



The FCO Cockpit Global Bubble Status Report July 2021



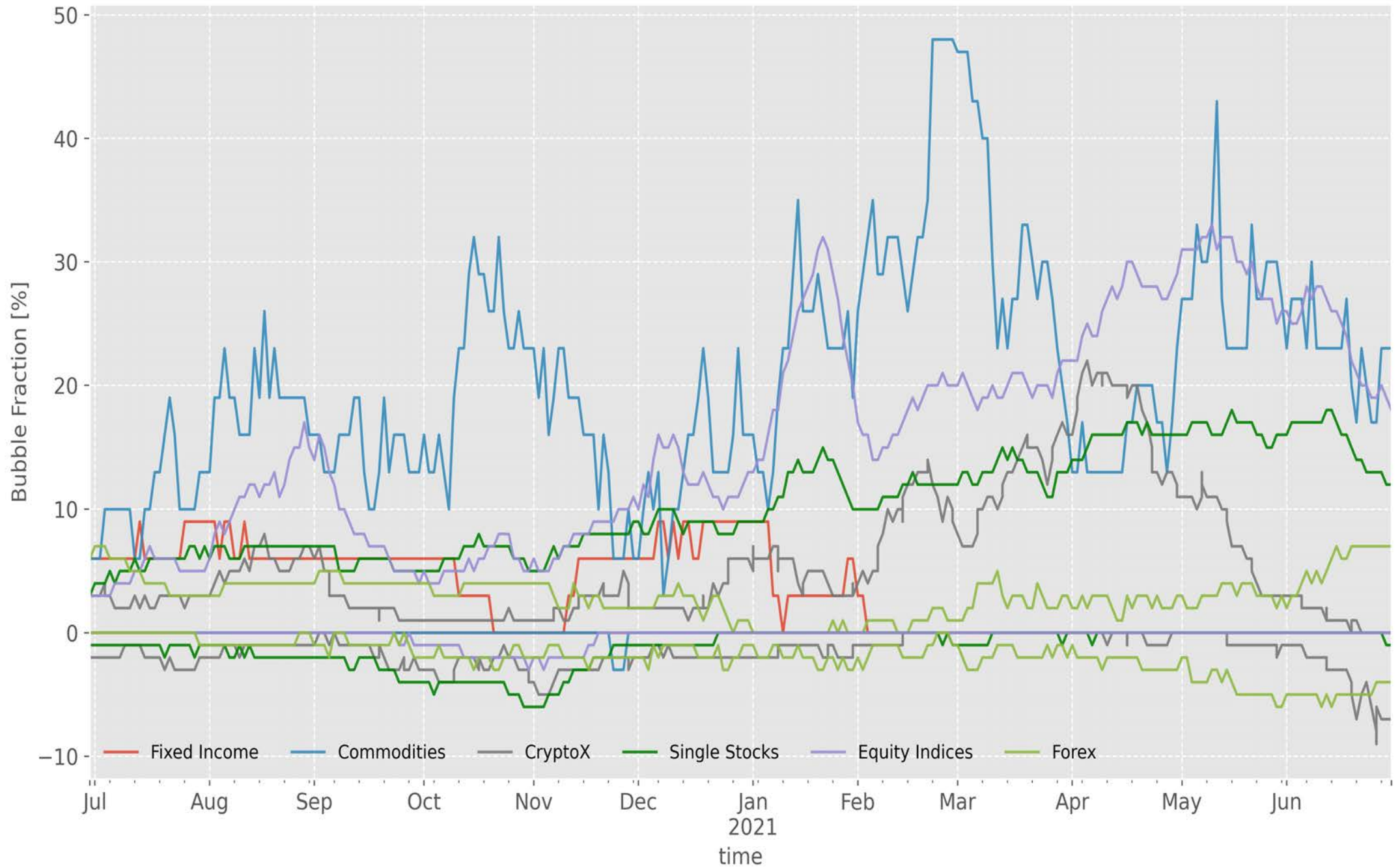
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Purpose and Benefits

- ▶ 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 **crowded** and to what degree they 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 applied to 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.

Fraction of Positive / Negative Bubble Signals for different Asset Classes



General Results as of 2021-06-30

	Region	Analyzed Assets	Fraction of Pos. Bubbles [%]	Fraction of Neg. Bubbles [%]
Fixed Income		33	0	0
Commodities		30	23	0
Single Stocks		1614	12	1
	Europe	941	13	1
	United States	660	12	1
Equity Indices		886	18	0
	Europe	57	19	0
	United States	377	19	0
	Global	383	19	0
Forex		100	7	4
CryptoX		491	0	7

- ▶ As with the previous few months, this month has zero bubble signals in the fixed income sector.
- ▶ In the commodities sector, the positive bubble fraction has fluctuated downward slightly from 27% to 23% during this month, while the negative bubble activity remains zero.
- ▶ Positive bubbles in the single stocks and equity indices sectors have dropped by 4% and 8% to 12% and 18% in this month, respectively, and negative bubbles generally remains unchanged a near-zero level.
- ▶ In this month, both the positive and negative bubble activity in the Forex sector remains low at a level of around 5%, yet a relatively significant increase is observed in the positive bubbles from 3% to 7%.
- ▶ In the cryptoX sector, the positive bubble activity has fallen down from 2% to zero, but the negative bubble fraction has climbed substantially from 1% to 7%. This substantial negative bubble increase plus last month's plunge in the positive bubble activity may be an indication that the correction regime that started about three months ago may be approaching its end and a new regime may be in view. Given the high level of speculation and hype on the cryptocurrencies, and considering China's recent swift and forceful crackdown on cryptocurrency mining and the potential follow-up by other countries, the new regime may be in the form of a long-lived lull. Or it could be a revive of the ascendancy of bitcoin, Ethereum and others.

FCO Market Outlook

Central banks' money printing game

European Central Bank's and Federal Reserve's assets were €1.5 trillion and \$0.9 trillion, respectively (before the 2008 GFC). Then, those mushroomed to €4.7 trillion and \$4.2 trillion before the COVID-19 pandemic. Now, they have around €7.9 trillion and \$8 trillion on their balance sheets. The current ECB is still committed to purchasing €1.85 trillion of bonds until March 2022 as part of its Pandemic Emergency Purchase Program (PEPP), while the Fed keeps injecting \$40 billion every month with its MBS-QE program, and monthly buying treasury securities for \$80 billion.

Assets' Bubbles?

From the graph (right), we can easily understand the report of Credit Suisse's Global Wealth Report that \$28.7 trillion were added to global household wealth over the past year (including \$12.4 trillion for North America; \$9.2 trillion for Europe and \$4.2 trillion for China). The significant liquidity from central banks has inflated all asset classes, and wealthier households have translated windfall savings into equities, cryptocurrencies, luxury products, as well as larger and better homes. As a testimony of this situation, Bernard Arnault, chairman and Chief Executive of LVMH (the world's largest luxury goods company), became the richest man in the world. At the same time, the global house prices and equity indexes have reached a new all-time high for many countries. Who can deny that we are in phenomenal global assets' bubbles?

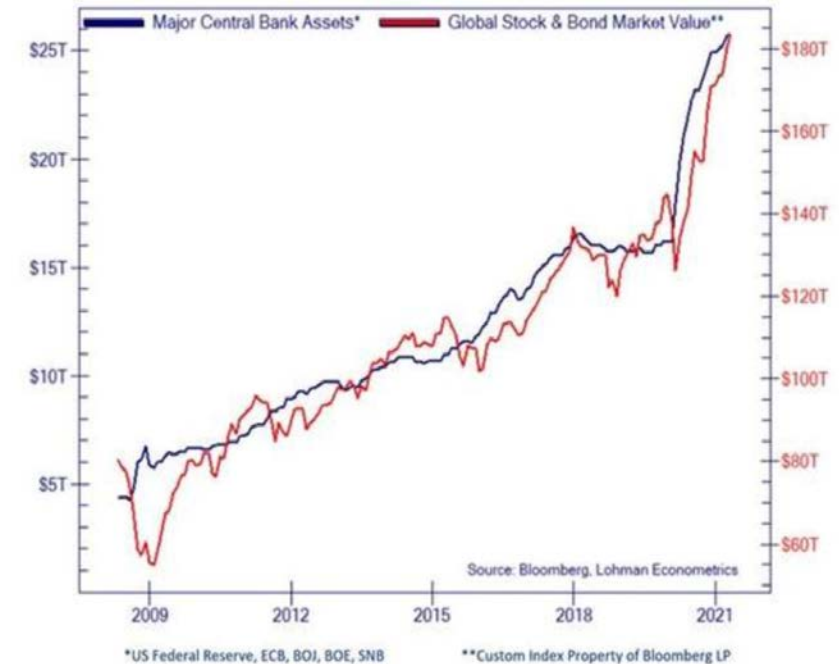
Fix income: In line with our June report, we still reckon that, in Q4 this year, the Fed will begin reducing its QE, at least for the \$40 billion monthly Mortgage Back Security (MBS) purchasing program. Otherwise, the massive inequality between classes will raise a new social problem, and the financial regulators will exacerbate the growing financial instability. Our current view is that the 10-year treasury yield might reach 2%, and inflation might be close to 5% by the year-end if the vaccination progress is on track.

Global equities: The music is still on, and the people at the party are still dancing, thanks to the "hardworking" central bankers. We notice that investors are expecting a continental shift to European countries in the next half-year, since: 1) the ECB commits to continue its Pandemic Emergency Purchase Program (PEPP) until March 2022, no matter what happens; 2) Fiscal stimulation will support demands, as the Next Generation EU recovery fund (roughly € 800 billion) will benefit the European Union's 27 member states; 3) The European equity market is much cheaper than the U.S. equity market (pan-Europe Stoxx Europe 600 is around 16.5 times 2022 estimated earnings, versus the S&P500's price/earnings multiple of 20.4; 4) The current economic cycle of European countries is about to recover from the pandemic, although the Delta variant is still contributing to uncertainties. In addition, the energy sector in some countries is still very cheap, while the current oil price has reached a 6-year high, beyond \$75 per barrel.

Commodities: Although the supply-chain disruption persists in the U.S., the sharp 40%+ plummet of lumber price in June indicates that the recent lumber bubble has burst. There are two possible explanations: a) vaccination progress in the U.S. enables people to travel, to book holidays and perform other outdoor activities (we notice a quick jump of "airline ticket" google search trend in June, as well as airline ticket price increases in recent months), instead of performing home renovations; b) the all-time high lumber price has slowed the building activities. However, given the unsolved housing deficit, the construction activities in the coming year remain a bright spot, which will support the lumber price to some extent. The prices of other commodities are still around recent high.

Real Estate: The current global mega-trends of urbanization and digitization dominate the real estate market, with residential, logistics, and core infrastructure sectors being primary beneficiaries. The post-pandemic work-from-home lifestyle profoundly influences new property developments, especially in the city fringe and suburban markets. We also notice that the demand is outstripping supply for modern logistics since E-commerce is an irreversible trend, accelerated by the global pandemic. The capitalization rate of institutional-grade logistic and core community infrastructure assets might have a further compression, dropping to around 4% in some developed countries.

Major Central Bank Assets vs Global Stock & Bond Market Value



How to read the graphs and tables

DS LPPLS Multi-Scale Confidence Indicators:

- ▶ The graphs below use our extended methodology of the DS LPPLS Confidence Indicator to the so-called Multi-Scale Confidence Indicators (MCI). The MCI are finer version of the Confidence Indicator, computed in the same way, however based on different, sets of fit windows that describe different “timescales of thinking” of investors. More specifically, we base the computation of the MCI on the following window sets:
 - Super-Short (SS) Scale: [40,183] days
 - Short (S) Scale: [40,365] days
 - Medium (M) Scale: [365,730] days
 - Long (L) Scale: [730,1460] days
- ▶ These different sets range from few months up to several years. For each range, LPPLS signals are computed over all contained fit windows in steps of 1 day. The resulting signals are aggregated into four corresponding versions of the Confidence Indicator. These MCI range from very reactive (SS,S) to more stable (M,L) versions. Observing them simultaneously allows understanding the formation and evolution of speculative bubbles in more detail.
- ▶ Based on these four new indicators, the indicator plots show the detailed positive and negative bubble indicator timeseries for all four of them. In the asset tables, we report only the strongest of the four in the column “DS LPPLS Confidence”. The new column “strongest signal” indicates which of the four indicator this corresponds to.

How to read the graphs and tables

Additional Bubble Metrics:

- ▶ We show the top positive and negative bubble signals, as well as the corresponding bubble characteristics.
- ▶ The “**bubble CAGR**” (bg) measures the annualized compound bubble growth (bg) of the price during a bubble phase, as implied by the size (bs) and duration (bd) of a bubble.

$$bg = \exp\left(\frac{\ln(bs+1)}{bd}\right)$$

- ▶ The **bubble size** since the bubble start t_1 is $bs = \frac{p_t}{p_1} - 1$ and the bubble duration is $bd = t - t_1$
- ▶ By estimation of the start time t_1 and the predicted end time t_c of a bubble, the **progress of the bubble** at the current time t is computed as:

$$bp = \frac{t-t_1}{t_c-t_1}$$

- ▶ Thus, the bubble progress measures the percentage of time until the predicted end of the bubble that has passed so far (i.e. until t) since the beginning of the bubble. The numerator is the **current bubble duration** and the divisor $t_c - t_1$ is the “**implied bubble duration**”, implied by the LPPLS model.

New Ranking Methodology:

- ▶ We rank top positive and negative bubble signals from our database according to the **geometric average** of the confidence indicator, the bubble CAGR and the bubble progress:

$$ga = (ci \cdot bg \cdot bp)^{1/3}$$

- ▶ This geometric average considers the strength of the bubble signal, the intensity of the bubble (compound growth), as well as the maturity of the bubble. These three metrics characterize the most relevant “dimensions” of a bubble and thus, the geometric average is a reasonable choice to rank bubble signals.

Fixed Income

No bubbles to report

Commodities

Mlcx Natural Gas Spot Index

Rank	Strongest Signal	DS-LPPLS Confidence <i>ci</i> [%]	Bubble Size <i>bs</i> [%]	Bubble CAGR <i>bg</i> [%]	Duration [days]	Bubble Progress <i>bp</i> [%]	Geometric Average (<i>ci, bg, bp</i>)	Critical Time \hat{t}_c	Scenario Probability [%]
1	Super Short	43.8	35.46	163.3	79	99.13	89.17	2021-07-01	99.99



MLcx Unseasonal Nat. Gas Spot Index

Rank	Strongest Signal	DS-LPPLS Confidence ci [%]	Bubble Size bs [%]	Bubble CAGR bg [%]	Duration [days]	Bubble Progress bp [%]	Geometric Average (ci, bg, bp)	Critical Time \hat{t}_c	Scenario Probability [%]
2	Super Short	20.82	44.74	230.24	78	99.99	78.26	2021-06-30	99.99



Mlxx Energy Spot Index

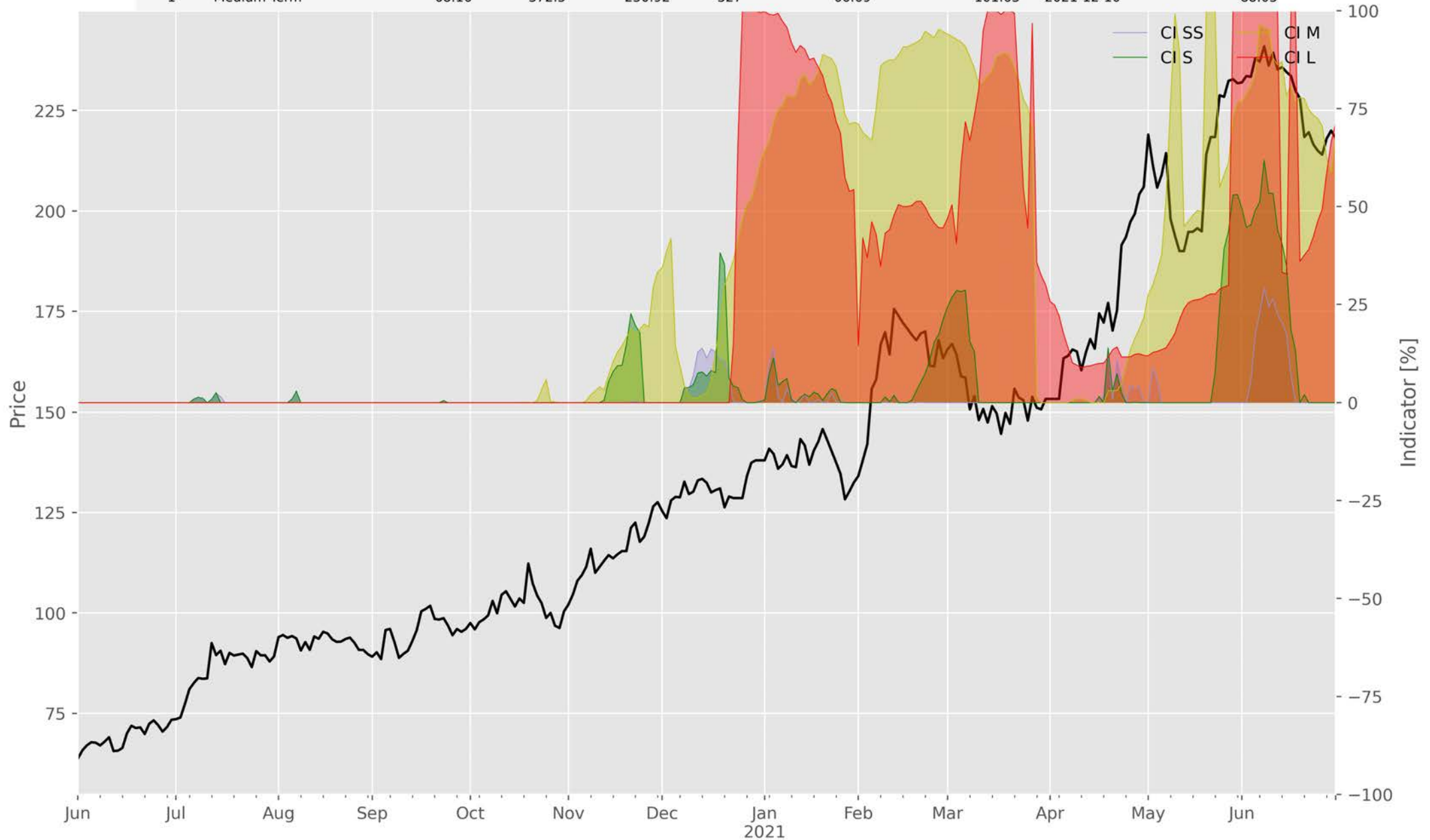
Rank	Strongest Signal	DS-LPPLS Confidence	Bubble Size	Bubble CAGR	Duration	Bubble Progress	Geometric Average	Critical Time	Scenario Probability
		ci [%]	bs [%]	bg [%]	[days]	bp [%]	(ci, bg, bp)	\hat{t}_c	[%]
3	Super Short	53.04	18.14	75.11	75	87.8	70.46	2021-07-10	99.99



Single Stocks

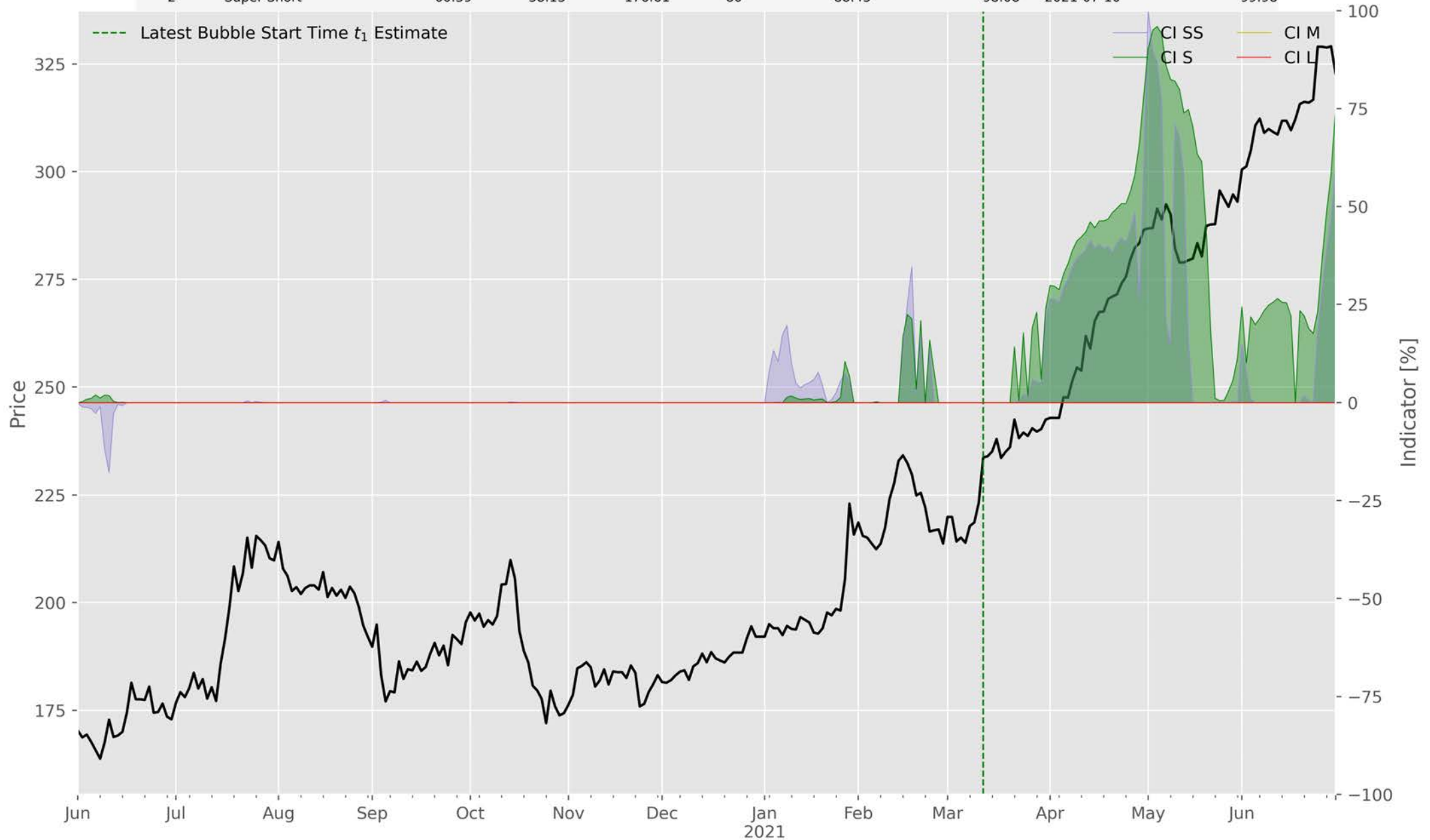
Nordic Semiconductor

Rank	Strongest Signal	DS-LPPLS Confidence	Bubble Size	Bubble CAGR	Duration	Bubble Progress	Geometric Average	Critical Time	Scenario Probability
		ci [%]	bs [%]	bg [%]	[days]	bp [%]	(ci, bg, bp)	\hat{t}_c	[%]
1	Medium Term	68.16	372.5	230.92	327	66.69	101.63	2021-12-10	88.05



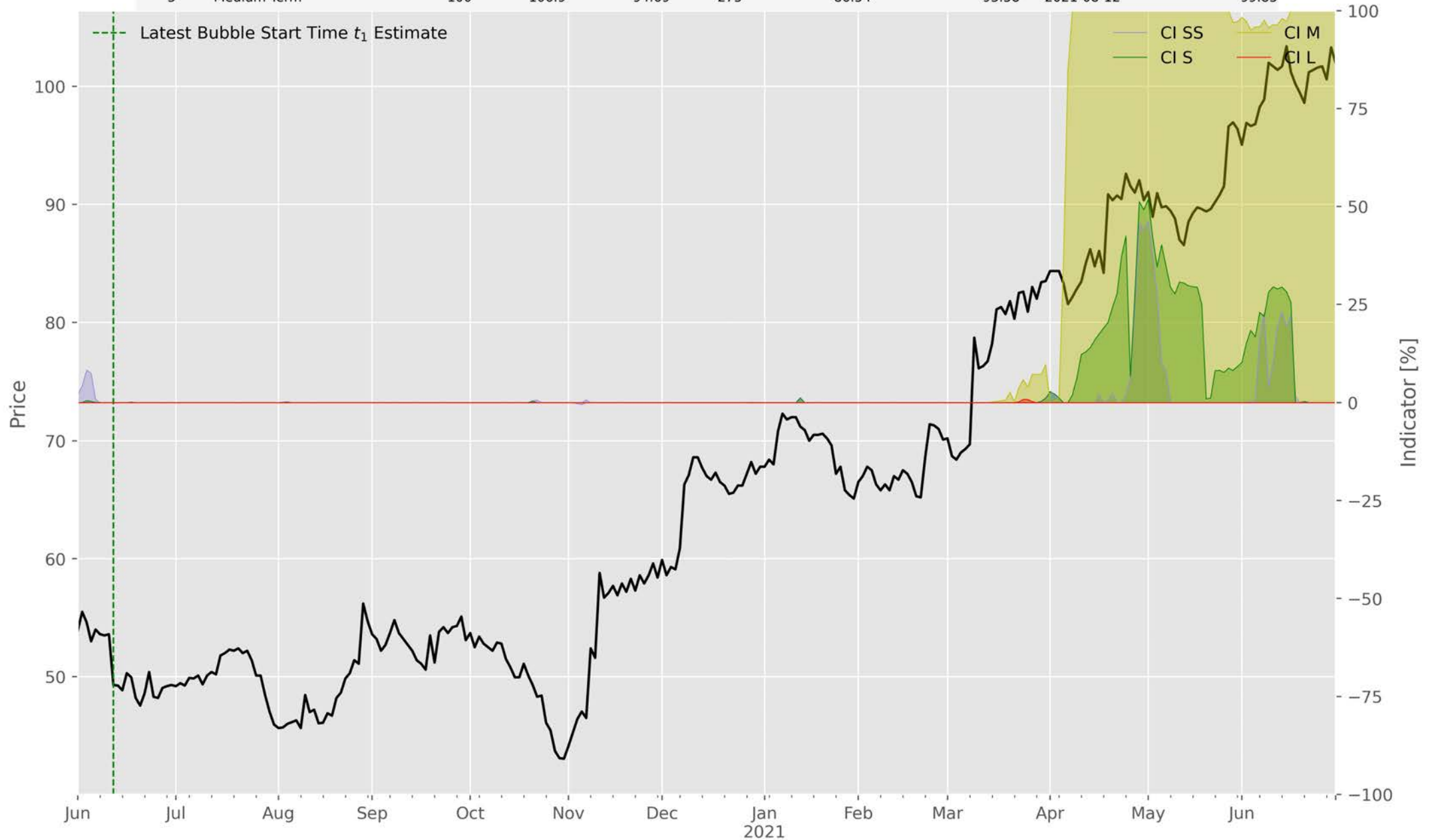
Getinge B

Rank	Strongest Signal	DS-LPPLS Confidence <i>ci</i> [%]	Bubble Size <i>bs</i> [%]	Bubble CAGR <i>bg</i> [%]	Duration [days]	Bubble Progress <i>bp</i> [%]	Geometric Average (<i>ci</i> , <i>bg</i> , <i>bp</i>)	Critical Time \hat{t}_c	Scenario Probability [%]
2	Super Short	60.39	38.13	176.61	80	88.45	98.08	2021-07-10	99.98



D'leteren

Rank	Strongest Signal	DS-LPPLS Confidence	Bubble Size	Bubble CAGR	Duration	Bubble Progress	Geometric Average	Critical Time	Scenario Probability
		ci [%]	bs [%]	bg [%]	[days]	bp [%]	(ci, bg, bp)	\hat{t}_c	[%]
3	Medium Term	100	106.9	94.69	275	86.54	93.58	2021-08-12	99.85



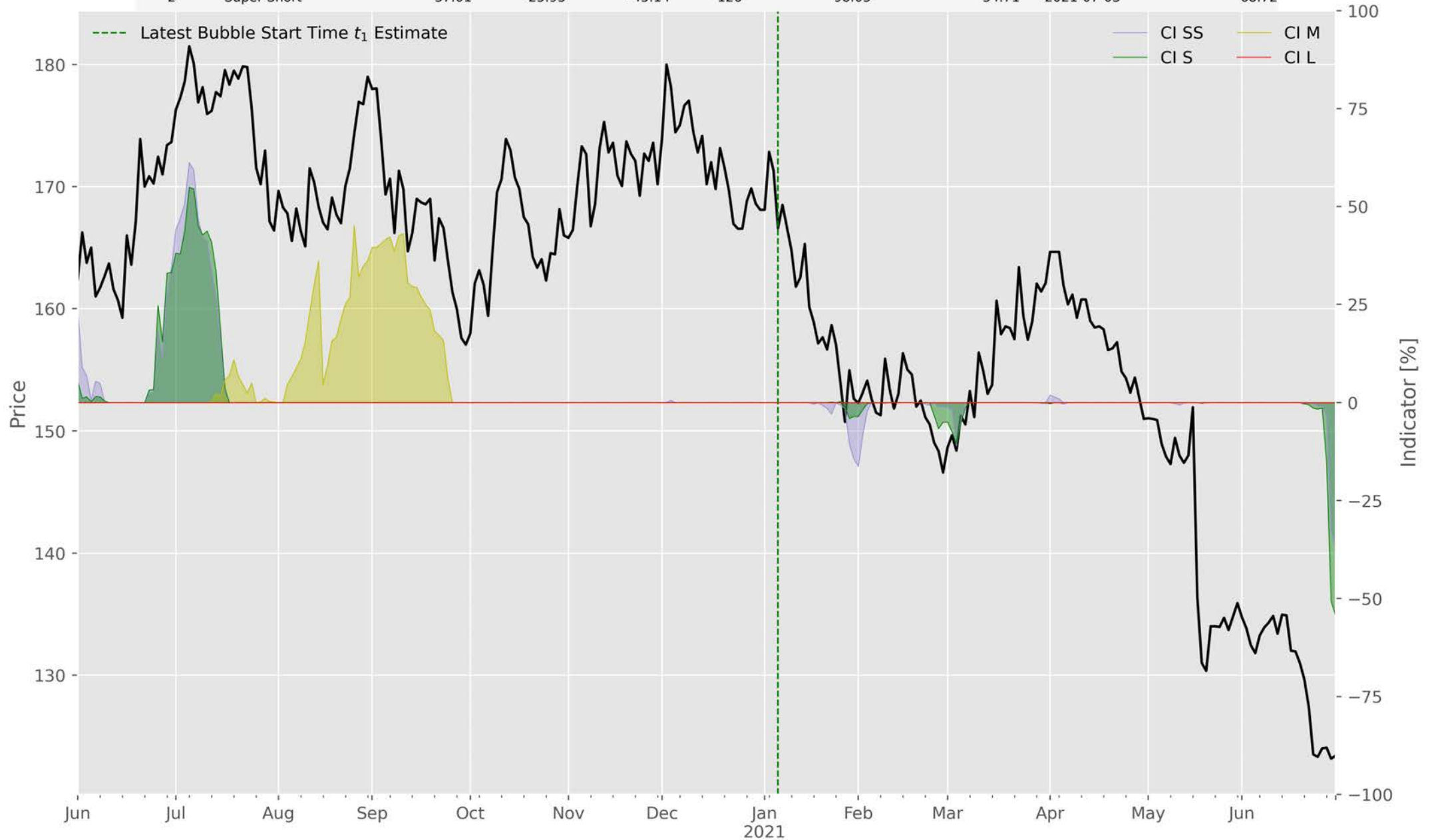
Morphosys (Xet)

Rank	Strongest Signal	DS-LPPLS Confidence <i>ci</i> [%]	Bubble Size <i>bs</i> [%]	Bubble CAGR <i>bg</i> [%]	Duration [days]	Bubble Progress <i>bp</i> [%]	Geometric Average (<i>ci</i> , <i>bg</i> , <i>bp</i>)	Critical Time \hat{t}_c	Scenario Probability [%]
1	Medium Term	57.8	-36.05	-31.22	301	96.08	55.76	2021-07-12	37.03



Iliad

Rank	Strongest Signal	DS-LPPLS Confidence ci [%]	Bubble Size bs [%]	Bubble CAGR bg [%]	Duration [days]	Bubble Progress bp [%]	Geometric Average (ci, bg, bp)	Critical Time \hat{t}_c	Scenario Probability [%]
2	Super Short	37.01	-25.93	-45.14	126	98.05	54.71	2021-07-03	68.72



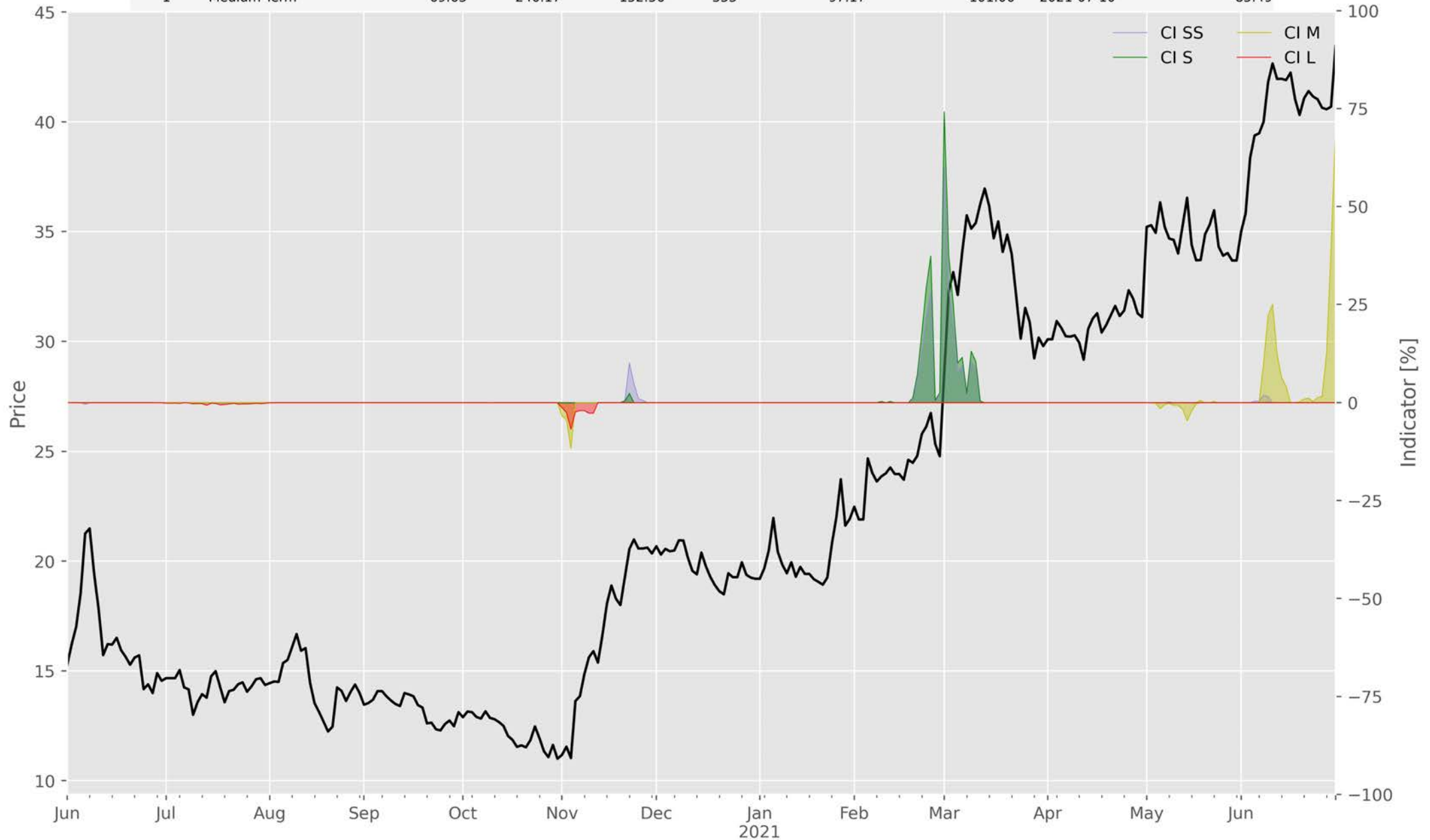
Magnora

Rank	Strongest Signal	DS-LPPLS Confidence	Bubble Size	Bubble CAGR	Duration	Bubble Progress	Geometric Average	Critical Time	Scenario Probability
		ci [%]	bs [%]	bg [%]	[days]	bp [%]	(ci, bg, bp)	\hat{t}_c	[%]
3	Super Short	23.04	-33.79	-61.79	108	95.07	51.34	2021-07-06	78.46



Meredith

Rank	Strongest Signal	DS-LPPLS Confidence	Bubble Size	Bubble CAGR	Duration	Bubble Progress	Geometric Average	Critical Time	Scenario Probability
		ci [%]	bs [%]	bg [%]	[days]	bp [%]	(ci, bg, bp)	\hat{t}_c	[%]
1	Medium Term	69.63	240.17	152.56	333	97.17	101.06	2021-07-10	85.49



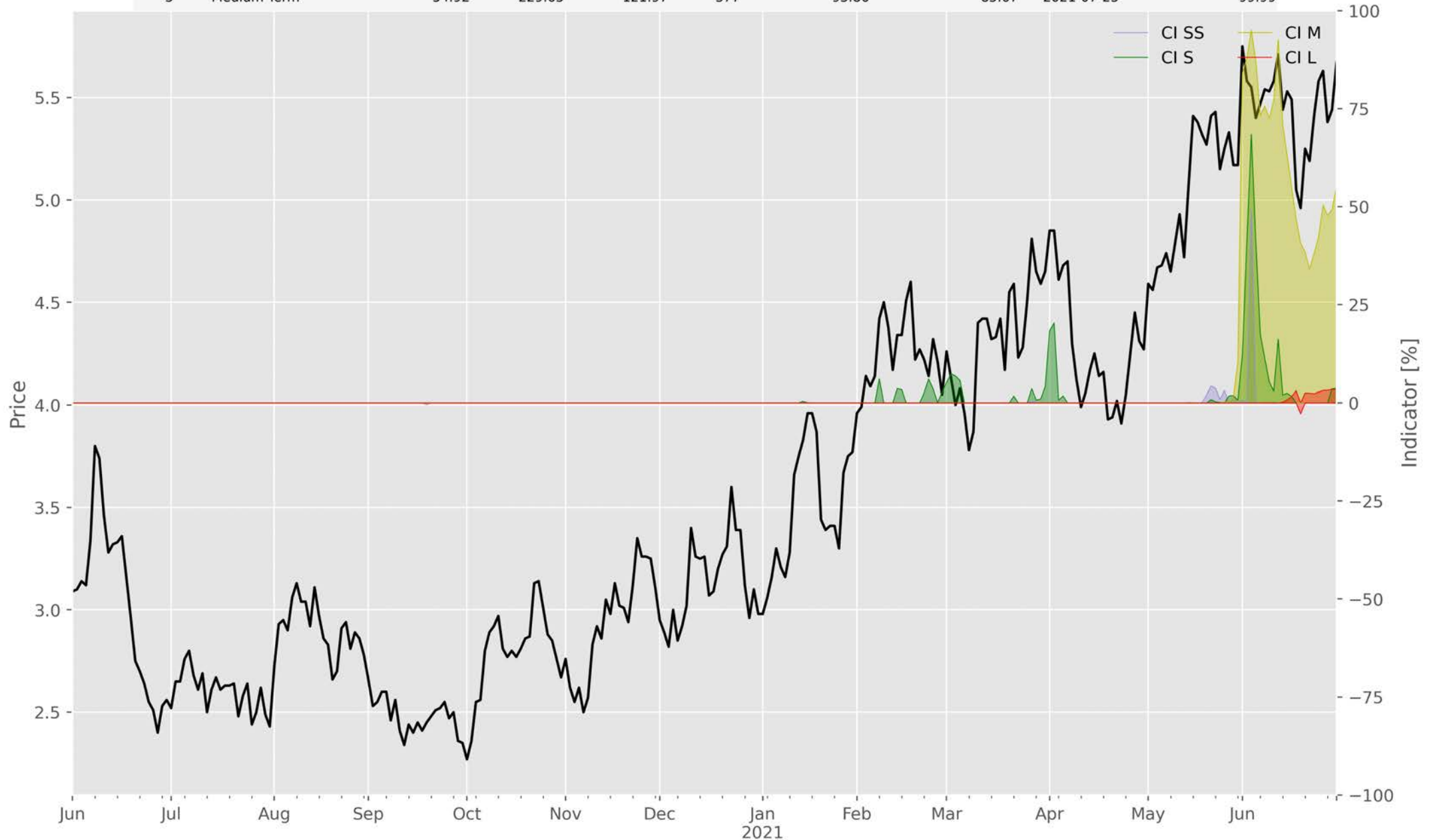
Genesco

Rank	Strongest Signal	DS-LPPLS Confidence	Bubble Size	Bubble CAGR	Duration	Bubble Progress	Geometric Average	Critical Time	Scenario Probability
		ci [%]	bs [%]	bg [%]	[days]	bp [%]	(ci, bg, bp)	\hat{t}_c	[%]
2	Super Short	36.91	76.74	221.18	123	91.32	90.68	2021-07-12	99.96



Southwestern Energy

Rank	Strongest Signal	DS-LPPLS Confidence	Bubble Size	Bubble CAGR	Duration	Bubble Progress	Geometric Average	Critical Time	Scenario Probability
		ci [%]	bs [%]	bg [%]	[days]	bp [%]	(ci, bg, bp)	\hat{t}_c	[%]
3	Medium Term	54.92	229.65	121.97	377	93.86	85.67	2021-07-25	99.99



Newmarket

Rank	Strongest Signal	DS-LPPLS Confidence <i>ci</i> [%]	Bubble Size <i>bs</i> [%]	Bubble CAGR <i>bg</i> [%]	Duration [days]	Bubble Progress <i>bp</i> [%]	Geometric Average (<i>ci</i> , <i>bg</i> , <i>bp</i>)	Critical Time \hat{t}_c	Scenario Probability [%]
1	Super Short	28.04	-24.88	-43.57	126	86.49	47.28	2021-07-20	89.42



Clorox

Rank	Strongest Signal	DS-LPPLS Confidence	Bubble Size	Bubble CAGR	Duration	Bubble Progress	Geometric Average	Critical Time	Scenario Probability
		ci [%]	bs [%]	bg [%]	[days]	bp [%]	(ci, bg, bp)	\hat{t}_c	[%]
2	Short Term	11.83	-21.95	-21.95	252	66.73	25.88	2021-11-03	81.68



Equity Indices

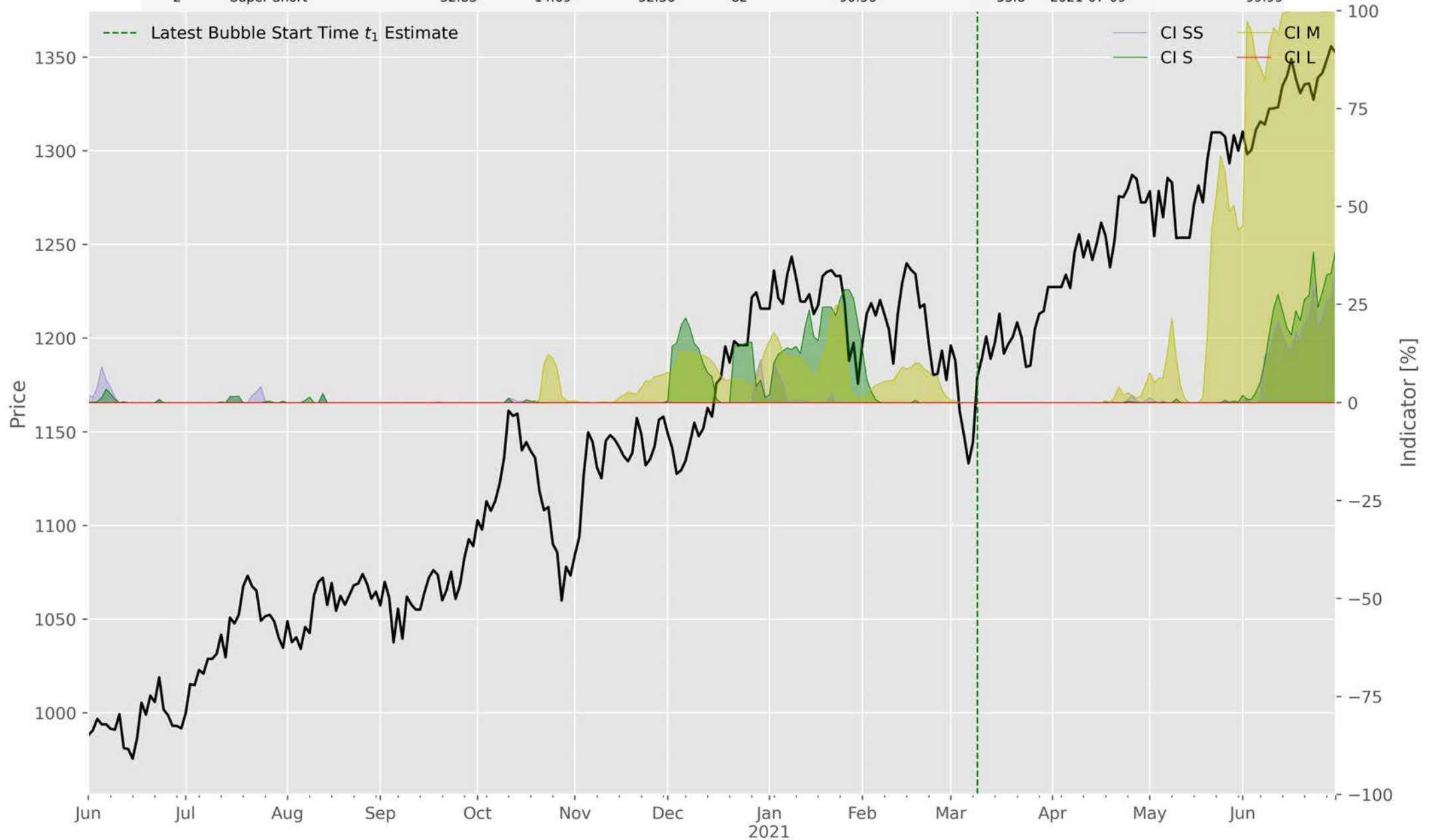
Omx Vilnius (Omxv)

Rank	Strongest Signal	DS-LPPLS Confidence <i>ci</i> [%]	Bubble Size <i>bs</i> [%]	Bubble CAGR <i>bg</i> [%]	Duration [days]	Bubble Progress <i>bp</i> [%]	Geometric Average (<i>ci, bg, bp</i>)	Critical Time \hat{t}_c	Scenario Probability [%]
1	Medium Term	99.29	43.39	32.7	321	73.6	62.05	2021-10-23	42.77



Omx Copenhagen (Omx)

Rank	Strongest Signal	DS-LPPLS Confidence ci [%]	Bubble Size bs [%]	Bubble CAGR bg [%]	Duration [days]	Bubble Progress bp [%]	Geometric Average (ci, bg, bp)	Critical Time \hat{t}_c	Scenario Probability [%]
2	Super Short	32.83	14.69	52.36	82	90.56	53.8	2021-07-09	99.99



Omx Helsinki (Omxh)

Rank	Strongest Signal	DS-LPPLS Confidence	Bubble Size	Bubble CAGR	Duration	Bubble Progress	Geometric Average	Critical Time	Scenario Probability
		ci [%]	bs [%]	bg [%]	[days]	bp [%]	(ci, bg, bp)	\hat{t}_c	[%]
3	Short Term	63.36	17.45	28.63	161	81.61	52.9	2021-08-05	99.98



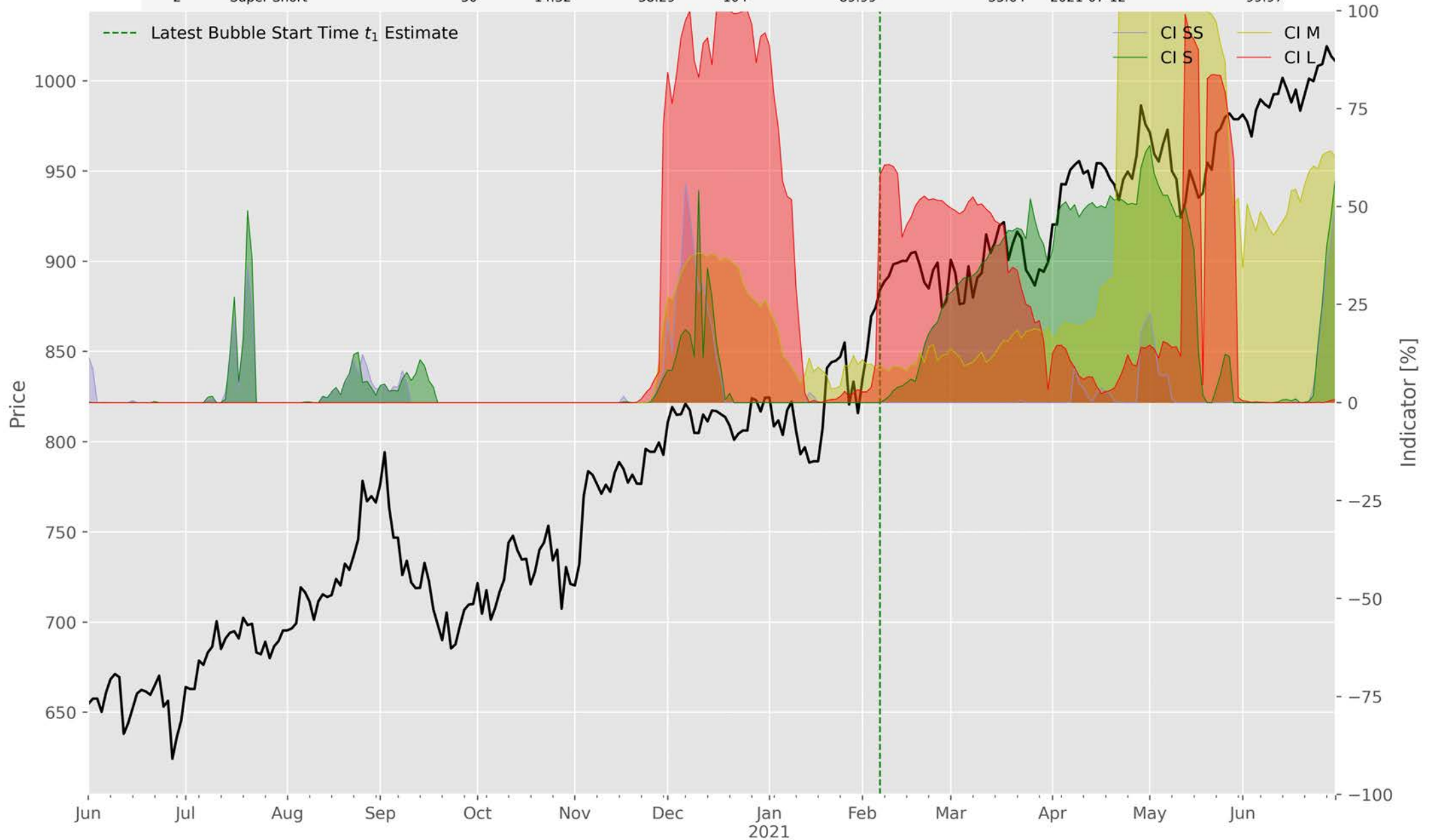
S&P500 Trucking

Rank	Strongest Signal	DS-LPPLS Confidence	Bubble Size	Bubble CAGR	Duration	Bubble Progress	Geometric Average	Critical Time	Scenario Probability
		ci [%]	bs [%]	bg [%]	[days]	bp [%]	(ci, bg, bp)	\hat{t}_c	[%]
1	Long Term	97.17	127.69	45.89	549	66.69	66.75	2022-03-31	55.63



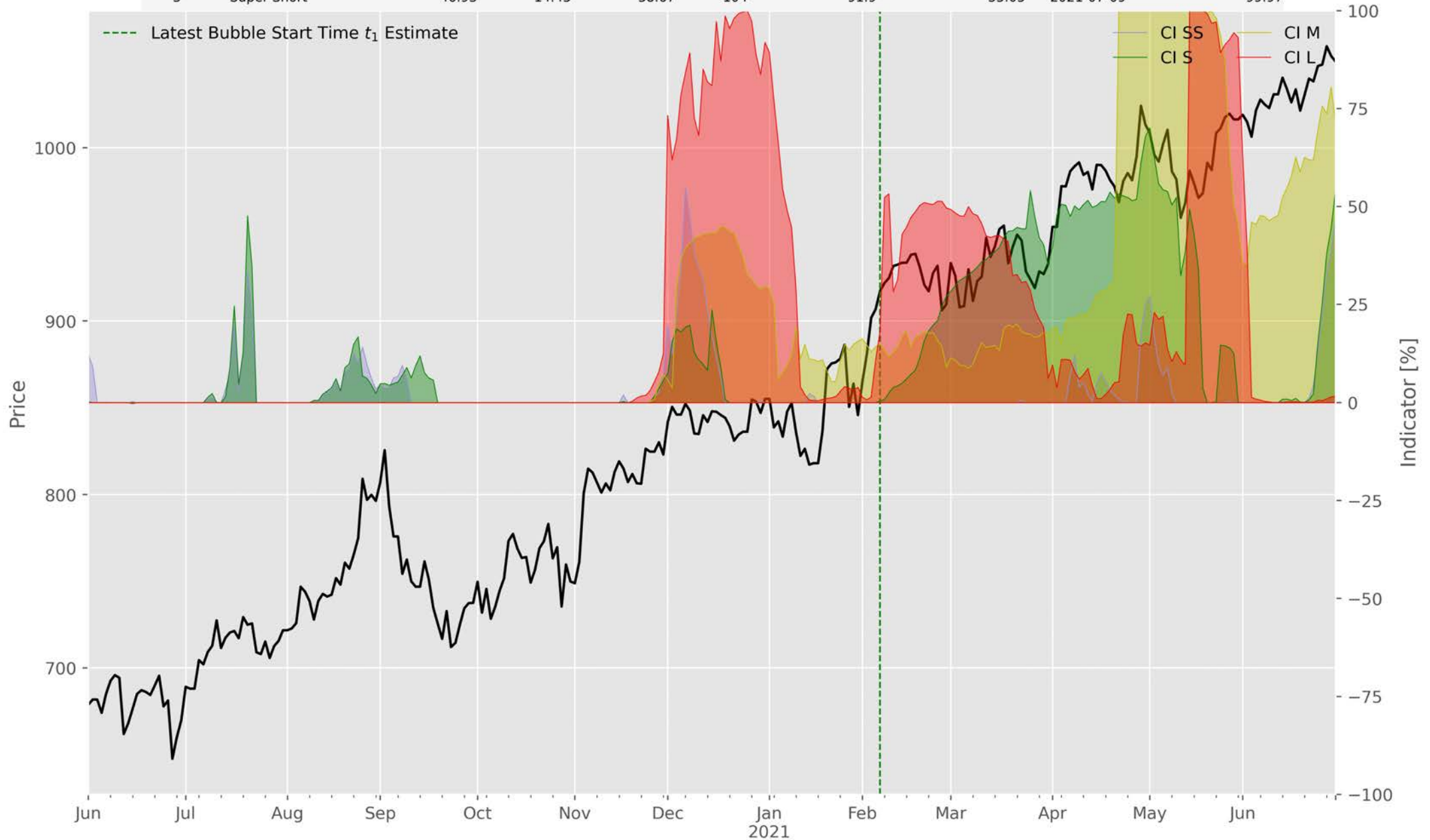
S&P1500 Media & Ent

Rank	Strongest Signal	DS-LPPLS Confidence ci [%]	Bubble Size bs [%]	Bubble CAGR bg [%]	Duration [days]	Bubble Progress bp [%]	Geometric Average (ci, bg, bp)	Critical Time \hat{t}_c	Scenario Probability [%]
2	Super Short	50	14.32	38.29	104	89.99	55.64	2021-07-12	99.97



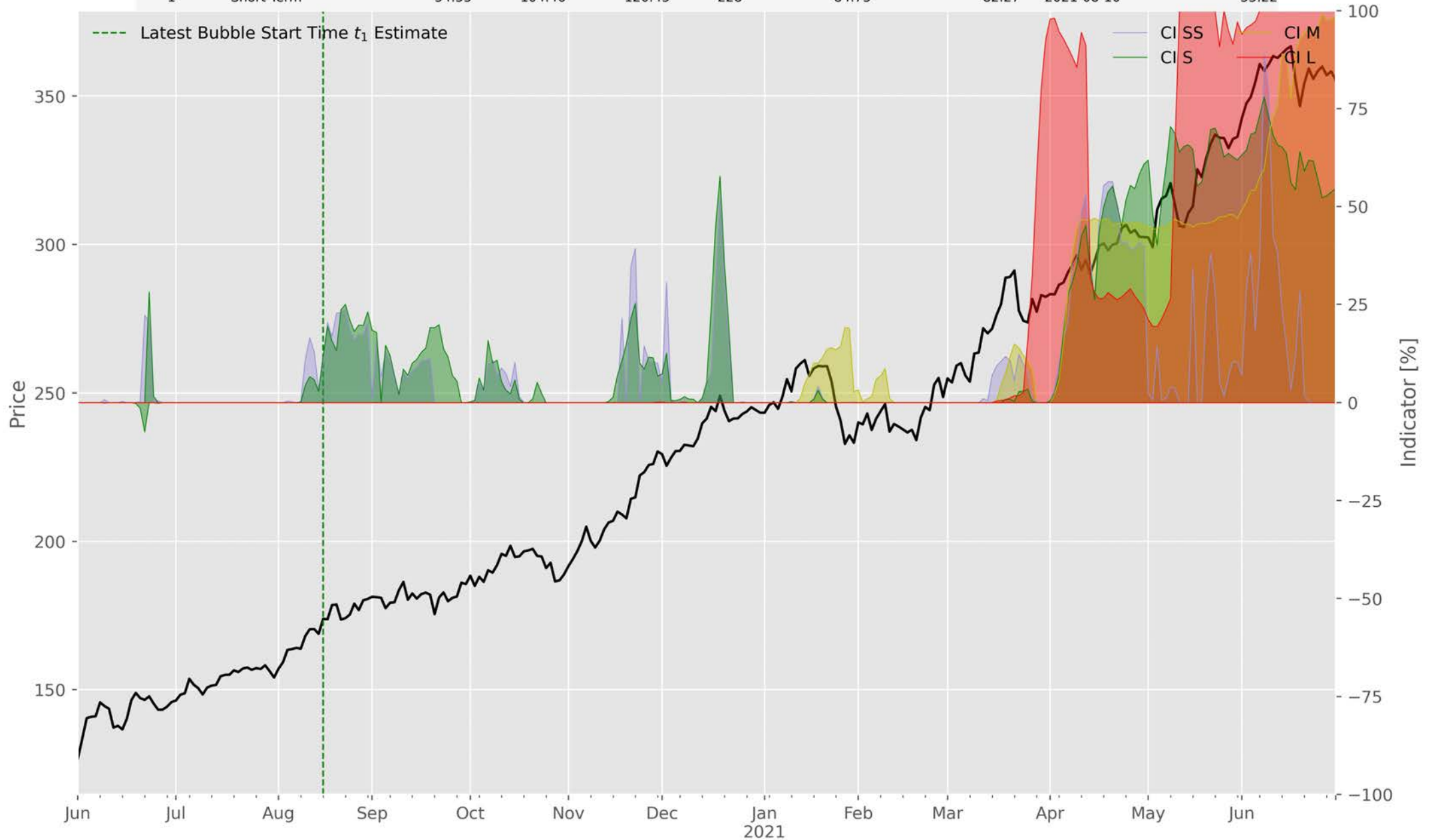
S&P500 Media & Ent

Rank	Strongest Signal	DS-LPPLS Confidence ci [%]	Bubble Size bs [%]	Bubble CAGR bg [%]	Duration [days]	Bubble Progress bp [%]	Geometric Average (ci, bg, bp)	Critical Time \hat{t}_c	Scenario Probability [%]
3	Super Short	46.93	14.45	38.67	104	91.9	55.05	2021-07-09	99.97



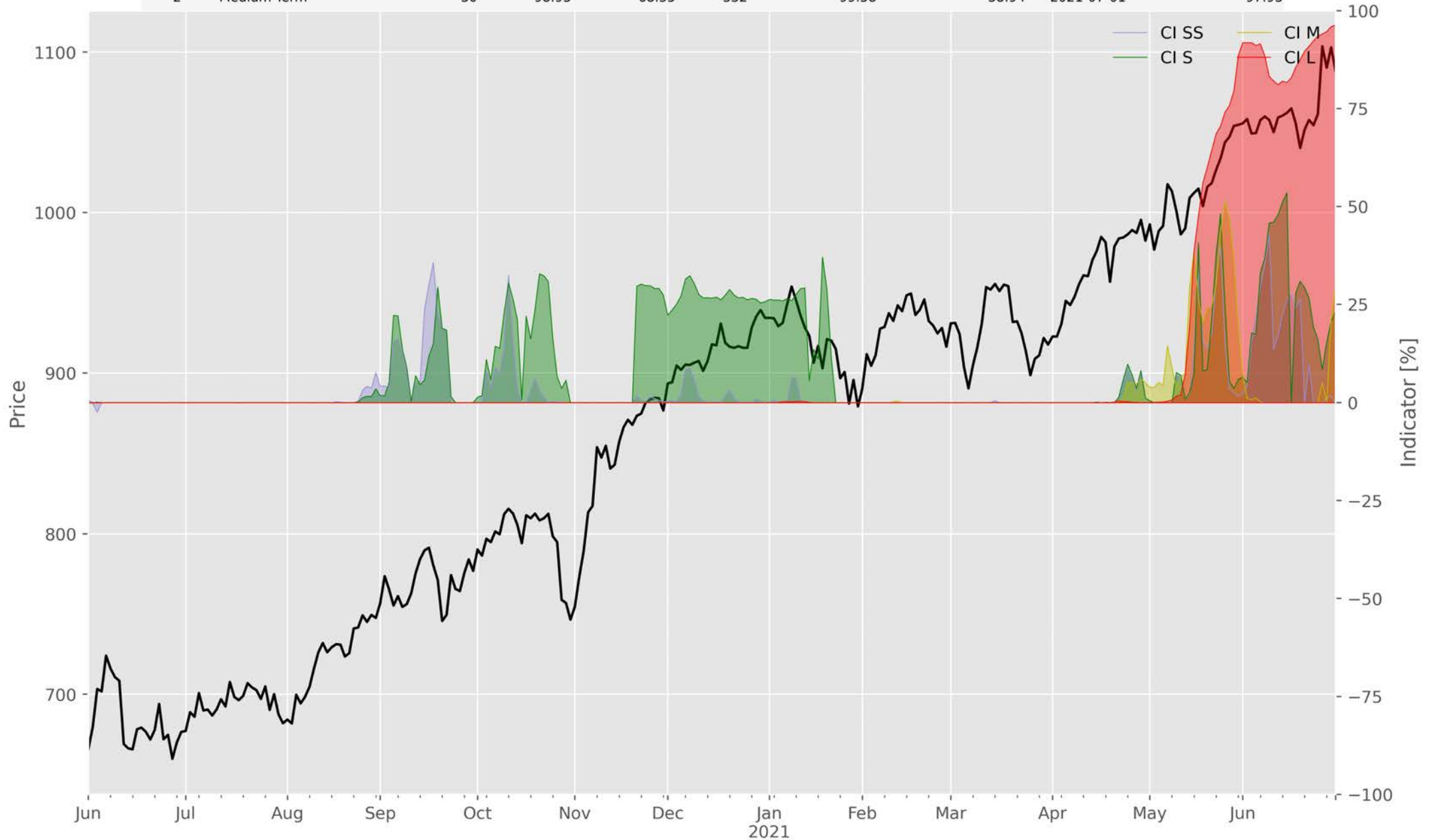
Msci World Marine \$

Rank	Strongest Signal	DS-LPPLS Confidence <i>ci</i> [%]	Bubble Size <i>bs</i> [%]	Bubble CAGR <i>bg</i> [%]	Duration [days]	Bubble Progress <i>bp</i> [%]	Geometric Average (<i>ci, bg, bp</i>)	Critical Time \hat{t}_c	Scenario Probability [%]
1	Short Term	54.55	104.46	120.45	228	84.75	82.27	2021-08-10	55.22



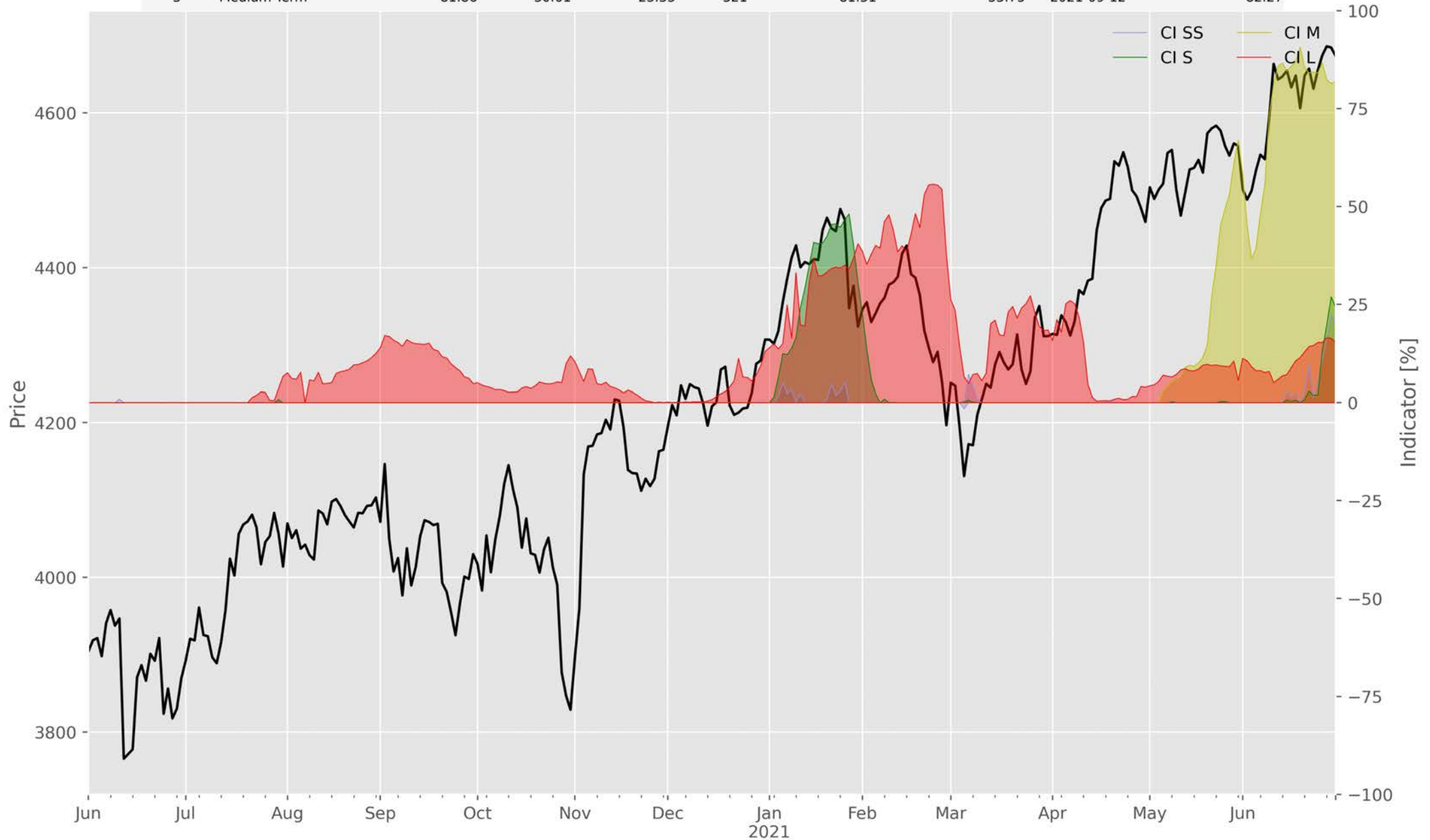
Msci World Txt/App/Lux \$

Rank	Strongest Signal	DS-LPPLS Confidence	Bubble Size	Bubble CAGR	Duration	Bubble Progress	Geometric Average	Critical Time	Scenario Probability
		ci [%]	bs [%]	bg [%]	[days]	bp [%]	(ci, bg, bp)	\hat{t}_c	[%]
2	Medium Term	30	98.93	68.55	332	99.58	58.94	2021-07-01	97.93



S&P Global 1200 Health Care

Rank	Strongest Signal	DS-LPPLS Confidence ci [%]	Bubble Size bs [%]	Bubble CAGR bg [%]	Duration [days]	Bubble Progress bp [%]	Geometric Average (ci, bg, bp)	Critical Time \hat{t}_c	Scenario Probability [%]
3	Medium Term	81.86	30.61	23.33	321	81.31	53.75	2021-09-12	82.27



Forex

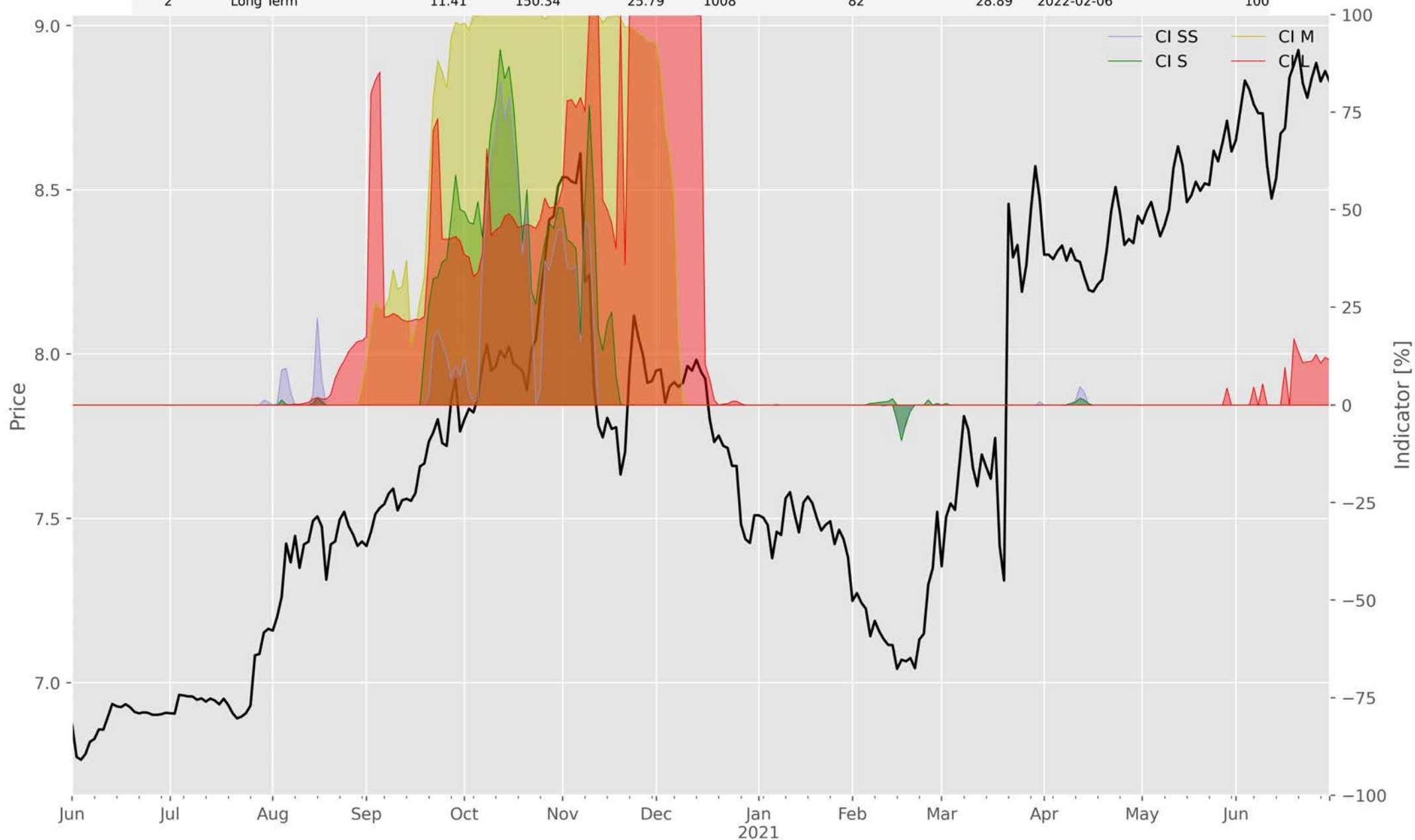
Jpm Chile Reer Ppi (2010=100)

Rank	Strongest Signal	DS-LPPLS Confidence <i>ci</i> [%]	Bubble Size <i>bs</i> [%]	Bubble CAGR <i>bg</i> [%]	Duration [days]	Bubble Progress <i>bp</i> [%]	Geometric Average (<i>ci, bg, bp</i>)	Critical Time \hat{t}_c	Scenario Probability [%]
1	Medium Term	15.56	29.41	18.43	384	86.4	29.16	2021-08-29	97.13



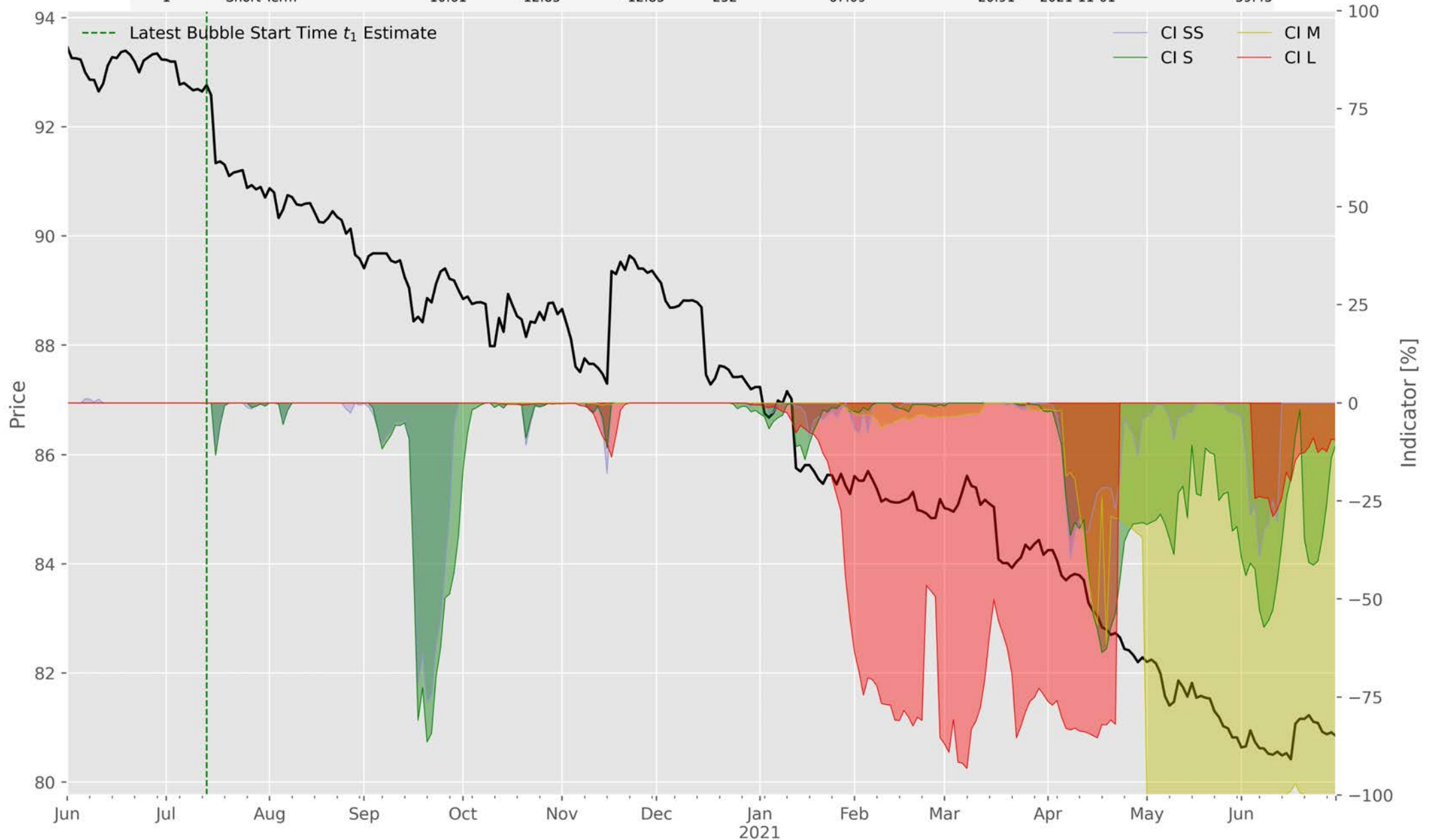
New Turkish Lira To Us \$ 1M Fwd

Rank	Strongest Signal	DS-LPPLS Confidence <i>ci</i> [%]	Bubble Size <i>bs</i> [%]	Bubble CAGR <i>bg</i> [%]	Duration [days]	Bubble Progress <i>bp</i> [%]	Geometric Average (<i>ci</i> , <i>bg</i> , <i>bp</i>)	Critical Time \hat{t}_c	Scenario Probability [%]
2	Long Term	11.41	150.34	25.79	1008	82	28.89	2022-02-06	100



Jpm Hong Kong Reer Ppi (2010=100)

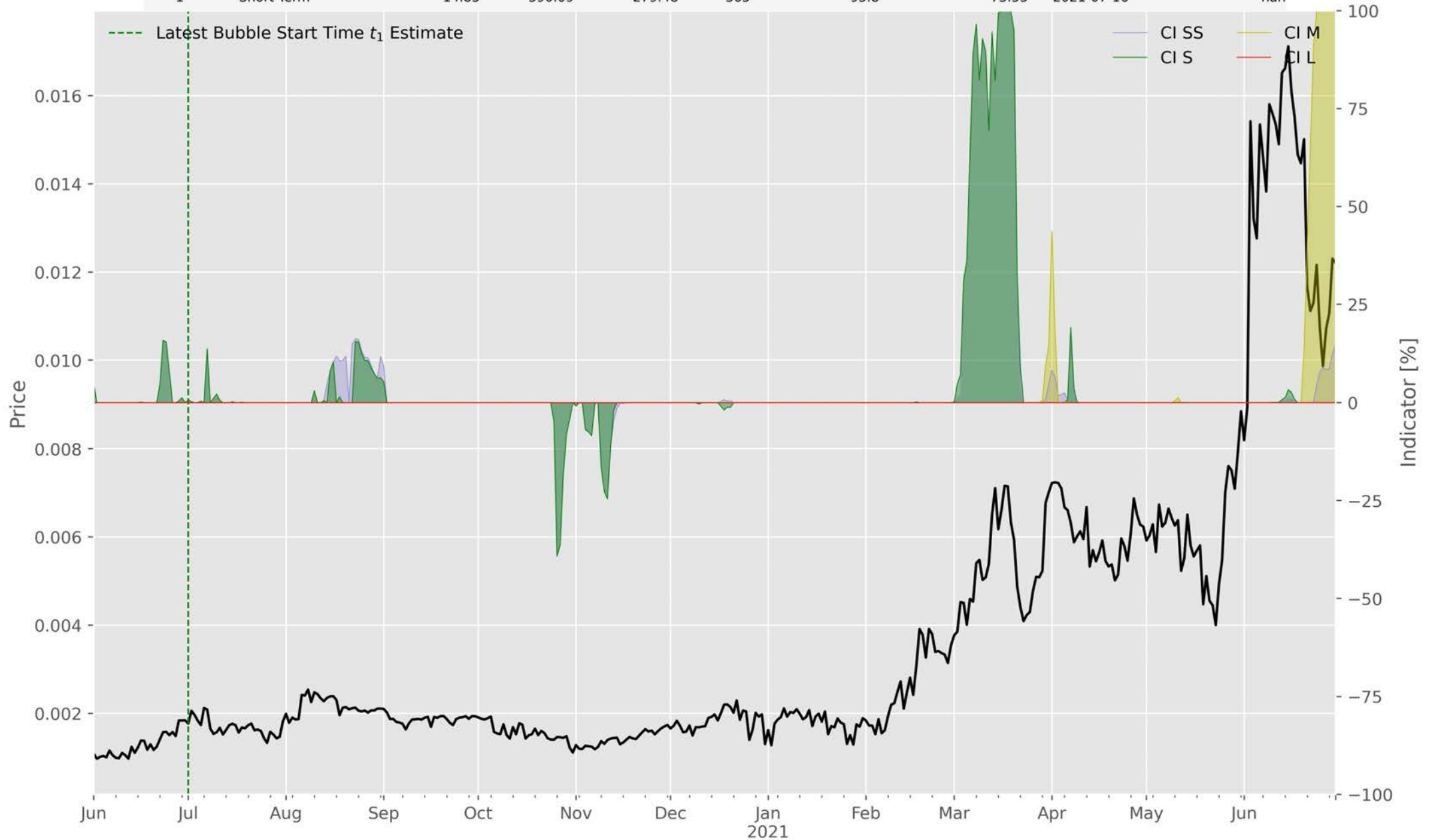
Rank	Strongest Signal	DS-LPPLS Confidence <i>ci</i> [%]	Bubble Size <i>bs</i> [%]	Bubble CAGR <i>bg</i> [%]	Duration [days]	Bubble Progress <i>bp</i> [%]	Geometric Average (<i>ci</i> , <i>bg</i> , <i>bp</i>)	Critical Time \hat{t}_c	Scenario Probability [%]
1	Short Term	10.61	-12.85	-12.85	252	67.09	20.91	2021-11-01	59.45



CryptoX

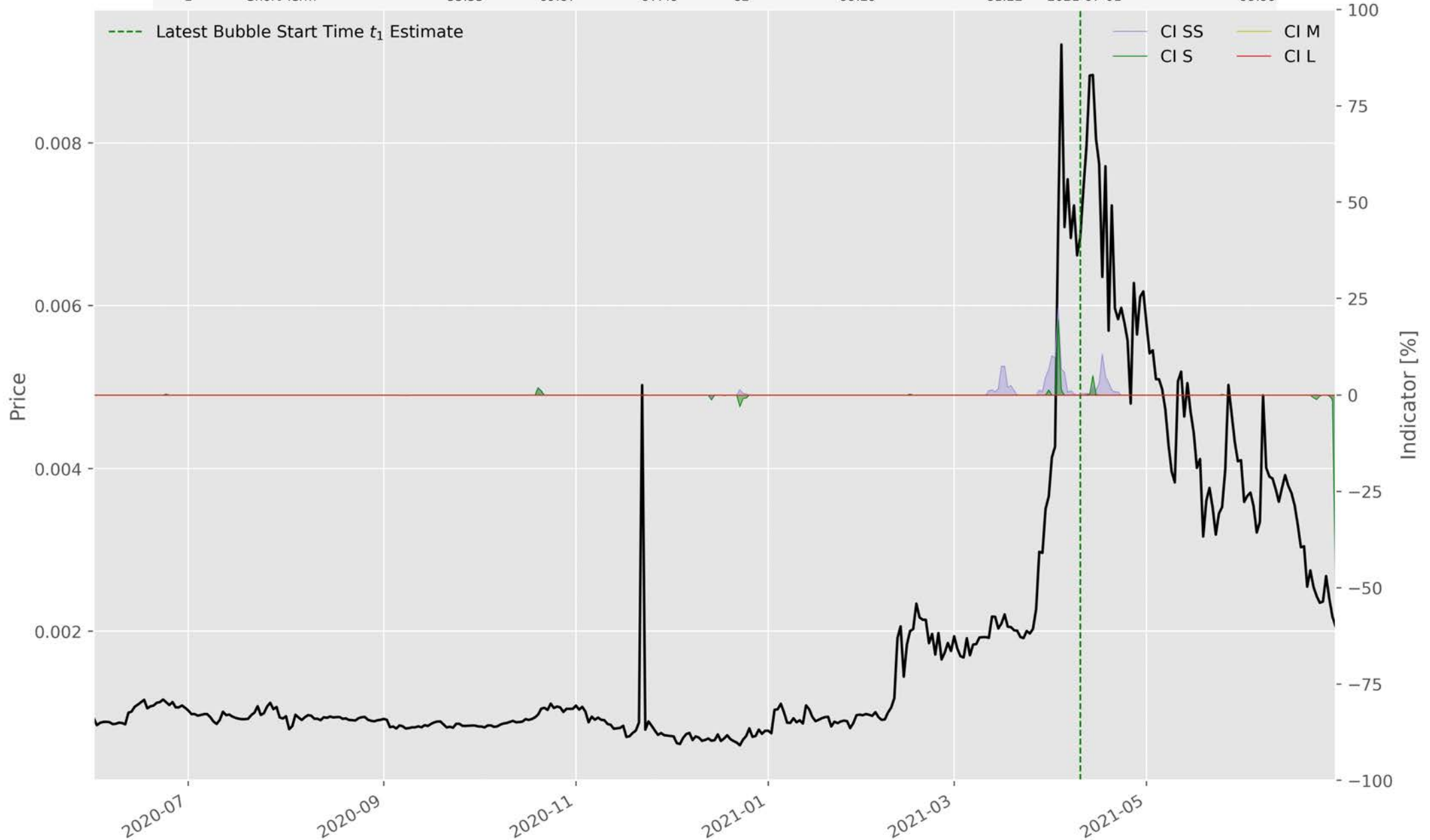
BLOCKv/USD

Rank	Strongest Signal	DS-LPPLS Confidence ci [%]	Bubble Size bs [%]	Bubble CAGR bg [%]	Duration [days]	Bubble Progress bp [%]	Geometric Average (ci, bg, bp)	Critical Time \hat{t}_c	Scenario Probability [%]
1	Short Term	14.85	590.09	279.48	365	95.8	73.53	2021-07-16	nan



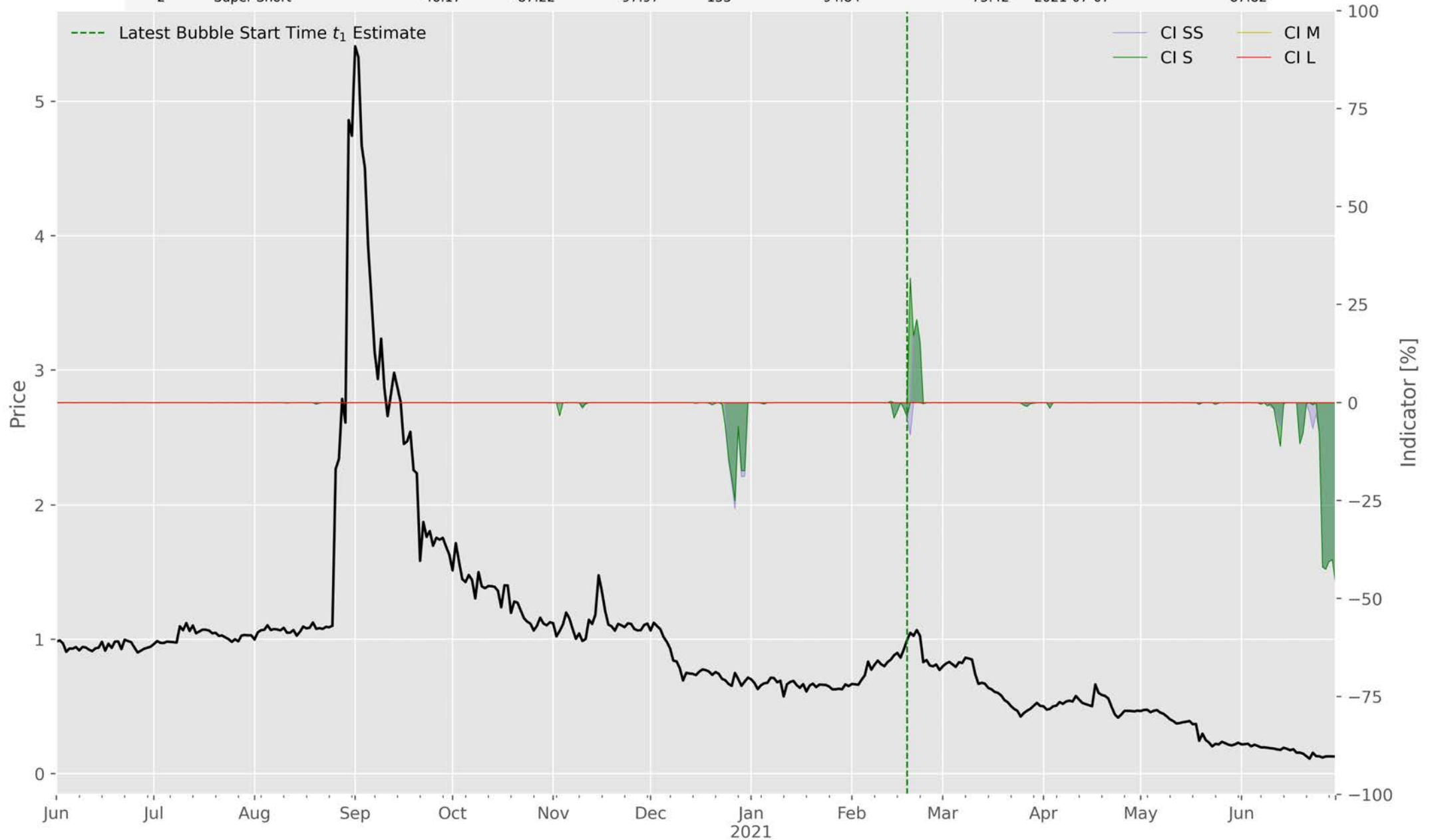
Apollo Currency/USD

Rank	Strongest Signal	DS-LPPLS Confidence <i>ci</i> [%]	Bubble Size <i>bs</i> [%]	Bubble CAGR <i>bg</i> [%]	Duration [days]	Bubble Progress <i>bp</i> [%]	Geometric Average (<i>ci, bg, bp</i>)	Critical Time \hat{t}_c	Scenario Probability [%]
1	Short Term	55.35	-69.87	-97.49	82	99.29	81.22	2021-07-01	99.99



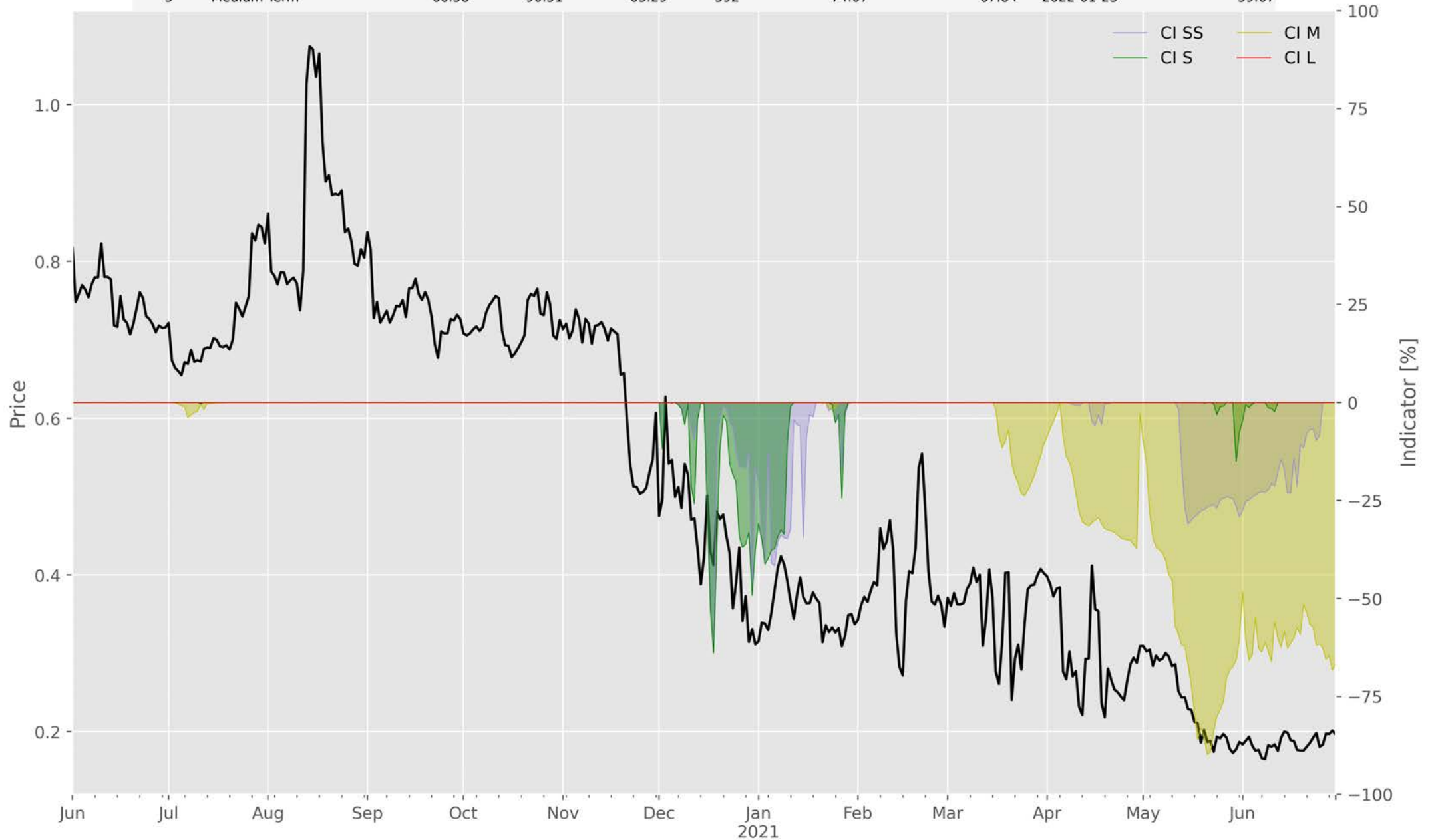
Exchange Union/USD

Rank	Strongest Signal	DS-LPPLS Confidence <i>ci</i> [%]	Bubble Size <i>bs</i> [%]	Bubble CAGR <i>bg</i> [%]	Duration [days]	Bubble Progress <i>bp</i> [%]	Geometric Average (<i>ci</i> , <i>bg</i> , <i>bp</i>)	Critical Time \hat{t}_c	Scenario Probability [%]
2	Super Short	46.17	-87.22	-97.97	133	94.84	75.42	2021-07-07	87.82



ZrCoin/USD

Rank	Strongest Signal	DS-LPPLS Confidence <i>ci</i> [%]	Bubble Size <i>bs</i> [%]	Bubble CAGR <i>bg</i> [%]	Duration [days]	Bubble Progress <i>bp</i> [%]	Geometric Average (<i>ci</i> , <i>bg</i> , <i>bp</i>)	Critical Time \hat{t}_c	Scenario Probability [%]
3	Medium Term	66.58	-90.51	-63.29	592	74.07	67.84	2022-01-23	59.67

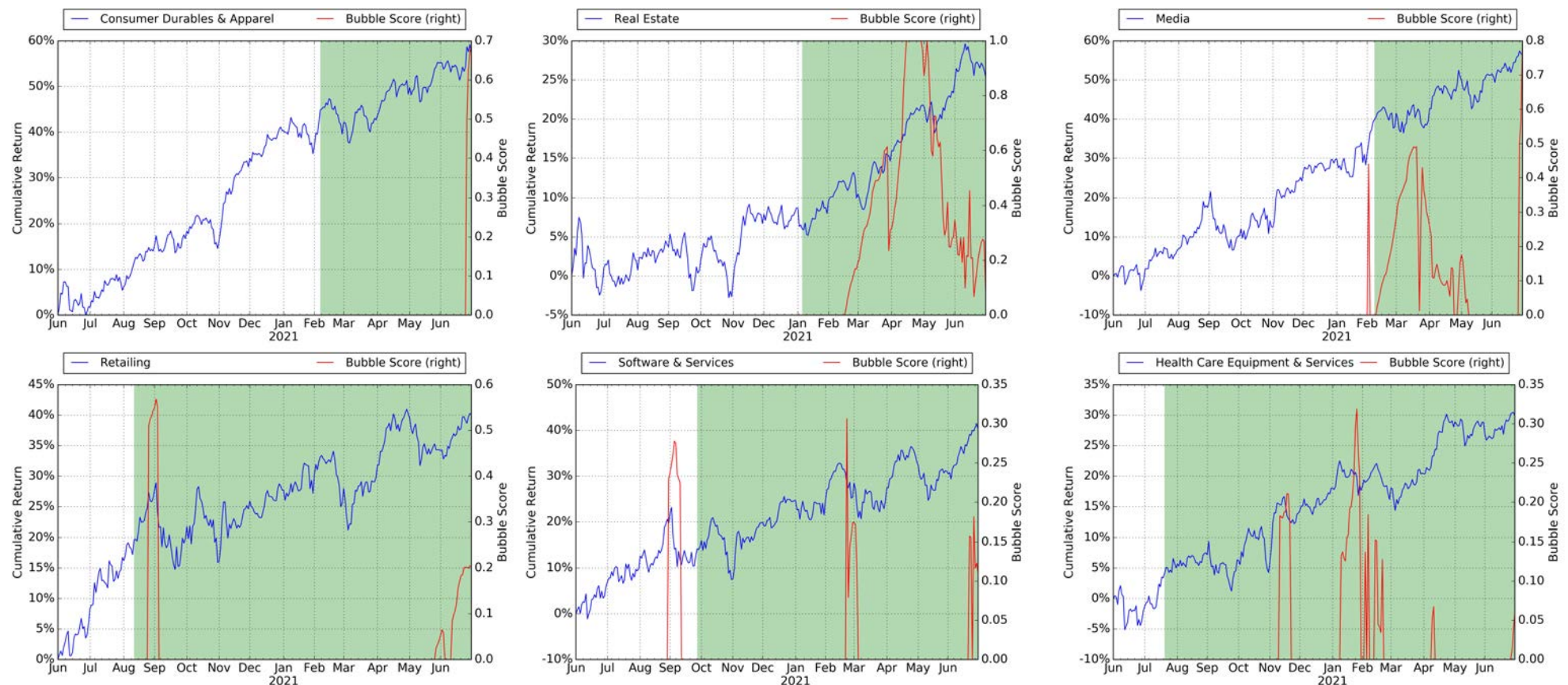


Sectors

GICS Industry Group Name	Yearly Return		Bubble Size		Bubble Score		Value Score		Growth Score	
	Jul 1st	Jun 1st	Jul 1st	Jun 1st	Jul 1st	Jun 1st	Jul 1st	Jun 1st	Jul 1st	Jun 1st
Pharmaceuticals, Biotechnology & Life Sciences	12.2%	13.2%	0.0%	0.0%	0.0%	0.0%	64.4%	65.0%	57.0%	56.5%
Consumer Services	39.0%	39.9%	0.0%	0.0%	0.0%	0.0%	22.3%	21.4%	59.8%	59.8%
Retailing	23.9%	33.5%	17.0%	11.0%	20.3%	4.1%	19.8%	21.2%	44.0%	43.6%
Transportation	43.2%	49.7%	0.0%	33.2%	0.0%	23.2%	43.1%	44.7%	58.2%	56.1%
Consumer Durables & Apparel	49.6%	53.7%	8.6%	0.0%	68.7%	0.0%	34.2%	33.7%	48.9%	52.2%
Semiconductors & Semiconductor Equipment	57.2%	60.7%	0.0%	0.0%	0.0%	0.0%	58.5%	58.4%	40.1%	39.0%
Technology Hardware & Equipment	40.2%	44.5%	0.0%	0.0%	0.0%	0.0%	59.1%	61.9%	50.2%	48.7%
Automobiles & Components	77.4%	93.1%	0.0%	0.0%	0.0%	0.0%	59.4%	64.2%	38.4%	36.1%
Telecommunication Services	9.0%	13.9%	0.0%	0.0%	0.0%	0.0%	60.7%	60.4%	43.2%	42.9%
Energy	36.6%	26.9%	0.0%	0.0%	0.0%	0.0%	50.4%	49.9%	70.1%	70.0%
Software & Services	30.4%	31.0%	22.9%	0.0%	11.0%	0.0%	28.1%	29.2%	53.6%	53.7%
Materials	33.9%	50.3%	0.0%	0.0%	0.0%	0.0%	47.5%	48.0%	50.6%	50.8%
Health Care Equipment & Services	29.3%	34.9%	24.7%	0.0%	5.9%	0.0%	49.0%	48.1%	51.8%	51.3%
Capital Goods	41.2%	48.0%	0.0%	0.0%	0.0%	0.0%	48.7%	48.2%	49.9%	50.2%
Media & Entertainment	48.0%	53.3%	11.8%	0.0%	79.1%	0.0%	29.5%	29.5%	32.1%	30.9%
Commercial & Professional Services	27.7%	29.5%	0.0%	29.5%	0.0%	8.0%	27.7%	28.1%	52.0%	51.3%
Food & Staples Retailing	16.5%	21.8%	0.0%	0.0%	0.0%	0.0%	44.4%	44.6%	63.5%	63.1%
Household & Personal Products	8.4%	15.3%	0.0%	0.0%	0.0%	0.0%	28.7%	30.1%	52.9%	53.2%
Food, Beverage & Tobacco	16.4%	21.2%	0.0%	16.2%	0.0%	38.8%	48.1%	47.8%	58.0%	58.1%
Utilities	7.9%	13.7%	0.0%	0.0%	0.0%	0.0%	45.8%	46.0%	53.1%	53.9%
Insurance	28.5%	39.4%	0.0%	20.8%	0.0%	40.1%	-	-	-	-
Real Estate	26.4%	21.4%	18.3%	22.0%	7.9%	28.5%	-	-	-	-
Diversified Financials	47.3%	53.4%	0.0%	55.1%	0.0%	27.5%	-	-	-	-
Banks	53.3%	59.7%	0.0%	0.0%	0.0%	0.0%	-	-	-	-

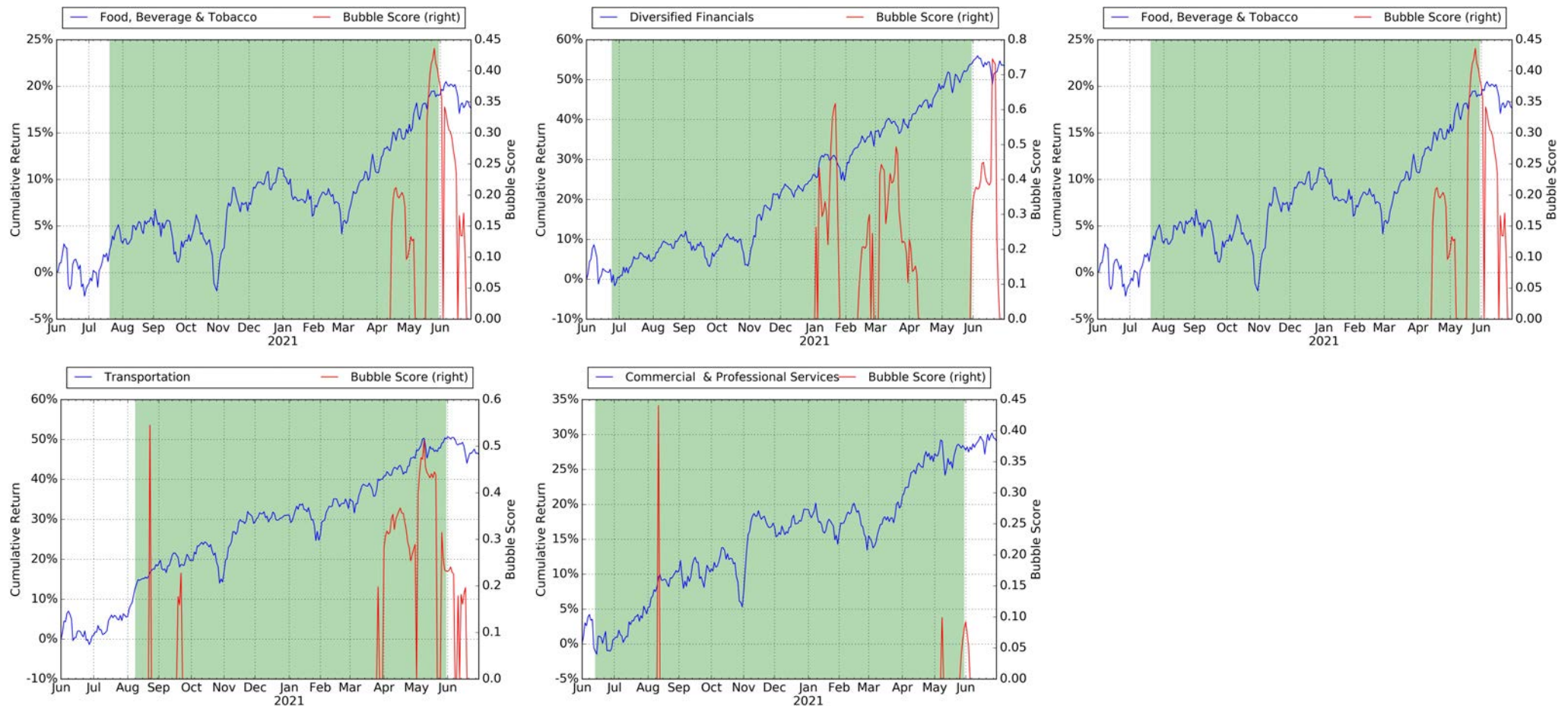
Sectors

- ▶ 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.
- ▶ There are six positive bubbles identified in the 24 MSCI World Industry Group Indices (see below): *Retailing, Consumer Durables & Apparel, Software & Services, Health Care Equipment & Services, Media & Entertainment, Real Estate*. The high bubble scores indicate that this industry index may face a high probability of correction in the near future.



Sectors

Apart from those industry groups with a significant bubble score again in this month, we identified last month that the *Transportation, Commercial & Professional Services, Food, Beverage & Tobacco, Insurance, Diversified Financials* industry groups had a significant bubble. Except for the Commercial & Professional Services industry group, all of the others seem to have switched to a new market regime. The signal for the Commercial & Professional Services industry group last month seems to be a false alarm or a signal for an early stage bubble that may or may not continue to develop.



Portfolio Construction & Performance

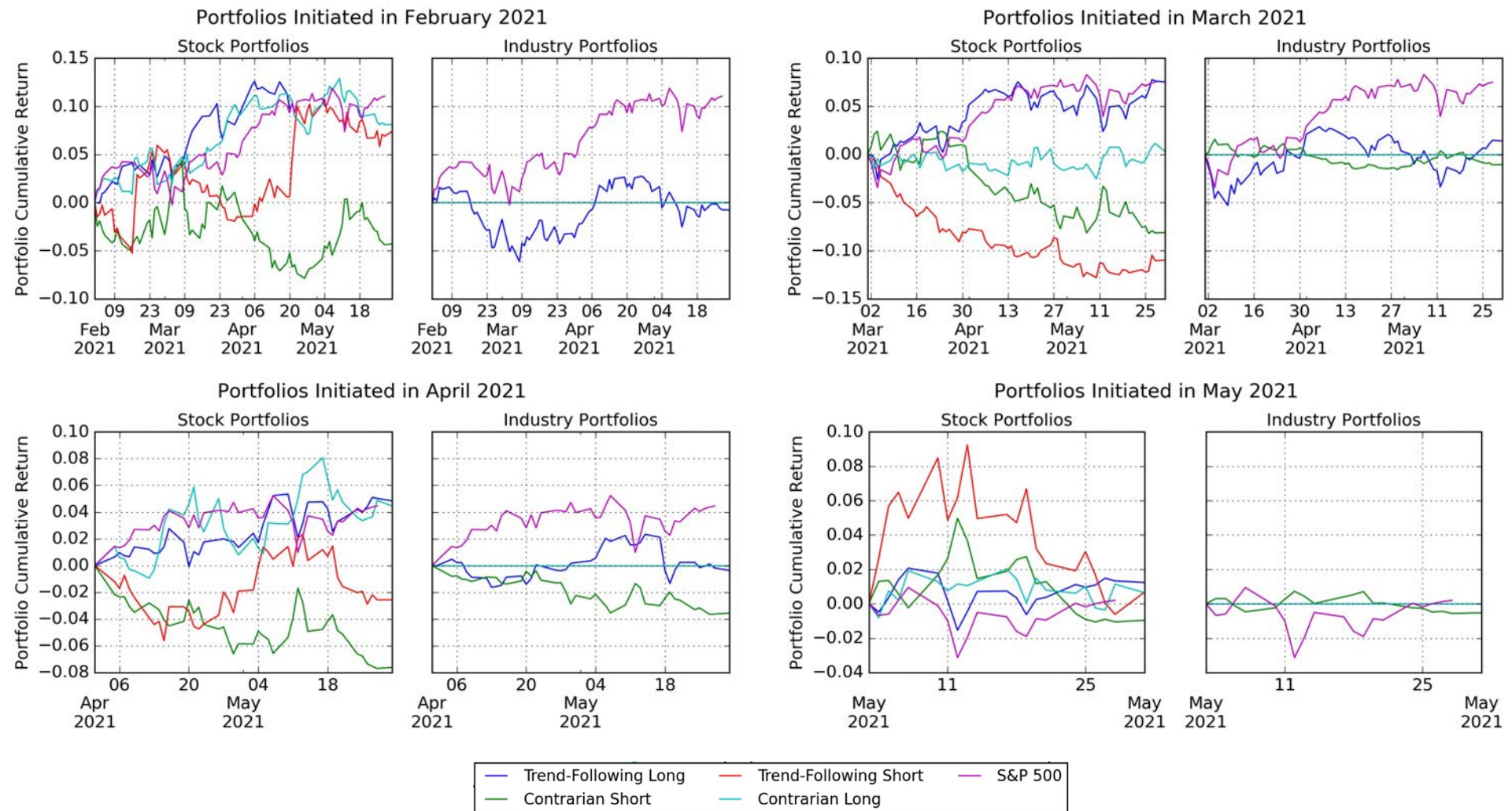
- ▶ Here we illustrate the methodology of the portfolio construction process based on the results of our previous analyses.
- ▶ For individual stocks that we identified in the 4 quadrants, we constructed 4 portfolios based on the 4 quadrants defined in the last report. Each portfolio consists of all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

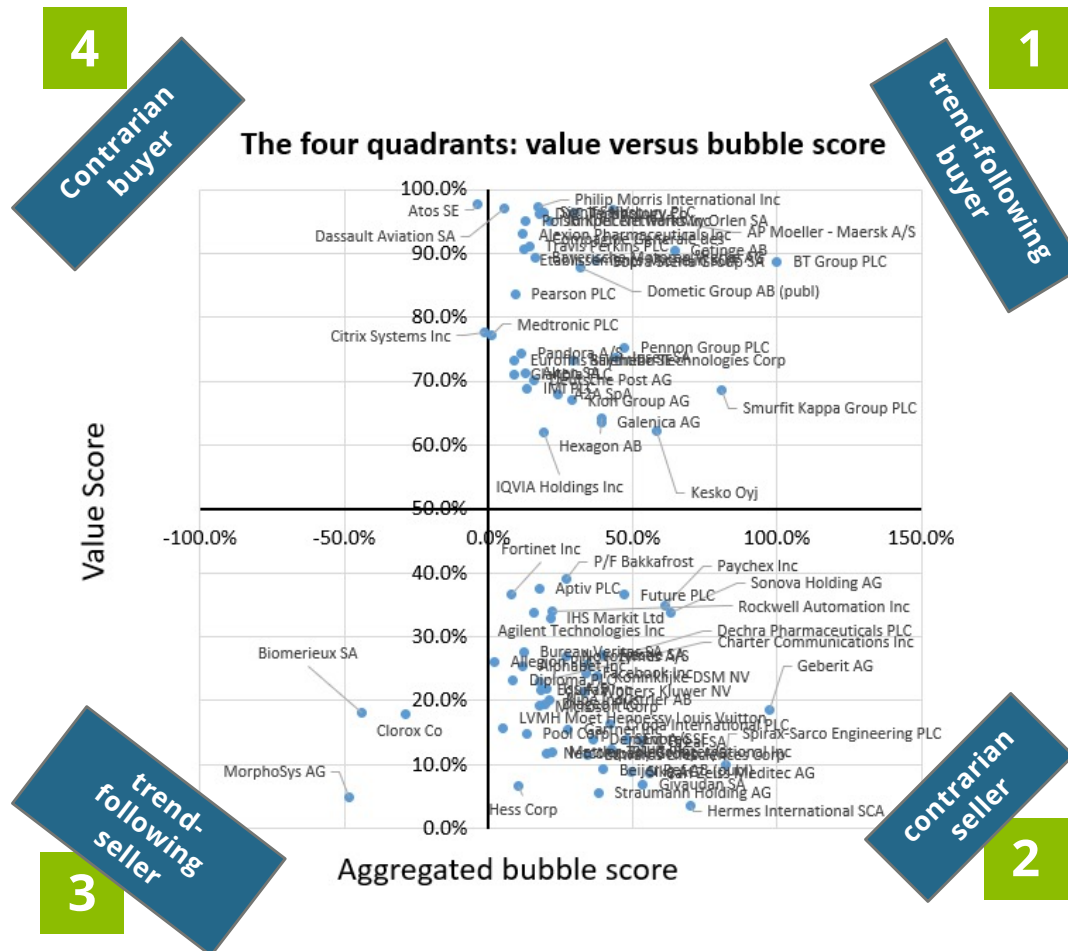
Portfolio Construction & Performance

- Similar to the market, Portfolios in this month are relatively flat with low volatility. 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. Pearson 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. Fortinet 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. Clorox Co
- **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. Atos SE.

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 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.

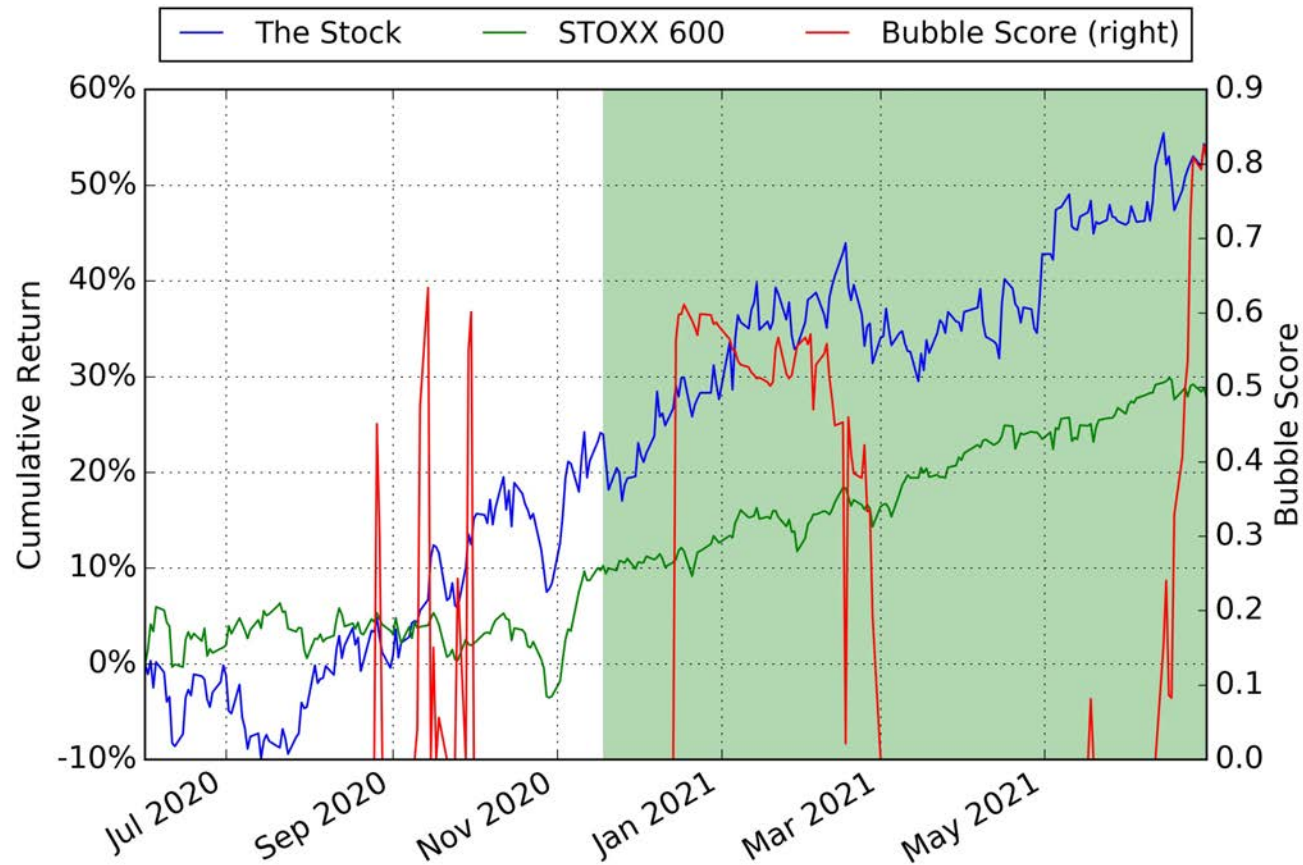
Single Stocks

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
Galenica AG	Switzerland	Health Care Equipment & Services	-6.6%	12.5%	Nov-20	38.9%	63.5%	4.5%
Bayerische Motoren Werke AG	Germany	Automobiles & Components	55.5%	47.6%	Sep-20	16.3%	89.3%	83.2%
Deutsche Post AG	Germany	Transportation	68.1%	38.0%	Jan-21	15.5%	70.2%	87.1%
Kion Group AG	Germany	Capital Goods	57.4%	26.2%	Oct-20	28.8%	66.9%	2.9%
AP Moeller - Maersk A/S	Denmark	Transportation	124.9%	92.7%	Aug-20	43.0%	96.8%	93.2%
Pandora A/S	Denmark	Consumer Durables & Apparel	113.5%	85.6%	Aug-20	11.3%	74.3%	84.6%
Kesko Oyj	Finland	Food & Staples Retailing	96.8%	53.1%	Dec-20	58.0%	62.3%	62.1%
Sopra Steria Group SA	France	Software & Services	41.9%	34.6%	Nov-20	37.4%	88.8%	81.3%
Alten SA	France	Software & Services	65.8%	47.1%	Sep-20	12.9%	71.2%	90.7%
Compagnie Generale des Etablissements Michelin SCA	France	Automobiles & Components	47.5%	47.5%	Jul-20	12.1%	90.6%	95.0%
Dassault Aviation SA	France	Capital Goods	21.8%	11.6%	Nov-20	5.3%	97.1%	5.4%
Ipsen SA	France	Pharmaceuticals, Biotechnology & Life Sciences	12.8%	28.6%	Dec-20	44.2%	73.7%	22.7%
Eurofins Scientific SE	Luxembourg	Pharmaceuticals, Biotechnology & Life Sciences	75.5%	46.7%	Sep-20	8.9%	73.2%	5.7%
Pearson PLC	United Kingdom	Media & Entertainment	51.1%	8.2%	Feb-21	9.2%	83.5%	23.2%
BT Group PLC	United Kingdom	Telecommunication Services	79.9%	47.4%	Jan-21	100.0%	88.7%	87.9%
J Sainsbury PLC	United Kingdom	Food & Staples Retailing	50.3%	14.0%	Feb-21	29.8%	96.3%	91.8%
IMI PLC	United Kingdom	Capital Goods	84.9%	61.5%	Jul-20	13.4%	68.9%	14.8%
Travis Perkins PLC	United Kingdom	Capital Goods	59.3%	59.3%	Jul-20	14.0%	91.1%	44.9%
Pennon Group PLC	United Kingdom	Utilities	6.7%	18.9%	Dec-20	47.1%	75.2%	3.8%
Glanbia PLC	Ireland; Republic of	Food, Beverage & Tobacco	36.8%	56.4%	Sep-20	9.0%	71.1%	39.6%
Smurfit Kappa Group PLC	Ireland; Republic of	Materials	68.4%	26.8%	Nov-20	80.7%	68.6%	82.3%
Medtronic PLC	Ireland; Republic of	Health Care Equipment & Services	37.7%	19.3%	Aug-20	1.1%	77.1%	67.7%
A2A SpA	Italy	Utilities	39.8%	20.9%	Feb-21	23.9%	67.9%	4.4%
Signify NV	Netherlands	Capital Goods	132.7%	59.8%	Dec-20	19.1%	96.4%	4.7%
Polski Koncern Naftowy Orlen SA	Poland	Energy	25.5%	54.8%	Nov-20	12.8%	95.1%	77.2%
Getinge AB	Sweden	Health Care Equipment & Services	77.1%	79.7%	Oct-20	64.4%	90.5%	8.6%
Dometic Group AB (publ)	Sweden	Automobiles & Components	72.5%	45.0%	Nov-20	31.8%	87.8%	95.1%
Hexagon AB	Sweden	Technology Hardware & Equipment	60.2%	31.1%	Sep-20	39.0%	64.2%	84.0%
Alexion Pharmaceuticals Inc	United States of America	Pharmaceuticals, Biotechnology & Life Sciences	69.4%	73.1%	Aug-20	11.8%	93.0%	25.4%
DXC Technology Co	United States of America	Software & Services	156.9%	62.7%	Dec-20	17.4%	96.2%	14.3%
IQVIA Holdings Inc	United States of America	Pharmaceuticals, Biotechnology & Life Sciences	67.1%	64.0%	Jul-20	19.2%	61.9%	58.8%
Juniper Networks Inc	United States of America	Technology Hardware & Equipment	20.3%	12.0%	Jan-21	21.2%	95.0%	52.6%
Philip Morris International Inc	United States of America	Food, Beverage & Tobacco	41.3%	32.6%	Nov-20	17.1%	97.3%	56.9%
Raytheon Technologies Corp	United States of America	Capital Goods	46.8%	46.8%	Jul-20	29.3%	73.3%	69.0%
Target Corp	United States of America	Retailing	105.0%	33.4%	Jan-21	16.9%	71.6%	56.4%

Single Stocks

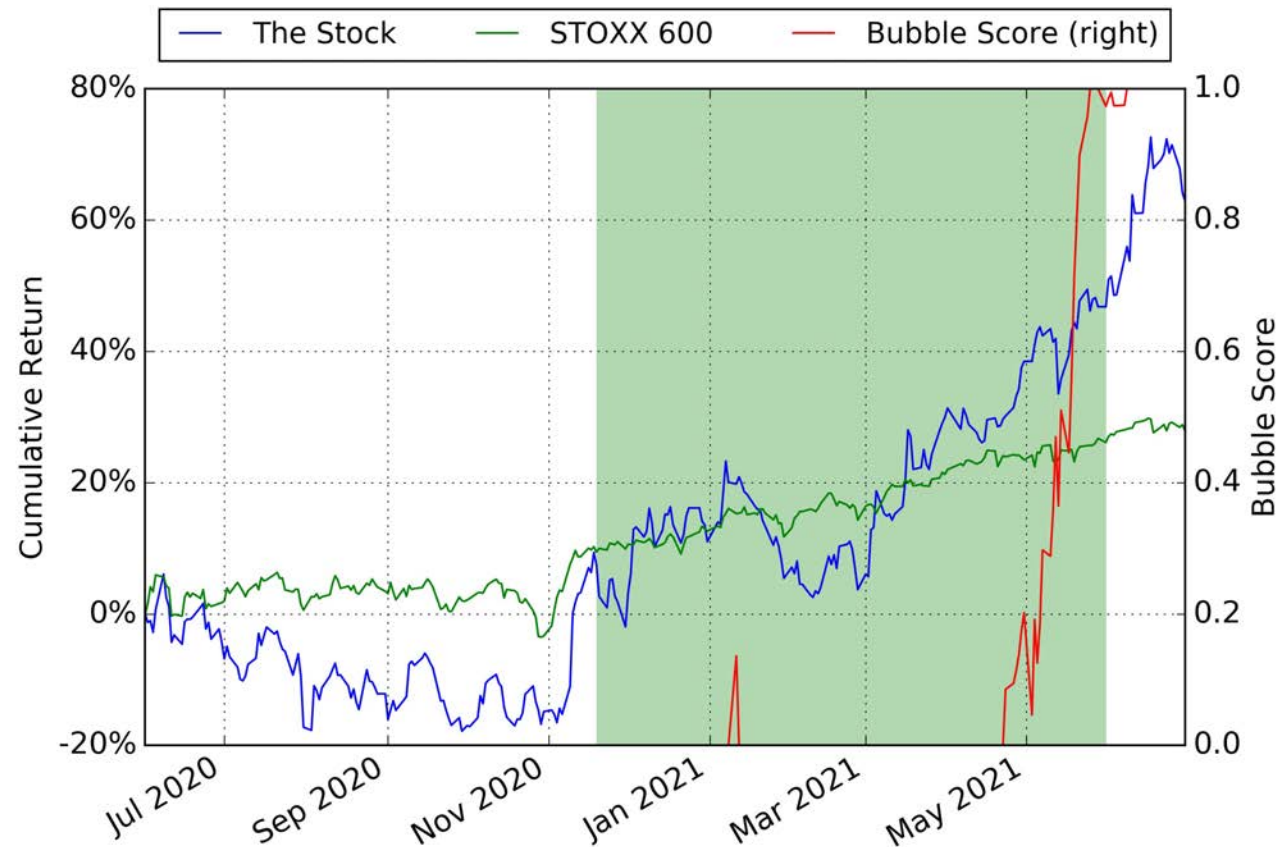
Quadrant 1 Stocks Current Month Example – Smurfit Kappa Group PLC.



- 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 seven-month bubble has reached 80.7% with a bubble size 26.8%.

Single Stocks

Quadrant 1 Stocks Last Month Example – BT Group 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 stock price went up for another 10% in the past month, with the bubble score still running at 100%. Although we have seen a small drawdown in the past few days, the bubble scores indicate that the stock has not yet reached the critical point and one should remain cautious about it.

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
IHS Markit Ltd	United Kingdom	Commercial & Professional Services	48.7%	23.6%	Nov-20	21.5%	32.8%	51.2%
Givaudan SA	Switzerland	Materials	20.3%	17.9%	Jan-21	53.5%	6.9%	80.0%
Straumann Holding AG	Switzerland	Health Care Equipment & Services	74.1%	42.2%	Dec-20	38.1%	5.6%	62.8%
Sonova Holding AG	Switzerland	Health Care Equipment & Services	74.0%	55.1%	Jan-21	63.2%	33.8%	18.7%
Geberit AG	Switzerland	Capital Goods	43.9%	22.8%	Jan-21	97.5%	18.6%	77.0%
Nestle SA	Switzerland	Food, Beverage & Tobacco	9.1%	12.8%	Jan-21	39.7%	27.2%	65.3%
Sika AG	Switzerland	Materials	61.7%	20.6%	Jan-21	49.3%	8.8%	83.9%
Carl Zeiss Meditec AG	Germany	Health Care Equipment & Services	82.0%	82.0%	Jul-20	55.9%	8.6%	79.5%
Evotec SE	Germany	Pharmaceuticals, Biotechnology & Life Sciences	59.8%	59.8%	Jul-20	48.0%	14.0%	86.2%
Novozymes A/S	Denmark	Materials	23.6%	33.9%	Nov-20	26.7%	26.8%	71.0%
Iss A/S	Denmark	Commercial & Professional Services	47.9%	36.8%	Dec-20	20.1%	22.0%	80.9%
Demant A/S	Denmark	Health Care Equipment & Services	89.2%	34.5%	Feb-21	36.2%	13.8%	58.5%
Netcompany Group A/S	Denmark	Software & Services	49.3%	35.5%	Aug-20	20.3%	11.7%	89.0%
P/F Bakkafrøst	Faroe Islands	Food, Beverage & Tobacco	27.1%	27.1%	Jul-20	27.0%	39.0%	90.1%
Hermes International SCA	France	Consumer Durables & Apparel	60.3%	38.8%	Feb-21	70.2%	3.6%	32.9%
L'Oreal SA	France	Household & Personal Products	31.1%	23.2%	Jan-21	52.7%	13.6%	58.9%
LVMH Moët Hennessy Louis Vuitton SE	France	Consumer Durables & Apparel	64.9%	67.2%	Sep-20	5.0%	15.8%	45.7%
Bureau Veritas SA	France	Commercial & Professional Services	39.1%	34.9%	Sep-20	12.2%	27.7%	65.4%
Diploma PLC	United Kingdom	Capital Goods	59.1%	54.6%	Sep-20	8.4%	23.3%	63.4%
Diageo PLC	United Kingdom	Food, Beverage & Tobacco	28.1%	18.4%	Jan-21	19.8%	19.5%	64.3%
Dechra Pharmaceuticals PLC	United Kingdom	Pharmaceuticals, Biotechnology & Life Sciences	50.0%	35.6%	Dec-20	34.5%	25.7%	59.3%
Croda International PLC	United Kingdom	Materials	38.4%	14.7%	Jan-21	42.1%	16.2%	48.4%
Spirax-Sarco Engineering PLC	United Kingdom	Capital Goods	37.5%	24.2%	Nov-20	82.4%	9.9%	47.4%
Future PLC	United Kingdom	Media & Entertainment	171.9%	79.6%	Jan-21	47.1%	36.5%	21.2%

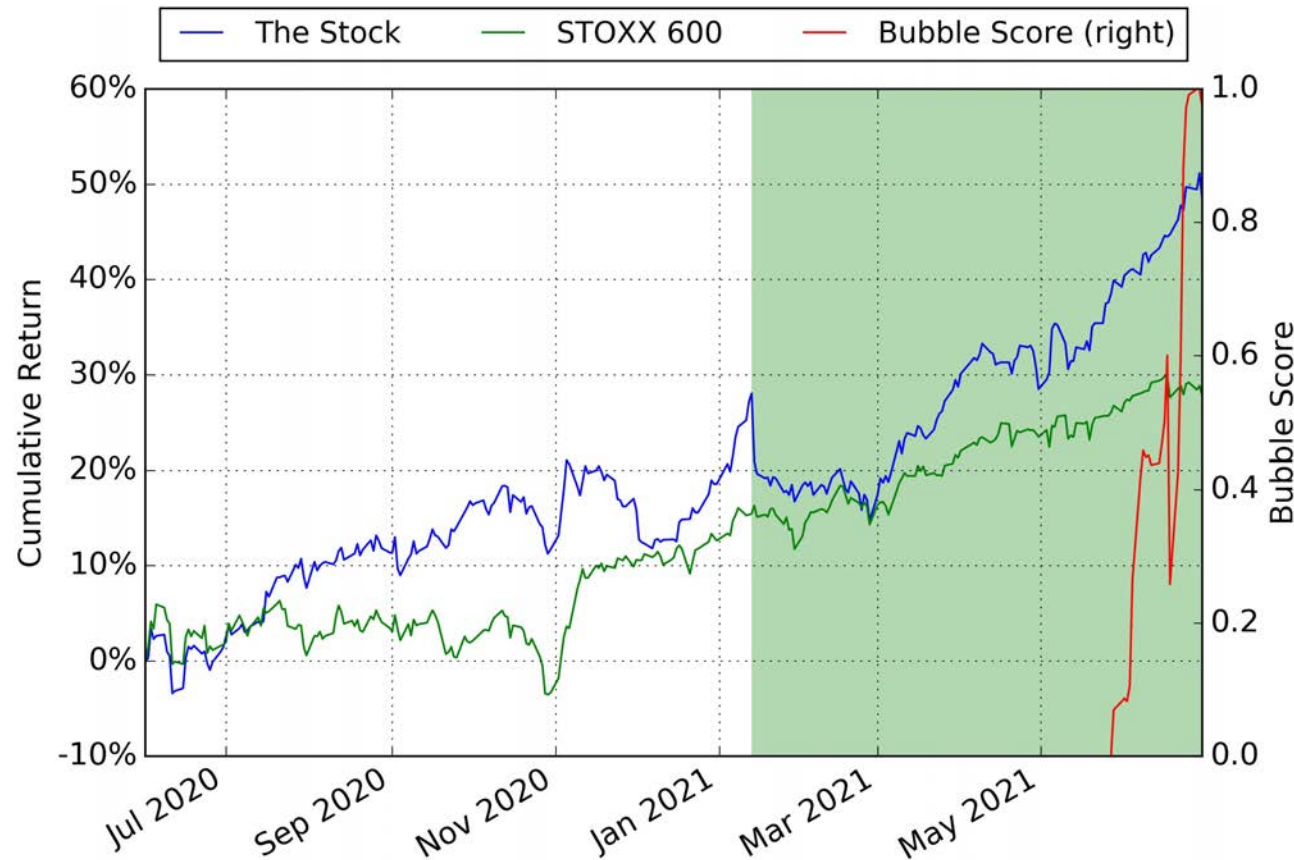
Single Stocks

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

Company Name	Country of Headquarters	GICS Industry Group Name	Yearly Return	Bubble Size	Bubble Start	Bubble Score	Value Score	Growth Score
Allegion PLC	Ireland; Republic of	Capital Goods	38.6%	35.8%	Jul-20	2.0%	26.1%	33.3%
Aptiv PLC	Ireland; Republic of	Automobiles & Components	108.7%	50.2%	Nov-20	17.6%	37.6%	37.6%
Koninklijke DSM NV	Netherlands	Materials	25.7%	16.9%	Nov-20	37.9%	23.7%	85.6%
Wolters Kluwer NV	Netherlands	Commercial & Professional Services	21.7%	24.3%	Dec-20	33.2%	21.5%	38.9%
Beijer Ref AB (publ)	Sweden	Capital Goods	55.8%	32.9%	Dec-20	39.8%	9.2%	71.7%
Nibe Industrier AB	Sweden	Capital Goods	69.0%	55.3%	Sep-20	21.2%	20.2%	73.9%
Agilent Technologies Inc	United States of America	Pharmaceuticals, Biotechnology & Life Sciences	64.4%	20.3%	Jan-21	15.9%	33.7%	55.6%
Alphabet Inc	United States of America	Media & Entertainment	65.9%	71.7%	Sep-20	11.9%	25.4%	21.7%
Charter Communications Inc	United States of America	Media & Entertainment	36.1%	30.7%	Jul-20	17.8%	22.9%	32.7%
Edwards Lifesciences Corp	United States of America	Health Care Equipment & Services	51.7%	22.1%	Jan-21	34.5%	11.6%	75.7%
Equifax Inc	United States of America	Commercial & Professional Services	48.0%	48.0%	Jul-20	18.0%	21.7%	41.9%
Facebook Inc	United States of America	Media & Entertainment	42.2%	24.7%	Nov-20	34.0%	24.3%	32.8%
Fortinet Inc	United States of America	Software & Services	59.2%	106.5%	Sep-20	7.9%	36.6%	55.3%
Gartner Inc	United States of America	Software & Services	105.0%	65.6%	Nov-20	27.5%	15.4%	18.9%
Hess Corp	United States of America	Energy	95.4%	46.2%	Jan-21	10.2%	6.6%	87.5%
Intuit Inc	United States of America	Software & Services	59.2%	33.0%	Dec-20	42.6%	12.4%	39.3%
Mettler-Toledo International Inc	United States of America	Pharmaceuticals, Biotechnology & Life Sciences	66.8%	48.2%	Jul-20	22.2%	11.9%	55.0%
Microsoft Corp	United States of America	Software & Services	26.4%	25.2%	Nov-20	17.4%	19.1%	50.4%
Paychex Inc	United States of America	Software & Services	47.2%	18.5%	Feb-21	61.3%	34.8%	62.2%
Pool Corp	United States of America	Retailing	64.3%	48.1%	Sep-20	13.1%	14.8%	40.9%
Rockwell Automation Inc	United States of America	Capital Goods	35.3%	22.6%	Oct-20	22.2%	33.9%	51.9%
Waters Corp	United States of America	Pharmaceuticals, Biotechnology & Life Sciences	83.2%	22.2%	Feb-21	75.0%	30.2%	28.2%
West Pharmaceutical Services Inc	United States of America	Health Care Equipment & Services	52.2%	26.3%	Oct-20	22.9%	7.4%	51.3%
Zoetis Inc	United States of America	Pharmaceuticals, Biotechnology & Life Sciences	35.4%	21.7%	Jan-21	57.8%	11.5%	62.4%

Single Stocks

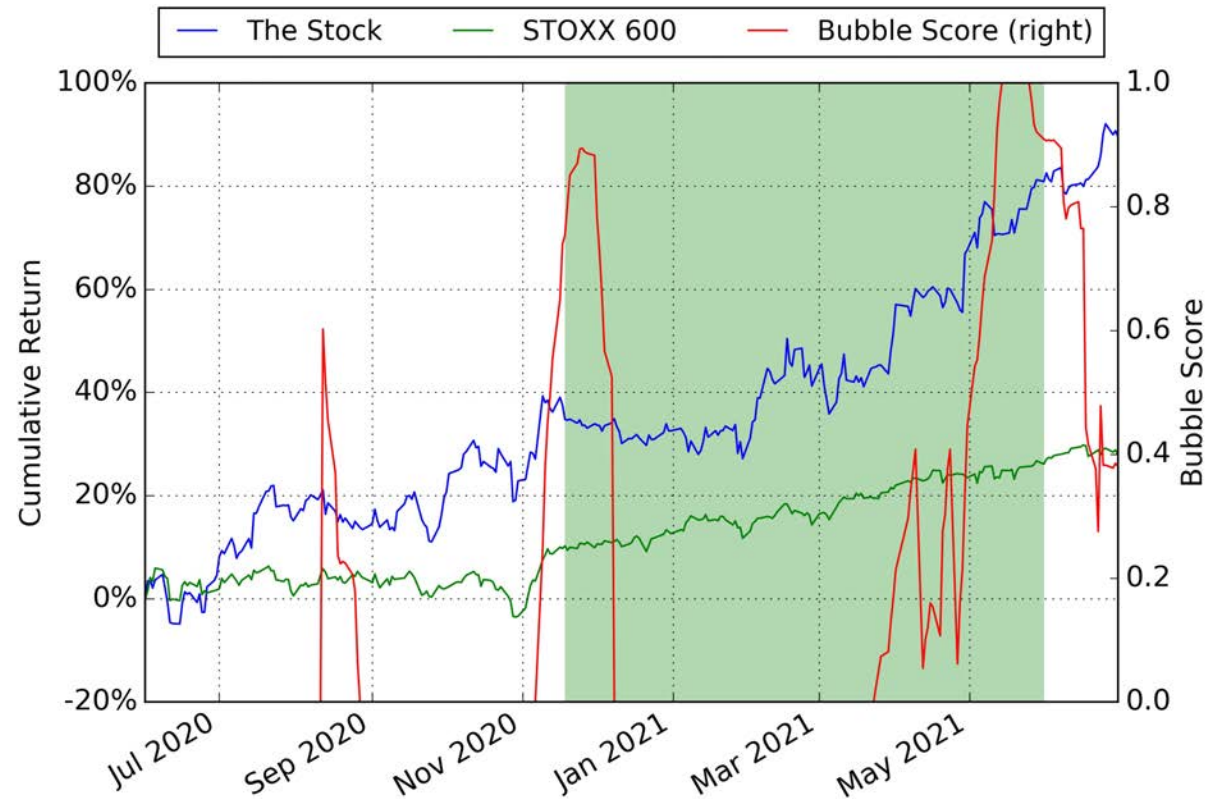
Quadrant 2 Stocks Current Month Example – Geberit AG.



- 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 seven-month bubble has reached 97.5% with a bubble size 22.8%. The strong positive bubble signal and weak fundamentals may indicate a high probability of correction in the future.

Single Stocks

Quadrant 2 Stocks Last Month Example – Straumann Holding AG.



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 stock price continued its upward trend in the past month with its bubble score remaining positive. This means that the signal last month may be a false positive or a transition to a larger bubble.

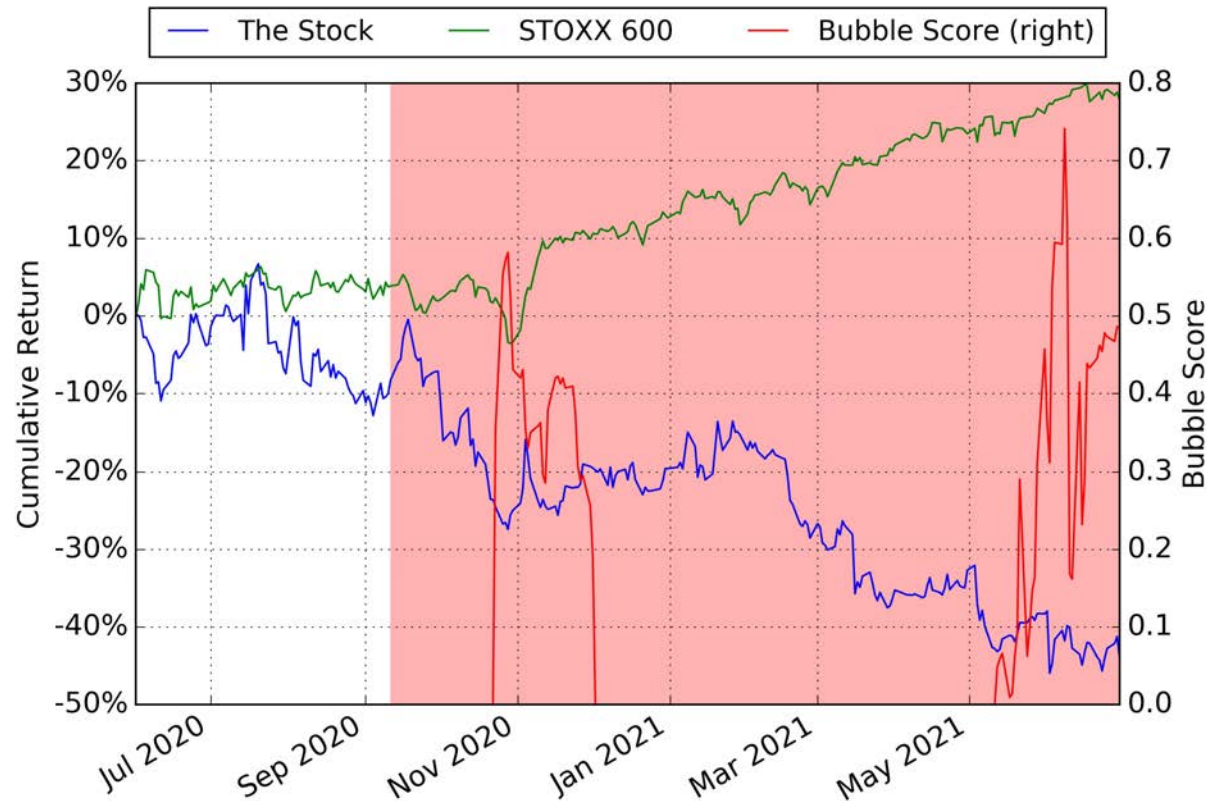
Single Stocks

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
MorphoSys AG	Germany	Pharmaceuticals, Biotechnology & Life Sciences	-43.9%	-40.3%	Sep-20	-48.6%	4.8%	1.3%
Biomerieux SA	France	Health Care Equipment & Services	-23.4%	-24.7%	Jul-20	-43.8%	18.0%	69.3%
Clorox Co	United States of America	Household & Personal Products	-21.6%	-17.0%	Sep-20	-28.7%	17.9%	29.2%

Single Stocks

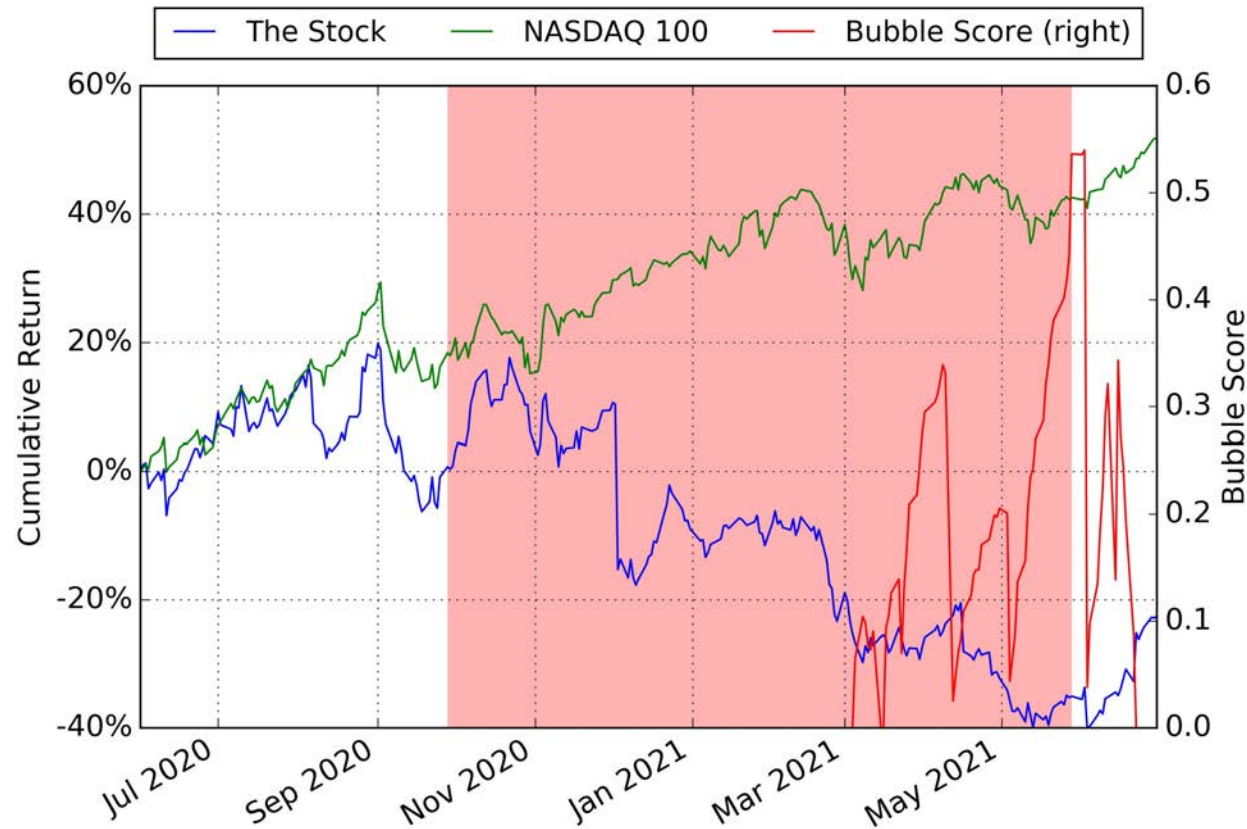
Quadrant 3 Stocks Current Month Example – MorphoSys AG.



- 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 ten-month bubble has reached 48.6% with a bubble size -40.3%.

Single Stocks

Quadrant 3 Stocks Last Month Example – Splunk Inc.



- The figure above plots the one-year cumulative return of the stock (blue), NASDAQ 100 (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 price has started a strong rebound of 30% in the past month, which is in line with our bubble signal identified last month.

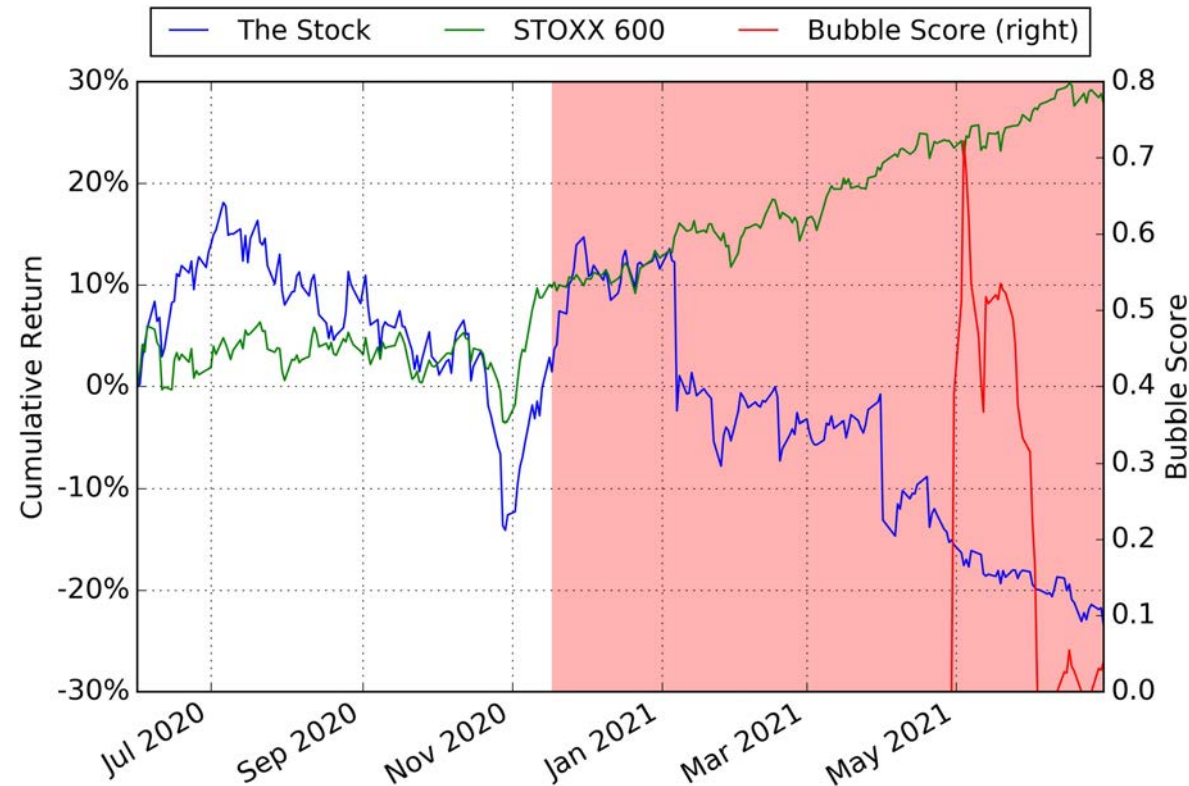
Single Stocks

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
Atos SE	France	Software & Services	-33.5%	-26.2%	Nov-20	-4.0%	97.6%	92.6%
Citrix Systems Inc	United States of America	Software & Services	-23.2%	-19.4%	Jul-20	-1.6%	77.7%	43.8%

Single Stocks

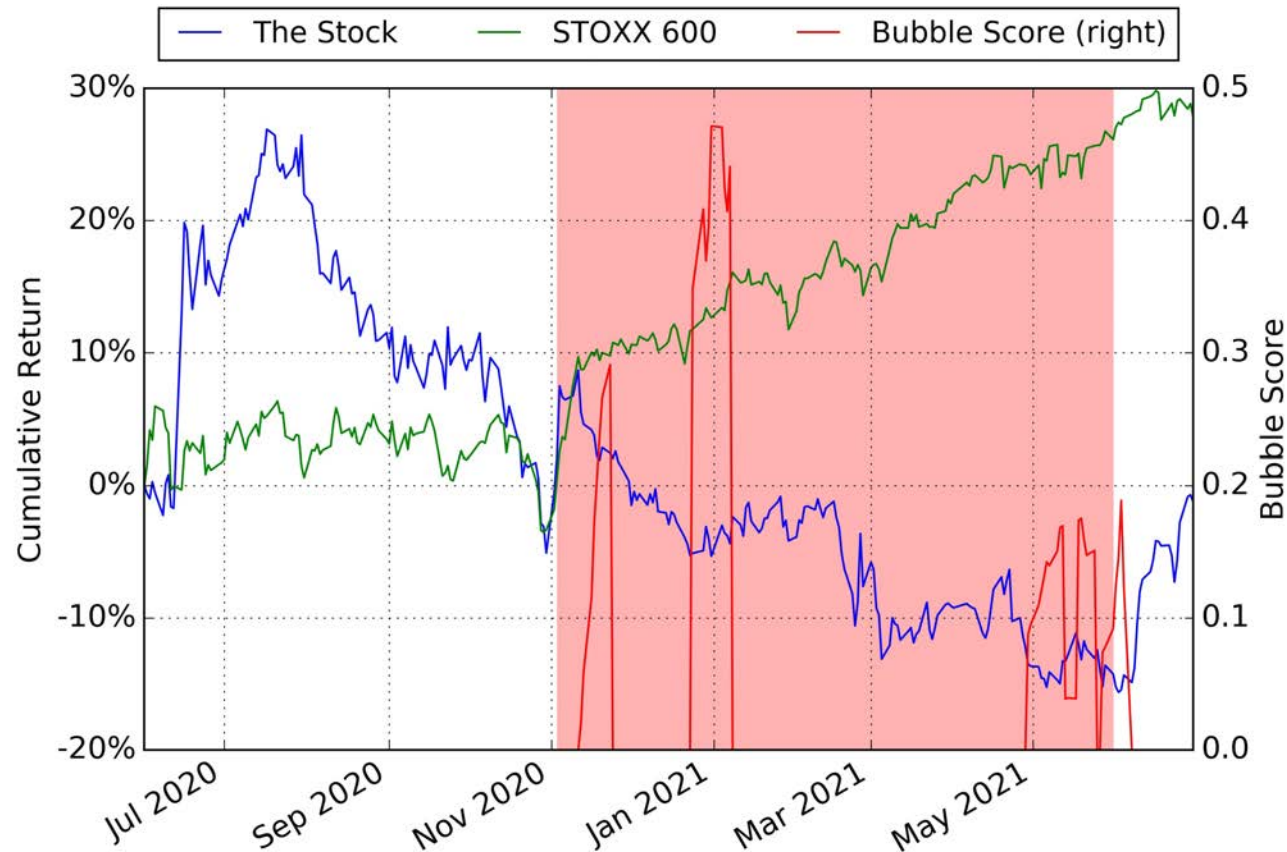
Quadrant 4 Stocks Current Month Example – Atos SE.



- 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 eight-month bubble has reached 4% with a negative bubble size -26.2%. We expect a rebound in the future when the negative bubble is mature, given our diagnostic of a negative bubble signal with strong fundamentals, calling for a contrarian buyer position.

Single Stocks

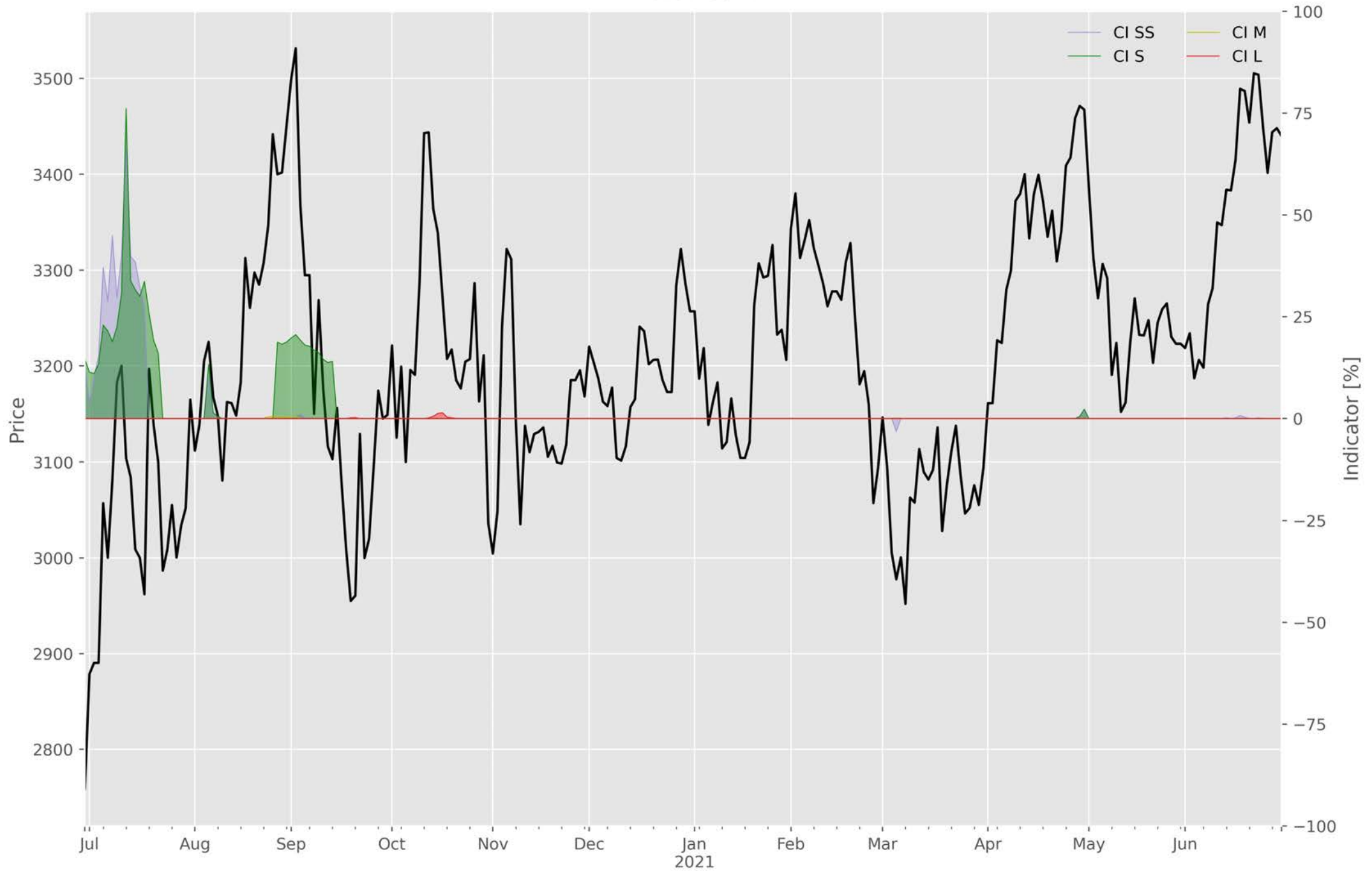
Quadrant 4 Stocks Last Month Example – Ucb SA.



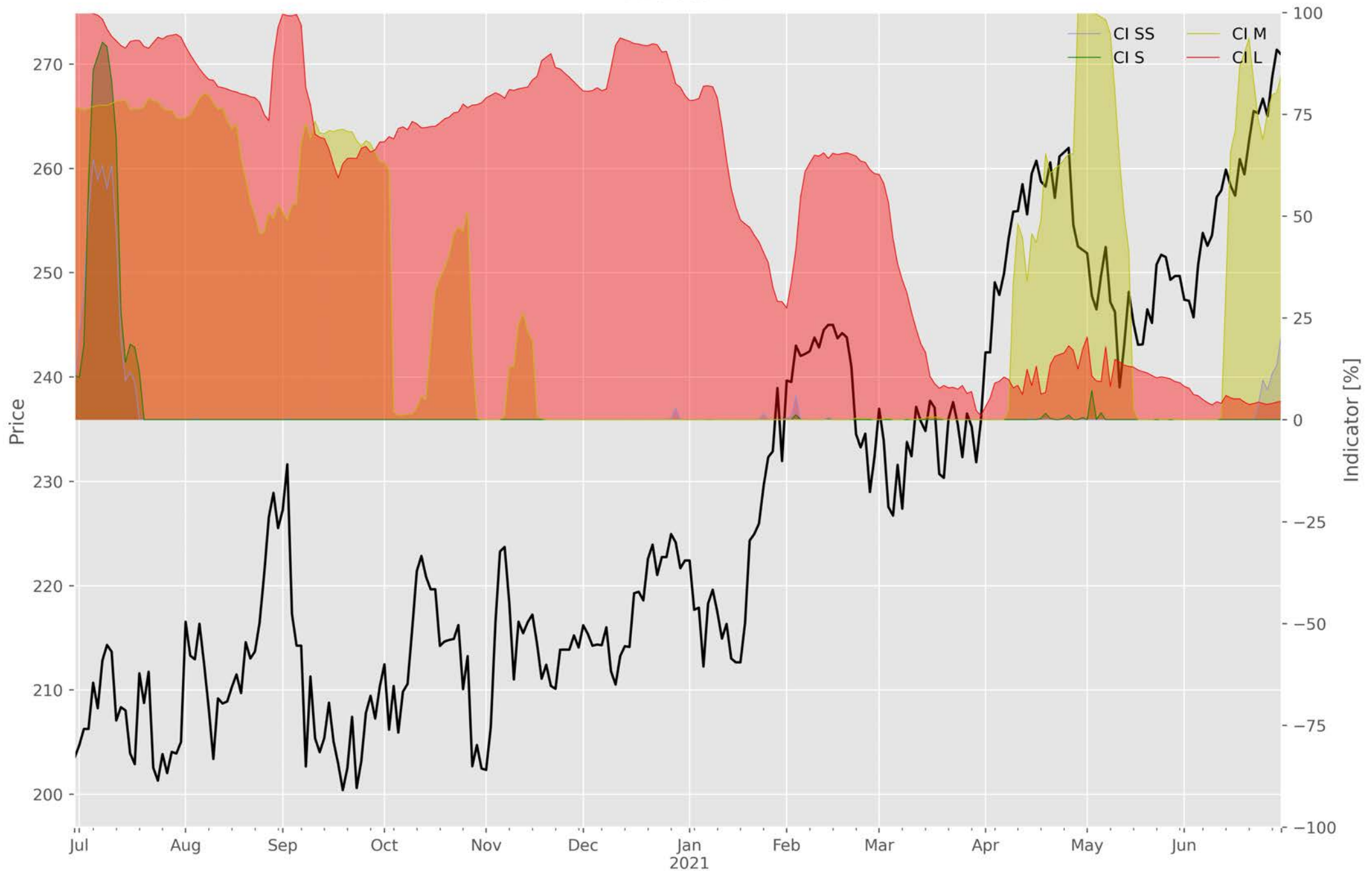
- The figure above plots the one-year cumulative return of the stock (blue), STOXX 600 (green) and LPPLS Bubble Score (red line on the right y-axis). The red shaded period delineates the time interval within which the strong negative bubble was identified and reported last month. The stock price has rebounded by more than 15% in the past month, indicating the end of the previous detected negative bubble, in agreement with our diagnostic.

Appendix

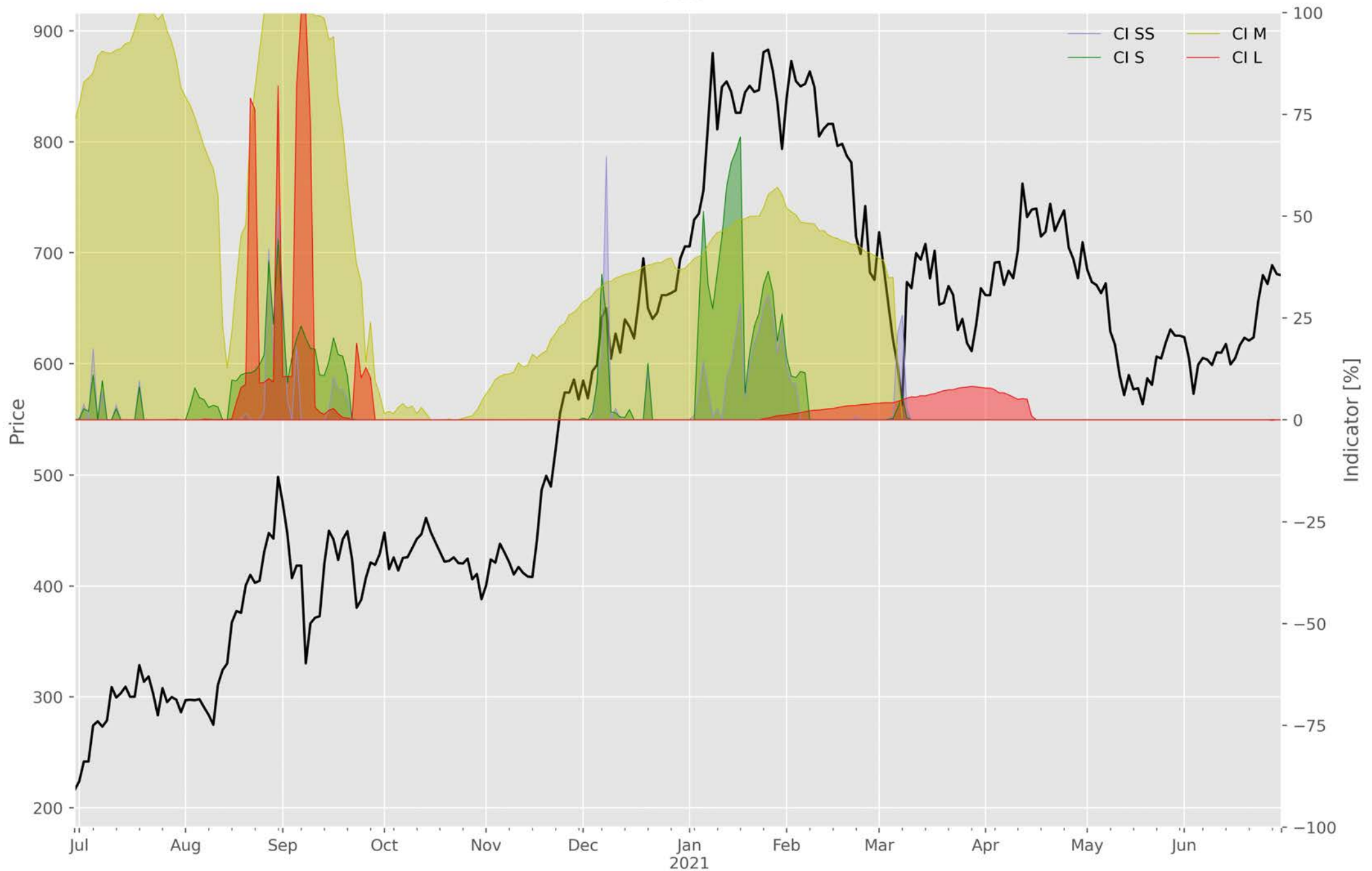
Amazon.Com



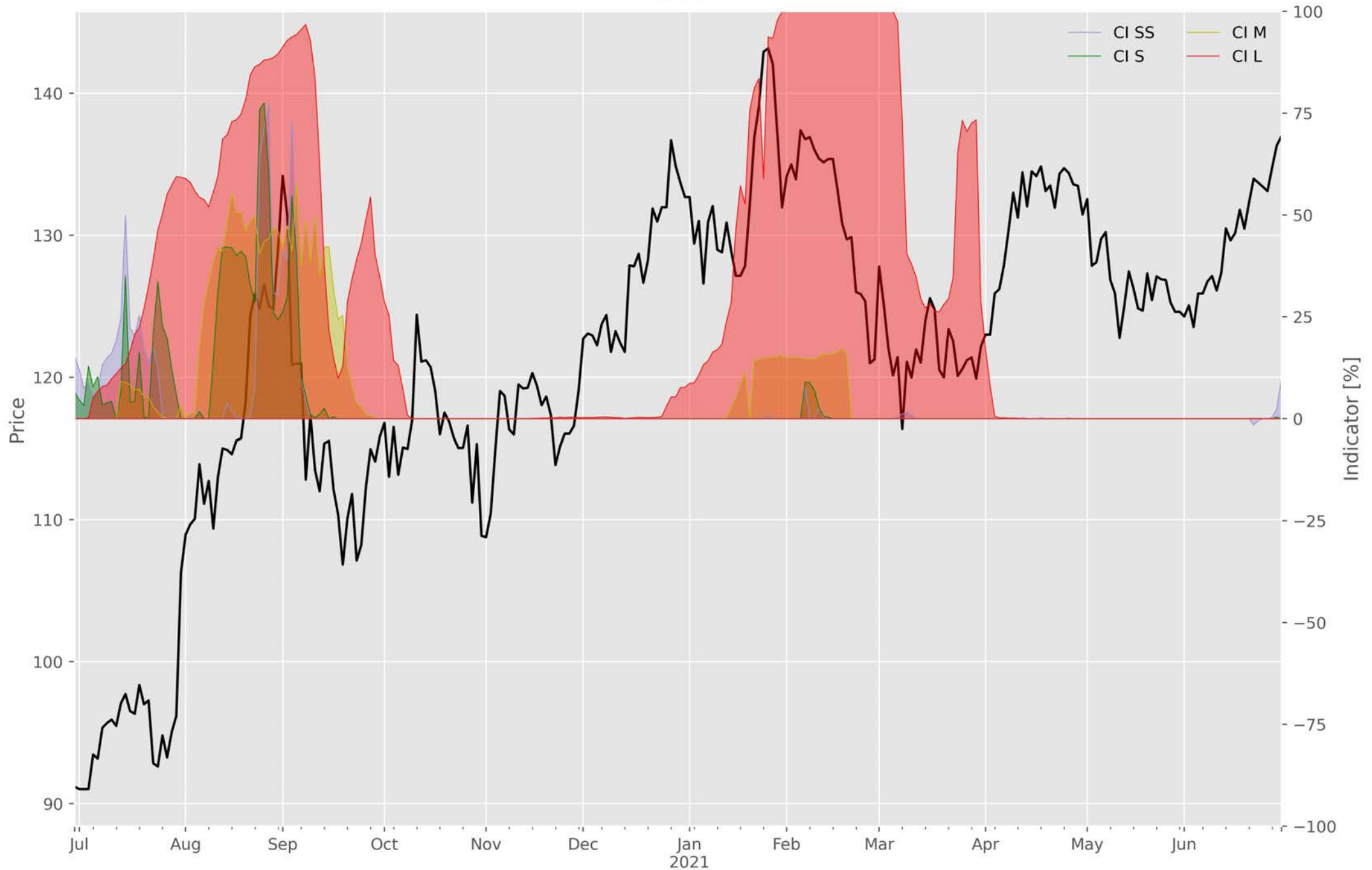
Microsoft



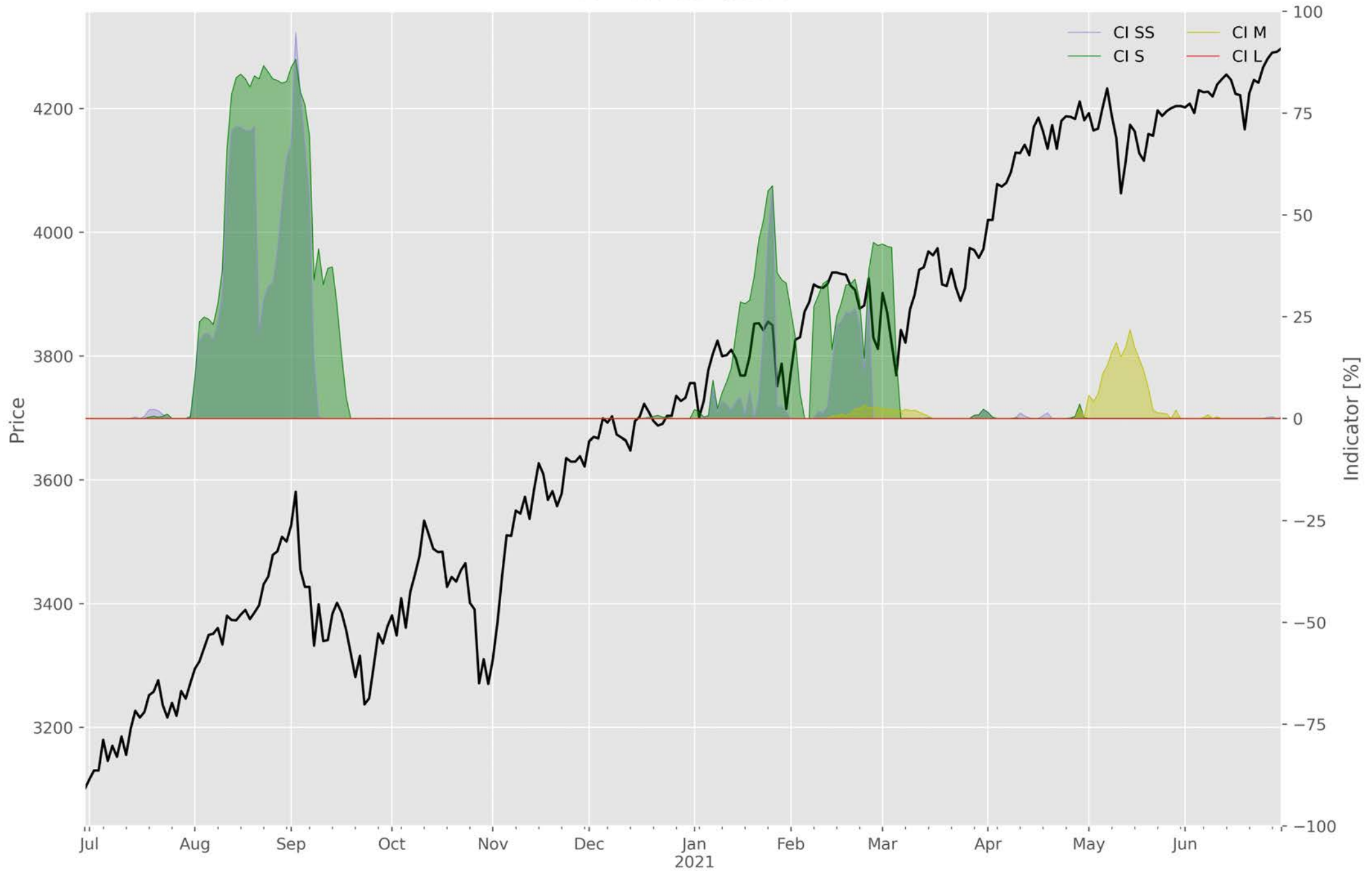
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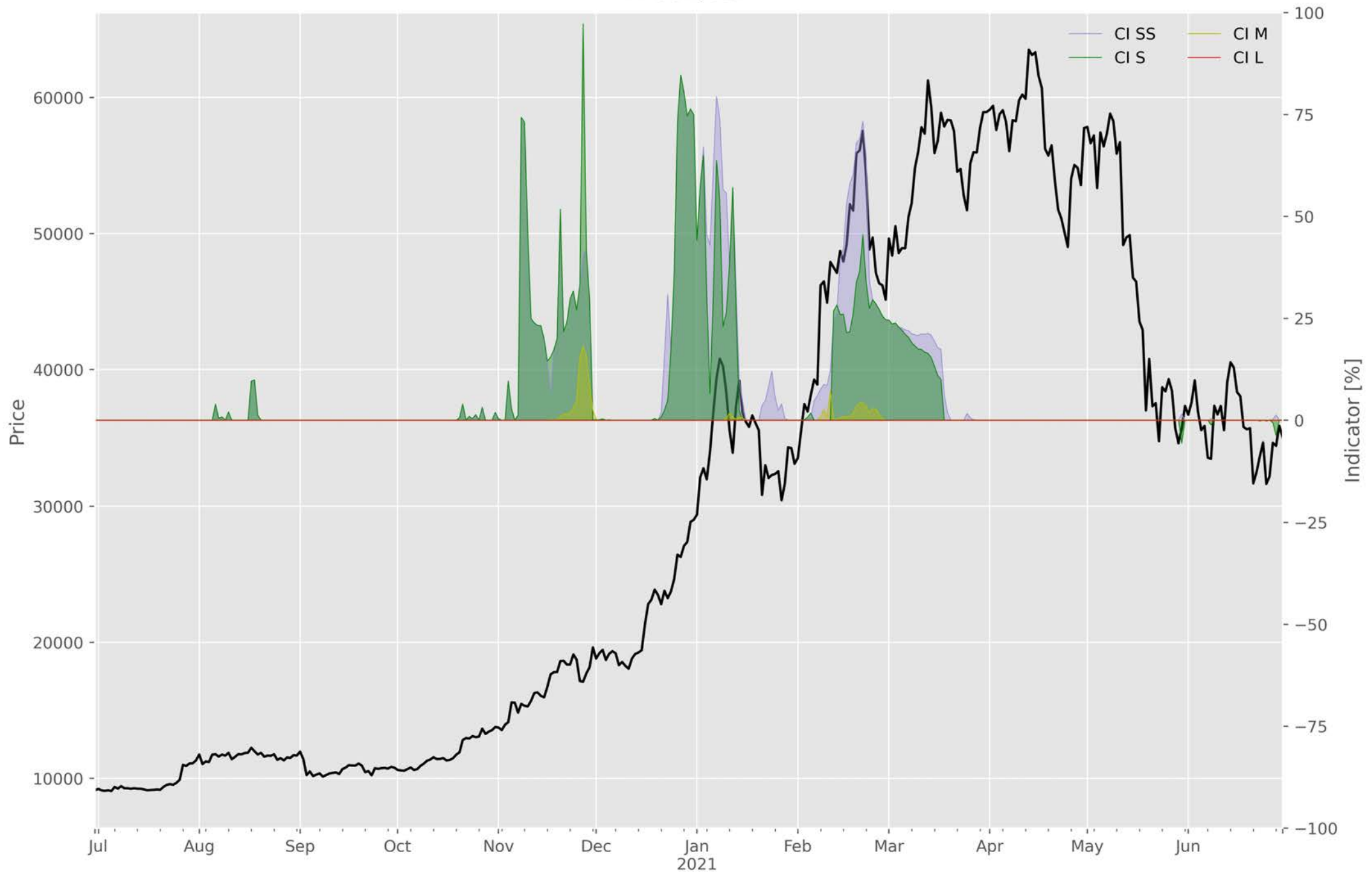
Apple



S&P 500 Composite



Bitcoin/USD



More Information

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

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

- ▶ **Contacts ETH Zurich**

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