MOODY'S
ANALYTICS

WEBINAR

March 2020

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COVID-19: Global Recession Q&A

Because of the large number of questions we received, we have combined many. If you have further questions, please email us at help@economy.com.

Question: What's the criteria for a country being in recession and labeled as below potential growth?

Answer: We stick with the technical recession definition for countries except for the U.S. A technical recession is two consecutive quarters of declining GDP. For the U.S., a recession, as defined by the National Bureau of Economic Research, is "a significant decline in economic activity spread across the economy, lasting more than a few months, normally visible in real GDP, real income, employment, industrial production, and wholesale-retail sales." The U.S. economy clearly contracted in March and that will extend through the second quarter. To be labeled as below potential growth, trend growth in a country has to be below our estimate of potential.

Q: What are the implications of lower oil prices for the U.S. economy?

A: The impact of lower prices on consumer spending is fairly linear, all else being equal. However, the implications for energy-related investment from a drop in global oil prices are not linear; they depend on the break-even price of oil. Therefore, the drop in oil prices could hurt the economy this quarter and next. The Bureau of Economic Analysis uses the American Petroleum Institute's weighted average of footage drilled along with rotary rig counts from Baker Hughes in its current quarter estimate of private fixed investment in mining exploration, shafts and wells.

The good news is that this segment now accounts for around 18% of nominal private fixed investment in nonresidential structures, compared with about 35% before the slump in oil prices that began in the second half of 2014. As a share of GDP, private fixed investment in mining exploration, shafts and wells accounts for less than 1%.

Q: What are the most important indicators to watch going forward?

A: We are closely monitoring high-frequency economic data but also financial market conditions, primarily the A2/P2 spread and the components of change for the Fed's balance sheet. Discount window borrowing has picked up recently but some of this likely was volunteering, since some large banks publicly stated they were taping the discount window. This was likely done to try and address the stigma on borrowing from the discount window. As in the financial crisis, we will be watching to see how much activity occurs in the Fed's various credit facilities. The A2/P2 spread will also be important to watch.

As for the economic data, weekly initial claims will provide a timely look at the number of layoffs. Timely measures of either business confidence (our weekly survey) or Morning Consult's daily consumer sentiment index are also important.

Q: Why haven't metals prices fallen as much as oil?

A: There are a few reasons that metal prices have not fallen as much as oil. First, there has not been a supply shock layered on top of a demand shock. The collapse of the OPEC+ production cut agreement could throw up to 3 million barrels per day of supply onto an already-oversupplied market. These dynamics are unique to the oil market; they do not even affect the price of natural gas, let alone metals.

Second, transportation is the most affected industry in the global economy, and oil is used primarily for transportation purposes. Demand for travel has fallen orders of magnitude more than demand for raw materials such as copper and aluminum that are used in the manufacturing and construction industries. Demand for copper and aluminum has and will continue to decline as the global recession unfolds, but it also operates with a lag. Businesses need more time to react to the rapid spread of COVID-19 by cutting orders for raw materials. This could lead to lower prices in the future, but the ultimate peak-to-trough decline in metals demand will not even come close to the decline in oil demand.

Third, gold is a safe-haven asset. Demand for gold rises at a time of maximum economic uncertainty. It is a pure sentiment play; it is hardly used in the real economy. Gold will retain its value even as financial markets continue to sell off.

Demand for industrial commodities, and their prices, will continue to fall as the global recession takes shape. The ultimate decline in demand and thus prices will depend on how successfully global governments can slow the spread of the virus and how much they stimulate their countries' economies. But demand declines will not come near those of oil, nor will price declines.

Q: How will the U.S. auto industry be affected by the coronavirus?

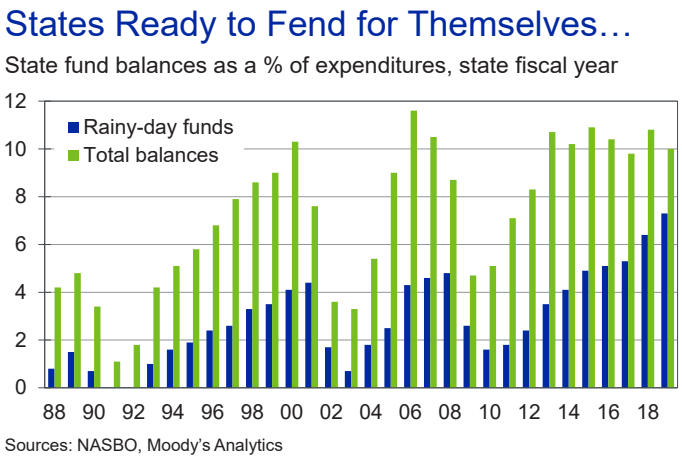
A: The impact that COVID-19 will have on the U.S. auto industry is unprecedented. Demand will be sapped not once but twice as the ripples of this devastating virus pulse through the American economy. The impacts of the virus will drive down units sold and prices for both new and used vehicles and force automakers into difficult decisions on production and plant operations.

Q: How do you think muniland will fare?

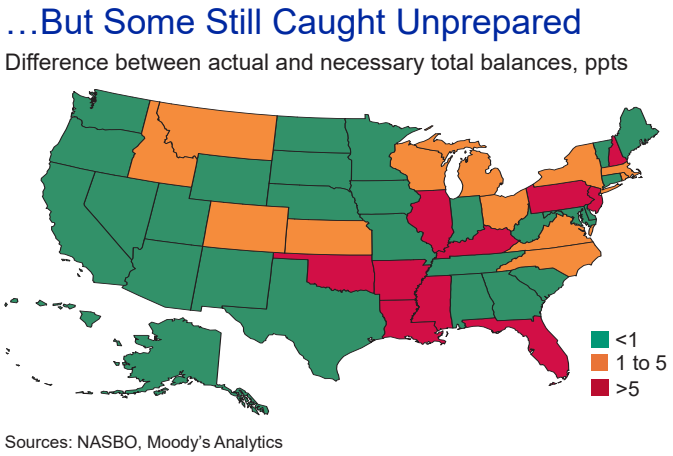
A: Aside from the immediate increase in demand for many government services during this national emergency, the most visible impact to most municipal issuers will come via lower revenues. The demand shock resulting from what is likely to be at least several weeks of social-distancing and travel limitations will pull overall economic activity materially lower in the second quarter of 2020.

This will in turn result in lower sales and personal income tax collections as consumers pull back on spending and workers see their hours reduced or eliminated. Enterprise issuers such as transportation agencies and convention authorities will also see operating revenues fall significantly, potentially putting some in a perilous near-term position.

Even though the majority of the economic disruption will occur in fiscal 2020 (July 2019 to June 2020 for most states), the revenue impacts will extend well into the first half of fiscal 2021. The length of the downturn will matter a great deal, but our preliminary analyses estimate that the amount of fiscal shock to state governments alone in the next few quarters could be as much as 10% of overall general fund revenues. This would be roughly in line with the types of moderate recession scenarios that states have been stressing their budgets with as part of their annual budgeting processes.



The good news is that most states—in large part because of their newfound use of stress-testing in the budget process—are well prepared for an economic downturn of that magnitude. In our most recent 50-state stress-testing exercise, we found that 28 states had sufficient money set aside to handle the impacts of a moderate recession without having to raise taxes or cut spending. An additional 12 states were relatively close to having sufficient funds set aside, while only 10 were substantially unprepared.



That preparation will come in handy over the next few quarters as revenues decline and demand for social services increases. Those states that have set aside sufficient reserves will be able to continue on without having to make any contractionary policy decisions that could lower aggregate demand even further. Those not prepared will likely have to impose spending cuts or tax increases at a time when their economies can least afford them. As a result, look for those economies with state budgets best situated for the current crisis to outperform those whose governments are least prepared through at least 2021.

Q: How will consumer defaults impact recession?

A: The good news is that U.S. consumer balance sheets were in good shape heading into the recession as debt service burdens and financial obligations were low. There will likely be moratoriums on foreclosures and evictions. Also, the fiscal stimulus should provide direct payments to consumers. Delinquencies will rise because of the damage to the labor market. However, this is unlikely to magnify the recession.

The bigger concern is the possibility of a wave of small-business bankruptcies.

Q: What are the implications of COVID-19 on your election model?

A: Given the decline in stock prices and expected increase in unemployment, the specification of our election model suggests that President Trump's odds of being re-elected are falling as a result of the crisis. We will update our election model in the near future.

COVID-19

Q: What is the basis/what assumptions factor into your total number of infected? Government officials, such as the Governor of California, stated publicly that he expects 25 million Californians to be infected.

A: We based our estimate on looking at the experience abroad. California's estimate is likely based on a model, and therefore isn't a certainty. There is a tremendous amount of uncertainty about the number of infections.

Q: It seems that our economy will not stabilize until we get back to some degree of normalcy, we see cases decline, or we get effective treatments or vaccines. But absent effective treatments or vaccines, what are the best guesstimates of how long the U.S. has to remain on lockdown?

A: We can't stress enough that we are economists, not epidemiologists, but we do have to make assumptions about the virus, and there is enormous uncertainty about how it will unfold. We follow closely containment efforts in other countries and are monitoring how the new U.S. COVID-19 cases track those.

Q: Are there long-term effects that linger beyond the solution of the health crisis?

A: It is unclear what normal will look like after the crisis. Will a large number of small businesses make it to the other side? Also, COVID-19 could permanently impact business travel. Will there be a larger shift toward working from home, and what are the productivity implications? We do not expect that COVID-19 and the recession will cause an increase in structural unemployment.

Q: How is a Z-score calculated?

A: Here is the formula for calculating a z-score:
Z = (datapoint – mean)/standard deviation

Labor market

Q: Are you able to tell if the layoffs are concentrated in the small-business sector or is it something else or a mix?

A: We expect to see large declines across many industries, particularly those hardest-hit by social-distancing measures—leisure/hospitality, retail trade and other services. However, manufacturing, construction and transportation could also be hit hard.

Q: There is an estimate of the peak unemployment rate hitting 20%, but in the critical pandemic [scenario] it is just above 6%. Why not higher?

A: The official U-3 unemployment rate will be too narrowly defined to capture the true depth of the impact to workers. To be counted as unemployed, workers either must be on layoff awaiting recall—which will account for some of the COVID-19-related layoffs if businesses have just temporarily suspended operations—or not working but actively looking for a job within the last four weeks. With entire swaths of the economy shutting down, it is unrealistic to think that all laid-off workers will be actively looking for work, as there may not be anywhere to look.

Broader measures of unemployment will help. The number of discouraged workers is likely to rise in response to the crisis. If someone is out of work and the primary reason they have not searched for a new job is because they believe there are no jobs available, they count as discouraged. Another category likely to show a large impact includes people working part time for economic reasons or involuntary part-time workers. Firms that have not completely shut down may be cutting hours of existing employees to cope with diminished demand. For both reasons it will be important to watch the broadest measure of labor underutilization, U-6.

One other thought to consider is that even the U-6 measure of labor underutilization may not fully capture the unique fallout from COVID-19. For people who are out of the labor force—meaning without a job and not actively searching—a key requirement to be included in the broader measures of unemployment is that you want a job now. To the extent that there are people who were laid off and either do not want a job now given the risk of contracting COVID-19 or they are not available for work now, possibly because they are already infected or caring for family, they will not be reflected in any measure of unemployment.

Housing

Q: What do you expect the impact to be on U.S. housing?

A: Ongoing shelter-in-place orders, social-distancing, and overall declines in homebuyer confidence will create a perfect storm for both home sales and residential construction activity in the second quarter. A timely survey from the National Association of Realtors found that half of all Realtors experienced less homebuyer interest last week than in the week prior, and this effect will likely persist as preventive measures to combat COVID-19 remain in place for the near future. Moreover, although mortgage rates are down since the start of the year, the Mortgage Bankers Association's mortgage purchase applications index plunged 14.6% last week, adding to losses accrued in the previous week. Despite their short frequency, these indicators are a bad omen of housing activity to come over the next couple of months.

We now expect existing-home sales to decline to approximately 4 million units at a seasonally adjusted annualized rate in the second quarter, down from their current 5.4 million-unit pace and close to their lows during the 2008-2009 financial crisis. In addition, risks to this bleak outlook are tilted toward the downside as an increasing number of states are ordering their citizens to stay home except to conduct essential activities. Anecdotal evidence points to a pullback in homeowners listing properties for sale, which could push inventories—already at a multidecade low—down even further. The spring homebuying season will be marked with few open houses and risks are rising that the early portion of the summer homebuying season will be uncharacteristically poor.

Likewise, housing starts will retest their late-2016 levels in the second quarter as construction crews temporarily halt activity because of the spread of the pandemic. Although single-family housing starts have rebounded over the course of 2019, they are still well below their 2006 highs, and the expected near-term slowdown will contribute to the already-tight supply of housing on the market.

The sharp downtick in both near-term housing demand and housing supply will mirror the twin demand and supply shocks inflicted on the overall U.S. economy by COVID-19. Consequently, house prices, already somewhat overvalued when compared with their long-term trend value, will register an average decline of 0.5 percentage point for full-year 2020. Although housing demand will crater because of potential homebuyers staying in their current dwellings, the persistent shortage of available housing supply will somewhat counteract greater downward pressure on house prices.

Monetary and fiscal policy

Q: Is the $1 trillion proposed bill from the Republicans nearly enough?

A: Unlikely. But the good news is that a $2 trillion one was close to passing and is equivalent to nearly 10% of U.S. GDP, more than the stimulus Congress enacted during the financial crisis. Though lawmakers had been bogged down in disagreement, the turnaround in congressional negotiations was remarkably quick compared with the months it took lawmakers during the financial crisis. Nevertheless, Washington DC should not rest on its laurels once the stimulus package passes. Though the stimulus funds will kick into high gear over the next two quarters, providing a crucial floor for the economy, they will not prevent a recession in the near term, and Congress will have to do more.

About a quarter of the stimulus package is directed to individuals, mostly through direct payments to lower- and middle-income households and an expansion of unemployment insurance benefits. These two provisions are crucial components of the rescue package but are lacking in certain ways. In early April, checks amounting to $1,200 per individual, $2,400 per couple, and $500 per child will be cut to eligible families. This financial assistance should not be a onetime occurrence, but rather should be provided each month for at least as long as much of the country is on lockdown.

Language in the legislation limits the duration of the emergency increase of $600 per week in traditional UI benefits to the period between now and the end of July. The duration of this increase should be extended. Not only do health experts and policymakers warn that COVID-19 could plague us for much longer, but there will be an initial lag to the rollout of UI benefits with state offices deluged.

Expanding the package's financial assistance to low- and middle-income families and its enhancement of UI benefits would be one of the cost-effective ways to further stem the economic fallout from the coronavirus. Our past work suggests that the economic multiplier (the dollar change in GDP for a given dollar in government spending or tax cuts) is among the highest for tax rebates and UI benefits. Though the majority of the stimulus package is directed toward businesses big and small, few of those provisions will have as much of a bang for the buck as direct payments to households and UI benefits. The one exception would be the deferral of 2020 payroll taxes for employers, which could deliver more than $275 billion in stimulus this year.

Q: Why did the Fed slash the reserve requirement to 0%?

A: The reserve requirement is not needed because of the operating system of ample reserves.

Q: Will the Fed adopt negative interest rates given the intensifying COVID-19 concerns?

A: Negative interest rates don't appear to be on the table. The Fed has not warmed to the use of negative interest rates, but if the situation gets dire, everything could be on the table.

International

Q: How do you think this recession will affect Mexico?

A: Despite its limited ties with China, Mexico's economy is more vulnerable because of its dependence on the U.S. and the unpreparedness of the public health system. The peso has depreciated significantly, and the stock market has plunged. The lack of government actions to prevent an acceleration in the spread of infection and the anemic economic situation support strong volatility in financial markets. Given the wider monetary space opened by the Fed's two recent rate cuts, Mexico's central bank reduced the funding interest rate by 50 basis points to 6.5%.

Despite the additional rate cut, the policy rate remains in restrictive territory after six consecutive cuts. The interest rate has been effectively used as a second buffer of internal and external shocks, in addition to the exchange rate. However, if volatility deteriorates further, policymakers will face a monetary restriction since the currency will depreciate more, thus raising the risk of an acceleration in inflation. Therefore, monetary relaxation will have to be gradual, unless the economy plunges deep and opens up space for policymakers to implement more rate cuts during the year.

Q: Will the bounce back in the rest of world's economies be as fast as it was in Asia?

A: Many Asian economies have shown signs of a strong rebound from COVID-19. China is slowly recovering, but there is a risk that its economy will suffer a setback as the U.S. economy reels. Containment efforts along with fiscal and monetary policy responses will all factor into how each economy recovers, but they will not all be strong nor uniform.

Forecasts and scenarios

Q: Given the magnitude and duration of the COVID-19 health crisis, would you think this recession could be something other than V-shaped?

A: This is the debate economists have as the economy enters recession. The only thing we know for sure is that the economy is in a severe downturn and policy will be key in determining if it is a V, U, L or W recovery. V-shaped recoveries are less common recently and, in the past, have been driven by interest-rate-sensitive industries. Rates were already low before COVID-19. An L-shaped recovery would occur if fiscal policy is not sufficient, since the economy would simply muddle along after the worst of COVID-19 has passed. A W, or a double-dip, recession could occur if there is a second or third wave of the virus. Something to consider is the possibility of a check-mark recovery, one similar to that following the Great Recession; the economy falls hard, and the recovery is gradual.

Q: Will the changes to the baseline forecast be documented and available and will there be further updates to the alternative scenarios?

A: Yes, changes in the forecast are documented on Data Buffet and we discuss the key forecast changes on Economic View. The alternative scenarios will be updated.

Q: Will the critical pandemic scenario be available at the state and metro area level?

A: Yes, and they will be posted to Data Buffet by the end of this week.

Q: Any ad hoc updates in the works for the unemployment/housing starts/retail sales/business output forecasts prior to March 31?

A: Yes, it is in the works.

CECL and IFRS 9

Q: How should we handle shifting forecast scenarios?

A: Our standard practice is to produce baseline and alternative economic forecasts on a monthly basis. Our forecast process kicks off with the release of the monthly Employment Situation from the Bureau of Labor Statistics (typically the first Friday of the month). At that point we incorporate all of the latest reported economic and financial data as well as any unmeasured shocks or forthcoming policy changes that have yet to make it into the observed data.

We are committed to continuing this process given how many of our clients have built their processes around our calendar. We released our March baseline forecast on March 10 and alternative scenarios shortly thereafter.

To address shocks to the economy that occurred after the posting of our standard scenarios, we released a series of ad hoc "thematic" series specific to COVID-19. We typically release such scenarios after natural disasters or to assess the risk of potential economic events such as a Greek bond default. We released a Severe Pandemic scenario on March 13 and a Critical Pandemic scenario on March 20. Given the continuation of the COVID-19 pandemic and the growing economic fallout, it is highly probable that we will release additional updated scenarios on either a weekly or biweekly basis until the situation stabilizes and ameliorates.

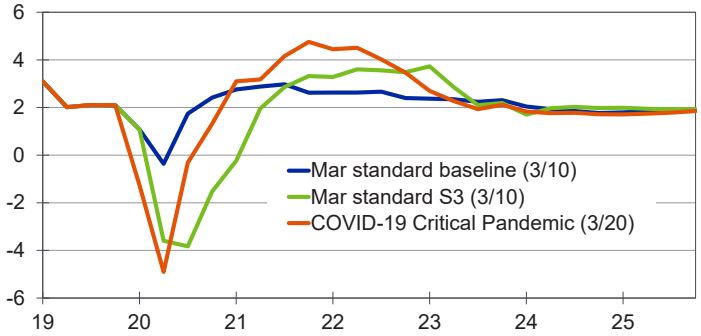
The Critical Pandemic scenario incorporated information about the spread of the virus and economic events through March 19. In addition to assumptions regarding the epidemiology of the virus, we assumed $1.65 trillion in fiscal stimulus this year (specifically, $8.3 billion in tranche 1; $90 billion in tranche 2; $1.5 trillion in tranche 3; and $600 million freed up by emergency declaration). We hosted a webinar on March 20 to explain our latest forecast and guided clients to consider this scenario as our latest baseline view.

While these stimulus assumptions are aggregated up to a macroeconomic level, we note that the stimulus will not be even across industries in either magnitude or impact. In terms of the effect on individual loan portfolios, much depends on specific assumptions about the stimulus. Does it go primarily to support households and small businesses as we have assumed, or will it be used to support the balance sheets of businesses in heavily impacted industries such as cruise ships, airlines hotels and energy companies? CECL filers will want to carefully consider their own portfolio concentrations and stimulus assumptions to justify any positive—or negative—qualitative adjustments to their loss forecasts.

The charts below describe the forecast path for the Critical Pandemic scenario and how it has changed from other scenarios published earlier in the month. While we do call for a sharp decline in output and a rise in unemployment in the short term, the effect of monetary and fiscal stimulus is anticipated to lead to faster growth in 2021. As a result, the impact on modeled lifetime losses is not as large as one might expect, though it does vary considerably by asset class. Short-term consumer or small-business loans are predicted to fail at high rates, but losses on super-prime mortgage portfolios may experience only a modest increase—or even a decline—as low interest rates accelerate refinancing.

Output Contraction Swift and Severe

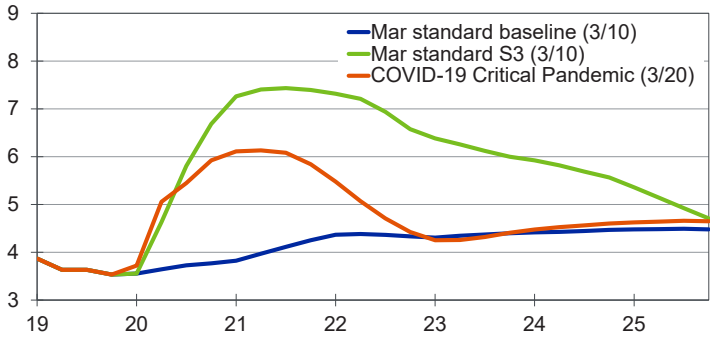
Real GDP, annualized qtr/qtr growth rate, Mar 2020 forecast vintage



Sources: BEA, Moody's Analytics

Unemployment to Spike With Gradual Recovery

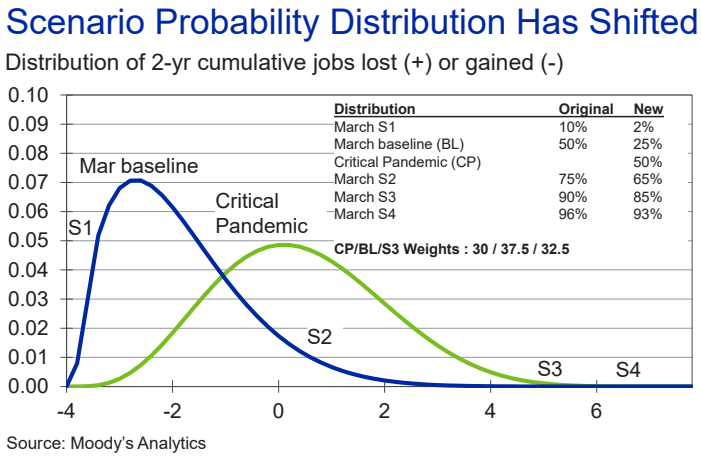
Unemployment rate, Mar 2020 forecast vintage



Sources: BEA, Moody's Analytics

Further, we are providing guidance regarding shifts in the distribution of possible economic outcomes. With the downgrading of our baseline forecast, it is logical that the probabilities associated with our standard, alternative scenarios would shift as well. As illustrated in the diagram below, our view is that the Critical Pandemic scenario is centered at the 50th percentile while the previously published March baseline has migrated to the 25th percentile.

Other scenarios have shifted to the left of the distribution as well, though we note that the shift is disproportionately smaller further out in the tails. This is an assumption based on the historically observed pattern of "risk compression." The bounds of the distribution provide one argument for this behavior: Unemployment cannot go outside of the 0% to 100% range. The presence of automatic stabilizers, market forces, and mean reversion behavior are also assumed to slow movement in the tails of the distribution. We reiterate that this is an assumption. Users should consider their own assumptions regarding the shape of the distribution in light of recent events and may justifiably assign either lower or higher percentiles to each of the scenarios.



Operationally, CECL and IFRS 9 filers have several choices for incorporating additional scenarios into their loss estimation process. Many of the filers we have surveyed have developed highly controlled processes based on the standard alternative scenarios that Moody's Analytics produces (for example, baseline, S1, S3). Deviating from established processes could create audit issues unless exception procedures are carefully followed.

All filers are intending to incorporate qualitative overlays (that is "Q factors") to account for the high level of uncertainty in the economy overall as well as for particular geographic footprints or industrial exposures. Many filers are running additional scenarios in an ad hoc manner to provide supporting analysis for their selected Q factor adjustments. Others—including many IFRS 9 filers—are considering formally running additional scenarios with additional weights attached to them.

For CECL and IFRS 9 filers running multiple scenarios, our current recommendation is to estimate losses given the new Critical Pandemic scenario and reweight loss estimates resulting from other scenarios assuming that the CP scenario is located in the middle of the distribution. While CP represents our latest baseline thinking, there is tremendous uncertainty at this time. Under the CECL guidelines, individual filers need to make their own assessment of what they consider a "reasonable and supportable" distribution of possible outcomes. That may mean putting additional weight on downside scenarios as we learn more in the days and weeks ahead. Alternatively, filers could consider producing their own customized economic scenario(s) using the Moody's Analytics Scenario Studio tool to best represent their own "reasonable and supportable" forecast.

Once users have assigned percentiles to each of the economic scenarios, weights may be calculated based on a midpoint, average or percentile approach. (Details are available in our white paper.) We note that the assignment of weights to discrete scenarios to approximate the expectation of a continuous distribution is itself based on a set of assumptions. CECL filers have discretion to deviate from the calculated weights based on their own set of assumptions.

As a clarifying example, we compute the weights under the midpoint approach for the combination of the Critical Pandemic, March baseline and March S3 scenarios based on our assumed percentiles in the diagram above:

March baseline wgt = 25 + (50-25)/2 = 37.5

March S3 wgt = 100 – (85 - (85-50)/2) = 32.5

Critical Pandemic wgt = 100-37.5-32.5 = 30

We recognize there are operational and/or governance constraints that may limit the ability of some users to quickly implement updated scenarios in their loss estimates. They may have no other option but to reweight the losses calculated based on the standard March scenarios Moody's Analytics published earlier in the month. If the original March BL, S1 and S3 scenarios are used with the new percentile assumptions, the mathematically derived weights would be 41.5, 13.5 and 45 based on the midpoint approach. Note that this presumes that the distribution is fairly uniform or normal, which is highly unlikely today. Therefore, there is a strong case for users to choose to assign more weight to S3 and less weight on either the BL or S1 scenarios.

A further complication is that updated scenarios may continue to be released before the end of the quarter. Assuming Moody's Analytics releases a more severe baseline scenario on March 27, the probability distribution will shift further, leading to the assignment of new scenario probabilities and weights. Users may want to consider the very latest information Moody's Analytics publishes when finalizing their CECL estimates for the reporting period.

Though downside risks have risen considerably, we caution users not to immediately adopt the darkest conceivable path as their expectation. While considering extreme paths such as 20% unemployment may be prudent for planning and risk management, our understanding is that this is incongruent with the CECL guidance around the computation of expected losses. Users are directed to consider not only the nega-

tive effects of the virus but also the partially offsetting impact of fiscal and monetary policy. There will be an opportunity to downgrade loss forecasts in the future as events unfold. We are monitoring the situation day by day and will issue either new scenarios or guidance on shifts in the probabilities as needed in the days and weeks ahead.

Moody's Analytics is committed to providing users of our scenarios with the most up-to-date, highest-quality forecasts available while clearly acknowledging the key assumptions underlying each of them as well as the risks. Our analysts are available to assist users to understand all aspects of each scenario so that they may make fully informed decisions during this time of extreme volatility and uncertainty. While we are prepared to speak to any aspect of our forecasts, we should note that we are economists, not accountants. Any suggestions or guidance provided should not be construed as a recommendation or a professional opinion of financial reporting guidelines. The only indisputable advice we can provide is to check with your auditor before implementing any decisions.

Q: Which global economies are going to be affected most?

A: Economies across the globe are being heavily impacted by COVID-19 because of the combination of suppressed demand and supply chain disruptions. Those that are directly impacted the most by the virus are those that have had the highest number of confirmed cases and longest time taken to contain the spread. So far these include China, Italy, the U.S., Spain, Germany, Iran and France. All of these economies have a relatively high number of cases and (with the exception of China) have so far been unable to meaningfully calm the local spread.

Social-distancing and other containment methods in these economies have become increasingly aggressive to stem the growth rate of new infections. This is taking a rising economic toll. For instance, in the U.S. there have been widespread shutdowns across the country. Pennsylvania and New York have closed all nonessential businesses and California ordered its 40 million residents to stay at home except for essential activities. Our baseline assumption is that the U.S. economy will contract by 0.6% q/q in the March quarter and a further 5.1% in the June quarter.

Other economies that are heavily impacted by COVID-19 include those that have close linkages with the economies noted above. For instance, when COVID-19 initially appeared in China, the economies most impacted were first China and then Asia given that China is the largest trading partner for most economies throughout the region. The economic outlook throughout Asia suddenly dimmed as countries grappled with the sudden demand slump from China as well as supply chain disruptions from China's businesses and logistical links being severely disrupted.

Meanwhile, other economies, including India and New Zealand, have introduced a one-month shutdown to try and contain the spread. The economic impact will be severe, as nonessential businesses have been forced to close for that period and consumers to stay home. It is hoped that these aggressive measures will mean the growth rate of new infections abates sooner, the number of infected is reduced, and economic activity will be able to resume sooner.

Q: How much correlation do you expect to see between the U.S. and other regions?

A: Our baseline assumption is that most economies will experience recession in the first half of 2020 as a result of COVID-19. It is not the virus itself that is driving recession but rather government attempts to contain the virus via numerous measures including social-distancing, restrictions of trade flows both domestically and internationally, and closure of a wide array of businesses and transport links. This is the case for the U.S., Japan, Canada, and much of Latin America.

The U.S. is an important stimulant for global demand and source of final demand for many economies. The U.S. accounts for 15% of global GDP, so it is not surprising that the U.S. economy influences the timing and duration of business cycles outside of its own economy, including during troughs in both developed and developing economies. With the U.S. economy forecast to experience a slump in domestic demand through the first half of 2020, economies that heavily rely on the U.S. as a large trading partner will be hurt. These include China, Mexico, Canada, Japan, Germany and South Korea.

With this in mind, while China's economy is already getting back on its feet with the number of new COVID-19 infections abating, our expectation is that China's full-year GDP will record a 0.1% contraction in 2020. This takes into consideration the significant direct hit to the economy from COVID-19 and the secondary hit coming from the forecast global recession, which includes the U.S. falling into recession. While China's factories and broader economy may be moving back to full capacity, demand for its goods and services, including from the U.S., will not return to pre-COVID-19 conditions through 2020. This will keep Chinese demand depressed. This is also the case for Europe and broader Asia.

Q: As outsiders who model financial forecasts for a handful of banks, how should we think about the impact to reserve ratios in 1Q20? For example, if we previously estimated (ex-virus impact) that a bank had a reserve ratio of 1.00% in 1Q20, approximately to what would this reserve ratio increase to after layering in the new Moody's economic forecast (including the virus impact)?

A: COVID-19's impact on the reserve will be dependent on a few things:

1. Model sensitivity to economic factors. To what extent are your PD and LGD (or loss rate) sensitive to different levels of shocks? This will be model and asset class specific.
2. Financial instruments. The longer-weighted average life instruments will likely be more affected, depending on prepayment and the impact of the new low-rate environment.
3. For non-modeled approach, it gets a little trickier. You need to relate your portfolios' potential losses to historical experience that is similar and also take into account the differences in your current portfolio versus those present in your historical data (for example, the portfolio credit worthiness mix at that time, the maturity profile, etc.), so the nearest period would be the last recession loss rate, adjusting for the difference in portfolio mix between today's portfolio and that of the financial crisis.

We do provide industry peer benchmarks for retail and wholesale portfolios to clients who license ImpairmentStudio based on the impact of COVID-19 but cannot contractually share those outside of the user base.

Q: We were told by the CFOs of our banks that the impact of the updated economic scenario (including the virus impact) will flow through as a Day 2 impact, thereby impacting the P&L. Can you confirm this?

A: Yes. The initial true-up was as of January 31. Any changes past that initial true-up will go through earnings as of March 31.

Q: What kind of systematic risk do auto loans have compared to MBS (2008/2009)?

A: The systemic risk of auto loans is small because of the much smaller size of the portfolio relative to mortgages. Though the number and percentage of borrowers with an auto loan has expanded over the past 10 years, the percentage of loans that are securitized has remained stable. This means that the rise in auto loans was not driven by cheaper money from over-securitization.

About the Authors

Mark Zandi is chief economist of Moody's Analytics, where he directs economic research. Moody's Analytics, a subsidiary of Moody's Corp., is a leading provider of economic research, data and analytical tools. Dr. Zandi is a cofounder of Economy.com, which Moody's purchased in 2005.

Dr. Zandi's broad research interests encompass macroeconomics, financial markets and public policy. His recent research has focused on mortgage finance reform and the determinants of mortgage foreclosure and personal bankruptcy. He has analyzed the economic impact of various tax and government spending policies and assessed the appropriate monetary policy response to bubbles in asset markets.

A trusted adviser to policymakers and an influential source of economic analysis for businesses, journalists and the public, Dr. Zandi frequently testifies before Congress on topics including the economic outlook, the nation's daunting fiscal challenges, the merits of fiscal stimulus, financial regulatory reform, and foreclosure mitigation.

Dr. Zandi conducts regular briefings on the economy for corporate boards, trade associations and policymakers at all levels. He is on the board of directors of MGIC, the nation's largest private mortgage insurance company, and The Reinvestment Fund, a large CDFI that makes investments in disadvantaged neighborhoods. He is often quoted in national and global publications and interviewed by major news media outlets, and is a frequent guest on CNBC, NPR, Meet the Press, CNN, and various other national networks and news programs.

Dr. Zandi is the author of *Paying the Price: Ending the Great Recession and Beginning a New American Century*, which provides an assessment of the monetary and fiscal policy response to the Great Recession. His other book, *Financial Shock: A 360º Look at the Subprime Mortgage Implosion, and How to Avoid the Next Financial Crisis*, is described by The New York Times as the "clearest guide" to the financial crisis.

Dr. Zandi earned his BS from the Wharton School at the University of Pennsylvania and his PhD at the University of Pennsylvania. He lives with his wife and three children in the suburbs of Philadelphia.

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Before joining Moody's Analytics, Cristian worked for Fannie Mae and taught at Johns Hopkins University. He received his PhD in economics from Johns Hopkins University and is named on two U.S. patents for credit modeling techniques.

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About Moody's Analytics

Moody's Analytics provides financial intelligence and analytical tools supporting our clients' growth, efficiency and risk management objectives. The combination of our unparalleled expertise in risk, expansive information resources, and innovative application of technology helps today's business leaders confidently navigate an evolving marketplace. We are recognized for our industry-leading solutions, comprising research, data, software and professional services, assembled to deliver a seamless customer experience. Thousands of organizations worldwide have made us their trusted partner because of our uncompromising commitment to quality, client service, and integrity.

Concise and timely economic research by Moody's Analytics supports firms and policymakers in strategic planning, product and sales forecasting, credit risk and sensitivity management, and investment research. Our economic research publications provide in-depth analysis of the global economy, including the U.S. and all of its state and metropolitan areas, all European countries and their subnational areas, Asia, and the Americas. We track and forecast economic growth and cover specialized topics such as labor markets, housing, consumer spending and credit, output and income, mortgage activity, demographics, central bank behavior, and prices. We also provide real-time monitoring of macroeconomic indicators and analysis on timely topics such as monetary policy and sovereign risk. Our clients include multinational corporations, governments at all levels, central banks, financial regulators, retailers, mutual funds, financial institutions, utilities, residential and commercial real estate firms, insurance companies, and professional investors.

Moody's Analytics added the economic forecasting firm Economy.com to its portfolio in 2005. This unit is based in West Chester PA, a suburb of Philadelphia, with offices in London, Prague and Sydney. More information is available at www.economy.com.

Moody's Analytics is a subsidiary of Moody's Corporation (NYSE: MCO). Further information is available at www.moodysanalytics.com.

About Moody's Corporation

Moody's Analytics is a subsidiary of Moody's Corporation (NYSE: MCO). MCO reported revenue of $4.8 billion in 2019, employs more than 11,000 people worldwide and maintains a presence in more than 40 countries. Further information about Moody's Analytics is available at www.moodysanalytics.com.

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