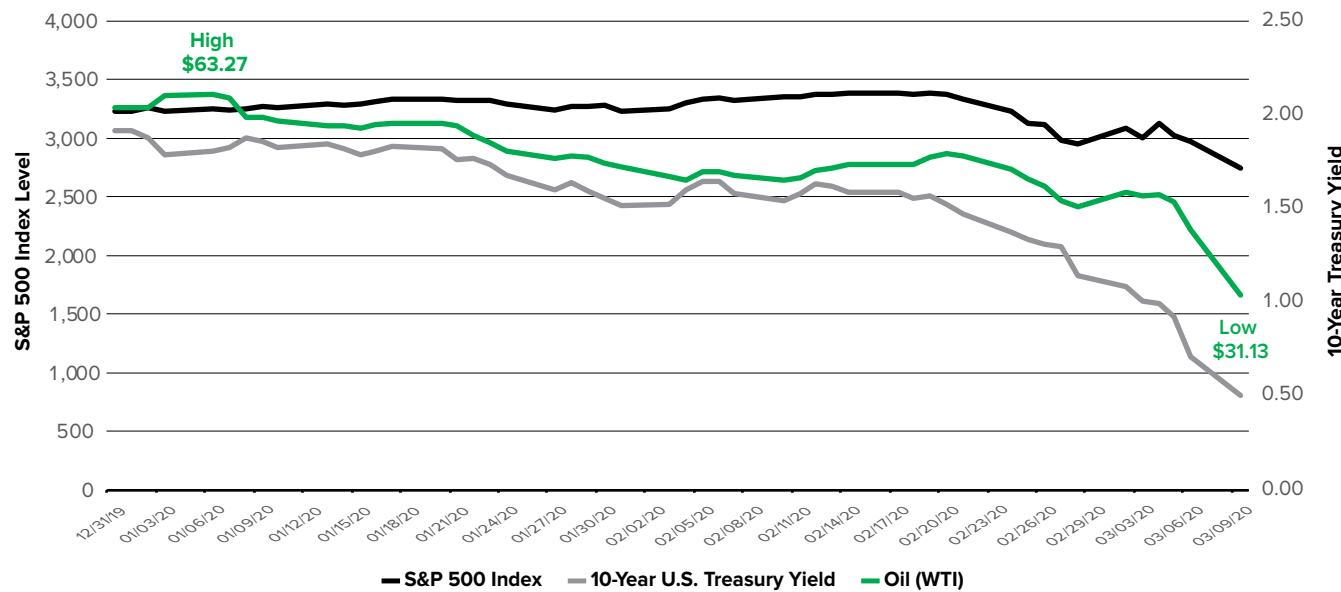


# Coronavirus: Market impact and macro view

As the novel coronavirus, COVID-19, evolves into a global pandemic, the capital markets continue to react dramatically. The major indexes have been wildly volatile, dipping into correction territory as elevated uncertainty over the threat the outbreak poses to the global economy and oil prices has rattled investors. The health impact of COVID-19 and its potential economic implications are extremely fluid, as are the market reactions to those two drivers. Given elevated market volatility and still unfolding developments, we are maintaining a proactive and analytical approach — placing greater emphasis on the fundamentals and quality of asset classes and sectors — rather than taking a reactive and emotional stance.

## COVID-19 IMPACT ON KEY MARKETS



Source: Ivy Investments and FactSet. Year-to-date performance of the S&P 500 Index, 10-Year U.S. Treasury yield index and West Texas Intermediate (WTI) crude oil price index; Jan. 1 – March 9, 2020. Past performance is not a guarantee of future results.

## RIPPLING EFFECT OF ECONOMIC WEAKNESS?

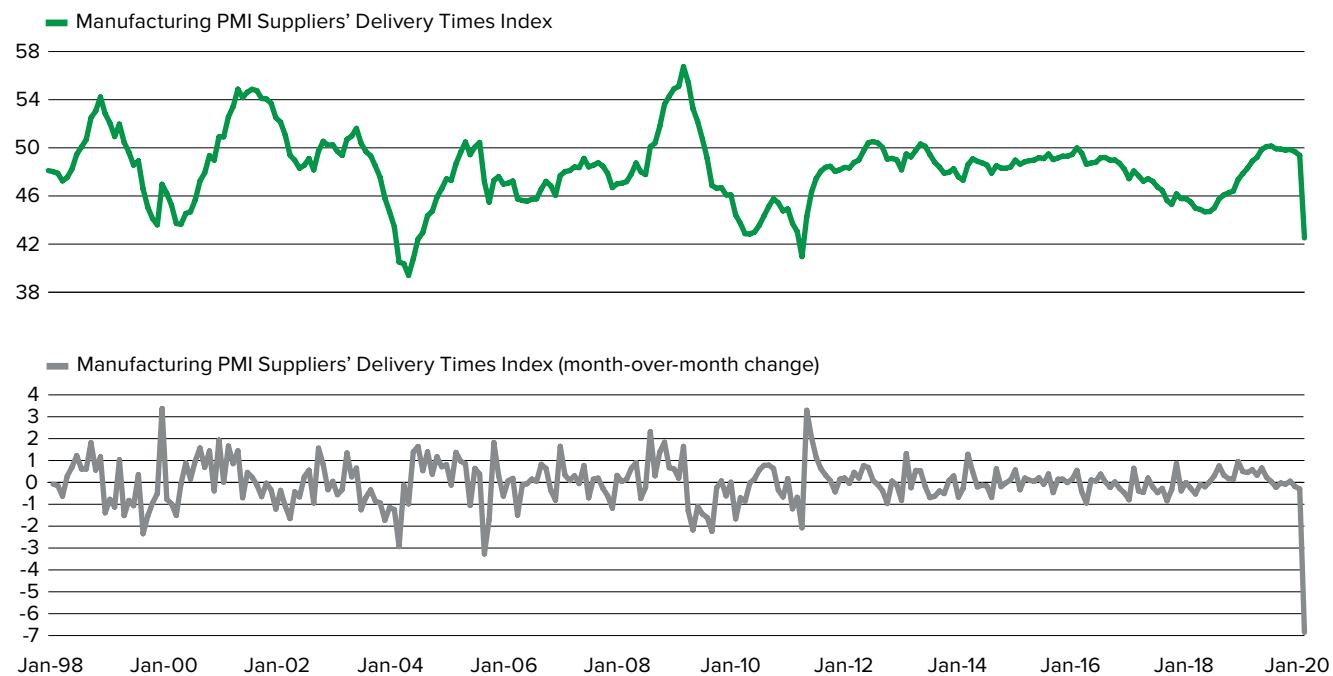
We believe global economic growth will be weaker in the first quarter, which could carry over into second quarter as COVID-19 spreads throughout the U.S. and Europe. Looking at specific economies, growth on a quarter-to-quarter basis could be negative in China, South Korea and Japan, as well as countries in Europe like Italy, which has issued quarantine measures across the country.

However, the situation in China appears to be improving as government officials and businesses work to balance containing the virus with

preventing further weakness in economic growth. We think the Chinese economy will likely continue to improve from here, albeit from very weak levels.

Global economic growth will likely be weak in the second quarter as the number of confirmed COVID-19 cases of rise in the U.S. and Europe, with a high likelihood that much of the western world sees negative growth on a quarter-to-quarter basis. Magnifying the economic impact of the virus outbreak is the supply chain disruption. We already are seeing massive delays in the delivery times on materials.

## SUPPLY CHAIN DISRUPTION — WORLD, MARKET PURCHASING MANAGERS' INDEX (PMI)



Source: Macrobond. Data show the measure times for suppliers to deliver goods to end users and the month-to-month disparity in deliveries. **Past performance is not a guarantee of future results.**

A drain on the supply portion of the equation could lead to shocks to the demand side. Social distancing actions taken by public health officials and businesses, coupled with likelihood that people may want to avoid high traffic locations — travel destinations, stadiums, theaters and restaurants — could shrink consumer consumption, further weakening gross domestic product (GDP) growth.

Oil prices recently plummeted following a breakdown of an alliance between the Organization of the Petroleum Exporting Countries (OPEC) and Russia after failing to agree to additional production cuts. We believe that this fracture will put downward pressure on oil prices for the foreseeable future, which should increase the purchasing power of consumers but should also hit capital spending on oil infrastructure. In general, recent weakness in oil prices could act as an additional drag on oil-producing economies, including the U.S.

Further price deflation is likely to occur as the oil cost curve is pushed lower. Lower cost production from OPEC and Russia is likely to push out higher cost production, effectively lowering the marginal cost of production. The need to lower cost structures may force some energy companies to consolidate in order to remain competitive. This action by OPEC and Russia could also have severe repercussions for many U.S. exploration and production firms, as well as oil service companies. We believe

bankruptcies are likely. This event could also affect other industries due to the severity of cuts to spending, higher unemployment and negative impact economic growth. We anticipate other sectors to feel pain.

We have revised our 2020 global outlook due to the economic and market impact of COVID-19. We now believe the global growth rate for 2020 will be around 3%, down from our initial forecast of 3.4% coming into year. However, we think this disruption is temporary and growth in the second half of 2020 could be closer to our original forecast, even surprising to the upside.

This is due in part to improvement in the underlying fundamentals, such as a better inventory situation and the reduced overhang of higher tariffs as a result in the cease fire in the U.S.-China trade war. These conditions could be amplified by the crisis as inventories are drawn down further as a result of supply-chain disruptions.

In addition, we are likely to see a considerable amount of stimulus added into the system. The Federal Reserve (Fed) enacted an emergency interest rate cut of 0.5%, and will likely cut rates another 0.5% or more in the next couple of months. Policymakers in Canada and Australia have also reduced interest rates. Several emerging markets central banks actually led the current rates reduction trend, and could possibly continue to make cuts.

We've also started to see fiscal stimulus in Italy, France and a number of Asian countries. We believe the U.S. could also introduce some form of fiscal stimulus, including a possible reduction in tariffs. Anything is possible in an election year.

If this slowdown is temporary as we believe, we could see a scenario where the combination of fundamentals and stimulus could further fuel a possible snapback.

#### DOWNSIDE CREDIT RISK IN THE SHORT TERM

The moves in the rate markets must be put into perspective in order to understand their magnitude. The chart below (Exhibit 1) shows the historical returns of the 2-year U.S. Treasury note — it is a distribution curve illustrating the standard deviation of returns. Looking at the far left side of the chart, a tiny green bar shows the intraday move after the Fed's March rate cut of 0.5%. The move broke the distribution chart, as the other side of the bell curve doesn't even appear. In essence, this was an unprecedented move on the 2-year U.S. Treasury note.

#### SPECIAL EDITION

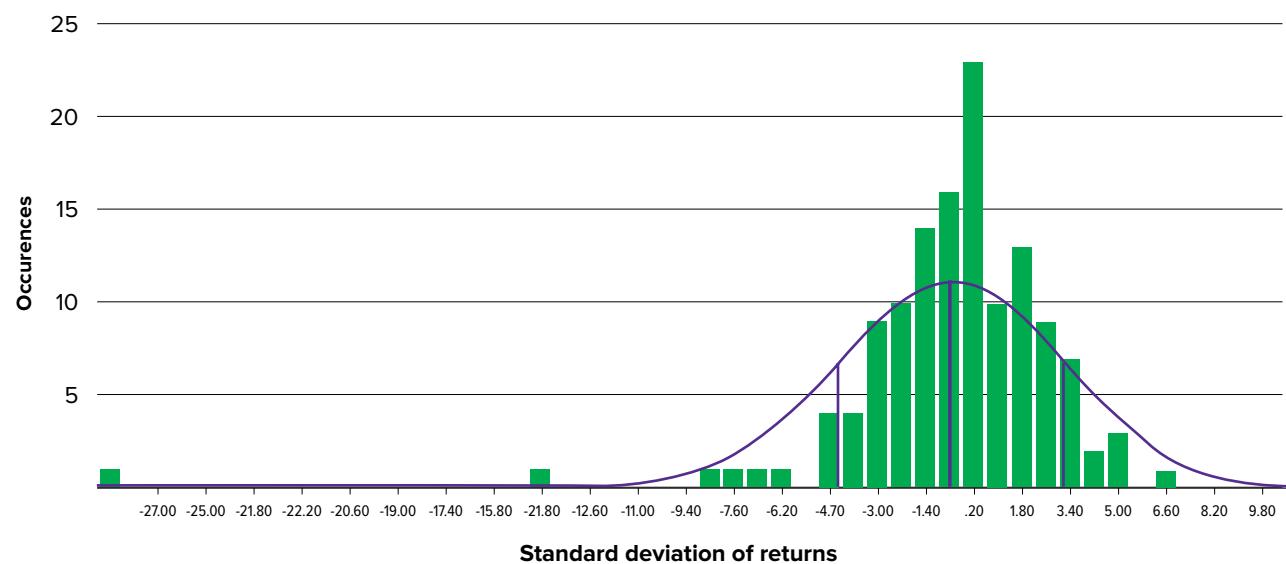
## Coronavirus: The macro view and market impact



[WATCH THE REPLAY](#)

#### EXTREME VOLATILITY IN THE FIXED INCOME MARKET (EXHIBIT 1)

Historical returns in the 2-Year Treasury Note



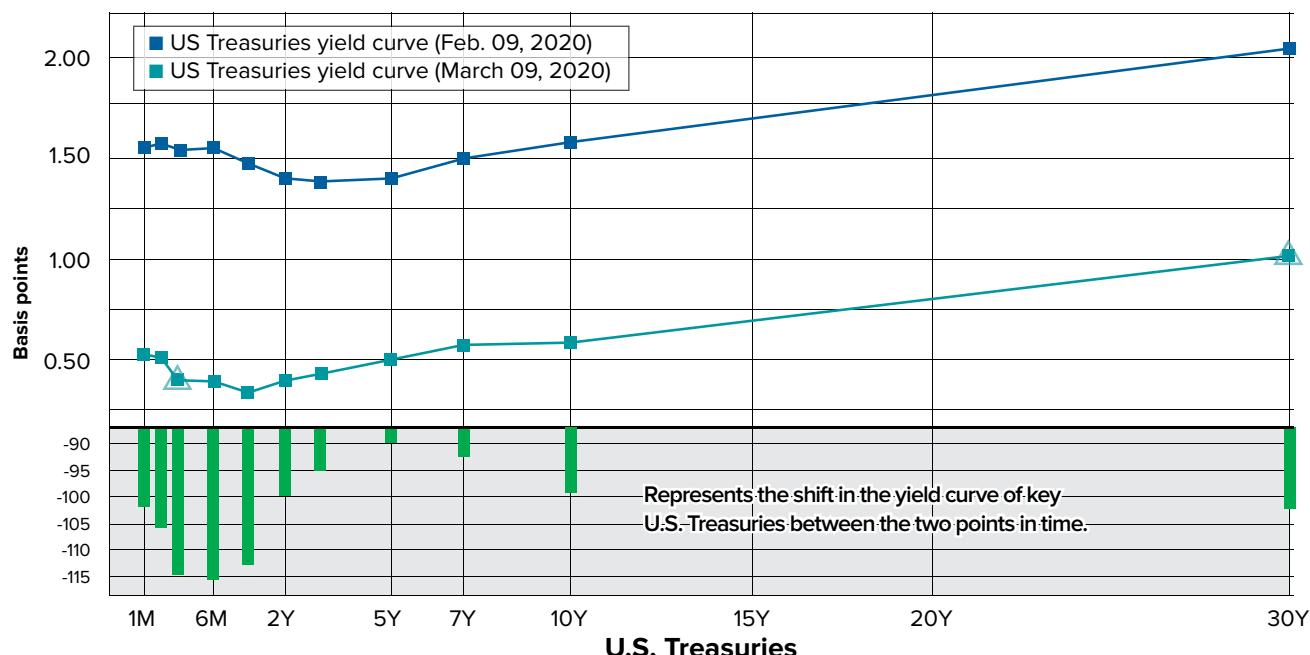
Source: Bloomberg. Data show the six-month returns of the 2-Year Treasury note from Sept. 3, 2019 - March 3, 2020. Past performance is not a guarantee of future results.

Additionally, the 10-year U.S. Treasury yield fell to historic lows. The root cause is inflation expectations are collapsing and, in an environment of falling demand, the chance of having an inflationary scare is minimal. So, while absolute rate levels are dramatically low, in the context of the current environment and its economic risks, we don't view current rate levels as overly irrational.

#### YIELD CURVE REMAINS ENCOURAGING

When looking at the yield curve of select U.S. Treasuries, most movement typically does not have meaningful deviation. However, the extent of the recent moves in rates is massive. The following chart (Exhibit 2) illustrates the downward shift in the yield curve of select U.S. Treasuries from one month ago to early March.

## YIELD CURVE REMAINS POSITIVELY SLOPED (EXHIBIT 2)



Source: Ivy Investments, Bloomberg. Data show 30-day comparison of the yield curve of select U.S. Treasuries as of March 09, 2020. Past performance is not a guarantee of future results.

While the magnitude of the moves is significant, the signal from the shape of the curve is critically important. With the parallel shift down in yields, we've seen a slight steepening on the curve. From a longer term economic perspective, this is how investors want to see the curve move down in environments like this. Worry creeps in when the curve flattens massively, as that tends to be a troubling sign. We believe the steepness in the curve two years and beyond demonstrates the market thinks a recovery will occur and return to normal at some point in time.

In credit, investment grade spreads have widened. Whenever markets come down, companies come to market with new issues, trying to take advantage of lower interest rates. High yield credits have seen spreads widen due to increased economic uncertainty. The rise in spreads is even greater following the oil price decline as energy-related issuers come under pressure.

In terms of overseas credit, in Europe, the German sovereign curve, which is the best gauge of yields in Europe, had a similar shift to the U.S. Treasury curve. In contrast to the U.S., the absolute changes haven't

been as big given rates in Europe are in negative territory. While we are seeing big moves in rates, we're not seeing things that we deem irrational or concern us materially.

### EVERY MARKET CHALLENGE IS AN OPPORTUNITY

In our view, the coronavirus outbreak is likely to be a transitory event. While tragic, we believe such passing events lead to risk-off market environments, providing us opportunities to seek to take advantage of near-term stock price dislocations to invest in long-term advantaged business models. Looking ahead, we continue to put greater emphasis on the fundamentals and quality of asset classes and sectors.

We believe it is important to stay focused on the merits of individual market sectors, industries and companies when making investment decisions. Historically, those fundamentals have tended to outweigh external factors such as the coronavirus outbreak. While these factors can certainly impact markets and economic growth over the shorter term, we think the innovation and management skill within individual companies can drive stock selection opportunities.

# The epidemiology of COVID-19

After its initial detection in the Hubei province of China last December, cases of COVID-19 were confirmed in South Korea, Italy and Iran within weeks. By late January, the World Health Organization (WHO) issued a warning to take precautions for a possible pandemic. This alert was followed by a similar action from the Centers for Disease Control and Prevention (CDC). On Feb. 26, the first confirmed U.S. case of COVID-19 was identified in a patient with no known risk factors, suggesting the virus is now circulating in our community.

As of early March, Covid-19 had spread to 110 countries with nearly 110,000 confirmed cases and had claimed at least 4,000 lives.

Two characteristics of the virus that are worrisome are its person-to-person transmissibility and its mortality rate. At the current time, the transmissibility is believed to be similar to influenza virus while the mortality rate appears to significantly exceed influenza virus (influenza morality rate overall < 0.1%). The mortality rate for COVID-19 is difficult to predict due to incomplete data, particularly in asymptomatic and mildly symptomatic individuals. However, advancing age seems to be a clear risk factor, with mortality rates in confirmed cases in excess of 8% for people age 70 and older, based on CDC estimates. In addition, the mortality rate among confirmed cases for people with chronic diseases, such as diabetes and cardiovascular disease, is greater than 5%.

## HISTORY OF PANDEMICS

Name	Timeline	World population	Est. infected population	Deaths	Mortality rate
SARS (coronavirus beta)	2003 – 2004 (15 months)	6,358,000,000	8,096	774	9.56%
H1N1	2009 – 2010 (14 months)	6,835,000,000	1,000,000,000	225,000	0.02%
Spanish Flu (H1N1 virus)	1918 – 1919 (12 months)	1,825,000,000	500,000,000	50,000,000	10.00%
COVID-19 (coronavirus)	2019 – ?	7,800,000,000	TBD	TBD	TBD

SOURCE: Centers for Disease Control and Prevention.

The opinions expressed in this article are those of Ivy Investment Management Company and are not meant to predict or project the future performance of any investment product. The opinions are subject to change at any time based on market and other current conditions, and no forecasts can be guaranteed. This commentary is being provided as a general source of information and is not intended as a recommendation to purchase, sell, or hold any specific security or to engage in any investment strategy. Investment decisions should always be made based on an investor's specific objectives, financial needs, risk tolerance and time horizon.

The S&P 500 Index is a float-adjusted market capitalization weighted index that measures the large-capitalization U.S. equity market. It is not possible to invest directly in an index. Standard deviation is a quantity calculated to indicate the extent of deviation for a group as a whole which can be used as a measure of how volatile a fund's returns are. The US Treasury yield curve is a graphical representation of the yields available for bonds of equal credit quality and different maturity dates.

**Risk factors:** Investment return and principal value will fluctuate and it is possible to lose money by investing. International investing involves additional risks, including currency fluctuations, political or economic conditions affecting the foreign country, and differences in accounting standards and foreign regulations. These risks are magnified in emerging markets. Fixed income securities are subject to interest rate risk and, as such, the value of such securities may fall as interest rates rise. Investing in below investment grade securities may carry a greater risk of nonpayment of interest or principal than higher-rated bonds.

IVY INVESTMENTS™ refers to the investment management and investment advisory services offered by Ivy Investment Management Company, the financial services offered by Ivy Distributors, Inc., a FINRA member broker dealer and the distributor of IVY FUNDS® mutual funds and IVY VARIABLE INSURANCE PORTFOLIOS®, and the financial services offered by their affiliates.