



The FCO Cockpit Global Bubble Status Report June 2020



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

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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

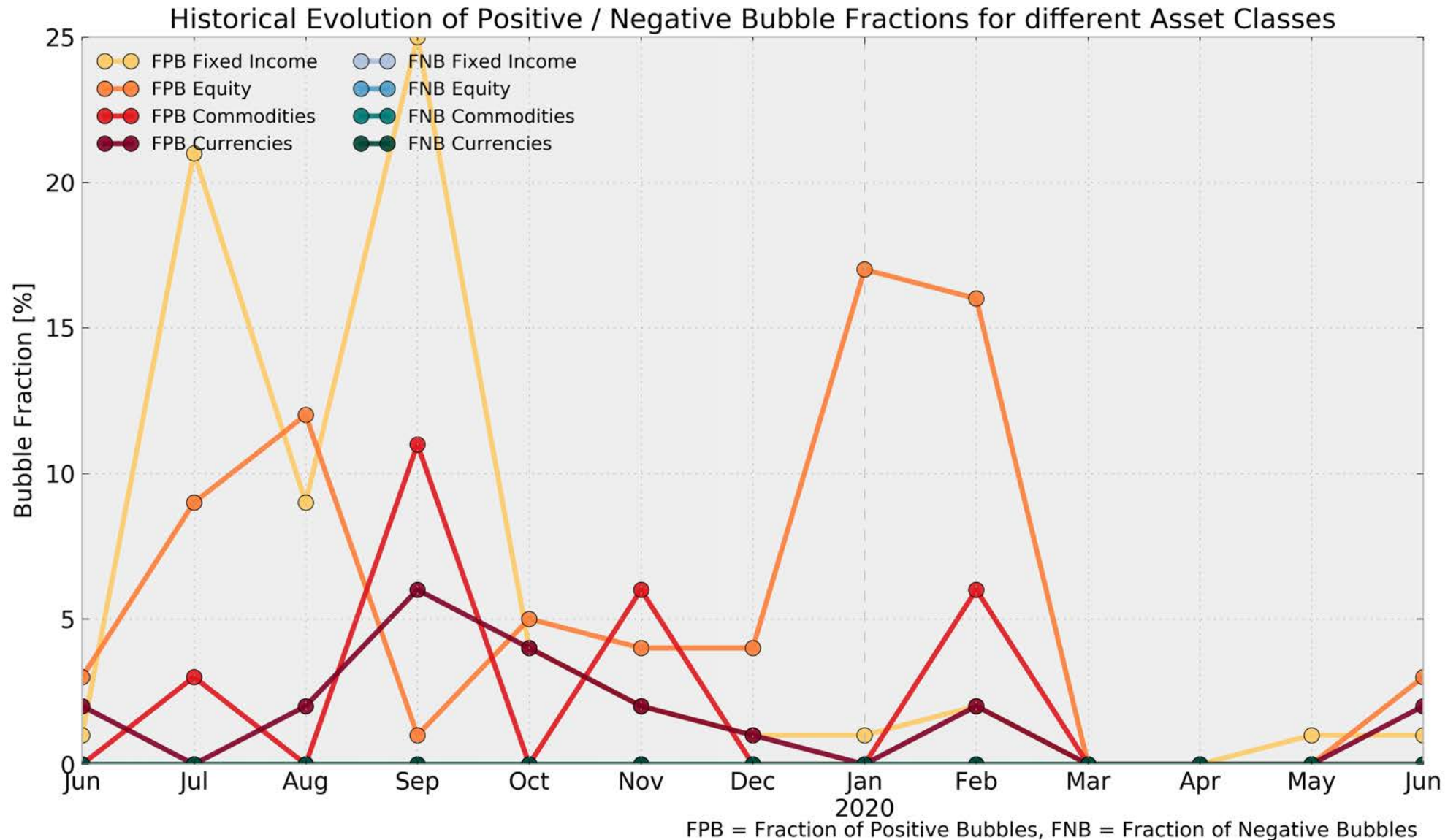
- ▶ The **Financial Crisis Observatory (FCO)** monthly report discusses the historical evolution of bubbles in and between different asset classes and geographies. The purpose of the FCO report is to ascertain which asset classes and sectors are deemed to be **crowded** and to what degree they can develop 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 or visit <https://www.simag.com/insights/fco-cockpit/>

General Results – Key Takeaways

- ▶ At the beginning of June, with to recent market recovery from the “Corona crash”, we diagnose a small number of new positive bubble signals emerging, while there are still no negative bubbles detected.
- ▶ Many assets have already recovered to pre-crash or even higher levels, raising the obvious question whether this remarkable short-term growth is sustainable.
- ▶ This rebound is strongly supported by central banks' and governments' measures, and the perception that the Pandemics is behind us in many countries across the world. The market is perhaps pricing that the economy will recover quickly to pre-pandemic levels, but more probably that the extraordinary monetary and fiscal measures augur strong asset inflations.
- ▶ We report three short-term bubbles in crypto-currencies.
- ▶ No bubbles in industrial sectors and a few positive and negative bubbles in individual stocks.

General Results – The Big Picture



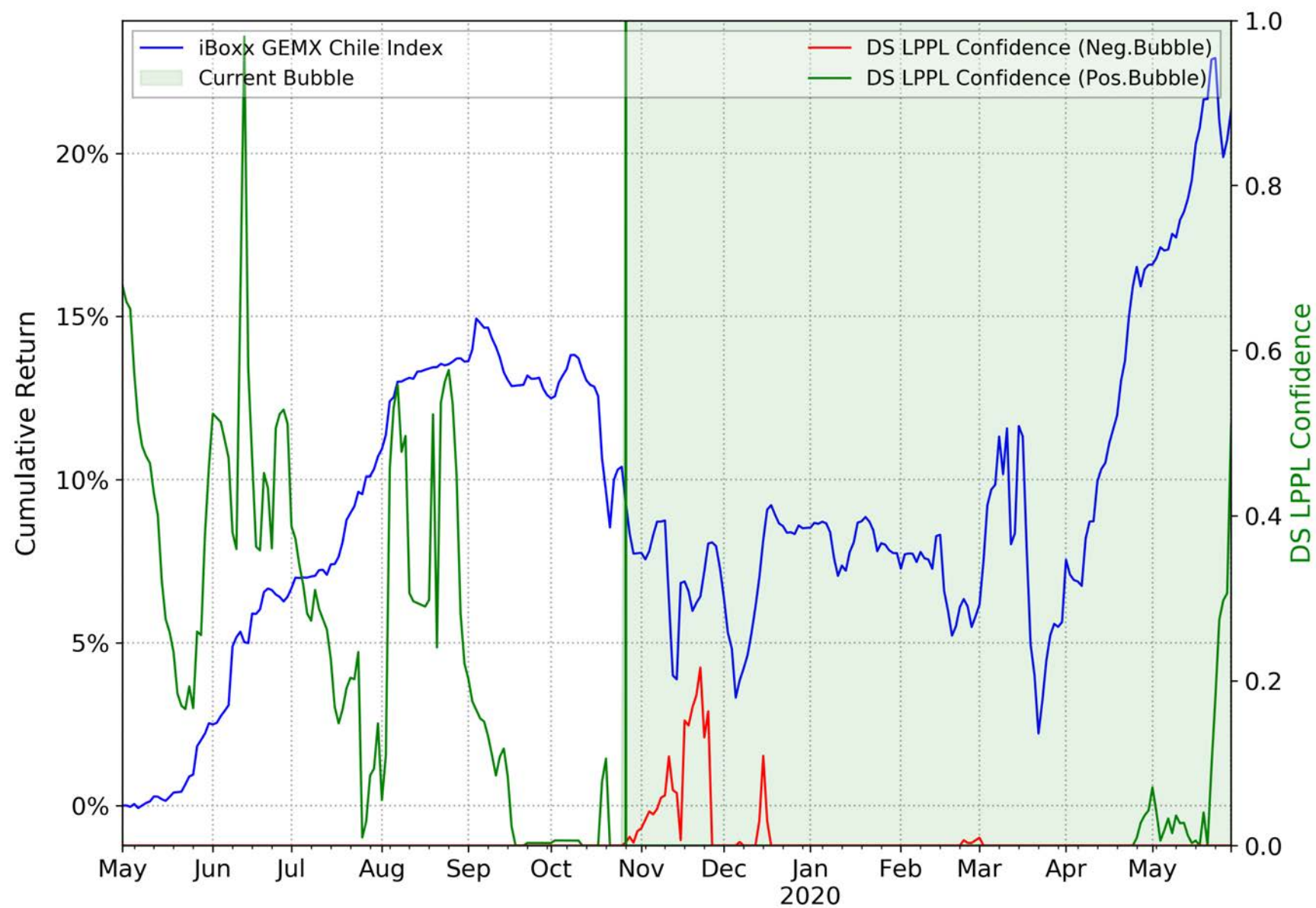
General Results – This Month's Overview

Category	Analyzed Assets	Fraction of Pos. Bubbles [%]	Fraction of Neg. Bubbles [%]
Fixed Income	155	1	0
Government Bonds	55	4	0
Finance and Insurance	21	0	0
Corporate Bonds	79	0	0
Equity	136	3	0
Country Indices	42	0	0
Europe	11	0	0
United States	83	5	0
Commodities	27	0	0
Forex	93	2	0

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_{tc}	σ_{tc} [$days$]	Scenario Probability [%]
Positive Bubbles								
	1	iBoxx GEMX Chile Index	11	216	51	24	2020-07-07	4

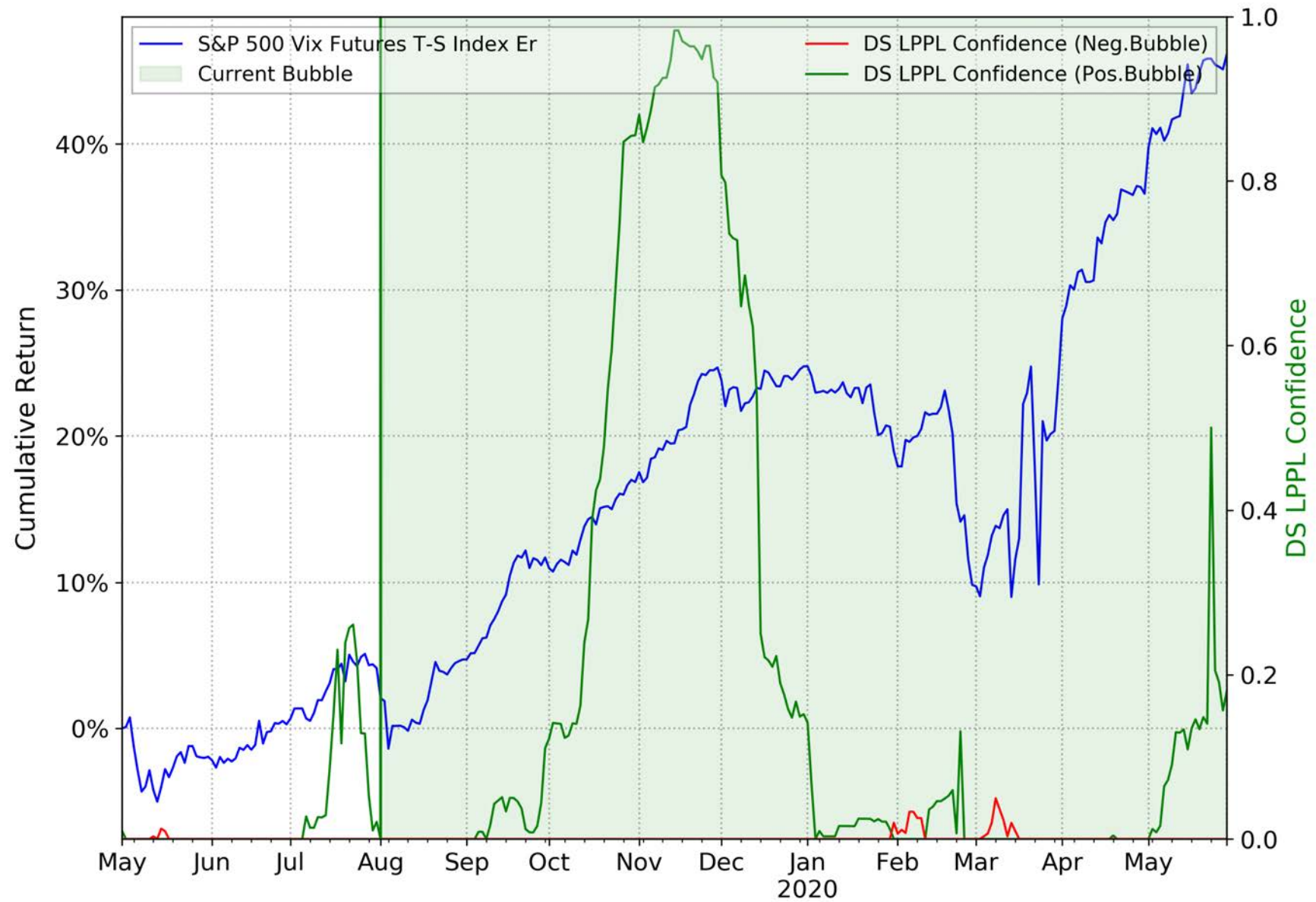
- ▶ In this month's report, we list just a single government bond index, of Chile, for which we detect positive bubble price dynamics.
- ▶ The estimated bubble size is at 11% while the Confidence Indicator value is higher, at 51%.
- ▶ The corresponding time series plot displaying the value of the Confidence Indicator over time is shown on the following slide.
- ▶ Note the strong recent upward acceleration of the price which is the typical for LPPLS patterns.

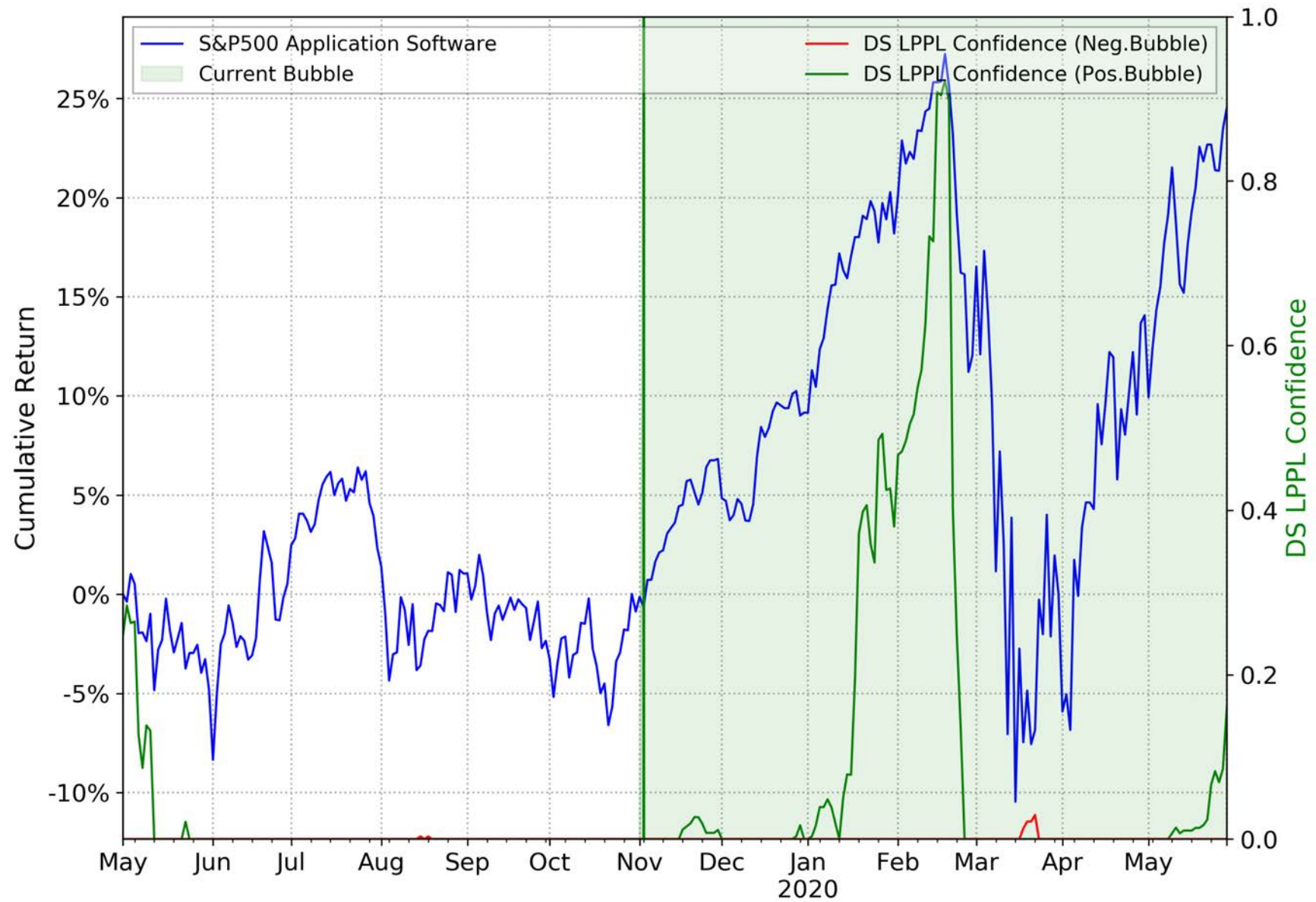


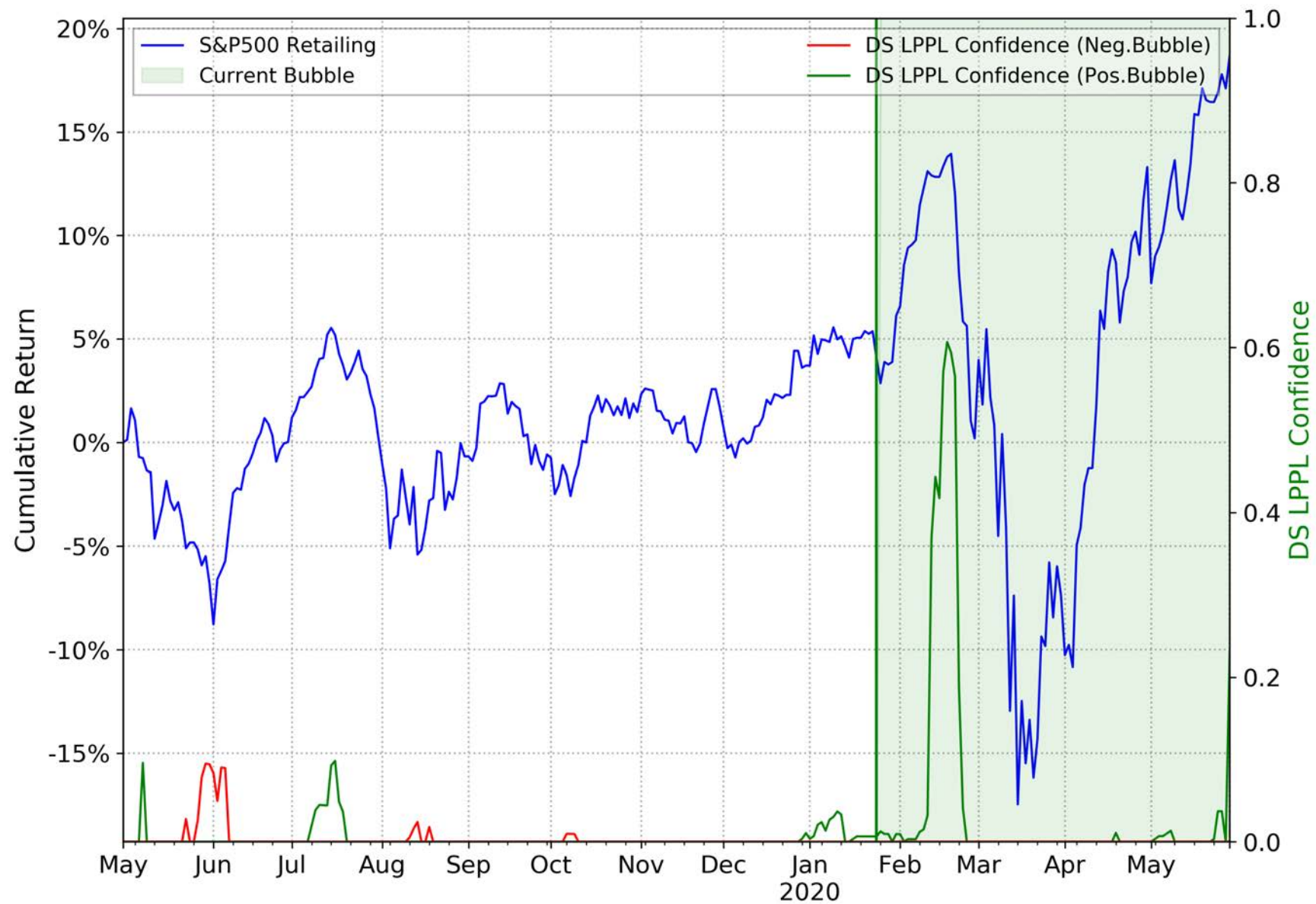
Equities – United States Indices

Name	Bubble Size bs [%]	Duration [days]	DS LPPL Confidence ci [%]	Geometric Average $\sqrt{bs \cdot ci}$ [%]	Critical Time Prediction μ_{tc}	σ_{tc} [days]	Scenario Probability [%]
Positive Bubbles							
1 S&P 500 Vix Futures T-S Index Er	43	302	18	28	2020-05-29		47
2 S&P500 Application Software	25	209	16	20	2020-10-20	31	69
3 S&P500 Retailing	14	126	23	18	2020-05-30	1	76

- ▶ For equity indices in the United States, following the recent crash, there are still only few or no bubble signals, because most assets are still in the “crash” or “recovery” state.
- ▶ Several months ago, we listed as our top positive bubble signal the S&P Vix Futures *Term Structure* Index. This index represents a basket of futures contracts with different maturities on the S&P 500 volatility index (VIX). It thus characterizes the shape of the futures term structure of the VIX and therefore reflects investors' short to mid term market volatility expectations, with a high (low) value meaning that investors expect market turbulence to occur more in the future (present), which corresponds to a steep (flat to inverted) VIX term structure shape. The current high value of the index is almost at its pre-2009-crisis, an all-time peak, indicating that investors currently expect low volatility, but might be fearing a future market turbulence.
- ▶ The detected bubble sizes on the top three signals range from 15% to 43%. The confidence indicator values are in the low end at 16%-23%.
- ▶ We show the corresponding plots in the following slides. Note the precise timing of the peaks of the two S&P subsectors (application software and retailing) just before their crash in February 2020 obtained from the peaks of the indicators.



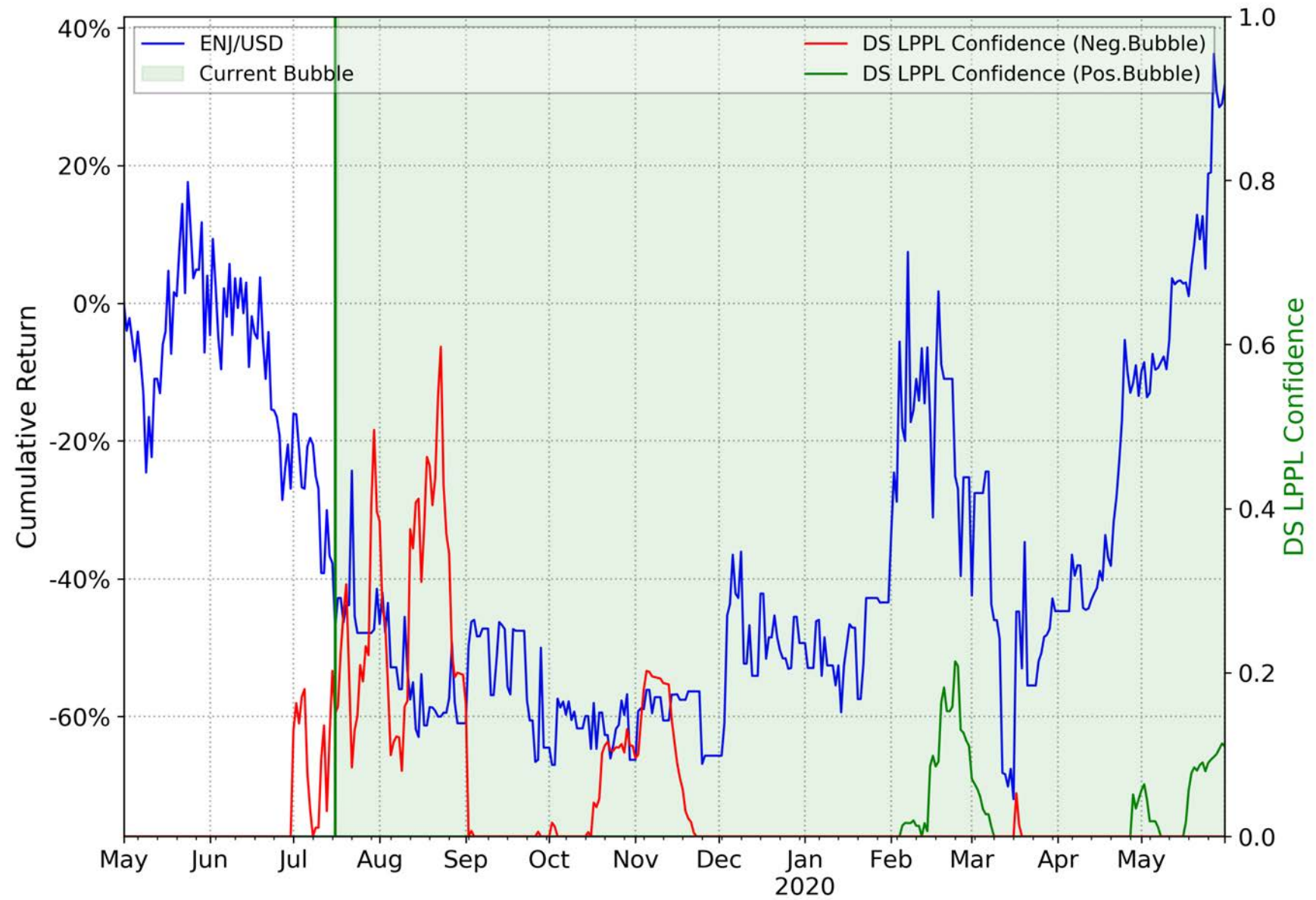


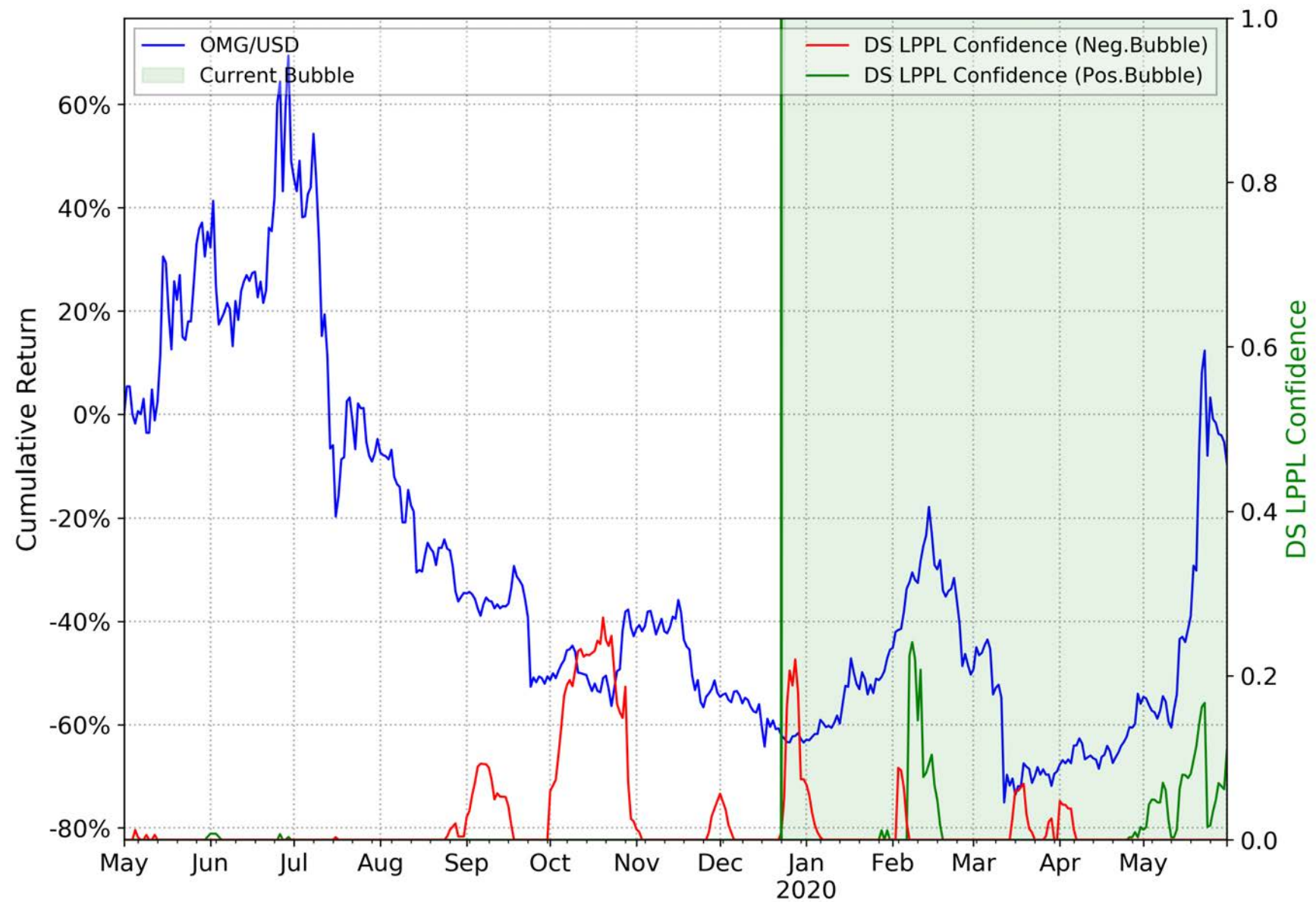


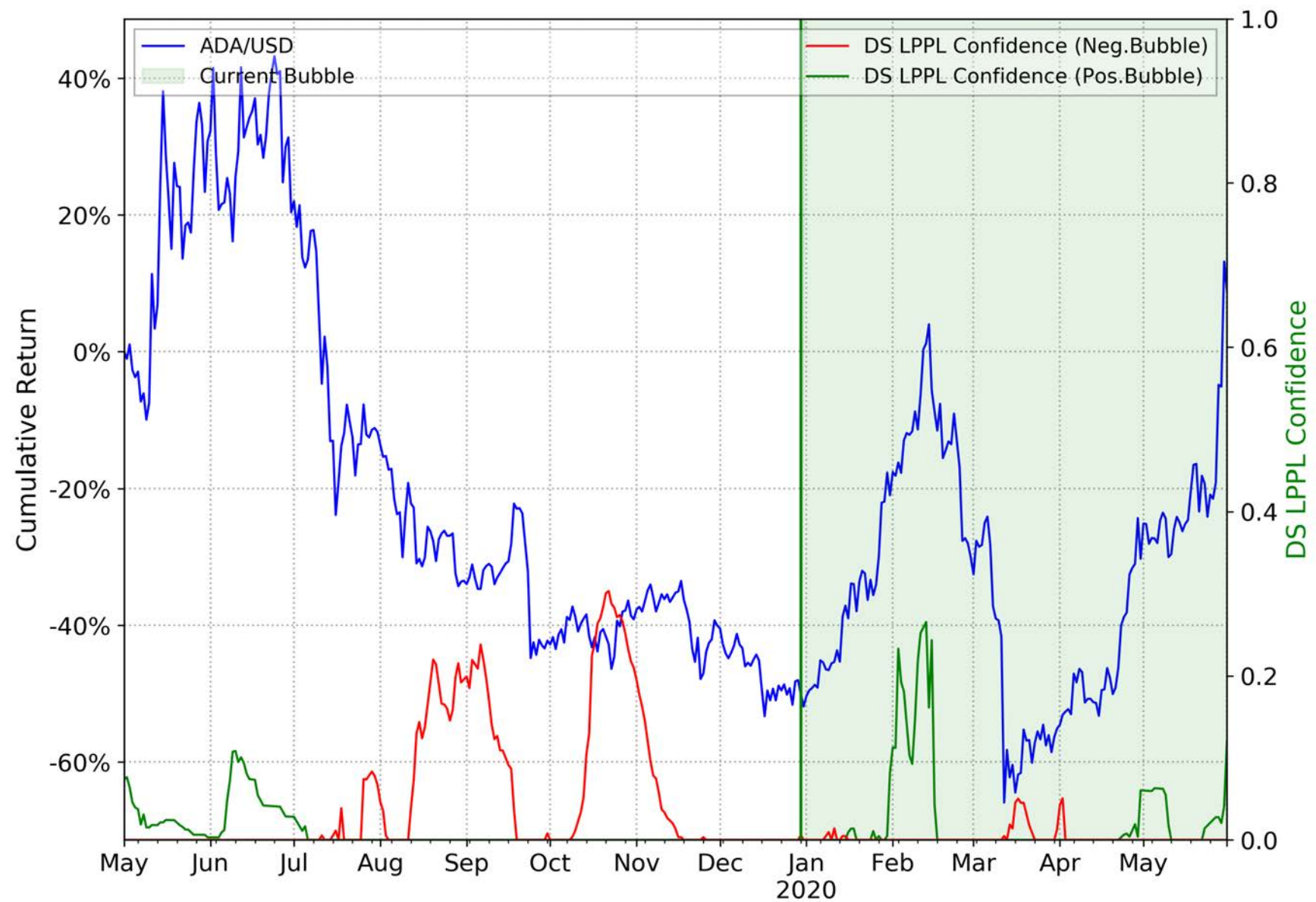
Cryptocurrencies

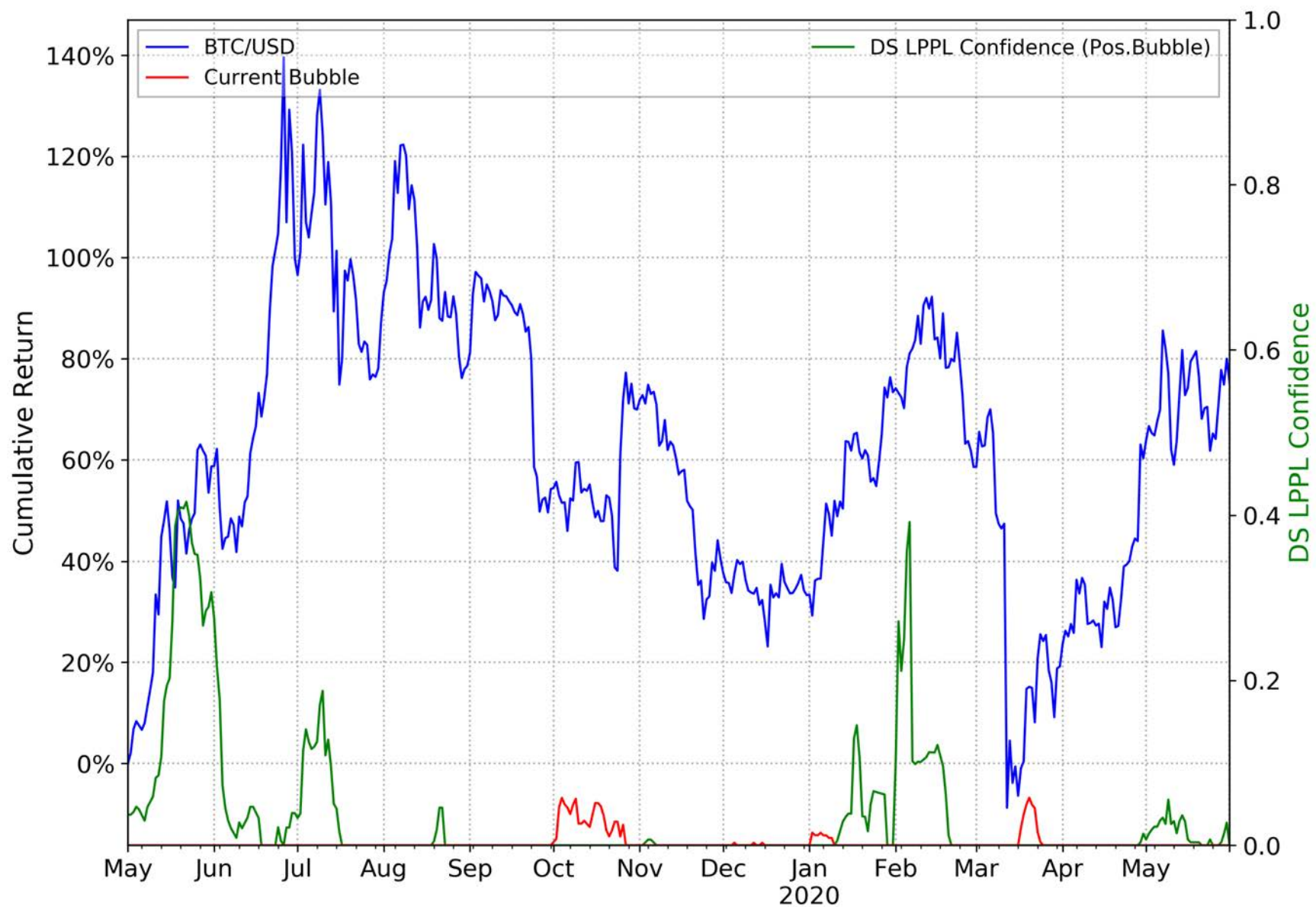
Bubble Data					Cluster Analysis			
Name		Bubble Size bs [%]	Duration [days]	DS LPPL Confidence ci [%]	Geometric Average $\sqrt{bs \cdot ci}$ [%]	Critical Time Prediction μ_{tc}	σ_{tc} [days]	Scenario Probability [%]
Positive Bubbles								
1	ENJ/USD	148	320	11	41	2020-10-04	27	62
2	OMG/USD	139	160	11	40	2020-09-30	22	58
3	ADA/USD	118	153	12	38	2020-06-06	8	59

- ▶ After months without detected bubble activity, we find three positive bubble signals for cryptocurrency exchange rates (against US Dollar) at the end of May.
- ▶ The corresponding cryptos are *Enjin Coin* with a market cap (MC) of about 170M USD (as of beginning June 2020), *OMG Network* (MC: 230M USD) and *Cardano* (MC: 2.1B USD).
- ▶ As we often observed in the past, the estimated bubble sizes are extreme compared to usual asset classes, and range between 118-148%, thus offering large potential gains in short trading.
- ▶ The detected bubble duration differs from 153 to 320 days, while the Confidence Indicator levels are low, at 11% and 12%.
- ▶ In the following slides, we show again the time series plots, including additionally the one for BTC due to its obvious importance as the leading cryptocurrency. BTC is currently not found to be in a bubble.









Sectors

GICS Industry Group Name	Yearly Return		Bubble Size		Bubble Score		Value Score		Growth Score	
	Jun 1st	May 1st	Jun 1st	May 1st	Jun 1st	May 1st	Jun 1st	May 1st	Jun 1st	May 1st
Pharmaceuticals, Biotechnology & Life Sciences	16.4%	17.0%	0.0%	0.0%	0.0%	0.0%	69.7%	69.0%	50.2%	50.5%
Consumer Services	-14.3%	-16.7%	0.0%	0.0%	0.0%	0.0%	31.5%	32.0%	44.6%	44.9%
Retailing	19.2%	13.3%	0.0%	0.0%	0.0%	0.0%	22.3%	22.3%	47.3%	47.4%
Transportation	-5.1%	-12.8%	0.0%	0.0%	0.0%	0.0%	54.4%	55.3%	48.0%	46.5%
Consumer Durables & Apparel	2.8%	-6.3%	0.0%	0.0%	0.0%	0.0%	29.9%	31.0%	60.0%	59.4%
Semiconductors & Semiconductor Equipment	42.5%	21.8%	0.0%	0.0%	0.0%	0.0%	62.0%	61.4%	38.1%	38.8%
Technology Hardware & Equipment	31.6%	22.0%	0.0%	0.0%	0.0%	0.0%	68.1%	66.3%	41.8%	42.9%
Automobiles & Components	-0.6%	-10.7%	0.0%	0.0%	0.0%	0.0%	70.8%	70.1%	53.3%	53.2%
Telecommunication Services	-3.4%	-3.7%	0.0%	0.0%	0.0%	0.0%	62.1%	64.3%	46.6%	45.0%
Energy	-32.3%	-38.3%	0.0%	0.0%	0.0%	0.0%	50.5%	51.7%	63.3%	63.2%
Software & Services	22.2%	15.7%	0.0%	0.0%	0.0%	0.0%	31.6%	34.0%	48.9%	49.3%
Materials	-1.8%	-7.4%	0.0%	0.0%	0.0%	0.0%	51.4%	52.0%	52.0%	51.5%
Health Care Equipment & Services	14.9%	14.0%	0.0%	0.0%	0.0%	0.0%	55.5%	56.2%	55.8%	52.3%
Capital Goods	-8.0%	-14.9%	0.0%	0.0%	0.0%	0.0%	46.4%	46.7%	49.2%	49.4%
Media & Entertainment	13.5%	2.9%	0.0%	0.0%	0.0%	0.0%	30.9%	30.5%	36.8%	37.3%
Commercial & Professional Services	4.0%	-0.6%	0.0%	0.0%	0.0%	0.0%	26.1%	28.1%	56.6%	56.6%
Food & Staples Retailing	7.4%	7.2%	0.0%	0.0%	0.0%	0.0%	47.1%	46.9%	57.6%	58.1%
Household & Personal Products	0.9%	1.0%	0.0%	0.0%	0.0%	0.0%	30.1%	30.3%	45.7%	46.4%
Food, Beverage & Tobacco	-4.3%	-6.6%	0.0%	0.0%	0.0%	0.0%	47.7%	48.5%	55.0%	55.8%
Utilities	0.6%	-2.4%	0.0%	0.0%	0.0%	0.0%	49.3%	49.6%	43.3%	43.8%
Insurance	-16.9%	-18.8%	0.0%	0.0%	0.0%	0.0%	-	-	-	-
Real Estate	-11.8%	-13.2%	0.0%	0.0%	0.0%	0.0%	-	-	-	-
Diversified Financials	1.0%	-5.7%	0.0%	0.0%	0.0%	0.0%	-	-	-	-
Banks	-22.7%	-27.2%	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.
- ▶ This month, we find 0 industry groups with a positive bubble score, as the market is in a volatile after-crash mode due to the COVID-19 pandemic. Note that the bubbles reported in this report usually have a bubble duration of 3-12 months. Therefore the recent rebound of the market after the bottom in March would not be identified as bubbles yet.

Portfolio Construction & Performance

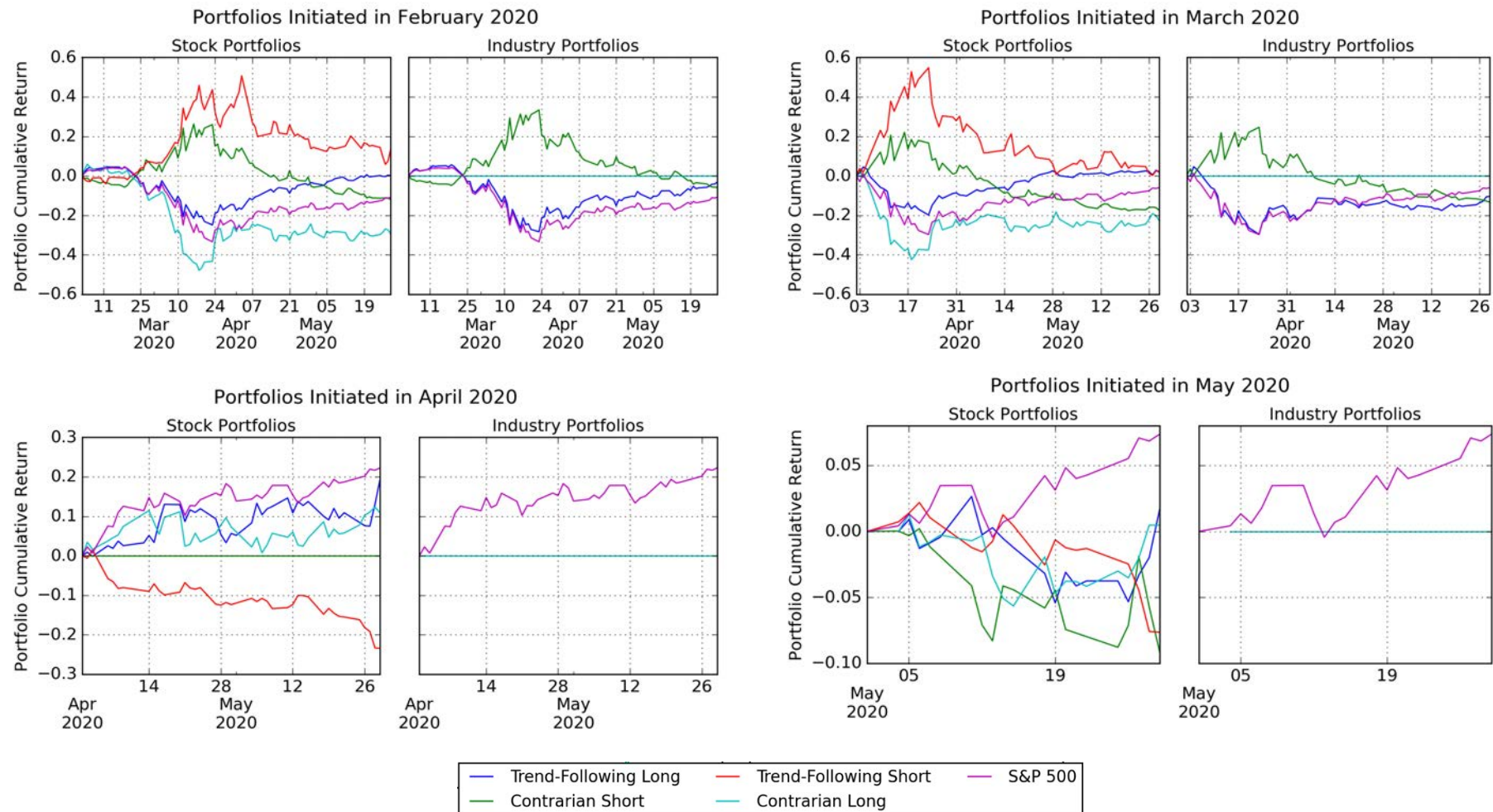
- ▶ Here we illustrate the methodology of the portfolio construction process based on the results of our previous analyses.
- ▶ For individual stocks that we identified in the 4 quadrants, we constructed 4 portfolios based on the 4 quadrants defined in the last report. Each portfolio consists of all 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.

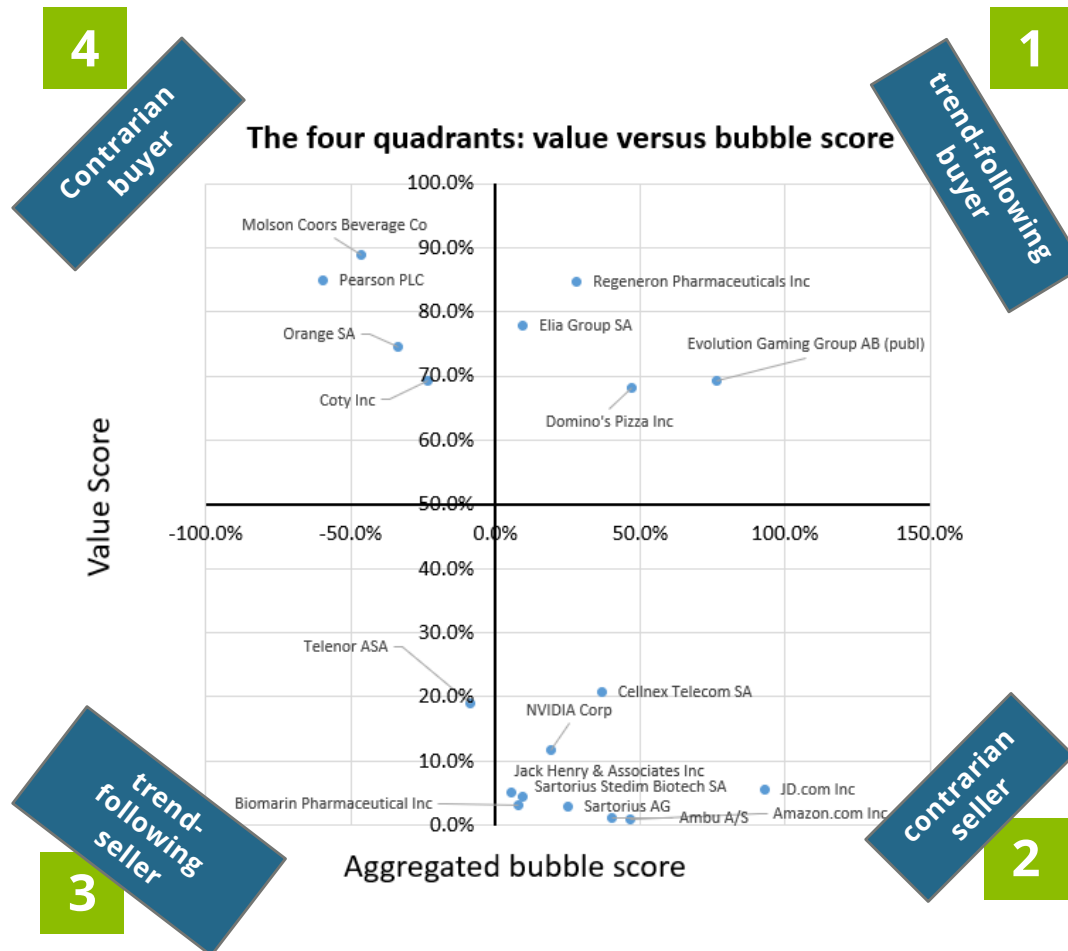
Portfolio Construction & Performance

- ▶ The market continued to rebound in the past month with the injection of liquidity from FED, ECB, BoJ in particular, and positive news of the COVID-19 outbreak, which hit the performance of Short Portfolios but propelled the Long portfolios. 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 quadrants¹⁾



- **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. Elia Group SA
- **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. NVIDIA 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. Telenor ASA
- **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. Pearson 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 768 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.

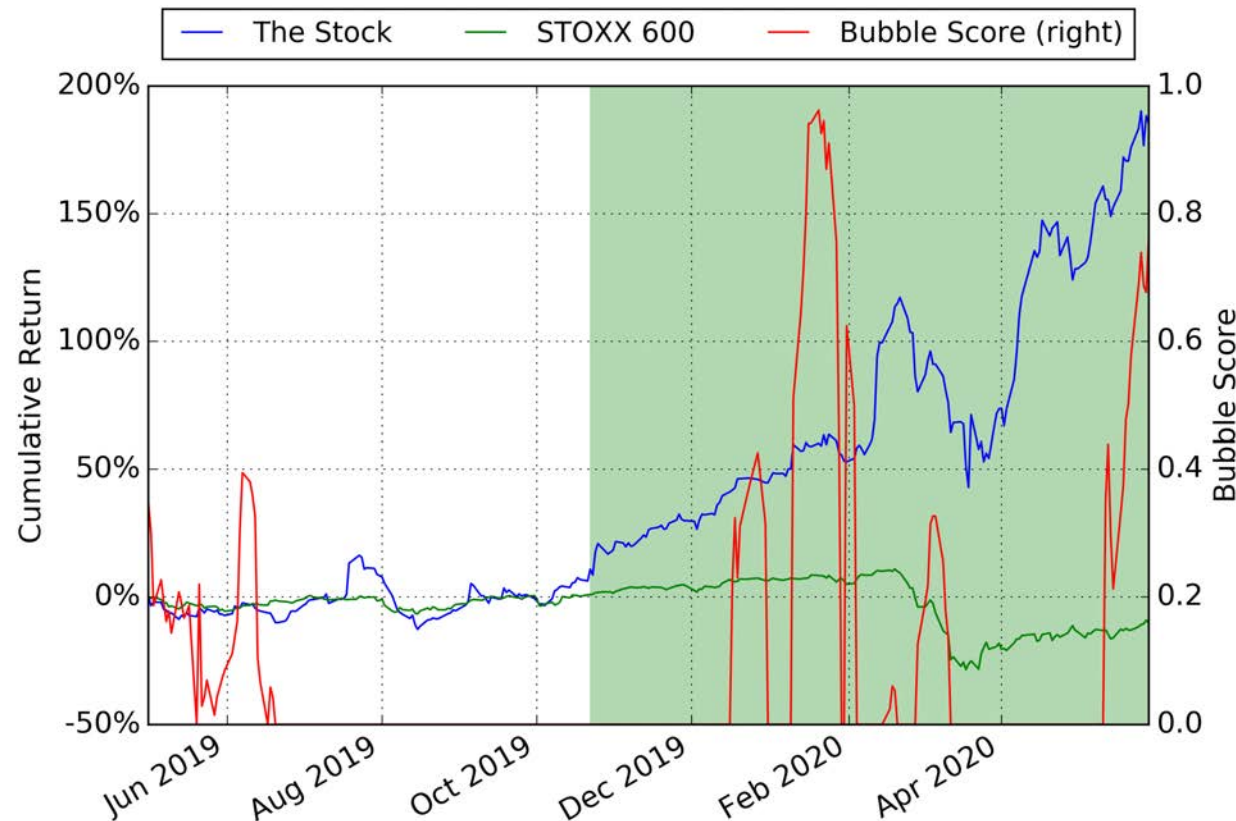
Single Stocks

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 Group SA	Belgium	Utilities	63.5%	44.3%	Sep-19	9.5%	77.9%	13.9%
Evolution Gaming Group AB (publ)	Sweden	Consumer Services	194.4%	142.7%	Oct-19	76.3%	69.4%	59.1%
Domino's Pizza Inc	United States of America	Consumer Services	36.5%	61.4%	Sep-19	46.9%	68.1%	56.9%
Regeneron Pharmaceuticals Inc	United States of America	Pharmaceuticals, Biotechnology & Life Sciences	101.4%	105.6%	Oct-19	28.1%	84.6%	27.6%

Single Stocks

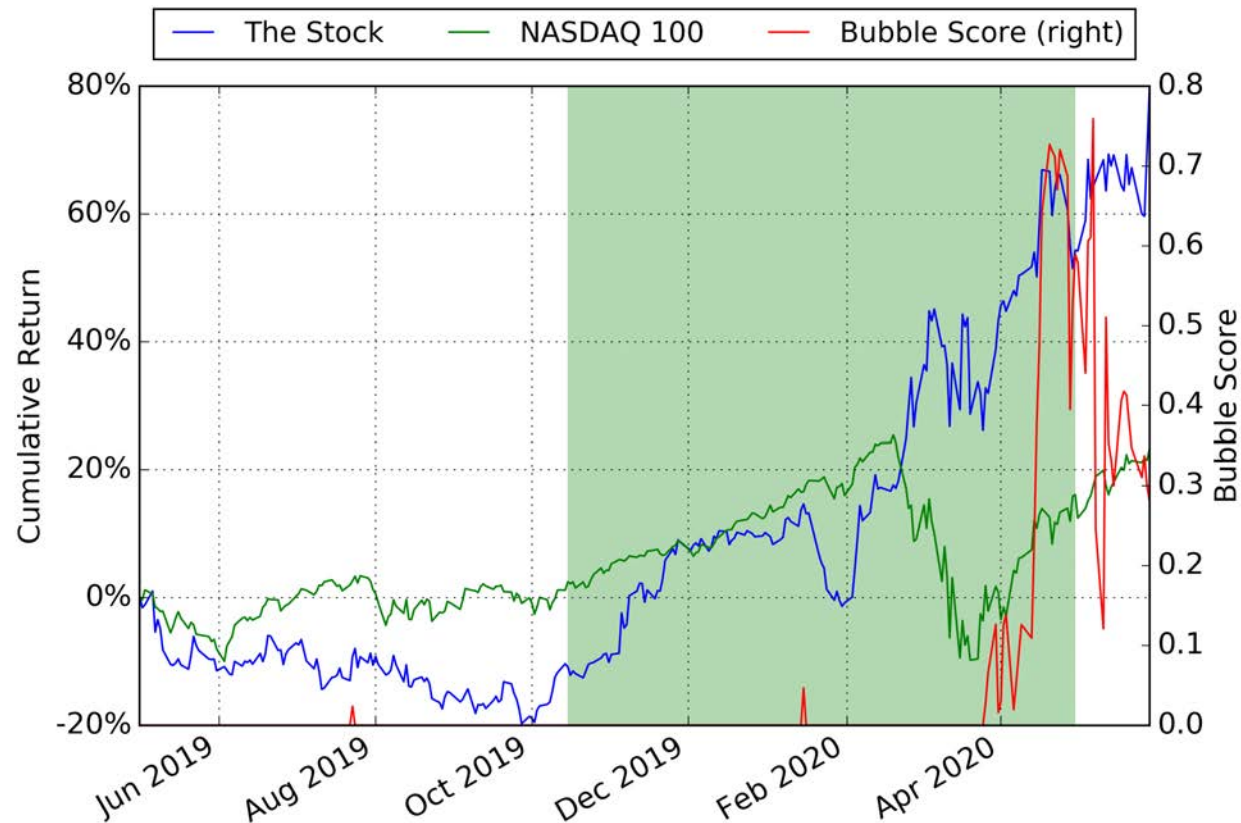
Quadrant 1 Stocks Current Month Example – Evolution Gaming Group AB (publ).



- 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 seven month bubble has reached 76.3% with a bubble size 142.7%.

Single Stocks

Quadrant 1 Stocks Last Month Example – Regeneron Pharmaceuticals Inc.



- The figure above plots the one year cumulative return of the stock (blue), NASDAQ 100 (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 went up 20% more in the past month after a small plateau, which is in agreement with our DS LPPLS indicator and is also supported by the strong fundamentals.

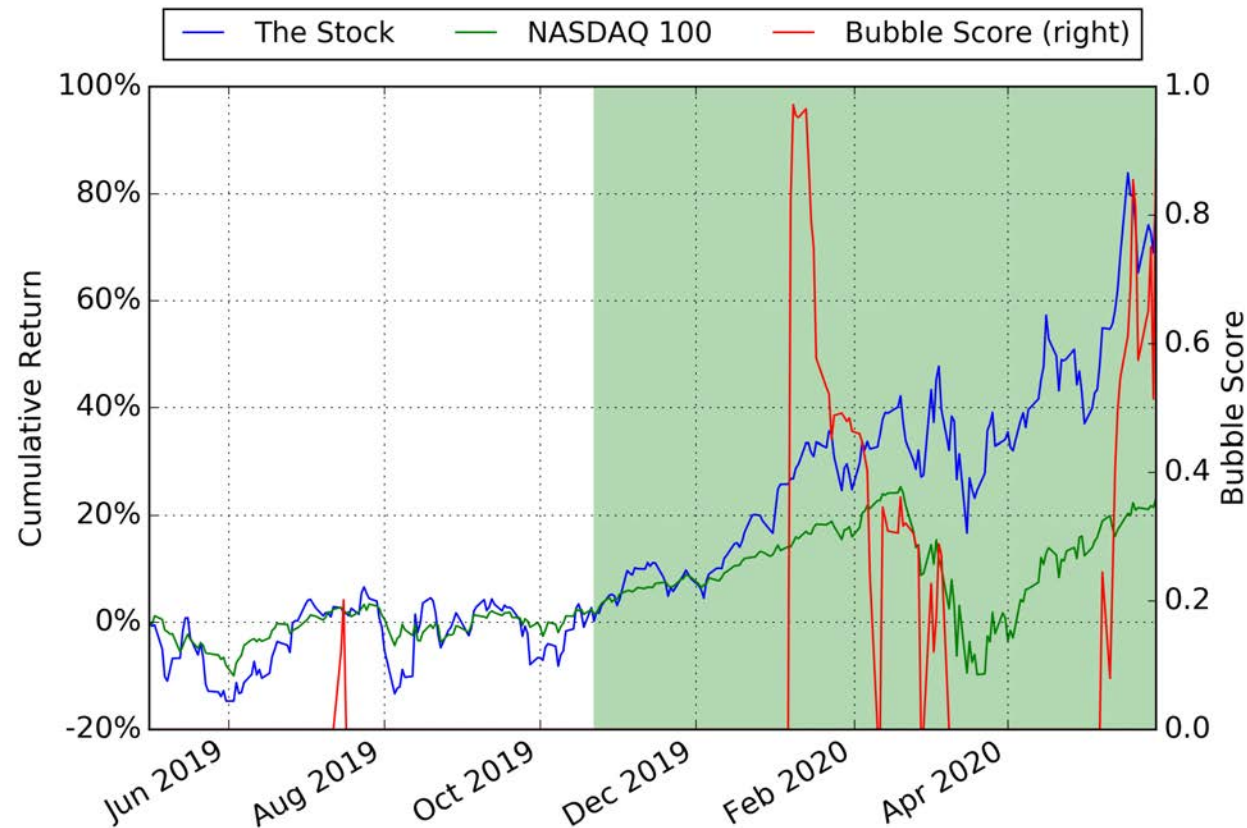
Single Stocks

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
Sartorius AG	Germany	Health Care Equipment & Services	90.7%	77.5%	Aug-19	25.1%	2.9%	49.1%
Ambu A/S	Denmark	Health Care Equipment & Services	123.2%	120.7%	Oct-19	40.2%	1.2%	76.1%
Cellnex Telecom SA	Spain	Telecommunication Services	72.6%	64.9%	Jun-19	36.7%	20.8%	75.5%
Sartorius Stedim Biotech SA	France	Pharmaceuticals, Biotechnology & Life Sciences	89.4%	80.2%	Aug-19	9.3%	4.5%	58.2%
Amazon.com Inc	United States of America	Retailing	31.3%	31.6%	Aug-19	46.6%	0.9%	42.6%
Biomarin Pharmaceutical Inc	United States of America	Pharmaceuticals, Biotechnology & Life Sciences	31.4%	58.1%	Sep-19	8.1%	3.1%	28.9%
Jack Henry & Associates Inc	United States of America	Software & Services	32.1%	24.7%	Aug-19	5.6%	5.1%	54.1%
JD.com Inc	China	Retailing	99.3%	71.2%	Oct-19	92.9%	5.6%	37.9%
NVIDIA Corp	United States of America	Semiconductors & Semiconductor Equipment	139.2%	80.8%	Oct-19	19.3%	11.7%	41.4%

Single Stocks

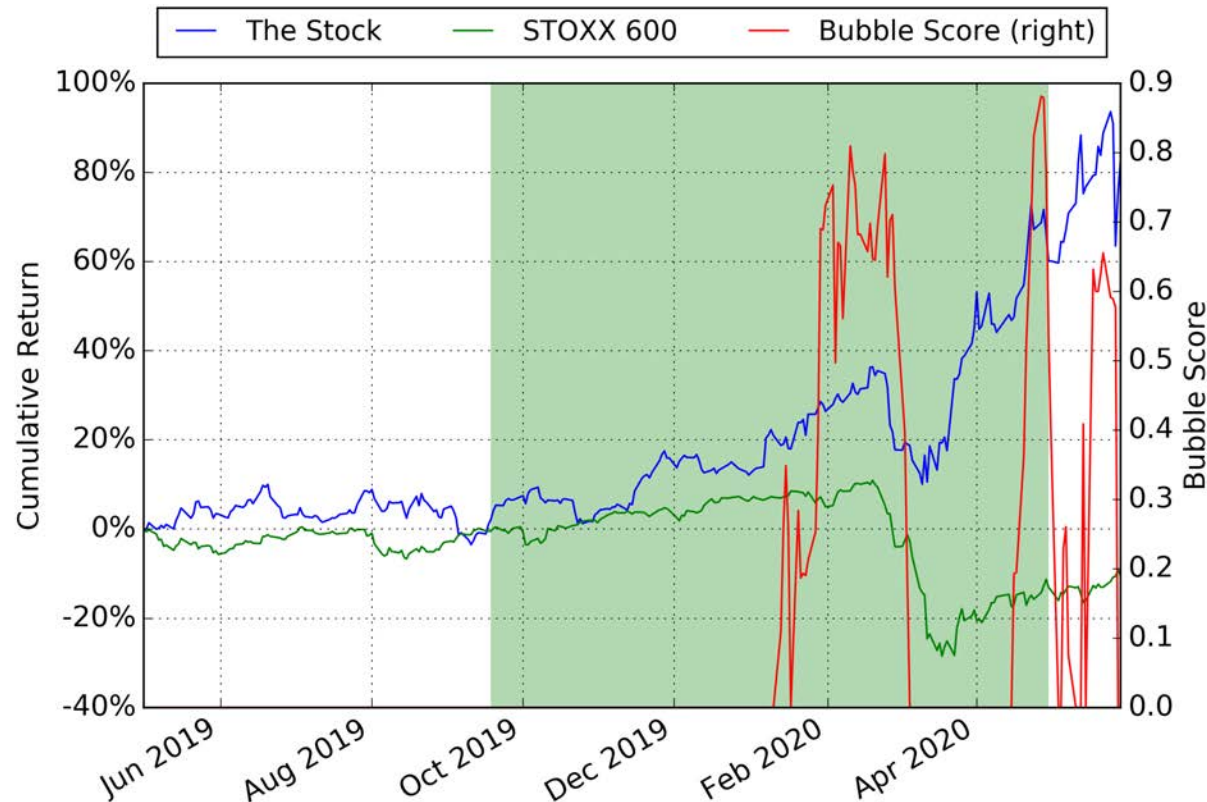
Quadrant 2 Stocks Current Month Example – JD.com Inc.



- 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 eight month bubble has reached 92.9% with a bubble size 71.2%. 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 – Biomerieux SA.



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. Since our analysis, there has been a surge of volatility and the stock price started to correct in the recent week after a new high in the past month. We expect the stock to further depreciate due to the weak fundamentals and the burst of the bubble.

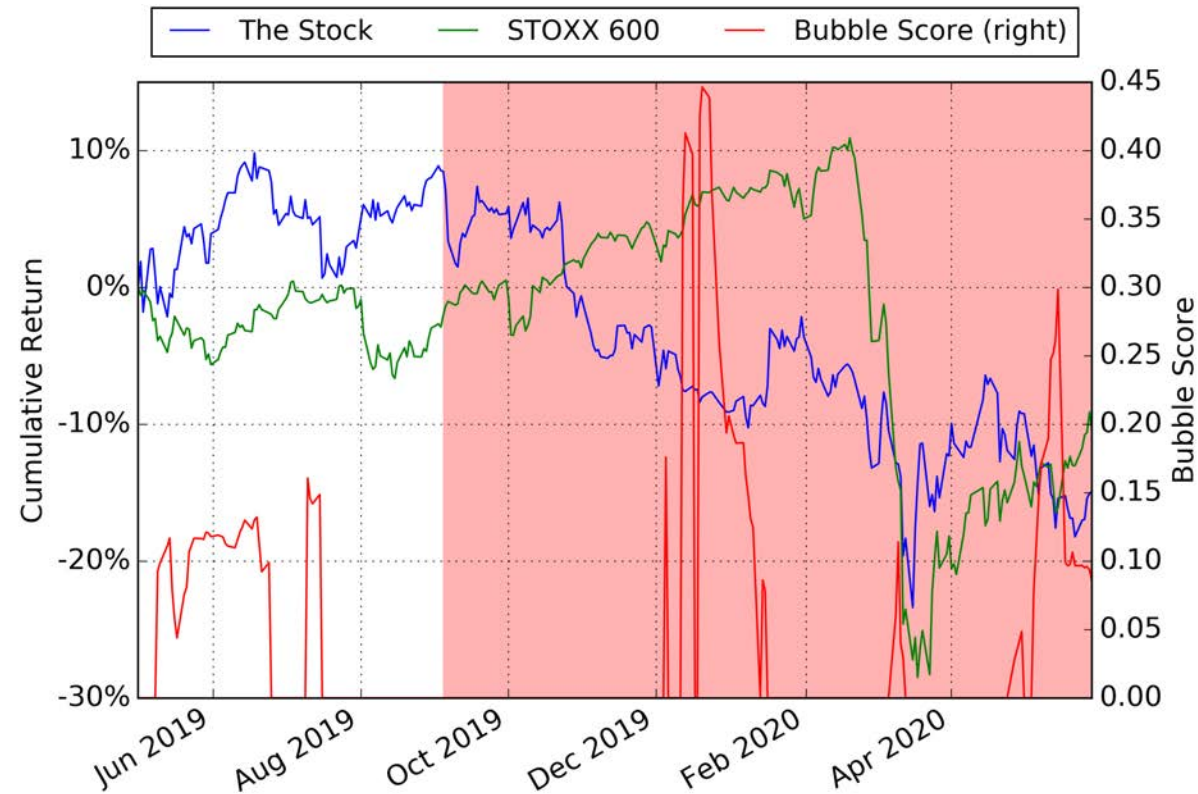
Single Stocks

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
Telenor ASA	Norway	Telecommunication Services	-20.4%	-17.7%	Sep-19	-8.5%	18.9%	11.0%

Single Stocks

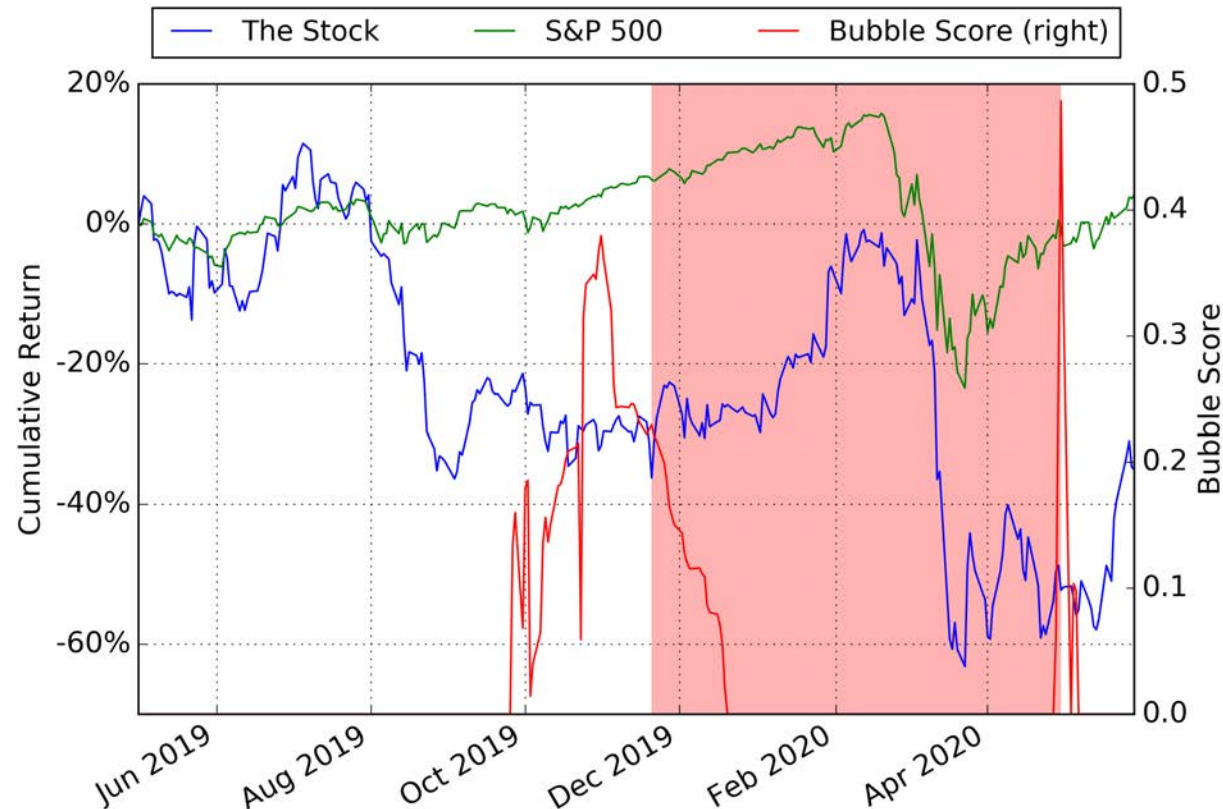
Quadrant 3 Stocks Current Month Example – Telenor ASA.



- 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 nine month bubble has reached 8.5% with a bubble size -17.7%, indicating a early stage bubble that may or may not mature.

Single Stocks

Quadrant 3 Stocks Last Month Example – L Brands Inc.



- The figure above plots the one year cumulative return of the stock (blue), S&P 500 (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 had a strong rebound in the past month following the market's rebound. The weak fundamental of this company under the weak global industrial environment provides limited space for it to further rebound, while we expect increased volatility.

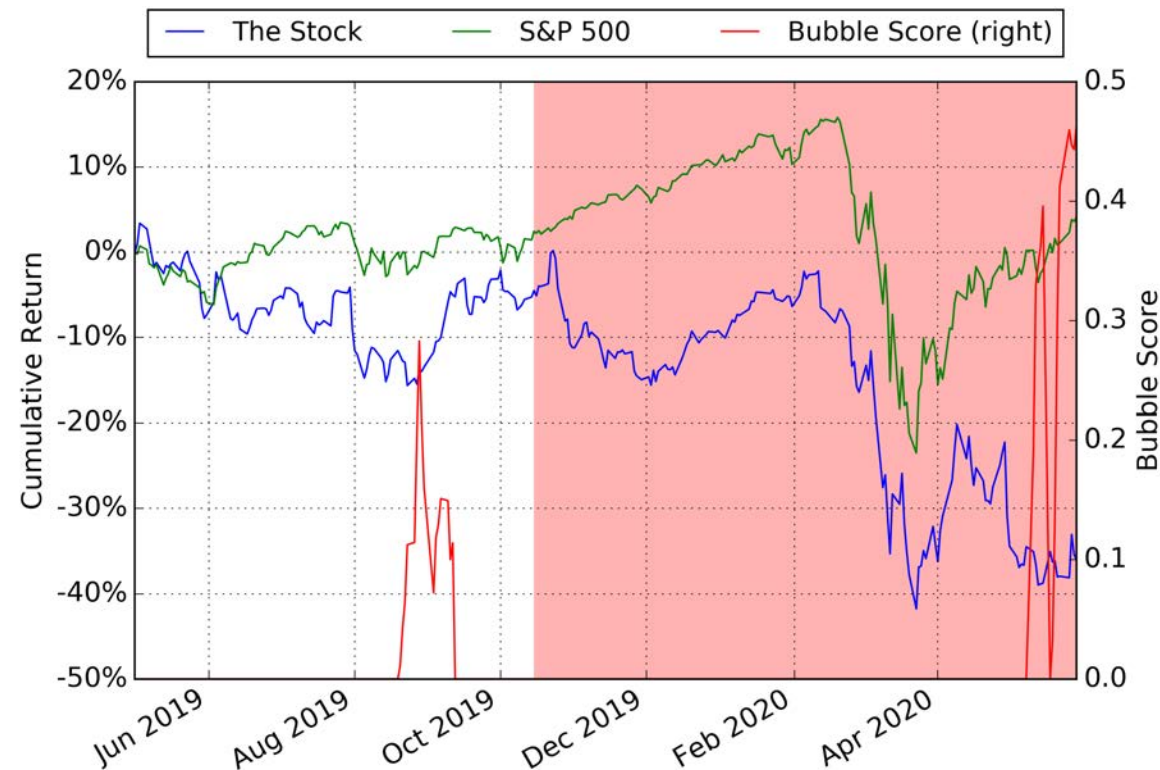
Single Stocks

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
Orange SA	France	Telecommunication Services	-21.2%	-22.3%	Sep-19	-33.9%	74.5%	4.3%
Pearson PLC	United Kingdom	Media & Entertainment	-42.8%	-32.6%	Oct-19	-59.6%	85.0%	6.6%
Coty Inc	United States of America	Household & Personal Products	-73.1%	-72.1%	Nov-19	-23.3%	69.2%	90.8%
Molson Coors Beverage Co	United States of America	Food, Beverage & Tobacco	-30.7%	-33.6%	Oct-19	-46.2%	88.8%	8.2%

Single Stocks

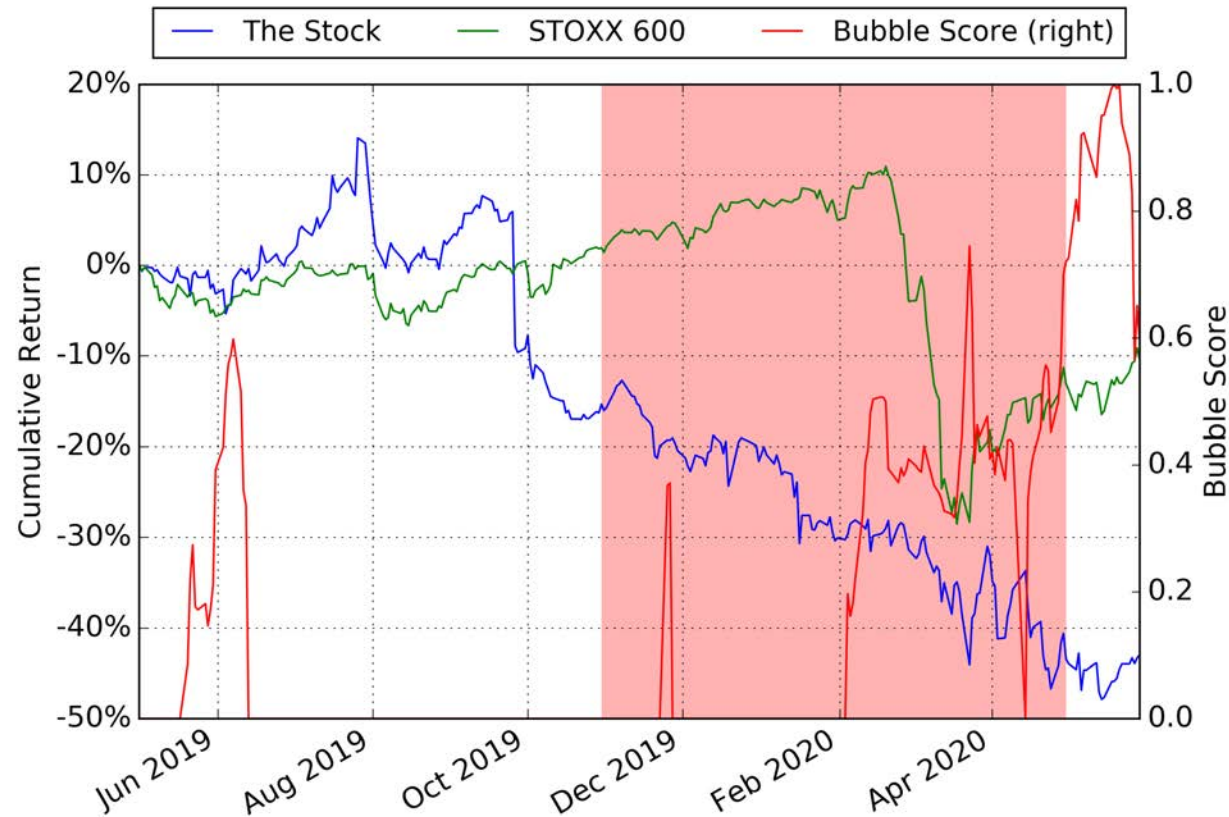
Quadrant 4 Stocks Current Month Example – Molson Coors Beverage Co.



- 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 red shaded period delineates the time interval within which the strong negative bubble is identified. The Bubble Score of this eight month bubble has reached 46.2% with a bubble size -33.6%. 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 – Pearson 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 followed the market's rebound in the past month with a relatively weaker performance. 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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