The FCO Cockpit
Global Bubble Status Report
October 2020

Entrepreneurial Risks
ETH *zürich*

SIMAG ® Systematic Investment Management AG

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

Contents

ETH FCO and SIMAG Join Forces

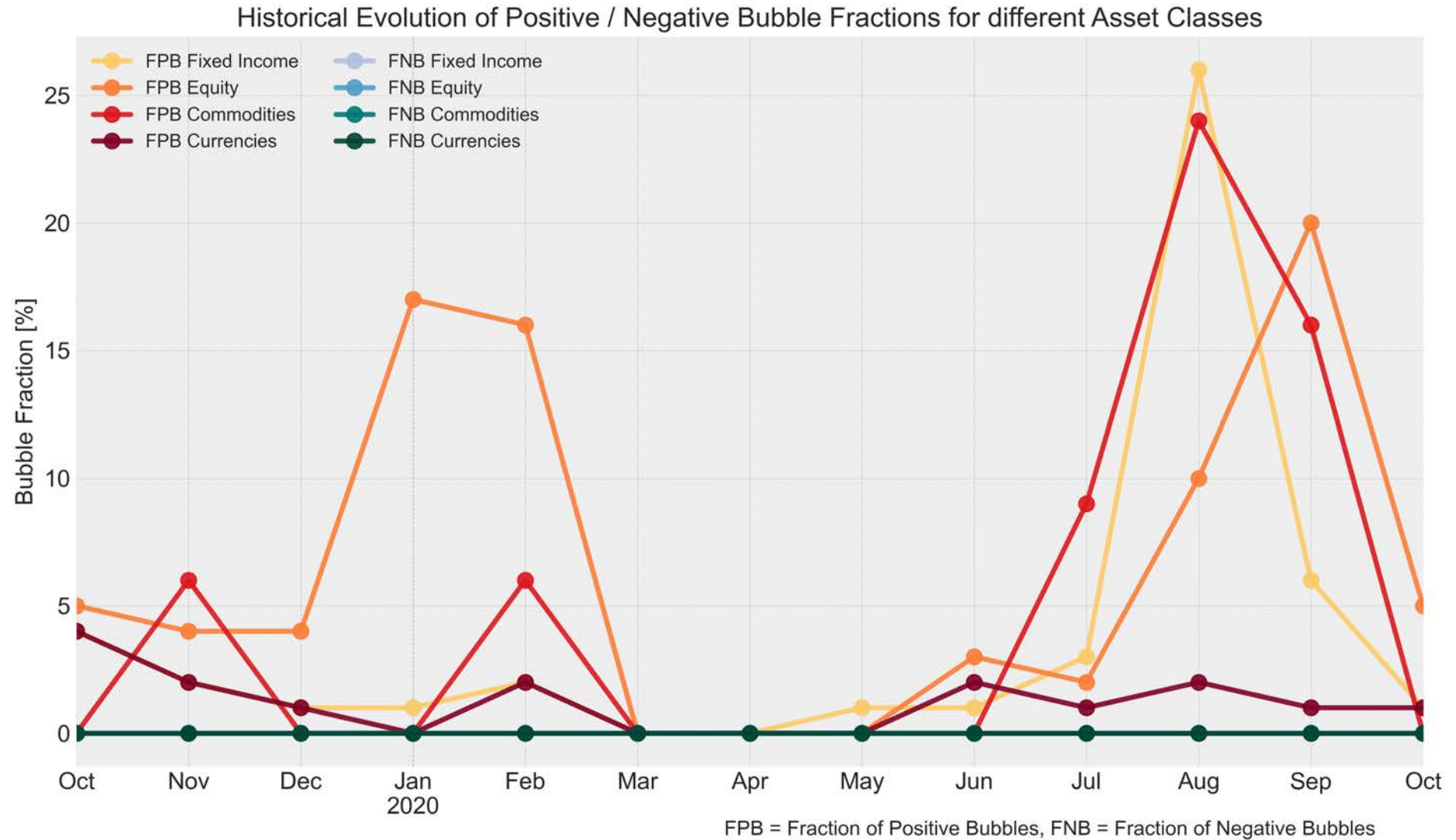| The Financial Crisis Observatory (FCO) is...	Systematic Investment Management AG (SIMAG) is ...
■ **Part of** the Chair of Entrepreneurial Risks at the Department of Management, Technology and Economics at the **ETH** Zurich ■ A **scientific platform** aimed at quantifying in a systematic way the hypothesis 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	■ 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 or visit https://www.simag.com/insights/fco-cockpit/

General Results – The Big Picture

Historical Evolution of Positive / Negative Bubble Fractions for different Asset Classes

FPB = Fraction of Positive Bubbles, FNB = Fraction of Negative Bubbles

General Results – This Month's Overview

Category	Analyzed Assets	Fraction of Pos. Bubbles [%]	Fraction of Neg. Bubbles [%]
Fixed Income	155	1	0
Government Bonds	55	2	0
Finance and Insurance	21	0	0
Corporate Bonds	79	0	0
Equity	204	5	0
Country Indices	59	7	0
Europe	25	4	0
United States	120	5	0
Commodities	30	0	0
Forex	94	1	0

▸ At the beginning of October 2020, bubble activity has calmed down across all sectors, as visible in the table above and bubble overview plot of the previous slide.

▸ As will be shown in this report, this is due to recent market corrections that were predicted in the previous report.

▸ As a consequence, the fraction of positive bubbles drastically drops to near-zero for all sectors, while the fraction of negative bubbles remains zero, as observed before.

▸ Generally, this speaks for a temporal relaxation of the market situation and lower crash risk.

Market Outlook

In line with our September FCO monthly report, the US market had a clear correction in September. In addition, Fed Chair Powell also indicated that the US economic recovery requires more fiscal supports, as certain areas of the economy will continue to struggle without aid. In our opinion, there are three uncertainties sources that will heavily impact the future dynamics of the market:

1. **Impact of policy to the economy recovery.** The US market has been waiting for CARES 2 for a while but the stimulus package bill between the democratic and republican parties are still under negotiation in the US congress at the time writing. Data shows that the sectors most deeply affected by COVID-19 disproportionately employ women, minorities and lower-income workers (the pandemic impacts the services, airline, hospitality and tourism industries heavily). Thus, delays will create more inequality and economic stressors in the world, reminding us of the depictions in "Les Misérables" by Victor Hugo.

2. **The second wave of COVID-19 in the US and European countries**. In part because of colder temperatures that drives people indoor, promoting the spread of the virus, and also due to a massive ramp-up of testing, European countries are recording increases of daily infection cases while the US cases has surged to a two-month high. Donald Trump and some of his team members caught the disease, illustrating that "The virus spares no one", furthering a climate of anxiety and uncertainty, certainly unfavorable to markets.

3. **The US presidential election**. The chaotic first debate between Biden and Trump added confusion in many voters and Trump's Coronavirus infection added some irony and comedy elements into the election. The corresponding higher level of uncertainty is detrimental for the investment environment. The passing away of supreme court judge Ruth Bader Ginsburg contributed to even more uncertainty in polarizing the political discourses.

Implications for the different asset classes:

Fixed Income: Given the above mentioned uncertainties, the yield curve remain flat for now. It is likely that the curve will steepen as soon as these uncertainties are removed. For now, caution is "de rigueur".

US equity: The market, especially the tech sector, experienced a clear correction in September, which is in line with our September FCO monthly report. However, the second wave of COVID-19 tends to support the tech sector since more restrictions are being progressively introduced by many countries. However, if any of the three risks above or unexpected anti-trust hearing result appear, the downside risk will still be significant and more corrections are thus expected. Thus, we remain cautious about the upcoming events, in the context of the drawdown that started in September.

Commodities: Due to the slower than expected recovery in the labor market (not a good sign for the demand-side recovery) and high inventory, we expect that the oil price might not have sufficient support for further increases. However, the Natural Gas price might be supported by the colder winter. According to the National Oceanic and Atmospheric Administration, there is a high chance that La Niña will come in this winter. As for the Iron Ore, we expect its price level for the next 12 month to decrease as Brazil will increase its production (as COVID-19 impact decrease) while China will lower fiscal stimulus next year (in reaction to high stimulus this year).

Real Estate: The U.S. mortgage delinquency rate in September dropped, compared with August. In addition, given the tight inventory (due to the COVID-19 and other factors.) and low interest rate, U.S. house prices exhibit a positive trend but it should remain moderate, given the slow recovery in the labor market.
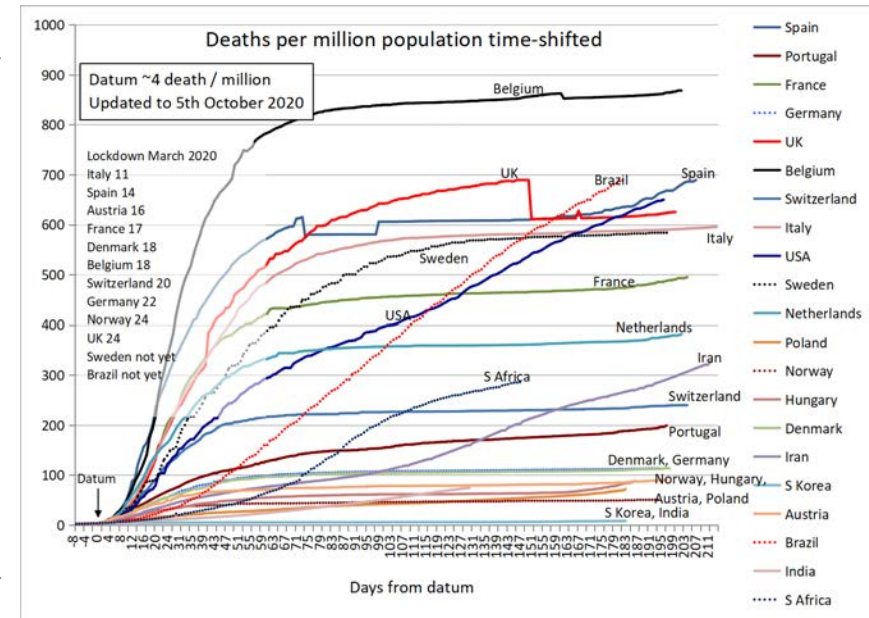
Deaths / millions in different countries as a function of time. The time 0 for each country is the week when 4 deaths per million was reached.

This allows one to compare the development of the epidemics at similar levels of progress in different countries.

For delay updates of this graph, see https://er.ethz.ch/Covid-19.html

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 μ_{t_c}	σ_{t_c} [$days$]	Scenario Probability [%]
Positive Bubbles							
1 iBoxx GEMX Uruguay Index	22	193	49	33	2020-10-03	5	72

- Among Fixed Income Indices, the fraction of positive bubble drops from 6% in September to 1%, this month.

- The iBoxx GEMX Uruguay Index is listed for the second month in a row, with the bubble size having grown from prior 19% to now 22%, the bubble duration extended by about a month, from 164 days to 193 days and a strong, and one can observe a five-fold increase of the DS LPPLS Confidence Indicator from 10% to 49%.

- As usual, the indicator plot is shown on the next slide.

- Additionally, we provide time series plots for two previously listed indices. For the Sri Lanka GEMX Index, one can observe that the bubble signal has vanished, as the index continues its side-trend.

- Similarly, the Asia Indonesia iBoxx Index has entered a sideward movement and is still found to exhibit weak bubble dynamics, as the indicator is non-zero. However, the value of the indicator is so weak that the signal is rejected by our minimum filtering criteria (min 10% bubble size, 60 days duration and 10% CI), and therefore it is not listed in the table above. Furthermore, as visible, the indicator peaked in August, reaching about 80%, at the approximate time when the regime change (entering the side-trend) occurred on the index. Thus, the current, small amplitude of the indicator might be qualified as a weak "aftershock" of the true signal.
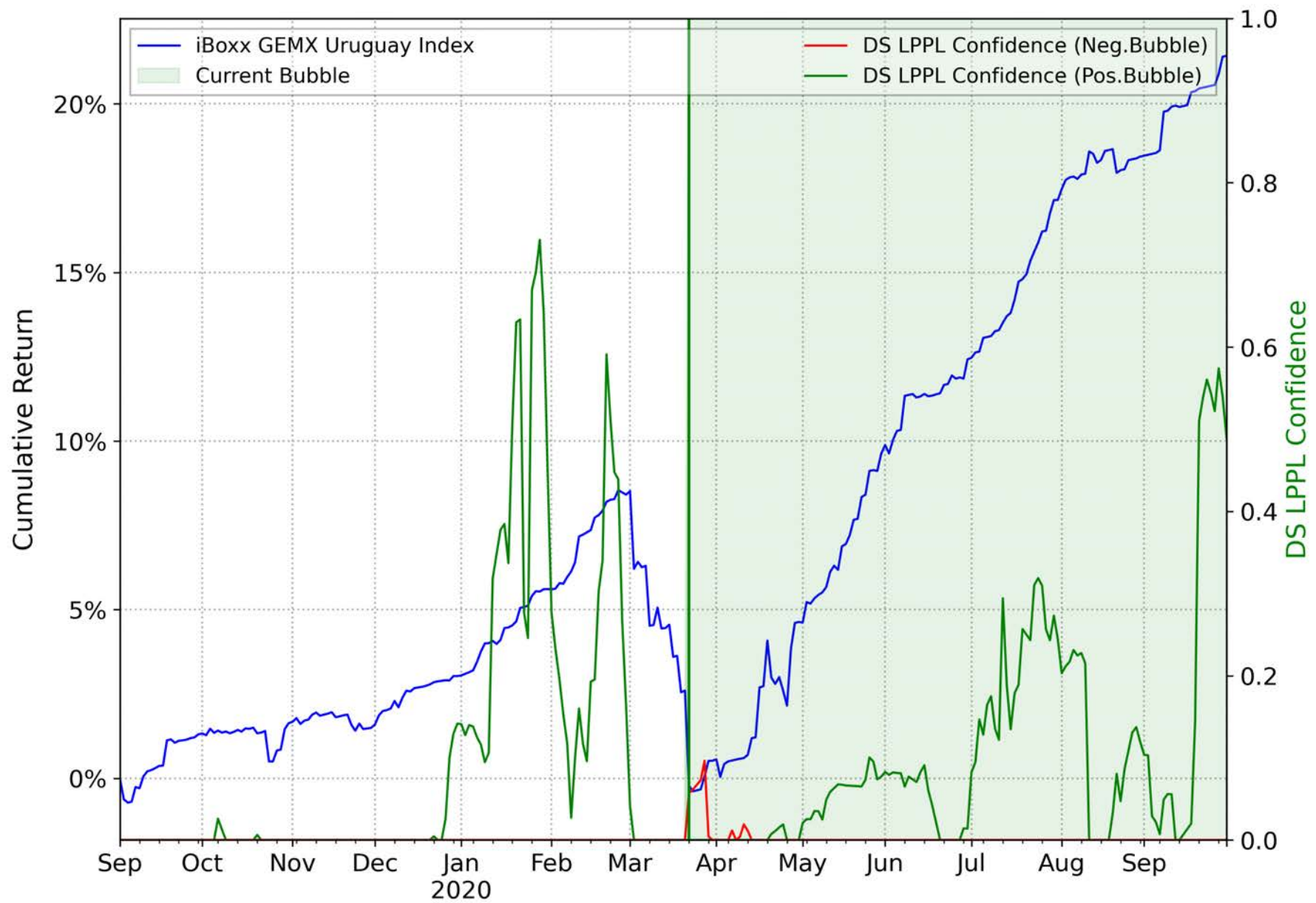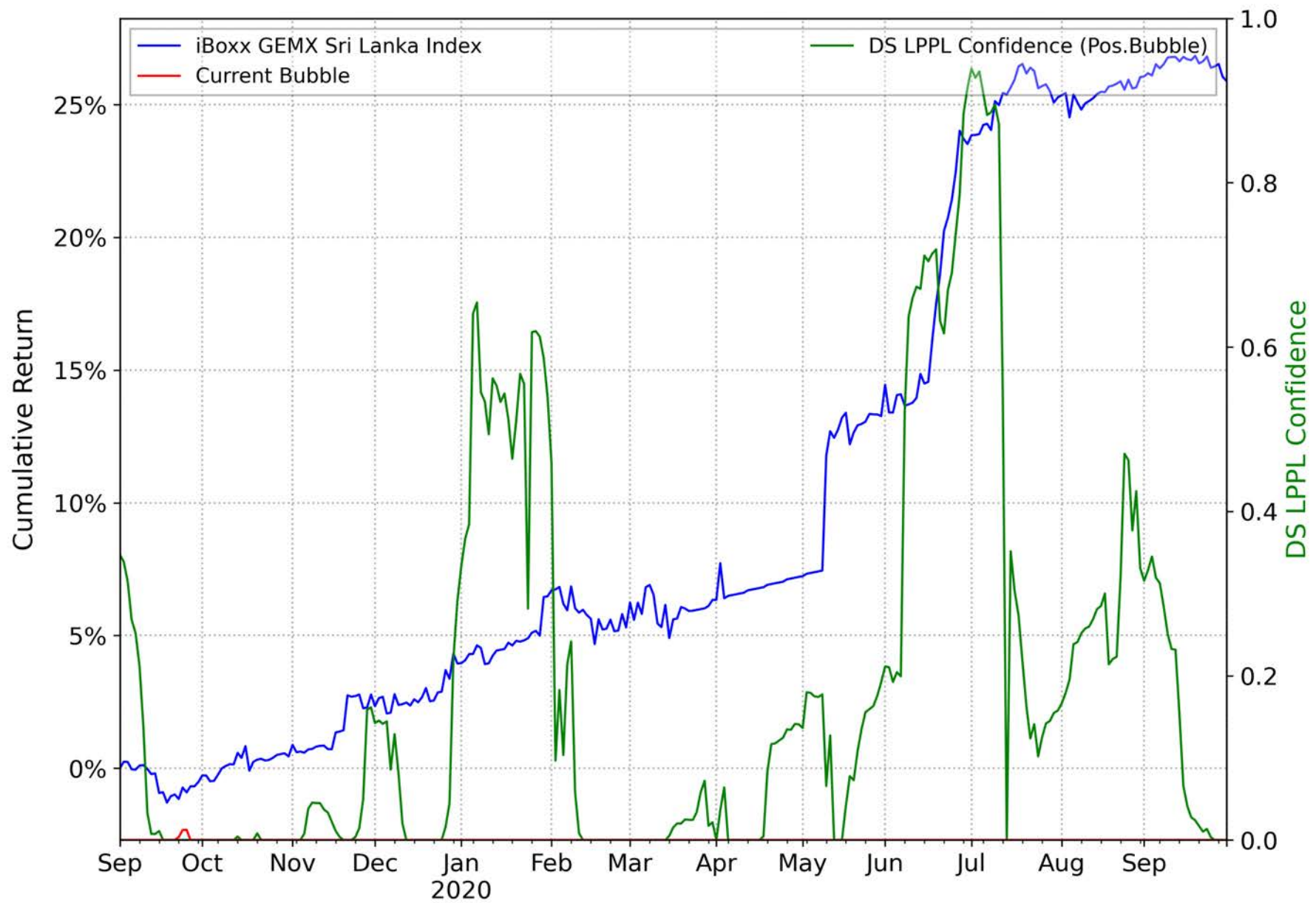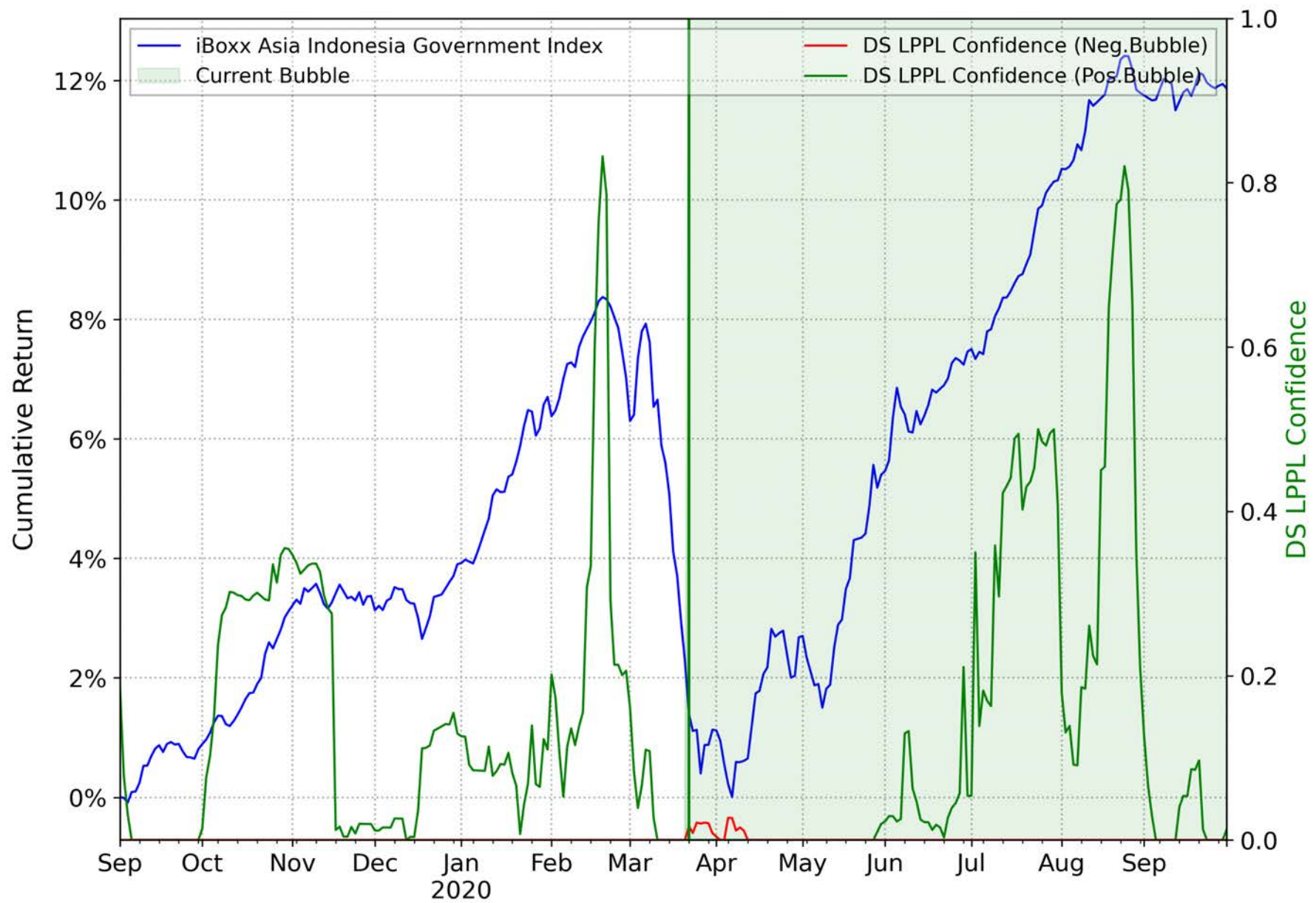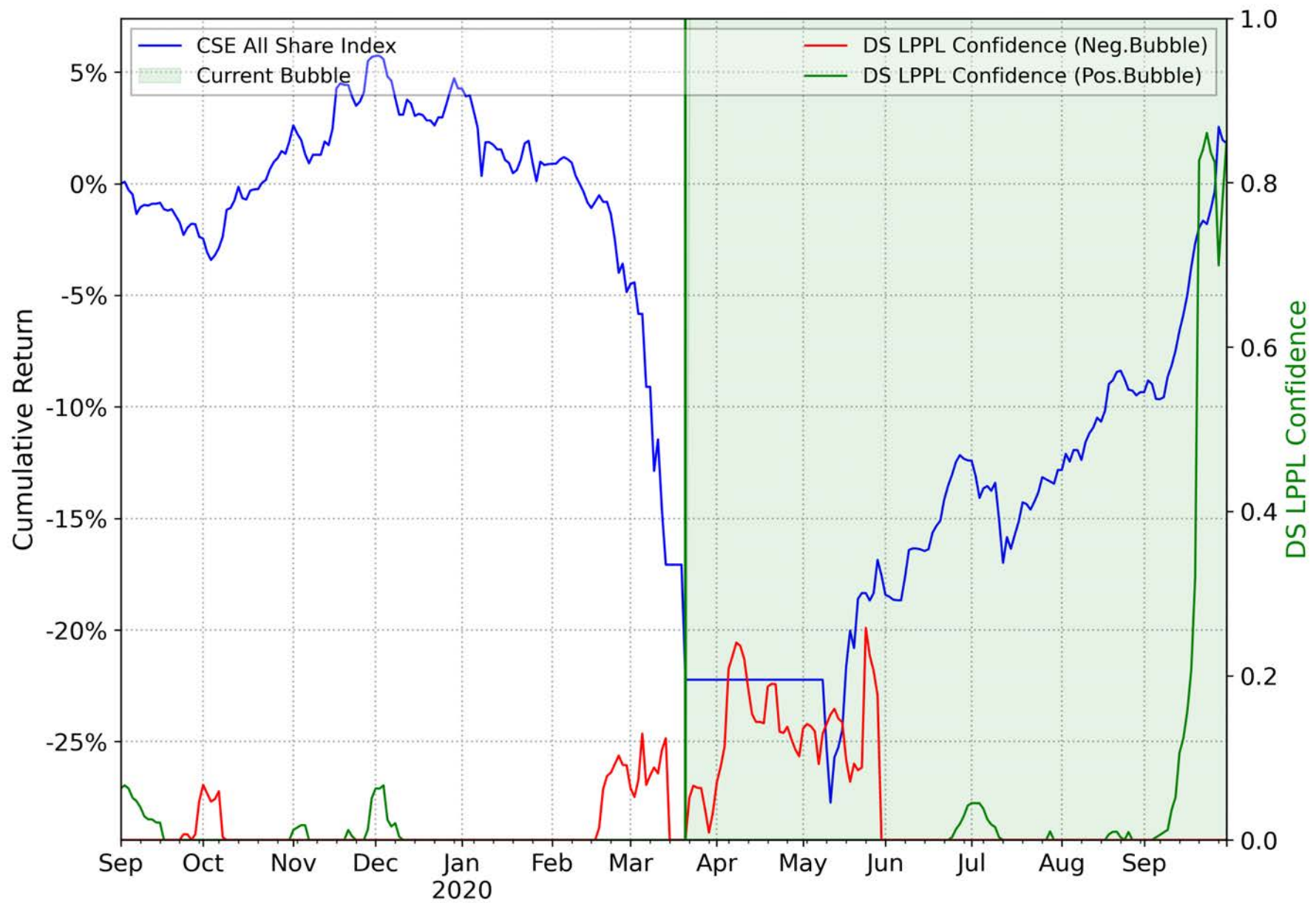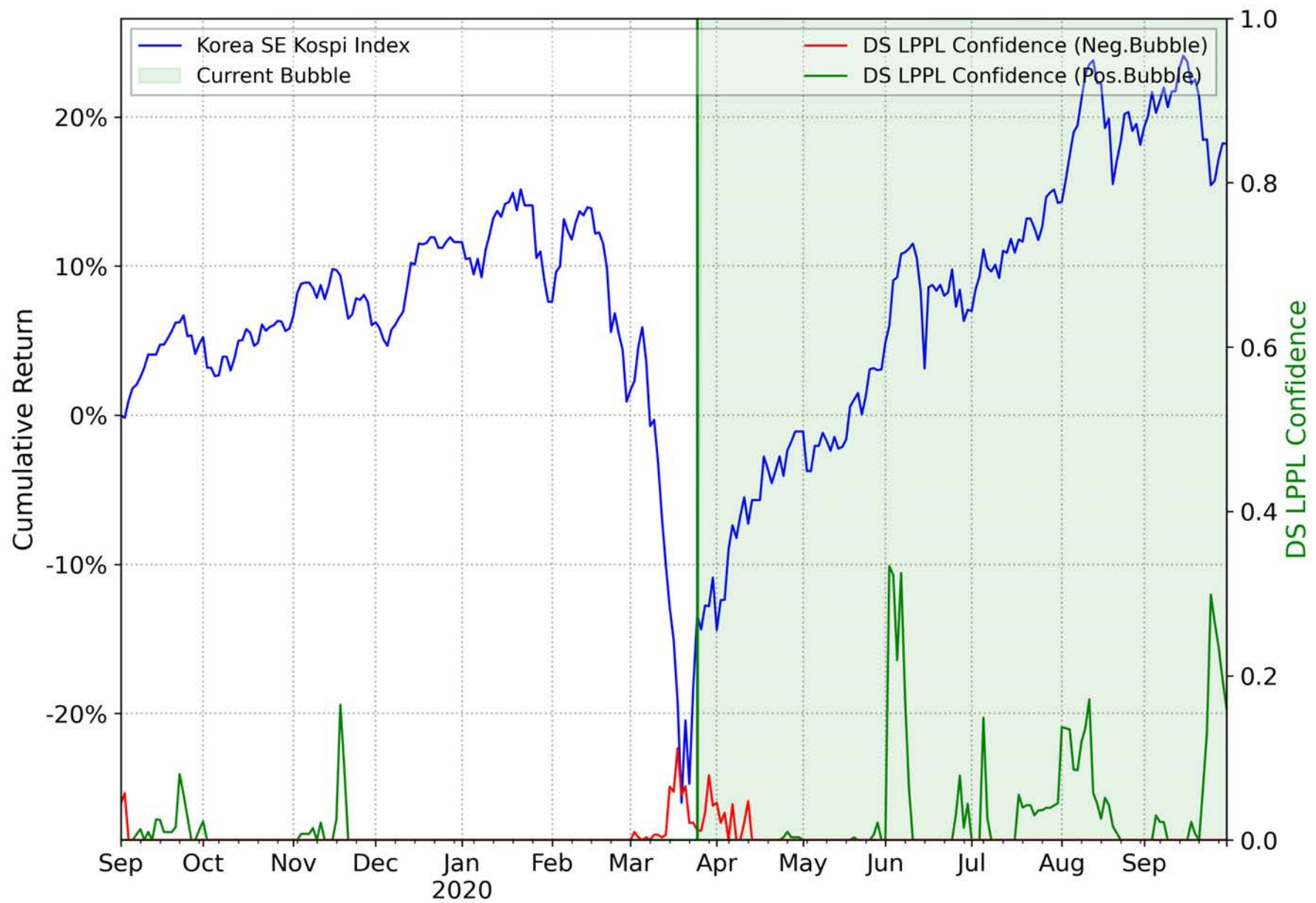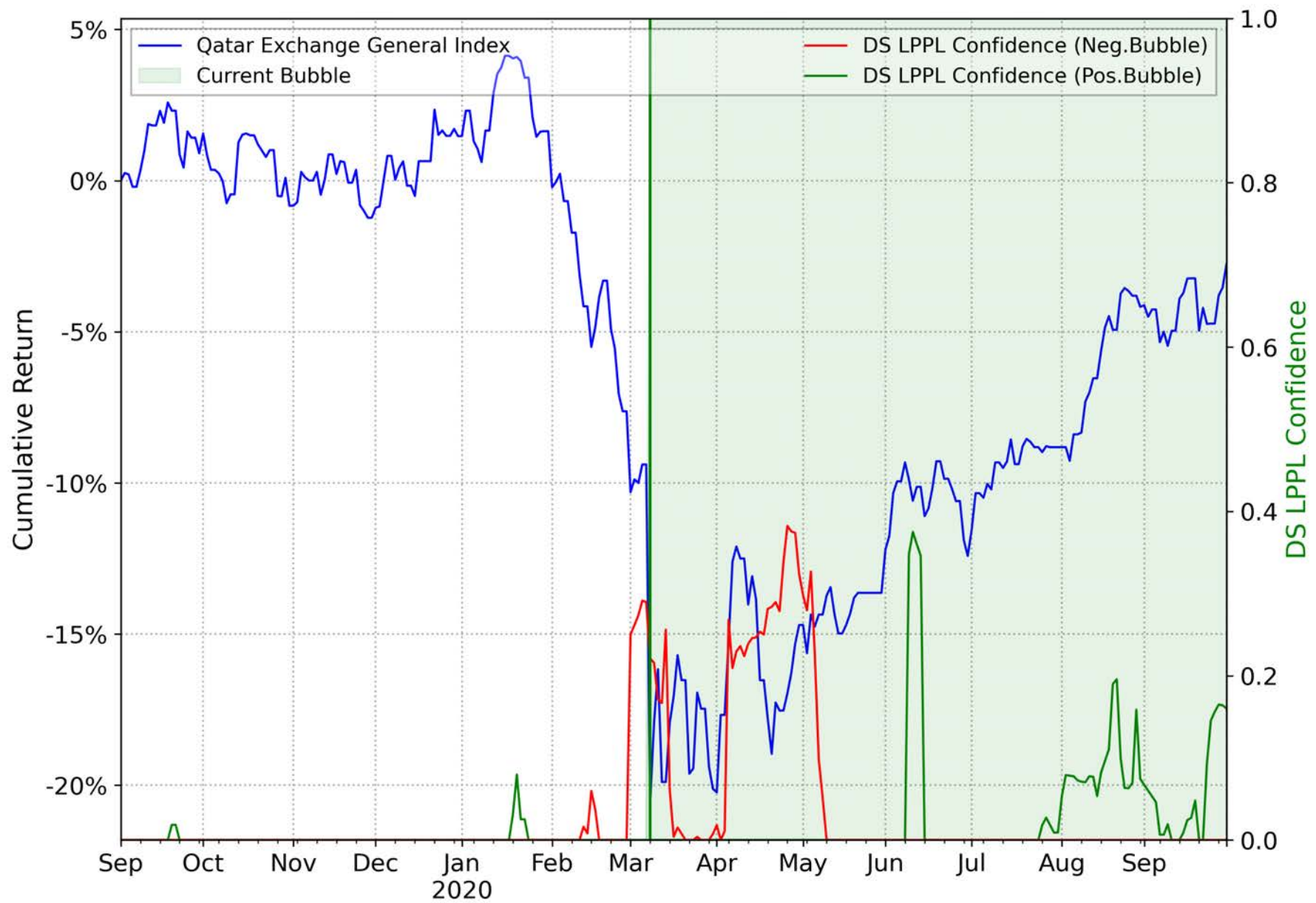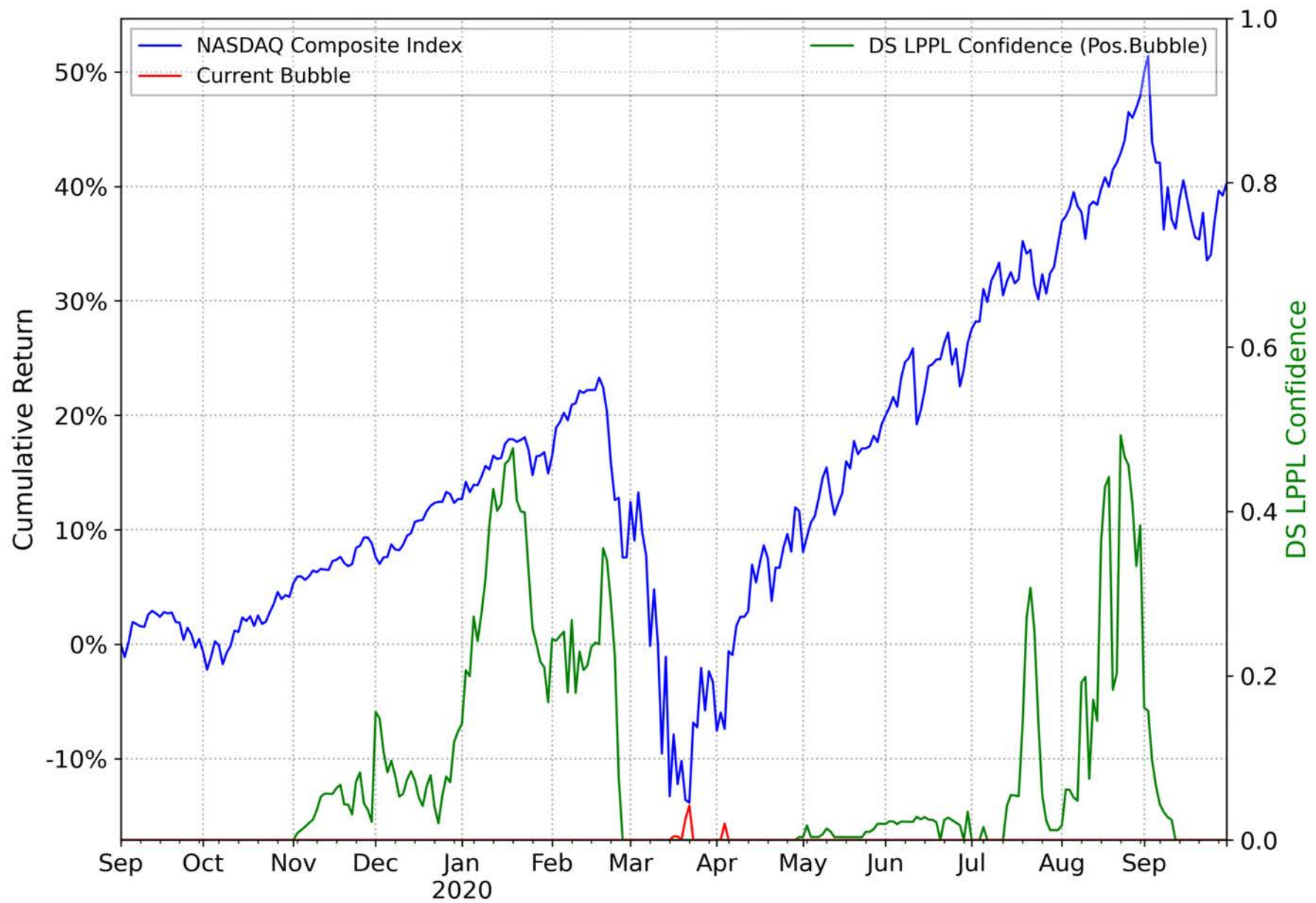
Equity – Stock Market Indices by Country

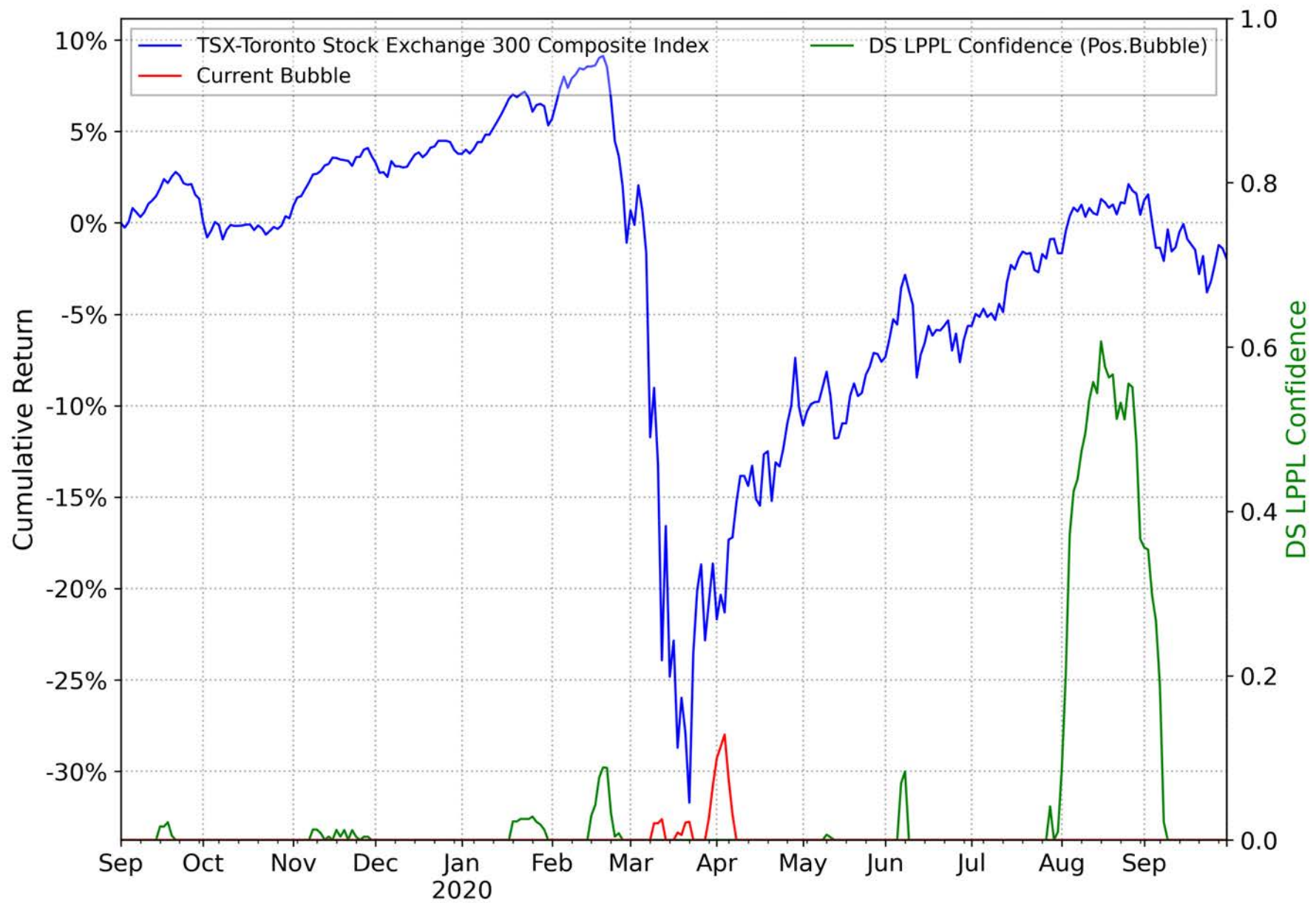|		Bubble Data				Cluster Analysis		
	Name	Bubble Size bs [%]	Duration [$days$]	DS LPPL Confidence ci [%]	Geometric Average $\sqrt{bs \cdot ci}$ [%]	Critical Time Prediction μ_{t_c}	σ_{t_c} [$days$]	Scenario Probability [%]
Positive Bubbles								
1	CSE All Share Index	31	194	85	51	2020-10-02	2	92
2	Korea SE Kospi Index	37	189	16	24	2020-12-04	8	38
3	Qatar Exchange General Index	22	207	16	19	2020-10-15	13	64
4	OMX Riga_GI	13	176	24	18	2020-10-05	4	33

▸ Positive bubble activity amongst the equity sector declines from 20% to 5% in October.

▸ At the top of our list, we find the CSE All Share (Sri Lanka) with 31% bubble size and 85% Confidence Indicator, which signals a quite strong bubble. Interestingly, our technical analysis also revealed bubble activity on the GEMX Sri Lanka Government Bond Index in the previous report.

▸ Overall, bubble sizes reach from 13% to 37%, durations are similar, between 176 and 207 days, and the confidence indicator ranges from 16% to 85%. Corresponding time series plots are shown on the following slides.

▸ Mostly, the decline in bubble activity month-to-month is attributable to recent corrections observed on indices that were listed in the previous report. These comprise for instance the NASDAQ Composite, the Canadian TSX Composite and the OMX Helsinki 25 Index, which are also shown on the slides following.

▸ As visible, the NASDAQ composite has undergone a correction of more than 10%, with the peak time accurately matching the peak in the DS LPPLS Confidence Indicator. As the decline is more than 10%, we might even speak of a "crash" already.
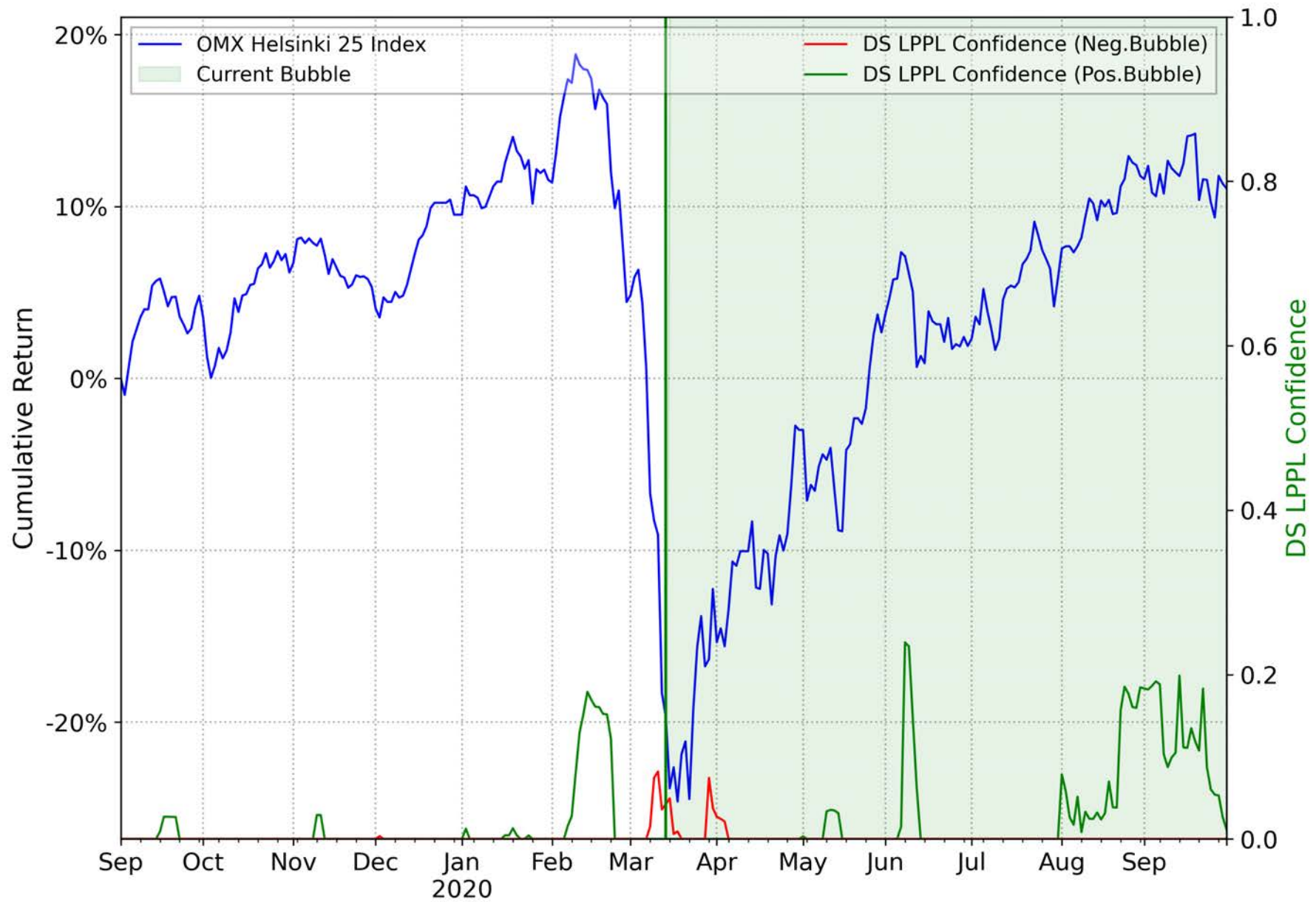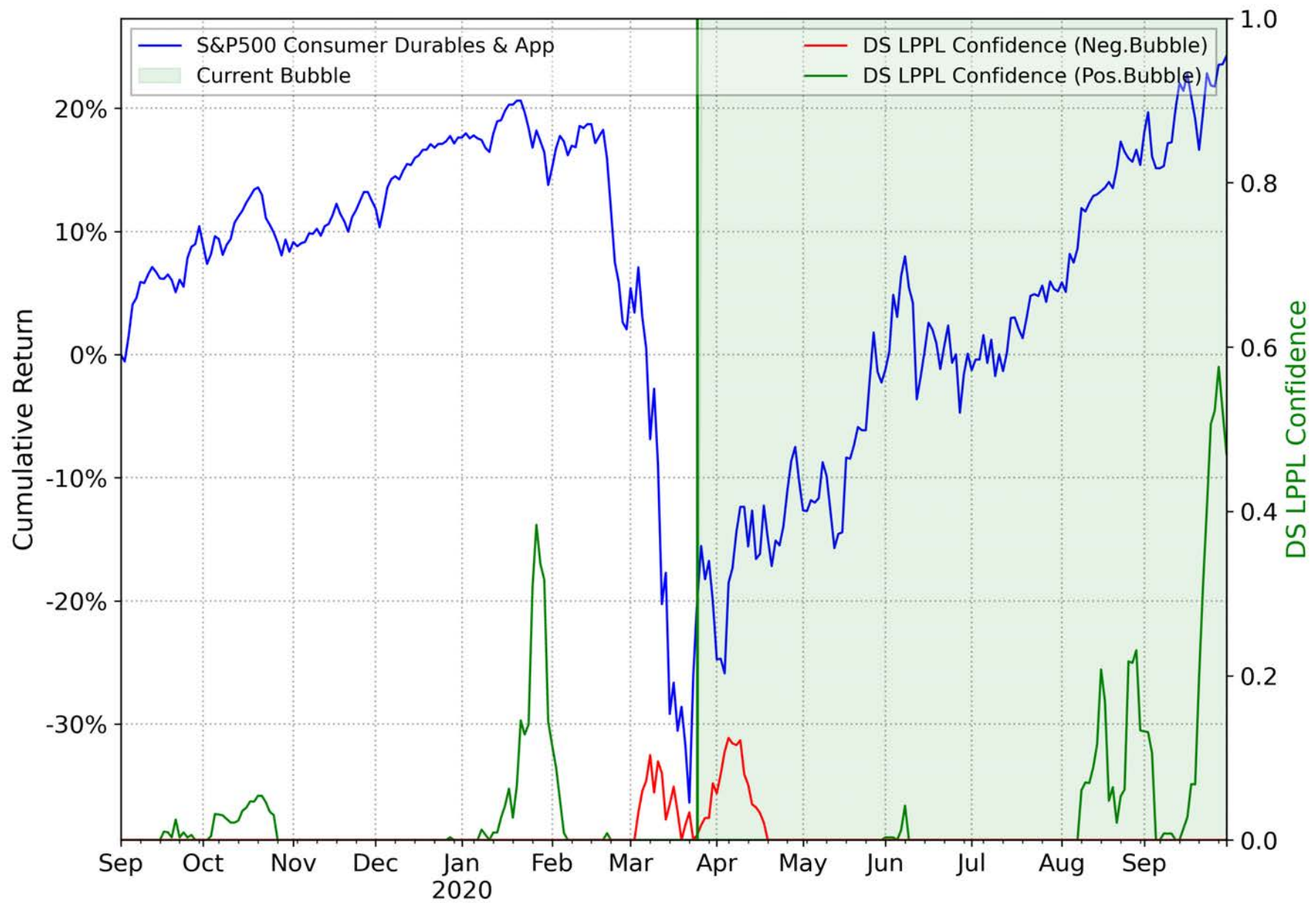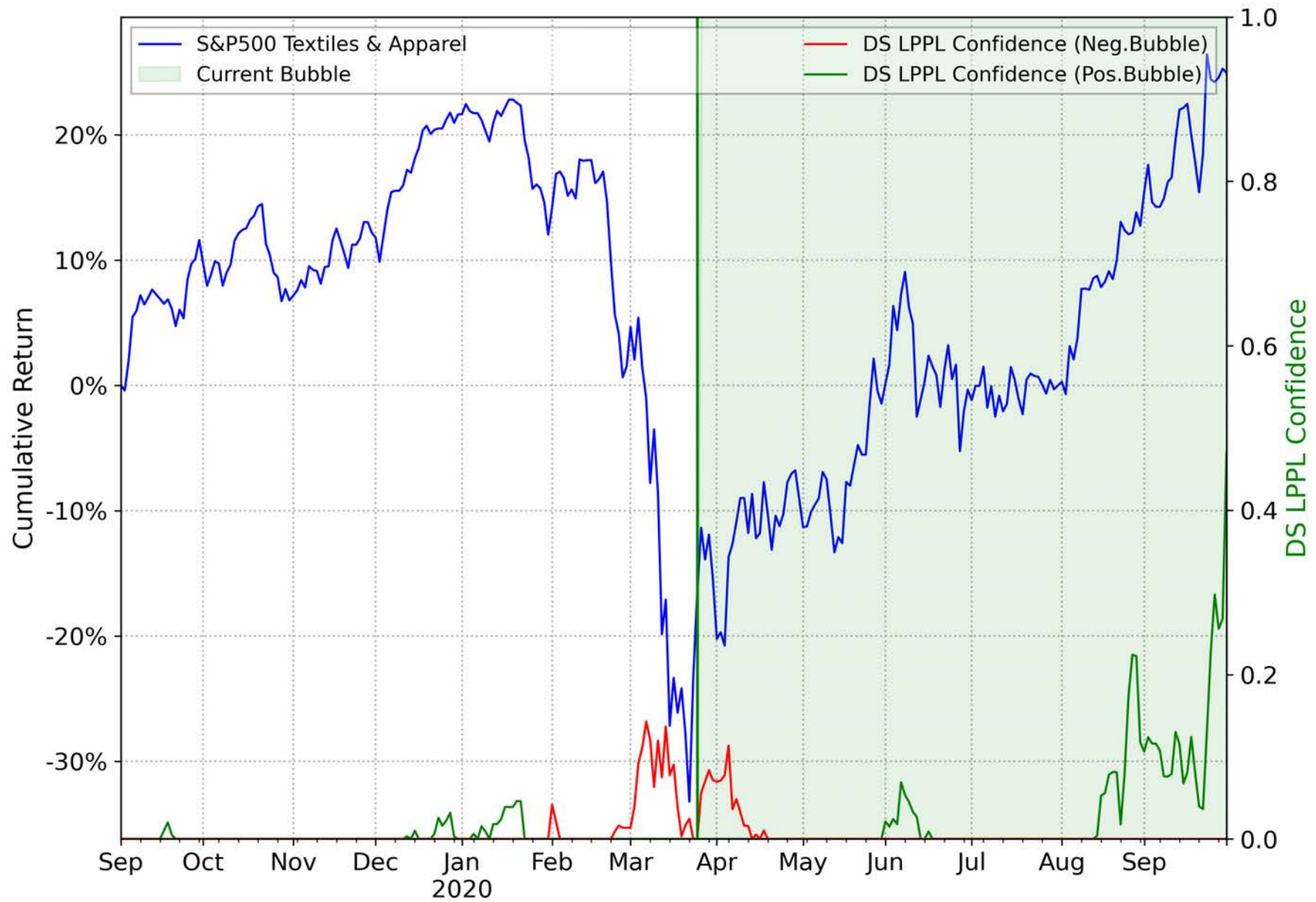
Equity – United States

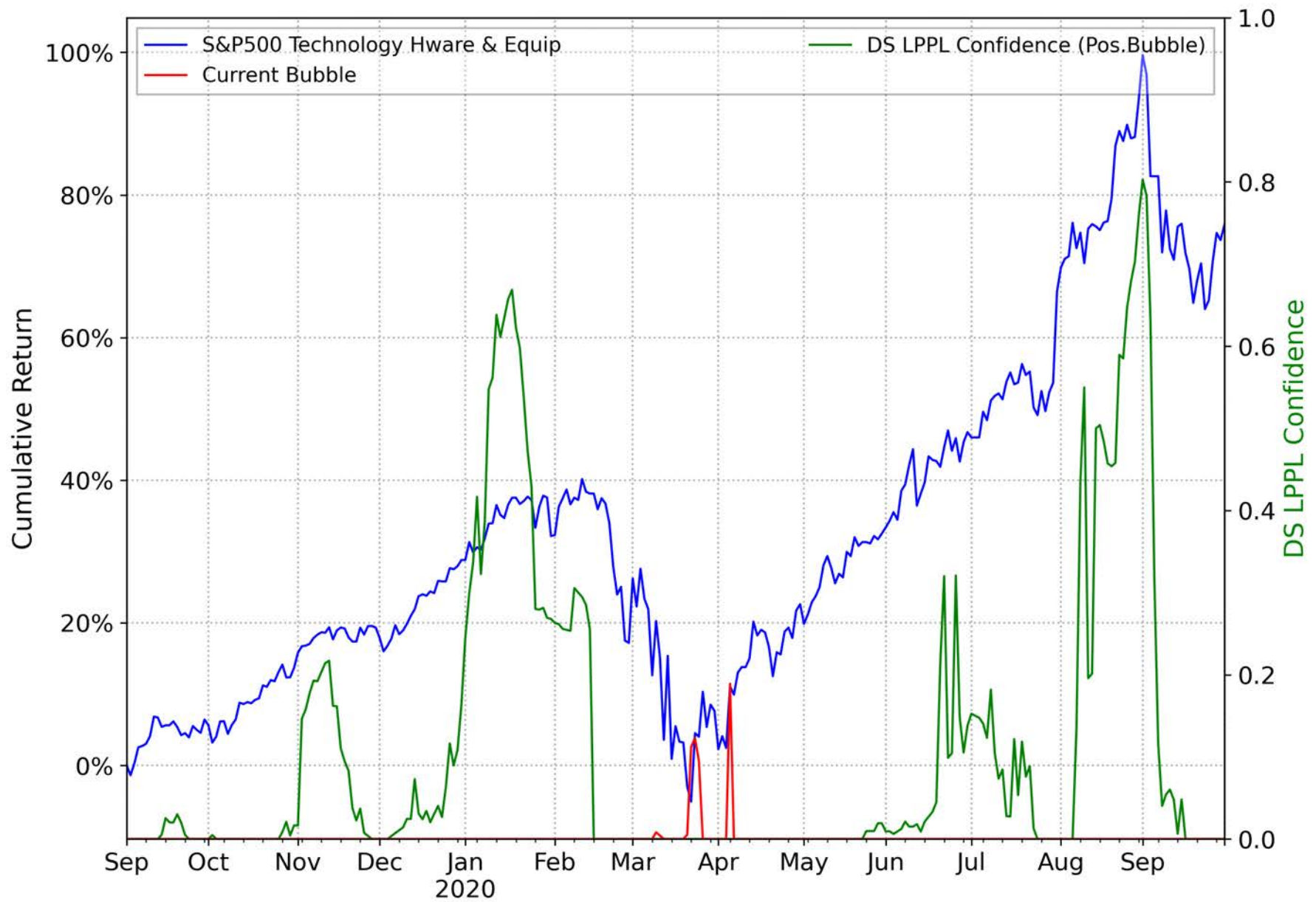| Bubble Data					Cluster Analysis			
Name	Bubble Size bs [%]	Duration [$days$]	DS LPPL Confidence ci [%]	Geometric Average $\sqrt{bs \cdot ci}$ [%]	Critical Time Prediction μ_{t_c}	σ_{t_c} [$days$]	Scenario Probability [%]
Positive Bubbles								
1	S&P500 Footwear	59	189	48	53	2020-10-06	5	96
2	S&P500 Consumer Durables & App	55	189	47	51	2020-10-04	7	62
3	S&P500 Textiles & Apparel	50	189	47	48	2020-10-01	1	41
4	S&P500 Transportation	62	200	16	32	2020-10-23	6	34
5	S&P500 Machinery	54	190	14	28	2020-10-09	11	76

- Focusing on the United States S&P500 equity sub-indices, we detect bubble signals for several branches. Overall, the fraction of positive bubbles in this asset subclass has decreased from 28% to 5%, as a consequence of the September corrections.

- In the table above, the estimated bubble characteristics for the top three sectors (which all are part of the "consumer / retail branch") are remarkably similar; bubble size ranges from 50-59%, the duration is at 189 days (thus, the same start date of the bubble is identified for all sectors), and the confidence indicator also matches quite accurately at 47%-48%. This is of course a consequence of the high correlation between these indices. Nevertheless, the simultaneous analysis of such correlated time series is often quite helpful to strengthen the robustness and statistical confidence of the identified signals.

- Besides the indicator plots for the top three listed indices, we also show the ones for the top indices from the previous report. Again, the peak of the indicator clearly matches the peak of the price in advance of the decline.
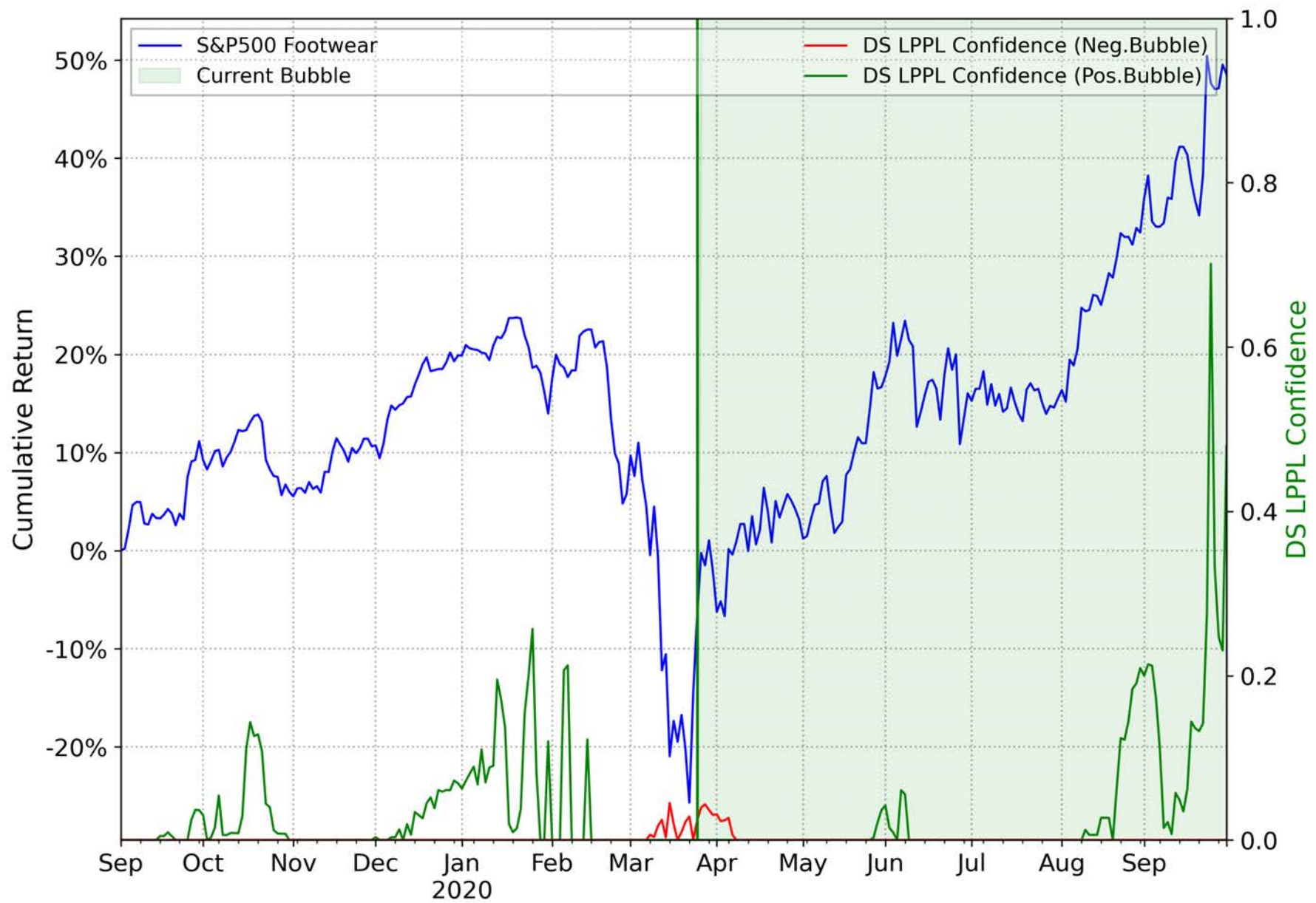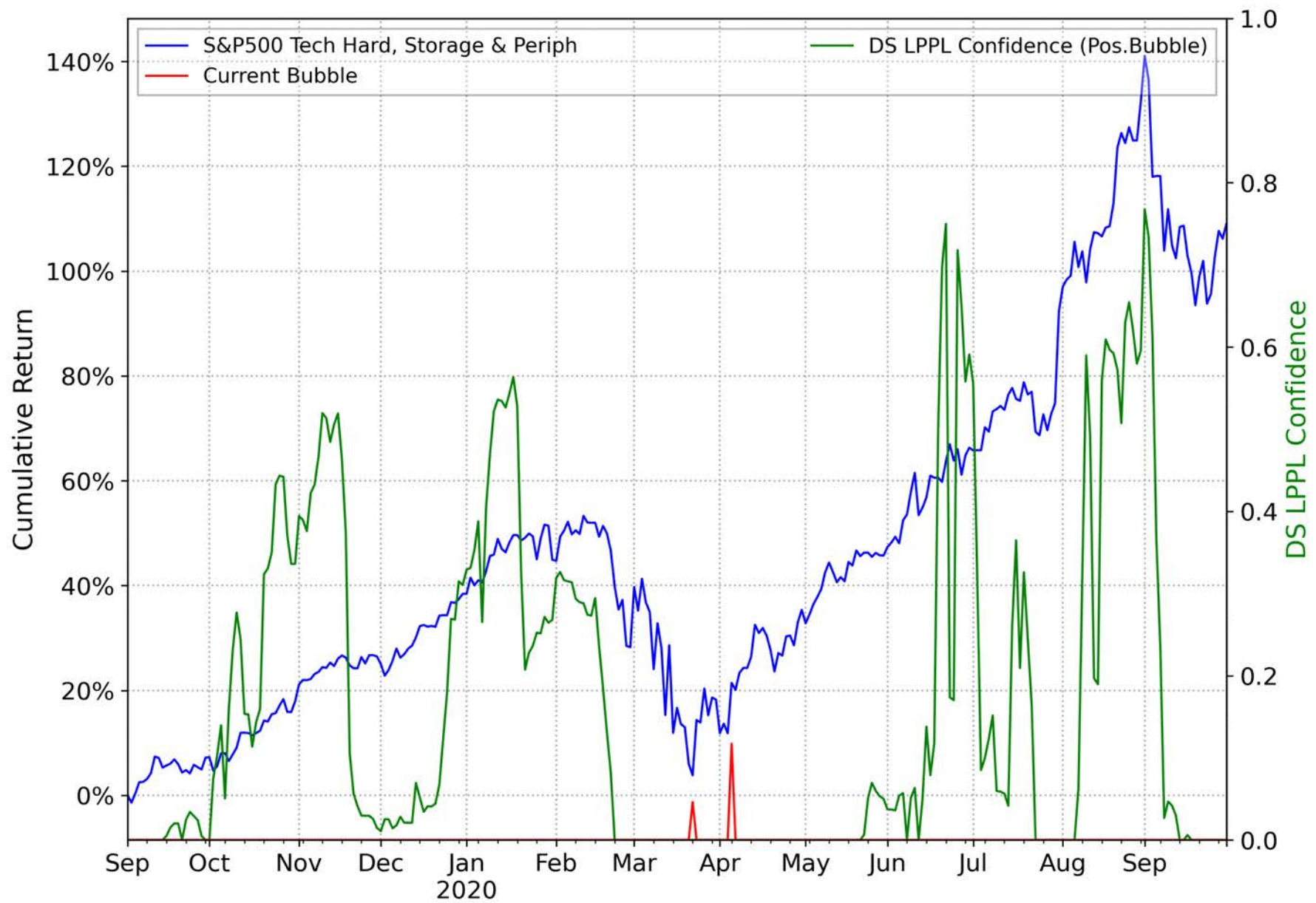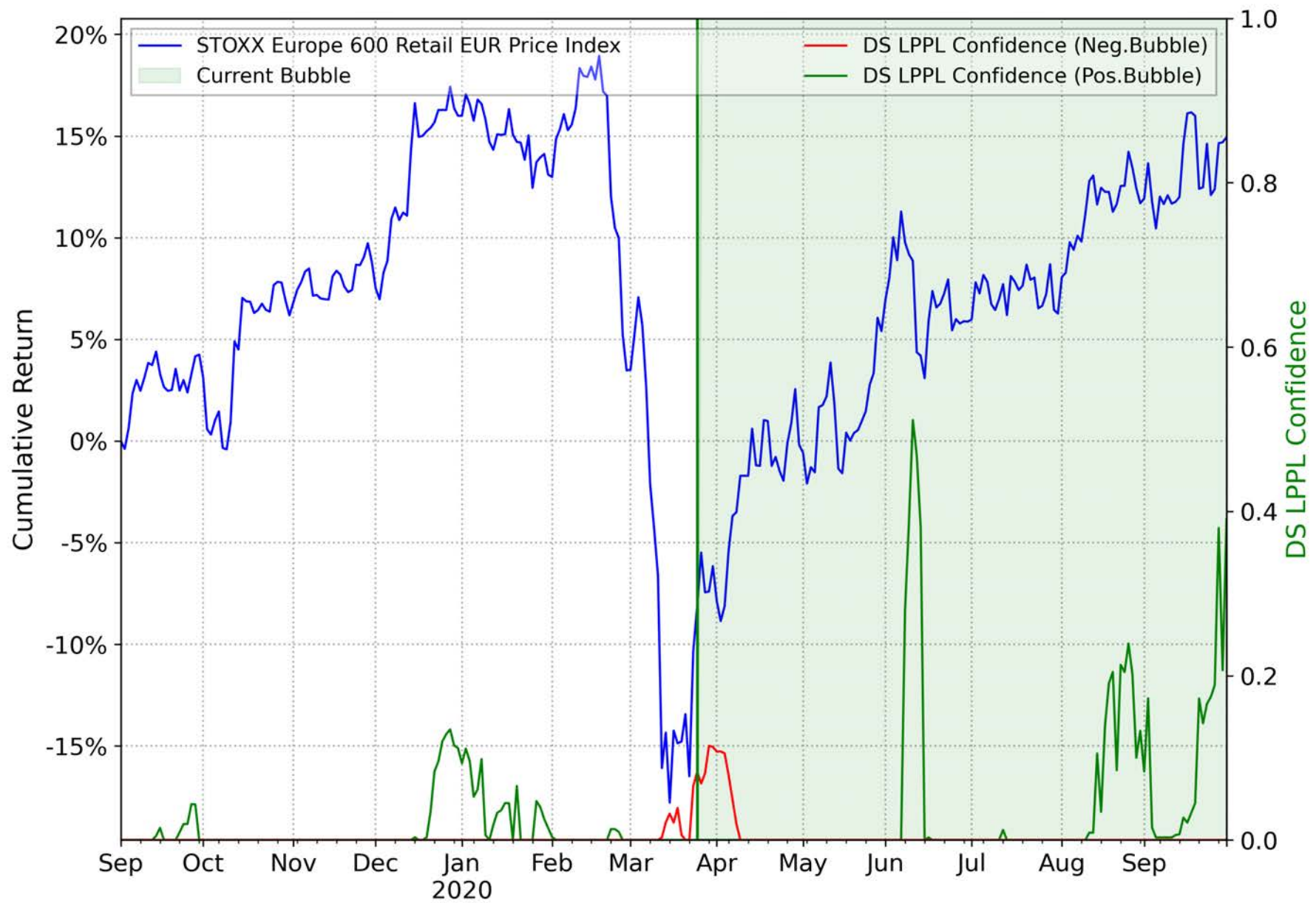
Equity – Europe

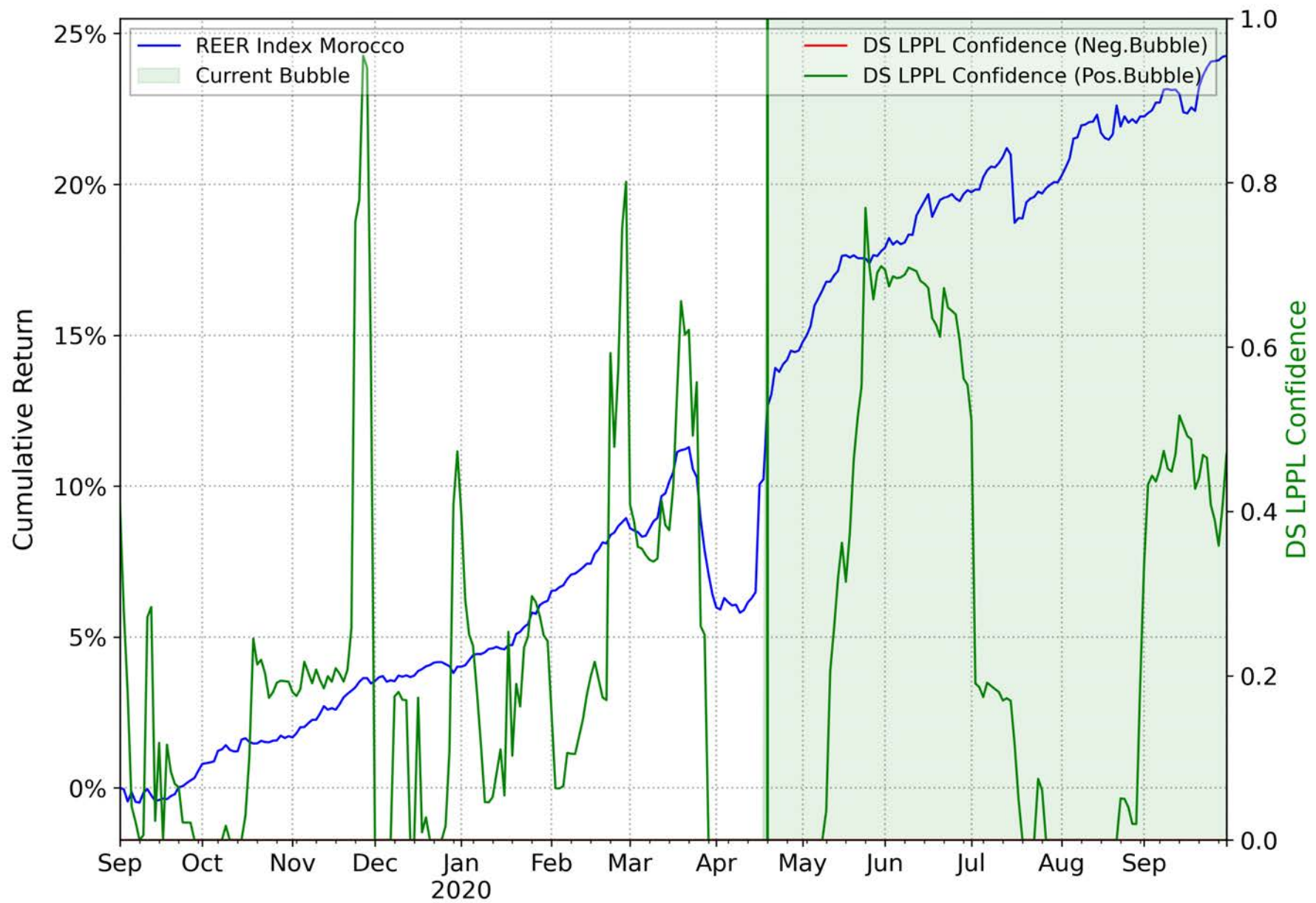| Bubble Data					Cluster Analysis		
Name	Bubble Size $bs\,[\%]$	Duration $[days]$	DS LPPL Confidence $ci\,[\%]$	Geometric Average $\sqrt{bs \cdot ci}\,[\%]$	Critical Time Prediction μ_{t_c}	σ_{t_c} $[days]$	Scenario Probability $[\%]$
Positive Bubbles							
1 STOXX Europe 600 Retail EUR Price Index	25	189	39	31	2020-10-04	3	55

▸ Bubble activity remains low this month in the Europe equity index class.

▸ A single signal is identified for the STOXX Europe 600 Retail Price Index.

▸ The signal is of intermediate strength with an estimated bubble size of 25% and a confidence indicator level of 39%.

▸ The identified bubble duration of 189 days is the same as for the United states indices, as is the retail ranch.

▸ There are no predictions from the last report to evaluate, as previously the fraction of bubbles was zero for both positive and negative bubbles.

▸ On the following slide, the corresponding indicator plot is shown.

Currency REER Indices

Bubble Data					Cluster Analysis		
Name	Bubble Size bs [%]	Duration [$days$]	DS LPPL Confidence ci [%]	Geometric Average $\sqrt{bs \cdot ci}$ [%]	Critical Time Prediction μ_{t_c}	σ_{t_c} [$days$]	Scenario Probability [%]
Positive Bubbles							
1 REER Index Morocco	10	165	47	22	2020-10-01	1	28

▶ The analysis of Real Effective Exchange Rate (REER) Indices for the valuation of currencies returns a signal on the REER Index Morocco, this month.

▶ The signal, though of intermediate strength, is quite erratic, as seen on the next slide.

▶ We also show the REER Index for Norway from the previous month, which is not deemed in a positive bubble anymore, as its value has fallen by approximately 5% during the past month, corresponding to a decline in the Norwegian Crown (NOK).
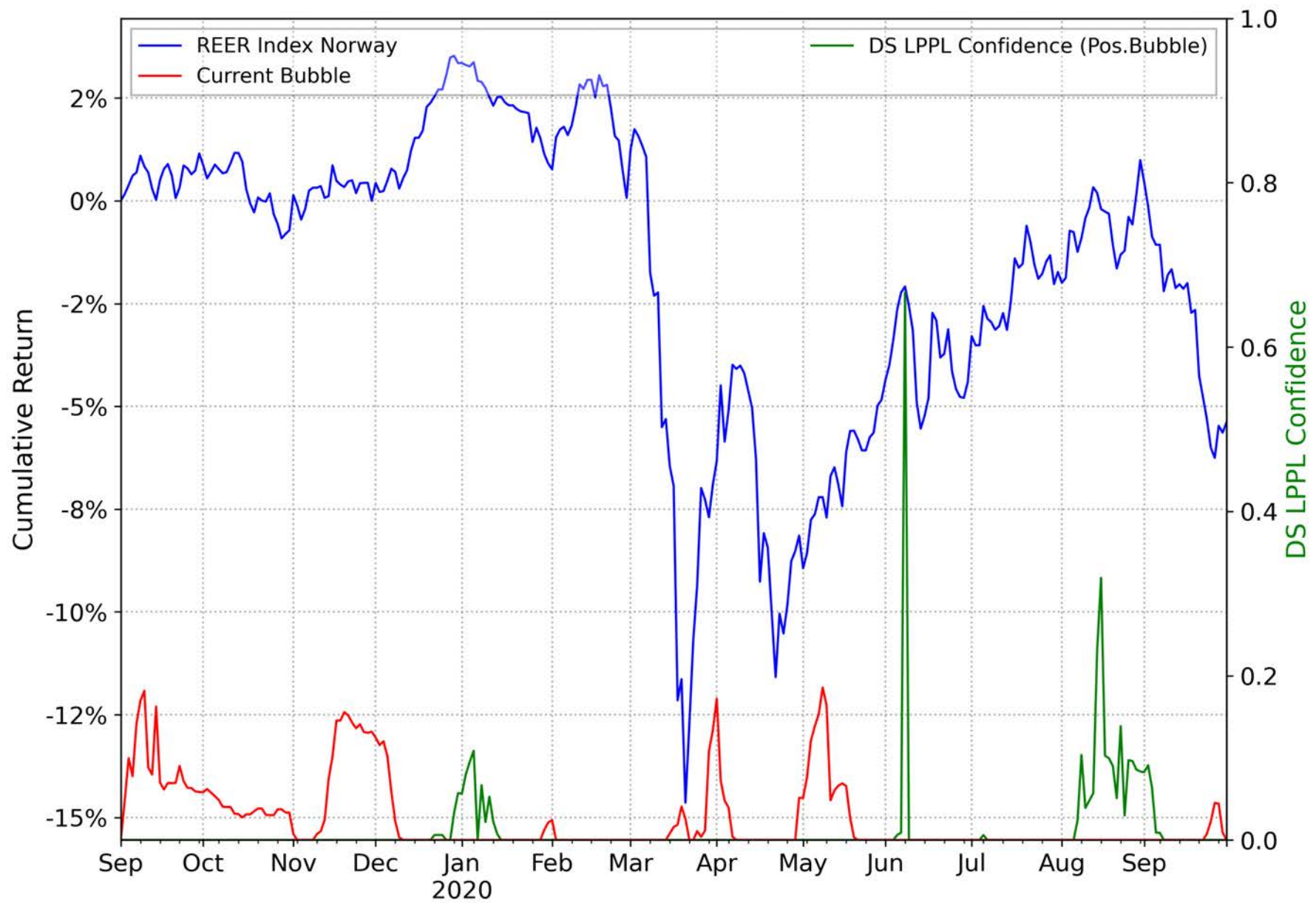
Digital Assets / Cryptocurrencies

	Bubble Data				Cluster Analysis		
Name	Bubble Size bs [%]	Duration [$days$]	DS LPPL Confidence ci [%]	Geometric Average $\sqrt{bs \cdot ci}$ [%]	Critical Time Prediction μ_{t_c}	σ_{t_c} [$days$]	Scenario Probability [%]
Positive Bubbles							
CVT/USD	378	157	21	89	2020-09-30		48

▸ In the digital assets / cryptocurrencies sector, the list of bubble signals has shrunk, as well, from prior five to now only a single signal.

▸ The CyberVeinToken (CVT) is found to be in a bubble of large size 378% versus the US Dollar. The duration of the bubble is about half a year, the strength of the signal is about 21%, thus at the lower end.

▸ CyberVeinToken currently has a (strongly fluctuating) market capitalization of around 100M US Dollar (as of October 1st).

▸ We also show the indicator plots for several previously listed coins, such as REN and ADA, as well as for the "top sellers" Ethereum and Bitcoin. All of them are currently not in a bubble (anymore). However, for REN, ADA and ETH, we see that previous peaks advancing strong crashes have again been identified by strong peak of the DS LPPLS Confidence Indicator.
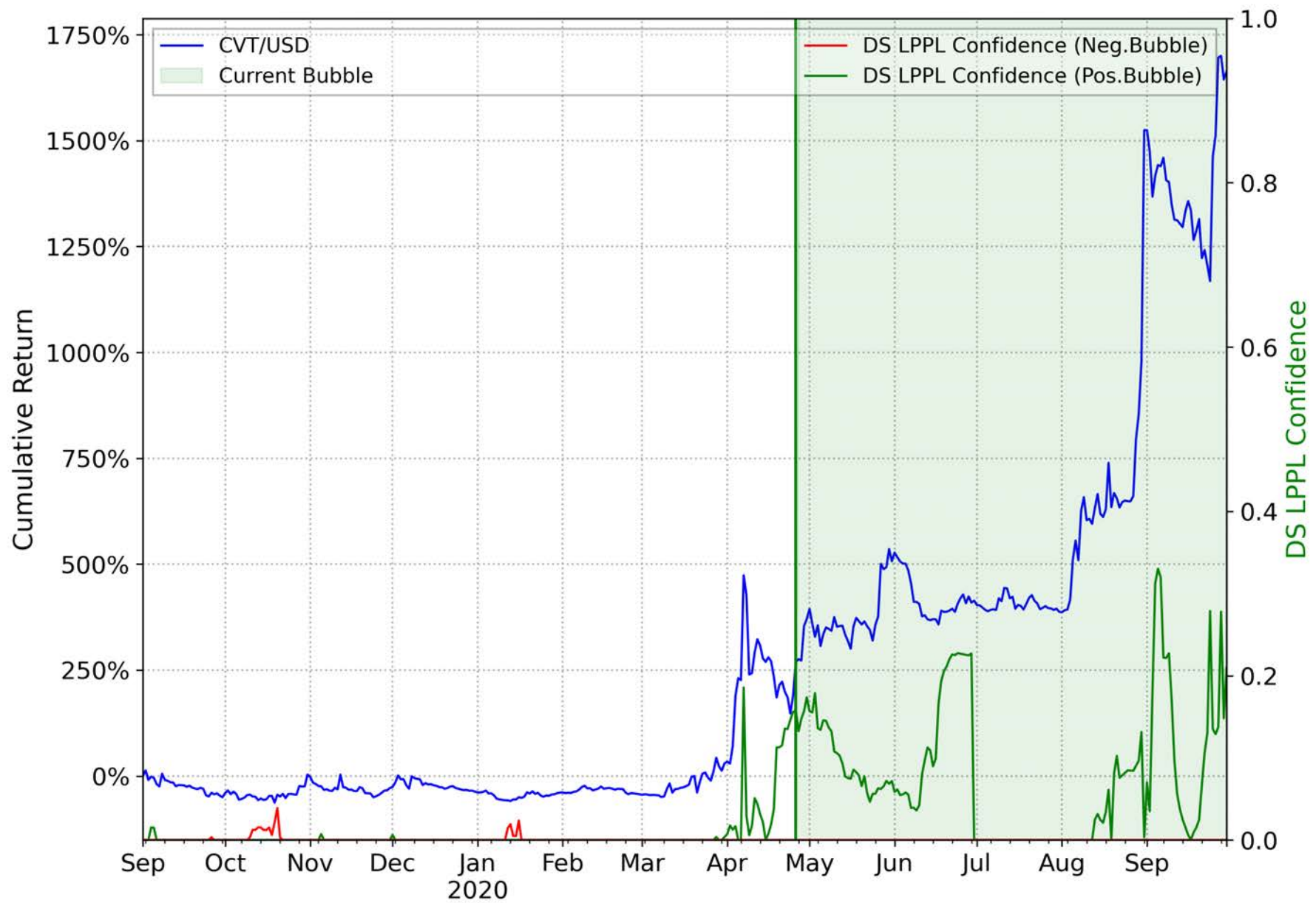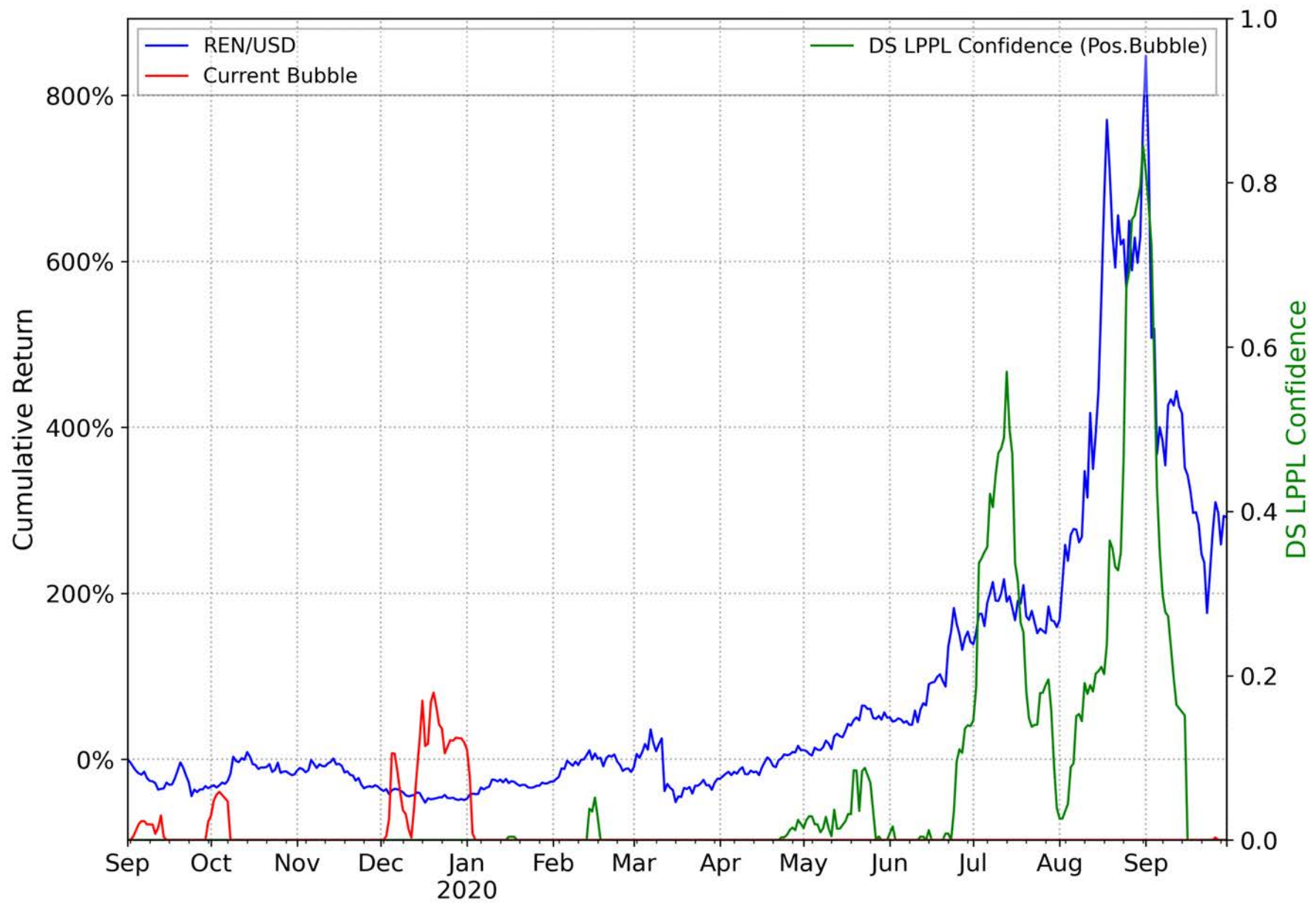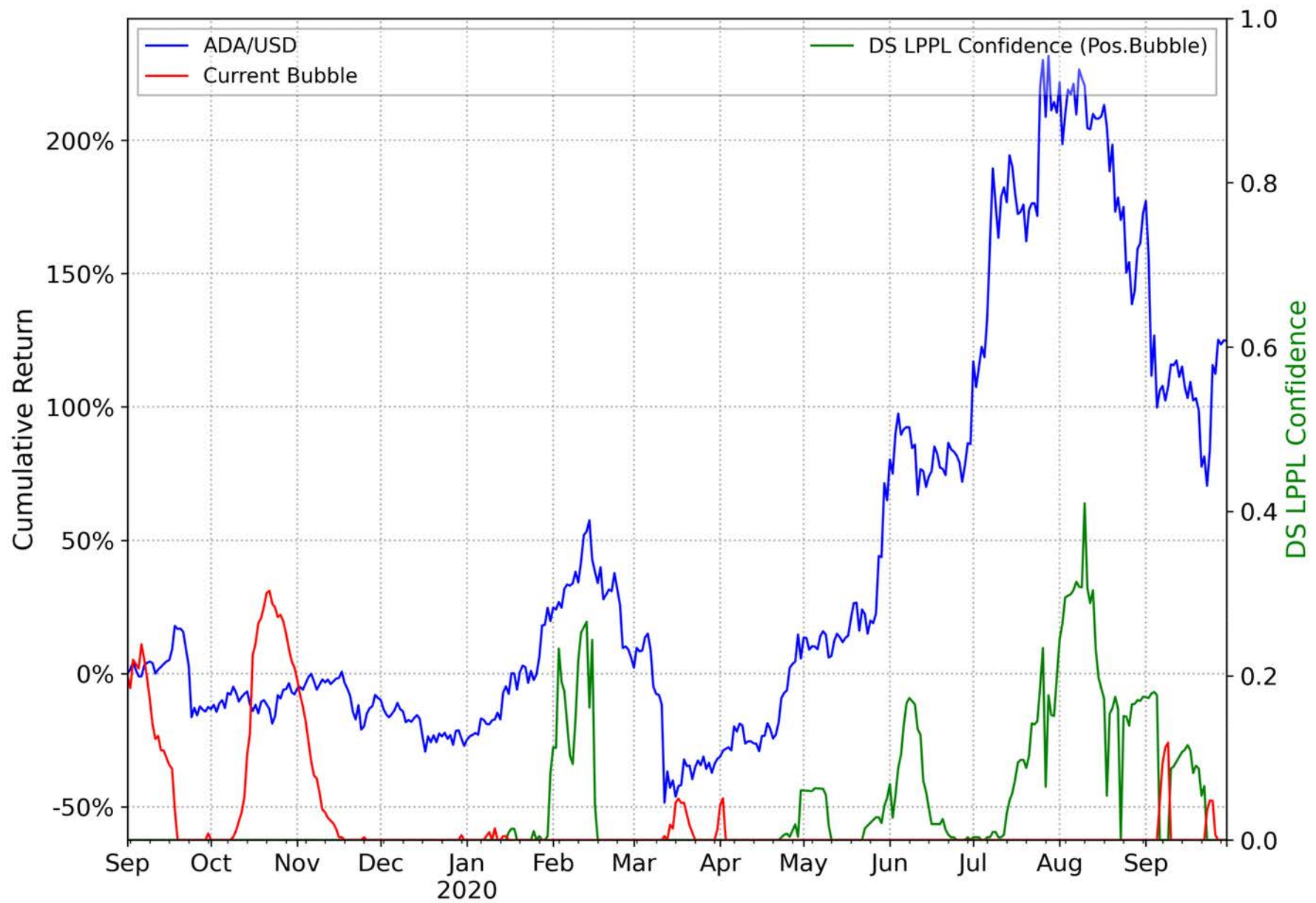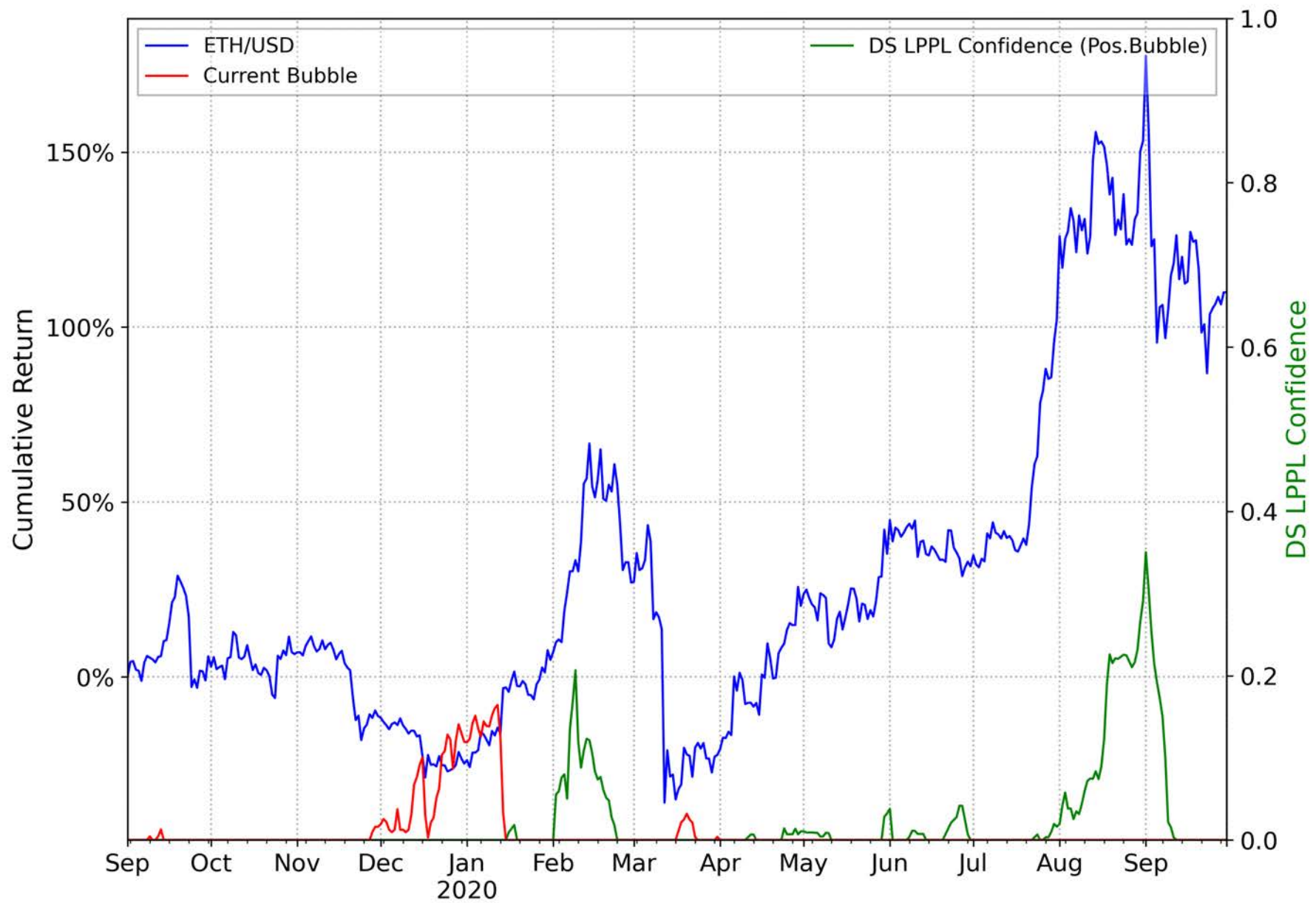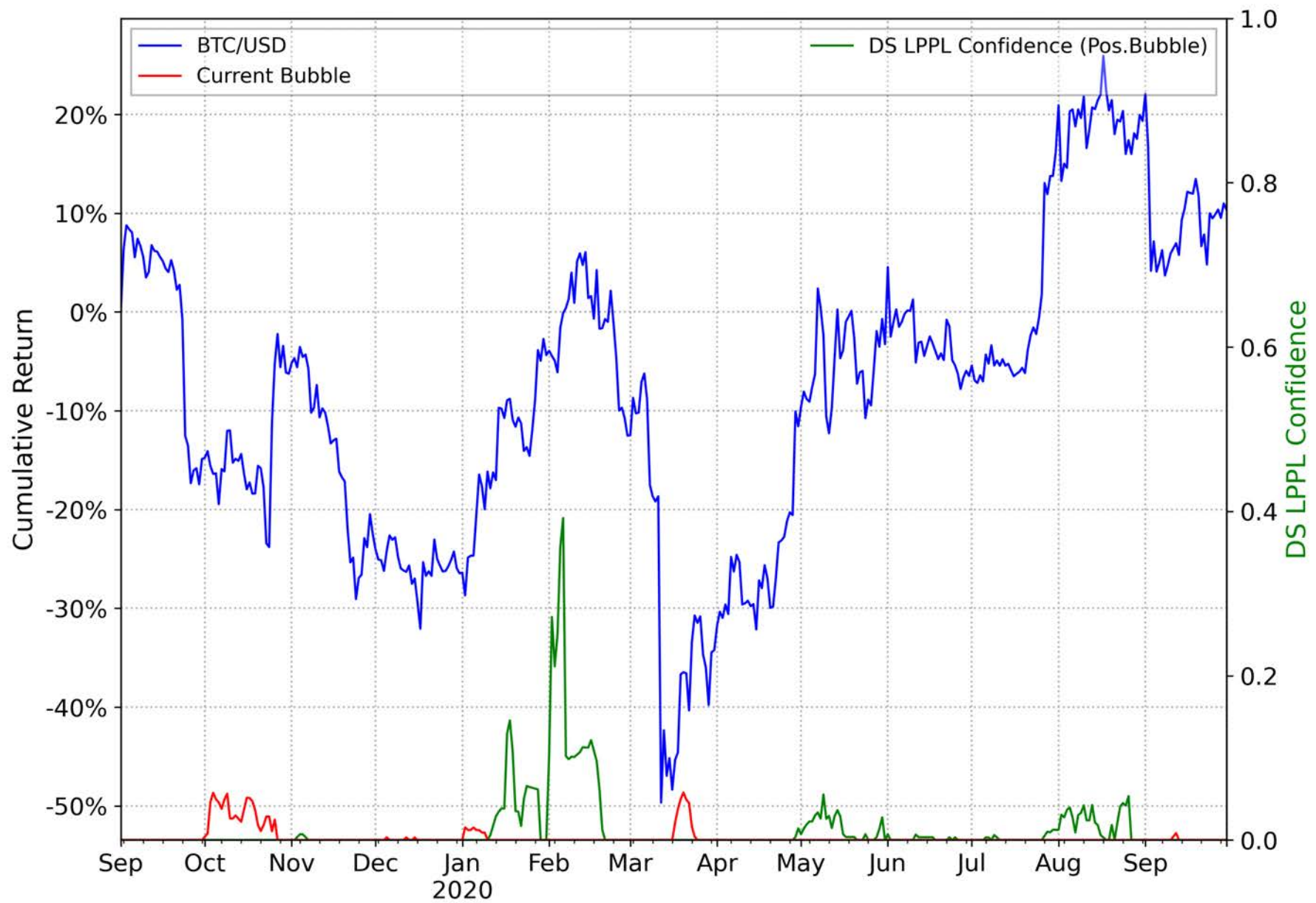
Sectors

| GICS Industry Group Name	Yearly Return		Bubble Size		Bubble Score		Value Score		Growth Score	
	Oct 1st	Sep 1st	Oct 1st	Sep 1st	Oct 1st	Sep 1st	Oct 1st	Sep 1st	Oct 1st	Sep 1st
Pharmaceuticals, Biotechnology & Life Sciences	14.6%	20.7%	0.0%	0.0%	0.0%	0.0%	67.5%	69.1%	49.6%	49.6%
Consumer Services	-8.4%	-8.3%	0.0%	0.0%	0.0%	0.0%	33.2%	31.2%	46.1%	46.2%
Retailing	37.5%	48.7%	0.0%	48.7%	0.0%	56.8%	19.6%	19.3%	50.0%	50.8%
Transportation	9.9%	8.6%	0.0%	0.0%	0.0%	0.0%	54.4%	53.4%	47.9%	48.3%
Consumer Durables & Apparel	10.9%	13.6%	0.0%	0.0%	0.0%	0.0%	32.5%	28.9%	62.2%	63.7%
Semiconductors & Semiconductor Equipment	37.7%	46.5%	0.0%	49.6%	0.0%	22.7%	60.1%	60.9%	39.1%	39.5%
Technology Hardware & Equipment	49.5%	73.4%	0.0%	87.3%	0.0%	65.3%	61.4%	63.5%	43.9%	44.6%
Automobiles & Components	22.6%	27.7%	0.0%	80.8%	0.0%	95.3%	73.1%	71.3%	55.8%	55.1%
Telecommunication Services	-9.3%	-4.5%	0.0%	0.0%	0.0%	0.0%	61.6%	61.7%	45.5%	45.6%
Energy	-45.5%	-39.1%	0.0%	0.0%	0.0%	0.0%	53.6%	54.4%	63.1%	62.9%
Software & Services	36.1%	46.8%	0.0%	47.1%	0.0%	24.9%	34.2%	33.5%	50.8%	51.0%
Materials	9.5%	11.8%	0.0%	0.0%	0.0%	0.0%	51.9%	50.6%	51.0%	50.6%
Health Care Equipment & Services	17.2%	22.0%	0.0%	0.0%	0.0%	0.0%	53.1%	54.1%	55.3%	55.2%
Capital Goods	-1.8%	-0.1%	0.0%	0.0%	0.0%	0.0%	47.3%	47.8%	48.3%	48.6%
Media & Entertainment	19.4%	31.7%	0.0%	0.0%	0.0%	0.0%	30.0%	28.5%	37.7%	39.1%
Commercial & Professional Services	11.3%	13.6%	0.0%	0.0%	0.0%	0.0%	27.9%	26.3%	54.9%	54.1%
Food & Staples Retailing	5.9%	11.5%	0.0%	21.0%	0.0%	48.2%	43.6%	42.7%	57.0%	58.3%
Household & Personal Products	12.2%	12.0%	0.0%	25.1%	0.0%	41.3%	31.8%	30.9%	43.9%	43.5%
Food, Beverage & Tobacco	-2.8%	-0.1%	0.0%	0.0%	0.0%	0.0%	47.7%	46.7%	54.7%	54.7%
Utilities	-1.9%	-0.8%	0.0%	0.0%	0.0%	0.0%	47.7%	48.0%	45.7%	45.6%
Insurance	-15.1%	-10.3%	0.0%	0.0%	0.0%	0.0%	-	-	-	-
Real Estate	-12.9%	-9.7%	0.0%	0.0%	0.0%	0.0%	-	-	-	-
Diversified Financials	3.0%	5.5%	0.0%	0.0%	0.0%	0.0%	-	-	-	-
Banks	-28.5%	-22.8%	0.0%	0.0%	0.0%	0.0%	-	-	-	-

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.

▸ The market experienced a significant correction after almost half-a-year of appreciation since the bottom at mid-March, bringing the number of industry groups with significant bubbles from seven last month to zero this month. The performances of the 7 industry groups identified last month are displayed below and in the next slide.
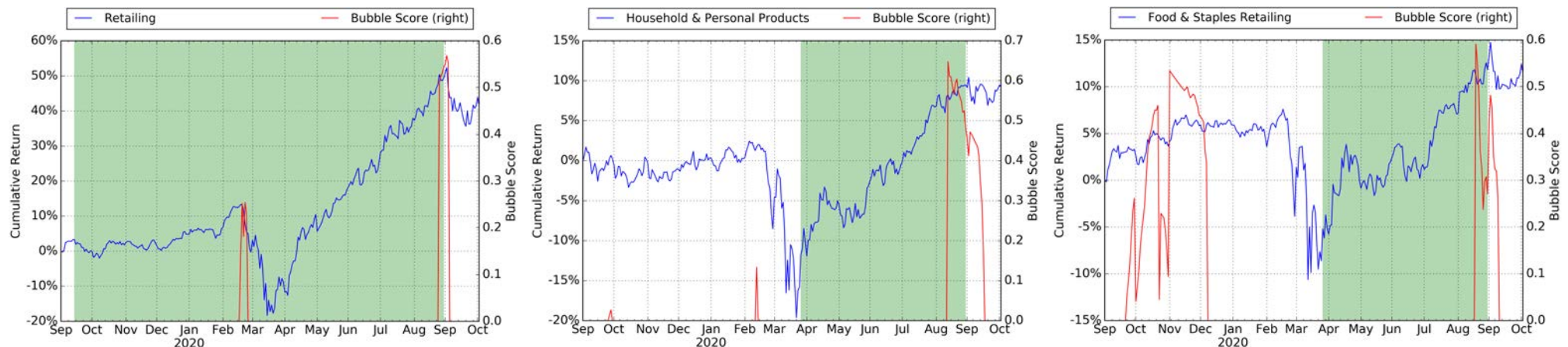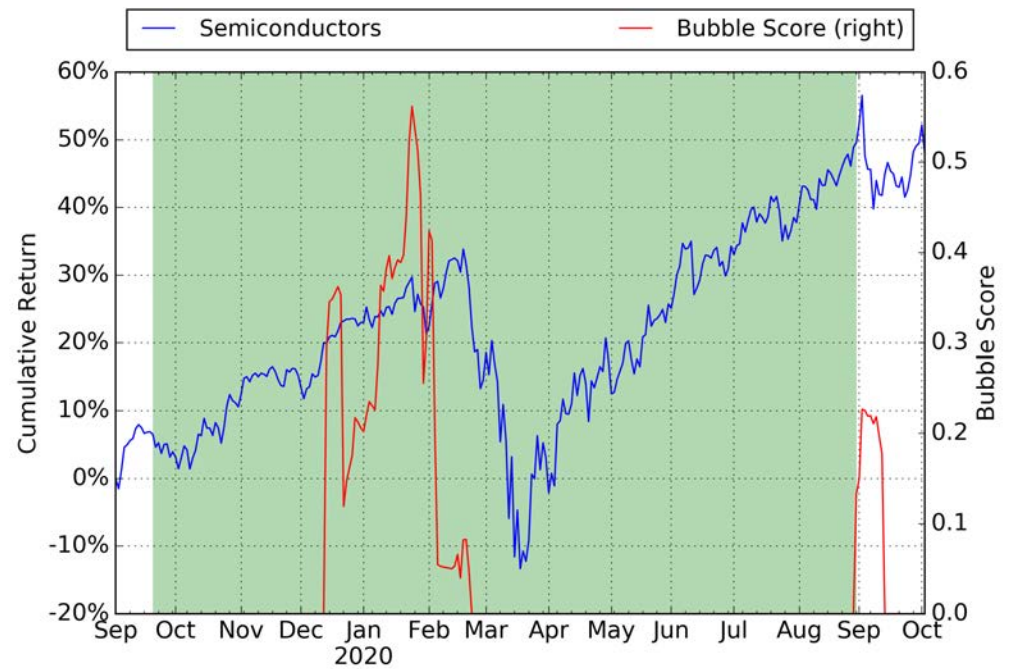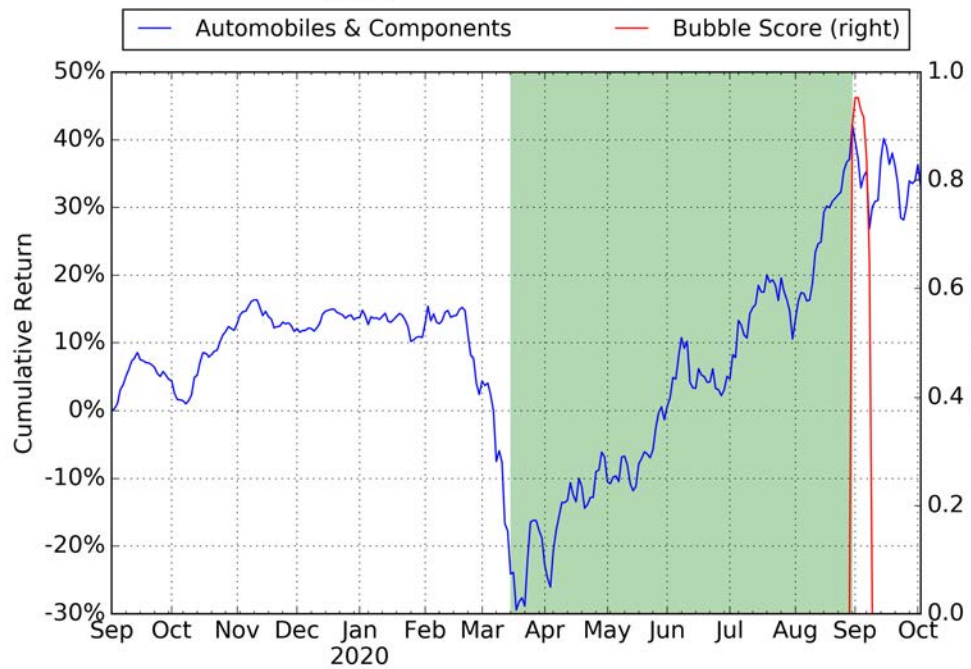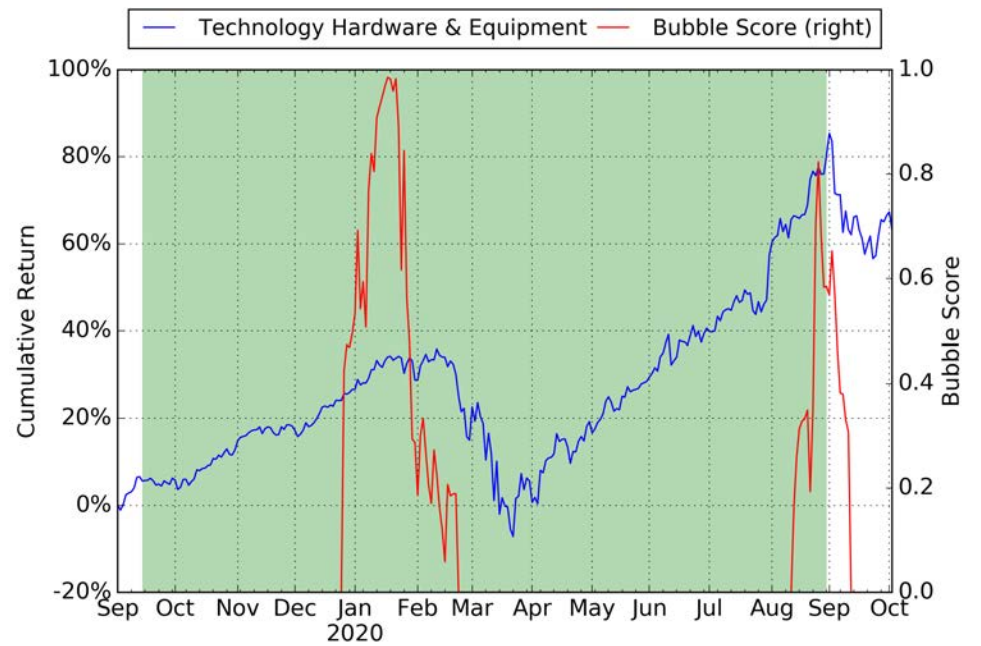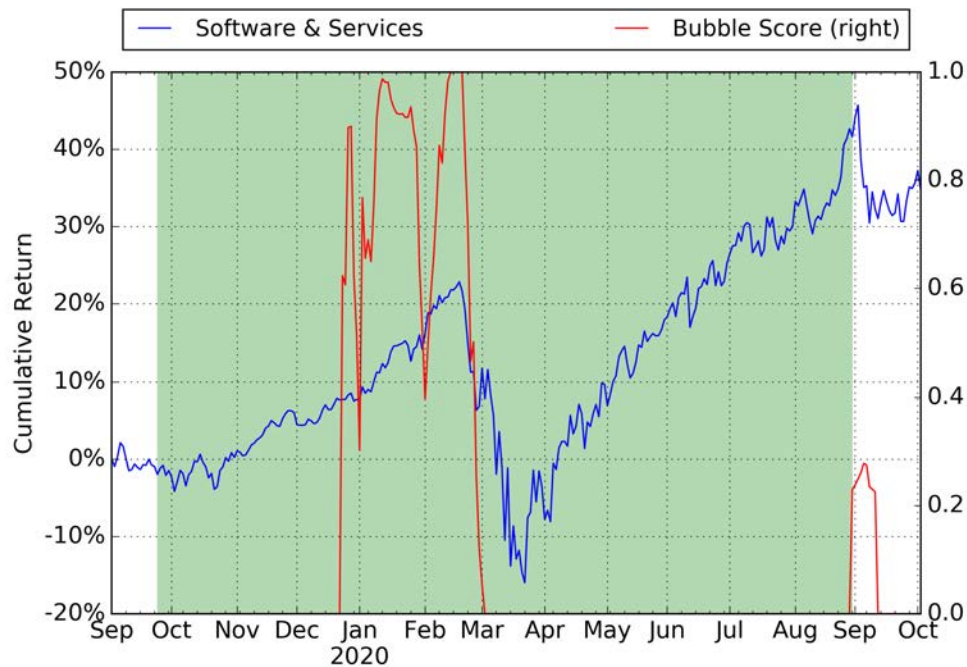
Portfolio Construction & Performance

▶ 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

▶ The market experienced a significant correction after almost half-a-year of appreciation since the bottom at mid-March. Most portfolios are under-performing the market as the market is mainly pushed up by the big techs. Contrarian Portfolios are more delicate to use due to their sensitivity to timing the expected reversal and exhibit very volatile performances. 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.
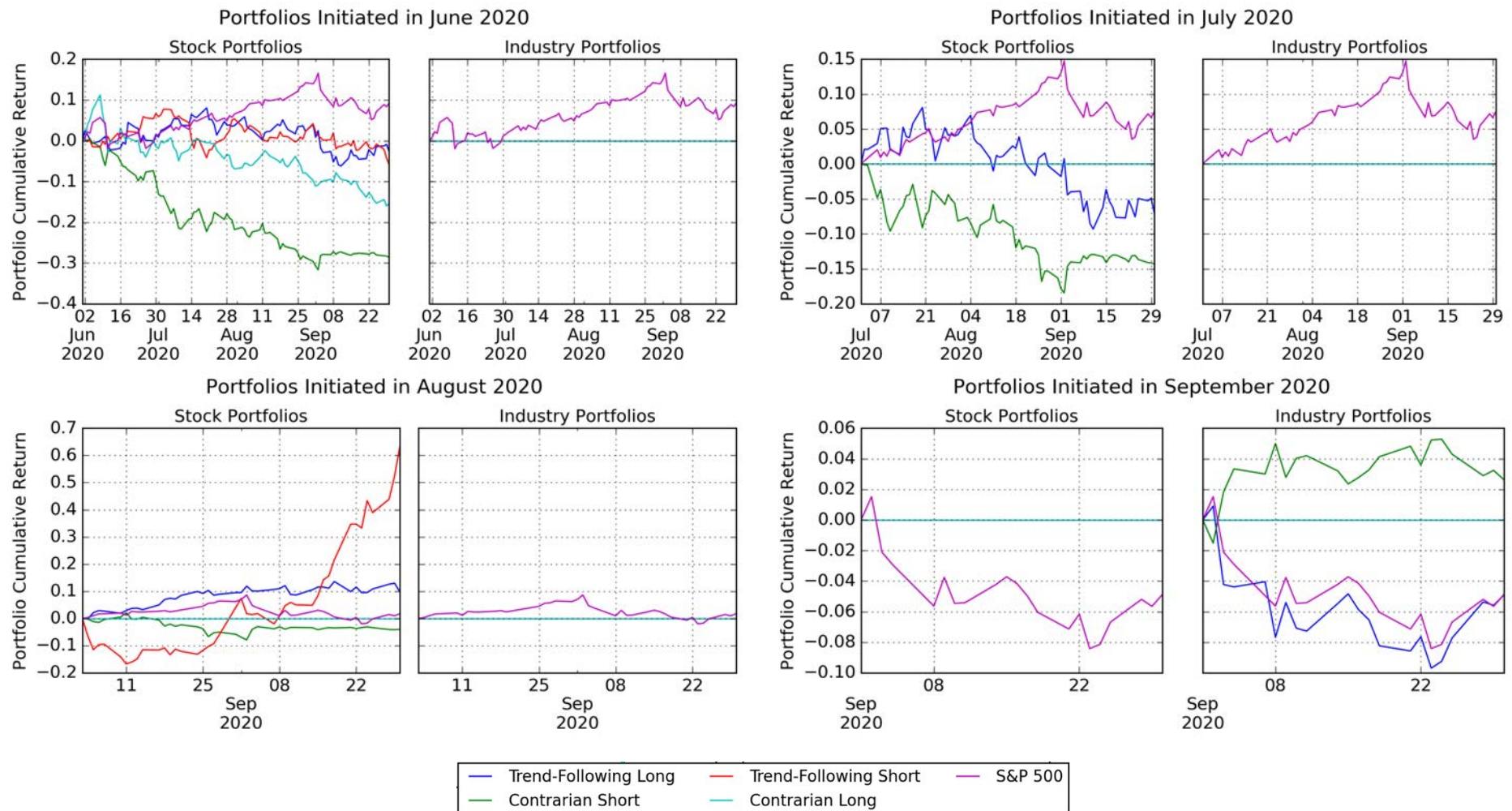
Single Stocks

We can divide the stocks into four quadrants[1]

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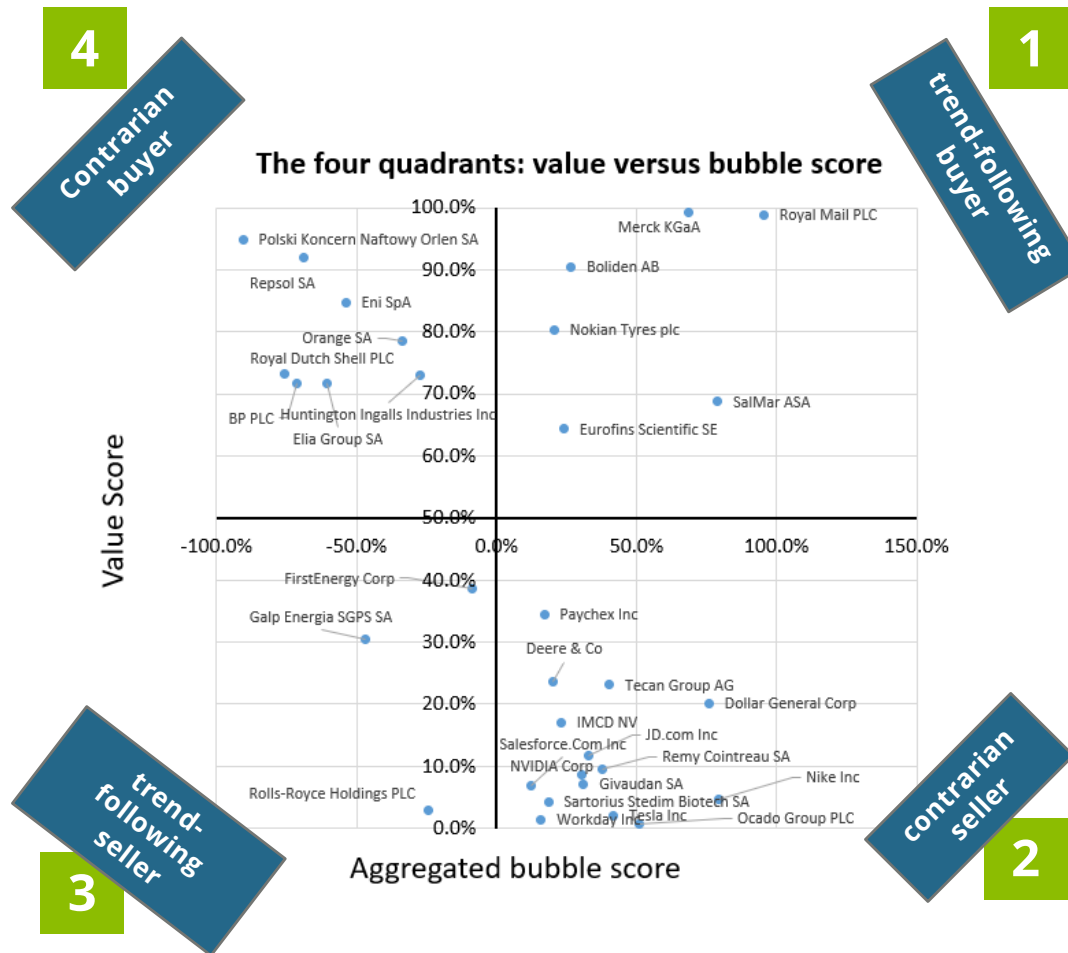
- ▸ **Quadrant 1**: Stocks with a strong value score are cheap relative to their earnings potential. The strong positive bubble signal should be interpreted as a momentum indicator possibly the consequence of a repricing based on the fundamentals. As an investor, one could be a **trend-following buyer**.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

- ▸ **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. JD.com Inc

- ▸ **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. Rolls-Royce Holdings PLC

- ▸ **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. BP PLC

[1] 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 818 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
Merck KGaA	Germany	Pharmaceuticals, Biotechnology & Life Sciences	21.9%	41.8%	Mar-20	68.4%	99.3%	73.1%
Nokian Tyres plc	Finland	Automobiles & Components	-6.8%	44.6%	Mar-20	20.6%	80.4%	84.5%
Eurofins Scientific SE	Luxembourg	Pharmaceuticals, Biotechnology & Life Sciences	50.1%	43.2%	Jan-20	24.1%	64.3%	15.0%
Royal Mail PLC	United Kingdom	Transportation	14.6%	61.8%	Apr-20	95.4%	98.8%	9.6%
SalMar ASA	Norway	Food, Beverage & Tobacco	33.3%	41.1%	Apr-20	78.9%	68.7%	81.5%
Boliden AB	Sweden	Materials	4.5%	65.9%	Mar-20	26.6%	90.4%	14.4%

Single Stocks

Quadrant 1 Stocks Current Month Example – Royal Mail PLC.
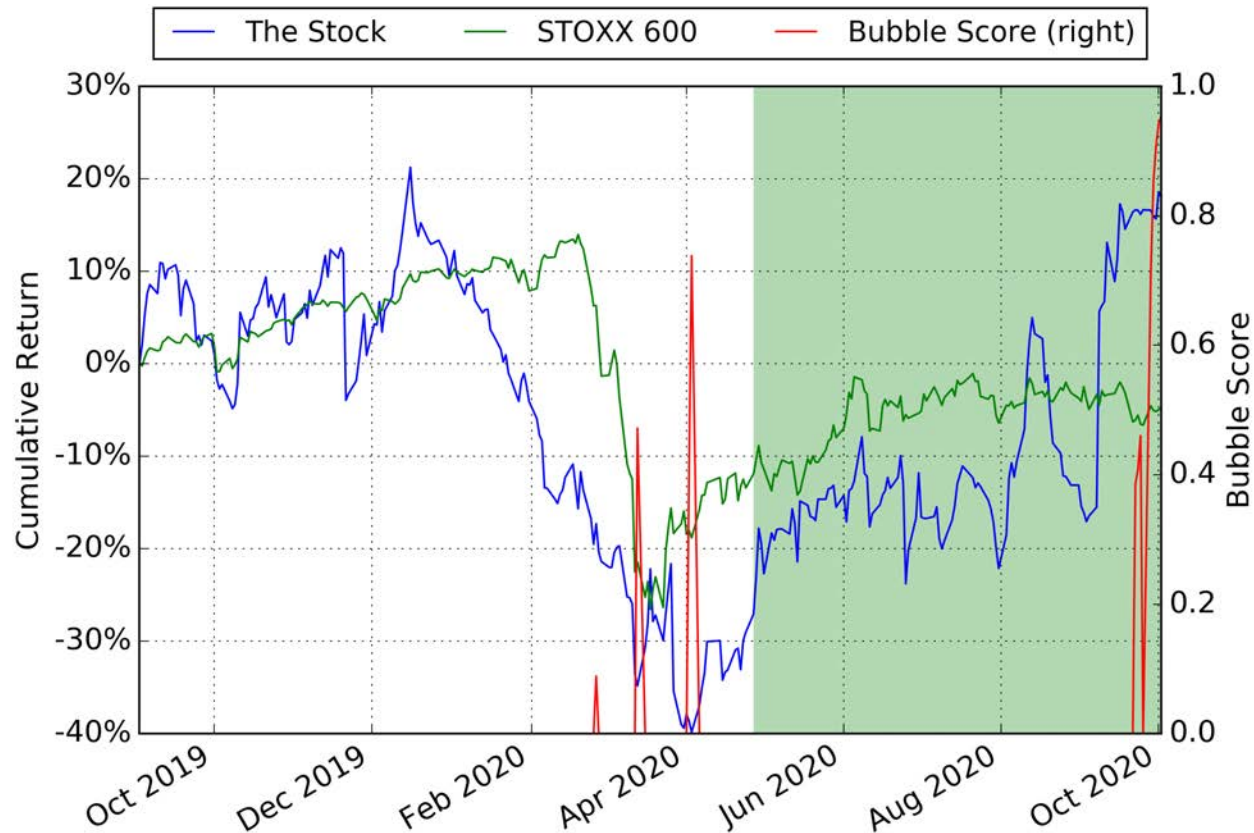
▸ The above graph shows the one-year cumulative return of the stock in blue (left hand scale), STOXX 600 in green (left hand scale) and the calculated DS LPPLS Bubble Score in red (right hand scale). The green shaded period delineates the time interval within which the positive bubble is identified. The Bubble Score of this five-month bubble has reached 95.4% with a bubble size 61.8%.

Single Stocks

Quadrant 1 Stocks Last Month Example – Eaton Corporation PLC.
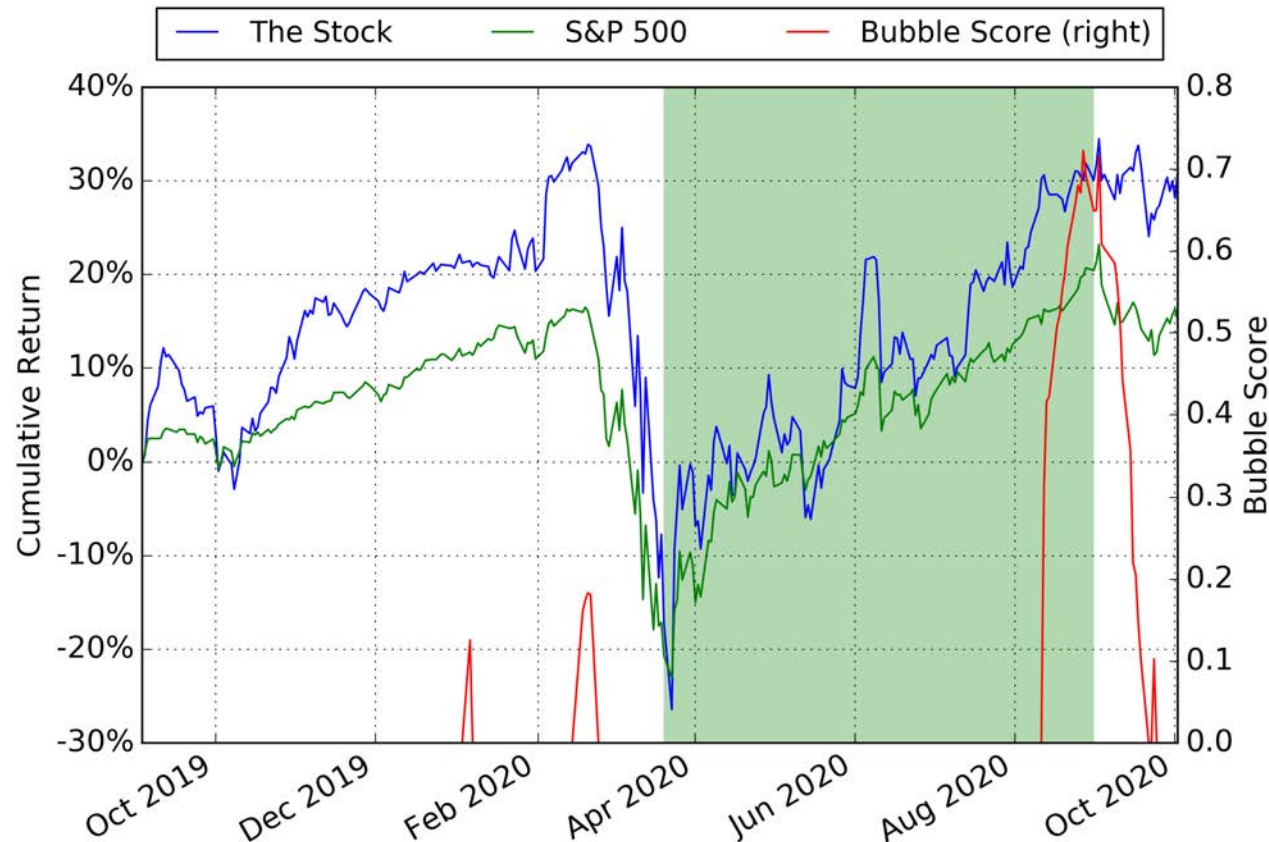
- ▸ The figure above plots the one-year cumulative return of the stock (blue), S&P 500 (green) and LPPLS Bubble Score (red lines on the right y-axis). The green shaded period delineates the time interval within which a strong positive bubble has been identified and reported last month. The stock price has reached a plateau in the past month, which is in agreement with our DS LPPLS Bubble signal provided last month. We expect this stock to continue growing in the long term due to the strong 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
Givaudan SA	Switzerland	Materials	43.9%	40.6%	Dec-19	31.1%	7.1%	27.7%
Tecan Group AG	Switzerland	Pharmaceuticals, Biotechnology & Life Sciences	99.6%	62.8%	Apr-20	40.3%	23.1%	72.8%
Remy Cointreau SA	France	Food, Beverage & Tobacco	23.1%	58.0%	Jan-20	37.9%	9.4%	38.7%
Sartorius Stedim Biotech SA	France	Pharmaceuticals, Biotechnology & Life Sciences	138.3%	138.3%	Oct-19	18.5%	4.3%	61.7%
Ocado Group PLC	United Kingdom	Retailing	104.1%	79.1%	Apr-20	51.1%	0.6%	76.6%
IMCD NV	Netherlands	Capital Goods	47.3%	42.9%	Apr-20	23.1%	16.9%	40.0%
Deere & Co	United States of America	Capital Goods	33.1%	72.8%	May-20	20.0%	23.6%	70.3%
Dollar General Corp	United States of America	Retailing	31.2%	18.8%	Apr-20	75.8%	20.1%	61.0%
JD.com Inc	China	Retailing	155.1%	133.1%	Nov-19	32.7%	11.8%	43.2%
Nike Inc	United States of America	Consumer Durables & Apparel	33.5%	60.3%	Mar-20	79.5%	4.7%	90.2%
NVIDIA Corp	United States of America	Semiconductors & Semiconductor Equipment	180.1%	180.1%	Oct-19	30.5%	8.6%	48.8%
Paychex Inc	United States of America	Software & Services	-6.2%	33.4%	Mar-20	17.0%	34.4%	71.0%
Salesforce.Com Inc	United States of America	Software & Services	65.9%	62.3%	Oct-19	12.4%	6.7%	49.3%
Tesla Inc	United States of America	Automobiles & Components	707.7%	532.5%	Oct-19	41.7%	2.1%	59.9%
Workday Inc	United States of America	Software & Services	21.5%	72.8%	Mar-20	15.9%	1.3%	49.4%

Single Stocks

Quadrant 2 Stocks Current Month Example – Nike Inc.
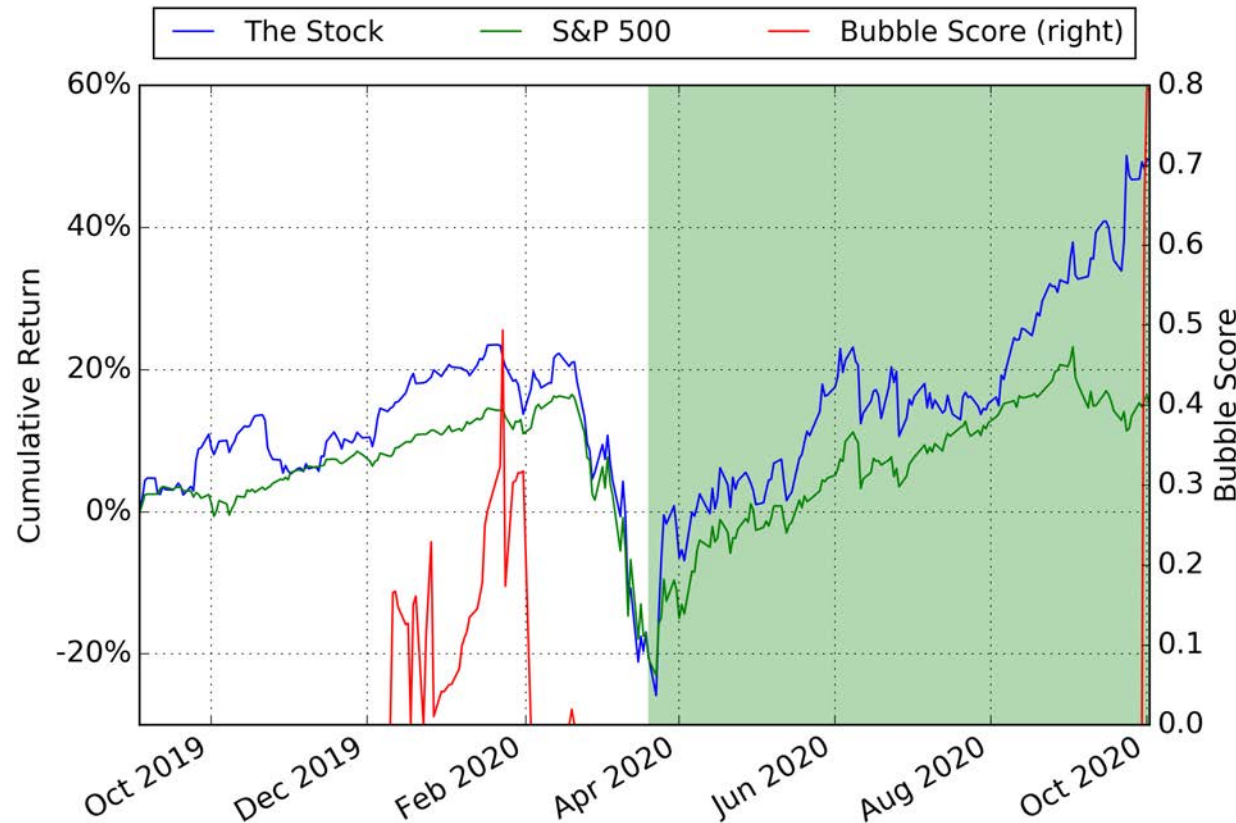
▸ The above graph shows the one-year cumulative return of the stock in blue (left hand scale), S&P 500 in green (left hand scale) and the calculated DS LPPLS Bubble Score in red (right hand scale). The green shaded period delineates the time interval within which the positive bubble is identified. The Bubble Score of this six-month bubble has reached 79.5% with a bubble size 60.3%. The strong positive bubble signal and weak fundamentals indicate a high probability of correction in the future.

Single Stocks

Quadrant 2 Stocks Last Month Example – Deere & Co.
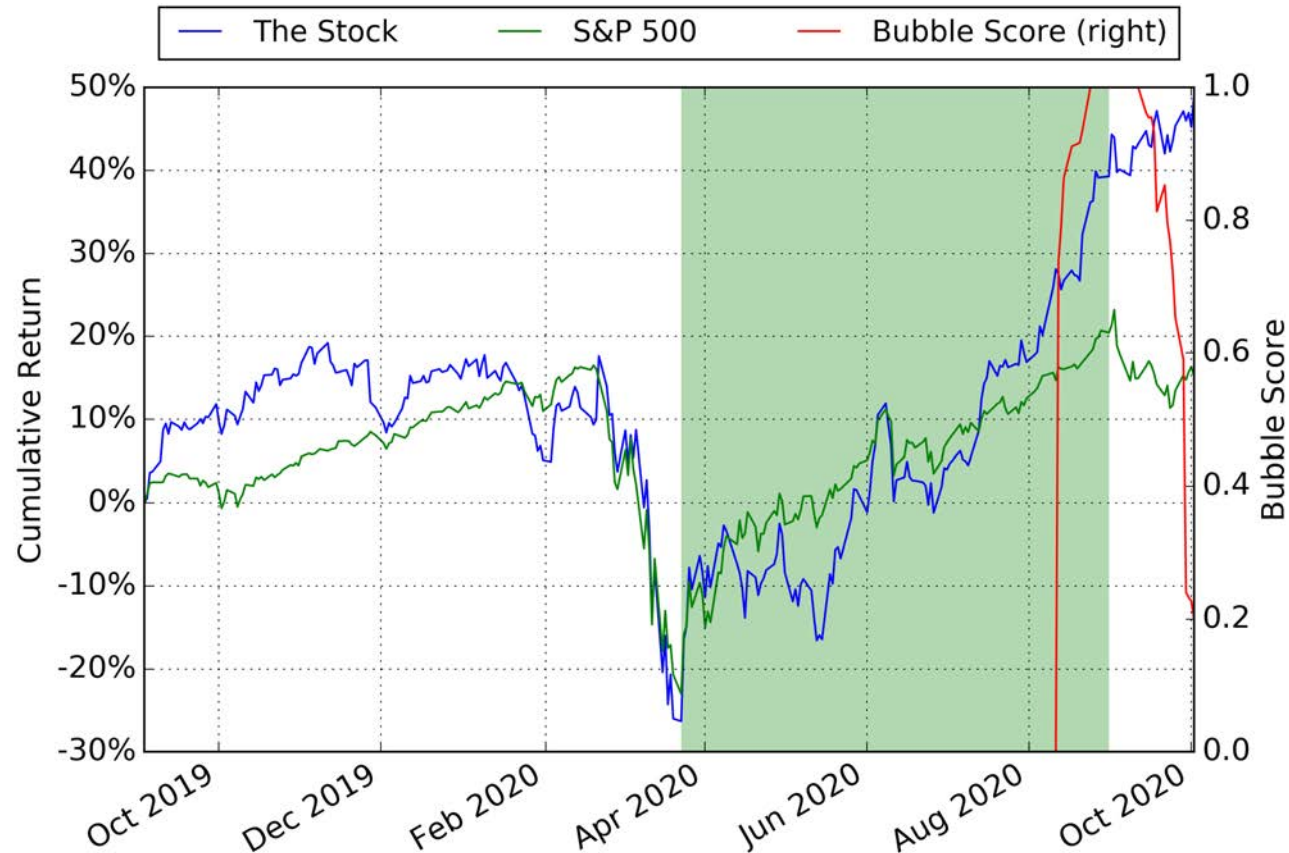
The figure above plots the one-year cumulative return of the stock (blue), S&P 500 (green) and LPPLS Bubble Score (red lines on the right y-axis). The green shaded period delineates the time interval within which a strong positive bubble has been identified and reported last month. The bubble regime of the stock has lost its momentum in the past month, while still outperformed the market. The stock may continue to evolve into a larger bubble, while faced with significant risk of correction due to the weak fundamentals.
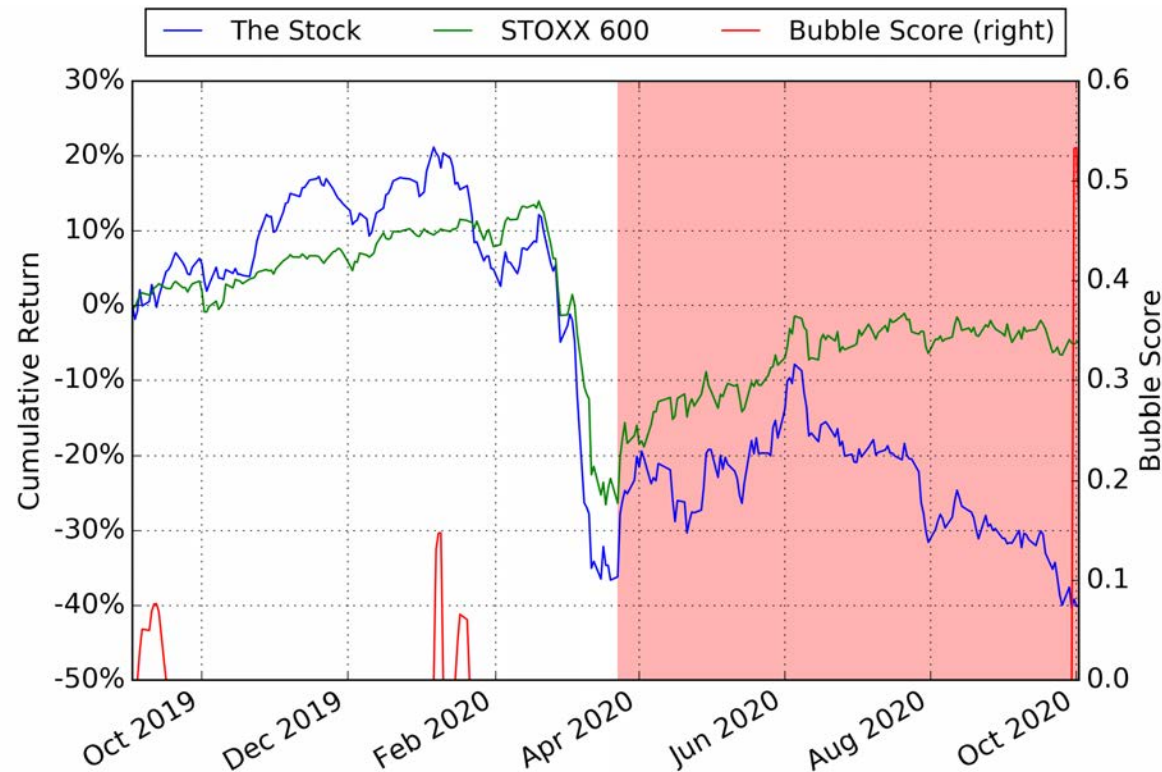
Single Stocks

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
Rolls-Royce Holdings PLC	United Kingdom	Capital Goods	-84.8%	-67.2%	Mar-20	-24.2%	2.8%	0.6%
Galp Energia SGPS SA	Portugal	Energy	-42.5%	-16.9%	Mar-20	-46.8%	30.4%	91.4%
FirstEnergy Corp	United States of America	Utilities	-37.7%	-37.7%	Oct-19	-9.0%	38.5%	18.5%

Single Stocks

Quadrant 3 Stocks Current Month Example – Galp Energia SGPS 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 negative bubble is identified. The Bubble Score of this six-month bubble has reached 46.8% with a bubble size -16.9%.

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
Elia Group SA	Belgium	Utilities	14.3%	-10.5%	Apr-20	-60.7%	71.8%	11.8%
Repsol SA	Spain	Energy	-59.5%	-24.5%	Mar-20	-68.9%	92.0%	95.8%
Orange SA	France	Telecommunication Services	-39.9%	-39.9%	Oct-19	-33.9%	78.4%	3.3%
BP PLC	United Kingdom	Energy	-56.5%	-31.4%	Mar-20	-71.3%	71.7%	3.2%
Royal Dutch Shell PLC	Netherlands	Energy	-60.0%	-30.1%	Mar-20	-75.9%	73.1%	94.1%
Eni SpA	Italy	Energy	-52.7%	-25.5%	Mar-20	-53.8%	84.7%	96.3%
Polski Koncern Naftowy Orlen SA	Poland	Energy	-56.5%	-27.0%	Apr-20	-90.6%	94.8%	99.3%
Huntington Ingalls Industries Inc	United States of America	Capital Goods	-32.2%	-32.2%	Oct-19	-27.4%	73.0%	20.2%

Single Stocks

Quadrant 4 Stocks Current Month Example – Polski Koncern Naftowy Orlen SA.
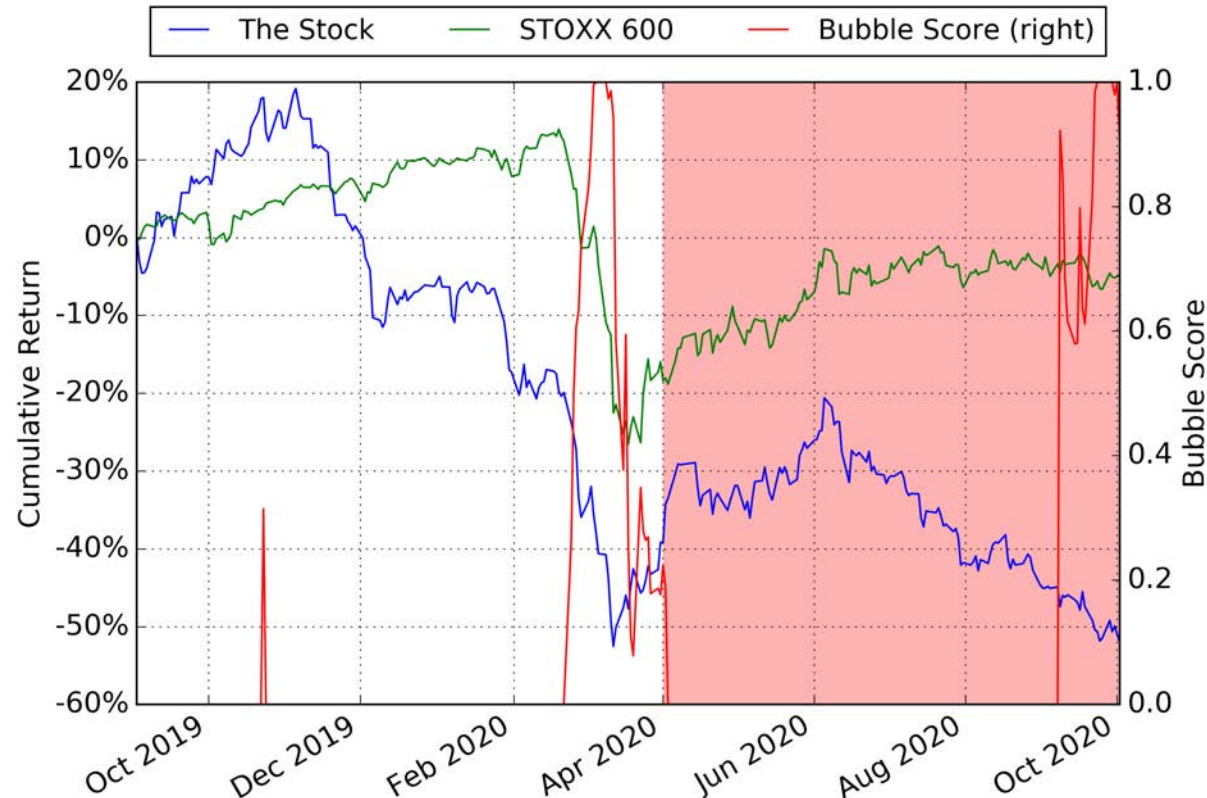
▸ The above graph shows the one-year cumulative return of the stock in blue (left hand scale), STOXX 600 in green (left hand scale) and the calculated DS LPPLS Bubble Score in red (right hand scale). The red shaded period delineates the time interval within which the strong negative bubble is identified. The Bubble Score of this six-month bubble has reached 90.6% with a negative bubble size -27%. 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 – Imperial Brands PLC.
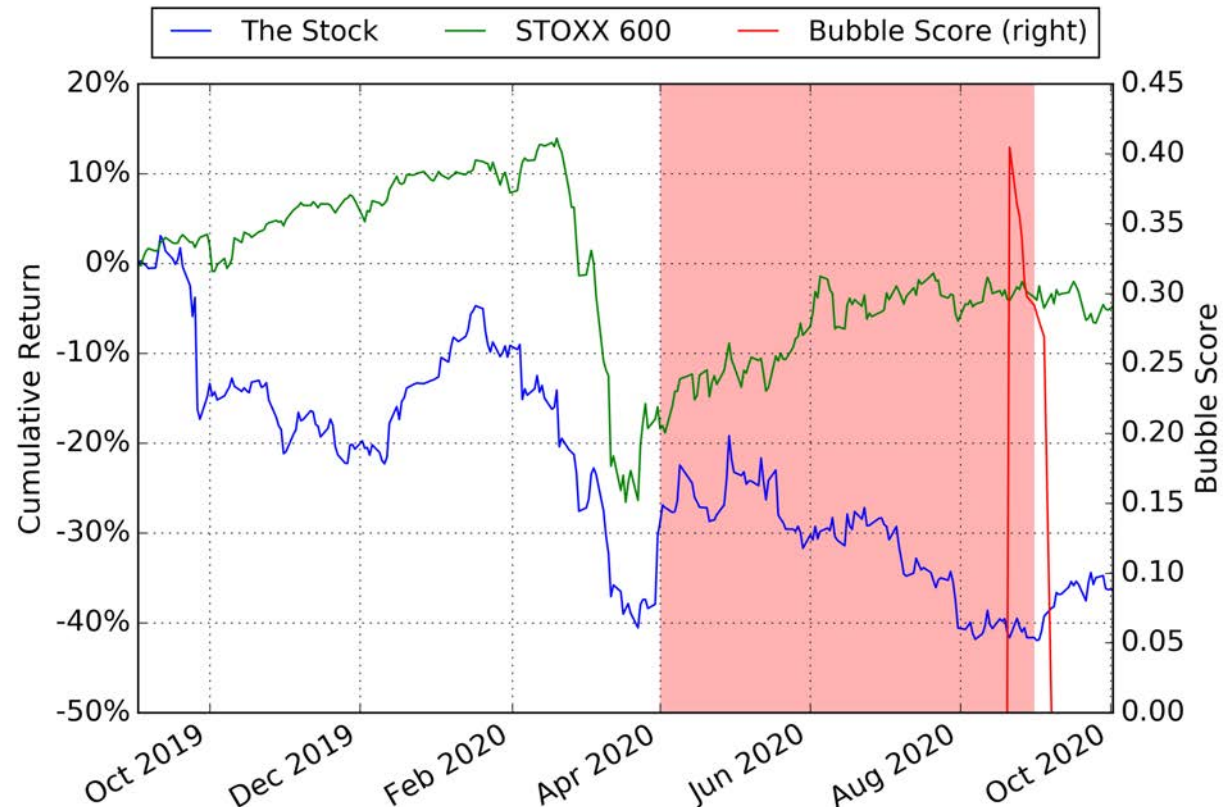
▸ The figure above plots the one year cumulative return of the stock (blue), STOXX 600 (green) and LPPLS Bubble Score (red line on the right y-axis). The red shaded period delineates the time interval within which the strong negative bubble was identified and reported last month. The stock has rebounded in the past month, which is in agreement with 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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