



# The FCO Cockpit Global Bubble Status Report February 2020



A collaboration of the Chair of Entrepreneurial Risks,  
ETH Zurich and Systematic Investment Management AG

# Contents

1. Introduction
2. General Results
3. Results per Asset Class
4. Sectors and Sector Portfolios
5. Single Stocks
6. Contact
7. Appendix

# ETH FCO and SIMAG Join Forces

## The Financial Crisis Observatory (FCO) is...

- **Part of** the Chair of Entrepreneurial Risks at the Department of Management, Technology and Economics at the **ETH Zurich**
- A **scientific platform** aimed at quantifying in a systematic way the hypothesis that financial markets exhibit a degree of inefficiency and a **potential for predictability**, especially during regimes when **bubbles** develop
- Aiming to **provide warnings** at different time scales (week, month, quarter) on the development of future financial instabilities

## Systematic Investment Management AG (SIMAG) is ...

- A **Joint Venture** between **Credit Suisse Asset Management** and an **ETH Zurich spin off**
- A **FINMA-licensed Investment Manager** for collective investment schemes.
- Relying on a **proprietary machine learning engine** specifically designed for **financial markets**
- The first and only investment manager globally which can **systematically leverage ETH's Financial Crisis Observatory (FCO) research insights**

Together we are able to provide you with richer investment content and deeper research insights

# Purpose and Benefits

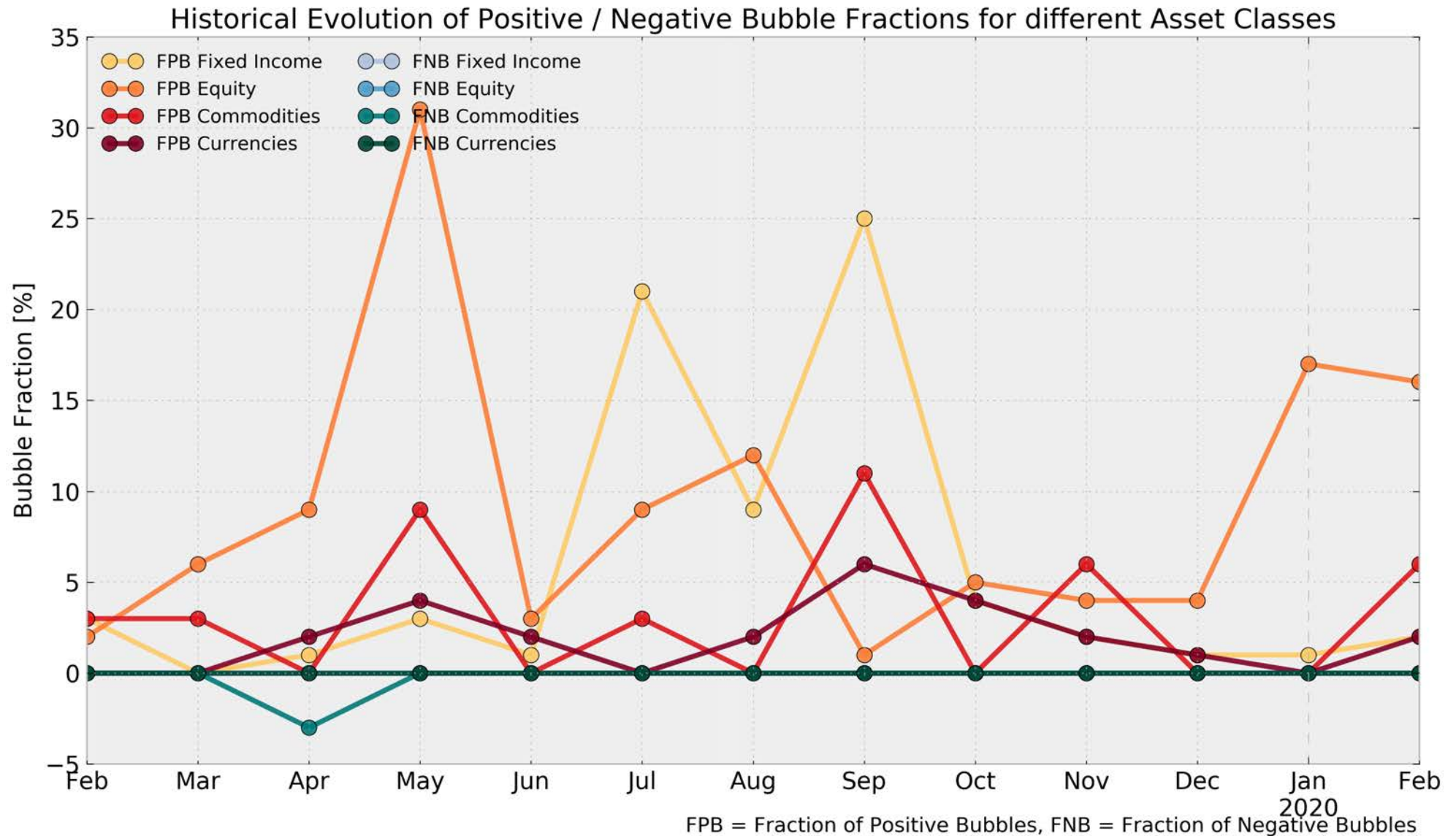
- ▶ The **Financial Crisis Observatory (FCO)** monthly report discusses the historical evolution of bubbles in and between different asset classes and geographies. The purpose of the FCO report is to ascertain which asset classes and sectors are deemed to be **crowded** and to what degree they can develop contagion risks.
- ▶ Today, the report is **used by 600+ institutions world-wide**, including universities, think tanks, sovereign wealth funds, hedge funds, family offices, private banks and pension funds.
- ▶ It delivers the big picture in terms of growing bubbles and instabilities in today's financial markets for **Chief Investment Officers, Senior Researchers, Fund Managers**, and **Independent Financial Advisors**, and all parties with **investment performance responsibility** or **managing financial risks**.
- ▶ The report is the result of an extensive analysis done on the historical time series of about 450 systemic assets and about 850 single stocks. The systemic assets are bond, equity and commodity indices, as well as a selection of currency pairs. The single stocks are mainly US and European equities. The data is from Thomson Reuters.
- ▶ To new readers, we recommend proceeding to the appendix for more detailed information about the methodology and procedures applied in this report.

**Access to the FCO analysis data can be granted upon request. Please contact [info@simag.com](mailto:info@simag.com) or visit <https://www.simag.com/insights/fco-cockpit/>**

# General Results – Key Take Aways

- ▶ In February 2020, we report the positive bubbles amongst all asset classes.
- ▶ The highest fraction, as in the previous month, is obtained for the equity sector.
- ▶ Positive bubble activity amongst the other sectors remains low, with however a growth of the number of bubbles in commodities.
- ▶ No negative bubble activity is detected.
- ▶ We provide a more detailed analysis of the particular development of Tesla Inc.

# General Results – The Big Picture



# General Results – This Month's Overview

Category	Analyzed Assets	Fraction of Pos. Bubbles [%]	Fraction of Neg. Bubbles [%]
Fixed Income	155	2	0
Government Bonds	55	5	0
Finance and Insurance	21	0	0
Corporate Bonds	79	0	0
Equity	237	16	0
Country Indices	61	10	0
Europe	30	23	0
United States	146	18	0
Commodities	31	6	0
Forex	95	2	0



# Macro Perspectives February 2020

The current macro regime of massive credit inflation continues to drive market returns but not necessarily real economic growth. Last year we already faced the slowest global economic growth since the crisis of 2008 due to low investment rates. As a recent IMF report confirms, “firms turned cautious on long-range spending and global purchases of machinery and equipment decelerated.” Now, in January 2020, we learned that, in the US, Commercial and Industrial loans (C&I loans) continued to fall and that banks have started to tighten standards for credit card and auto loans despite unprecedented liquidity injections by the FED.

The contraction in loan growth is a sign for a slowdown in the real economy and an indication that the FED is becoming less effective in driving economic growth higher. At the same time, the zero or negative interest rate policy and massive liquidity injections of global central banks have resulted in a massive market dislocation: For companies it is easier to buy back own stocks instead of making long-term investments and to build a productive asset base. But the fundamental driver of our capitalist economy is profit which drives investments and generates jobs. But profits in the real economy are not growing at all. Analysts argue that profits and investments in the real economy are stagnating whereas the financial economy is booming: Forward price-to-earnings ratios for US growth stocks have reached extreme readings. The central banks collectively injected more than 1.000 bn. USD liquidity into the market during the last quarter. This is to make money losing companies survive as, increasingly, more companies rely on debt to fund the cost of servicing existing debt. According to the Wall Street Journal, 40% of all US-listed companies are losing money, the highest level since the late 1990s. The ample empirical evidence tells us that economic recessions happen as a result of unsustainable and unserviceable debt levels.

Tesla's share price performance has gone ballistic in January. It is another symptom of market dislocation. Speculative blow offs such as Tesla correspond to the point of maximum vulnerability in speculative herding (on the short side) as price momentum becomes unsustainable. Most bubbles end in an acceleration phase but every bubble inevitably will burst because tighter liquidity increases the risk of defaults with smaller, lower credit quality being the most vulnerable.

Tightening financial conditions will reveal balance sheet vulnerabilities and cash flow problems. Rising stock prices such as Tesla is no indication of increased wealth in absence of real economic growth. Rising stock prices are an indication of an erosion of purchasing power of the currency. There are fears that the debt inflation just leads to asset inflation, which is a transfer of wealth from working people to asset holders and landlords. The middle class is already facing recession-like pressure. The majority of people continue to become poorer as the cost of living outpaces any real wage growth. Most people are already living in recession even when stocks are going up, their medical, college costs and taxes are going up.

The global macro situation is not overwhelming as well.

The Baltic Freight Index, which measures the rates for panamax and supramax vessels shipping dry bulk commodities across the world, has hit a record low in January as two thirds of China's economy had to come to a standstill because of the corona virus. Prices have fallen by more than 80% since September 2019 due to cooling global economy. The capsize index has collapsed in January, the sharpest decline in history as demand for large-sized carriers and tankers came to an abrupt halt. The global economy was already weakening due to US tightening and credit deleveraging in India.

China posted already the weakest growth in 29 years on the back of the trade war. The coronavirus was only the trigger for something that was underway anyway. The world relies so heavily on the Chinese growth miracle to prevent the global debt cycle from progressing to the next phase. The country remains the marginal source for both global credit and commodity demand. But one can worry that China's debt fueled growth may have become unsustainable for some time now and the country may have reached its debt saturation level already many years ago. Now, China is struggling to keep its troubled banks and small businesses from defaulting. Its 45 trn. USD financial system is still not under control after the country's shadow banking sector has fallen by 2.3 trn. USD over the past 3 years. Defaults on bonds across the world's second biggest economy are rising as creditors are unable to make interest payments affecting its real economy. Car sales continued for example to fall in the last months. China's new home price increases and real estate investment growth slowed down markable in December.



# Macro Perspectives February 2020

The IMF downgraded its economic growth forecast for India to 4.8% from 6.1% for the current fiscal year (its slowest pace in 11 years). India is experiencing a cooling of its economy due to its credit crunch with reduced commercial lending. Credit growth fell to a multiyear low after the country's attempt to combat the excesses in its shadow banking system. The measures finally took their toll by a contracting money supply which led to a cooldown in private consumption, slower industrial activity and more importantly stagnant investments. If India did not have enough problems already, its government was criticized for overstating GDP figures by at least two percentage points between 2012 and 2017. Expectations of a wider budget deficit has motivated a lot of emerging market funds to sell their India's sovereign bonds. Unfortunately, this comes at a time when the country needs more foreign capital to finance its borrowing needs.

The bank of Japan nudged up its GDP growth forecasts and said it was too soon to consider reducing its massive stimulus program. Bank of Japan's Kuroda said he won't hesitate to ease further if needed. Japan's exports fell 6.3% year on year (much higher than the 4.2% decline expected) for a 13th straight month in December due to weaker global demand. Factory output fell 4% in October to December 2019 raising concerns that the Japanese economy contracted in the fourth quarter 2019. Japanese Economy minister warned that corporate profits and factor production might be hit by the coronavirus.

In Europe, we saw Poland as the first emerging market country issuing debt at negative rates. The Ministry of Finance priced, on January 16th, 2020, 1-year EUR denominated bonds in Private Placement format. The yield of -0.31% was achieved with annual coupon at the level of 0%. We see a slowly increasing default rate across European countries, even though Euro rates are negative or zero up to 10 years because consumers have stopped buying and companies have stopped investing for the lack of profitable business opportunities. The French and Italian economies, the second and third largest in the Eurozone, shrank unexpectedly in the fourth quarter of 2019 bringing down GDP growth for the 19 countries Eurozone to 1% year-on-year. On the other side, the German government revised their GDP growth up 0.1% to 1.1% this year.

## Outlook

The IMF warned that more easing is not the answer at this point in the economic cycle and rising financial vulnerabilities – including the rise in asset valuations to stretched levels - could threaten growth in the medium term. Cycle theory holds that a recession is necessary to get rid of malinvestments and debt excesses before a new round of innovations based on renewed profitability outlook can begin.

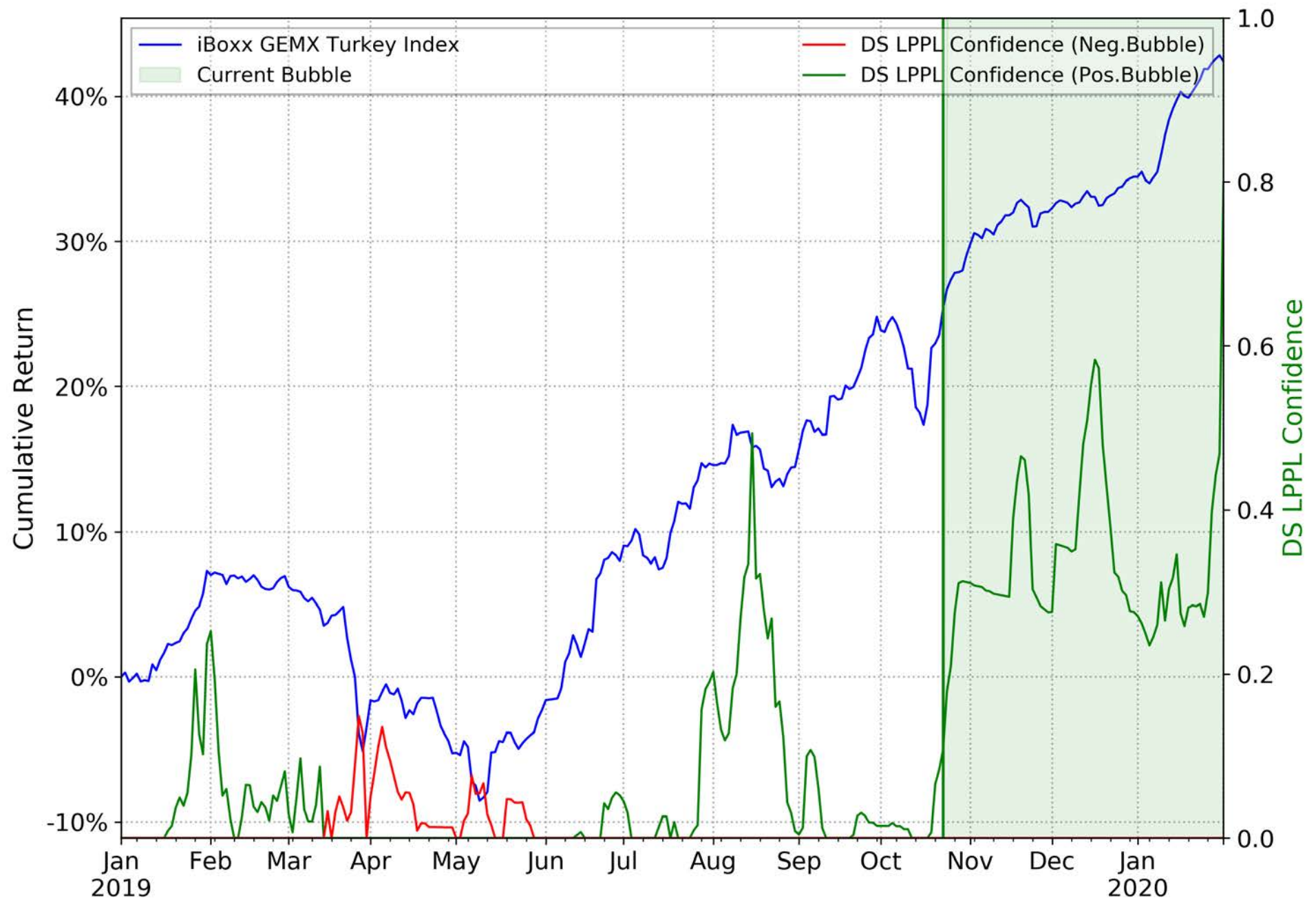
Central banks continue to buy collectively hundreds of billions of financial assets each month and these liquidity injections will remain the major driver for asset prices and more importantly currencies. Investors have a guarantee that central banks will step in to save their investments from any significant drawdown. According to conventional belief, any risk off is a buying opportunity for the fear of missing out (FOMO). This seems to be fully priced in the market. Some market observers argue that stock markets today is reminiscent of the latter stages of the bull market in 1999, which created the dotcom frenzy and the subsequent popping of the bubble. But, there are important differences, The liquidity is not reaching the real economy, the central banks are trapped, they cannot stop the credit cycle progressing by further lowering interest rates or monetizing debt (The bank of Japan buys government bonds in unlimited amounts and the FED has been essentially buying up 70% of all net treasury debt issued since October 2019).

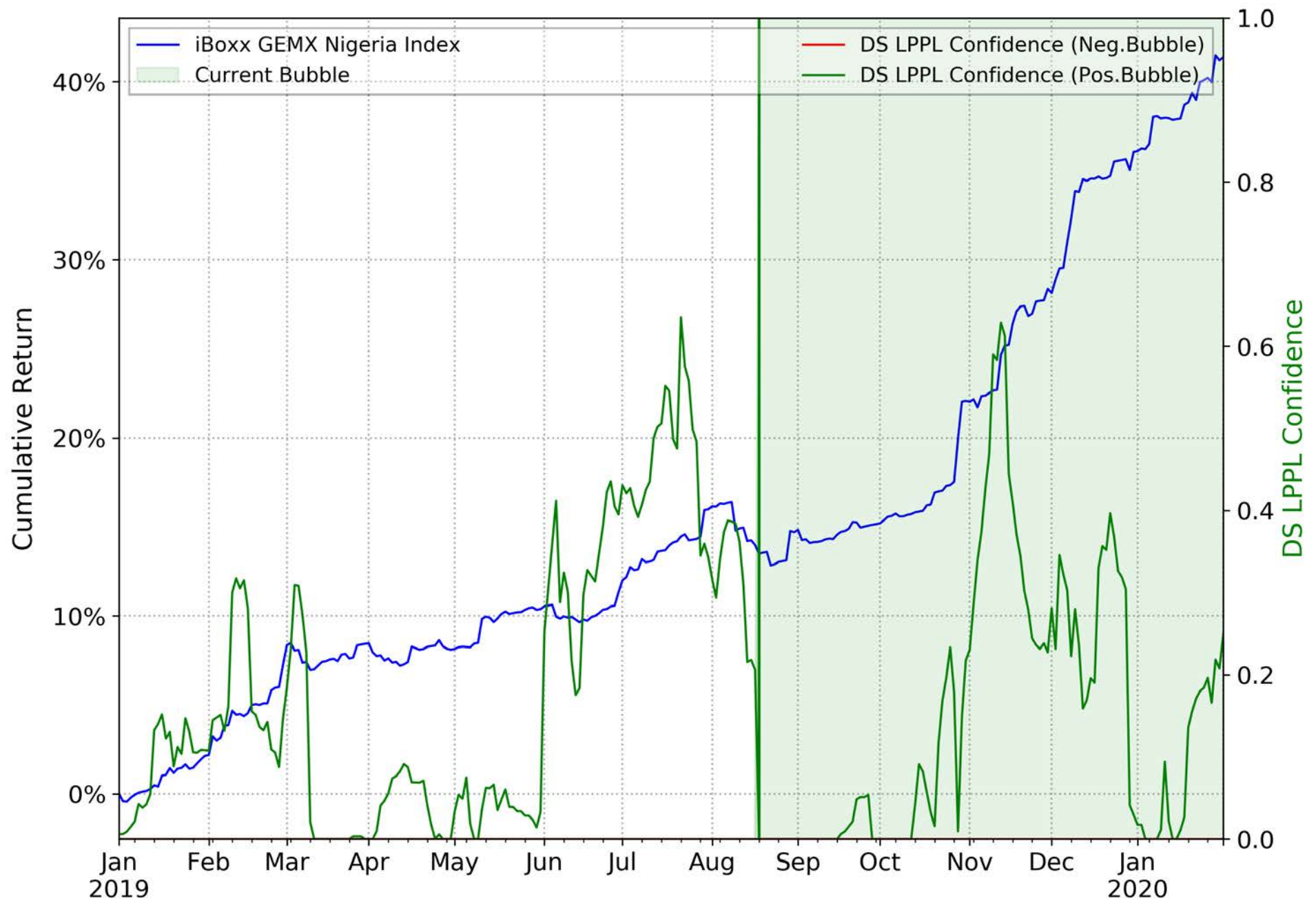
So, the risk is no longer deflation, it is a possible loss of confidence in the benefits and sustainability of such unconventional policies, and the fear of the associated debasement of currencies. And one can expect a tipping point where confidence in the purchasing power of the currency will collapse so that the conservation equation of the economic and financial system (which is  $MV=PQ$ ) no longer holds. Gold will most probably continue to benefit from debasement policies of central banks.

# Fixed Income – Government Bonds

Bubble Data					Cluster Analysis			
	Name	Bubble Size $bs$ [%]	Duration [days]	DS LPPL Confidence $ci$ [%]	Geometric Average $\sqrt{bs \cdot ci}$ [%]	Critical Time Prediction $\mu_{tc}$	$\sigma_{tc}$ [days]	Scenario Probability [%]
Positive Bubbles								
1	iBoxx GEMX Turkey Index	14	100	80	33	2020-02-11	1	34
2	iBoxx GEMX Nigeria Index	24	167	25	24	2020-02-05	5	46

- In the fixed income sector, this month, at the top of our list, we find the iBoxx GEMX Turkey Index. We report a quite high DS LPPLS Confidence Indicator of 80%. The plot is given on the following slide.
- We furthermore report a signal on the Nigerian Index at a relatively high bubble size of 24% and a rather low confidence indicator of 25%.



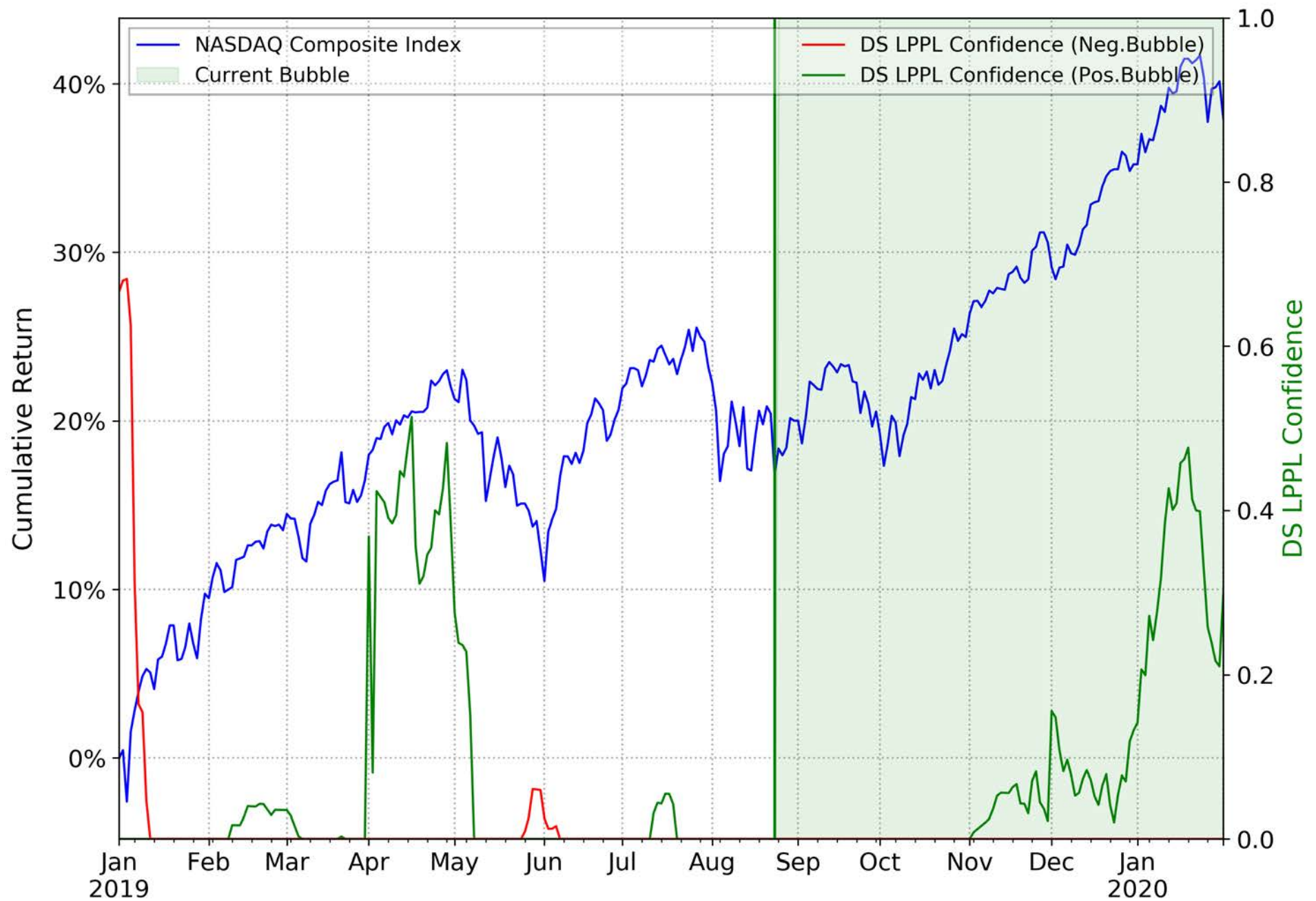


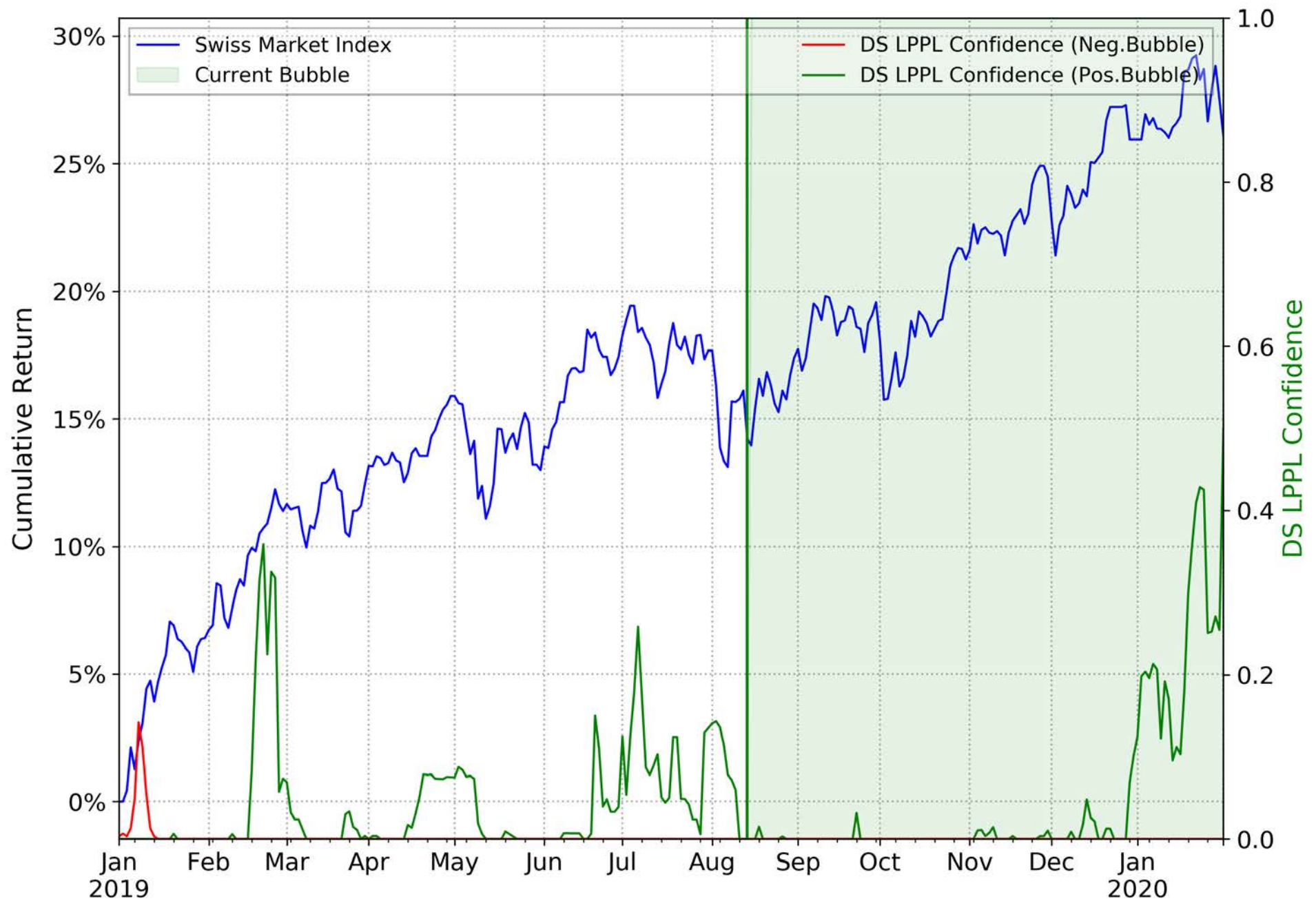
# Equities – Country Indices

Bubble Data					Cluster Analysis			
Name		Bubble Size $bs$ [%]	Duration [days]	DS LPPL Confidence $ci$ [%]	Geometric Average $\sqrt{bs \cdot ci}$ [%]	Critical Time Prediction $\mu_{tc}$	$\sigma_{tc}$ [days]	Scenario Probability [%]
Positive Bubbles								
1	NASDAQ Composite Index	18	161	30	23	2020-02-06	4	48
2	Swiss Market Index	10	170	50	23	2020-03-09	9	74
3	OMX Copenhagen 20 Index	18	121	28	22	2020-02-19	12	82
4	Karachi SE 100 Index	36	158	10	19	2020-02-03	5	14
5	Dow Jones Industrial Average Index	11	170	23	16	2020-02-07	1	19

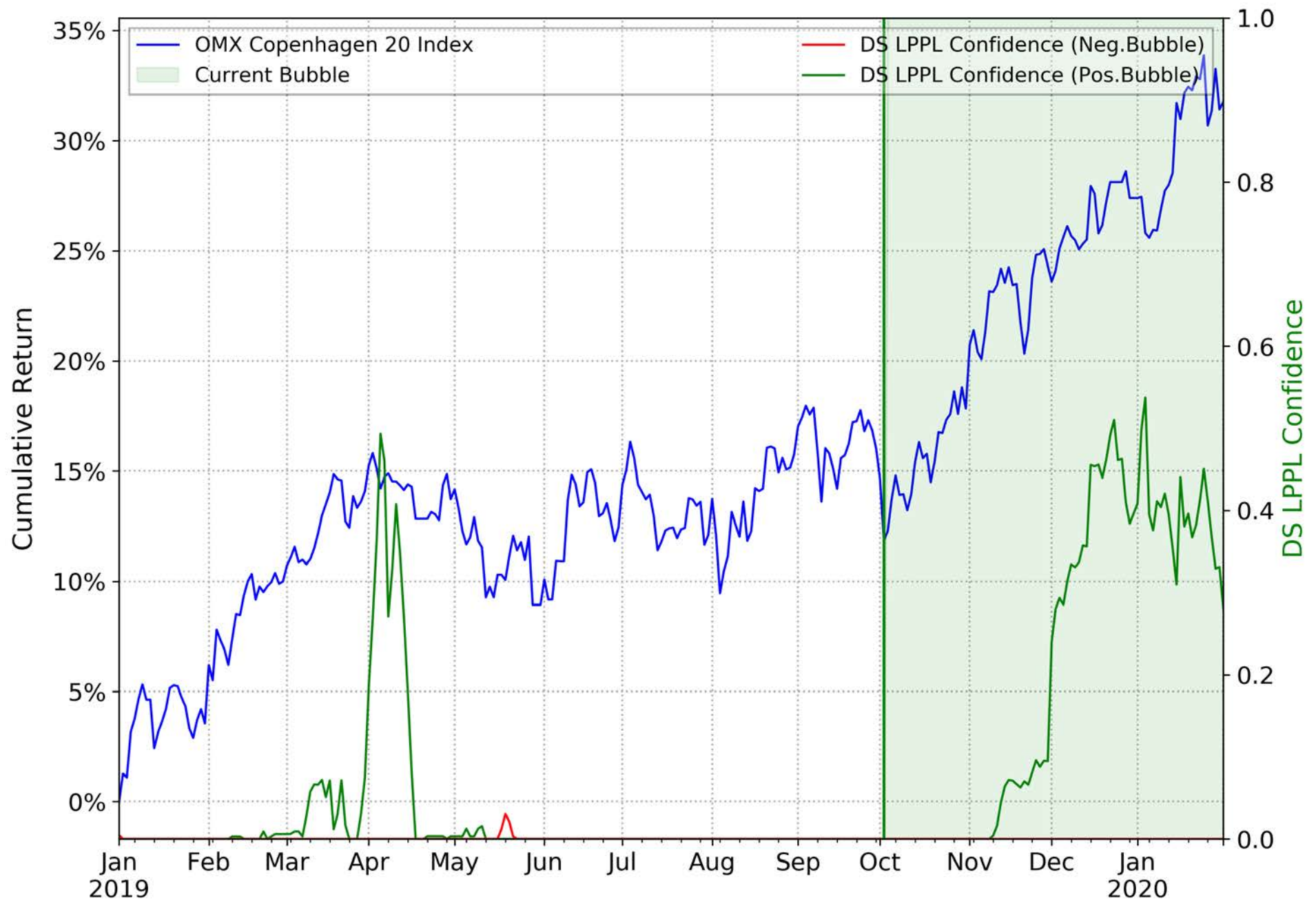
- ▶ We detect bubble activity for a number of important stock market indices, with the NASDAQ Composite Index leading the table.
- ▶ Secondly, a minor bubble for the SMI is observed, at a medium indicator value of 50%.
- ▶ Overall, reported bubble sizes range from 11%-36% and confidence indicators are between 10%-50%.
- ▶ In fact, recent surges in indicator levels occur for the top three reported bubble signals on the next slides.







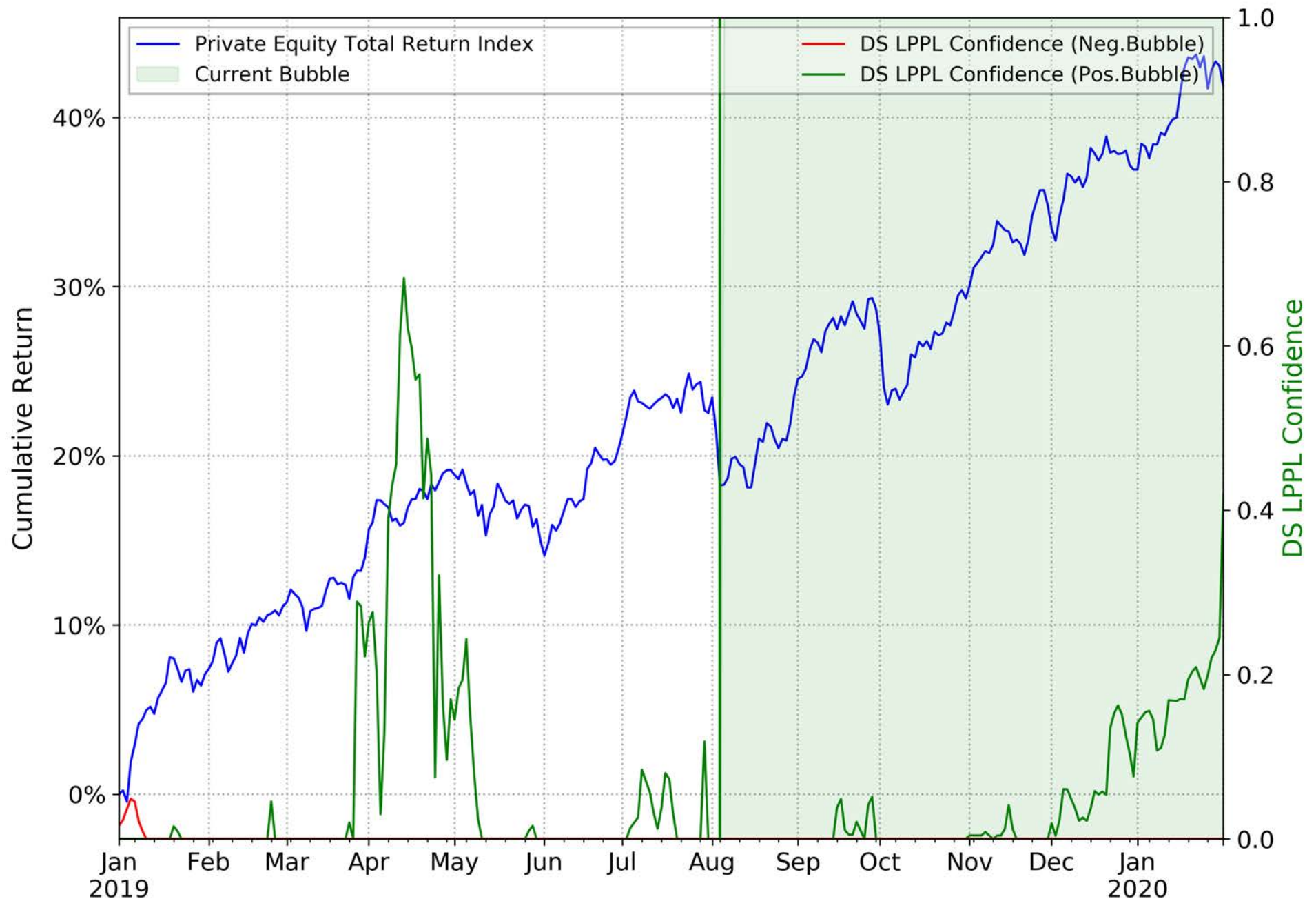


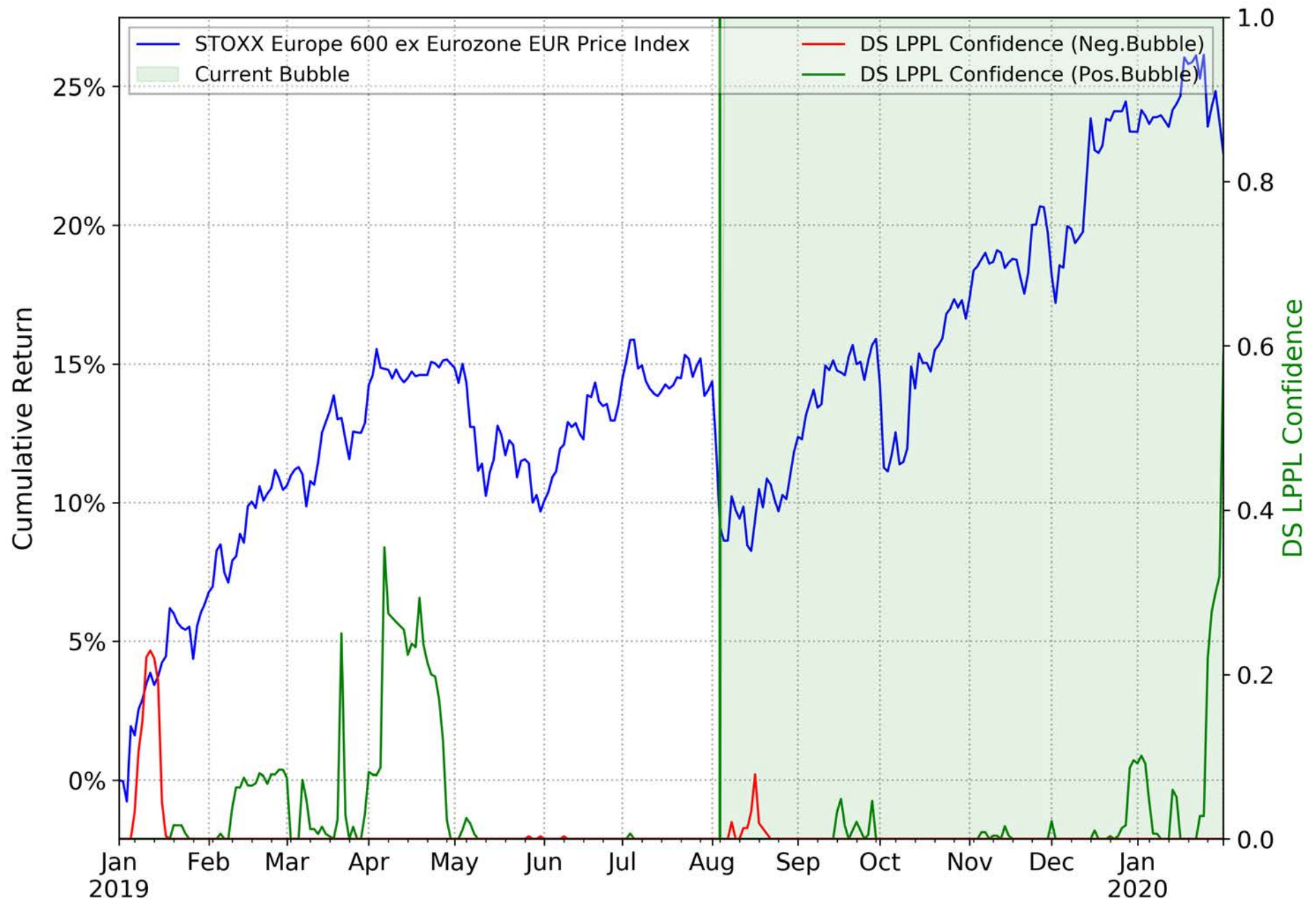


# Equities – Europe Indices

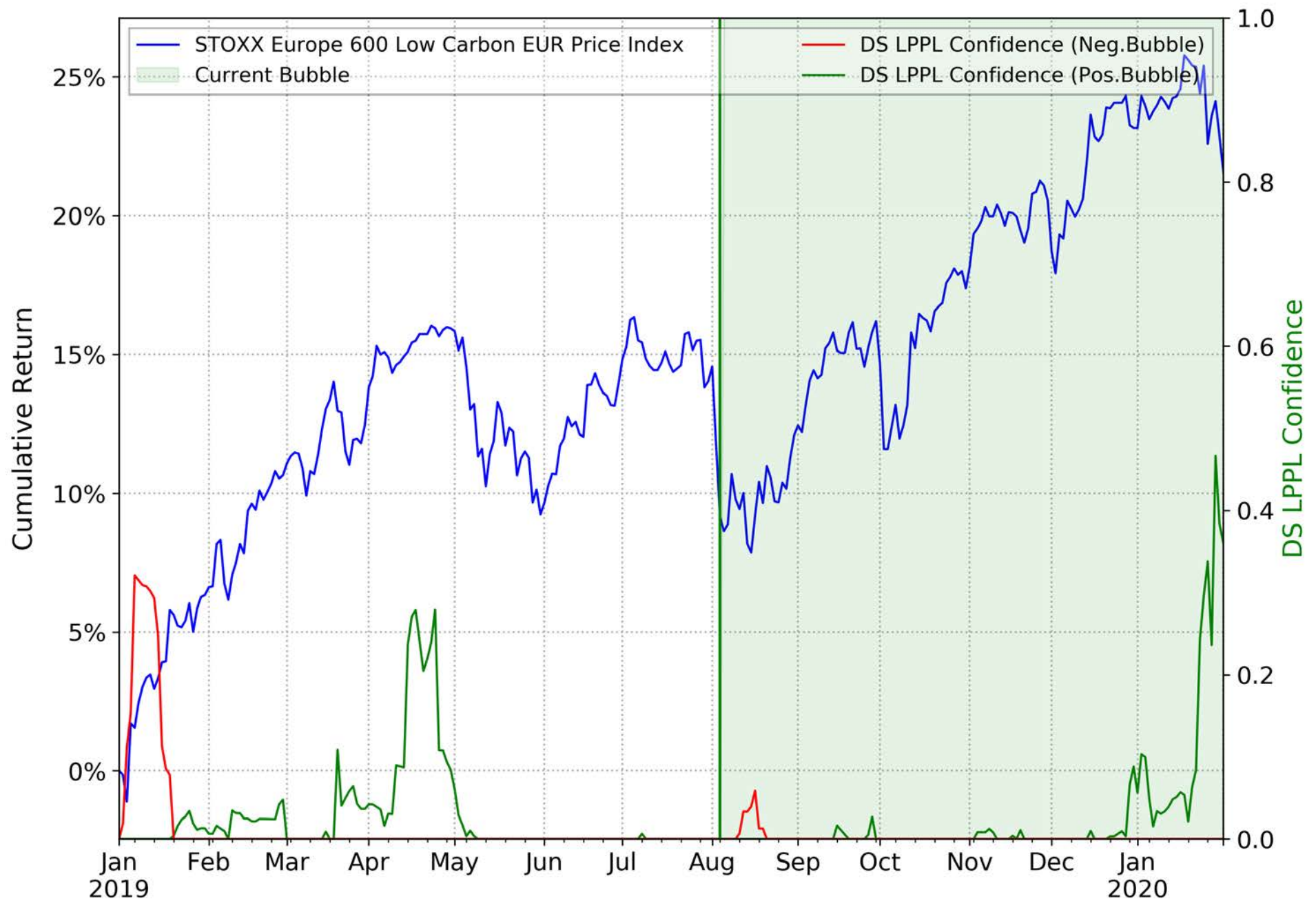
Bubble Data				Cluster Analysis			
Name	Bubble Size $bs$ [%]	Duration [days]	DS LPPL Confidence $ci$ [%]	Geometric Average $\sqrt{bs \cdot ci}$ [%]	Critical Time Prediction $\mu_{t_c}$	$\sigma_{t_c}$ [days]	Scenario Probability [%]
Positive Bubbles							
1 Private Equity Total Return Index	20	179	42	29	2020-02-17	13	67
2 STOXX Europe 600 ex Eurozone EUR Price Index	12	179	59	27	2020-02-11	3	22
3 STOXX Europe 600 Low Carbon EUR Price Index	11	179	36	20	2020-03-23	4	27
4 STOXX Europe 600 EUR Price Index	11	179	29	18	2020-03-23	3	27
5 STOXX Europe 600 Futures Replication EUR Price...	11	179	25	17	2020-03-24	3	25

- ▶ Focusing on the European equity sector, we observe a slight relaxation of the fraction of positive bubbles from former 33% to current 23% levels.
- ▶ Reported bubble sizes range from 11%-20%, bubble durations are all of the same length of 179 days, and the confidence indicator is in the range 25%-59%.
- ▶ As before, we observe recent surges in indicator levels in the corresponding plots.





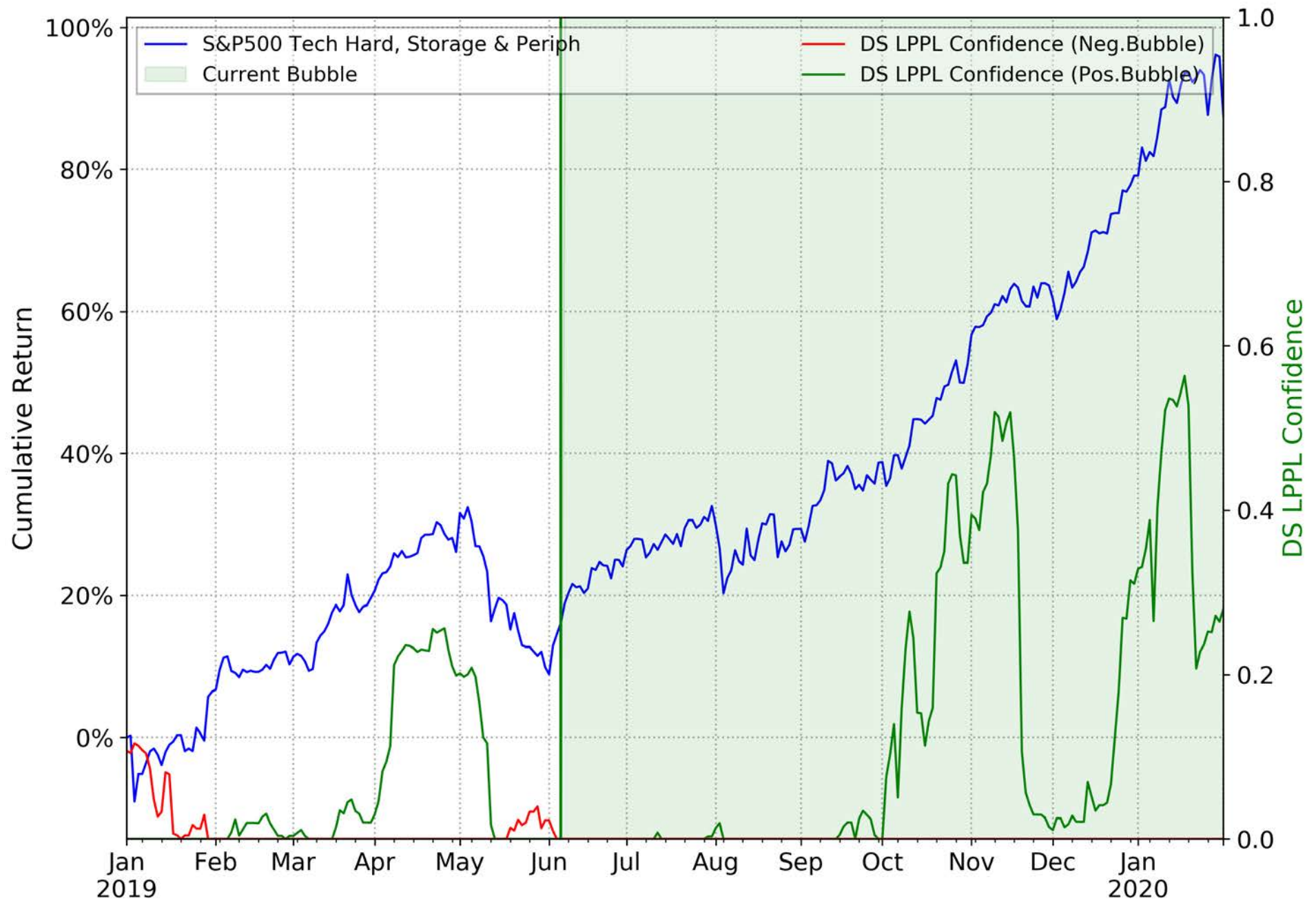




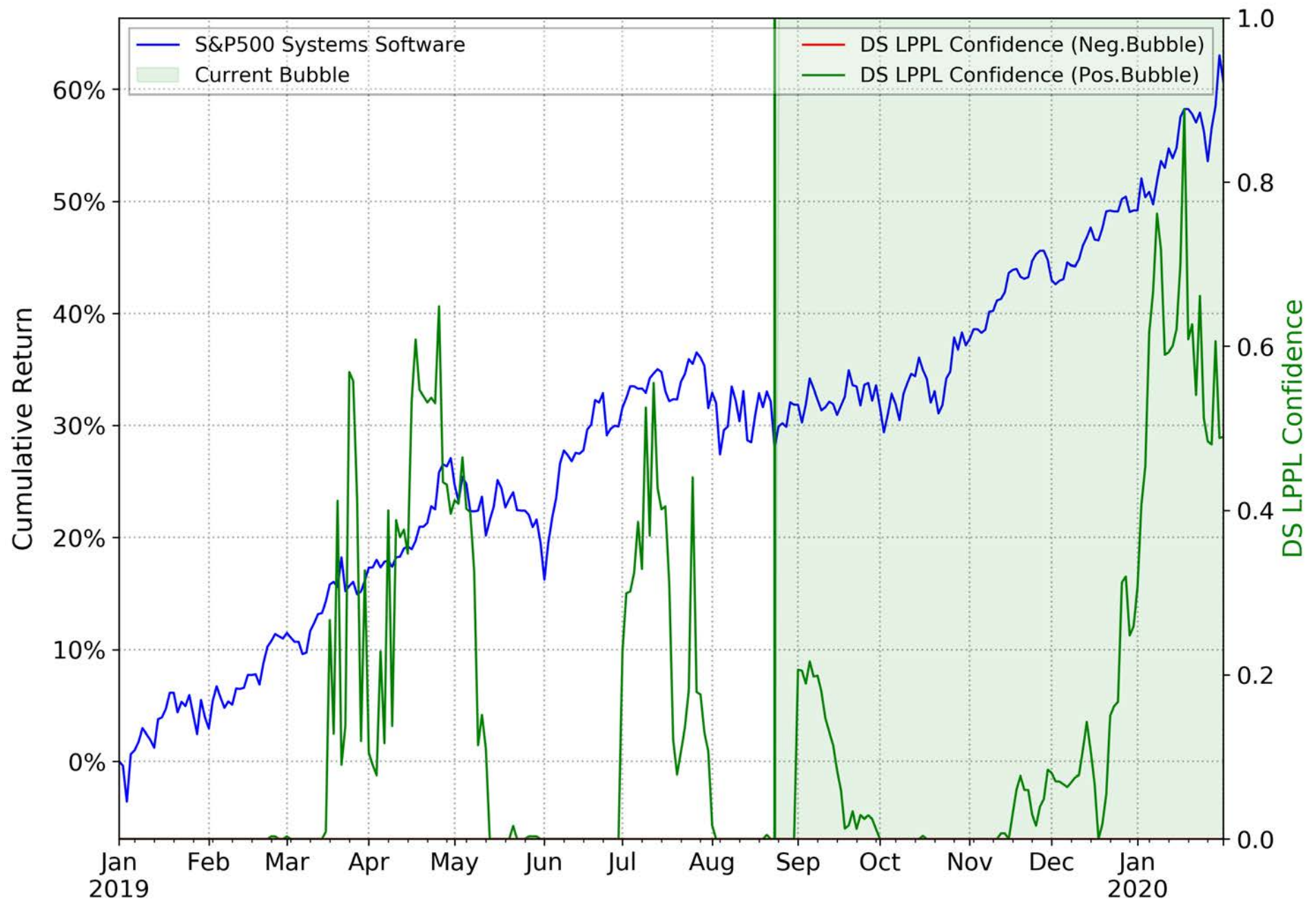
# Equities – United States Indices

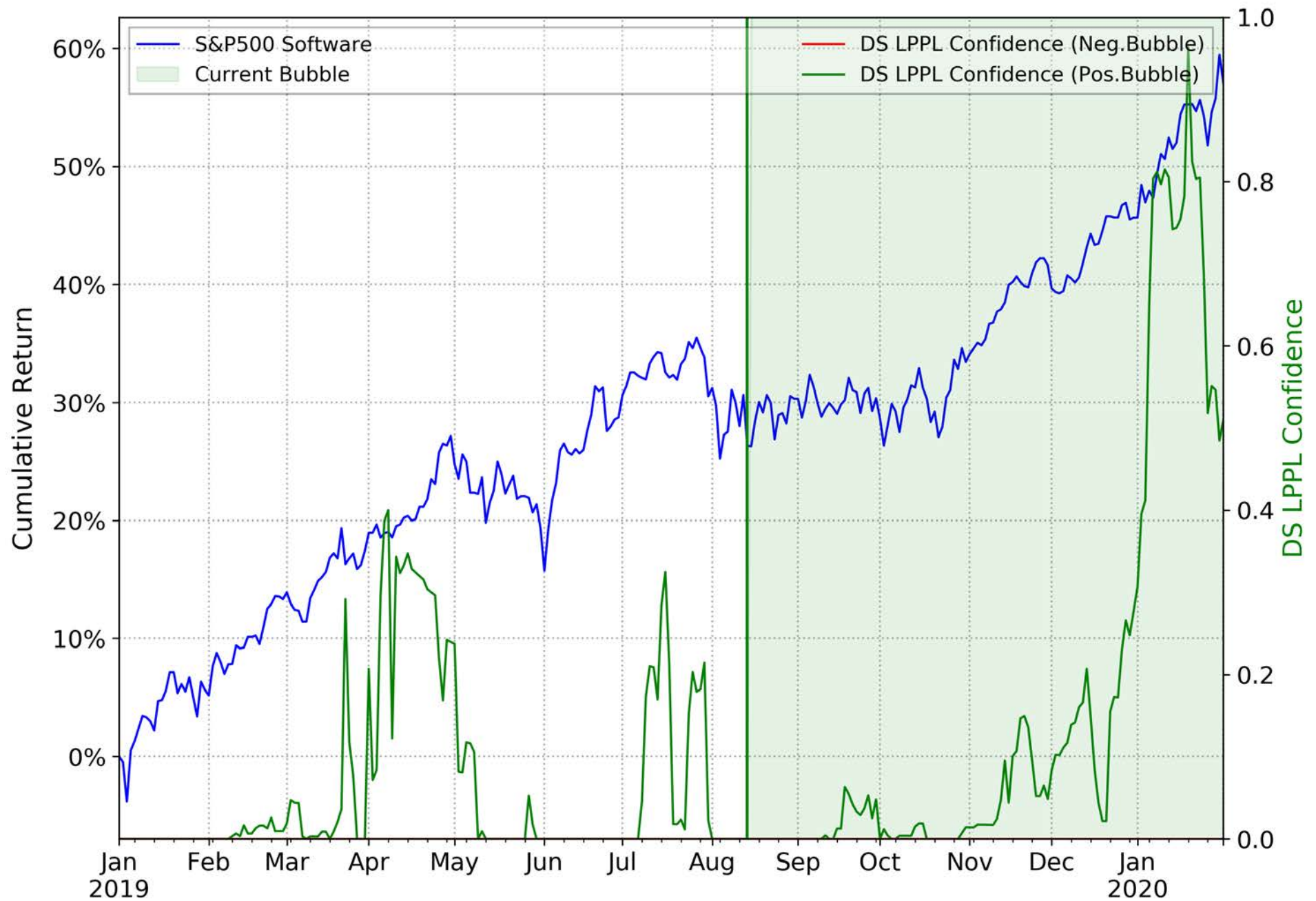
Bubble Data					Cluster Analysis			
Name		Bubble Size $bs$ [%]	Duration [days]	DS LPPL Confidence $ci$ [%]	Geometric Average $\sqrt{bs \cdot ci}$ [%]	Critical Time Prediction $\mu_{tc}$	$\sigma_{tc}$ [days]	Scenario Probability [%]
Positive Bubbles								
1	S&P500 Tech Hard, Storage & Periph	62	239	28	41	2020-03-01	17	51
2	S&P500 Systems Software	26	161	49	35	2020-02-21	4	46
3	S&P500 Software	24	170	51	35	2020-02-01	1	35
4	S&P500 Es Info Technology	23	174	52	35	2020-03-03	4	47
5	S&P500 Application Software	19	144	58	34	2020-02-07	1	45

- ▶ Bubble signals for about 18% (previously 15%) of the US equity indices are reported this month.
- ▶ Bubble sizes range from 19% to 62% and are thus comparably higher than for the European sector while the bubble durations are similar, between 144 and 239 days.
- ▶ The DS LPPL Confidence Indicator ranges from 28% to 58%.
- ▶ As usual, we show the time series plots for the top three assets, which in this case are quite correlated, thus the similarity of the resulting indicator time series.





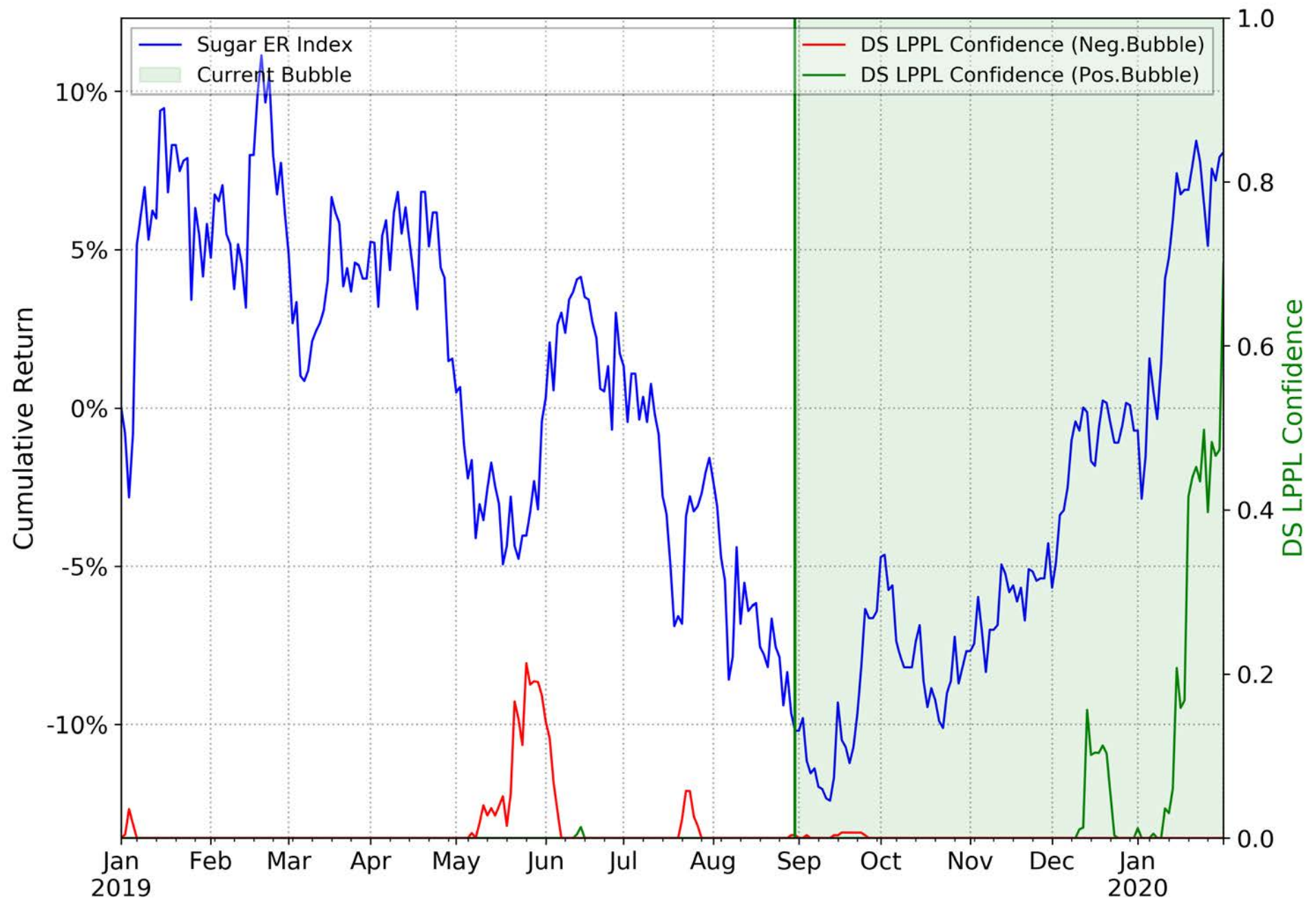




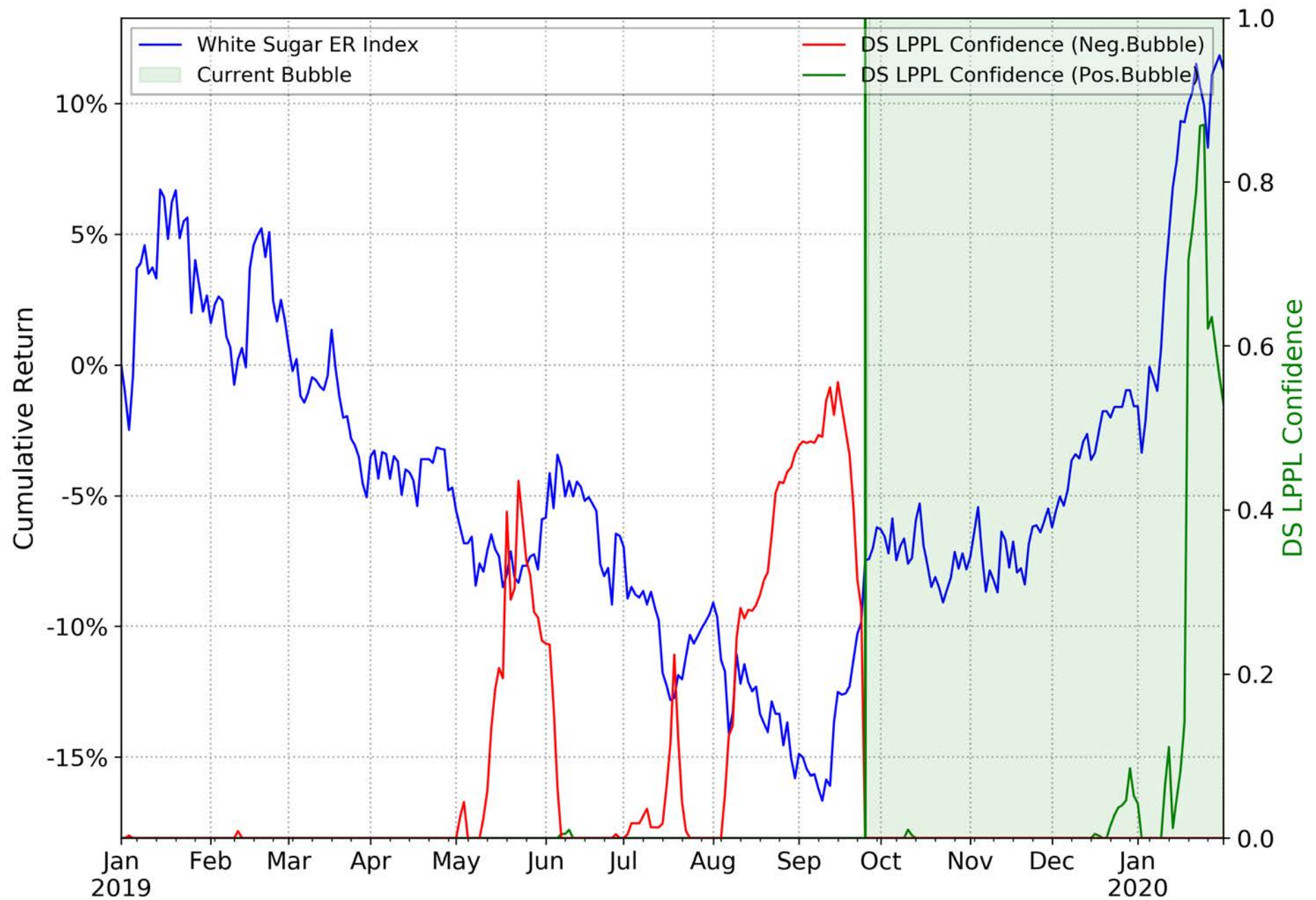
# Commodities

Bubble Data					Cluster Analysis			
	Name	Bubble Size $bs$ [%]	Duration [days]	DS LPPL Confidence $ci$ [%]	Geometric Average $\sqrt{bs \cdot ci}$ [%]	Critical Time Prediction $\mu_{tc}$	$\sigma_{tc}$ [days]	Scenario Probability [%]
Positive Bubbles								
1	Sugar ER Index	20	154	70	38	2020-02-26	6	90
2	White Sugar ER Index	20	128	53	33	2020-02-18	3	51

- ▶ Once more, we report bubble signals in the commodities sector, for which we found no bubbles in the previous month.
- ▶ Overall activity however remains low, with only 6% of analysed commodities exhibiting bubble signals.
- ▶ Two quite correlated sugar excess return indices are found to be in a positive bubble state. The reported bubble size is 20%, while their durations slightly differ.
- ▶ The indicator values are in the medium to high range.
- ▶ Both indices have reached a negative bubble trough in 2019, followed by a fast recovery and recent strong upwards movements.



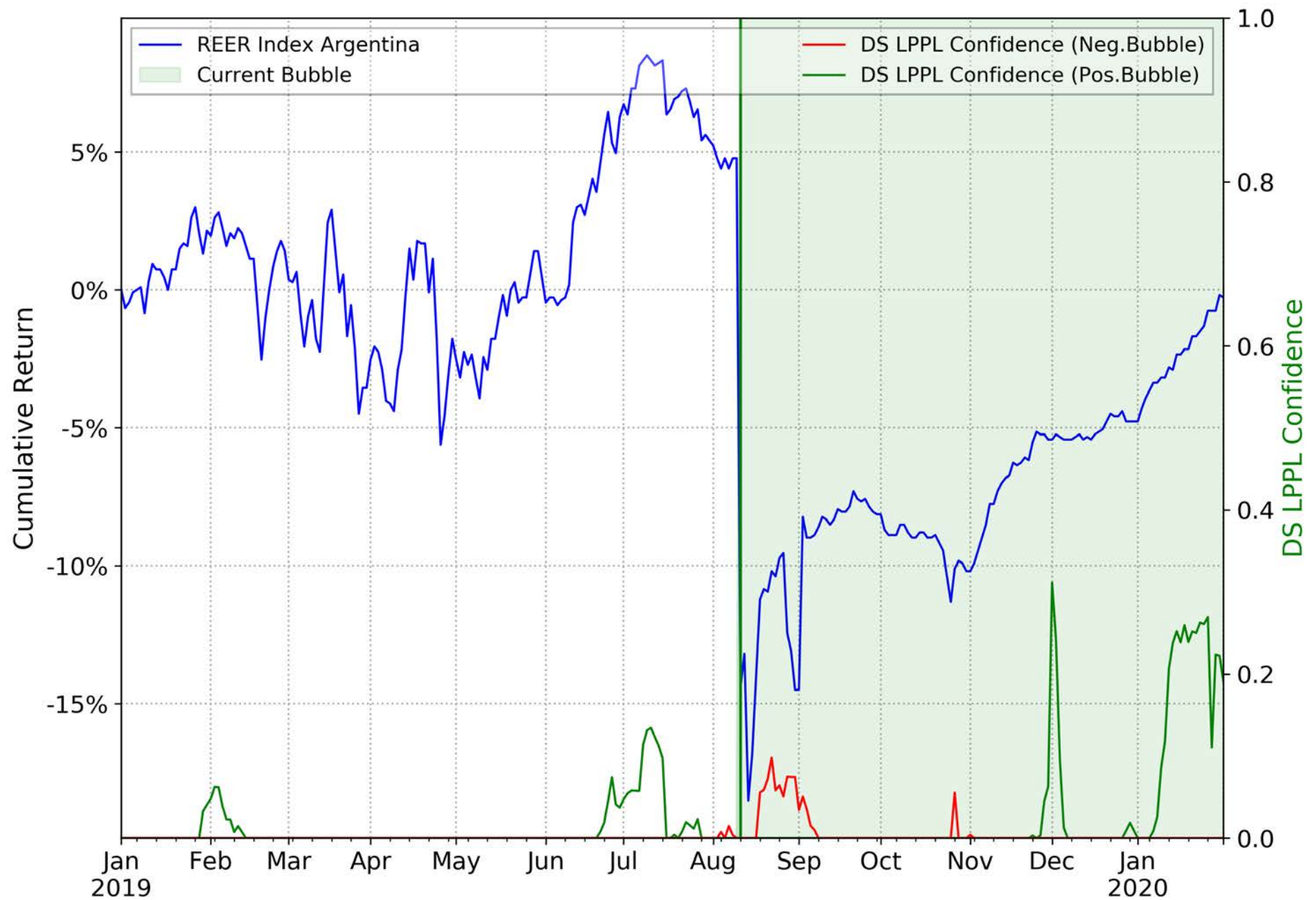




# Currencies

Bubble Data					Cluster Analysis			
	Name	Bubble Size $bs$ [%]	Duration [days]	DS LPPL Confidence $ci$ [%]	Geometric Average $\sqrt{bs \cdot ci}$ [%]	Critical Time Prediction $\mu_{tc}$	$\sigma_{tc}$ [days]	Scenario Probability [%]
Positive Bubbles	REER Index Argentina	17	174	19	18	2020-02-01	2	49

- ▶ A single positive bubble is detected on the Real Effective Exchange Rate Index of the Argentine peso.
- ▶ The bubble size is estimated at 17% with a duration of 174 days.
- ▶ The confidence indicator is at a low level of 19%.
- ▶ As visible on the next slide, the currency had previously recovered from a negative bubble trough following a sharp devaluation in August 2019 caused by political election events.



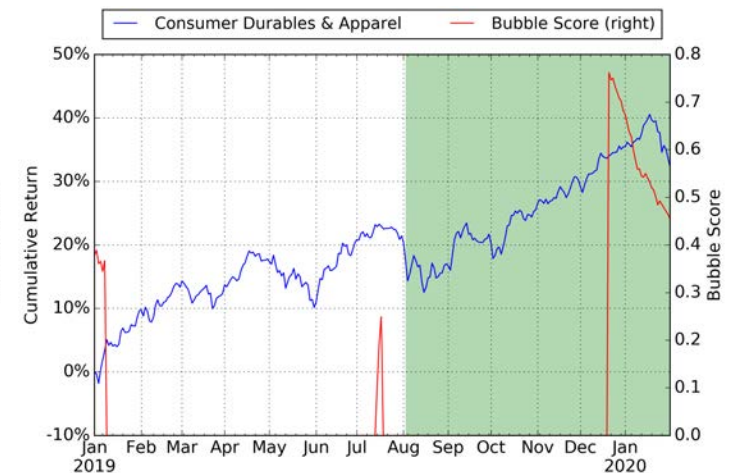
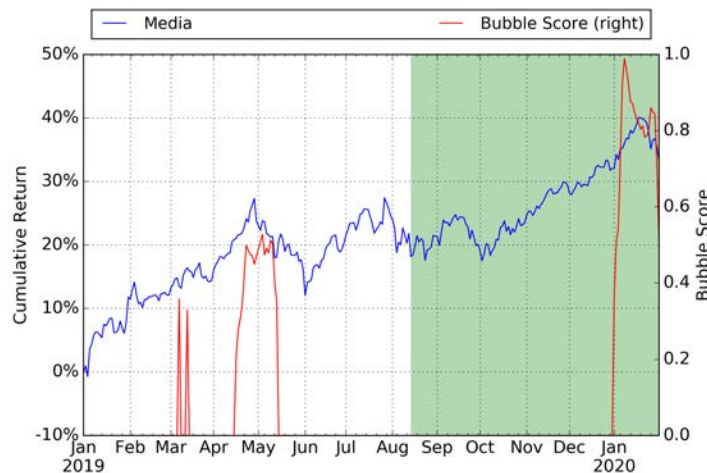
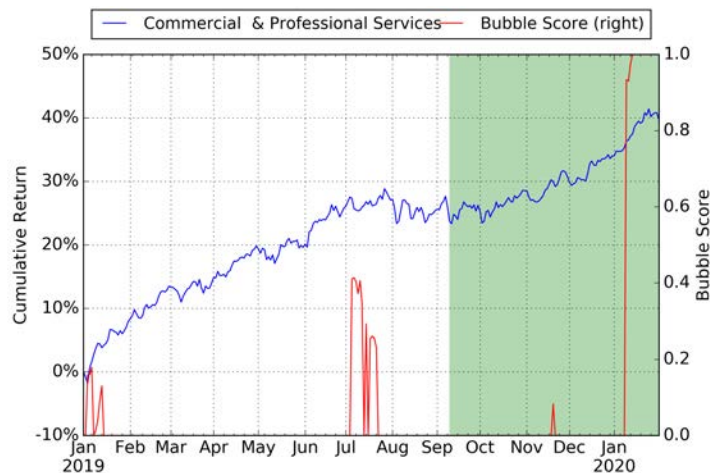


# Sectors

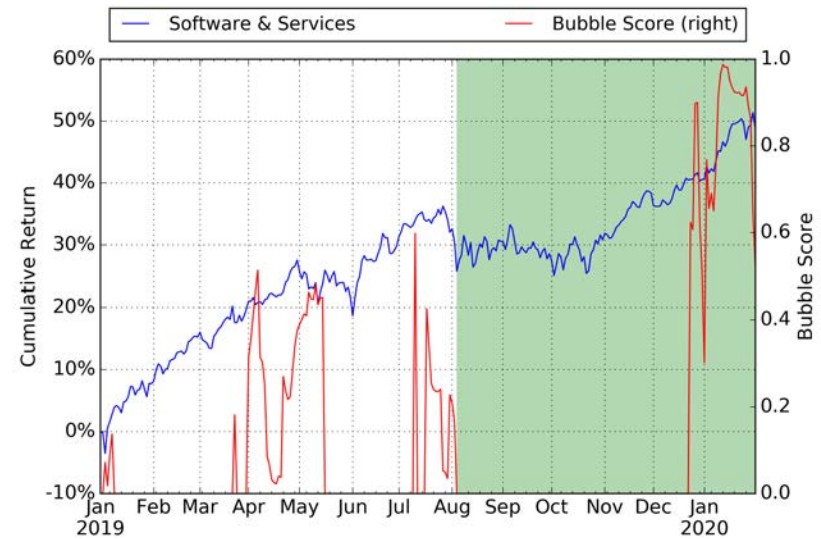
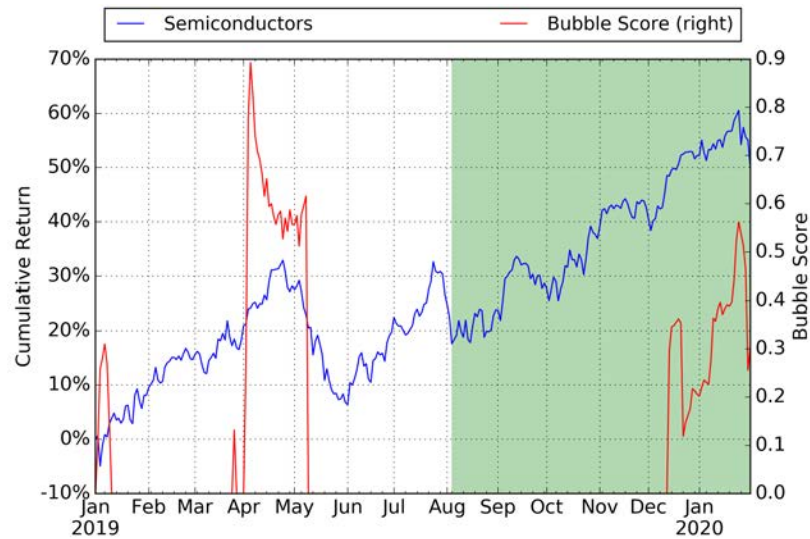
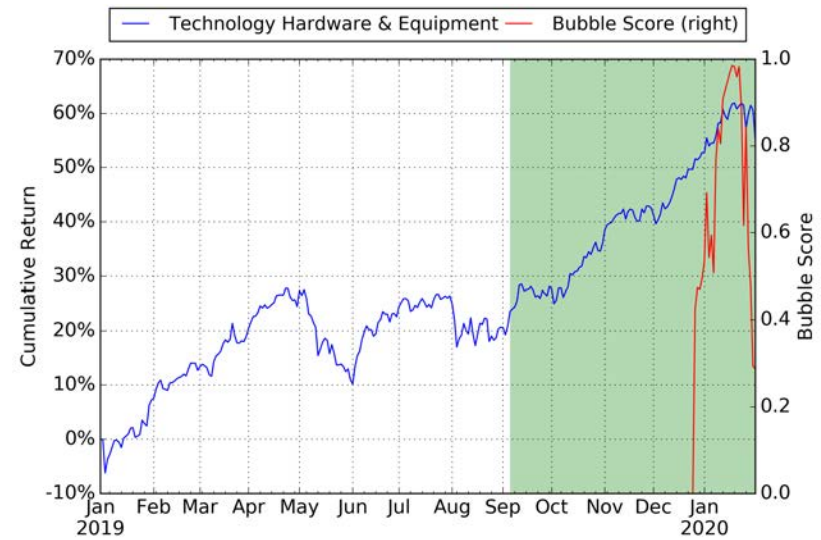
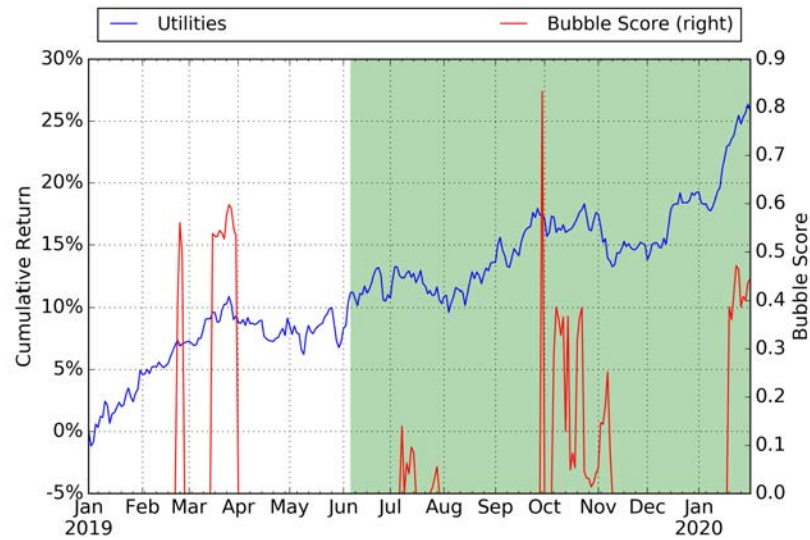
GICS Industry Group Name	Yearly Return		Bubble Size		Bubble Score		Value Score		Growth Score	
	Feb 1st	Jan 1st	Feb 1st	Jan 1st	Feb 1st	Jan 1st	Feb 1st	Jan 1st	Feb 1st	Jan 1st
Pharmaceuticals, Biotechnology & Life Sciences	12.4%	16.6%	0.0%	0.0%	0.0%	0.0%	65.5%	64.8%	47.3%	53.1%
Consumer Services	12.5%	21.4%	0.0%	0.0%	0.0%	0.0%	33.0%	28.5%	49.5%	50.7%
Retailing	17.6%	19.4%	0.0%	0.0%	0.0%	0.0%	20.2%	21.1%	45.6%	55.1%
Transportation	5.2%	13.4%	0.0%	0.0%	0.0%	0.0%	56.8%	52.4%	50.8%	48.5%
Consumer Durables & Apparel	19.8%	30.1%	12.7%	15.4%	45.6%	68.2%	31.4%	34.0%	61.6%	55.2%
Semiconductors & Semiconductor Equipment	31.1%	47.0%	27.6%	29.5%	30.4%	20.6%	64.3%	61.4%	35.8%	37.0%
Technology Hardware & Equipment	40.3%	55.1%	25.7%	29.0%	28.8%	49.4%	73.1%	69.7%	40.8%	41.3%
Automobiles & Components	3.8%	4.8%	0.0%	0.0%	0.0%	0.0%	72.7%	74.1%	51.9%	57.1%
Telecommunication Services	9.7%	9.5%	0.0%	11.4%	0.0%	33.3%	66.8%	61.4%	43.9%	41.7%
Energy	-12.1%	0.4%	0.0%	0.0%	0.0%	0.0%	57.6%	53.4%	62.4%	48.6%
Software & Services	33.2%	36.5%	18.4%	10.3%	52.7%	51.1%	37.2%	33.4%	47.3%	46.3%
Materials	4.9%	16.1%	0.0%	0.0%	0.0%	0.0%	52.9%	53.6%	48.6%	50.8%
Health Care Equipment & Services	13.3%	25.2%	0.0%	0.0%	0.0%	0.0%	65.6%	59.3%	49.3%	50.1%
Capital Goods	10.9%	20.6%	0.0%	0.0%	0.0%	0.0%	49.6%	50.0%	46.0%	48.1%
Media & Entertainment	19.2%	25.3%	12.8%	0.0%	51.3%	0.0%	31.0%	33.2%	41.4%	42.9%
Commercial & Professional Services	27.0%	29.1%	12.9%	0.0%	100.0%	0.0%	28.8%	29.0%	53.6%	53.3%
Food & Staples Retailing	10.7%	14.7%	0.0%	0.0%	0.0%	0.0%	46.4%	47.4%	53.8%	54.0%
Household & Personal Products	15.1%	22.0%	0.0%	0.0%	0.0%	0.0%	34.1%	33.2%	46.3%	46.3%
Food, Beverage & Tobacco	13.5%	18.3%	0.0%	0.0%	0.0%	0.0%	46.8%	46.7%	54.0%	53.5%
Utilities	19.7%	18.5%	13.2%	0.0%	44.4%	0.0%	50.3%	50.5%	45.4%	45.0%
Insurance	14.1%	20.6%	0.0%	19.9%	0.0%	25.3%	-	-	-	-
Real Estate	9.0%	15.3%	0.0%	0.0%	0.0%	0.0%	-	-	-	-
Diversified Financials	18.3%	21.2%	0.0%	0.0%	0.0%	0.0%	-	-	-	-
Banks	4.6%	13.3%	0.0%	10.9%	0.0%	4.6%	-	-	-	-

# Sectors

- ▶ We use the MSCI World Industry Group Indices to calculate bubble size and bubble score of the corresponding sectors. To determine the value scores and growth scores of the sectors, we average over the corresponding values for each stock of a given sector, weighted by market cap.
- ▶ This month, we find 7 industry groups with a positive bubble score: Consumer Durables & Apparel, Semiconductors & Semiconductor Equipment, Technology Hardware & Equipment, Software & Services, Media & Entertainment, Commercial & Professional Services, Utilities, four of which were already identified last month. The new industry groups with significant bubbles we identify this month are presented below, and the ones identified last month are presented in the next slide.



# Sectors



# Portfolio Construction & 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 **positive** bubble signal as well as a **strong** value score. For instance, TFLSP November consists of all the stocks listed in quadrant 1, identified in slide 37 of November 2017 FCO Report.
  2. **Trend-Following Short Stock Portfolio (TFSSP)** is made of the stocks that have a **negative** bubble signal as well as a **weak** value score.
  3. **Contrarian Long Stock Portfolio (CLSP)** is made of the stocks that have a **negative** bubble signal as well as a **strong** value score.
  4. **Contrarian Short Stock Portfolio (CSSP)** is made of the stocks that have a **positive** bubble signal as well as a **weak** value score.

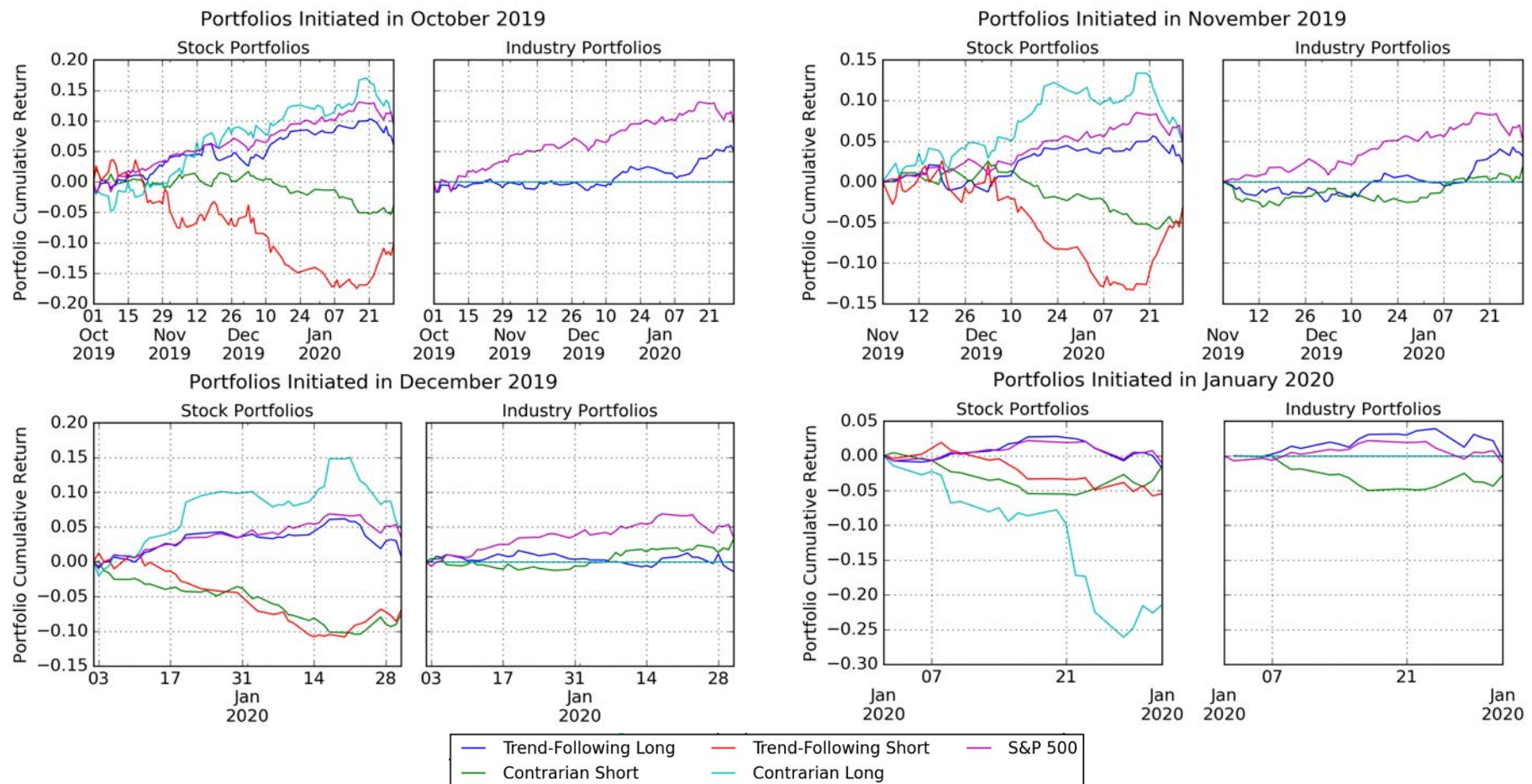
# Portfolio Construction & Performance

- ▶ At the same time, we also classified 20 industries into 4 quadrants, and 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).
- ▶ In each month, we initiated 8 new portfolios based on the updated results. The performance of every 8 portfolios we initiated since November 2017 are presented in the next slide. All of the stocks in our portfolios are weighted by their market capitalizations and we don't consider transaction cost in the portfolio performance.



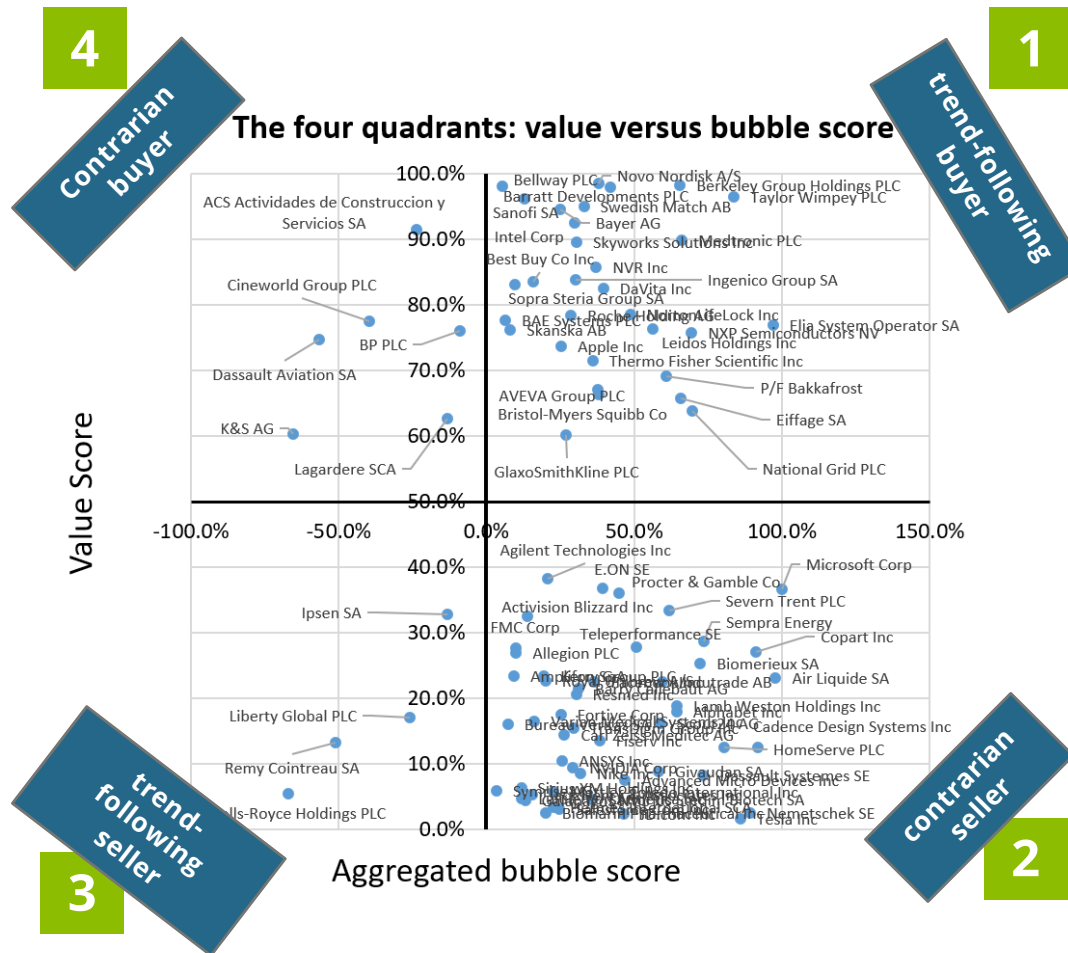
# Portfolio Construction & Performance

- With the market achieving new highs this month, we find that the Contrarian Long Stock Portfolios have outperformed most of the portfolios except for January, coinciding with the outbreak of the Wuhan coronavirus. 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 over which the predicted corrections play out, as illustrated here by the difference between the contrarian portfolio initiated in January and the earlier ones.



# Single Stocks

We can divide the stocks into four quadrants<sup>1)</sup>



- **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**. E.g. Intel Corp
- **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**. E.g. Microsoft Corp
- **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**. E.g. Ipsen SA
- **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**. E.g. K&S AG

<sup>1)</sup> A strong positive bubble signal is identified if bubble score is positive, and a strong negative bubble signal is identified if bubble score is negative.

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

- ▶ For 823 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.
- ▶ To analyze the **financial strength of individual stocks**, we have two indicators. 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.
  - 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; Value scores are calculated by comparing ROIC level versus EV/IC in each industry.
  - A **growth score** that has characteristics similar to the PEG ratio, which is the Price to Earnings ratio normalized by the expected growth of the EPS (Earnings per Share).
- ▶ 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.

# Single Stocks

Quadrant 1 stocks: strong positive bubble signals with strong fundamentals

Company Name	Country of Headquarters	GICS Industry Group Name	Yearly Return	Bubble Size	Bubble Start	Bubble Score	Value Score	Growth Score
Elia System Operator SA	Belgium	Utilities	33.9%	22.9%	Aug-19	97.0%	76.9%	8.5%
Roche Holding AG	Switzerland	Pharmaceuticals, Biotechnology & Life Sciences	20.0%	22.4%	May-19	28.7%	78.5%	30.6%
Bayer AG	Germany	Pharmaceuticals, Biotechnology & Life Sciences	9.7%	28.0%	May-19	24.9%	94.6%	23.3%
Novo Nordisk A/S	Denmark	Pharmaceuticals, Biotechnology & Life Sciences	28.0%	29.4%	Jul-19	38.0%	98.6%	74.1%
P/F Bakkafrost	Faroe Islands	Food, Beverage & Tobacco	45.9%	31.1%	Aug-19	61.0%	69.1%	60.4%
Sopra Steria Group SA	France	Software & Services	71.7%	49.3%	Jun-19	9.7%	83.1%	92.7%
Sanofi SA	France	Pharmaceuticals, Biotechnology & Life Sciences	15.4%	18.5%	May-19	13.0%	96.2%	69.9%
Ingenico Group SA	France	Technology Hardware & Equipment	123.7%	16.2%	Aug-19	30.2%	83.8%	66.2%
Eiffage SA	France	Capital Goods	30.2%	22.6%	May-19	65.7%	65.8%	12.7%
Barratt Developments PLC	United Kingdom	Consumer Durables & Apparel	43.9%	44.6%	May-19	5.3%	98.2%	19.2%
Bellway PLC	United Kingdom	Consumer Durables & Apparel	41.4%	44.1%	Feb-19	42.1%	97.9%	14.9%
BAE Systems PLC	United Kingdom	Capital Goods	21.3%	27.3%	Apr-19	6.4%	77.7%	32.4%
Taylor Wimpey PLC	United Kingdom	Consumer Durables & Apparel	36.9%	45.9%	Aug-19	83.8%	96.5%	15.5%
GlaxoSmithKline PLC	United Kingdom	Pharmaceuticals, Biotechnology & Life Sciences	15.1%	13.9%	Mar-19	27.0%	60.1%	19.4%
Berkeley Group Holdings PLC	United Kingdom	Consumer Durables & Apparel	36.4%	49.4%	May-19	65.5%	98.3%	3.8%
AVEVA Group PLC	United Kingdom	Software & Services	67.3%	31.0%	Aug-19	37.8%	67.1%	44.1%

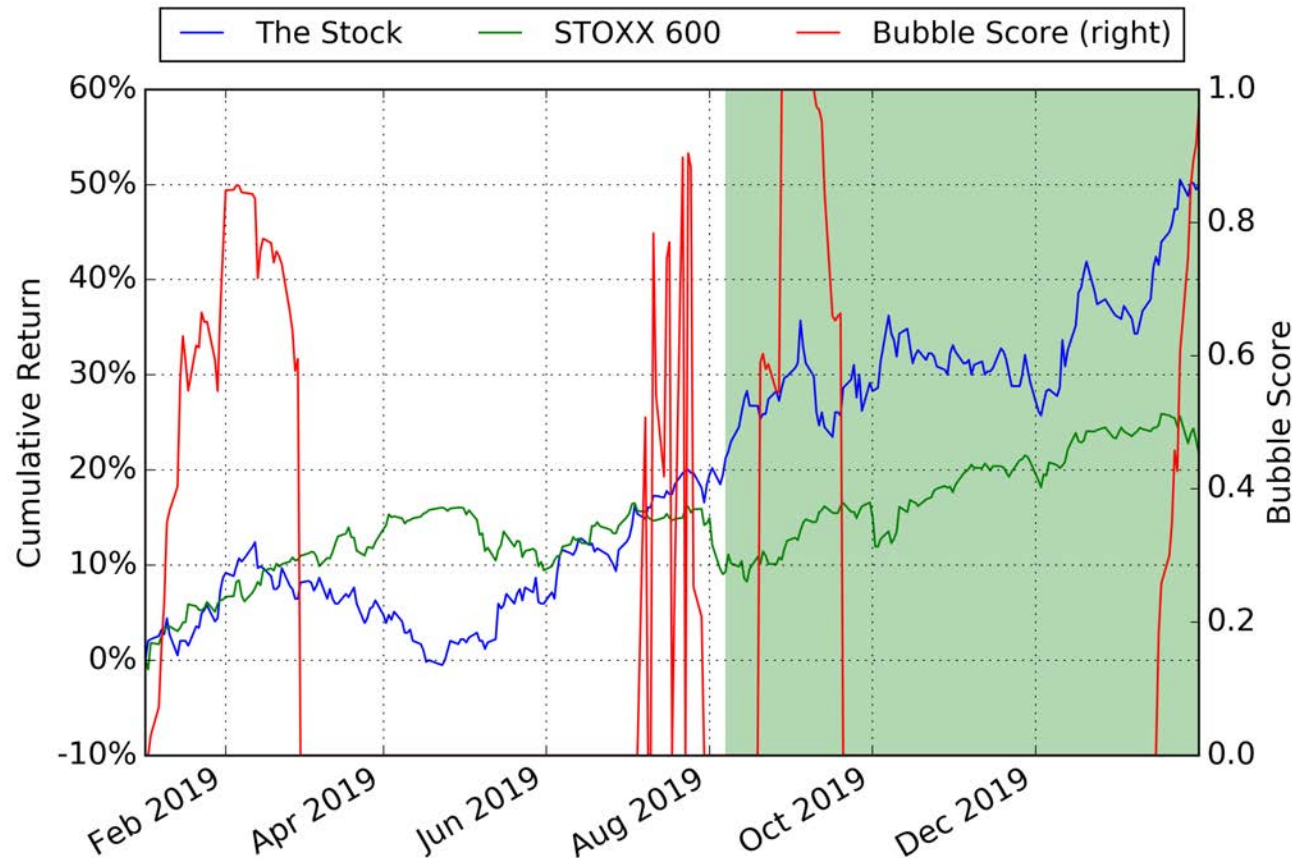
# Single Stocks

Quadrant 1 stocks: strong positive bubble signals with strong fundamentals

Company Name	Country of Headquarters	GIICS Industry Group Name	Yearly Return	Bubble Size	Bubble Start	Bubble Score	Value Score	Growth Score
National Grid PLC	United Kingdom	Utilities	19.2%	22.7%	Sep-19	69.5%	63.8%	14.4%
Medtronic PLC	Ireland; Republic of	Health Care Equipment & Services	28.8%	19.6%	Jun-19	66.2%	89.9%	47.2%
NXP Semiconductors NV	Netherlands	Semiconductors & Semiconductor Equipment	42.1%	29.5%	Aug-19	69.5%	75.8%	37.3%
Skanska AB	Sweden	Capital Goods	40.5%	35.8%	Feb-19	8.1%	76.3%	95.6%
Swedish Match AB	Sweden	Food, Beverage & Tobacco	31.1%	40.2%	Jul-19	33.0%	95.0%	46.8%
Apple Inc	United States of America	Technology Hardware & Equipment	82.7%	67.1%	Jun-19	25.3%	73.7%	40.5%
Best Buy Co Inc	United States of America	Retailing	44.9%	33.4%	Aug-19	15.9%	83.6%	11.4%
Bristol-Myers Squibb Co	United States of America	Pharmaceuticals, Biotechnology & Life Sciences	25.6%	27.8%	Sep-19	38.1%	66.4%	32.2%
DaVita Inc	United States of America	Health Care Equipment & Services	42.7%	70.2%	May-19	39.6%	82.6%	76.4%
Intel Corp	United States of America	Semiconductors & Semiconductor Equipment	31.1%	25.5%	Sep-19	29.8%	92.6%	11.8%
Leidos Holdings Inc	United States of America	Software & Services	62.2%	18.3%	Sep-19	56.4%	76.4%	63.8%
NVR Inc	United States of America	Consumer Durables & Apparel	46.7%	9.5%	Aug-19	37.2%	85.8%	36.8%
NortonLifeLock Inc	United States of America	Software & Services	26.8%	24.0%	Aug-19	48.6%	78.6%	35.9%
Skyworks Solutions Inc	United States of America	Semiconductors & Semiconductor Equipment	38.3%	66.4%	May-19	30.6%	89.6%	55.1%
Thermo Fisher Scientific Inc	United States of America	Pharmaceuticals, Biotechnology & Life Sciences	28.1%	12.8%	Jul-19	36.0%	71.5%	58.7%

# Single Stocks

Quadrant 1 Stocks Current Month Example – Elia System Operator SA.

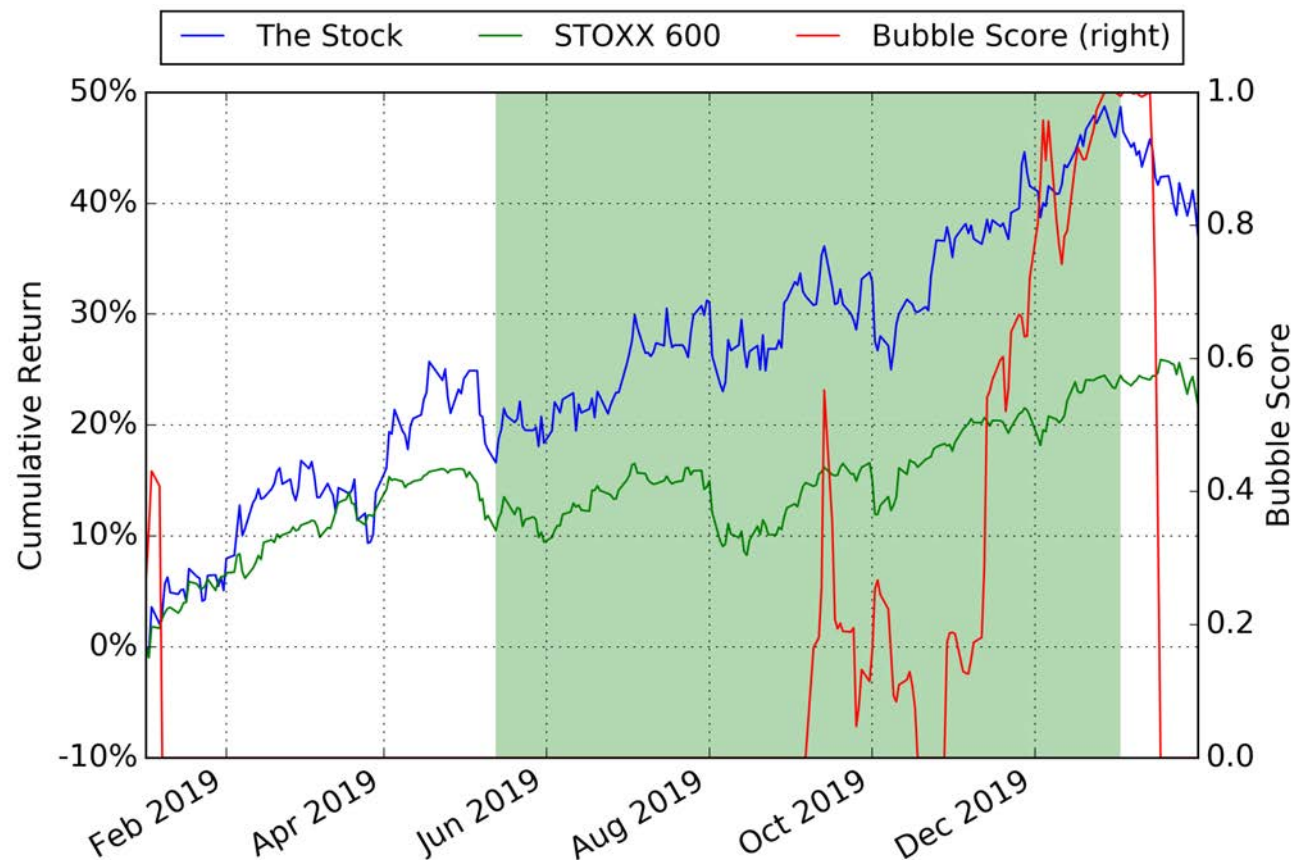


- The above graph shows the one year cumulative return of the stock in blue (left hand scale), STOXX 600 in green (left hand scale) and the calculated DS LPPLS Bubble Score in red (right hand scale). The green shaded period delineates the time interval within which the strong positive bubble is identified. The Bubble Score of this six month bubble has reached 97% with a bubble size 22.9%.



# Single Stocks

Quadrant 1 Stocks Last Month Example – CRH PLC.



- The figure above plots the one year cumulative return of the stock (blue), STOXX 600 (green) and LPPLS Bubble Score (red lines on the right y-axis). The green shaded period delineates the time interval within which a strong positive bubble has been identified and reported last month. The bubble regime has finished, followed by a strong correction in the past month. This change of regime is in agreement with our DS LPPLS indicator, suggesting that the bubble exuberance is here stronger than the fundamentals.

# Single Stocks

Quadrant 2 stocks: strong positive bubble signals with weak fundamentals

Company Name	Country of Headquarters	GICS Industry Group Name	Yearly Return	Bubble Size	Bubble Start	Bubble Score	Value Score	Growth Score
Galapagos NV	Belgium	Pharmaceuticals, Biotechnology & Life Sciences	126.5%	32.8%	Jul-19	13.1%	4.4%	9.1%
Barry Callebaut AG	Switzerland	Food, Beverage & Tobacco	25.6%	18.8%	Mar-19	31.2%	21.4%	82.4%
Givaudan SA	Switzerland	Materials	30.8%	16.0%	Sep-19	58.2%	8.8%	20.6%
Carl Zeiss Meditec AG	Germany	Health Care Equipment & Services	34.5%	9.4%	Sep-19	26.4%	14.5%	80.1%
Nemetschek SE	Germany	Software & Services	54.9%	33.9%	Aug-19	89.3%	2.4%	50.6%
Scout24 AG	Germany	Media & Entertainment	52.7%	25.1%	Sep-19	59.0%	16.2%	54.9%
E.ON SE	Germany	Utilities	6.9%	21.8%	Aug-19	39.4%	36.8%	8.6%
Symrise AG	Germany	Materials	21.9%	9.5%	Jun-19	3.4%	5.9%	86.9%
Royal Unibrew A/S	Denmark	Food, Beverage & Tobacco	27.4%	33.4%	Jul-19	20.0%	22.7%	51.7%
Teleperformance SE	France	Commercial & Professional Services	48.1%	20.5%	Aug-19	50.9%	27.8%	94.9%
Hermes International SCA	France	Consumer Durables & Apparel	26.8%	12.2%	Aug-19	22.8%	3.3%	52.8%
Air Liquide SA	France	Materials	36.9%	15.6%	Aug-19	97.9%	23.1%	42.8%
Dassault Systemes SE	France	Software & Services	22.6%	22.3%	Aug-19	73.4%	8.2%	38.6%
Bureau Veritas SA	France	Commercial & Professional Services	27.4%	18.6%	Aug-19	7.2%	16.0%	35.8%
Sartorius Stedim Biotech SA	France	Pharmaceuticals, Biotechnology & Life Sciences	61.9%	25.1%	Sep-19	35.8%	4.5%	34.6%
Biomerieux SA	France	Health Care Equipment & Services	40.0%	28.2%	Sep-19	72.4%	25.3%	32.7%
Severn Trent PLC	United Kingdom	Utilities	29.4%	24.0%	Jul-19	61.7%	33.3%	11.0%
HomeServe PLC	United Kingdom	Commercial & Professional Services	33.7%	16.5%	Aug-19	80.4%	12.6%	47.7%
Kerry Group PLC	Ireland; Republic of	Food, Beverage & Tobacco	25.4%	22.8%	Mar-19	19.5%	23.5%	59.1%
Allegion PLC	Ireland; Republic of	Capital Goods	41.3%	45.7%	Mar-19	10.1%	26.9%	47.8%
Amplifon SpA	Italy	Health Care Equipment & Services	56.6%	56.6%	Feb-19	9.3%	23.3%	67.1%
Indutrade AB	Sweden	Capital Goods	48.2%	31.8%	Aug-19	59.6%	22.4%	91.7%
Activision Blizzard Inc	United States of America	Media & Entertainment	45.8%	26.0%	Mar-19	14.0%	32.6%	40.0%
Advanced Micro Devices Inc	United States of America	Semiconductors & Semiconductor Equipment	104.7%	55.4%	Aug-19	46.9%	7.4%	51.2%
Agilent Technologies Inc	United States of America	Pharmaceuticals, Biotechnology & Life Sciences	8.5%	12.4%	Jul-19	20.6%	38.2%	42.4%

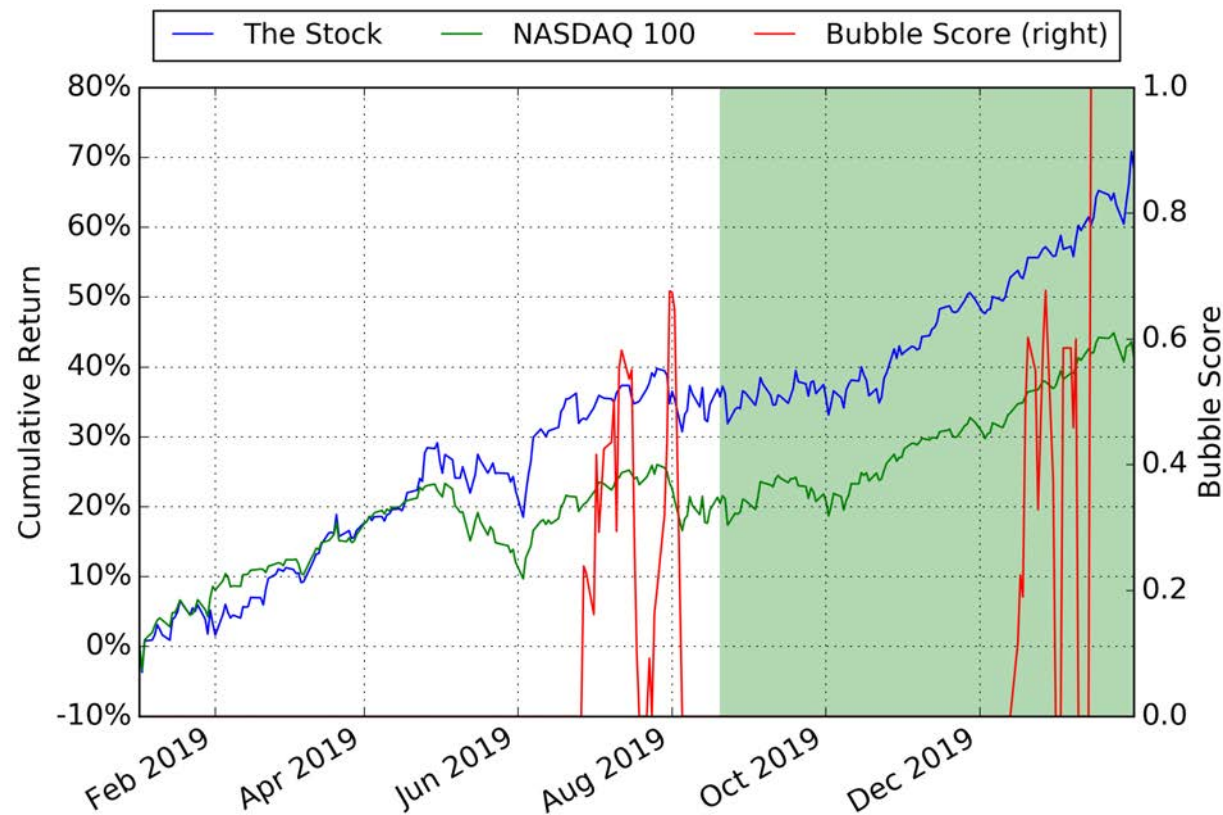
# Single Stocks

Quadrant 2 stocks: strong positive bubble signals with weak fundamentals

Company Name	Country of Headquarters	GICS Industry Group Name	Yearly Return	Bubble Size	Bubble Start	Bubble Score	Value Score	Growth Score
Alphabet Inc	United States of America	Media & Entertainment	31.0%	18.6%	Aug-19	64.4%	17.9%	39.0%
ANSYS Inc	United States of America	Software & Services	60.2%	41.9%	Jun-19	25.7%	10.4%	26.2%
Biomarin Pharmaceutical Inc	United States of America	Pharmaceuticals, Biotechnology & Life Sciences	-9.9%	11.8%	Aug-19	20.0%	2.6%	53.2%
Cadence Design Systems Inc	United States of America	Software & Services	41.8%	9.6%	Sep-19	91.9%	12.4%	51.4%
Copart Inc	United States of America	Commercial & Professional Services	94.4%	25.9%	Sep-19	91.3%	27.1%	67.9%
FMC Corp	United States of America	Materials	30.1%	29.2%	Feb-19	10.1%	27.7%	24.2%
Facebook Inc	United States of America	Media & Entertainment	21.8%	11.1%	Aug-19	36.5%	22.6%	42.3%
Fiserv Inc	United States of America	Software & Services	40.3%	36.4%	Mar-19	38.3%	13.6%	69.2%
Fortive Corp	United States of America	Capital Goods	-2.9%	8.5%	Aug-19	25.2%	17.6%	41.0%
Jack Henry & Associates Inc	United States of America	Software & Services	13.8%	7.7%	May-19	15.4%	5.3%	51.5%
JD.com Inc	China	Retailing	55.2%	22.9%	Aug-19	46.3%	2.3%	21.0%
Lamb Weston Holdings Inc	United States of America	Food, Beverage & Tobacco	29.7%	50.2%	May-19	64.5%	18.8%	59.9%
Lululemon Athletica Inc	Canada	Consumer Durables & Apparel	59.8%	23.1%	Sep-19	12.0%	4.7%	54.6%
Mettler-Toledo International Inc	United States of America	Pharmaceuticals, Biotechnology & Life Sciences	14.3%	14.6%	Aug-19	22.7%	5.8%	61.7%
Microsoft Corp	United States of America	Software & Services	61.7%	27.6%	Aug-19	100.0%	36.7%	32.9%
Nike Inc	United States of America	Consumer Durables & Apparel	15.1%	17.2%	May-19	31.8%	8.6%	63.7%
NVIDIA Corp	United States of America	Semiconductors & Semiconductor Equipment	61.4%	56.8%	Aug-19	29.3%	9.4%	31.5%
Procter & Gamble Co	United States of America	Household & Personal Products	26.8%	9.2%	Jul-19	44.9%	36.0%	48.1%
Resmed Inc	United States of America	Health Care Equipment & Services	63.5%	28.9%	Jul-19	30.4%	20.6%	64.1%
Salesforce.Com Inc	United States of America	Software & Services	14.0%	27.7%	Aug-19	24.6%	3.1%	46.3%
Sempra Energy	United States of America	Utilities	39.7%	16.0%	Aug-19	73.6%	28.7%	28.1%
Sirius XM Holdings Inc	United States of America	Media & Entertainment	20.6%	20.6%	Feb-19	11.8%	6.3%	75.0%
Tesla Inc	United States of America	Automobiles & Components	108.0%	180.7%	Sep-19	85.9%	1.7%	23.7%
TransDigm Group Inc	United States of America	Capital Goods	68.0%	32.5%	Sep-19	29.5%	15.5%	55.5%
Varian Medical Systems Inc	United States of America	Health Care Equipment & Services	7.2%	33.3%	Aug-19	16.2%	16.4%	80.4%

# Single Stocks

## Quadrant 2 Stocks Current Month Example – Microsoft Corp.

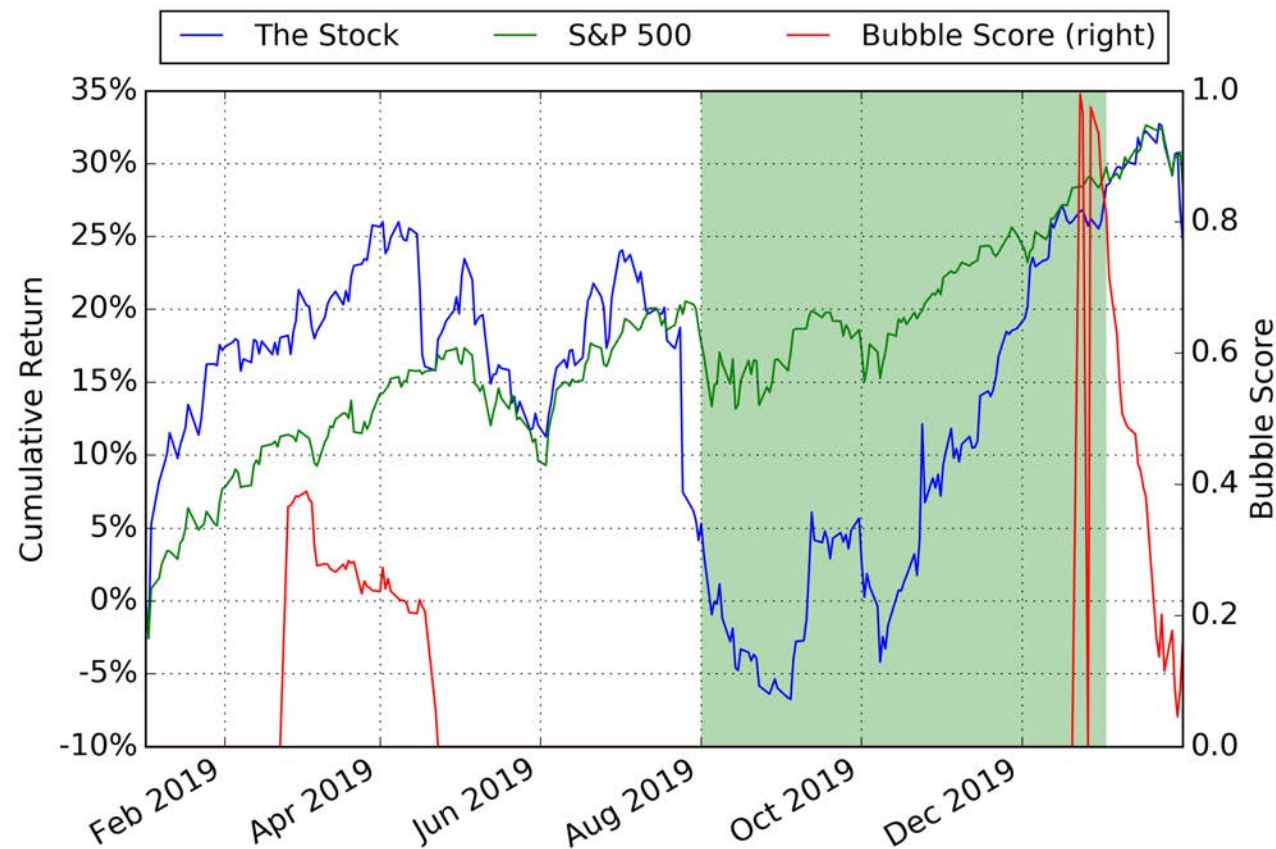


- The above graph shows the one year cumulative return of the stock in blue (left hand scale), NASDAQ 100 in green (left hand scale) and the calculated DS LPPLS Bubble Score in red (right hand scale). The green shaded period delineates the time interval within which the positive bubble is identified. The Bubble Score of this five month bubble has reached 100% with a bubble size 27.6%. The strong positive bubble signals and weak fundamentals indicate a high probability of correction in the future.



# Single Stocks

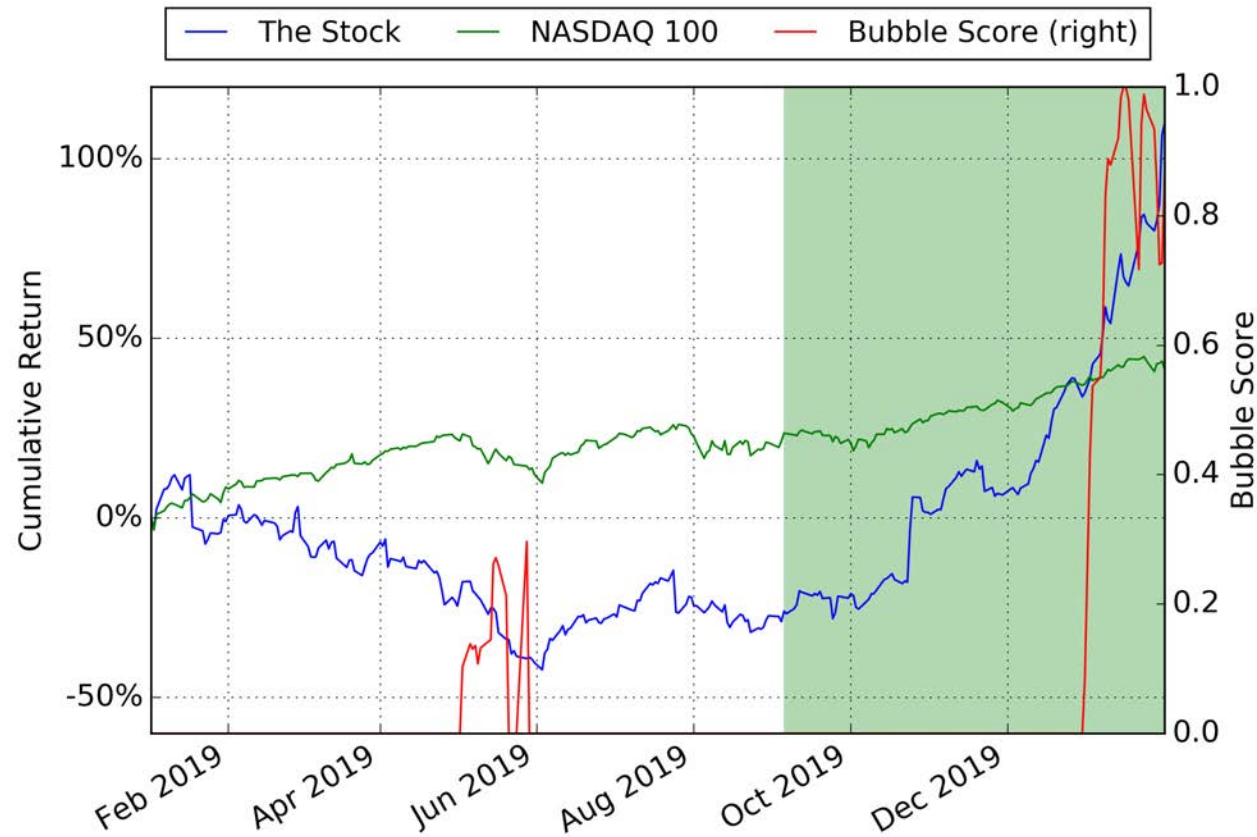
## Quadrant 2 Stocks Last Month Example – Varian Medical Systems Inc.



- The figure above plots the one year cumulative return of the stock (blue), S&P 500 (green) and LPPLS Bubble Score (red lines on the right y-axis). The green shaded period delineates the time interval within which the strong positive bubble was identified and reported last month. The stock price started a correction in the recent week after a new high in the past month, which is in agreement with our LPPLS Bubble Indicator. We expect the stock to further depreciate due to the weak fundamentals and the burst of the bubble.

# Single Stocks

## Quadrant 2 Stocks Current Month Example – Tesla Inc.



- The above graph shows the one year cumulative return of the stock in blue (left hand scale), NASDAQ 100 in green (left hand scale) and the calculated DS LPPLS Bubble Score in red (right hand scale). The green shaded period delineates the time interval within which the positive bubble is identified. The Bubble Score of this five month bubble has reached 85.9% with a bubble size 180.7%. The strong positive bubble signals and weak fundamentals indicate a high probability of correction in the future.

# Single Stocks

## Quadrant 2 Stock: the particular case of Tesla Inc.

Tesla, currently the most controversial company, is torturing many high profile investors with its soaring price. AI algorithms and such hot topics as driverless systems, green energy and new Chinese manufacturing in Shanghai are all exciting people's imaginations. As the dragonhead of the Electrical Automobile companies, Tesla has persuaded many people that it is a new "APPLE" of the coming decade and all other petrol-fuel mechanical car companies are just like "Nokia".

Elon Musk, the clever CEO with many creative marketing strategies, knows how to catch the eyes of the media. E.g. a \$50 million rocket bursting experiment, cooperation with the Chinese government, better than forecasted revenue & earnings growth (from Tesla Inc. and the upper supply chain) and even his funny dance. Besides, plenty of good news recently came to the market, squeezing the shorts a few times during the past one month, and one of the shareholders, Ron Baron, even claimed that the revenue of Tesla will reach \$1 trillion in ten years.

However, all those news remind us of the story of the legendary investor Julian Robertson. When Julian closed his Tiger Fund in 2000, many observers were confused about whether there was a real bubble at that time because the Internet is a mind blowing concept and the new technology is so sexy. People even began to question Warren Buffett as being too old to catch up with the new technology. But, when we look back from today, we can see that the dotcom bubble was truly big and risky and it was indeed very hard to short sell.

Tesla's annual reports are not satisfying conventional institutional investors for valuation purposes but retail investors are attracted by its revenue & earnings growth and the fancy storyline and, therefore, flood in.

Weak fundamentals, high valuation and lots of exciting good news: it is a typical Dotcom-like bubble and very dangerous for short-sellers. Like the question that Julian was facing, it was not if, but when. Currently, Tesla has already "spilled over" its bubble to many other related companies: E.g. Lithium and battery-related industries. (Although we call it "bubble", it is still an early positive bubble from the long term view).

In the short term, the speculative sentiment pumped up Tesla's market cap to more than \$160 billion, while in the long term, the green energy and Electrical Automobile tides are forming. Thus, a technical correction is inevitable. When a correction will be coming, the sky-high valuation of Tesla (lack of reasonable fundamentals to justify the price) will become the last dagger to sting the foam.

**TSLA: Daily 3 Months Volatility Chart** ( 3 months | 6 months | 1 Year )  
[IV Index Call](#) | [IV Index Put](#) | [IV Index Call & Put](#) | [IV Index Mean](#)



Very strong acceleration of the implied volatility (orange) compared with the Historical volatility) blue

# Single Stocks

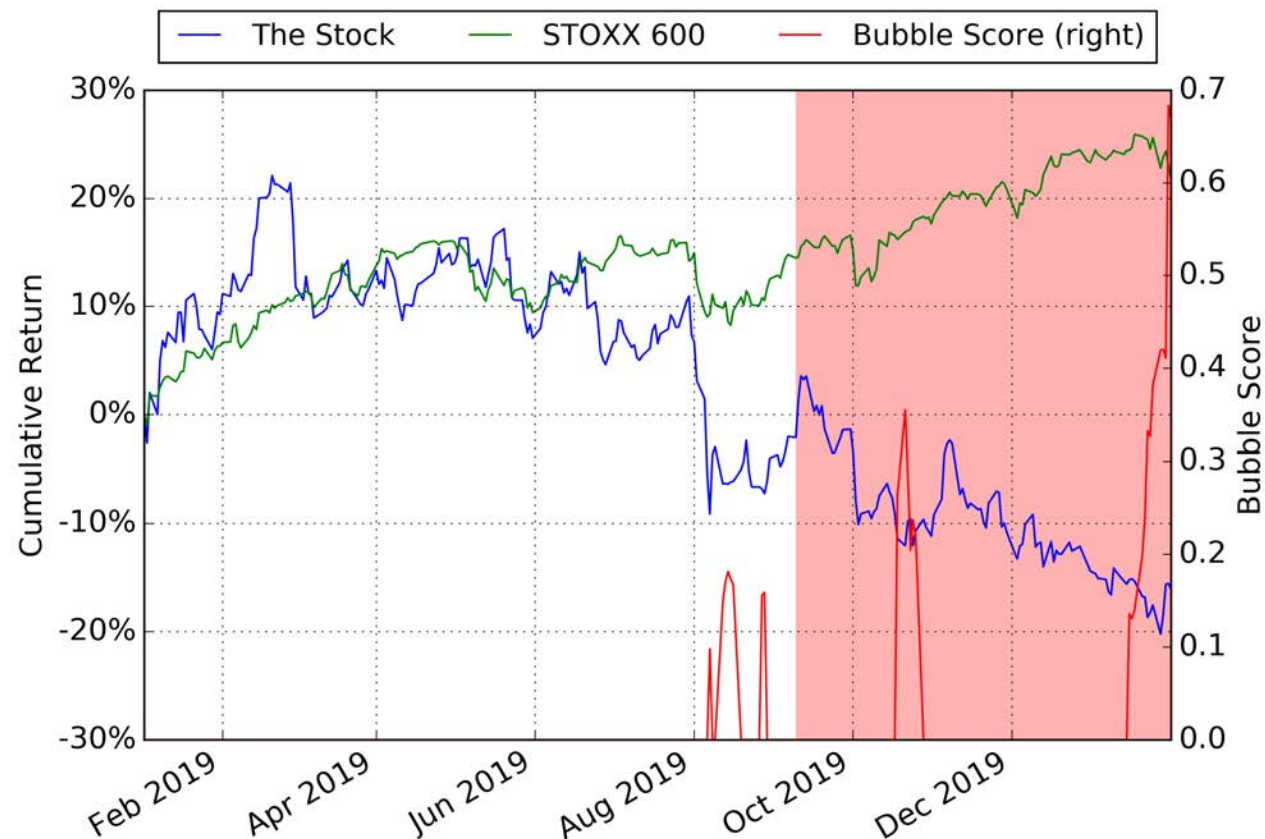
Quadrant 3 stocks: strong negative bubble signals with weak fundamentals

Company Name	Country of Headquarters	GICS Industry Group Name	Yearly Return	Bubble Size	Bubble Start	Bubble Score	Value Score	Growth Score
Remy Cointreau SA	France	Food, Beverage & Tobacco	-12.3%	-24.9%	Jun-19	-51.2%	13.2%	22.3%
Ipsen SA	France	Pharmaceuticals, Biotechnology & Life Sciences	-39.3%	-41.8%	Feb-19	-13.3%	32.8%	11.2%
Rolls-Royce Holdings PLC	United Kingdom	Capital Goods	-25.7%	-17.2%	Sep-19	-67.0%	5.4%	4.9%
Liberty Global PLC	United Kingdom	Media & Entertainment	-15.5%	-27.0%	Jul-19	-26.0%	17.1%	99.7%



# Single Stocks

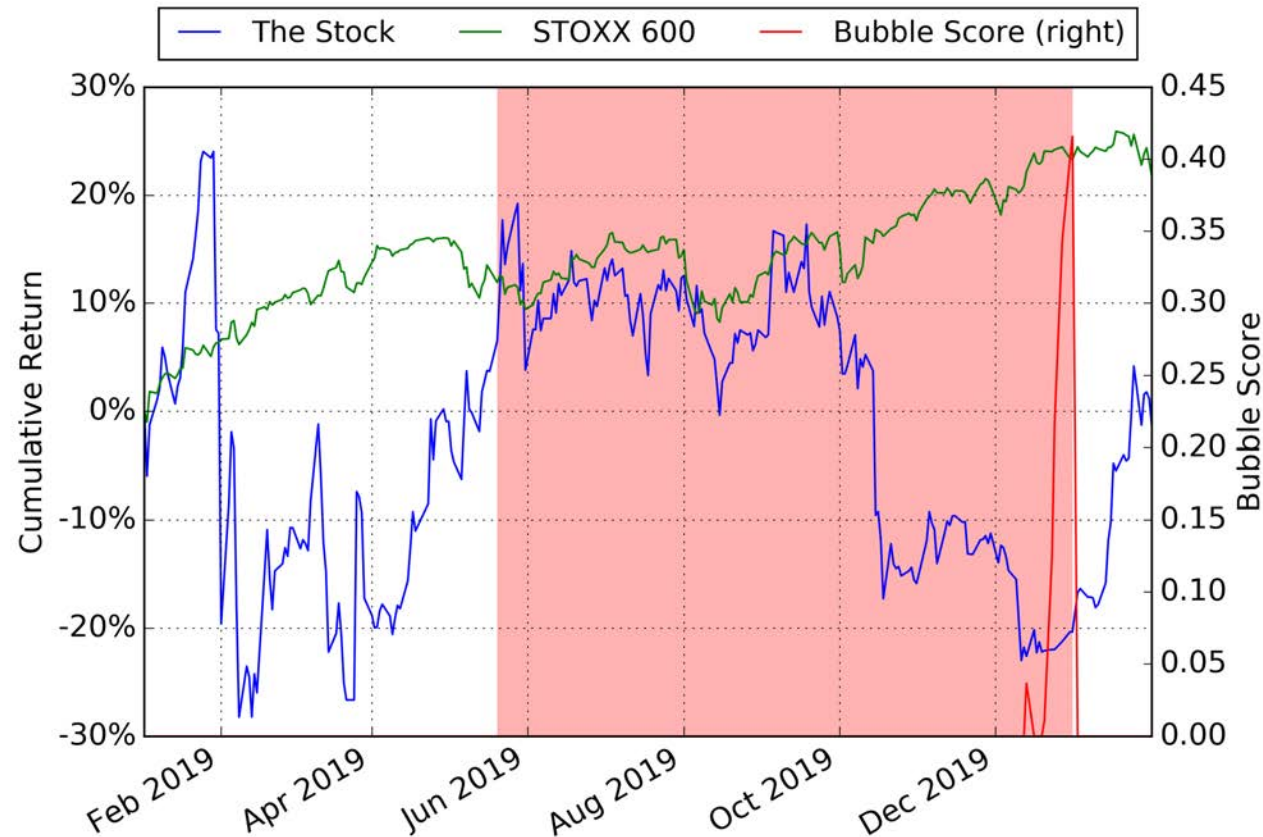
Quadrant 3 Stocks Current Month Example – Rolls-Royce Holdings PLC.



- The above graph shows the one year cumulative return of the stock in blue (left hand scale), STOXX 600 in green (left hand scale) and the calculated DS LPPLS Bubble Score in red (right hand scale). The red shaded period delineates the time interval within which the negative bubble is identified. The Bubble Score of this five month bubble has reached 67.0% with a bubble size -17.2%.

# Single Stocks

Quadrant 3 Stocks Last Month Example – Wirecard AG.



- The figure above plots the one year cumulative return of the stock (blue), STOXX 600 (green) and LPPLS Bubble Score (red line on the right y-axis). The red shaded period delineates the time interval within which the strong negative bubble was identified and reported last month. The stock has entered into a strong rebound regime in the past month, which is in agreement with our DS LPPLS bubble indicator indicating a coming change of regime, but a bit surprising given the weak fundamentals.

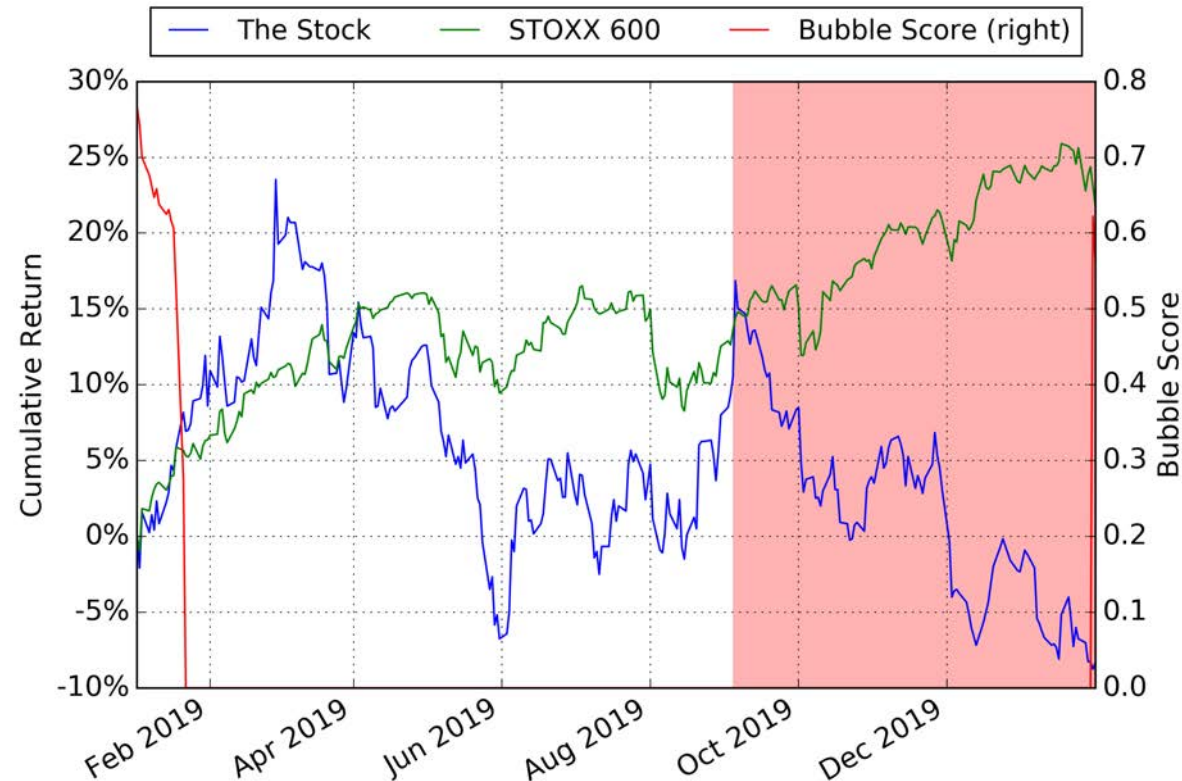
# Single Stocks

Quadrant 4 stocks: strong negative bubble signals with strong fundamentals

Company Name	Country of Headquarters	GICS Industry Group Name	Yearly Return	Bubble Size	Bubble Start	Bubble Score	Value Score	Growth Score
K&S AG	Germany	Materials	-45.5%	-45.7%	May-19	-65.6%	60.4%	9.7%
ACS Actividades de Construcción y Servicios SA	Spain	Capital Goods	-16.2%	-13.2%	Sep-19	-23.8%	91.5%	7.7%
Dassault Aviation SA	France	Capital Goods	-15.8%	-21.6%	Sep-19	-56.5%	74.7%	15.0%
Lagardere SCA	France	Media & Entertainment	-22.5%	-22.5%	Feb-19	-13.2%	62.7%	94.0%
BP PLC	United Kingdom	Energy	-16.1%	-16.6%	May-19	-8.8%	76.0%	6.7%
Cineworld Group PLC	United Kingdom	Media & Entertainment	-27.2%	-22.7%	Sep-19	-39.8%	77.6%	25.1%

# Single Stocks

Quadrant 4 Stocks Current Month Example – Dassault Aviation SA.

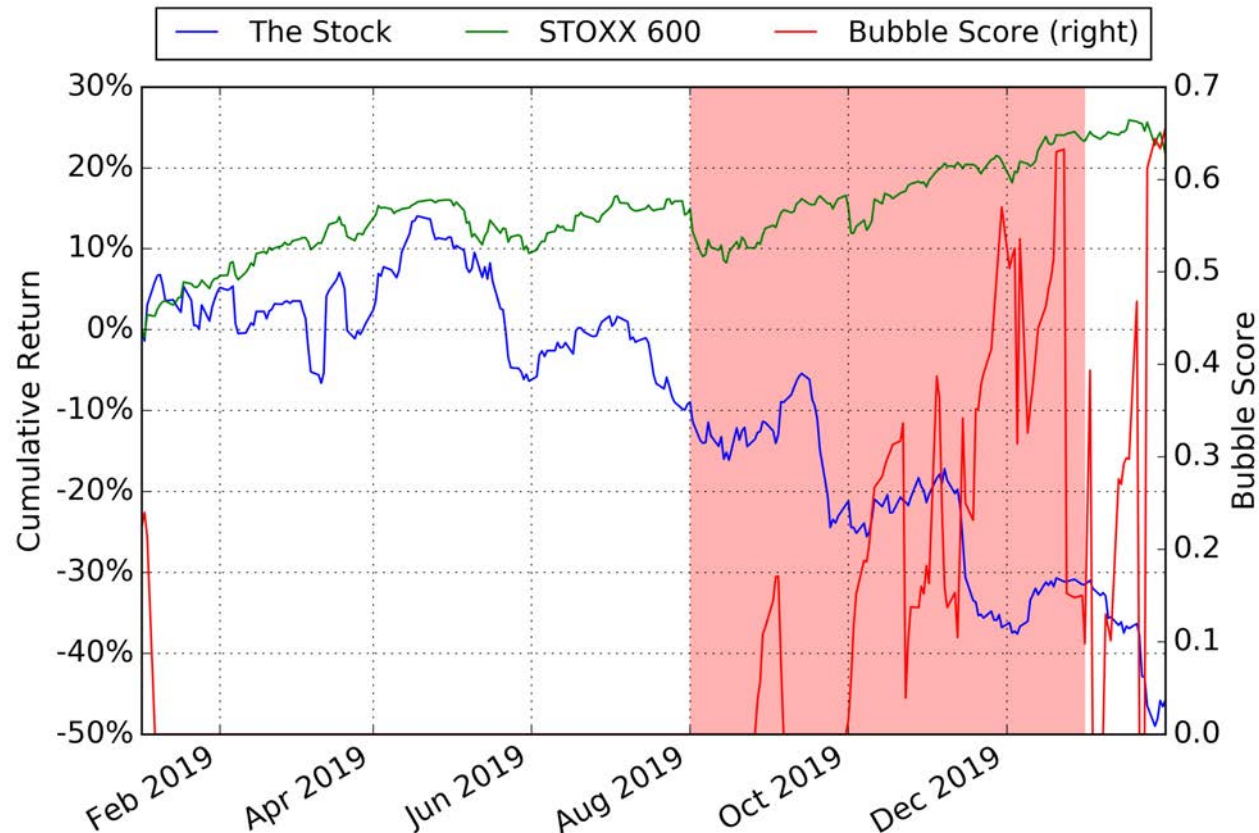


- The above graph shows the one year cumulative return of the stock in blue (left hand scale), STOXX 600 in green (left hand scale) and the calculated DS LPPLS Bubble Score in red (right hand scale). The red shaded period delineates the time interval within which the strong negative bubble is identified. The Bubble Score of this five month bubble has reached 56.5% with a bubble size -21.6%. We expect a rebound in the future, 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 – K&S AG.



- The figure above plots the one year cumulative return of the stock (blue), STOXX 600 (green) and LPPLS Bubble Score (red line on the right y-axis). The red shaded period delineates the time interval within which the strong negative bubble was identified and reported last month. The stock fell another 15% in the past month, leading to a stronger negative bubble signal this month. We expect this stock to rebound in the future due to our diagnostic of a negative bubble signal with strong fundamentals, calling for a contrarian buyer position.

# More Information

- ▶ Visit the **Financial Crisis Observatory** for more information

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

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- ▶ Contact **Systematic Investment Management AG** for practical implementation in investment portfolios

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