Consumer and Investment Management Division

Goldman Sachs

Investment Strategy Group

Sunday Night Insight
March 22, 2020

A Light at the End of the Tunnel

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The most important question on all our minds is when and where will we see a light at the end of the tunnel. This question pertains to three areas:

1. Healthcare:

   - What can we expect in terms of diagnostics so there is more data on the number of infections and a better understanding of the fatality rate?

   - When will we know if the rapid increase in infections has peaked and follows the path observed in China?

- When will we know if any of the therapies that are being developed are effective?

- Will a vaccine be developed soon enough to protect front-line healthcare workers and ultimately the broader population?

2. The Economy:

   - How deep and prolonged will this recession be?

   - What has the Federal Reserve done to ameliorate the illiquidity and volatility in the financial markets?

   - What are the Federal Government's fiscal stimulus plans and will they put a floor on the decline in US GDP?

   - Are other central banks and governments instituting similar measures in other parts of the world?

3. Client Portfolios:

   - How much further can the equity markets decline?

   - Is this the time to add to equity positions or totally de-risk the portfolios?

   - If the recommendation is to add to risk, then what is the most to effective way to do so?

The purpose of this *Sunday Night Insight* is to address these questions as best as we can, factoring in the immense uncertainty we mentioned as early as February 4 in our first Covid-19 client call, but also factoring in the herculean monetary and fiscal policy measures announced around the world over the last several weeks.

Healthcare

We begin with a review of the key points made on our Covid-19 client call on Friday, March 20, to see whether one can realistically expect a light at the end of this pandemic tunnel in the foreseeable future. Our guest speakers were as follows:

For Diagnostics:

- **Stephen H. Rusckowski,** Chairman, CEO and President, Quest Diagnostics
- **Thomas Schinecker,** CEO, Roche Diagnostics

For Therapies and Vaccines:

- **Leonard S. Schleifer,** Founder, President & CEO, Regeneron Pharmaceutical
- **Stéphane Bancel,** CEO, Moderna
- **Pablo Tebas,** Professor of Medicine, Hospital of the University of Pennsylvania

For State of the Healthcare System and Covid-19 Insights:

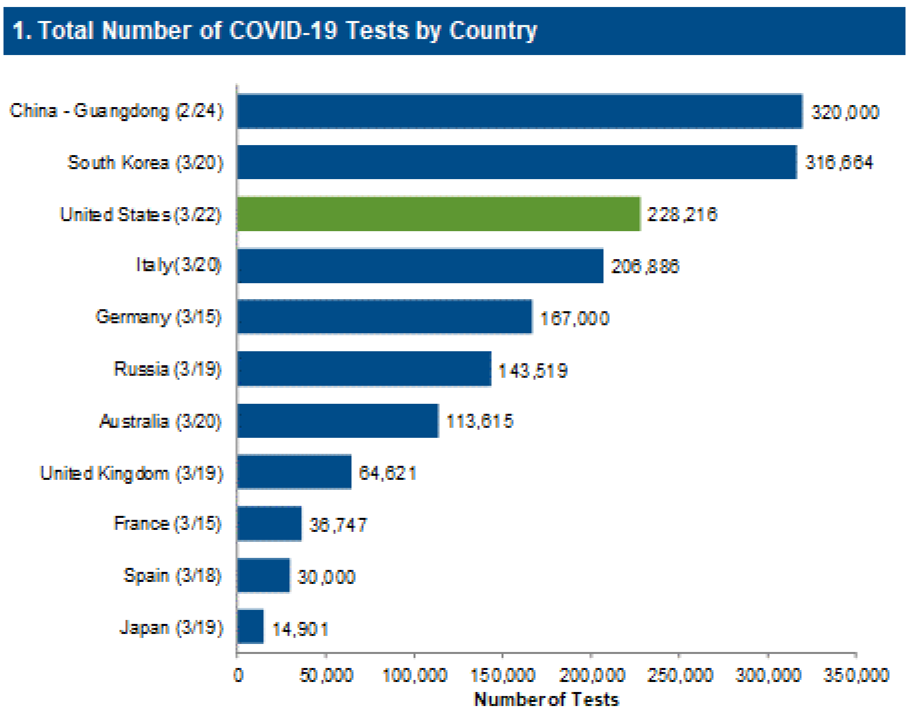
- **Peter Slavin**, President, Massachusetts General Hospital
- **Barry Bloom**, Professor of Public Health, Harvard T.H. Chan School of Public Health

Our observations are based on their commentaries.

<u>Diagnostics</u>

As many of you already know, the US has faced a number of challenges with testing for the virus, ranging from capacity constraints as the US Centers for Disease Control and Prevention (CDC) was initially the only institution that could confirm infections, to problems with reagents used in the kits, to availability of lab materials for testing people.

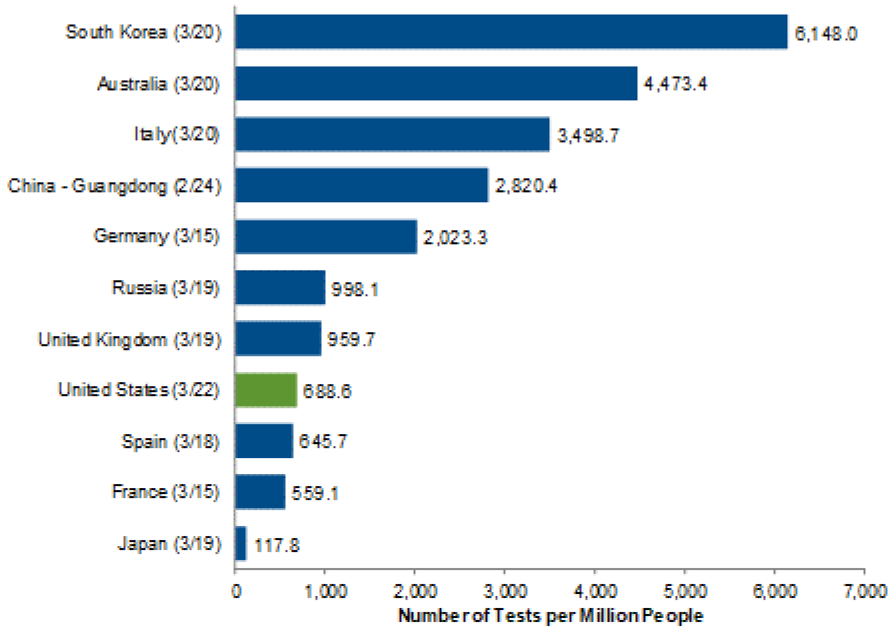
To put the limitations of the US testing capacity in perspective, the number of tests performed in the US relative to other countries—both absolutely and relative to population size—is shown below in Exhibits 1 and 2.



Data as of March 22, 2020.

Source: Investment Strategy Group, Our World in Data, The COVID Tracking Project.

2. Number of COVID-19 Tests per Million People by Country



Data as of March 22, 2020.

Source: Investment Strategy Group, Our World in Data, The COVID Tracking Project.

However, healthcare companies and members of the medical community have ramped up their efforts significantly over the last month since they received approvals from the CDC and the Food and Drug Administration (FDA) to develop their own tests. Both Roche Diagnostics and Quest Diagnostics provided extensive information on the various platforms used for testing and the extent to which they have increased and continue to increase testing capacity.

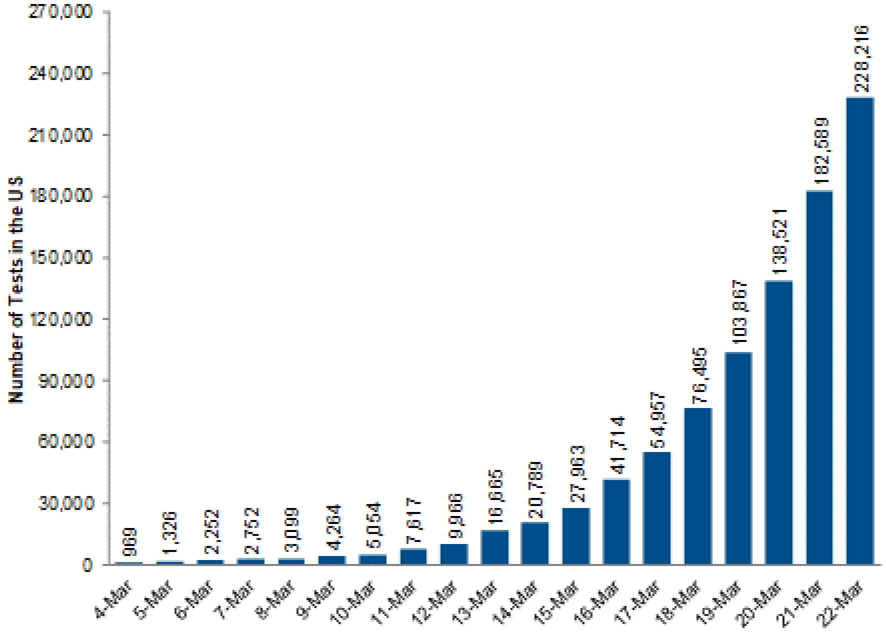
Roche began shipping their initial 400,000 test kits for their large throughput systems called cobas 6800 and cobas 8800 on March 13, a day after they received approval from the FDA. Cobas 6800 provides 1,440 results in 24 hours, and cobas 8800 provides 4,128 results in 24 hours. They are manufacturing 900,000 tests per week and believe their testing kits will support 5 million tests per month.

Quest Diagnostics has similarly increased their capacity for testing in their laboratories after they and other laboratories in the US received approval from the FDA on February 29. Quest has increased its capacity from zero on March 1 to 20,000 tests per day by March 20; Steve Rusckowski suggested that other large laboratories such as LabCorp were at similar levels.

However, a few bottlenecks remain. These include having staff to correctly collect the specimens, having enough swabbing equipment to collect specimens, having adequate specimen transport material, and getting the specimens to the laboratories in a timely fashion. The Federal Emergency Management Agency (FEMA) initiated their first testing site in a CVS parking lot in Massachusetts on Thursday, March 19th.

The impact of the ramp-up in efforts is best seen in the trajectory of the number of tests over the last few weeks (see Exhibit 3). Steve Rusckowski expects that the nation's testing demand will be met in the next two to three weeks. There certainly seems to be a light at the end of the diagnostics tunnel.

3. Total Number of COVID-19 Tests in the US Over Time



Data as of March 22, 2020.

Source: Investment Strategy Group, The COVID Tracking Project.

Therapies and Vaccines

The Milken Institute has been tracking the number of institutions working on therapies and vaccines in different stages of development all over the world: the current estimate is 58 treatment therapies and 43 vaccines.[1]

Regeneron shared their two-pronged approach to dealing with Covid-19. The first approach is to leverage what is already “on the shelf.” For example, Kevzara is an already approved drug that is used to treat rheumatoid arthritis by creating a fully human antibody that blocks a receptor called cytokine interleukin-6 that causes inflammation. Regeneron shared that this drug has been used in China in an “uncontrolled” approach, but has had some encouraging results. Regeneron has initiated a phase 2/3 trial to properly test the efficacy of this drug. If successful, it would be used to reduce lung inflammation arising from Covid-19 for the critically ill.

The second approach is to recreate antibodies that one would ordinarily get from a vaccine. Regeneron has isolated virus-neutralizing, fully human antibodies that have been developed in their Velocimmune mice; these antibodies are then manufactured through recombinant DNA. This approach was used to fight Ebola successfully in the Congo. Regeneron expects to begin testing in June and producing the antibodies on a larger scale in late summer.

There is also considerable work being done on vaccines using more innovative biotechnology. The National Institute of Health dosed its first participant in a Phase 1 study with Moderna’s messengerRNA-1273 vaccine (mRNA) on March 16. In this new class of medicine, the mRNA is injected in the muscle to instruct human cells to produce the virus protein which will, in turn, teach the body to make a productive antibody, thereby mimicking a natural infection. Phase 1 is expected to enroll 45 healthy adult volunteers between the ages of 18 to 55 over approximately six weeks. The goal of the Phase 1 study is to gather data on the safety and immunogenicity (ability of the vaccine to induce an immune response in participants). If Phase 1 and the subsequent Phase 2 demonstrate safety and good immunogenicity, Moderna is optimistic that they may be able to provide vaccinations by the fall of 2020 for emergency personnel, doctors, nurses, and others on the front line of defense against the pandemic. Broader-based availability would be in the fall of 2021.

Interestingly, if the virus mutates, Moderna believes that they can easily adapt their vaccine to the new genetic sequence of the virus.

Inovio is working on a similar concept, but based on a DNA vaccine rather than an mRNA-based one. They expect to start clinical trials in a few weeks. However, as pointed out by Dr. Tebas, Phase 1 trials look at safety and immunogenicity, but Phase 3 trials measure efficacy of the vaccine over a larger group of people to see if the vaccine actually prevents people from getting Covid-19. He reiterated the time table suggested by other speakers: Phase 1 in multiple organizations has already started or is starting soon, Phase 2 with larger trials possibly including high-risk populations and first responders, and Phase 3 expected in the fall of 2020.

One of the very interesting points raised by Leonard Schleifer of Regeneron was one of serological testing, which is used to determine who has already had an infection. On March 17, a team of scientists, led by Dr. Florian Krammer of the Icahn School of Medicine at Mount Sinai in New York, published a paper showing how their test can measure the level of antibodies in a patient.[2] This test can be used to identify recovered patients who could then donate their SARS-CoV-2 antibody-rich serum to help treat critically ill patients. According to Dr. Krammer, another key application of these tests would be to identify people who have likely developed immunity to the virus, especially among hospital staff. These virus-resistant staff could then take on front-line jobs during the pandemic by delivering care to patients with minimal risk to themselves or others.

One of the most frequently asked questions is the efficacy of chloroquine or hydro chloroquine combined with the antibiotic azithromycin in treating the virus. The inquiry is the result of a mid-January report from China translated into English with no data, and a subsequent report by a group of French doctors with 36 patients. According to Dr. Barry Bloom, these drugs are currently being investigated in a more systematic scientific manner, but the current data is more anecdotal. Dr. Leonard Schleifer, M.D., also cautioned our clients "not to jump on late night infomercial equivalents," referring to therapies that have not yet been rigorously tested.

While the light at the end of the therapies and vaccines tunnel is not shining brightly, it is still visible. The amount of talent and resources devoted to addressing both the virus and the disease is immense, and it is hard to imagine that these efforts, as discussed by our panel of experts, will not yield any successful results in the near future. We believe there is room for a modicum of optimism.

State of the Healthcare System and Covid-19 Insights

Where the light at the end of the tunnel is shining somewhat dimly is in the healthcare system. Dr. Peter Slavin, President of Massachusetts General Hospital—which is ranked number 2 in the US News Best Hospitals Honor Roll—shared some of his insights. The hospital is actively freeing up capacity by canceling elective surgeries and leveraging telemedicine to reduce outpatient visits to the hospital. They are even using telemedicine between patients with Covid-19 and hospital staff to minimize the number of staff visits into patients' rooms, thereby protecting the staff and preserving personal protective equipment (PPE).

Dr. Slavin's greatest concern at this time is the potential shortages of N-95 masks, personal protective equipment, and ventilators, as well as the turnaround time for testing results. He estimated that the US might need 3.5 billion masks during this pandemic, while national stockpiles typically have 12.5 million masks.

He was hopeful that industry and the US government will mobilize quickly enough to address these shortcomings, especially given President Trump's signing of the Defense Production Act. FEMA has said they are shipping masks and Vice President Pence has stated they have ordered "hundreds of millions" of N-95 masks. The Department of Defense announced on March 17 that they would make up to 5 million respirator masks and other personal protective equipment available from their strategic reserves. Two thousand deployable ventilators that are different than civilian ventilators will also be made available. In New York State, Governor Cuomo said the state would be sending 1 million masks to NYC and 500,000 to Long Island, in addition to purchasing 6,000 additional ventilators.

FEMA will also be supplying four large federal medical stations with 1,000 beds each in New York City and eight such stations with 2,000 beds each in California.

While all the stockpiles of important equipment are not yet in place, the public and private sectors are mobilizing on a rapid scale.

Finally, Dr. Barry Bloom reiterated what he has mentioned in past calls. It is imperative to implement stringent social distancing to prevent infected people from transmitting to other people. It is equally imperative to have extensive testing. In the absence of extensive testing, it is impossible to know where the growth rate of infections has been successfully curtailed.

The Economy

There are four issues to consider as we examine the economic perspective: the depth and length of a recession in the US, the efficacy of monetary policy and liquidity-enhancing measures by the Federal Reserve, the force and impact of the forthcoming fiscal stimulus in the US, and the strength of similar measures elsewhere in the world.

We believe that there is an emerging light at the end of the economic tunnel.

Depth and Length of a US Recession

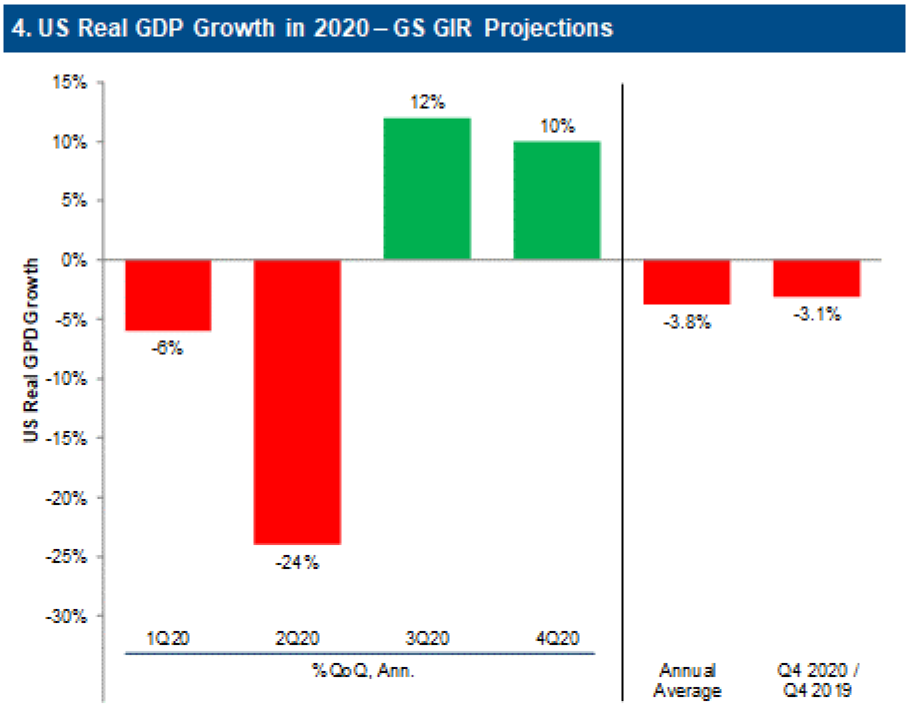
Our colleague, Jan Hatzius, Chief Economist and head of Global Investment Research, and his team updated their forecast for US GDP. Extensive social distancing (the panacea for the pandemic emphasized by Dr. Boom) has led to a "sudden stop for the US economy."[3]

While there will be a surge in healthcare consumption, other areas of consumer spending are forecast to decline, from 15% for education services to as much as 85% for sports and entertainment and 90% for casino gambling and package tours.

Manufacturing, which was already expected to decline due to supply-chain disruption from China and a decline in exports, is expected to decline by 20%, partly driven by the closure of automobile manufacturing plants.

Homebuilding and business structures investment is expected to decline by 25%.

In aggregate, US GDP is forecasted to decline 3.8% on an annual average basis, or 3.1% if we compare the fourth quarter of 2020 to that of 2019. The quarterly path for this growth rate is shown in Exhibit 4. Jan Hatzius and his team note that a 24% decline in Q2 is two-and-a-half times greater than the next-largest quarterly GDP decline on record, which was seen in the first quarter of 1958.



Data as of March 22, 2020.

Source: Goldman Sachs Global Investment Research.

These numbers assume that by the summer, social distancing has been effective in slowing the pace of infections, warmer weather will further contribute to the reduction in new infections, and there will be some progress on therapies and vaccines discussed above.

Federal Reserve Policies

The Federal Reserve has been very aggressive in its response to the coronavirus pandemic with the following measures:

- The Federal Open Market Committee (FOMC) cut the Federal Funds rate by 50 basis points on March 3 and another 100 basis points on March 15, lowering the target rate to a 0–0.25% range.
- Interest on Excess Reserves was reduced to 0.10% from 1.10%.
- The Reverse Repurchase Program offering rate was cut to zero from 1.00%.
- Interest rates charged on standing swap lines with five foreign central banks were lowered to 0.25% from 0.50%.
- The FOMC directed the Federal Reserve Bank of New York to begin asset purchases of Treasury securities and Agency Mortgage-Backed Securities to total at least $700 billion.

- The discount rate was cut to 0.25% from 1.75%, and depository institutions were encouraged to utilize intraday credit on both a collateralized and uncollateralized basis.

- The reserve requirement ratios were reduced to zero effective March 26, so that depository institutions can support lending to households and businesses.

The Federal Reserve also instituted a number of liquidity facilities to ensure liquidity in the short-term debt markets:

- Primary Dealer Credit Facility

- Commercial Paper Funding Facility

- Money Market Mutual Fund Liquidity Facility

<u>Fiscal Stimulus Policies</u>

The total size of the expected fiscal stimulus is large and widespread. While Phase 1 and Phase 2 of the fiscal stimulus were small at about $100 billion each, Phase 3 is expected to be about $1.3 trillion, for a total fiscal stimulus that amounts to about 7.5% of GDP. This compares to the American Recovery and Reinvestment Act of 2009, in response to the Global Financial Crisis, which was about $800 billion. That stimulus package was about 5% of GDP and spread over two years. This package is not only larger as a percentage of GDP, but also more concentrated in 2020.

The expected package, which may well be voted on by the Senate on Monday, is broad-based. Based on the Republican text released by the Senate earlier on Sunday, the package has three goals:

- *Keep workers paid and employed*, which includes support to small businesses to keep their workers employed, unemployment insurance provisions, tax credit for individuals, and provisions for businesses, such as deferring employer-paid taxes.

- *Provide enhancements to the healthcare system*, which includes improvements in the medical supply chain, requiring the strategic national stockpile to include certain medical supplies, expedited health device approvals, protection for healthcare workers, and rapid development of vaccines and expedited immunization. It also includes teacher loan forgiveness and suspended student loan payments for six months.

- *Stabilize the economy*, which includes an emergency stabilization fund (ESF) for businesses and municipalities, funding to airlines, air cargo and businesses critical to national security, temporary relief to community banks, and emergency funding for Covid-19 health response such as funds for hospitals, veteran's healthcare, vaccines and therapeutics, funds for airports, FEMA disaster relief fund and public transportation emergency relief fund.

We believe that this a very significant package in terms of both size and the range of sectors covered by the bill. Of course, passage of this Phase 3 package may require further market pressure, as was the case with the $700 billion Troubled Asset Relief Program (TARP) in 2008. Recall that although leaders on both sides of the aisle had announced a tentative deal on Sunday evening, the bill failed to pass its initial vote on Monday, September 29, 2008. Yet the ensuing nearly 9% drop in the S&P 500 in the wake of the failed vote ultimately led to the bill's passage just days later. Given that neither party will want to be blamed for withholding much-needed aid to American voters, we think it is highly likely that this bill passes.

Global Monetary and Fiscal Policies

On a more global basis, developed and emerging market countries across the world have undertaken significant monetary and fiscal policy stimulus measures.

On the monetary side, measures have included lowering benchmark interest rates (except in Japan and the Eurozone, since their rates were already in negative territory), asset purchases including broadening the range of assets that would be purchased, lending facilities for small and medium enterprises, and easing some capital requirements for banks.

On the fiscal side, BCA estimates that governments have or will be introducing $2.49 trillion of fiscal stimulus, which amounts to 3% of the GDP of these countries.[4] The countries included in their estimates range from the United States with a 7% of GDP fiscal package, to China at 3%, Germany at 4%, Japan at 6% including "cash handouts," Spain at 9%, and Canada at 2%.

In aggregate, the level of monetary and fiscal stimulus is monumental in size and breadth. Some observers believe that these measures will have no impact on alleviating a demand shock created by the social distancing that has ground many sectors of economies to a halt. There is no doubt that the only catalysts for a sustainable recovery will be the significant reduction in the spread of Covid-19 and the discovery of therapies and vaccines.

However, in the interim, these measures will reduce the burden on households and workers with limited income, they will help certain industries—large, medium, and small—weather the storm, they will lower the cost of financing the debt to fund some of the programs, they will substantially reduce the freezing of the capital markets as witnessed in 2008, and they will help stimulate the recovery once it unfolds. In our view, these measures certainly provide a notable light at the end of the tunnel.

Client Portfolios

As we debate whether we should recommend adding additional risk to portfolios or sit on the sidelines until there is greater clarity on the impact of the Covid-19 pandemic, we consider three questions:

1. Has the market already discounted the potential fallout from the pandemic?

2. What is the scope for further downside as the news in the US and some parts of the world deteriorates for several weeks, if not longer?

3. If China is a template for the path of infections and resumption of economic activity, what is the potential upside when we emerge from this crisis?

What has been discounted?

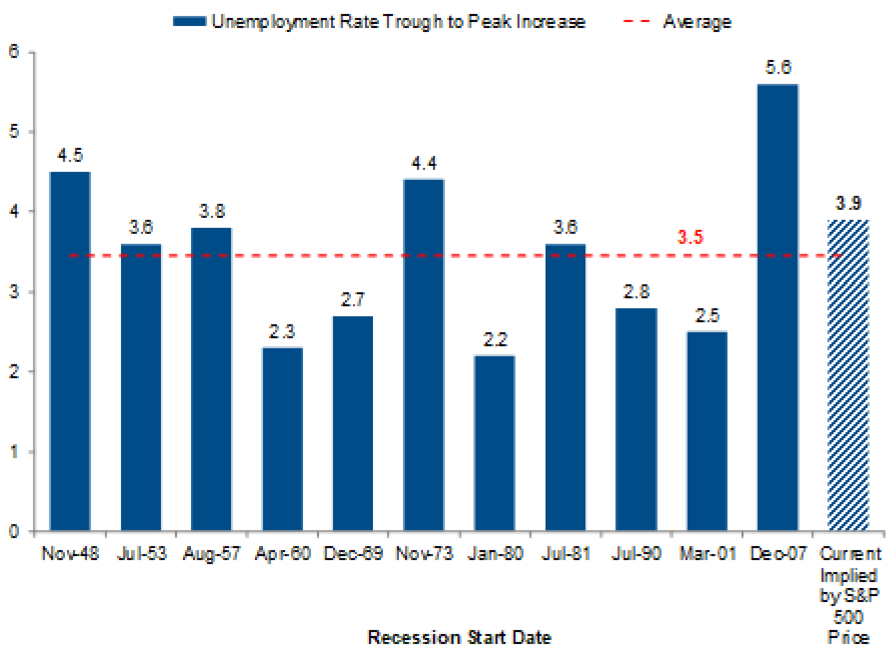
Turning to the first question, it is important to remember that the stock market is forward-looking. The dramatic decline in equity prices—and the pace at which it unfolded—reflect the market's attempt to discount the equally sudden and sizable decline in economic activity that is soon to result from nationwide containment efforts. Thus, while there is ample bad news ahead of us—higher confirmed virus cases, significant negative revisions to GDP growth and corporate earnings, a spike in unemployment claims, etc.—the market has moved lower in anticipation of these events.

The key uncertainty is whether the market is discounting a recession that is driven by a GDP decline of over 3% for all of 2020 as forecast by Jan Hatzius, as discussed earlier, or whether the market could decline further as the path to that annual GDP decline is realized, particularly since GIR's forecast features a 24% QoQ annualized decline in Q2.

While it is impossible to precisely determine what is priced into the stock market—particularly when the daily movements in stocks are equivalent to a typical year's worth of gains or losses—the below observations suggest that risk assets have already priced in an above-average recession:

- The S&P 500 has suffered a 32% peak-to-trough decline from its highs in February, exceeding the 30% average downdraft during a recession. Based on our models, the market's decline is consistent with a significant rise in the unemployment rate to 7.4%, nearly 4 percentage points above its current level. The average increase during a recession in the post-WWII period is 3.5 percentage points (see Exhibit 5).

5. Historical Trough to Peak Increase in the Unemployment Rate vs. Current Market-Implied Increase

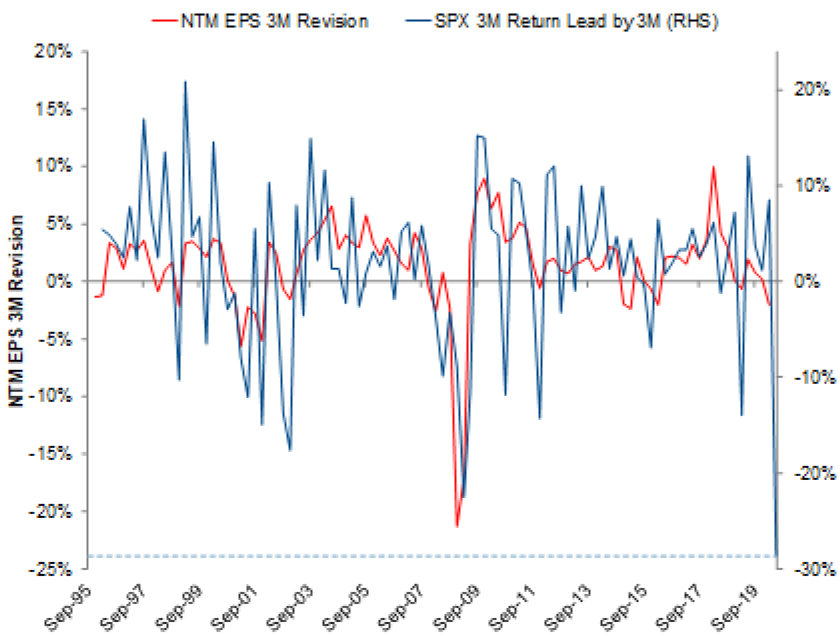


Data as of March 22, 2020.

Source: Investment Strategy Group, Bloomberg, FactSet.

- The market's decline is consistent with a negative revision of more than 20 percentage points to corporate earnings growth over the next three months, based on the historical relationship between these two series (see Exhibit 6). This would match the worst three-month earnings revisions seen during the financial crisis.

6. S&P 3M Price Return Lead by 3M vs. NTM EPS 3M Revision



Data as of March 22, 2020.

Source: Investment Strategy Group, Bloomberg, FactSet.

- Valuation spreads—which measure the valuation difference between the cheapest and average stock, rather than the aggregate valuation of all stocks—stand more than 4 standard deviations above their mean and at levels last seen at the peak of the financial crisis.

- The CBOE VIX Index—which measures expectations for future volatility—rose to its highest level ever, exceeding even the peak seen during the global financial crisis.

- Cross-asset movements tell a similar recessionary tale: commodities have fallen about 27% from their peak, consistent with the typical 30% recessionary outcome, while global currency volatility has risen 10 percentage points from its trough, compared to 9 percentage points in recessions. Finally, high yield spreads have exceeded 1,000 basis points, a level only exceeded during recessions historically.

<u>What is the scope for further downside?</u>

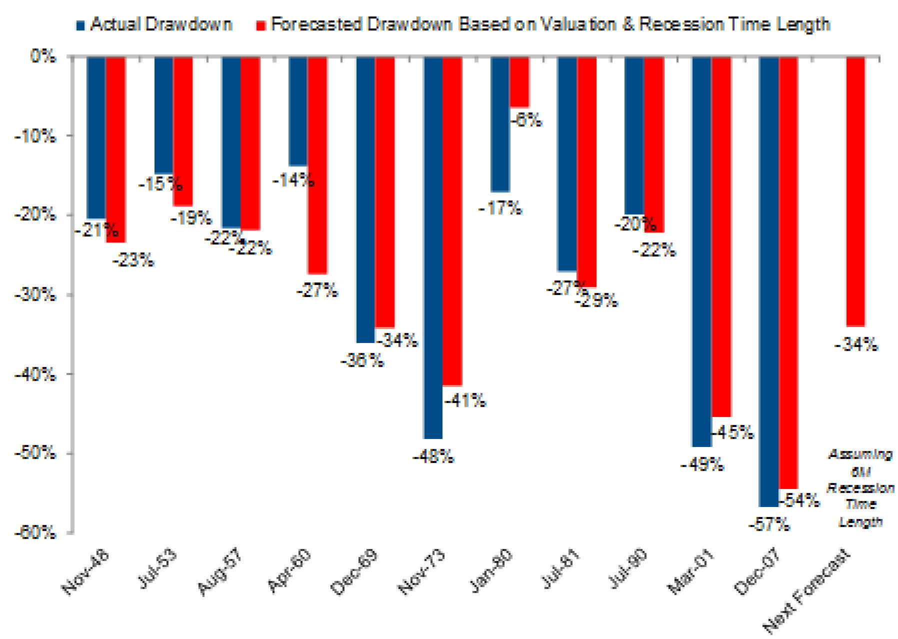
Despite the sizable declines seen so far, prices could decline further as events unfold in a way that is worse than market expectations. As the number of cases and fatalities continues to increase, investors could decide the uncertainty of the pandemic is simply too great. Or if Q2 GDP declines by the 50% that James Bullard, President of the Federal Reserve Bank of St. Louis, raised as a possibility during an interview with Bloomberg, there is clearly scope for further declines.[5]

Below, we have used historical relationships to estimate potential downside under different fundamental scenarios. We emphasize, however, that these are not our expected downside targets, as prices may never reach these levels. At the same time, these levels could be exceeded even if the fundamental developments are as expected, as fear combined with poor liquidity often drives markets to overshoot in the short run.

These approaches suggest a range of S&P 500 prices from 1950–2234, with an average of around 2100:

- A model based on the starting valuation of the market and the length of the recession has explained about 83% of the variation of past bear market declines. Assuming that the recession is relatively short-lived—consistent with the sharp but temporary shocks seen in China and South Korea—this model suggests an S&P 500 level of 2234 (see Exhibit 7). The same model would imply an S&P 500 level of 1963 if the recession were to match the historical median recession length of 10 months.

7. Actual vs. Forecast Equity Price Drawdown During Recession, Based on Peak Valuation & Recession Time Length



Data as of March 22, 2020.

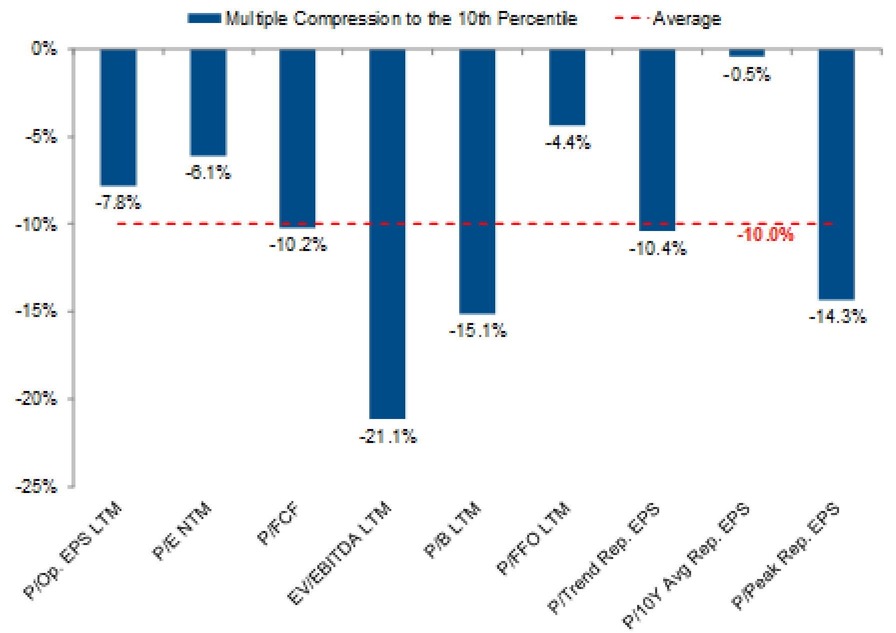
Source: Investment Strategy Group, Bloomberg, FactSet.

- The average P/E ratio on trough corporate earnings at market bottoms during periods of low and stable inflation has been around 17x. If we apply that to our newly lowered 2020 EPS estimate range of $120-125, that implies an S&P 500 level of 2040–2125.

- If the increase in the unemployment rate (U3 rate) for 2020 were to match that seen in the financial crisis (i.e. an increase of 5.6 percentage points), that would imply a 9.1% U3 rate and S&P 500 level of 2120 based on our models. Note GIR expects the U3 rate to reach 9%.

- If we assume all the valuation metrics shown in Exhibit 8 were to fall to their lowest historical decile, it would imply an S&P 500 level of 2074. Note our commonly used decile valuation chart—which currently stands in its sixth decile—is based on all post-WWII valuation data, whereas this analysis focuses on the low and stable inflation period that has existed in the US since the mid-1990s. Such periods of low and stable inflation have supported higher valuations historically.

8. Multiple Compression from Current to Reach the 10th Percentile Values Since 1996 April



Data as of March 22, 2020.

Source: Investment Strategy Group, Bloomberg, FactSet, S&P Global.

- If the equity risk premium—which is estimated by the difference between the earnings yield of the market less the 10-year Treasury yield—were to reach the average of the highest point during the financial crisis and the highest point at the time of the 2011 US debt downgrade selloff, it would imply an S&P 500 level of 1950, assuming yields fell to 0.5%.

<u>What is the potential upside?</u>

While economic and profit growth are set to be dismal in the second quarter, forward-looking equity markets are likely to focus on the sequential path of growth from there. If the US is able to bring the virus under control in the coming months, economic activity should resume in the second half of this year and into 2021. That recovery should be aided by the sizable fiscal and monetary stimulus that was put in place during the crisis.

The implication is that a recovery in economic and corporate earnings growth, coupled with the removal of election uncertainty, is likely to leave the market higher than current levels over the next 1-2 years:

- The recovery in GDP growth in 2021 implies around $170 of earnings next year. If the equity risk premium reverted to its post-crisis average of 4.4% and the 10-year Treasury yields stood at 1.25% by yearend, this would imply an S&P 500 level of 3009.

- The history of 25%-or-greater drawdowns in the S&P 500 in less than 3 months shows that the average maximum gain over the following year was 28%, while the same figure over the next two years was a gain for 49%. Taking the one-year number at face value would imply an S&P 500 level of 2950.

- The average of these two approaches would imply the S&P 500 reaches 2980, consistent with our new 2950–3050 year-end target range.

The foregoing suggests that the market has already priced in a recessionary outcome and that the potential upside from current levels (S&P 500 up 30% by year-end) is more than twice as large as the potential downside (S&P 500 dipping by 3–15%, depending on the fundamental approach used). This risk/reward is similar to that calculated by our colleagues in GIR, who have an S&P 500 year-end target of 3000 but see risk that the market trades to 2000 first.

A lynchpin of realizing that upside is that the virus is contained in the first half of this year, following the template of both China and South Korea.

To be clear, we are not trying to call the bottom in the market. No market participant can predict the top or bottom in any market with consistency. What an investor can do, however, is assess whether the contemplated investment offers an attractive return, under a reasonable set of assumptions, to justify the amount of risk that must be assumed. Given the recent market decline, we think the compensation for taking that risk has become attractive enough to slowly increase exposure, provided one has excess liquidity and an appropriate strategic asset allocation which provides staying power.

As we highlighted in last week's *Sunday Night Insight*, there are several ways to incrementally add to one's S&P 500 exposure:

- Remove portfolio hedging strategies

- Rebalance risk positions that have declined in value

- Use options in place of direct purchases of risk assets

- Slowly scale into direct purchases of risk assets

All of these approaches are appropriate in our view. However, a client needs to consider their own utility function and aversion to any further losses at a time of such heightened uncertainty before proceeding.

Clearly, in our view, there is a light at the end of this pandemic tunnel. As more and better testing kits become available, as eventual therapies and vaccines are introduced or unexpected ones such as the serological testing developments are made known, and the public and private sectors provide greater resources for the healthcare system, fear will abate. At the same time, massive monetary and fiscal policy stimulus on a global basis will be taking hold and partially offsetting the hit from Covid-19. If clients can see past the bumpy road to the light at the end of the tunnel, we recommend implementing such strategies opportunistically as outlined above.

Endnotes:

(1) Milken Institute, "COVID-19 Treatment and Vaccine Tracker," March 20, 2020.

(2) Gretchen Vogel, "New Blood Tests for Antibodies Could Show True Scale of Coronavirus Pandemic," *Science*, March 19, 2020.

(3) US Economics Group, "A Sudden Stop for the US Economy," Goldman Sachs Global Investment Research, March 20, 2020.

(4) BCA, "Global Fiscal Policy Response," March 19, 2020.

(5) Steve Matthews, "U.S. Jobless Rate May Soar to 30%, Fed's Bullard Says," Bloomberg, March 22, 2020.

This report includes forward-looking statements. These statements are not historical facts, but instead represent only the Firms' presenting beliefs regarding future events, many of which, by their nature, are inherently uncertain and outside of the Firms' control. Forward-looking statements include statements about the potential efficacy of diagnostic kits, therapies, vaccines and their potential impact on the global outbreak of a novel strain of coronavirus (COVID-19). Any impact of these measures on the results of the companies presenting or on financial markets or national economies more broadly is uncertain. As at the time of this report, the COVID-19 outbreak is resulting in widespread disruption to financial markets and normal patterns of business activity across the world and has led to significant market volatility and accommodative monetary policies by global central banks and companies around the world activating business continuity planning (BCP) strategies to safeguard the well-being of employees, the continued operation of critical functions and the support of clients. The extent of the impact of these measure on the COVID-19 outbreak and on the companies' operational and financial performance, and on the markets and national economies more generally, will depend on future developments including the efficacy of these measures and the duration and continued spread of the outbreak.

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