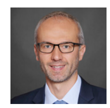
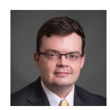
PULSe Indicator: Pandemic Factor Rises to Crisis Levels

Typically this leads Liquidity and Sentiment factors, which may trend higher.

February 2021


Thomas Poullaouec
Head of Multi-Asset Solutions, APAC


Nathan Wang
Solutions Analyst, Multi-Asset Solutions, APAC


David Clewell
Quantitative Investment Analyst, Multi-Asset—Baltimore

KEY INSIGHTS

- In December, the PULSe indicator of global financial conditions increased noticeably due to a deterioration in the Pandemic, Uncertainty, and Sentiment factors.
- Toward the top of the stable zone, the composite remains below the peak in November 2020, around the time of the U.S. presidential election.
- The Pandemic factor returned to the Crisis zone as new coronavirus cases continued to rise in the U.S., Europe, Japan, and many developing countries.

PULSe is a composite indicator that is designed to monitor the state of global financial markets since the coronavirus crisis. It stands for Pandemic, Uncertainty, Liquidity, and Sentiment—four factors that we believe encompass much of the market's dynamics. High positive values of PULSe are typically a negative sign for market stability.[1]

As of December 31, 2020, the PULSe indicator overall is characterized as Stable.

- The Pandemic factor reentered the Crisis zone as new virus waves continued to spread in the U.S., Europe, and Japan during the holiday season.
- The Uncertainty factor returned to the Stable zone after briefly touching the Much Lower zone in early December.
- The Liquidity factor has been fluctuating within the Stable zone.
- The Sentiment factor spiked to the Crisis zone early in November as market tensions rose around the U.S. presidential election and has abated to the Stable zone since then.

During December, the PULSe indicator increased noticeably due to the deterioration in the Pandemic, Uncertainty, and Sentiment factors.

- The Pandemic factor climbed over the last month of 2020 as daily new case growth rates surged in Europe, positive test ratios rose across all the G-7 countries that we follow, and Google retail mobility data dropped significantly, especially in Germany.
- The Uncertainty factor rose due to multiple inputs: The trend in

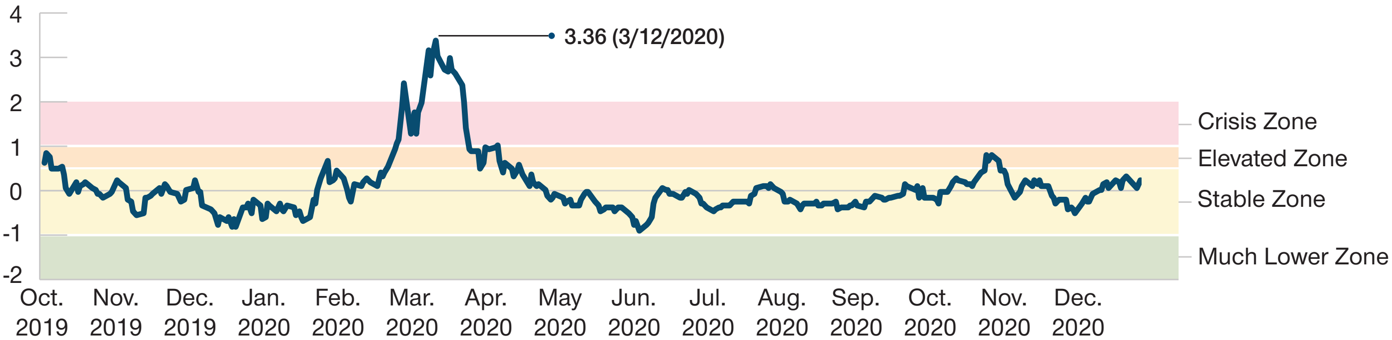
[1] For full details, please see our white paper "Taking the Market's PULSe in the Coronavirus Era" and additional information at the end of this paper.

Visualizing the PULSe Indicator

(Fig. 1) Expressed as an average of the four component indicators

	PULSe	Pandemic	Uncertainty	Liquidity	Sentiment
Current	0.20	1.43	-0.15	-0.19	-0.30
Zone	Stable	Crisis	Stable	Stable	Stable
5-Day Trend	→ 0.01	→ 0.42	→ -0.04	→ -0.43	→ 0.08
1-Month Trend	↑ 0.65	↑ 1.07	↑ 0.55	→ 0.01	↑ 0.96
3-Month Trend	→ 0.40	↑ 1.69	↑ 0.58	↓ -0.80	→ 0.15

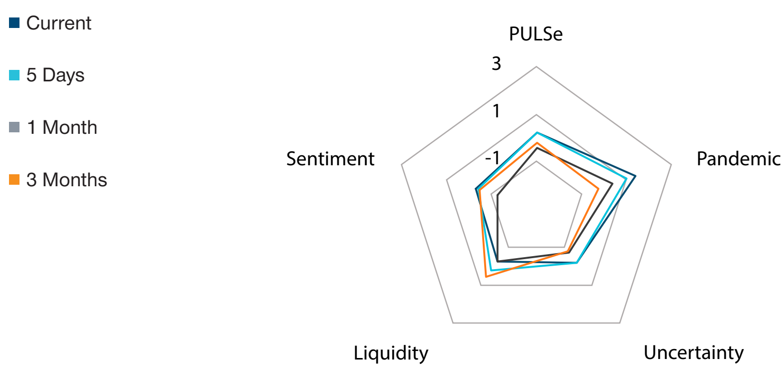
PULSe Indicator History



As of December 31, 2020.
Source: Haver Analytics/Bloomberg Finance L.P. Analysis by T. Rowe Price.
For illustrative purposes only. Subject to change. The PULSe indicator has been developed by T. Rowe Price. Using different underlying indicators and data could yield different results. Future outcomes may differ significantly. Note: Positive indicator values are typically a negative sign for market stability. The division of PULSe into zones is subjective, based on historical data and statistical assumptions. “Trends” represent the change in the given indicator over the stated period. Please see additional disclosures on the PULSe indicator at the end of this paper.

Radar Chart Showing the PULSe Indicator and Its Components

(Fig. 2) Radial axes expressed as Z-scores (number of standard deviations from the mean)



As of December 31, 2020.
Sources: Haver Analytics/Bloomberg Finance L.P. Analysis by T. Rowe Price.
For illustrative purposes only. Subject to change. The PULSe indicator has been developed by T. Rowe Price. Using different underlying indicators and data could yield different results. Future outcomes may differ significantly. “5 days,” “1 month,” and “3 months” represent the Z-score readings at those time periods prior to the current period. Please see additional disclosures on the PULSe indicator at the end of this paper.

commodities (inventory and prices) decelerated, 10-year yields contracted, and company earnings forecasts got revised down modestly.

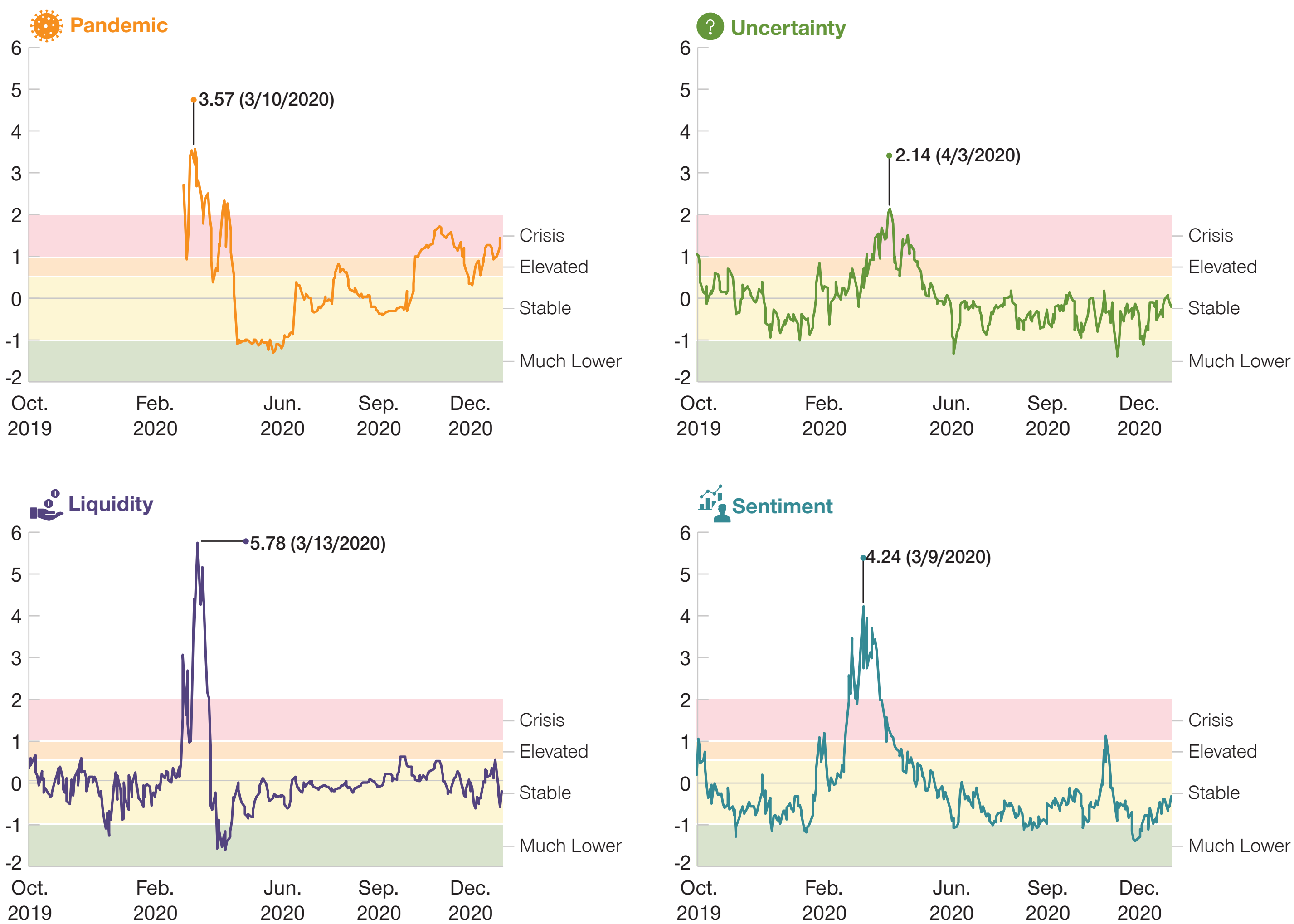
- The Liquidity factor remained largely unchanged as the spreads[2] of various credit sectors didn't move meaningfully over the period.
- The Sentiment factor shot up as the equity put/call ratio surged, implied volatility rose, and the gold price outperformed the copper price.

Changes in PULSe Indicator Construction

At the beginning of the coronavirus outbreak, we used daily new cases as the sole input data to construct the Pandemic factor. In early July, we made significant enhancements to the calculation of the Pandemic factor as

The Four Components of PULSe

(Fig. 3) Pandemic factor rose sharply



As of December 31, 2020.
Sources: Haver Analytics/Bloomberg Finance L.P. Analysis by T. Rowe Price.
Indicator level on left-hand side expressed as a Z-score and subjective stability zone on right-hand side of each chart.
For illustrative purposes only. Subject to change. The PULSe indicator has been developed by T. Rowe Price. Using different underlying indicators and data could yield different results. Future outcomes may differ significantly. Note: Positive indicator values are typically a negative sign for market stability. The division of PULSe into zones is subjective, based on historical data and statistical assumptions. Please see additional disclosures on the PULSe indicator at the end of this paper.
[2] Credit spreads measure the additional yield that investors demand for holding a bond with credit risk over a similar-maturity, high-quality government security.

more data (positive test ratio, Google retail mobility data) became available. These enhancements better reflect how markets react to the virus news. In the current Pandemic factor model, we now look at three metrics: (1) daily new cases to track the spread of the COVID-19 (the disease caused by the coronavirus); (2) positive test ratio to confirm the trend of the diffusion curve; and (3) Google retail mobility to assess the impact of the pandemic on consumer behavior.

Background Note

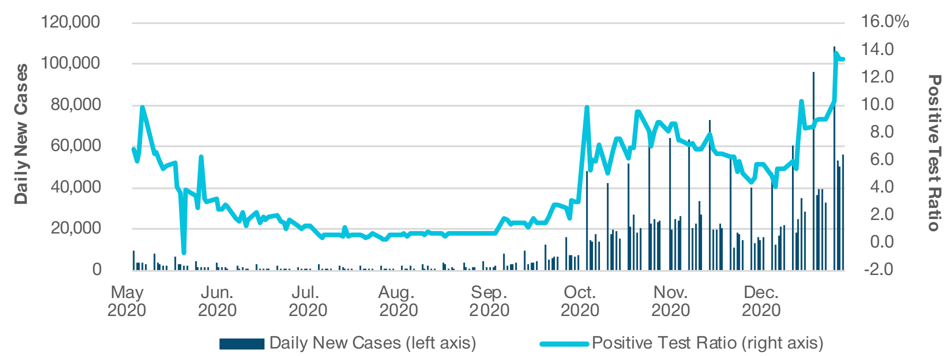
In this note we highlight three factors that contributed meaningfully to the PULSe indicator over the last month of the quarter: The new virus wave continued to spread in the UK, the rising trend of the copper price decelerated, and the equity put/call ratio surged.

1. The new virus wave continued to spread in the UK

Over the past month, daily new cases in the UK surged, likely due to the new strain of the virus being more contagious at a time of family gatherings during the holiday season. The positive test ratio increased to 13.4% from 4.4% at the beginning of December.

U.K. Second Wave Spikes in December

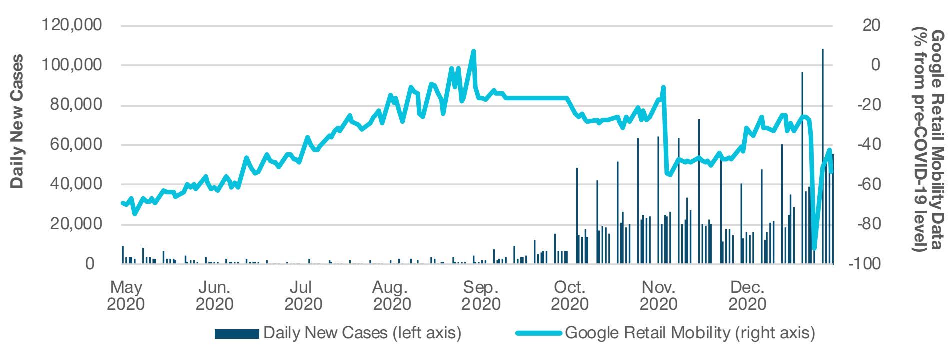
(Fig. 4) Positive test ratio and daily new cases



As of December 31, 2020.
Sources: Haver Analytics/Bloomberg Finance L.P.

UK Lockdowns Tightened After Surge in New Cases

(Fig. 5) Google retail mobility data[3] and number of daily new cases



As of December 31, 2020.
Sources: Haver Analytics/Bloomberg Finance L.P.

[3] Google retail mobility data use aggregated, anonymized user data to chart movement trends over time by geography, across different place categories such as retail and recreation. They are expressed as percentage change from pre-COVID-19 level.

The UK government extended its strictest restrictions to additional areas, seeking to curb the surge in infections, hospitalizations, and deaths caused by the new variant of the virus. Three-quarters of the country is now in a de facto lockdown. Not surprisingly, Google retail mobility dropped to approximately 55% below the pre-pandemic level according to Google data. On the bright side, after regulatory approval, authorities began deploying a second vaccine, one produced by AstraZeneca and Oxford University, enabling the government to accelerate its inoculation program.

2. The rising trend of the copper price decelerated

Copper price is a proxy measure of infrastructure investment and activity levels in emerging markets, especially in China. As the first round of the coronavirus hit China and other countries in Asia, the copper price plunged to a trough of USD 4,630 on the London Metal Exchange on March 23, 2020. Since then, we have observed a V-shaped recovery in copper prices. The strong run reflected the momentum surge often found in the early makings of a trend change. This period coincided with the outperformance of the MSCI Emerging Markets Index over the S&P 500 Index.

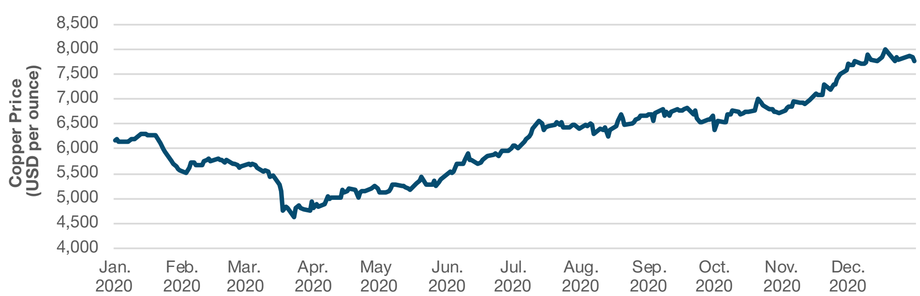
Since the beginning of October, "Dr. Copper" has continued to march higher on the back of the Chinese economic recovery underway. Copper traded to a seven-year high of USD 7,985 on December 18, indicating the pro-risk macro tone that continues to permeate most corners of the world. Over the last two weeks of December, copper prices were modestly softer after the resurgence of coronavirus cases and the Brexit uncertainties out of the UK, reflecting higher economic uncertainty in the short run. While some may argue that the metal is overbought, our metals and mining team feels that the supportive fundamentals for copper are still in place with an expectation of continued positive momentum from demand bumping against low inventories.

3. The equity put/call ratio surged

After the initial spike due to the COVID-19 outbreak in 2020, the equity put/call ratio continued to abate, reflecting the drop in demand for hedging and the rapid recovery of investor confidence. Since September, the ratio has been range-bound, driven by macro news around the developments of the U.S. presidential election, new fiscal stimulus, U.S.-China frictions, Brexit, the coronavirus resurgence, and subsequent government responses and the news on vaccines. During December, the elevated market valuation level; the resurgent coronavirus infections in the U.S., Europe, and Japan; and the uncertainty over U.S.-China relations led to a decrease

Uptrend in the Price of Copper Slows

(Fig. 6) Price of copper at the London Metal Exchange

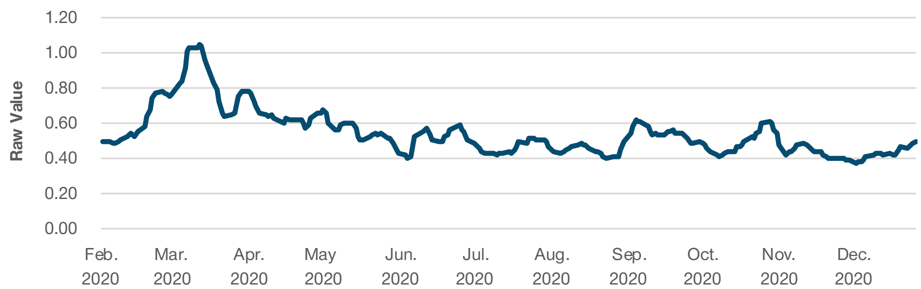


Past performance is not a reliable indicator of future performance.
As of December 31, 2020.
Sources: Haver Analytics/Bloomberg Finance L.P.

in investors' risk appetite. As a result, we witnessed an increase in demand for hedging with put options. Since government bonds are unlikely to be as effective a hedge as they used to be, investors appear to be looking for options to help hedge some risk in their portfolios. An increase in the equity put/call ratio indicated deteriorating market sentiment.

The Equity Put/Call Ratio Rises (5-Day Moving Average)

(Fig. 7) A sign of deteriorating investor sentiment



As of December 31, 2020.
Sources: Haver Analytics/Bloomberg Finance L.P.

Additional Information Regarding the PULSe Indicator:

We stress that the PULSe indicator is directional only, meant to show whether the key factors underlying the market turbulence are strengthening or weakening over time. It is not meant to be the basis for making market or asset allocation decisions and is not designed to be a market timing indicator.

A high number for the PULSe indicator is a sign of market stresses and, thus, potential turbulence.

Z-score: We focus on how the latest market data are different from the recent past using a Z-score, where each data point is expressed in terms of the number of standard deviations above or below the mean, or average, of the series.

The Pandemic factor or score differs slightly from the other three factors in terms of its underlying principles and, thus, the manner of its construction. Our Pandemic series is measured focusing on the largest economies such as the G-7. In the current Pandemic factor model, we now look at three metrics: (1) daily new cases to track the spread of the COVID-19 (the disease caused by the coronavirus); (2) positive test ratio to confirm the trend of the diffusion curve; and (3) Google retail mobility to assess the impact of the pandemic on consumer behavior. Our Uncertainty factor focuses on economic data and how they differ from market expectations. Examples of underlying data include the Bloomberg economic surprise indices, changes in oil supply and demand, yield curves, and earnings per share growth forecasts. The Liquidity indicator aims to identify any stresses in the credit market. Spreads on credit typically widen when liquidity dries up. Our Liquidity gauge uses commercial paper spread, the financials sector spread, the high yield energy and ex-energy spreads, and ratio. Finally, our gauge of market Sentiment looks at risk appetite from market participants. This includes put/call ratio, implied volatility, a measure of extremes in daily returns, currency sentiment, and some commodity prices.

Our aggregate PULSe indicator is composed of the four components or factors that are themselves composite indices. A simple average is taken across the four components.

For full details, please see our white paper "Taking the Market's PULSe in the Coronavirus Era."

INVEST WITH CONFIDENCE®

T. Rowe Price focuses on delivering investment management excellence that investors can rely on—now and over the long term.

To learn more, please visit troweprice.com.

T. Rowe Price®

Important Information

This material is provided for informational purposes only and is not intended to be investment advice or a recommendation to take any particular investment action.

The views contained herein are those of the authors as of February 2021 and are subject to change without notice; these views may differ from those of other T. Rowe Price associates.

This information is not intended to reflect a current or past recommendation concerning investments, investment strategies, or account types, advice of any kind, or a solicitation of an offer to buy or sell any securities or investment services. The opinions and commentary provided do not take into account the investment objectives or financial situation of any particular investor or class of investor. Please consider your own circumstances before making an investment decision.

Information contained herein is based upon sources we consider to be reliable; we do not, however, guarantee its accuracy.

Past performance is not a reliable indicator of future performance. All investments are subject to market risk, including the possible loss of principal. Derivatives such as options typically involve risks different from, and possibly greater than, the risks associated with investing directly in the assets on which the derivative is based. Certain derivatives can be highly volatile, lack liquidity, be difficult to value, involve counterparty risk, may be considered speculative and are not suitable for everyone. Copper, gold and other commodities are subject to increased risks such as higher price volatility and geopolitical risks. All charts and tables are shown for illustrative purposes only.

T. Rowe Price Investment Services, Inc.

ID0004007 (02/2021)
202101-1498655