

Continued Escalation of COVID-19 Outbreak Yields Uncertain Forecast

- COVID-19 has spread considerably faster than SARs and has not been contained to China
- COVID-19 has now spread to Europe and the U.S. where it is having meaningful, negative economic ramifications
- **Economic conditions have deteriorated further in the U.S. and globally, likelihood of recession has increased**
- Uncertainty about duration of outbreak makes economic and interest rate projections unreliable
- **Sufficient reasons to believe Fed will respond with another 50-basis-point cut at, or before, their March 18 meeting**
- Increasingly reasonable argument for **Fed to cut to zero**
- Yields rebounded sharply after 2003 SARs event, but this scenario is materially different
- Expect double-barreled stimulus from monetary and fiscal policymakers
- For link to full Coronavirus Chartbook, [please click here](#)

Deteriorating Conditions Increase Odds of Assertive Policy Response and Potential Contraction

The news regarding the coronavirus outbreak and the expected economic implications has deteriorated further since our last forecast revision. Additionally, the collapse of oil prices is expected to have a negative effect on some regions of the country, and has added to risks for the credit markets. At the time of our last revision, we expected the Fed to cut another 50 basis points but believed they would be able to wait until April to do so. Given the recent developments, we now expect the Fed to cut 50 basis points at, or before, their scheduled March 18 meeting. Additionally, the likelihood of the Fed cutting to zero has now increased meaningfully.

MONITORING THE OUTBREAK

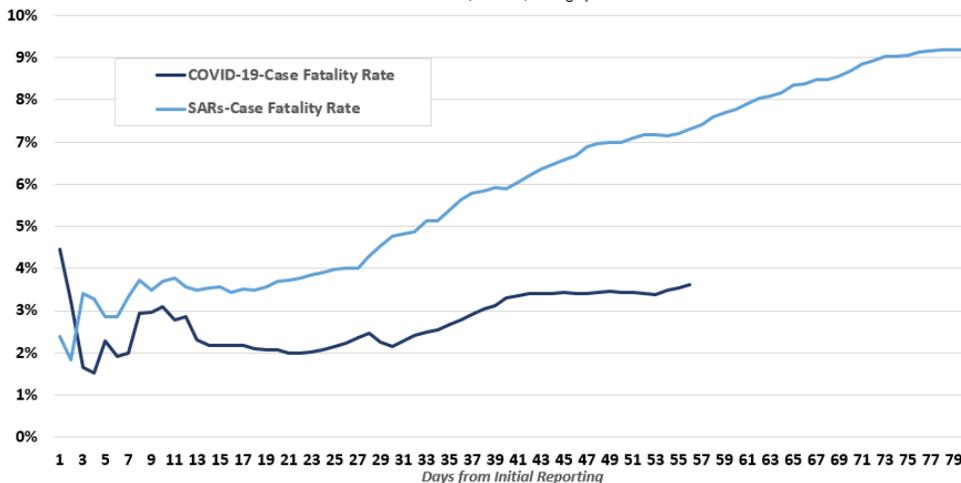
Monitoring COVID-19: We continue to monitor four key questions in determining the economic impact of the COVID-19 outbreak: 1) How large will the outbreak be? 2) Will the outbreak spread outside of Asia? 3) How deadly will the virus prove to be? 4) How long will the outbreak and associated fear persist?

Magnitude of Outbreak Has Been Significant: The first two questions have already been answered. The outbreak has proven materially larger than the 2003 SARs event and it has now spread meaningfully outside of China and Asia.

Virus Has Proven Sufficiently Virulent to Alter Economic Activity: As it relates to the third question related to COVID-19's virulence, there remain divergent views. In the absence of an authoritative conclusion, the anecdotal evidence of

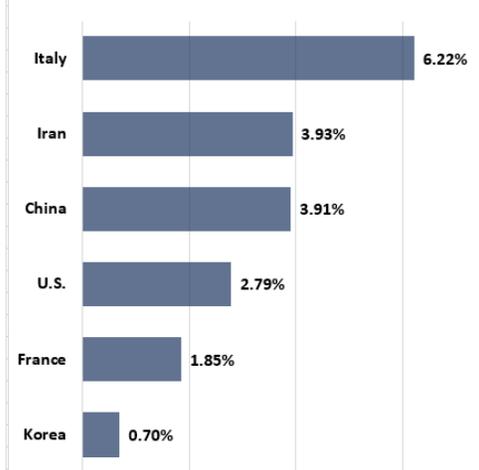
SARs and Coronavirus - Disease Mortality Rates

Sources: N.H.C, W.H.O., Vining Sparks



Case Fatality Rate by Country

Sources: N.H.C., W.H.O., Johns Hopkins, Vining Sparks



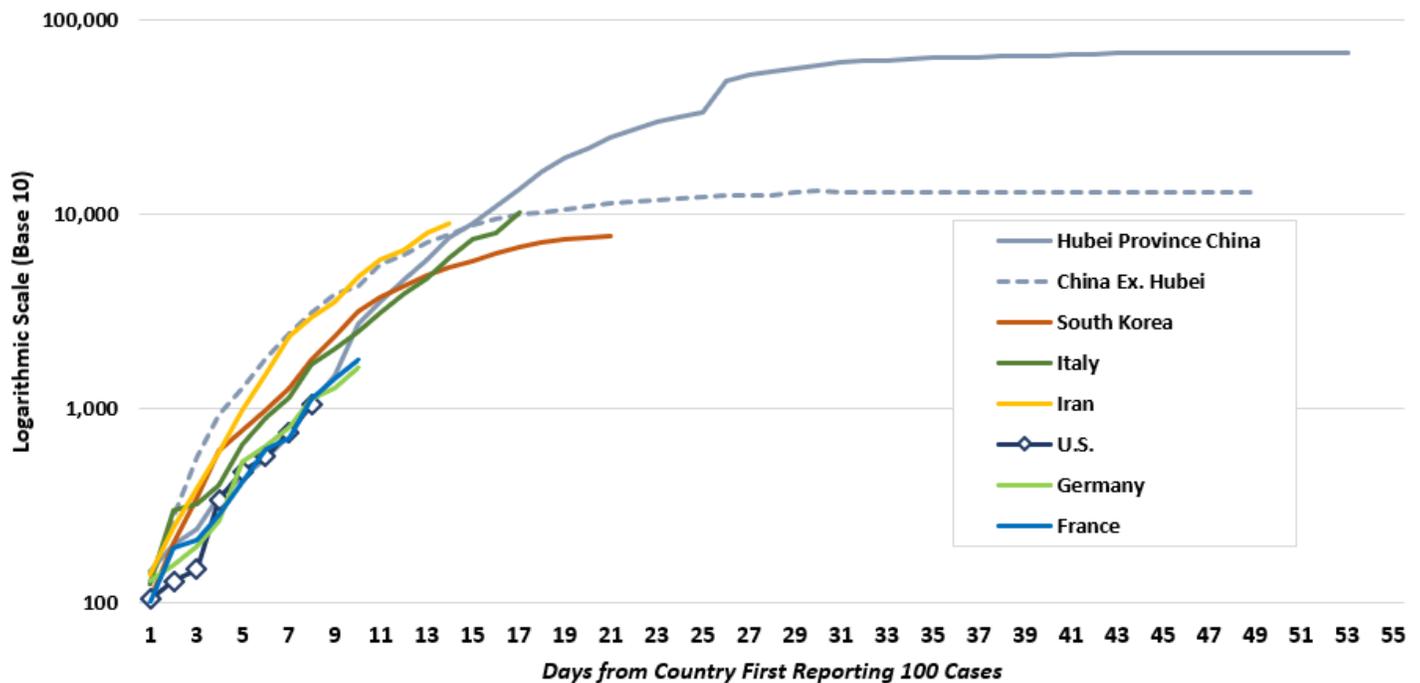
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the virus’s severity has been sufficient to alter consumer behavior. Not only will this affect consumer behavior, the unprecedented containment measures are expected to weigh on business confidence and investment. On net, we expect these factors to slow economic activity until the virus is contained, or proves convincingly benign.

Duration of Outbreak Uncertain: At the heart of today’s uncertainty, there is no consensus regarding the fourth question: how long the outbreak will last. As such, any forecast predicting the future spread of the virus, and its eventual effect on economic activity and interest rates, is highly speculative. If the outbreak follows the seasonal pattern of other coronaviruses, there is reason to believe the impact could be limited. The next two weeks will be critical in determining how limited the impact is to the U.S. economy.

Cases by Country - Once Country Crosses 100 Cases

Sources: N.H.C., W.H.O., Johns Hopkins CSSE Data, Vining Sparks



UNCERTAINTY PLAGUES ECONOMIC OUTLOOK

Expected Economic Impact of the Coronavirus: The economic outlook is increasingly opaque, but definitively affected. Data from countries affected earlier than the U.S. have shown a significant impact from activity being shuttered. While it could be weeks before the official economic reports reflect an impact in the U.S., the anecdotal evidence signals a slow-down, if not outright contraction: cruise ships have been idled; airlines are cutting back on flight offerings; the list of institutions canceling conferences grows by the day; companies are calling off business travel; and popular consumer events, such as SXSW and March Madness, have been cancelled or are considering abnormal adjustments to their layouts. We expect these negative effects, followed by a wave of secondary effects, to persist until the virus is contained, or proves convincingly benign.

Specifically, we expect the manufacturing, transportation, retail trade, and services industries to be most directly affected. This economic event is somewhat unique in that it is hitting both the supply side and the demand side of the economy simultaneously. The supply chain has been disrupted, economic transactions are being lost, and there is likely to be job loss in the hardest hit sectors. On a positive note, the labor market was unusually tight coming into this event which may help delay any potential layoffs given the difficulty businesses have faced in filling job openings. The duration of the

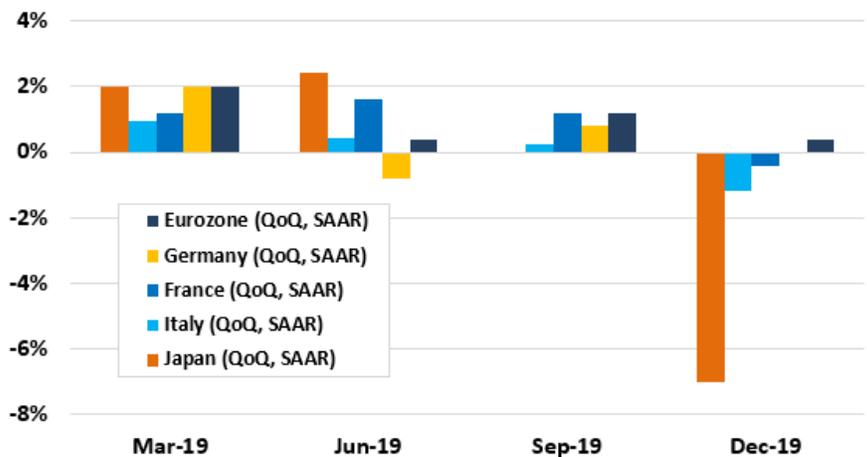
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weakness in the labor market will be key to determining the eventual economic impact. If the fear of the outbreak persists, job losses could begin to cascade and negatively affect other sectors, broadening the economic weakness.

Weaker Global Growth Environment: In addition to the domestic impact, the containment response globally has weakened an already soft global economic environment. Japan's economy contracted 7.1% QoQ, SAAR in 4Q. Italy's economy contracted 1.2%, France's contracted 0.4%, and German growth stagnated. There was optimism coming into the year that global growth would broadly rebound, but the uncertainty of the outbreak and the containment measures are likely to derail this. As San Francisco Fed Bank President Daly stated prior to the escalation of the crisis, "Countries across the globe face slow growth, low real interest rates, and persistent low inflation. This makes our economies less resilient to everyday shocks and less able to offset them with the tools we've traditionally relied on. Moreover, our futures are interconnected. Today, a shock to one country can spill over. Said simply, when one of us stumbles, all of us sway." The U.S. economy is now operating in an environment of even weaker global growth.

Global Environment Weakened Coming into 2020

Sources: ESRI Japan, Eurostat, German FSO, INSEE, ISTAT, Vining Sparks



Oil Price Collapse Adds Regional Risk to U.S. Economy: Adding to the heightened uncertainty, the collapse of oil prices is expected to weigh heavily on some regions of the country. At the national level, the drop in oil is expected to have a slightly positive impact on U.S. activity. Based on current consumption figures, a 50% drop in crude is expected to boost personal consumption 0.6% and overall GDP 0.4%. Conversely, lower prices would also drag on capital investment in the energy industry. However, investment in mining exploration, shafts, and wells only accounts for 0.6% of GDP while investment in mining and oilfield machinery equipment only makes up 0.1%. As such, a 50% decline in crude would be expected to drag only 0.3% from GDP. As for the impact to the labor market, we expect to see job losses of around 5k per month based on a sustained 25% decline in oil prices. Of primary concern, this decline in investment and job loss would be focalized on specific regional economies.

Risk of Recession and Likelihood of Double-Barreled Stimulus Higher: The confluence of headwinds could easily push the U.S. economy into recession. If the economy does contract, our basecase view is that it will be short-term and shallow. However, this presumes an inherent uncertainty, that the coronavirus outbreak is contained over the medium term and does not continue to negatively affect economic conditions through the summer. On a positive note, we anticipate a double-barreled response from policymakers in the form of both monetary and fiscal stimulus. The U.S. government has already passed \$8.3B in fiscal stimulus and is considering other options such as a payroll tax, assistance for hourly workers, loans to small businesses, and help to certain industries hardest hit by the virus. If the virus does not begin to fade over the short to intermediate term, the economic fallout is likely to become significant.

MONETARY POLICY RESPONSE

Best-Case Scenario: Fed Cut, Fiscal Stimulus, Quick Rebound: Given the uncertainty regarding the direction of the coronavirus, the weaker global outlook, and the negative regional implications of the collapse in oil prices; the best case scenario now appears to be a temporary slowdown in growth. In this scenario, the growth rate of the outbreak unexpectedly slows and consumer spending is only briefly interrupted/altered. Also in this scenario, most businesses are able to

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weather the storm and job loss is minimal. Under these conditions, we continue to expect a 50-basis point cut at, or before, the Fed's March 18 meeting followed by an additional cut in 2Q. Additionally, we would expect some amount of fiscal stimulus.

Growing Likelihood of Fed Cutting to Zero: However, the likelihood that the Fed cuts to zero has grown significantly as the situation has digressed, even if a worst-case scenario is averted. As the perceived economic impact has intensified and inflation expectations have plunged, an optimal control approach to monetary policy now supports a more decisive response. Furthermore, as New York Fed Bank President Williams argued in 2019, when interest rates are farther from the zero lower bound, policymakers can "afford to move slowly" in responding to "potentially adverse economic developments." But when the ZLB is in play, as it is today, "you want to do the opposite, and vaccinate against further ills. When you only have so much stimulus at your disposal, it pays to act quickly to lower rates at the first sign of economic distress."

Virus Controlled Quickly, Economic Damage Limited

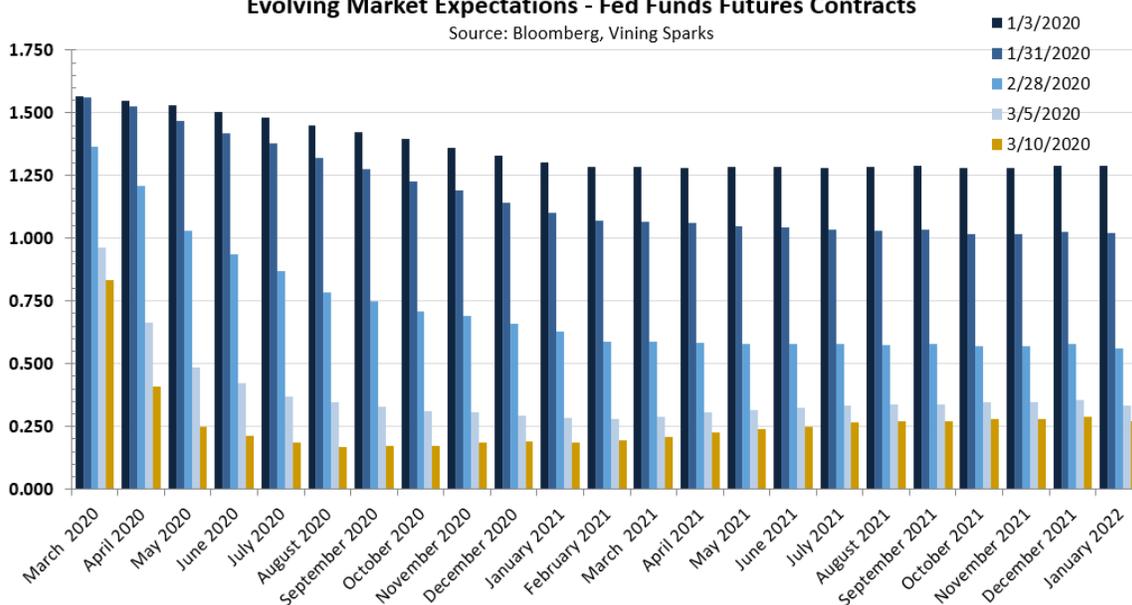
	Q120	Q220	Q320	Q420	Q121	Q221	Q321	Q421
<i>Fed Funds Target</i>	0.625	0.375	0.375	0.625	0.875	1.125	1.125	1.125
<i>2-Year Treasury Yield</i>	0.55	0.50	0.65	0.90	1.05	1.10	1.15	1.15
<i>10-Year Treasury Yield</i>	0.90	1.20	1.40	1.50	1.70	1.70	1.70	1.70
<i>30-Year Treasury Yield</i>	1.53	2.01	2.20	2.15	2.33	2.30	2.26	2.26
<i>Prime Rate</i>	3.75	3.50	3.50	3.75	4.00	4.25	4.25	4.25
<i>30-Year Mortgage Rate</i>	2.80	3.05	3.20	3.25	3.40	3.40	3.40	3.40

Virus Eventually Contained, Economic Damage Significant

	Q120	Q220	Q320	Q420	Q121	Q221	Q321	Q421
<i>Fed Funds Target</i>	0.125	0.125	0.125	0.125	0.125	0.375	0.625	0.625
<i>2-Year Treasury Yield</i>	0.25	0.20	0.25	0.35	0.45	0.60	0.70	0.75
<i>10-Year Treasury Yield</i>	0.50	0.40	0.50	0.65	0.75	0.85	0.90	0.95
<i>30-Year Treasury Yield</i>	1.07	0.88	0.97	1.10	1.15	1.22	1.23	1.28
<i>Prime Rate</i>	3.25	3.25	3.25	3.25	3.25	3.50	3.75	3.75
<i>30-Year Mortgage Rate</i>	2.40	2.25	2.30	2.40	2.45	2.55	2.60	2.65

Evolving Market Expectations - Fed Funds Futures Contracts

Source: Bloomberg, Vining Sparks



Notes on Travel and Tourism Industry

According to the most recent report from the BEA (2018), travel and tourism accounted for \$597 billion in value-added economic activity, or just under 3.0% of nominal U.S. GDP growth. The industry accounted for 9.2 million jobs, 5.9 million directly and 3.3 million indirectly. For the year, travel and tourism accounted for 90k in direct job growth. Jobs related directly to tourism include work related to traveler accommodations, food services, air transportation, other transportation, and recreation and entertainment. Indirect jobs include those related to the production of goods and services consumed during travel and tourism activities. Travel and tourism activity does not include services consumed within 50-100 miles of a person's normal area of activity according to the BEA classifications.

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