

WILLIAM BLAIR Looking Across the Gloom Implications From COVID-19

IMPORTANT NOTICE

The following material is provided by a third-party strategist unaffiliated with AssetMark. The strategist is solely responsible for its content. Please read the risks and disclosures section for additional important information. AssetMark has not verified the accuracy of the information contained in this material.

For financial advisor use with advisory clients.

C20-15759 | 03/2020 | EXP 03/31/2021

Equity Research Economics

27 March 2020

Richard de Chazal, CFA rdechazal@williamblair.com +44 20 7868 4489

Economics Weekly
Looking Across the Gloom
Implications From COVID-19



Please refer to important disclosures on pages 13 and 14. Analyst certification is on page 13.

Public debt levels will have increased. But the alternative—a permanent destruction of productive capacity and therefore of the fiscal base—would be much more damaging to the economy and eventually to government credit. We must also remember that given the present and probable future levels of interest rates, such an increase in government debt will not add to its servicing costs.

— Mario Draghi, Financial Times, 26 March 2020

The reaction by policymakers in the U.S. and the U.K. to the coronavirus outbreak has in many ways paralleled what happened in the film Jaws. In the film, Police Chief Brody rushes to close the beaches after the first attack. But Mayor Vaughn, who refuses to acknowledge the scale of the problem, overrules him and prematurely reopens the beaches so as not to miss the commercial opportunity of the July 4 holiday weekend. For those who have watched the film, this ends with tragic consequences. The film also contained plenty of fake news and advice from numerous "experts," up until when the gravity of the situation finally came into focus and an appropriate response was undertaken. Today, the U.S. and the U.K. continue to wait to see how this pandemic will play out. The U.S. is still several weeks away from the peak rates of infection, though developments in China—it is starting to re-normalize—are certainly encouraging. What is also encouraging is that in the past week, both Congress and Parliament have voted to at least provide "a bigger boat," in the form of substantial emergency assistance; however, prematurely "reopening the beaches" could turn out to be a major error of judgment in light of what's happening in many parts of Europe.

Last week, we discussed where we were in the current crisis with respect to the seven stages of grief, with the view that we were moving out of the panic phase and into the response phase. The behavior of financial markets this week seems to be in alignment, as the market is getting a better handle on the scale of the crisis and the scale of the policy response to it, and, thus, starting to adjust accordingly.

This is, for the most part, still believed to be a temporary crisis, and given that the virus has still yet to peak in many parts of the globe, it is far too soon to have any certainty about the longer-term implications of COVID-19. Nevertheless, it might not be too early to speculate as to what some those outcomes might be. In this week's Economics Weekly, we discuss what are being viewed as two possible outcomes—accelerated deglobalization and higher government debt levels.

The Potential Aftermath

There are certainly a number of potential longer-term outcomes from this crisis, such as what is likely to be a tangible swing in government spending (18% of GDP) from defense toward healthcare—call it guns versus scalpels. We may also find that it leaves a legacy of government ownership of public companies through both the debt and equity

markets (perhaps in a similar way to the U.K. government's ownership stake in RBS). Indeed, former ECB Governor Mario Draghi, in yesterday's *Financial Times* (cited above) has already looked past this and argued that many of those corporate debts assumed by the public sector in the coming months should end up being canceled.

Yet, there are also two other relatively obvious areas where we may see some longer-term impact; these include an acceleration in the trend toward deglobalization and rising government debt levels—both of which have implications for inflation and longer-term interest rates.

Acceleration of Deglobalization

This crisis is being viewed by many as an accelerator of the existing trend toward deglobalization. It is already coming, for example, on the heels of the trade war with China, and it has yet again starkly exposed the frailty of many of the underlying supply chains that have been built up over the last several decades.

For the Trump administration, this is a prime opportunity to accelerate this trend. White House trade advisor Peter Navarro has reportedly seized the moment to further promote the "Buy American" agenda (starting with medical goods and equipment) and to encourage companies to produce more locally. President Trump has been very keen to support this agenda, while simultaneously stressing what he views as the risks posed by interacting with foreign nations—in this case the viral threat from the "China Virus."

While many view this crisis as being a big "win" for China and its authoritarian ability to enforce draconian measures to halt and contain the spread of the virus, coupled with its ability to get up and running again given the current moderate recovery that is now underway, the reality is that it is also under immense pressure to do so. The longer it takes to recover, the more companies in the West will continue to view China as an unreliable supplier, and the more willing they may be to break up those supply chains. For a country that has so heavily invested in its new Silk Road/Belt and Road initiative, accompanied by considerable amounts of leverage, the risks of not getting it right are high.

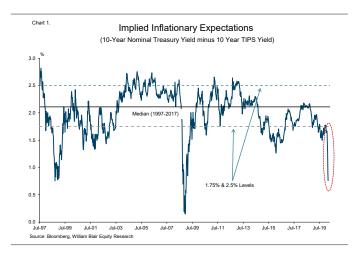
Domestically in the U.S., producing more locally might (at least in the near term) be associated with higher production costs, considering that companies may no longer be able to choose the cheapest, most efficient, and first best option i.e., outsourcing to China/Vietnam/Indonesia or other low cost regions. This could result in a structural lowering of profit margins (and therefore of structurally higher P/E ratios), unless offset by cost-cutting elsewhere, increased pricing power, and/or productivity increases.

Furthermore, if globalization has theoretically been one of the key factors holding down inflation, and, therefore, longer-term interest rates, should its reversal not start to do the opposite? Might it also not result in a shift

away from the U.S. dollar? And wouldn't both of these pressure longer-term rates?

There is clearly no near-term risk of inflation as a result of this disinflationary/deflationary global demand shock. Furthermore, as we have discussed in previous weeklies (e.g., *Economics Weekly: Signs of a Regime Change for Inflation?*), inflation over the longer term is still being held back by a number of factors, including: demographics, digitization, the Amazon effect, and, importantly, lower energy prices (and not just petroleum prices, prices for alternative energy sources were falling dramatically even before the recent collapse in crude oil)—hence, not just globalization.

While it might normally be helpful to look at the message from the TIPS market with regard to expected future inflation levels (chart 1), that current message is being heavily distorted by the flight to quality and the high demand for safe assets, and therefore should not be viewed as being particularly reflective of true inflationary expectations.

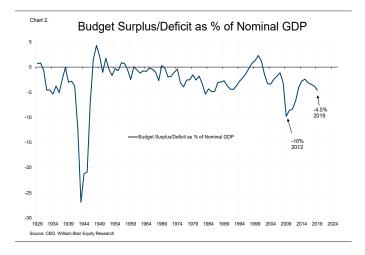


Second, while this may mean less international trade, we would still need something to replace the dollar as the global reserve currency of choice. The gap between the almost \$13 trillion global euro dollar market (non-U.S. banks' dollar liabilities) and the next best alternative—euros and yuans—is still extremely wide, to the point that it would likely take at least a decade or more for any alternative to represent a viable risk to the dollar's status. The extent of this demand is something we have yet again been witnessing with the international rush for the U.S. dollar and the need for the Fed to once again set up dollar swap lines with a large number of developed market and emerging market central banks. Any move to dedollarize the world would still seem quite a long way away.

Government Debt Levels Are About to Dramatically Increase

With Congress about to pass the \$2.0 trillion CARES emergency relief package—which is more than double the size of last year's \$989 billion budget deficit—government debt issuance is set to soar (chart 2). But at what cost? Over

the longer term, some are already starting to fret that this might also start to put upward pressure on both inflation and interest rates.

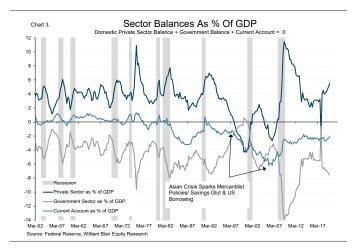


Given the scale of the health and economic crisis now underway, fears about deficit spending causing interest rates to rise should in no way be a constraint on any packages Congress is drawing up to support the economy. Yet, we have also argued that one of the best options would have been to impose triggers or rules for fiscal spending—i.e., when it should be unleashed and when it should start to be scaled back following the crisis—to help make such decisions more like automatic stabilizers and less political. Perhaps these might still come into play should another fiscal package prove necessary, which Treasury Secretary Mnuchin suggested might be in the coming 10-12 weeks.

Nevertheless, despite the size of the package, it is still unlikely to act as a major boost to interest rates, as Mario Draghi also believes. We already know for example, that during the last financial crisis, despite the deficit exploding from 1.1% to 10% of GDP, in addition to trillions of dollars of QE, 10-year T-Note yields still fell from 5% to 2.5% in 2010, and then continued to fall for the next decade, to 1.4% just prior to the start of the current crisis.

The message here, however, is not that deficits don't matter, but rather that other factors have mattered more.¹ These factors include demographics and an aging population, low and stable inflation/inflationary expectations, weak real economic growth, weak productivity growth, increased global demand for safe dollar assets, and also, to some extent, the actions of the central bankers themselves.

It also helps to think about this question in terms of the circular flow model of an economy, where net private sector savings, net foreign capital inflows, and net public sector savings will necessarily sum to zero, e.g., my spending is someone else's savings (chart 3). That is to say, if the government starts to increase its deficit, this must necessarily be funded through increased savings from either the household sector, the corporate sector, or foreigners, or some combination of each.



Today, while some of this deficit spending is likely to be funded by increased savings from households (as discussed below), it is also likely to come from foreigners and in particular the corporate sector, which this time around has been the sector caught out "swimming naked"— i.e., the most heavily indebted and most financially fragile, and will almost certainly result in greater savings as it seeks to rebuild its balance sheet during the next recovery. This might also be aided by the current growing backlash against corporate sector buybacks.

Meanwhile, for (aging) U.S. households and foreigners, the demand for safe assets does not look as though it will change any time soon. In fact, one of the other potential longer-term outcomes of this crisis is that it may cause further increases in this demand.

It is possible, for example, that following a string of recent stock market crashes, from the internet bubble to the global financial crisis, to the 2018 20% plunge, the older segments of the population decide that they don't have the time or perhaps the stomach to risk any more such upset, with the result that savings rates and asset allocations to treasuries remain high on a sustained basis exiting this recession—just as happened following the last one. This would certainly fit well with what we know from behavioral psychology/economics about how people react following major shocks—i.e., they tend to dramatically overestimate the risk of seeing another such black swan in the near future.

Conclusion

While it is still extremely early to have any clear idea as to how things might start to look on the backside of this crisis, it is worth at least starting to think about some longer-term possible implications. While government spending is likely to move more toward scalpels than guns in the coming years and a possible acceleration in the move toward more localized production, some investors are already starting to raise concerns about whether or not the increased government debt burdens that have been necessary to fight this crisis might also start to raise inflation and long-term interest rates. At present, the answer looks to be no, in the sense that

while rising deficits on their own might help to push up interest rates, there are still a large number of significant other factors that are helping to push them down. Despite all the panic and volatility we have seen in the financial markets, there is still likely a way to go before we reach a peak in actual crisis at hand—the coronavirus. Short-term policies to re-open beaches prematurely may also come with a greater longer-term cost.

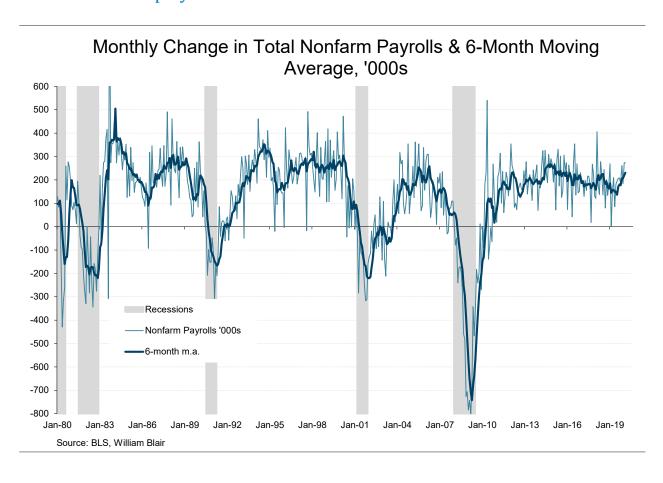
^{1. &}quot;Deficits are Raising Interest Rates. But Other Factors are Lowering Them." Ernie Tedeschi, *Medium,* February 19, 2019

Highlights in the Week Ahead

| Date | Time (EDT) | Indicator | Last | Consensus | WB Estimate | Actual |
|--------|---------------|-----------------------------------|--------|-----------|----------------|--------|
| 31 Mar | 10:00 a.m. | Consumer Confidence (Mar) | 130.7 | 119.0 | 115.0 | |
| 1 Apr | 10:00 a.m. | ISM Manufacturing Index (Mar) | 50.1 | 46.0 | 43.5 | |
| 2 Apr | 8:30 a.m. | Initial Jobless Claims (Mar 28) | 3,283K | NA | NA | |
| 2 Apr | 10:00 a.m. | Factory Orders (Feb) | -0.5% | NA | -1.0% | |
| 3 Apr | 8:30 a.m. | Nonfarm Payrolls (Mar) | 273K | -61K | -175K | |
| | | Unemployment Rate | 3.5% | 3.8% | 4.0% | |
| | | Average Hourly Earnings | 0.3% | 0.2% | 0.1% | |
| 3 Apr | 10:00 a.m. | ISM Non-manufacturing Index (Mar) | 57.3 | 48.0 | 47.3 | |

Sources: Bloomberg, William Blair

Indicator of the Week: Employment Situation

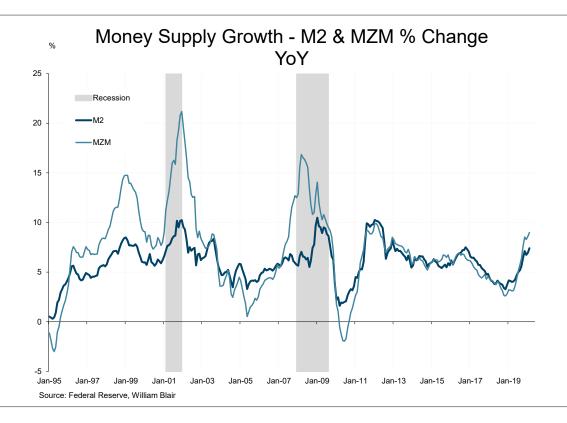


Economic Scorecard

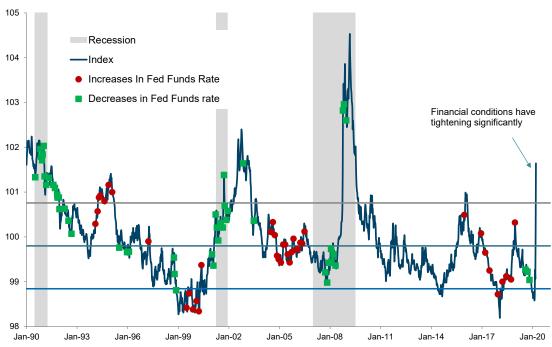
| tolling monthly heat map, % Change on Year Ago | Sep-18 | | Nov-18 | Dec-18 | Jan-19 | Ech 10 | Mar-19 | Apr-19 | May 10 | Jun-19 | lul 10 | Λυσ 10 | Sep-19 | Oct 10 | Nov-19 | Dec-19 | Jan-20 | Fel |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|--------|--------|--------|--------|--------|--------|--------|-----|
| Growth | 3ep-10 | OC1-10 | NOV-10 | Dec-10 | Jan-19 | ren-19 | Wai-19 | Apr-19 | Way-19 | Juli-19 | Jul-19 | Aug-19 | 3ep-19 | 001-19 | NOV-19 | Dec-19 | Jan-20 | rei |
| US Leading Indicators | 6.5 | 5.2 | 4.9 | 4.0 | 3.4 | 2.9 | 2.7 | 2.4 | 2.4 | 1.7 | 1.5 | 1.0 | 0.3 | 0.2 | 0.2 | 0.1 | 8.0 | |
| US Coincident Indicators | 2.7 | 2.3 | 2.2 | 2.2 | 2.4 | 2.2 | 2.2 | 1.8 | 1.8 | 1.7 | 1.5 | 1.5 | 1.6 | 1.4 | 1.5 | 1.2 | 1.1 | |
| US Lagging Indicators | 2.3 | 2.8 | 3.0 | 2.9 | 2.9 | 3.1 | 3.2 | 2.9 | 2.4 | 2.8 | 3.5 | 2.9 | 2.8 | 2.6 | 2.5 | 2.2 | 1.7 | |
| consumer | | | | | | | | | | | | | | | | | | |
| Total Retail Sales | 3.9 | 4.8 | 4.1 | 1.6 | 2.4 | 2.2 | 3.8 | 3.8 | 3 | 3.3 | 3.5 | 4.4 | 4 | 3.1 | 3.3 | 5.4 | 5 | |
| Personal Income | 5.4 | 5.1 | 4.7 | 5 | 4.5 | 4.7 | 4.7 | 4.8 | 4.7 | 4.6 | 4.1 | 4.1 | 4.3 | 4.1 | 4.4 | 3.6 | 4 | |
| Real Disposable Personal Income | 4 | 3.8 | 3.7 | 4.2 | 3.2 | 3.4 | 3.3 | 3.1 | 3 | 2.9 | 2.5 | 2.6 | 3 | 2.7 | 2.9 | 1.8 | 2.2 | |
| Real Personal Consumption | 3.1 | 3.2 | 3 | 1.7 | 2.4 | 2.3 | 2.8 | 2.7 | 2.6 | 2.6 | 2.6 | 2.5 | 2.7 | 2.3 | 2.3 | 3.3 | 2.7 | |
| Personal Saving Rate (%) | 7.5 | 7.3 | 7.2 | 8.8 | 8.3 | 8.8 | 8.4 | 8 | 7.8 | 7.8 | 7.4 | 7.7 | 7.8 | 7.7 | 7.8 | 7.5 | 7.9 | |
| Consumer Confidence (Conference Board)** | 135.3 | 137.9 | 136.4 | 126.6 | 121.7 | 131.4 | 124.2 | 129.2 | 131.3 | 124.3 | 135.8 | 134.2 | 126.3 | 126.1 | 126.8 | 128.2 | 130.4 | 1 |
| mployment | | | | | | | | | | | | | | | | | | |
| Employment Growth | 1.7 | 1.6 | 1.5 | 1.6 | 1.7 | 1.4 | 1.4 | 1.4 | 1.3 | 1.3 | 1.3 | 1.3 | 1.4 | 1.3 | 1.4 | 1.4 | 1.4 | |
| ASA Temporary Staffing Index | 3.9 | 3.7 | 1.1 | -12.7 | -0.6 | -1.3 | -1.9 | -3.0 | -2.4 | -1.7 | -4.6 | -4.7 | -5.1 | -6.5 | 1.4 | -6.9 | -6.2 | |
| ISM Employment Index Manufacturing* | 58.5 | 56.6 | 57.8 | 56.2 | 55.2 | 53.2 | 57.1 | 52.4 | 53.1 | 54.3 | 51.3 | 47.6 | 46.5 | 47.9 | 46.8 | 45.2 | 46.6 | |
| ISM Employment Index Services* | 61.9 | 58.4 | 57.8 | 56.2 | 56.4 | 55.6 | 55.9 | 54.5 | 57.1 | 55.2 | 55.7 | 53.7 | 51.7 | 53.9 | 54.9 | 54.8 | 53.1 | |
| Unemployment Rate, % | 3.7 | 3.8 | 3.7 | 3.9 | 4 | 3.8 | 3.8 | 3.6 | 3.6 | 3.7 | 3.7 | 3.7 | 3.5 | 3.6 | 3.5 | 3.5 | 3.6 | |
| Average Hourly Earnings | 3 | 3.3 | 3.4 | 3.4 | 3.3 | 3.5 | 3.4 | 3.3 | 3.3 | 3.4 | 3.5 | 3.5 | 3.1 | 3.2 | 3.3 | 3 | 3.1 | |
| Initial Jobless Claims (avg. wkly. chg. '000s) | 213 | 216 | 226 | 217 | 220 | 225 | 217 | 216 | 217 | 221 | 214 | 217 | 213 | 215 | 216 | 226 | 210 | |
| Jop Openings | 16.7 | 13.4 | 21.0 | 17.1 | 13.2 | 7.2 | 7.3 | 4.3 | 3.9 | -1.3 | -1.2 | -1.1 | -3.2 | 1.0 | -9.5 | -10.3 | -7.4 | |
| Layoff Announcements | 70.9 | 153.6 | 51.5 | 35.3 | 18.7 | 117.2 | 0.4 | 10.9 | 85.9 | 12.8 | 43.2 | 39 | -24.8 | -33.5 | -16 | -25.2 | 27.8 | |
| • | 10.5 | 155.0 | 31.3 | 33.3 | 10.7 | 117.2 | 0.4 | 10.9 | 05.5 | 12.0 | 43.2 | 33 | -24.0 | -00.0 | -10 | -20.2 | 21.0 | |
| lousing Market | | | | | | | | | | | | | | | | | | |
| Housing Starts | 6.7 | -4.3 | -7.8 | -5.6 | -3.2 | -10.9 | -9.6 | 0.2 | -5.1 | 4.5 | 1.7 | 7.5 | 2.4 | 10.7 | 14.9 | 40.2 | 25.8 | |
| New Home Sales | -5.5 | -11.7 | -14 | -14 | 2.5 | 3.9 | 6 | 4.3 | -8 | 18 | 8.4 | 17.2 | 19.4 | 26.9 | 13.8 | 28.4 | 24.2 | |
| Existing Home Sales | -3.9 | -5.0 | -8.2 | -10.1 | -8.6 | -2.5 | -5.6 | -3.7 | -1.1 | -2.0 | 0.8 | 2.5 | 3.2 | 4.2 | 3.1 | 10.4 | 8.8 | |
| Median House Price (Existing Homes) | -1 | 2.8 | -10.2 | -4 | -7.3 | -2 | -7.4 | 7.8 | -1.3 | 0.4 | -5.9 | 1.7 | -3.8 | -1.8 | 6.3 | -0.6 | 6.5 | |
| Existing Homes Inventory (Mths' supply) | 4.1 | 4.1 | 4.1 | 4.3 | 4.3 | 3.9 | 3.9 | 4 | 4 | 4 | 3.9 | 3.8 | 3.9 | 3.9 | 3.9 | 3.6 | 3.5 | |
| New Homes Inventory (Mths' supply) | 6.4 | 7.2 | 6.5 | 7.4 | 6.5 | 6.1 | 5.8 | 6.1 | 6.7 | 5.4 | 6 | 5.5 | 5.3 | 5.4 | 5.5 | 5.4 | 4.8 | |
| NAHB Homebuilder Sentiment* | 67 | 68 | 60 | 56 | 58 | 62 | 62 | 63 | 66 | 64 | 65 | 67 | 68 | 71 | 71 | 76 | 75 | |
| flation | | | | | | | | | | | | | | | | | | |
| Consumer Price Index | 2.3 | 2.5 | 2.2 | 1.9 | 1.6 | 1.5 | 1.9 | 2 | 1.8 | 1.6 | 1.8 | 1.7 | 1.7 | 1.8 | 2.1 | 2.3 | 2.5 | |
| CPI Less-food & energy | 2.2 | 2.1 | 2.2 | 2.2 | 2.2 | 2.1 | 2 | 2.1 | 2 | 2.1 | 2.2 | 2.4 | 2.4 | 2.3 | 2.3 | 2.3 | 2.3 | |
| Producer Price Index | 2.7 | 3.1 | 2.6 | 2.6 | 1.9 | 1.9 | 2 | 2.4 | 2.1 | 1.6 | 1.6 | 1.9 | 1.5 | 1 | 1.1 | 1.3 | 2.1 | |
| PPI Less-food & energy | 2.6 | 2.7 | 2.7 | 2.9 | 2.6 | 2.5 | 2.3 | 2.5 | 2.4 | 2.2 | 2.2 | 2.3 | 2 | 1.6 | 1.3 | 1.1 | 1.7 | |
| PCE Price Index | 2 | 2 | 1.9 | 1.8 | 1.4 | 1.3 | 1.4 | 1.5 | 1.4 | 1.4 | 1.4 | 1.4 | 1.3 | 1.3 | 1.3 | 1.5 | 1.7 | |
| PCE Prices Less-food & energy | 2.0 | 1.9 | 2.0 | 2.0 | 1.8 | 1.6 | 1.5 | 1.6 | 1.5 | 1.6 | 1.6 | 1.8 | 1.7 | 1.6 | 1.5 | 1.5 | 1.6 | |
| | | | | | | | | | | | | | | | | | | |
| usiness Activity - US | F 4 | 4.4 | 4.4 | 0.0 | 0.0 | 0.7 | 0.0 | 0.7 | 4.7 | 4.0 | 0.4 | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 4.0 | |
| Industrial Production | 5.4 | 4.1 | 4.1 | 3.8 | 3.6 | 2.7 | 2.3 | 0.7 | 1.7 | 1.0 | 0.4 | 0.3 | -0.2 | -0.8 | -0.4 | -0.9 | -1.0 | |
| New Cap Gds Orders less-aircraft & parts | 0.5 | 5.7 | 6.4 | 2.2 | 3.5 | 2.3 | 2.2 | 2.4 | 0.7 | -0.5 | 0.7 | -1.9 | 0.2 | -0.5 | -1.5 | 2.1 | 1.4 | |
| Business Inventories | 4.6 | 5.2 | 4.7 | 2.2 | 5.3 | 4.9 | 5 | 5.3 | 5.3 | 5.2 | 4.8 | 4.2 | 3.7 | 3 | 2.8 | 2.2 | 1.1 | |
| ISM Manufacturing PMI* | 59.3 | 58.5 | 58.8 | 55 | 55.5 | 54.1 | 54.6 | 53.4 | 52.3 | 51.6 | 51.3 | 48.8 | 48.2 | 48.5 | 48.1 | 47.8 | 50.9 | |
| Markit US Manufacturing PMI* | 55.6 | 55.7 | 55.3 | 53.8 | 54.9 | 53 | 52.4 | 52.6 | 50.5 | 50.6 | 50.4 | 50.3 | 51.1 | 51.3 | 52.6 | 52.4 | 51.9 | |
| ISM Non-Manufacturing Index* | 61.2 | 60.3 | 60.2 | 58 | 56 | 58.5 | 56.3 | 55.7 | 56.3 | 55.4 | 54.8 | 56 | 53.5 | 54.4 | 53.9 | 54.9 | 55.5 | |
| Markit US Services PMI* | 53.5 | 54.8 | 54.7 | 54.4 | 54.2 | 56 | 55.3 | 53 | 50.9 | 51.5 | 53 | 50.7 | 50.9 | 50.6 | 51.6 | 52.8 | 53.4 | |
| usiness Activity - International | | | | | | | | | | | | | | | | | | |
| Germany Manufacturing PMI Markit/BME* | 53.7 | 52.2 | 51.8 | 51.5 | 49.7 | 47.6 | 44.1 | 44.4 | 44.3 | 45 | 43.2 | 43.5 | 41.7 | 42.1 | 44.1 | 43.7 | 45.3 | |
| Japan Manufacturing PMI Jibun Bank* | 52.5 | 52.9 | 52.2 | 52.6 | 50.3 | 48.9 | 49.2 | 50.2 | 49.8 | 49.3 | 49.4 | 49.3 | 48.9 | 48.4 | 48.9 | 48.4 | 48.8 | |
| Caixin China Manufacturing PMI* | 50 | 50.1 | 50.2 | 49.7 | 48.3 | 49.9 | 50.8 | 50.2 | 50.2 | 49.4 | 49.9 | 50.4 | 51.4 | 51.7 | 51.8 | 51.5 | 51.1 | |
| China Manufacturing PMI* | 50.8 | 50.2 | 50 | 49.4 | 49.5 | 49.2 | 50.5 | 50.1 | 49.4 | 49.4 | 49.7 | 49.5 | 49.8 | 49.3 | 50.2 | 50.2 | 50 | |
| UK Manufacturing PMI Markit/CIPS* | 53.7 | 51.1 | 53.3 | 54.3 | 52.8 | 52.1 | 55.1 | 53.1 | 49.4 | 48 | 48 | 47.4 | 48.3 | 49.6 | 48.9 | 47.5 | 50 | |
| France Manufacturing PMI Markit* | 52.5 | 51.2 | 50.8 | 49.7 | 51.2 | 51.5 | 49.7 | 50 | 50.6 | 51.9 | 49.7 | 51.1 | 50.1 | 50.7 | 51.7 | 50.4 | 51.1 | |
| | 02.0 | 01.2 | 00.0 | 10.1 | 01.2 | 01.0 | 10.1 | 00 | 00.0 | 01.0 | 10.7 | 01.11 | 00.1 | 00.1 | 01 | 00.1 | 01.1 | |
| urrencies*** | 4.0 | 0.0 | | | | 0.7 | 0.0 | | | 0.7 | = 0 | | 0.4 | | 0.0 | 0.0 | | |
| Euro (EUR/USD) | -1.8 | -2.9 | -4.9 | -4.5 | -7.8 | -6.7 | -9.0 | -7.1 | -4.5 | -2.7 | -5.3 | -5.3 | -6.1 | -1.4 | -2.6 | -2.2 | -3.1 | |
| Renmimbi (USD/CNY) | 3.2 | 5.1 | 5.3 | 5.7 | 6.5 | 5.7 | 7.0 | 6.4 | 7.7 | 3.7 | 0.9 | 4.8 | 4.1 | 0.9 | 1.0 | 1.2 | 3.2 | |
| Yen (USD/Yen) | 1.1 | -0.6 | 0.9 | -2.7 | -0.3 | 4.4 | 4.3 | 1.9 | -0.5 | -2.6 | -2.8 | -4.3 | -4.9 | -4.3 | -3.6 | -1.0 | -0.5 | |
| Sterling (GBP/USD) | -2.7 | -3.9 | -5.7 | -5.6 | -7.6 | -3.6 | -7.0 | -5.3 | -5.0 | -3.9 | -7.4 | -6.2 | -5.7 | 1.4 | 1.4 | 3.9 | 0.7 | |
| Canadian \$ (USD/CAD) | 3.5 | 2.1 | 3.1 | 8.5 | 6.6 | 2.7 | 3.5 | 4.2 | 4.3 | -0.3 | 1.4 | 2.1 | 2.6 | 0.1 | -0.1 | -4.7 | 0.9 | |
| Mexican Peso (USD/MXN) | 2.5 | 6.2 | 9.3 | 0.0 | 2.7 | 2.4 | 6.9 | 1.2 | -1.5 | -3.4 | 2.7 | 5.1 | 5.4 | -5.4 | -4.1 | -3.7 | -1.4 | |
| S Equities | | | | | | | | | | | | | | | | | | |
| S&P 500 | 15.7 | 5.3 | 4.3 | -6.2 | -4.2 | 2.6 | 7.3 | 11.2 | 1.7 | 8.2 | 5.8 | 0.9 | 2.2 | 12.0 | 13.8 | 28.9 | 19.3 | |
| S&P 400 Midcap | 12.5 | -0.5 | -1.1 | -12.5 | -6.1 | 2.5 | 0.9 | 5.2 | -7.0 | -0.3 | -0.9 | -8.0 | -4.2 | 7.1 | 7.0 | 24.1 | 9.4 | |
| S&P 600 Smallcap | 17.5 | 4.2 | 2.1 | -9.8 | -2.6 | 5.7 | 0.3 | 2.9 | -11.8 | -6.3 | -8.1 | -16.4 | -10.8 | 1.6 | 3.2 | 20.9 | 4.9 | |
| | | | | | | | | | | | | | | | | | | |

^{*} Diffusion Index, **1985=100, ***Currencies - green/red = strengthening/weakening foreign currency vs dollar Source: ISM, Federal Reserve, Census Bureau, Bureau of Labor Statistics, Conference Board, Bloomberg, William Blair

Other Economic Indicators

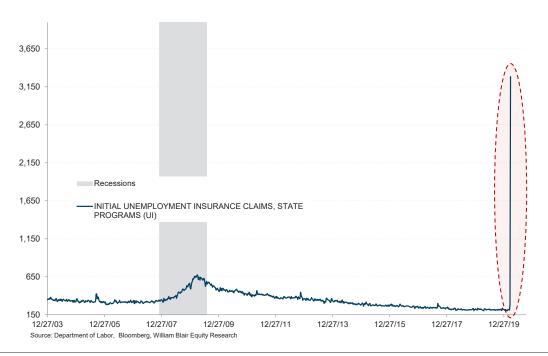


Financial Conditions Index*

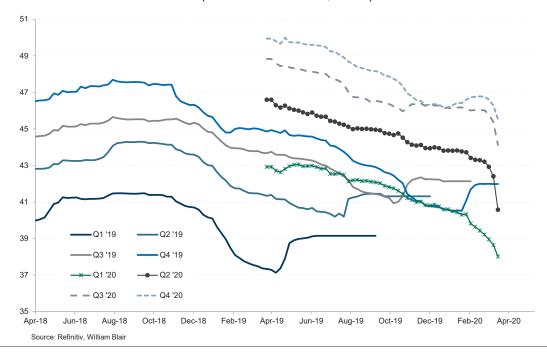


*The Goldman Sachs FCI is a weighted sum of a short-term bond yield, a long-term corporate yield, the exchange rate, and a stock market variable. Since 2005, the long-term corporate yield has been measured as a sum of the 10-year swap rate and the 10-year credit default swap spread. Source: Bloomberg, William Blair

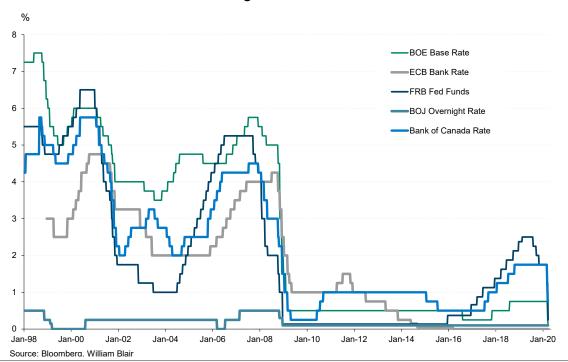
Initial Jobless Claims ('000s, Seasonally Adjusted)

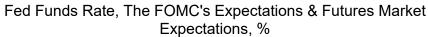


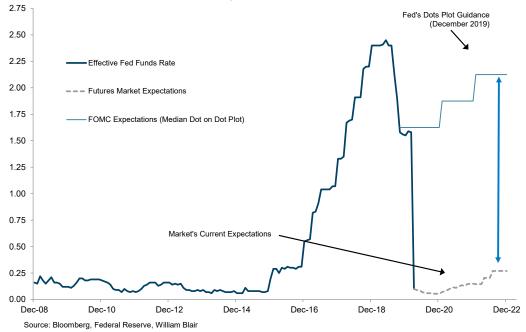
Progression of S&P 500 Bottom-Up EPS Estimates (2019 Q1 - 2020 Q4, \$/Shr)



Central Bank Target Short Term Interest Rates







S&P 500 Sector Performance

| Global Industry Classification System | Current Weight* 26-Mar-20 | Week Ago 19-Mar-20 | Month Ago 26-Feb-20 | Qtr-to-Date 31-Dec-19 | Year-to-Date 31-Dec-19 |
|--|------------------------------|---|--|--|--|
| S&P 500 Index S&P400 MidCap Index S&P600 SmallCap Index Dow Jones Industrials Nasdaq Composite | 100.00 | 9.16 11.69 10.31 12.27 9.05 | -15.61 -23.44 -25.07 -16.34 -13.18 | -18.59 -28.67 -31.39 -20.98 -13.10 | -18.59 -28.67 -31.39 -20.98 -13.10 |
| Communication Services | 10.86 | 4.91 | -14.57 | -16.24 | -16.24 |
| Advertising | 0.08 | 7.55 | -24.14 | -29.61 | -29.61 |
| Alternate Carriers | 0.04 | -8.01 | -27.13 | -29.67 | -29.67 |
| Broadcasting | 0.14 | 6.54 | -29.90 | -47.48 | -47.48 |
| Cable & Satellite | 1.23 | 5.79 | -13.64 | -15.76 | -15.76 |
| Integrated Telecommunication Services | 1.94 | -0.97 | -12.30 | -17.51 | -17.51 |
| Interactive Home Entertainment Interactive Media & Services | 0.38 5.10 | 8.05 5.28 | -3.09 -16.87 | -5.00 -15.95 | -5.00 -15.95 |
| Movies & Entertainment | 1.58 | 10.65 | -10.49 | -13.84 | -13.84 |
| Publishing & Printing | 0.02 | -4.45 | -26.28 | -35.62 | -35.62 |
| Wireless Telecommunication Svcs | 0.32 | 6.52 | -9.63 | 7.92 | 7.92 |
| Congumos Disgrationary | 10.42 | 11.84 | -15.00 | -17.09 | -17.09 |
| Consumer Discretionary Apparel Retail | 0.42 | 20.12 | -15.00 -27.23 | -17. 09 -24.29 | -17.09 -24.29 |
| Apparel & Accessories & Luxury Goods | 0.12 | 9.82 | -28.29 | -45.09 | -45.09 |
| Auto Parts & Equipment | 0.08 | 31.05 | -28.50 | -41.99 | -41.99 |
| Automobile Manufacturers | 0.23 | 23.02 | -28.55 | -40.64 | -40.64 |
| Automobile Retail | 0.27 | 12.58 | -18.84 | -28.14 | -28.14 |
| Casinos & Gaming | 0.23 | 36.52 | -32.10 | -43.99 | -43.99 |
| Computer & Electronics Retail | 0.07 | 14.85 | -23.48 | -28.38 | -28.38 |
| Consumer Electronics | 0.06 | 5.88 | -17.87 | -23.91 | -23.91 |
| Department Stores Distributors | 0.03 0.07 | -6.61 14.46 | -54.27 -25.24 | -62.71 -36.34 | -62.71 -36.34 |
| Footwear | 0.46 | 19.85 | -8.37 | -16.79 | -16.79 |
| General Merchandise Stores | 0.45 | -1.11 | -12.94 | -18.90 | -18.90 |
| Home Furnishings | 0.04 | 20.22 | -30.82 | -39.98 | -39.98 |
| Home Improvement Retail | 1.22 | 22.31 | -18.35 | -15.01 | -15.01 |
| Homebuilding | 0.19 | 25.56 | -31.69 | -25.89 | -25.89 |
| Hotels, Resorts & Cruise Lines | 0.30 | 37.35 | -36.47 | -52.71 | -52.71 |
| Household Appliances | 0.02 | 0.76 | -39.41 | -43.61 | -43.61 |
| Housewares & Specialties | 0.03 | 13.51 | -14.95 | -26.59 | -26.59 |
| Internet Retail Leisure Products | 4.69 0.04 | 4.95 44.40 | -3.37 -17.22 | 0.79 -35.34 | 0.79 -35.34 |
| Motorcycle Manufacturers | 0.04 | 11.02 | -34.66 | -44.20 | -44.20 |
| Restaurants | 1.12 | 14.74 | -19.50 | -19.52 | -19.52 |
| Specialized Consumer Services | 0.01 | 7.65 | -26.11 | -32.37 | -32.37 |
| Specialty Stores | 0.16 | 11.50 | -15.22 | -13.37 | -13.37 |
| Consumer Staples | 8.30 | 0.30 | -12.56 | -14.37 | -14.37 |
| Agricultural Products | 0.08 | 2.99 | -13.57 | -25.65 | -25.65 |
| Brewers | 0.03 | 0.29 | -25.36 | -28.35 | -28.35 |
| Distillers & Vintners | 0.18 | 8.83 | -23.07 | -23.72 | -23.72 |
| Drug Retail | 0.18 | -5.93 | -4.20 | -22.54 | -22.54 |
| Food Distributors | 0.12 | 44.11 | -26.61 | -37.48 | -37.48 |
| Food Retail | 0.10 | -15.16 | 0.87 | 0.03 | 0.03 |
| Household Products | 1.76 | -3.63 | -10.41 | -11.45 | -11.45 |
| Hypermarkets & Supercentres Packaged Foods & Meats | 1.94 1.22 | -6.36 3.59 | -3.89 -10.87 | -4.52 -15.01 | -4.52 -15.01 |
| Personal Products | 0.19 | 12.36 | -10.87 | -17.89 | -17.89 |
| Soft Drinks | 1.71 | 4.31 | -10.23 | -15.81 | -15.81 |
| Tobacco | 0.79 | 3.76 | -15.84 | -20.59 | -20.59 |
| Energy | 2.64 | 21.70 | -34.87 | -48.79 | -48.79 |
| Integrated Oil & Gas | 1.41 | 21.70 | -3 4.6 7 -27.28 | -42.83 | -42.83 |
| Oil & Gas Drilling | 0.01 | 48.06 | -51.27 | -58.29 | -58.29 |
| Oil & Gas Equipment & Services | 0.19 | 17.87 | -46.79 | -61.72 | -61.72 |
| Oil & Gas Exploration & Production | 0.49 | 19.79 | -40.83 | -54.71 | -54.71 |
| Oil & Gas Refining & Marketing & Transportation | 0.27 | 23.86 | -41.13 | -54.33 | -54.33 |
| Oil & Gas Storage & Transportation | 0.26 | 27.99 | -40.63 | -45.14 | -45.14 |

| Financials | 10.70 | 11.88 | -23.55 | -29.29 | -29.29 |
|--|-------|-------|--------|--------------|--------|
| Asset Management & Custody Banks | 0.81 | 8.73 | -19.57 | -25.39 | -25.39 |
| Consumer Finance | 0.56 | 25.43 | -29.86 | -36.47 | -36.47 |
| | | | | | |
| Diversified Banks | 3.43 | 11.84 | -26.29 | -35.82 | -35.82 |
| Financial Exchanges & Data | 1.19 | 15.21 | -14.85 | -9.72 | -9.72 |
| Insurance Brokers | 0.52 | 10.04 | -23.35 | -20.34 | -20.34 |
| Investment Banking & Brokerage | 0.76 | 10.74 | -22.56 | -28.30 | -28.30 |
| Life & Health Insurance | 0.45 | 26.47 | -30.49 | -37.91 | -37.91 |
| | | | | | |
| Multi-line Insurance | 0.19 | 22.40 | -35.76 | -42.40 | -42.40 |
| Multi-Sector Holdings | 1.12 | 5.29 | -14.88 | -18.80 | -18.80 |
| Property & Casualty Insurance | 0.79 | 10.92 | -22.44 | -21.15 | -21.15 |
| Reinsurance | 0.04 | 4.31 | -28.51 | -29.44 | -29.44 |
| Regional Banks | 0.85 | 10.90 | -30.39 | -39.15 | -39.15 |
| Regional Banks | 0.00 | 10.70 | 50.57 | 57.15 | 57.15 |
| Harakh Cama | 44.50 | 6.24 | 40.05 | 44.50 | 1456 |
| Health Care | 14.52 | 6.24 | -10.05 | -14.56 | -14.56 |
| Biotechnology | 2.27 | 0.42 | -7.63 | -6.38 | -6.38 |
| Health Care Distributors | 0.26 | 2.70 | -15.54 | -7.67 | -7.67 |
| Health Care Equipment | 3.39 | 9.16 | -12.68 | -16.99 | -16.99 |
| Health Care Facilities | 0.17 | 11.96 | -27.80 | -36.08 | -36.08 |
| | | | | | |
| Health Care Services | 0.76 | 10.40 | -10.88 | -18.75 | -18.75 |
| Health Care Supplies | 0.17 | 15.65 | -17.55 | -24.80 | -24.80 |
| Health Care Technology | 0.08 | 2.61 | -15.70 | -16.83 | -16.83 |
| Life Sciences Tools & Services | 1.03 | 6.85 | -8.36 | -16.04 | -16.04 |
| Managed Health Care | 1.66 | 15.93 | -4.17 | -14.53 | -14.53 |
| Pharmaceuticals | 4.72 | 3.11 | -10.05 | | -14.30 |
| Pharmaceuticais | 4./2 | 3.11 | -10.05 | -14.30 | -14.30 |
| | _ | | | | |
| Industrials | 8.44 | 14.58 | -19.96 | -24.29 | -24.29 |
| Aerospace & Defense | 2.26 | 26.92 | -24.20 | -26.95 | -26.95 |
| Agricultural & Farm Machinery | 0.19 | 16.24 | -16.67 | -19.72 | -19.72 |
| Air Freight & Logistics | 0.54 | 6.46 | -1.93 | -15.55 | -15.55 |
| - | | | | | |
| Airlines | 0.27 | 44.03 | -32.13 | -43.20 | -43.20 |
| Building Products | 0.31 | 5.98 | -22.89 | -26.49 | -26.49 |
| Construction & Engineering | 0.07 | 9.58 | -18.65 | -14.85 | -14.85 |
| Construction Machinery & Heavy Trucks | 0.49 | 9.41 | -15.26 | -25.71 | -25.71 |
| Diversified Support Svcs | 0.16 | 4.48 | -26.00 | -24.71 | -24.71 |
| Electrical Components & Equipment | 0.43 | 8.58 | -21.68 | -26.40 | -26.40 |
| * * * | | | | | |
| Environmental & Facilities Services | 0.34 | -0.67 | -19.03 | -13.02 | -13.02 |
| Human Resource & Employment Services | 0.02 | 13.77 | -16.84 | -31.18 | -31.18 |
| Industrial Conglomerates | 1.23 | 10.87 | -17.55 | -22.90 | -22.90 |
| Industrial Machinery | 0.69 | 14.22 | -23.65 | -27.32 | -27.32 |
| Railroads | 0.86 | 12.44 | -18.03 | -20.83 | -20.83 |
| Research & Consulting Svcs | 0.40 | 6.65 | -19.10 | -15.30 | -15.30 |
| | | | | | |
| Trading Companies & Distributors | 0.17 | 6.45 | -14.21 | -24.01 | -24.01 |
| Trucking | 0.12 | 22.47 | -1.36 | -2.79 | -2.79 |
| | | | | | |
| Information Technology | 25.31 | 10.71 | -10.71 | -10.01 | -10.01 |
| Application Software | 2.12 | 9.32 | -10.43 | -4.70 | -4.70 |
| Communications Equipment | 1.00 | 7.23 | -5.60 | -14.11 | -14.11 |
| Data Processing & Outsourced Services | 4.36 | 12.85 | -12.41 | -12.59 | -12.59 |
| | | | | | |
| Electronic Components | 0.18 | 9.53 | -15.77 | -26.12 | -26.12 |
| Electronic Equipment & Instruments | 0.14 | 2.17 | -15.47 | -22.58 | -22.58 |
| Electronic Manufacturing Services | 0.13 | 21.64 | -19.07 | -27.52 | -27.52 |
| Internet Software & Services | 0.16 | 6.57 | -5.01 | -1.30 | -1.30 |
| IT Consulting & Services | 1.16 | 10.62 | -17.26 | -18.93 | -18.93 |
| Semiconductor Equipment | 0.47 | 24.95 | -12.07 | -15.81 | -15.81 |
| | | | | | |
| Semiconductors | 3.91 | 16.66 | -9.26 | -11.57 | -11.57 |
| Systems Software | 6.30 | 9.53 | -7.96 | -0.99 | -0.99 |
| Technology Distributors | 0.06 | 14.50 | -19.05 | -29.25 | -29.25 |
| Technology Hardware, Storage & Peripherals | 5.33 | 6.49 | -12.34 | -13.06 | -13.06 |
| <u> </u> | | | | | |
| Materials | 2.40 | 9.82 | -17.58 | -25.02 | -25.02 |
| | | | | | |
| Commodity Chemicals | 0.18 | 12.22 | -29.73 | -44.70 | -44.70 |
| Construction Materials | 0.11 | 14.50 | -16.21 | -29.62 | -29.62 |
| Copper | 0.04 | 21.77 | -33.17 | -46.72 | -46.72 |
| Diversified Chemicals | 0.03 | 16.24 | -27.14 | -39.50 | -39.50 |
| Fertilizers & Agricultural Chemicals | 0.17 | 12.71 | -20.18 | -27.65 | -27.65 |
| Gold | 0.17 | 15.67 | -2.27 | 11.12 | 11.12 |
| | | | | | |
| Industrial Gases | 0.60 | 10.50 | -14.41 | -16.98 | -16.98 |
| Metal & Glass Containers | 0.09 | 4.08 | -17.32 | -3.26 | -3.26 |
| Paper Packaging | 0.23 | 5.41 | -16.48 | -28.11 | -28.11 |
| Specialty Chemicals | 0.73 | 7.35 | -18.17 | -27.09 | -27.09 |
| Steel | 0.04 | 8.81 | -23.20 | -40.41 | -40.41 |
| | | | | - | |

| Real Estate | 2.89 | 9.17 | -21.61 | -19.29 | -19.29 |
|--|------|-------|--------|--------|--------|
| Health Care REITs | 0.19 | 27.11 | -40.18 | -39.80 | -39.80 |
| Hotel & Resort REITs | 0.04 | 20.39 | -16.32 | -32.83 | -32.83 |
| Industrial REITs | 0.30 | 19.21 | -14.95 | -12.61 | -12.61 |
| Office REITs | 0.19 | 7.43 | -26.89 | -29.62 | -29.62 |
| Real Estate Service | 0.06 | 3.07 | -28.60 | -33.68 | -33.68 |
| Residential REITs | 0.37 | 2.49 | -30.24 | -26.78 | -26.78 |
| Retail REITs | 0.25 | 13.92 | -40.49 | -43.43 | -43.43 |
| Specialized REITs | 1.49 | 6.57 | -10.91 | -3.96 | -3.96 |
| Utilities | 3.38 | 7.49 | -17.32 | -14.23 | -14.23 |
| Electric Utilities | 2.29 | 8.78 | -17.71 | -13.03 | -13.03 |
| Gas Utilities | 0.05 | -2.28 | -14.12 | -13.94 | -13.94 |
| Independent Power Producers & Energy Traders | 0.04 | 22.83 | -26.02 | -32.35 | -32.35 |
| Water Utilities | 0.10 | 3.65 | -10.31 | -2.87 | -2.87 |
| Multi-Utilities | 1.07 | 5.32 | -16.88 | -16.22 | -16.22 |
| | | | | | |

 $[\]hbox{*Current Weight is market cap based, based on calculations by William Blair Intl. Ltd.}\\$

IMPORTANT DISCLOSURES

This report is available in electronic form to registered users via R*Docs™ at https://williamblairlibrary.bluematrix.com or www.williamblair.com.

Please contact us at +18006210687 or consult williamblair.com/Research-and-Insights/Equity-Research/Coverage.aspx for all disclosures.

Richard de Chazal attests that 1) all of the views expressed in this research report accurately reflect his/her personal views about any and all of the securities and companies covered by this report, and 2) no part of his/her compensation was, is, or will be related, directly or indirectly, to the specific recommendations or views expressed by him/her in this report. We seek to update our research as appropriate. Other than certain periodical industry reports, the majority of reports are published at irregular intervals as deemed appropriate by the research analyst.

DOW JONES: 21200.60 S&P 500: 2475.56 NASDAQ: 7384.30

Additional information is available upon request.

Current Rating Distribution (as of March 26, 2020):

| Coverage Universe | Percent | Inv. Banking Relationships * | Percent | |
|-----------------------|---------|------------------------------|---------|---|
| Outperform (Buy) | 71 | Outperform (Buy) | 22 | _ |
| Market Perform (Hold) | 29 | Market Perform (Hold) | 9 | |
| Underperform (Sell) | 1 | Underperform (Sell) | 0 | |

^{*}Percentage of companies in each rating category that are investment banking clients, defined as companies for which William Blair has received compensation for investment banking services within the past 12 months.

The compensation of the research analyst is based on a variety of factors, including performance of his or her stock recommendations; contributions to all of the firm's departments, including asset management, corporate finance, institutional sales, and retail brokerage; firm profitability; and competitive factors.

OTHER IMPORTANT DISCLOSURES

Stock ratings and valuation methodologies: William Blair & Company, L.L.C. uses a three-point system to rate stocks. Individual ratings reflect the expected performance of the stock relative to the broader market (generally the S&P 500, unless otherwise indicated) over the next 12 months. The assessment of expected performance is a function of near-, intermediate-, and long-term company fundamentals, industry outlook, confidence in earnings estimates, valuation (and our valuation methodology), and other factors. Outperform (0) - stock expected to outperform the broader market over the next 12 months; Market Perform (M) - stock expected to perform approximately in line with the broader market over the next 12 months; Underperform (U) - stock expected to underperform the broader market over the next 12 months; not rated (NR) - the stock is not currently rated. The valuation methodologies include (but are not limited to) price-to-earnings multiple (P/E), relative P/E (compared with the relevant market), P/E-to-growth-rate (PEG) ratio, market capitalization/revenue multiple, enterprise value/EBITDA ratio, discounted cash flow, and others. Stock ratings and valuation methodologies should not be used or relied upon as investment advice. Past performance is not necessarily a guide to future performance.

The ratings and valuation methodologies reflect the opinion of the individual analyst and are subject to change at any time.

Our salespeople, traders, and other professionals may provide oral or written market commentary, short-term trade ideas, or trading strategies-to our clients, prospective clients, and our trading desks-that are contrary to opinions expressed in this research report. Certain outstanding research reports may contain discussions or investment opinions relating to securities, financial instruments and/or issuers that are no longer current. Always refer to the most recent report on a company or issuer. Our asset management and trading desks may make investment decisions that are inconsistent with recommendations or views expressed in this report. We will from time to time have long or short positions in, act as principal in, and buy or sell the securities referred to in this report. Our research is disseminated primarily electronically, and in some instances in printed form. Research is simultaneously available to all clients. This research report is for our clients only. No part of this material may be copied or duplicated in any form by any means or redistributed without the prior written consent of William Blair & Company, L.L.C.

This is not in any sense an offer or solicitation for the purchase or sale of a security or financial instrument. The factual statements herein have been take from sources we believe to be reliable, but such statements are made without any representation as to accuracy or completeness or otherwise, except with respect to any disclosures relative to William Blair or its research analysts. Opinions expressed are our own unless otherwise stated and are subject to change without notice. Prices shown are approximate.

This material is distributed in the United Kingdom and the European Economic Area (EEA) by William Blair International, Ltd., authorised and regulated by the Financial Conduct Authority (FCA). William Blair International, Limited is a limited liability company registered in England and Wales with company number 03619027. This material is only directed and issued to persons regarded as Professional investors or equivalent in their home jurisdiction, or persons falling within articles 19 (5), 38, 47, and 49 of the Financial Services and Markets Act of 2000 (Financial Promotion) Order 2005 (all such persons being referred to as "relevant persons"). This document must not be acted on or relied on by persons who are not "relevant persons."

"William Blair" and "R*Docs" are registered trademarks of William Blair & Company, L.L.C. Copyright 2020, William Blair & Company, L.L.C. All rights reserved.