Verus

PERSPECTIVES THAT DRIVE ENTERPRISE SUCCESS

MARCH 17, 2020

Market Update

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Where are we?

Coronavirus

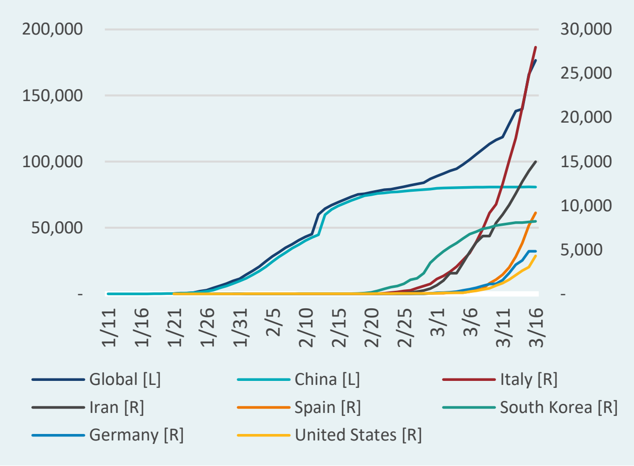
— Since January, the coronavirus, or COVID-19, has spread at an exponential pace around the world. Most experts believe that while the virus is about as infectious as the common flu, the mortality rate is much higher. The virus is significantly more dangerous for older citizens with pre-existing health conditions such as respiratory issues and obesity.

— The pace of new infections appears to be slowing in China. However, the number of new daily infections outside of China recently eclipsed the rate seen during the peak of the outbreak within China. The situation in Italy has continued to unravel, and alarming increases in the case count in the European periphery as well as Scandinavia support the World Health Organization's recent declaration that Europe is the current epicenter of the outbreak.

— Countries around the world have started putting in place restrictions on gatherings of significant numbers of people, and cities within the United States have implemented stricter social distancing policies. San Francisco legally prohibited residents from leaving their homes except to meet basic needs until April 7th, and Seattle forced the closure of its restaurants and bars.

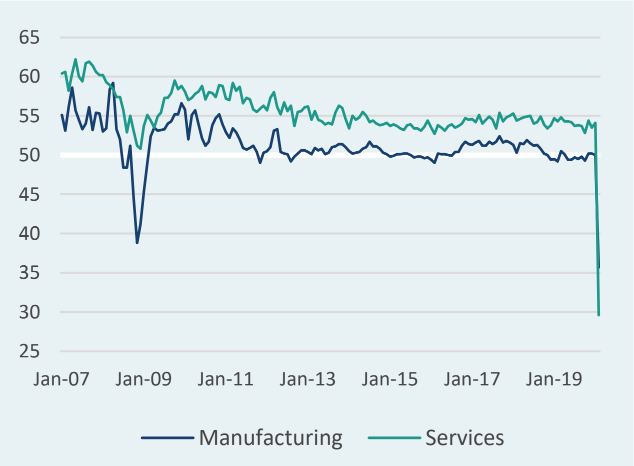
— It appears that the Trump administration has adopted a more serious, bi-partisan approach to tackling the spread of the virus over the last few days. Google and Wal-Mart have contributed to the effort as well, signaling a public/private sector cooperation which should improve the U.S. trajectory and shorten the eventual recovery period.

GLOBAL CONFIRMED COVID-19 CASES



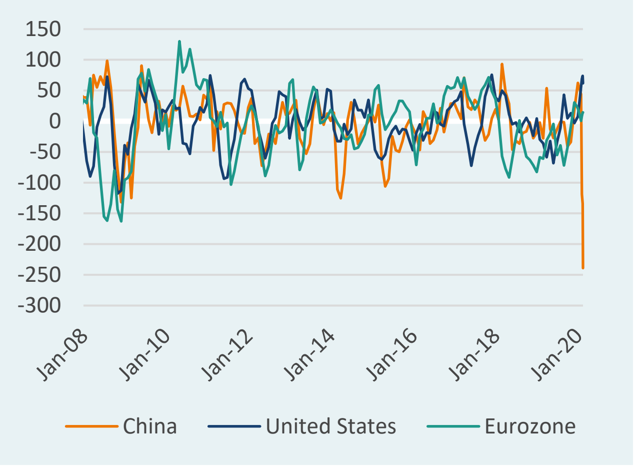
Source: Bloomberg, as of 3/16/20

CHINESE PURCHASING MANAGERS' INDICES



Source: China Federation of Logistics and Purchasing, as of 2/29/20

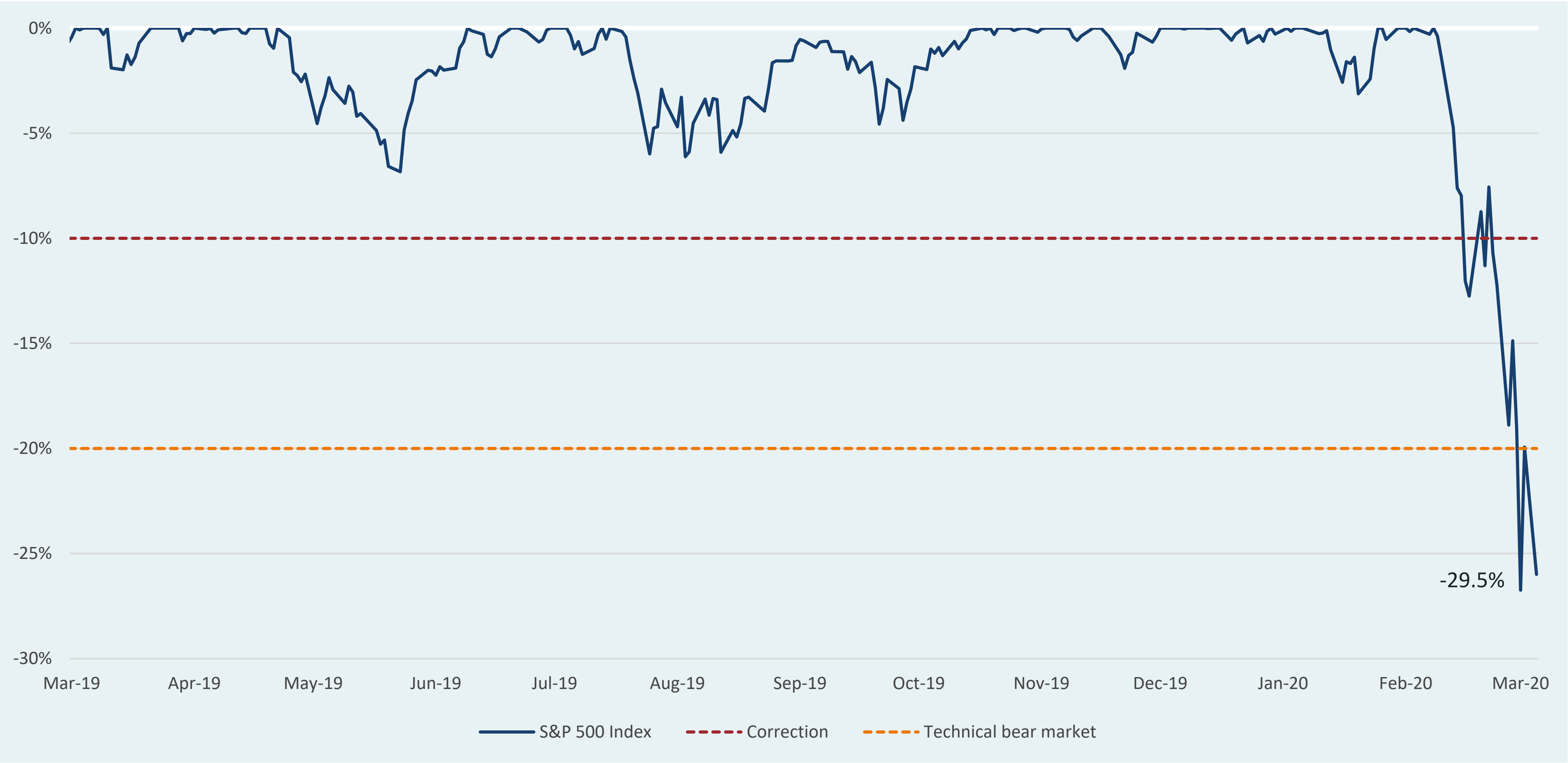
ECONOMIC SURPRISE INDICES



Source: Citi, Bloomberg, as of 3/16/20

S&P 500 drawdown

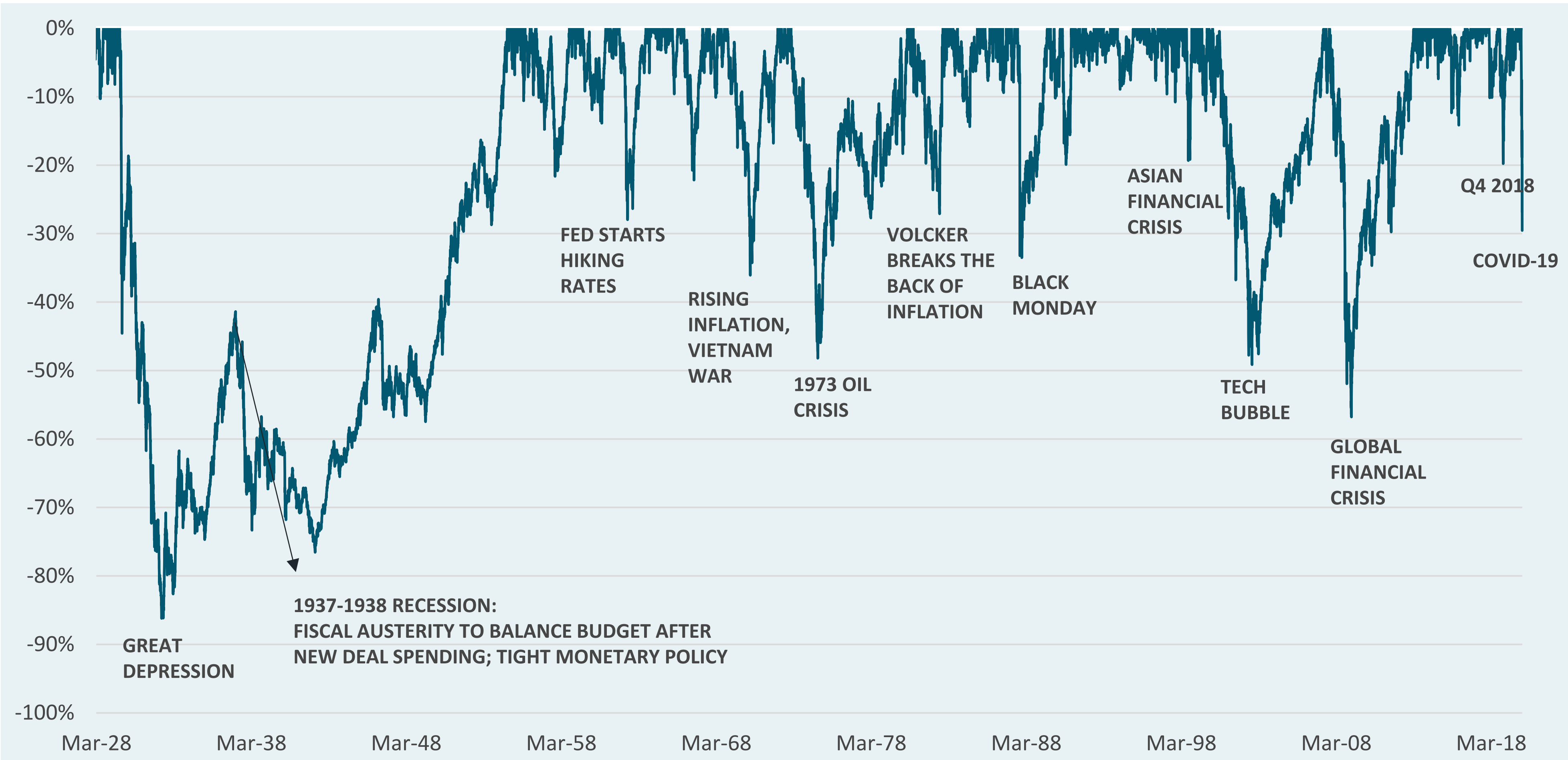
MAX DRAWDOWN FROM PREVIOUS ALL-TIME-HIGH



Source: Standard & Poor's, Bloomberg, as of 3/16/20

Corrections do happen, sometimes worse

MAX DRAWDOWN FROM PREVIOUS ALL-TIME-HIGH



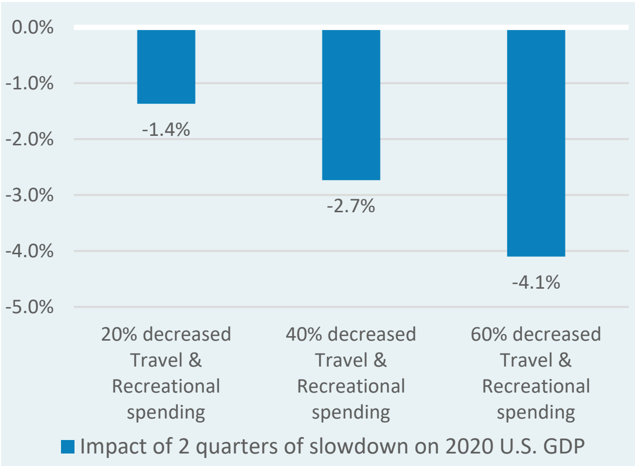
Source: Standard & Poor's, Bloomberg, as of 3/16/20

How much worse could it get?

— The strength of the U.S. consumer has been a foundational component of U.S. economic progress over the course of the expansion. For the past few years the labor market has remained solid and consumer sentiment has remained near all-time high levels. All of these factors have supported strong consumption, which represents nearly 70% of U.S. GDP. If we were to see long, drawn-out closures in the foodservice sector, and businesses remained closed for much longer than expected, there would inevitably be a significant hit to GDP as consumers pare back their spending.

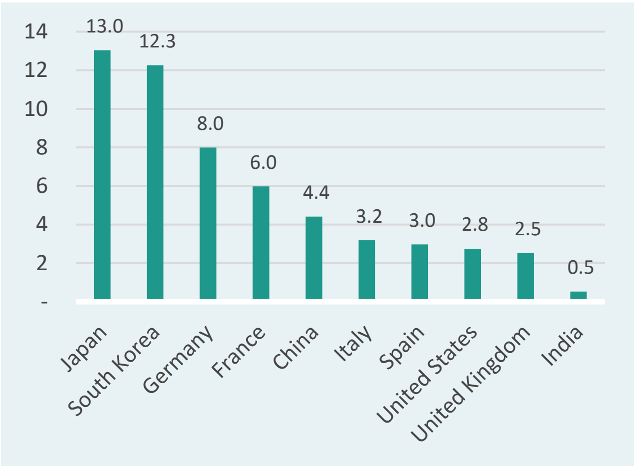
— From a health perspective, material concerns remain that without marked improvement in transmission statistics within the U.S. the health care and services sector may come under serious strain. The focus, for the time being, will be to "flatten the curve" to reduce the amount of people needing care at any given time, and to ensure that as many hospital beds as possible (the U.S. has about 3 per 1000 citizens) remain open for those with the most pressing need.

IF TRAVEL & RECREATION SPENDING DROPS…



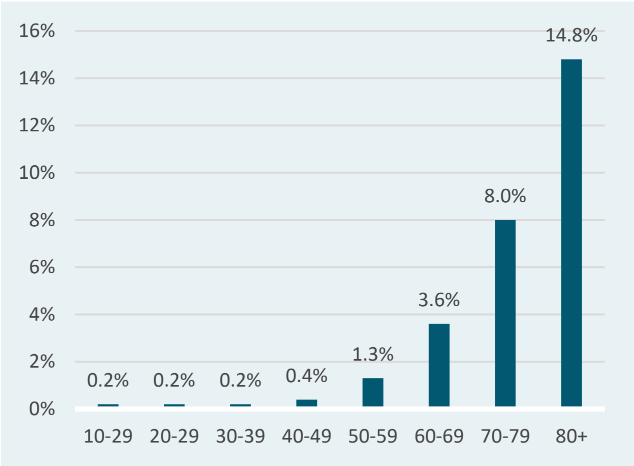
Source: Verus, BEA, as of 2/27/20

HOSPITAL BEDS PER 1,000 INHABITANTS



Source: World Bank, as of 2017

MORTALITY RATES BY AGE GROUP



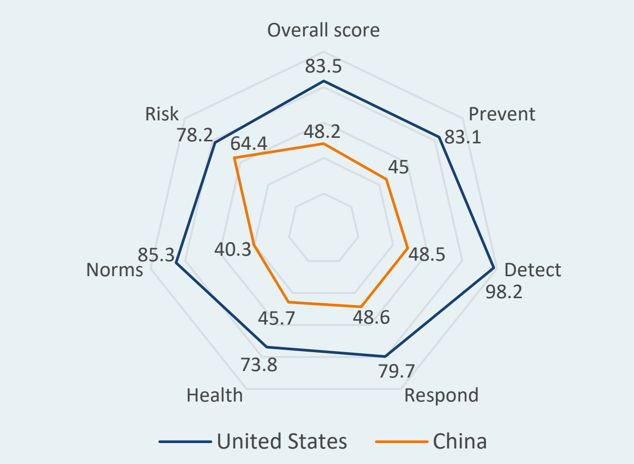
Source: Chinese Center for Disease Control & Prevention

Is China an accurate comparison?

— Each country that has experienced a coronavirus outbreak seems to be following a similar trajectory of infections. China was the first country to experience an outbreak, and the number of reported infections eventually slowed. But is it appropriate to use China as a comparison?

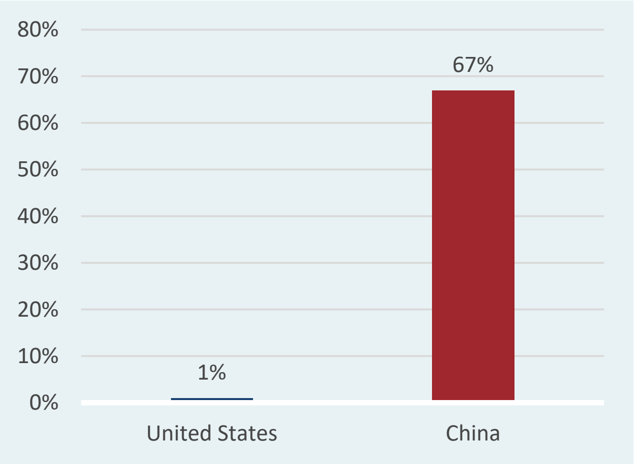
— The Chinese government implemented draconian measures to contain spread of the virus, including forced lockdowns of citizens, mass surveillance of the population, and cutting off infected cities from the rest of the country. The U.S. is not likely able (or willing) to take such extreme measures, which leads us to believe that China's COVID-19 trajectory may not be an appropriate model for the United States.

GLOBAL HEALTH SECURITY INDEX SCORES



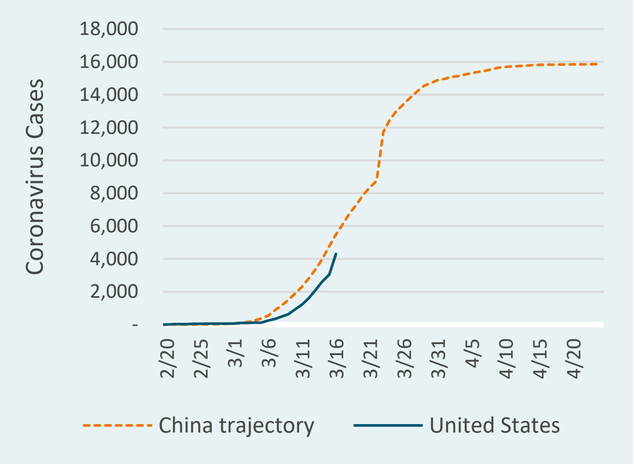
Source: Global Health Security Index, as of 2019

% OF POPULATION FACING MOVEMENT RESTRICTIONS



Source: Verus, as of 3/16/20

COMPARING THE U.S. TO CHINA'S TRAJECTORY



Source: Verus, adjusted for population size differences

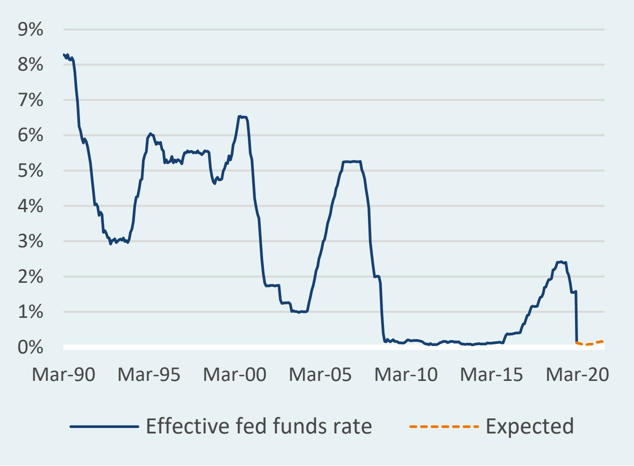
What will the response look like?

U.S. monetary response

In an emergency press conference on Sunday, the Federal Open Market Committee introduced a series of policy changes targeted at supporting financial markets given the challenges posed by COVID-19.

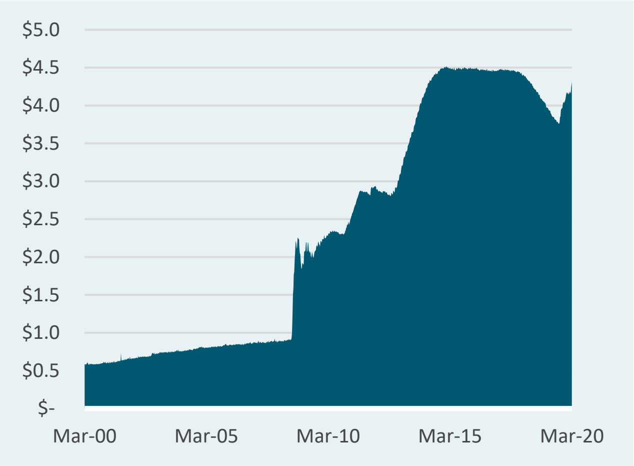
1. Cutting the fed funds range by 1.00%, bringing the new range to 0.00-0.25%
2. Purchasing $500 billion in U.S. Treasuries and $200B in agency mortgage-backed securities
3. Cutting required reserve ratios to 0% for thousands of banks, effective March 26th, 2020
4. Enhancing U.S. dollar liquidity globally by improving terms for dollar liquidity swap lines
5. Pumping nearly $2 trillion U.S. dollars into the funding markets through term repo operations

EFFECTIVE FED FUNDS RATE



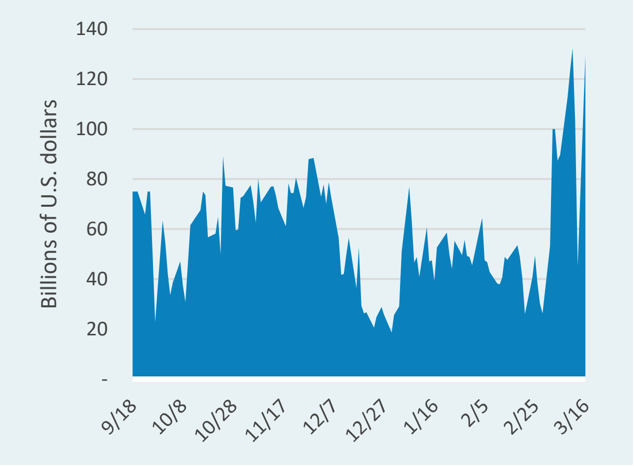
Source: Bloomberg, as of 3/16/20

FEDERAL RESERVE BALANCE SHEET (TRILLIONS)



Source: Federal Reserve, as of 3/11/20

VALUE OF OVERNIGHT REPO BIDS ACCEPTED



Source: Federal Reserve Bank of New York, as of 3/16/20

U.S. fiscal response

Families First Coronavirus Response Act:

— 10 sick days to full-time workers, prorated for part-time workers. This legislation applies to most U.S. workers, though some restrictions exist.

— Food support for low-income families increased through programs such as: increased SNAP coverage for jobless and lower-income Americans, emergency food allotments, and guaranteed school lunches.

Family and Medical Leave Act:

— This existing act has been amended to provide paid leave for employees of businesses with fewer than 500 staff in size.

— For workers who still require time off after the first two weeks, this act will cover these employees for up to 14 weeks.

Additional Discussions Underway:

— Lawmakers have reportedly discussed a range of additional fiscal measures, such as a cut to payroll taxes, small business loans, and targeted support for airlines, cruise lines, and industries most impacted by the virus.

— Outright payments to all Americans has also been proposed, commonly referred to as "helicopter money".

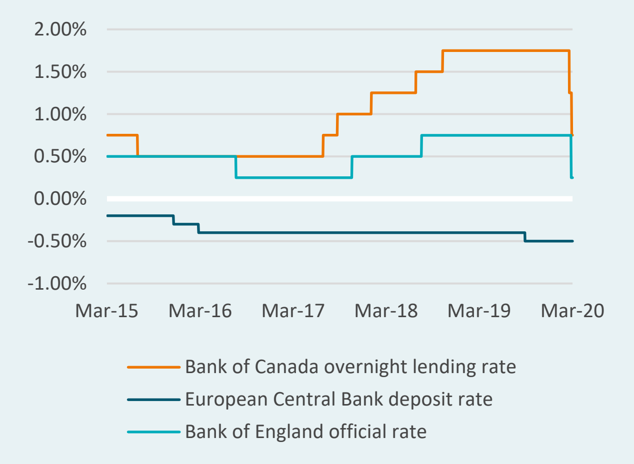
International monetary/fiscal response

— The European Central Bank unexpectedly elected not to cut its deposit rate below -0.50%, instead opting to expand its asset purchase program by €120 billion. The Bank of Japan followed suit, leaving its target for short rates unchanged at -0.10%, and doubling its annual ETF purchasing target, to ¥12T ($112B).

— The Bank of England cut its key bank rate by 0.50% to 0.25%, and even the Bank of Canada, which has been the most hawkish on interest rate policy as of late, cut its benchmark rate from 1.75% to 0.75% over the course of two weeks.

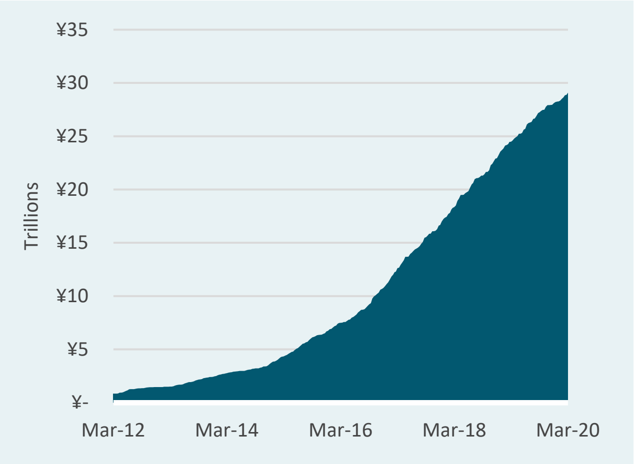
— Fiscal packages are being rolled out around the globe, and have featured cash subsidies to permanent adult residents, business subsidies in sensitive industries, bridge loans for small businesses, payroll/income/property/business tax relief, funding for paid sick leave, and childcare subsidies.

G7 CENTRAL BANK KEY INTEREST RATES



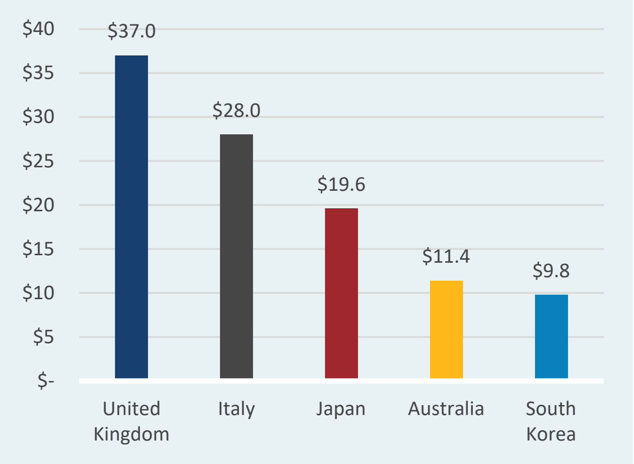
Source: Bloomberg, as of 3/16/20

BANK OF JAPAN INDEX-LINKED ETF HOLDINGS



Source: Bank of Japan, as of 3/10/20

FISCAL SUPPORT PACKAGES (BILLIONS)

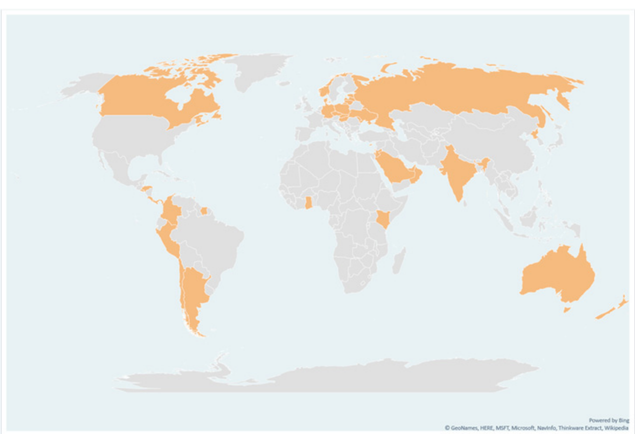


Source: Verus, as of 3/16/20

Travel restrictions and social distancing

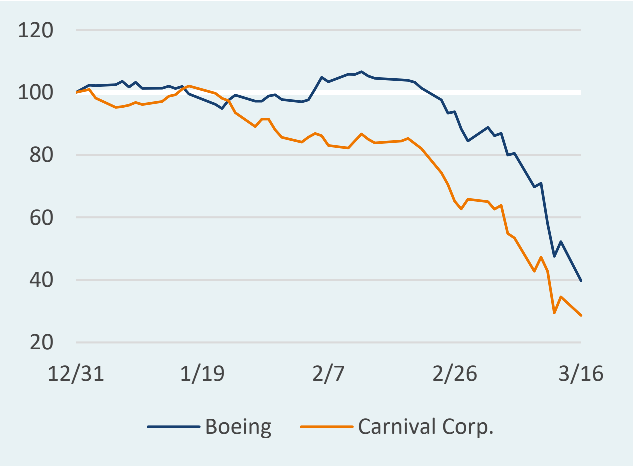
- As a result of the coronavirus pandemic, many countries around the world have started to implement border controls, quarantines, entry bans, and other measures aimed at generating the "social distance" which should help flatten the confirmed case curve and alleviate the pressure on the health care sector. As of March 16th, 39 countries had issued global travel bans, and many others had implemented their own packages of general quarantine measures, entry bans, border tightenings, and medical examination requirements. The United States banned travel to Europe for at least 30 days beginning March 13th.
- Industries with high exposure to global travel have unsurprisingly come under significant pressure. Boeing and the Carnival Cruise Line stock have both fallen over 50% over the year-to-date, and both appear to be likely beneficiaries of public sector support moving ahead.
- Voluntary self-quarantines, and more recently the closure of restaurants and bars in several parts of the country, have made it a tough go for those in the foodservice industry. Data from OpenTable showed that the number of diners last week in many major American cities was more than 50% lower than the number of diners in the equivalent week of 2019. Businesses and employees in this space may soon require some degree of federal assistance.

COUNTRIES ISSUING GLOBAL TRAVEL BANS



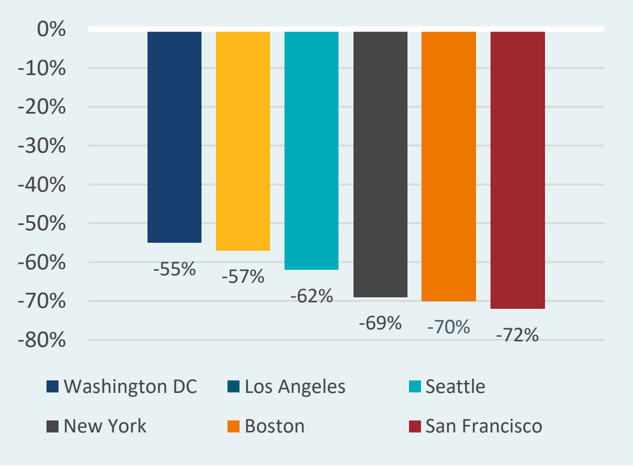
Source: Various, as of 3/16/20

TRAVEL-SENSITIVE STOCKS HAVE PLUNGED



Source: Bloomberg, as of 3/16/20

YEAR-ON-YEAR CHANGE IN NUMBER OF DINERS



Source: OpenTable, as of 3/15/20

Impacts

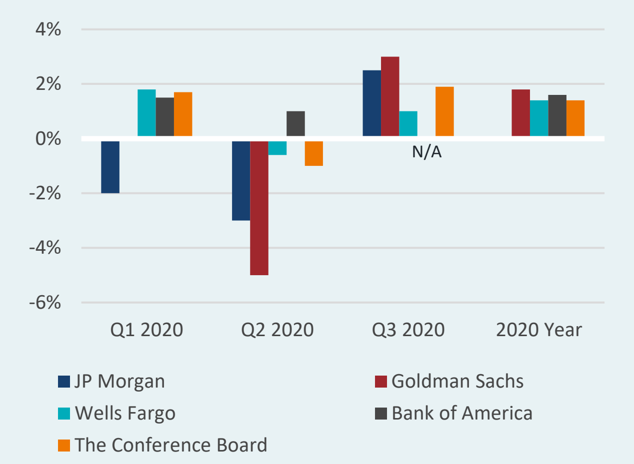
Growth and economic activity

— The Empire Manufacturing Survey of general business conditions fell from 12.9 to -21.5 in a preliminary March reading, its lowest level since 2009. Both the new orders and the shipments components of the overall index fell into the contractionary territory below 0.0. Moving into the next few weeks, we will be following the extent to which COVID-19 related disruptions flow through into the economic data.

— The COVID-19 pandemic is a fairly-unique economic event and it is difficult to model its possible impacts. Japan's Fukushima nuclear disaster might be useful for comparative purposes, where over 15,000 Japanese citizens died due to the accident, and 500,000 were displaced from their homes. The disaster also heavily impacted cities where Japan's industrial production is housed.

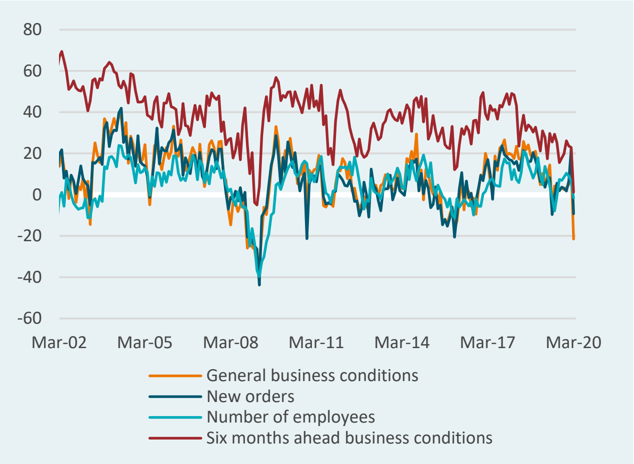
— Japan's real GDP fell by -2% over the two quarters of 2011 following the crisis, but rebounded +2% over the following two quarters, resulting in 0.2% real GDP growth for the year.

U.S. GDP GROWTH PROJECTIONS



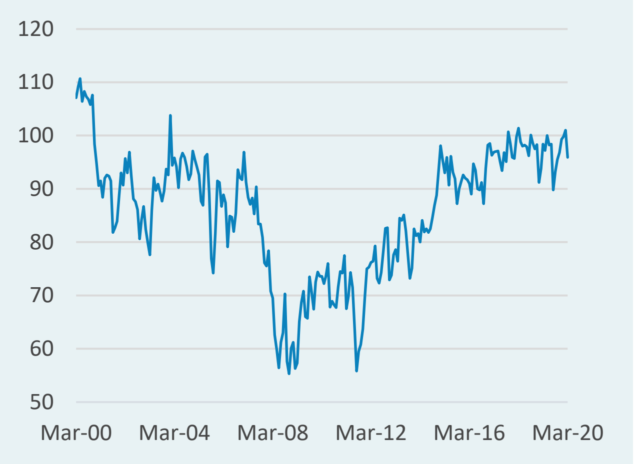
Source: Various, as of 3/16/20

U.S. EMPIRE MANUFACTURING SURVEY



Source: Federal Reserve Bank of New York, as of 3/16/20

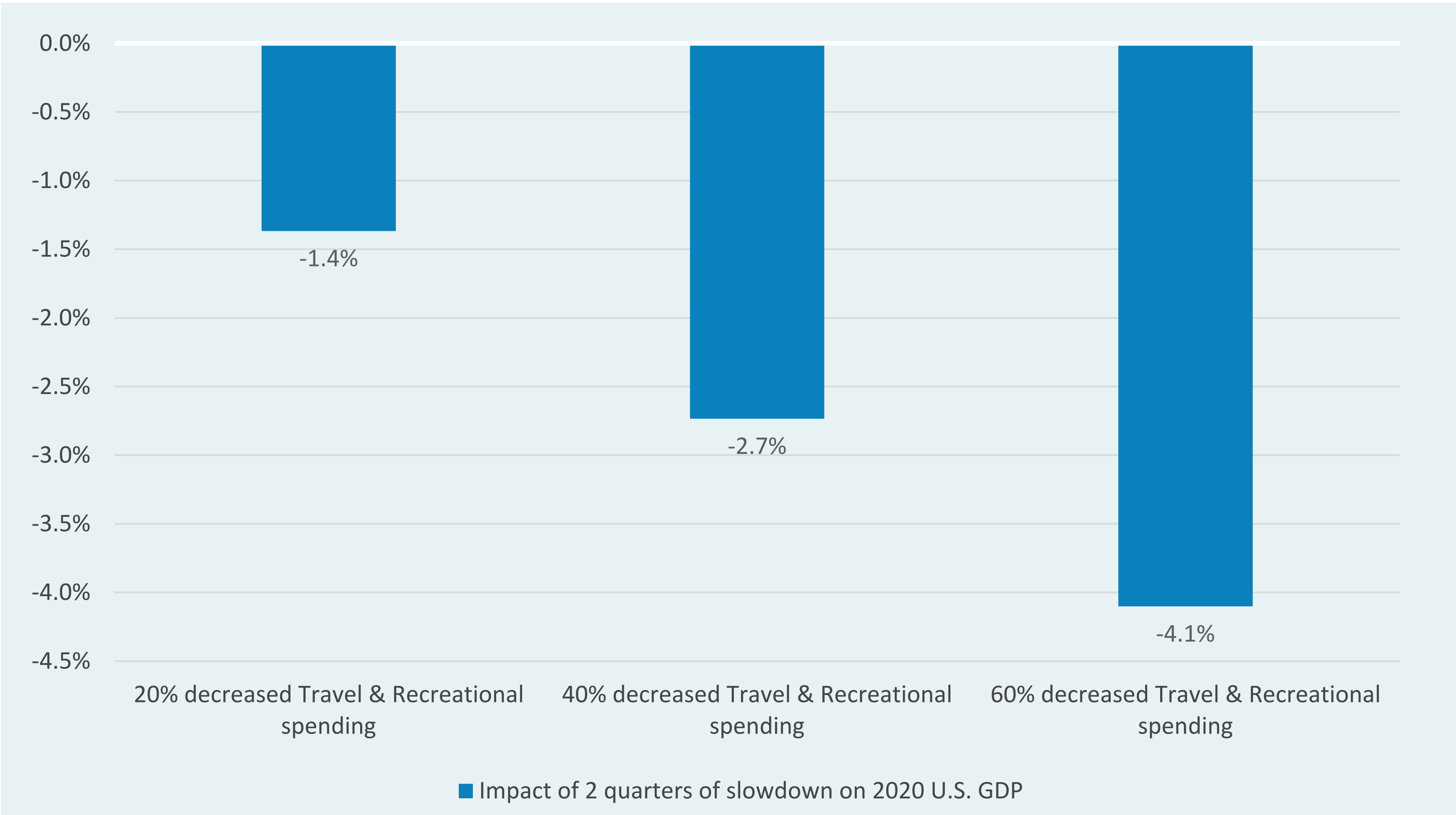
U. OF MICHIGAN CONSUMER SENTIMENT



Source: University of Michigan, preliminary data as of 3/31/20

Growth & economic activity (con't)

ESTIMATING GDP GROWTH IMPACT



A 20% fall in spending would be roughly the equivalent of Connecticut's economy disappearing for one year

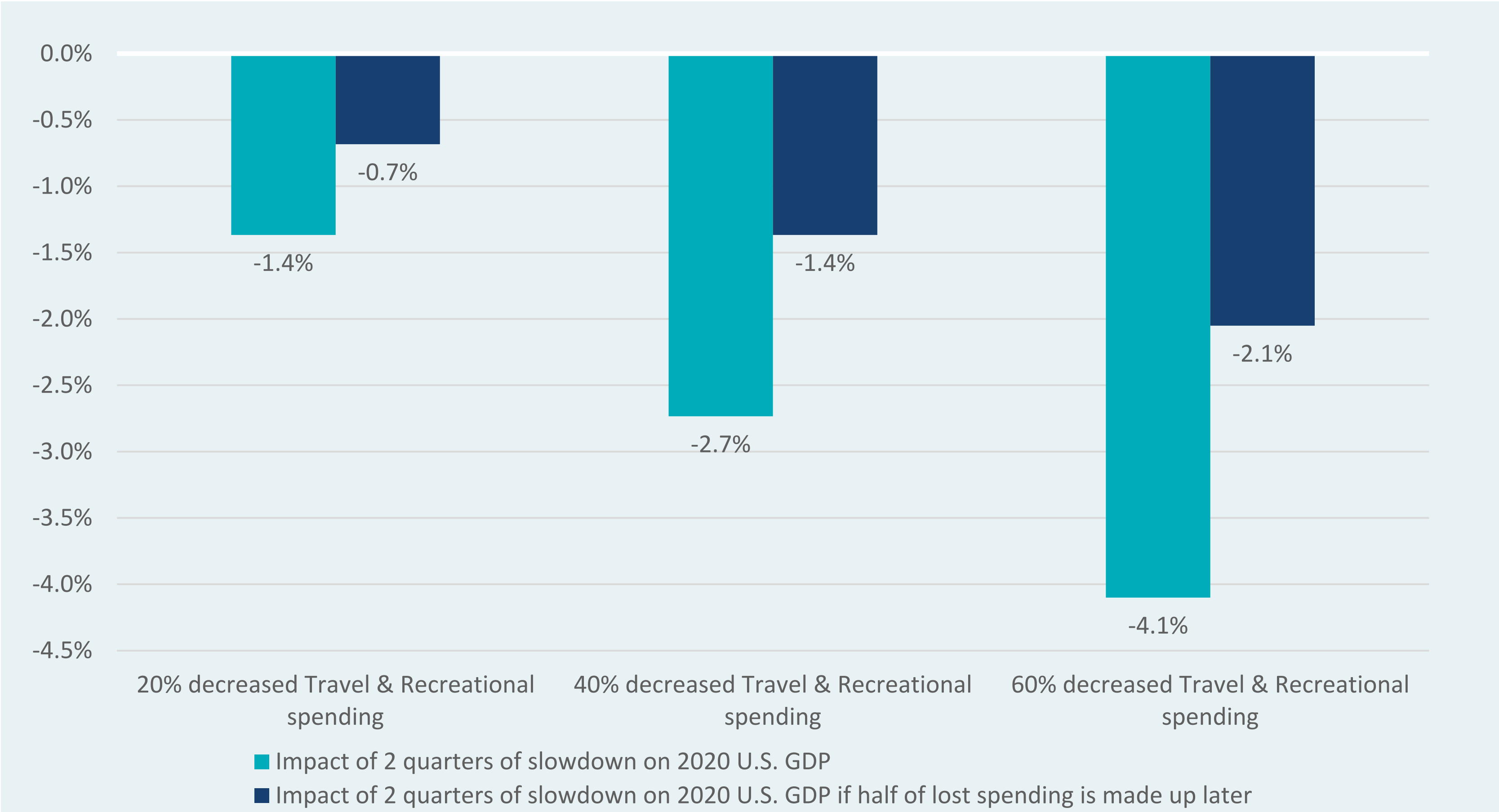
A fall of 40% would equal the loss of Massachusetts for one year

A 60% fall would equal losing Illinois & Vermont for a year

Source: Verus, Bureau of Economic Analysis. Our assumption above is that consumer spending relating to Travel & Recreation is impacted negatively by COVID-19 by either 20%, 40%, or 60%. These categories include: Recreational Goods & Vehicles, Gasoline & Energy Products, Transportation Services, Recreational Services, Food Services & Accommodations. We assume that these types of spending are impacted for 2 quarters.

Growth & economic activity (con't)

ESTIMATING GDP GROWTH IMPACT



However, we may expect that much of this spending is "made up" later if Americans delay, rather than cancel, their vacation and spending plans

Source: Verus, Bureau of Economic Analysis. Our assumption above is that consumer spending relating to Travel & Recreation is impacted negatively by COVID-19 by either 20%, 40%, or 60%. These categories include: Recreational Goods & Vehicles, Gasoline & Energy Products, Transportation Services, Recreational Services, Food Services & Accommodations. We assume that these types of spending are impacted for 2 quarters. The second scenario above assumes that half of this lost spending is made up as consumers simply delay (rather than cancel) their vacations and travel until after the COVID-19 risks ease.

U.S. equity market

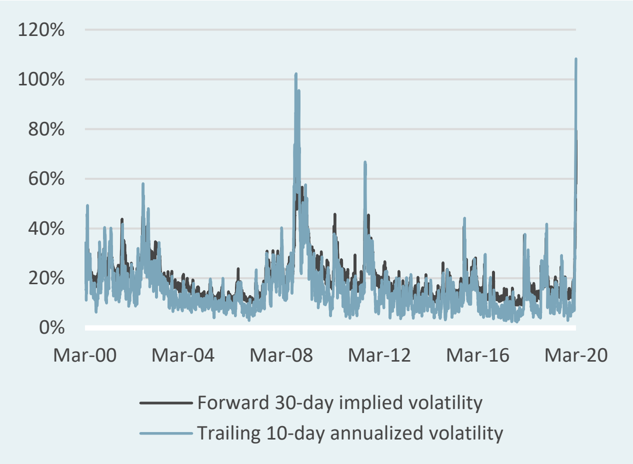
— The COVID-19 outbreak has resulted in rare volatility levels of a magnitude similar to the Global Financial Crisis. Daily S&P 500 moves of +/- 4% have become the norm over recent weeks – market moves which under normal circumstances are uncommon.

— On March 16th investors witnessed the largest one day fall since the October 1987 Black Monday sell-off. The S&P 500 fell -11.98% while the Dow Jones fell -12.93%. Last Thursday, March 12th, this record was also broken when the U.S. market fell by nearly 10%, which has made for two near-record market falls in one week's time.

S&P 500 PRICE INDEX

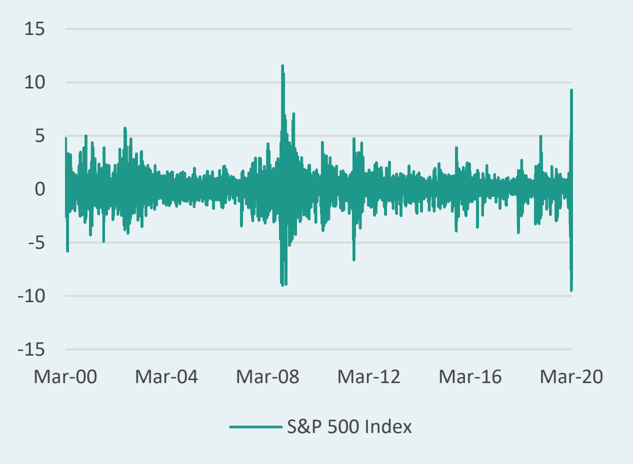
Source: Standard & Poor's, Bloomberg, as of 3/16/20

S&P 500 INDEX



Source: CBOE, Standard & Poor's, Bloomberg, as of 3/16/20

1-DAY PERCENTAGE CHANGE



Source: Standard & Poor's, Bloomberg, as of 3/16/20

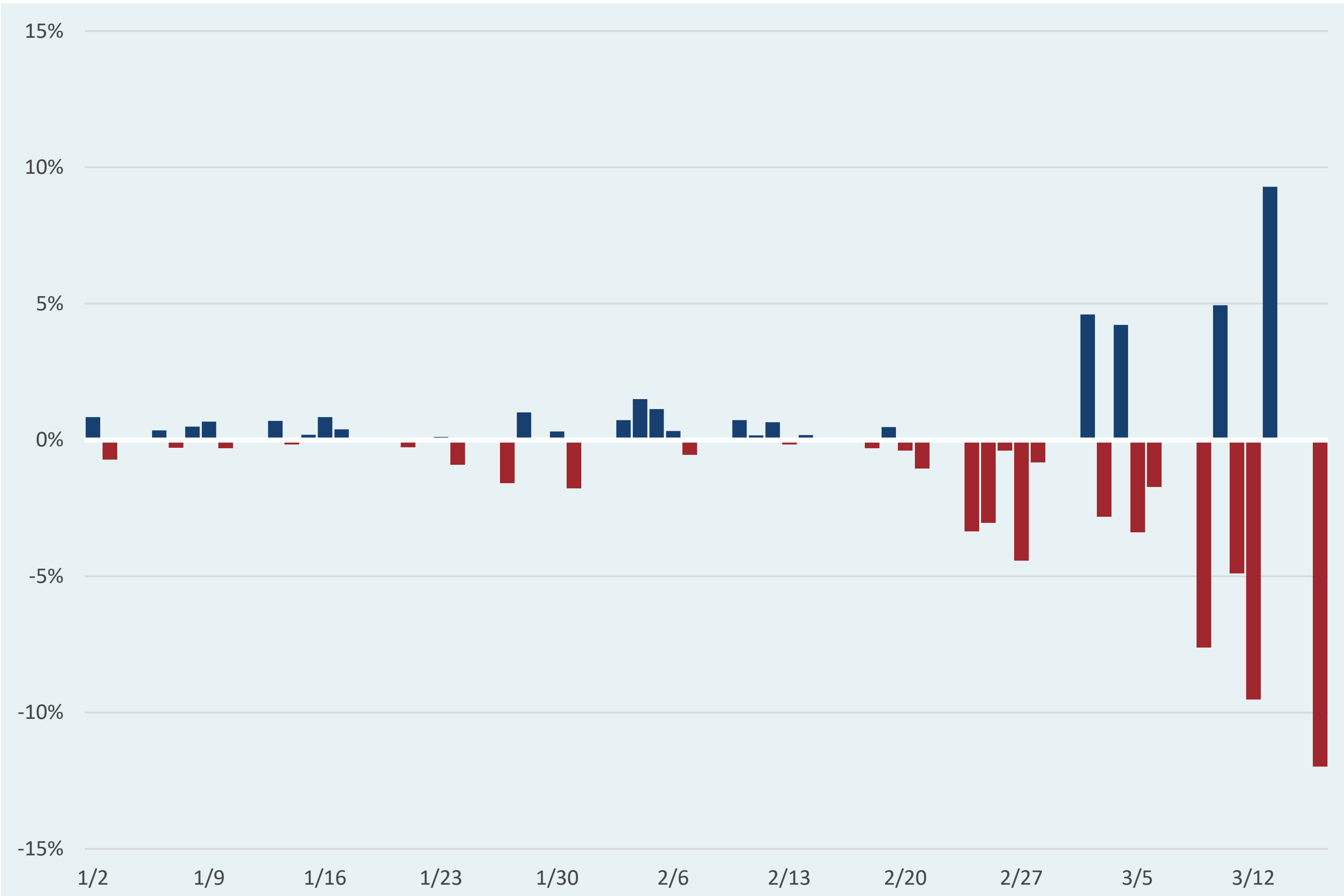
U.S. equity market

S&P 500 Price Index – log scale

Source: Standard & Poor's, Bloomberg, as of 3/16/20

Volatility remains at historic levels

S&P 500 INDEX: YEAR-TO-DATE 1-DAY PRICE RETURNS (%)



Source: Standard & Poor's, Bloomberg, as of 3/16/20

In the past three trading sessions, the S&P 500 has posted returns of -9.5%, +9.3%, and -12.0%

The last time the S&P 500 moved this much for three consecutive sessions was during the Great Depression

The benchmark posted price returns of -12.9%, -10.2%, and +12.5% between October 28th and October 30th, 1929

Discounted future earnings

$$\text{Value of Stock Market} = \frac{\text{Expected Earnings}}{\text{Required Return on Equity} - \text{Earnings Growth}}$$

Discounted future earnings (con't)

S&P 500 Required Return on Equity at February high

$$3386 = \frac{180}{\mathbf{7.4\%} - 2.1\%}$$

S&P 500 Required Return on March 16th

$$2386 = \frac{180}{\mathbf{9.6\%} - 2.1\%}$$

This adjustment towards higher required return is even more impressive, considering the large drop in interest rates

Assumptions: Next period corporate earnings in-line with Q4 2019 earnings, and a terminal earnings growth rate of 2.1% after inflation (equal to long-term average growth rate)

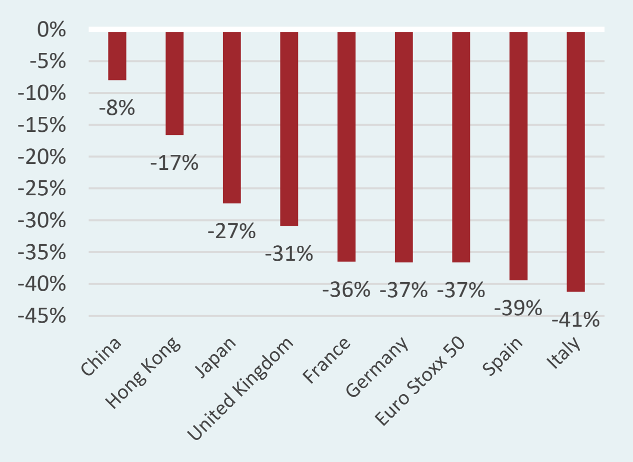
Non-U.S. equity markets

— International developed equities have been hit hardest so far through this global equity sell-off. The Italian regional benchmark is off about 41% from February 19th peaks, and Spanish equities (-39%) are not far behind. As of March 16th, Italy (27,980) and Spain (9,942) had the most confirmed cases within continental Europe, and both countries have issued quarantines in bids to contain COVID-19.

— Volatility remains at extremely high levels with both the forward 30-day implied volatility and the annualized 10-day realized volatility of the Euro Stoxx 50 Index above 80%.

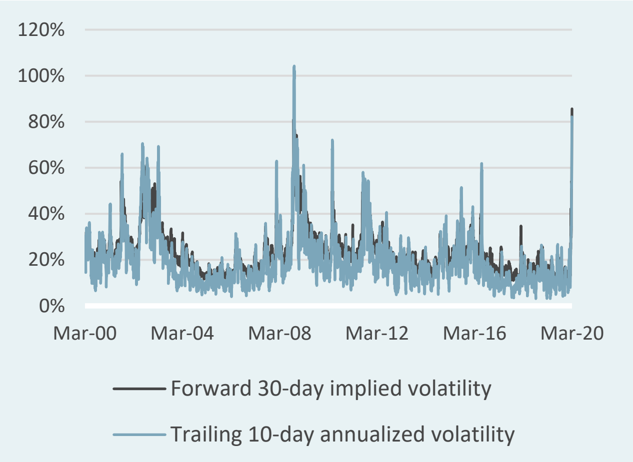
— Between February 19th and March 16th, the MSCI Emerging Markets Index has lost only -24.4% in U.S. dollar terms, outperforming both U.S. and international developed equity. Within the emerging markets complex, the Asian component (-20.2%) dramatically outperformed the Latin American component (-41.2%), supported by strength in the Chinese equity market (-8.0%) and Latin American currency weakness.

PERFORMANCE (2/19/20 – 3/16/20)



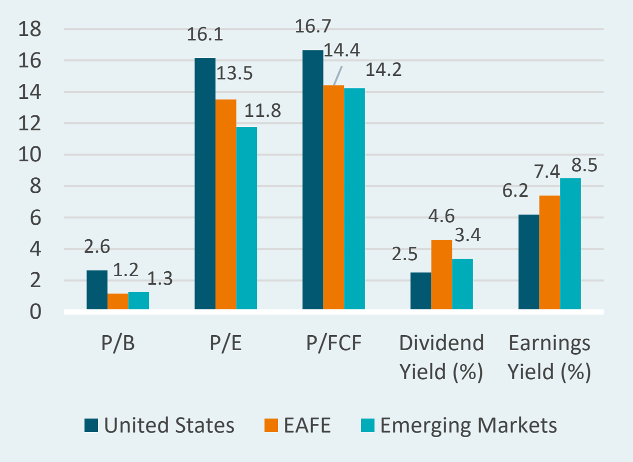
Source: Bloomberg, as of 3/16/20

EURO STOXX 50 INDEX



Source: Deutsche Borse Group, Bloomberg, as of 3/16/20

VALUATIONS



Source: MSCI, Bloomberg, as of 3/16/20

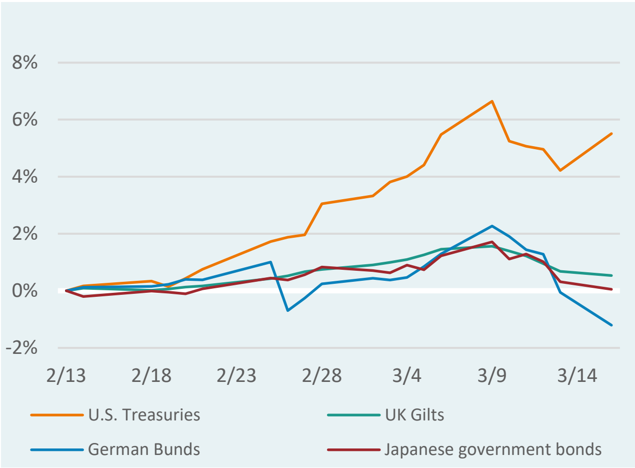
Rates

— Interest rates in the U.S. have been higher than most other developed markets for years – likely a reflection of the relatively stronger domestic economy.

— This may be changing quickly, as the U.S. yield curve has fallen considerably. The recent decision by the Federal Reserve to cut the Federal Funds Rate to 0.00-0.25% is probably another step toward interest rate convergence between the U.S. and other developed nations. We believe there is a decent possibility that U.S. Treasury yields approach 0% in the coming months.

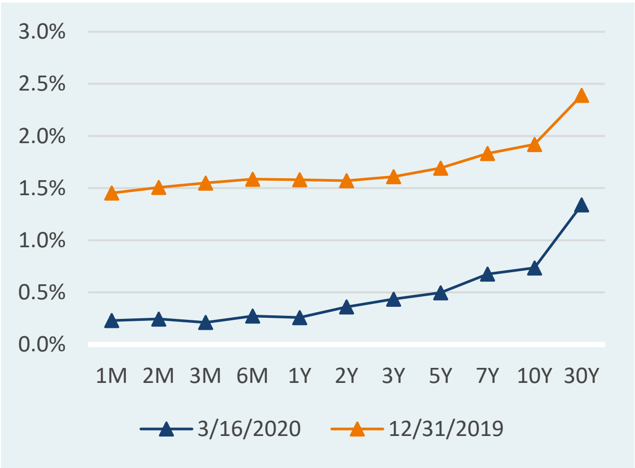
— Falling U.S. interest rates have placed downward pressure on the U.S. dollar, as lower rates damage the relative attractiveness of holding the domestic currency. However, demand for safe-haven currencies has been a counterbalancing force, lifting the U.S. dollar as fear rises in the markets.

PERFORMANCE (INDEXED 2/13 = 0%)



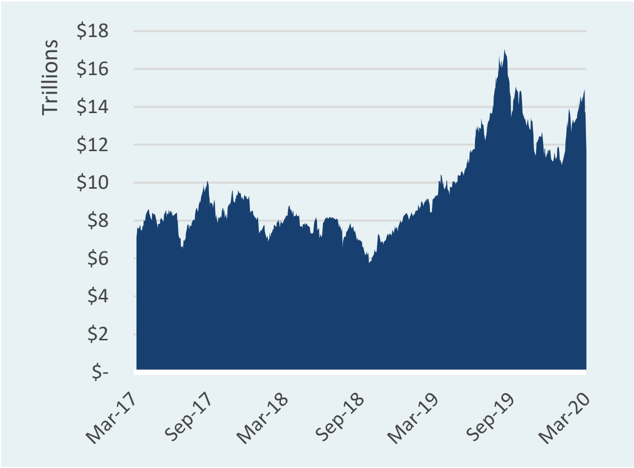
Source: Bloomberg, as of 3/16/20

U.S. TREASURY ACTIVES CURVE



Source: U.S. Treasury, Bloomberg, as of 3/16/20

GLOBAL VALUE OF NEGATIVE-YIELDING DEBT



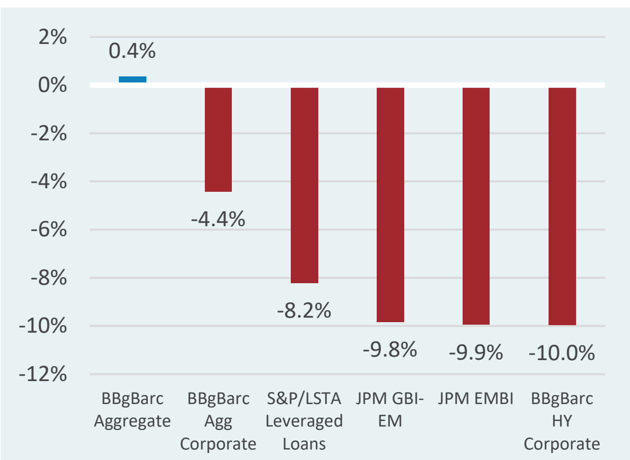
Source: Bloomberg, as of 3/16/20

Credit

— Credit markets have sold-off materially, as higher risk credit tends to move directionally with equities during market stress. Between February 14th and March 16th, investment-grade credit spreads gapped up from 96 bps to 242 bps. Over the same time period, high-yield credit spreads spiked from 3.44% to 8.27% and segments of the high-yield credit market came under serious pressure. The spread on high-yield issues in the Energy sector more than doubled from 8.04% to 18.95% as the challenges associated with a shaky demand outlook were compounded by the emergence of a crude oil price war between Saudi Arabia and Russia aimed in part at winning back some market share from U.S. shale producers.

— In terms of performance, the Bloomberg Barclays Aggregate Index led the way, primarily due to its 41% allocation to U.S. Treasuries during a period when Treasury yields plunged. Within the riskier segments of the credit space, U.S. leveraged loans (-11.0%) slightly outperformed U.S. high yield (-12.7%) while local (-12.0%) and hard (-12.3%) currency denominated emerging market debt fell by similar amounts.

PERFORMANCE (2/19/20 – 3/16/20)

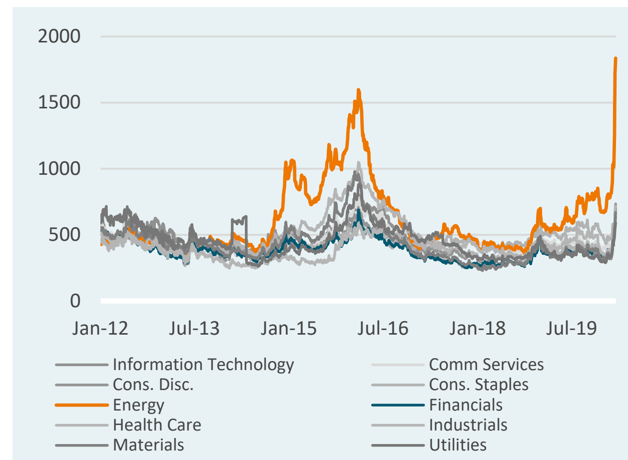


Source: Bloomberg, as of 3/16/20

INVESTMENT-GRADE CREDIT SPREADS

Source: Bloomberg, as of 3/16/20

HIGH-YIELD CREDIT SECTOR SPREADS (BPS)



Source: Bloomberg, as of 3/16/20

Likely impacts in the private markets

Private equity: Buyout

— Pause in investment activity and exits

— Write-down of portfolio companies impacted, primarily in the following sectors:

- Travel
- Retail / Consumer / Restaurants
- Services
- Financial services (some)
- Energy

— Write-up of companies that benefit:

- Healthcare
- U.S. manufacturing: benefit from supply chain disruptions
- Consumer good (short term increase, offset by mid-term decrease)

— Smaller companies impacted more than large companies, especially if they have high levels of debt

Generally slower write-down of existing investment valuations than public equity

Private equity: Venture capital

- Pause in investment activity, exits and IPOs
- Write-off of companies that run out of cash
- Write-down of companies impacted by the market downdraft:
  - Recently listed public companies
  - Late-stage VC
- Write-up of companies that benefit – example:
  - AbCellera (DCVC portfolio company): delivered the world's largest panel of anti-SAR-CoV-2 antibodies (hundreds), moved into functional testing, and signed a co-development agreement with Eli Lilly to develop the anti-body therapy

Late-stage risks begin to materialize

Private credit

— Direct lending: lower yields due to the drop in LIBOR to less than 75 bps. (100 bps. lower than 1 month ago and 200 bps. lower than last year).

- We continue to monitor the cost of leverage and the availability of bilateral financing.
- Upper-middle market will see amend-and-extend. Upper-middle market will also see borrowers from syndicated market turning to them for new capital. But for lower-middle market companies, direct lenders may be more inclined to take the keys and seek return through equitization.

— Covenant-lite documents will extend borrower flexibility, but a prolonged shutdown will introduce further liquidity needs. The need for capital will bring private equity back to the table and allow syndicated lenders another bite at the apple

— Increased demand for rescue capital by industries that have been at risk for some time: energy, travel and leisure, consumer and retail. Rescue likely via DIP loans

— Greatest distressed opportunity when liquidity issues extend beyond at-risk sectors into the broader credit leveraged credit universe – i.e. a U-shaped recovery, not V-shaped

Yields move lower

Increased opportunity for rescue capital providers and distressed investors

Real estate

— Sectors best able to withstand a downturn:

- Multi-family residential
- Industrial properties, especially those supporting last-mile logistics

— Impacted properties:

- Retail: largest impact. The sector was already under pressure from shifting trends in consumer purchasing.
- Hospitality: large short-term impact though it's a fairly small component of the commercial real estate market.
- Office: depending on how long and deep the downturn goes, office will be impacted in the normal course of a recession.
  - Fallout due to energy wars in and around Houston
  - Possible longer-term trend: the need to work from home is that companies realize they don't need to staff offices full-time. Downsizing of office footprints

Real estate properties tied to sectors of economy most impacted by the pandemic are at greatest risk

Real assets

- Infrastructure:
  - Impacted sectors:
    - Transportation infrastructure, such as airports, ports, toll roads and rail
    - Energy midstream
  - More resilient sectors:
    - Data / telecom infrastructure
    - Utilities (though repricing may occur)
    - Social infrastructure, such as student housing, senior living, hospitals
- Energy upstream / downstream: combination of falling demand and rising supply to continue the downturn of prospects for private energy companies
- Mining: while bullish on mining, industrial metals expected to be weak as economic activity declines. Gold and precious metals may rally. Long-term trends intact as demand picks up once economic activity stabilizes.
- Agriculture: on a relative basis, sector to hold up better than more GDP sensitive markets. Repricing of the sector would be welcome to deploy capital.

Energy and transport assets most impacted

Other infrastructure assets to perform well on a relative basis

What should we do?

Three things to do

Investors need to focus on three major things as these challenges unfold:

— People

- Your (and our) staff will have stress due to markets and concerns over their family and themselves
- They are the most important concern for us all to focus on

— Portfolio

- Are the elements of the portfolio behaving in the way expected?
- What has worked well? What has not worked?

— Plans

- This will pass. Where does your portfolio need to be when it does?
- How will you communicate what has happened after the fact? Will you be happy with it when you do so?

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