4%	56.2%
Pioneer Natural Resources Co	United States of America	Energy	Energy	-18.4%	-22.6%	19.5%	83.8%

Single Stocks - Quadrant 3 stocks

Quadrant 3 stocks: strong negative bubble signals with weak fundamentals
Example: Pioneer Natural Resources 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 of the negative bubble. The right graph shows the performance of the stock over the last year (orange) with respect to the S&P 500 benchmark (purple), it is roughly -39%.

Single Stocks - Quadrant 3 stocks

Last month example: strong negative bubble signals with weak fundamentals, Halliburton Co.

Note that the stock had a strong rebound in the past month, in synchrony with our DS LPPL trust indicator, notwithstanding the weak fundamentals. This is an example illustrating the power of market psychology over fundamentals. However, one should remain cautious as there is still downward risk for this stock.

Last month signal (1st Sep. 2017)

This month signal (1st Oct. 2017)

Single Stocks - Quadrant 4 stocks

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
Discovery Communications Inc	United States of America	Consumer Discretionary	Media	-21.4%	-16.9%	93.0%	88.8%
F5 Networks Inc	United States of America	Information Technology	Technology Hardware & Equipment	-0.5%	-23.7%	96.3%	78.2%
Kraft Heinz Co	United States of America	Consumer Staples	Food, Beverage & Tobacco	-12.6%	-11.5%	69.9%	56.8%
Mattel Inc	United States of America	Consumer Discretionary	Consumer Durables & Apparel	-50.0%	-44.9%	63.4%	2.4%
Stericycle Inc	United States of America	Industrials	Commercial & Professional Services	-8.9%	-12.2%	68.1%	36.7%
Viacom Inc	United States of America	Consumer Discretionary	Media	-27.3%	-22.2%	85.4%	76.2%
Babcock International Group PLC	United Kingdom	Industrials	Commercial & Professional Services	-21.3%	-13.0%	89.3%	24.4%
Brenntag AG	Germany	Industrials	Capital Goods	-3.4%	-14.1%	62.2%	74.4%
Prosiebensat 1 Media SE	Germany	Consumer Discretionary	Media	-24.1%	-20.2%	68.9%	16.6%
Dixons Carphone PLC	United Kingdom	Consumer Discretionary	Retailing	-47.9%	-27.0%	98.0%	16.5%
Mediaset Espana Comunicacion SA	Spain	Consumer Discretionary	Media	-10.0%	-10.9%	63.5%	70.7%
Carrefour SA	France	Consumer Staples	Food & Staples Retailing	-26.1%	-10.5%	72.3%	3.5%
Koninklijke Ahold Delhaize NV	Netherlands	Consumer Staples	Food & Staples Retailing	-22.0%	-21.6%	93.6%	78.0%
Gemalto NV	Netherlands	Information Technology	Software & Services	-33.3%	-10.1%	91.9%	3.7%
Hikma Pharmaceuticals PLC	United Kingdom	Health Care	Pharmaceuticals, Biotechnology & Life Sciences	-42.0%	-21.2%	89.4%	18.2%
Tenaris SA	Luxembourg	Energy	Energy	-5.2%	-23.8%	80.5%	94.3%

Single Stocks - Quadrant 4 stocks

Quadrant 4 stocks: strong negative bubble signals with strong fundamentals (cont'd)

Company Name	Country of Headquarters	GICS Sector Name	GICS Industry Group Name	Yearly Return	Bubble Score	Value Score	Growth Score
Imperial Brands PLC	United Kingdom	Consumer Staples	Food, Beverage & Tobacco	-21.7%	-11.7%	62.8%	26.9%
ITV PLC	United Kingdom	Consumer Discretionary	Media	-5.7%	-23.1%	89.1%	19.1%
Kingfisher PLC	United Kingdom	Consumer Discretionary	Retailing	-21.3%	-19.2%	96.2%	21.4%
Paddy Power Betfair PLC	Ireland; Republic of	Consumer Discretionary	Consumer Services	-17.7%	-17.6%	70.2%	69.3%
Chesapeake Energy Corp	United States of America	Energy	Energy	-32.0%	-22.8%	68.8%	99.8%
Envision Healthcare Corp	United States of America	Health Care	Health Care Equipment & Services	-32.1%	-11.5%	90.1%	2.7%
Foot Locker Inc	United States of America	Consumer Discretionary	Retailing	-48.5%	-29.5%	97.4%	1.9%
Fluor Corp	United States of America	Industrials	Capital Goods	-14.7%	-31.6%	75.0%	2.5%
General Electric Co	United States of America	Industrials	Capital Goods	-17.1%	-31.0%	64.1%	45.9%
HanesBrands Inc	United States of America	Consumer Discretionary	Consumer Durables & Apparel	-2.0%	-11.1%	60.6%	71.3%
Helmerich and Payne Inc	United States of America	Energy	Energy	-24.0%	-22.4%	63.3%	9.0%
Kroger Co	United States of America	Consumer Staples	Food & Staples Retailing	-31.8%	-20.7%	70.1%	6.3%
Mosaic Co	United States of America	Materials	Materials	-12.6%	-15.2%	93.5%	7.0%
Range Resources Corp	United States of America	Energy	Energy	-47.8%	-37.6%	86.7%	94.7%
SCANA Corp	United States of America	Utilities	Utilities	-32.1%	-12.5%	84.1%	19.0%
J M Smucker Co	United States of America	Consumer Staples	Food, Beverage & Tobacco	-22.7%	-17.0%	75.1%	32.1%
Snap-On Inc	United States of America	Industrials	Capital Goods	-1.8%	-25.4%	63.2%	71.9%
Skanska AB	Sweden	Industrials	Capital Goods	-5.6%	-11.2%	78.9%	8.4%
WPP PLC	United Kingdom	Consumer Discretionary	Media	-24.0%	-27.8%	86.0%	27.7%

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The FCO Cockpit - Global Bubble Status Report
1st October 2017

Single Stocks - Quadrant 4 stocks

Quadrant 4 stocks: strong negative bubble signals with strong fundamentals
Example: Mattel 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 of the negative bubble. The right graph shows the performance of the stock over the last year (orange) with respect to the S&P 500 benchmark (purple), it is -65%. We expect a future rebound, which is due to our diagnostic of a negative bubble signal with strong fundamentals, calling for a contrarian buyer position.

Single Stocks - Quadrant 4 stocks

Last month example: strong negative bubble signals with strong fundamentals, Range Resources Corp.

Note that the stock started a small rebound in the past month, which is in synchrony with our DS LPPL trust indicator and the strong fundamentals. We expect this stock to appreciate in the future due to the strong fundamentals and following its neglect by investors in previous months.

Last month signal (1st Sep. 2017)   This month signal (1st Oct. 2017)
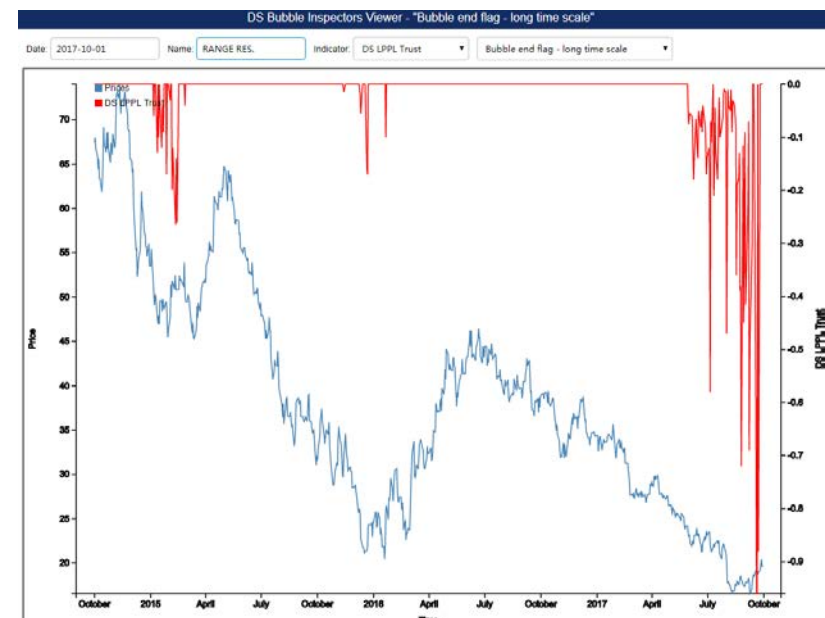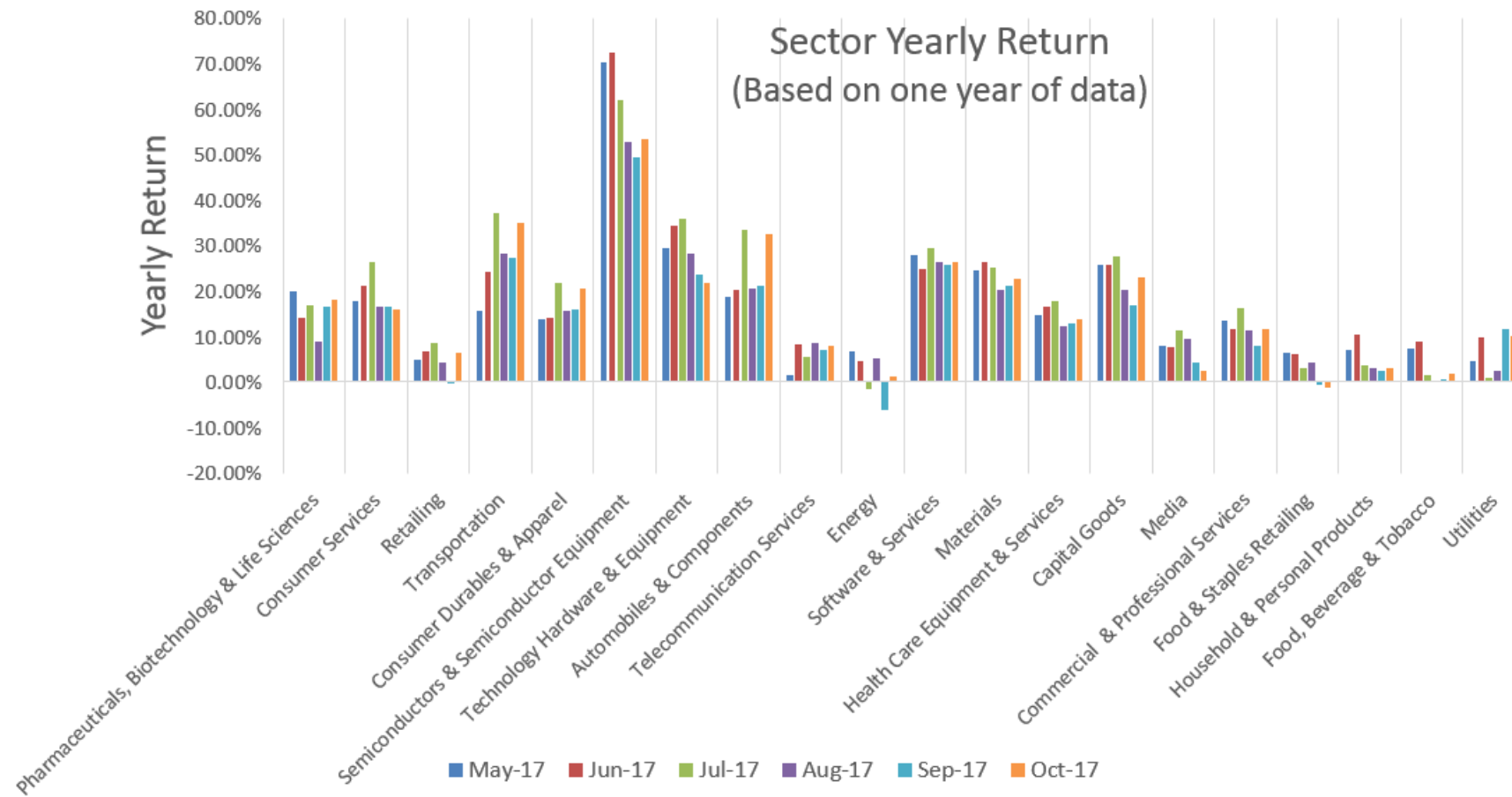
Sectors

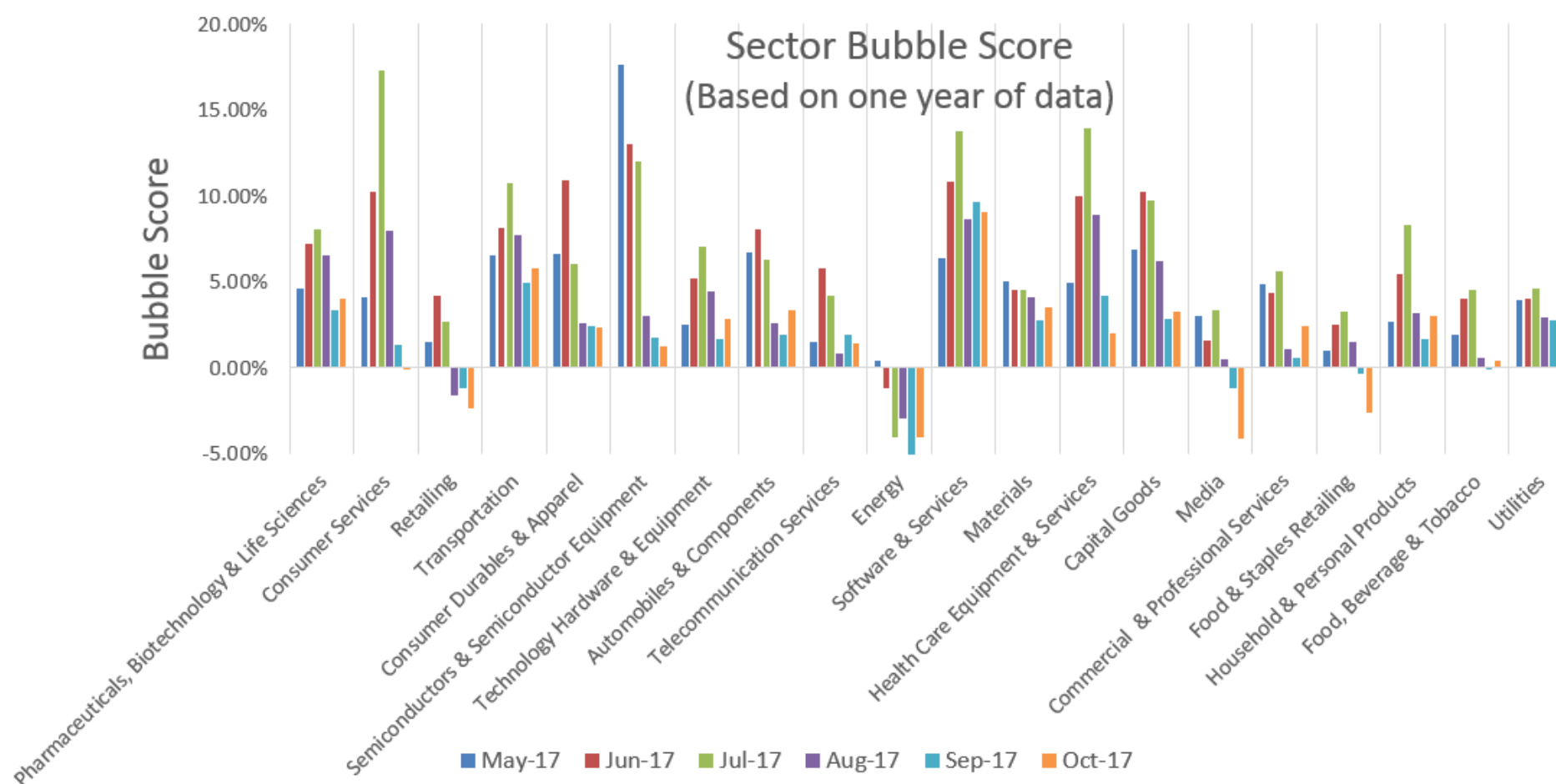| GICS Industry Group Name	Yearly Return		Bubble Score		Value Score		Growth Score	
	Oct 1st	Sep 1st	Oct 1st	Sep 1st	Oct 1st	Sep 1st	Oct 1st	Sep 1st
Pharmaceuticals, Biotechnology & Life Sciences	18.2%	16.6%	4.0%	3.3%	42.2%	42.1%	51.0%	51.2%
Consumer Services	15.9%	16.4%	-0.1%	1.3%	45.8%	45.1%	48.5%	47.2%
Retailing	6.5%	-0.2%	-2.4%	-1.2%	53.0%	55.4%	43.6%	43.1%
Transportation	35.1%	27.4%	5.8%	4.9%	53.8%	53.1%	39.9%	41.6%
Consumer Durables & Apparel	20.5%	16.0%	2.3%	2.4%	54.7%	53.6%	50.5%	52.2%
Semiconductors & Semiconductor Equipment	53.4%	49.4%	1.2%	1.7%	55.2%	58.4%	75.2%	76.9%
Technology Hardware & Equipment	21.7%	23.5%	2.8%	1.7%	62.5%	62.5%	49.1%	49.0%
Automobiles & Components	32.6%	21.2%	3.3%	1.9%	72.7%	74.4%	62.3%	62.7%
Telecommunication Services	7.9%	7.1%	1.4%	1.9%	53.3%	53.5%	38.4%	41.3%
Energy	1.2%	-6.3%	-4.1%	-5.9%	52.0%	55.2%	69.4%	67.4%
Software & Services	26.3%	25.8%	9.1%	9.7%	39.1%	39.7%	48.5%	47.9%
Materials	22.7%	21.1%	3.5%	2.7%	55.5%	54.4%	53.2%	53.0%
Health Care Equipment & Services	13.8%	12.9%	2.0%	4.2%	41.0%	39.7%	50.4%	50.4%
Capital Goods	23.0%	16.8%	3.2%	2.8%	44.1%	45.4%	52.4%	51.4%
Media	2.4%	4.2%	-4.1%	-1.2%	57.7%	55.9%	47.5%	48.5%
Commercial & Professional Services	11.5%	8.0%	2.4%	0.6%	41.4%	41.2%	40.1%	40.9%
Food & Staples Retailing	-1.4%	-0.5%	-2.7%	-0.4%	62.7%	58.5%	37.6%	38.3%
Household & Personal Products	3.1%	2.3%	3.0%	1.6%	33.3%	30.1%	47.4%	47.8%
Food, Beverage & Tobacco	1.7%	0.7%	0.4%	0.0%	40.7%	40.8%	47.6%	46.2%
Utilities	10.0%	11.7%	4.7%	2.8%	63.6%	60.7%	37.9%	38.6%

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 *Software & Services* we reported last month still has a significant positive bubble with low value score, calling for a contrarian buy position in this sector.

• The sector *Media* has a strong negative bubble this month due to recent drawdowns of media stocks. Investors are worrying about the performance of traditional media industry after the Disney gave a profit warning.
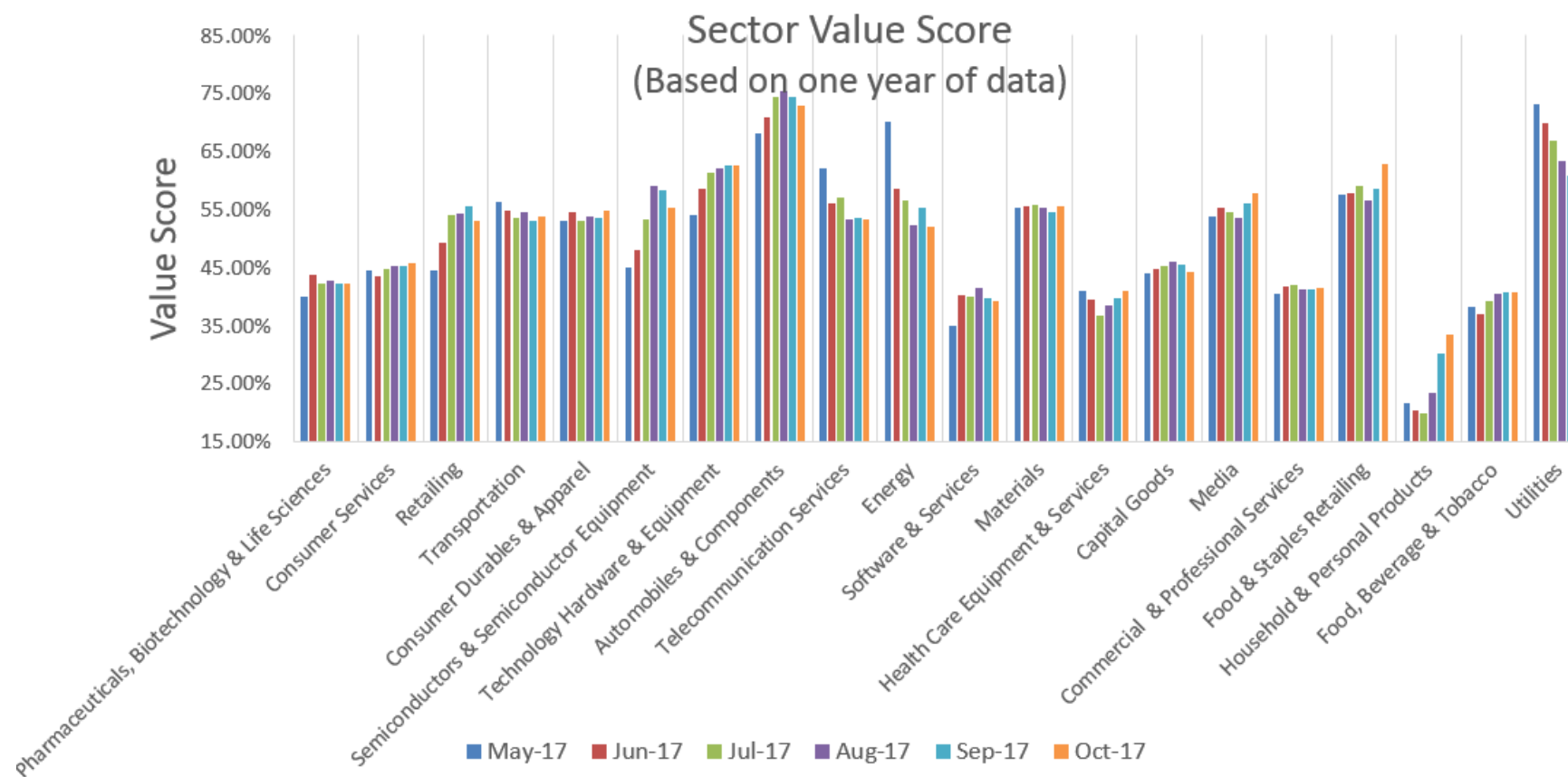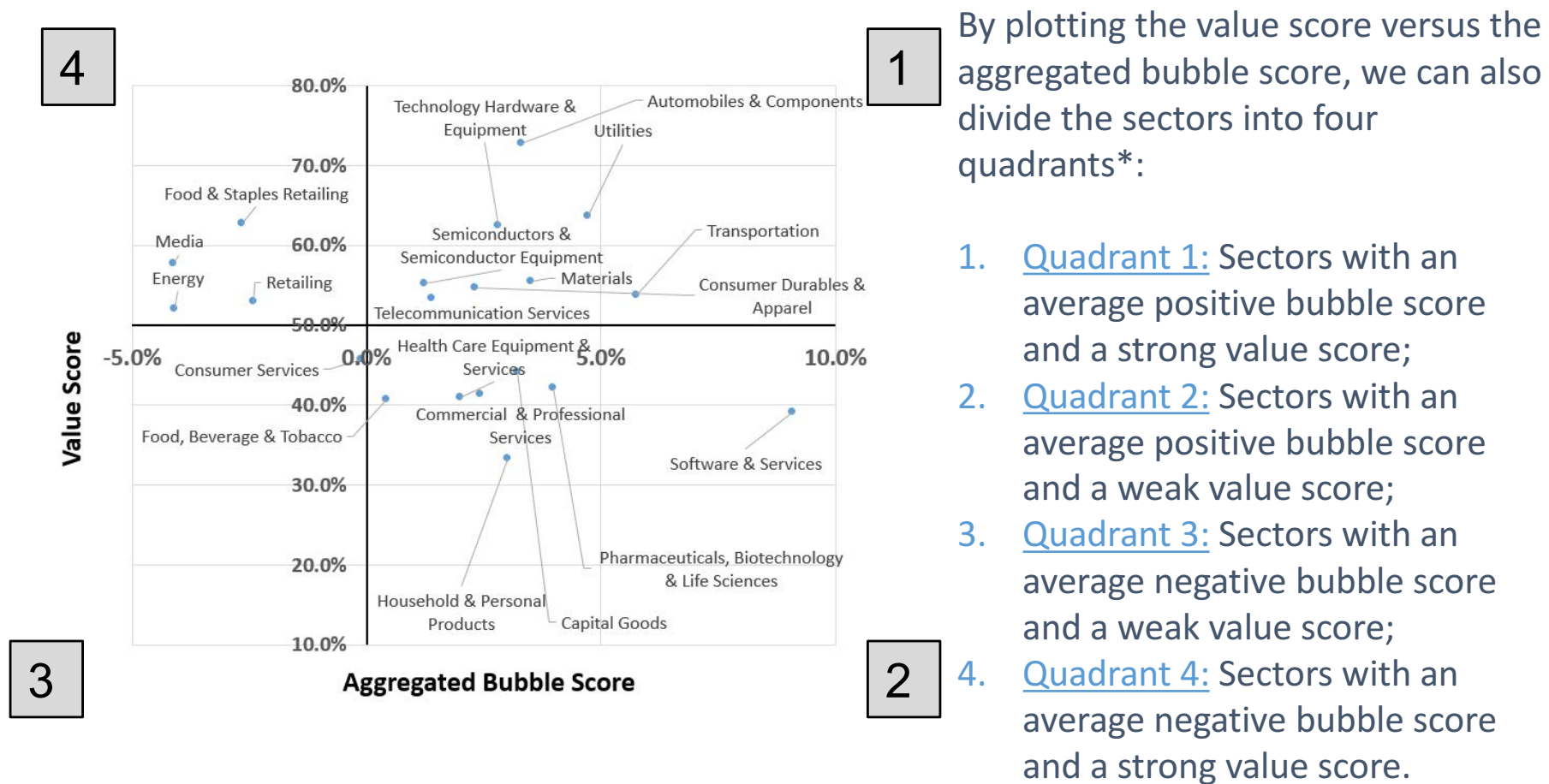
Sectors – Yearly Return

Sectors – Bubbles

Sector Bubble Score
(Based on one year of data)

Sectors – Value

Sectors – Growth

Sector Growth Score
(Based on one year of data)

Sectors

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;
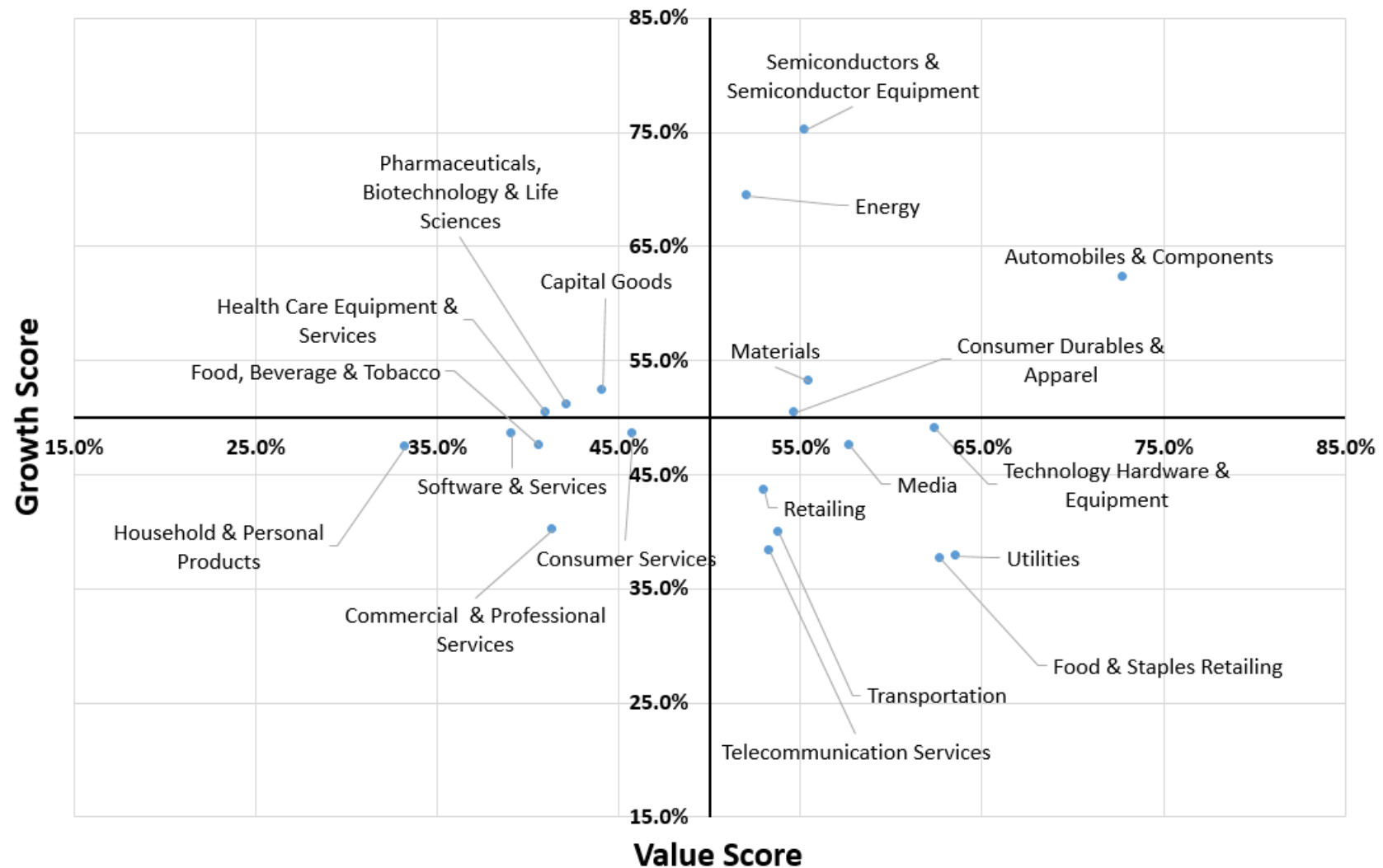4. Quadrant 4: Sectors with an average negative bubble score and a strong value score.

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

Sectors

Sectors - 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 26 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) Contrarian Short Stock Portfolio (CSSP) is made of the stocks that have a weak bubble signal as well as a weak value score.

Sectors - Portfolio Construction and Performance

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 49 of the June 2017 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 June 2017 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.

Final Remarks
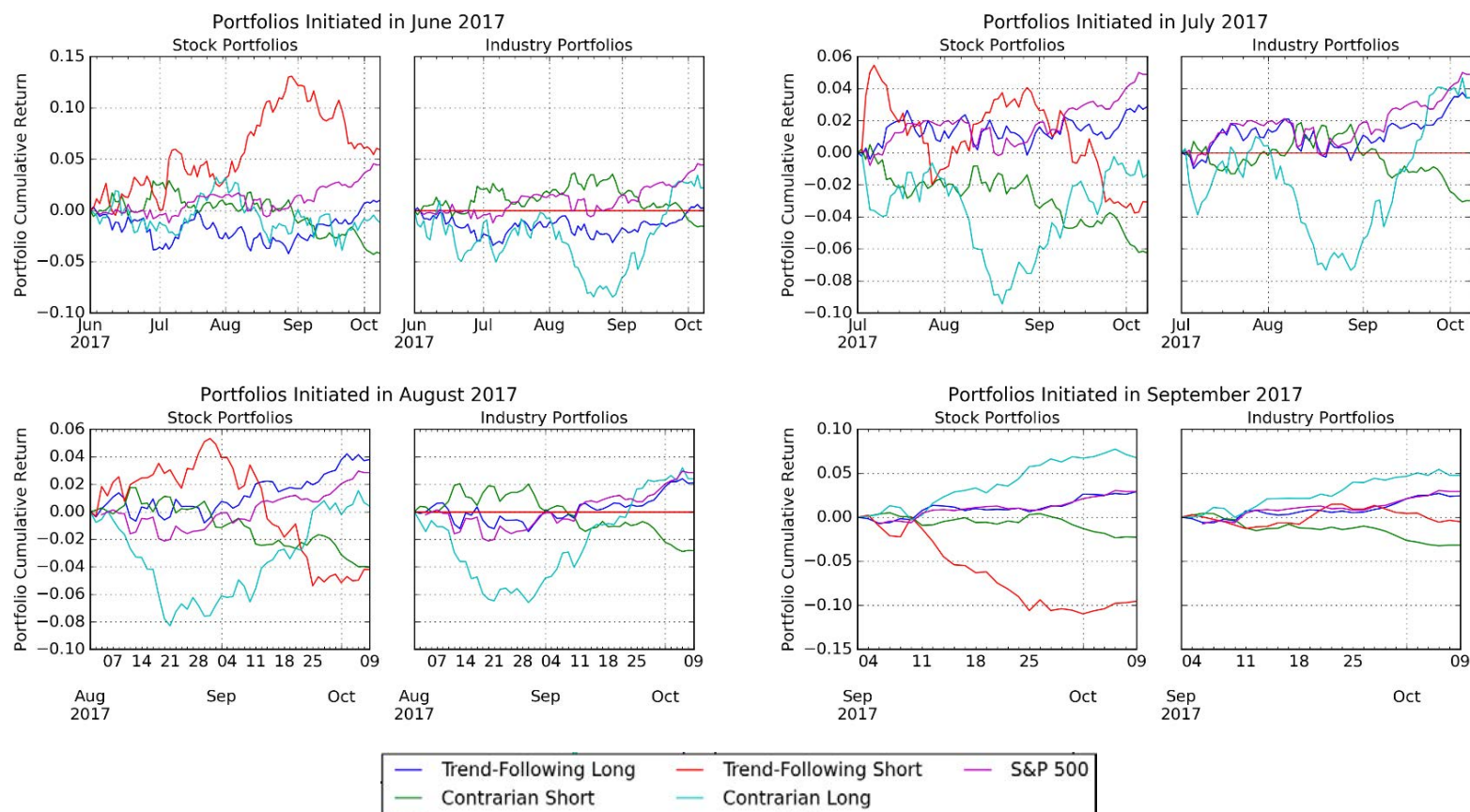
This month, we find that most Long portfolios initiated in June, July, August and September 2017 have good performances. This is mainly due to the continuing appreciation of the market. Contrarian Portfolios are more delicate to use due to their sensitivity to timing the expected reversal and exhibit very volatile performances, indicating that most of bubbles in the market are still dominating and that fundamentals have not yet played out. We expect trend-following positions to perform in the months following the position set-up and then contrarian positions to over-perform over longer time scales as the predicted corrections play out.

Visit the Financial Crisis Observatory for more information

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