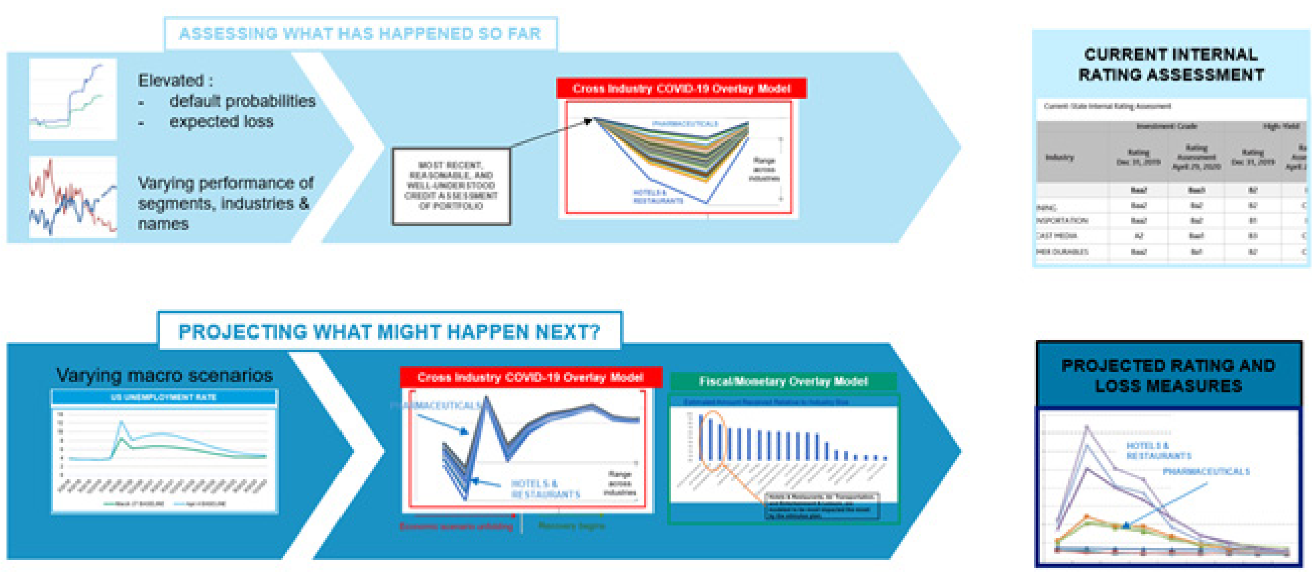
COVID-19 and Beyond: The New Norm of Credit Analytics and Data

As institutions attempt to use established, well-developed models to evaluate the current environment, it is clear these models are not working adequately. Internal ratings, an institution's cornerstone for long-term investment and lending strategies, rely on fundamental, name-level analysis. They cannot be updated at frequencies that allow financial institutions to react to and plan for quickly changing developments. Meanwhile, forward-looking measures used in regulatory stress testing or with CECL/IFRS 9 impairment may rely on scenarios defined by broad-brushed variables such as unemployment. These scenarios might not be sufficiently differentiated across certain industries (for example, Medical Devices, Hotels, or Transportation); their performances could vary in sensitivity to COVID-19 itself, and in their response to the direct and indirect protective measures put in place.

Our Current Internal Rating Assessment anchors to a reasonable, and well-understood starting point, say December 31, 2019, and uses Moody's Analytics Cross-Sectional COVID-19 Overlay Model that brings together epidemiological, economic and market data to assess the state of credit. The Cross-Sectional COVID-19 Overlay Model accounts for the granular, name-level, and cross-sectional impacts of COVID-19 across regions, countries and across well over 100 corporate segments.

Additionally, our Projected Ratings and Loss Measures use Moody's Analytics Cross-Sectional COVID-19 Overlay Model, anchoring to the portfolio's current state and an organization's traditional forward economic scenarios. Model output includes name-level projected ratings migration and loss In addition, Moody's Analytics Fiscal & Monetary Overlay Model quantifies the direct and indirect effects of COVID-19–related stimulus programs targeted to individuals, small businesses, corporations, and industry bailouts. These projections have natural applications for Comprehensive Capital Analysis and Review (CCAR)/European Banking Authority (EBA)/European Central Bank (ECB) stress testing and CECL/IFRS 9 impairment calculations. They offer useful complements to credit portfolio management and capital planning processes.

COVID-19 Analytics and Data



Moody's Analytics COVID-19 Credit Analytics and Data delivers name-level statistics for C&I/corporate credit portfolios, including forward projected:

» Default probabilities
» Credit downgrade estimates
» Default loss
» Expected OTTI loss estimates
» Risk-Based Capital (RBC)
» Fair value spreads

Across economic scenarios:

» Specified by the user with preset baseline, moderate, and severe industry lockdowns
» Users can set future fiscal and monetary actions and their effectiveness

With applications toward:

» Overlay to internal ratings
» Overlay for stress testing/CECL/IFRS 9 models
» Budget and capital planning and as complements to other credit portfolio and capital planning processes

Use Case 1: Current Internal Rating Assessment. Rating assessments on March 31, 2020 for indicative investment grade and high-yield portfolios are based on a December 31, 2019 rating anchoring date, which represents a reasonable, well-understood state of the portfolio. For exposition, we highlight industries most and least affected by COVID-19. To the right of the December internal rating is the rating assessment on March 31, 2020, as estimated by the Cross-Sectional COVID-19 Overlay Model. It applies the COVID-19 industry factors realized between December and April to each name in the portfolio and aggregated by industry. Not surprisingly, industries such as Oil and Air Transportation are most affected, with multiple-notch ratings downgrades expected. Utilities and Food & Beverage show the least impact, with ratings generally not affected. The Current Internal Rating Assessment gives organizations a quantitative and internally consistent current-state view of their credit portfolios, recognizing the variation in how COVID-19 has affected segments. These current rating assessments can be used to inform or be coupled with the subjective assessments that many organizations developed as the COVID crisis was initially unfolding.

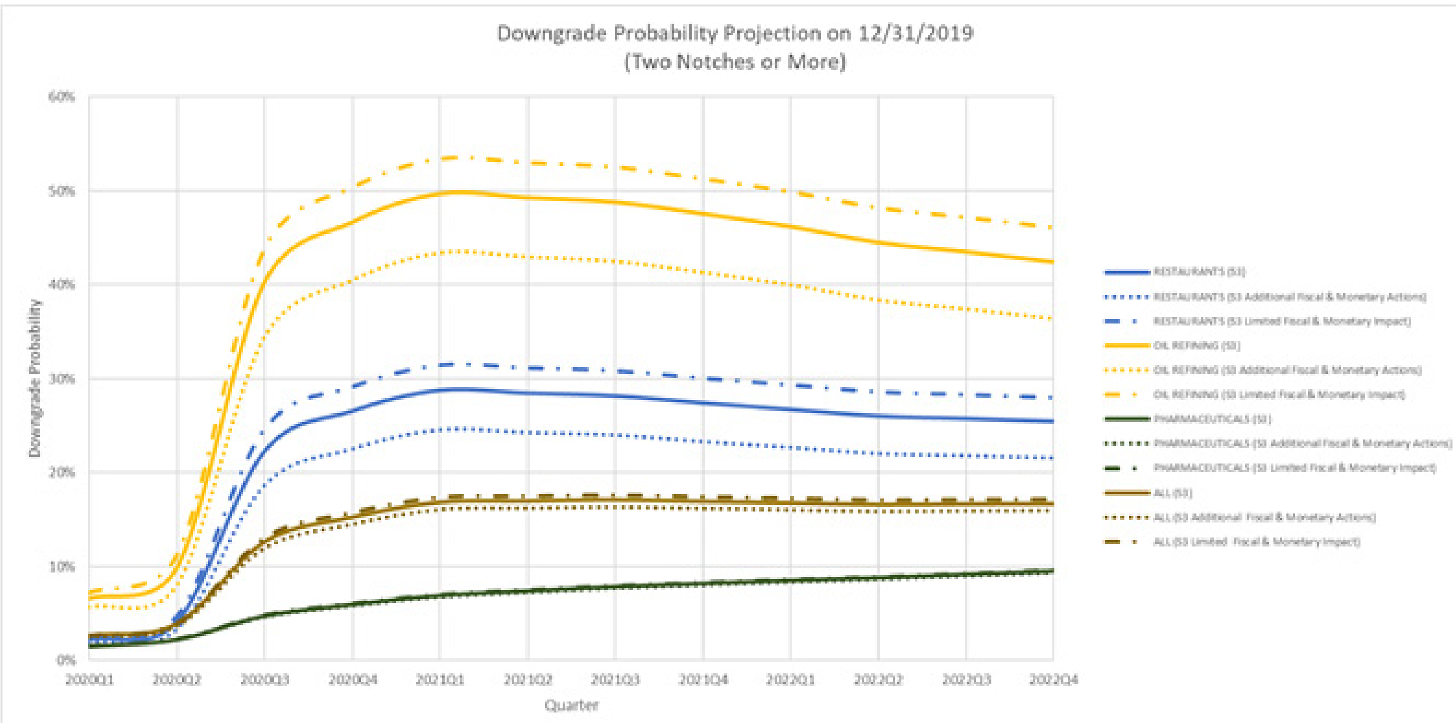
Current Internal Rating Assessment

	INVESTMENT GRADE		HIGH-YIELD	
Industry	Internal Rating Dec. 31, 2019	Estimated Internal Rating Assessment Mar. 31, 2020	Internal Rating Dec. 31, 2019	Estimated Internal Rating Assessment Mar. 31, 2020
Oil Refining	Baa2	Ba2	B2	Caa1
Air Transportation	Baa2	Ba2	B1	B3
Consumer Durables	Baa2	Ba1	B2	Caa1
Restaurants	A3	Baa1	B2	Caa1
Pharmaceuticals	Baa2	Baa2	B3	Caa1
Food & Beverage	Baa2	Baa2	B2	B2
Utilities, Electric	Baa2	Baa3	Ba2	Ba2

Source: Moody's Analytics

Use Case 2. Projected Ratings. After current internal ratings are established for the indicative portfolio, internal ratings are projected along Moody's Analytics S3, 90% Downside scenario, along with the Cross-Sectional COVID-19 and Fiscal & Monetary Overlay Models. The likelihood of downgrades of two or more notches for Oil Refining and Restaurants increase materially in the first few quarters. They subside after the second half of 2021 for those that survive, with the additional fiscal and monetary action scenario playing a material role in bolstering their credit quality; recognizing additional programs will support the hardest hit industries. Meanwhile, industries whose credit qualities are less affected by COVID-19, such as Pharmaceuticals, experience a relatively mild increase in their likelihood of a downgrade. The mild monotonic increase in downgrade probabilities is in line with the general negative migration tendency of entities on the high end of the credit quality spectrum.

Projected two+ notch downgrade probabilities anchored off of Dec. 31, 2019, with a Mar. 31, 2020 assessment using the Cross-Industry COVID-19 and Fiscal & Monetary Overlay Models



Source: Moody's Analytics

Use Case 3. Projected Loss. Expected defaults as measured by the EDF credit measure have changed markedly since December 31, with values on May 8 being orders of magnitude higher for many industries. Restaurants and Oil, Gas & Coal Expl/Prod were hit hard, and not surprisingly, Utilities were barely affected. The figure below shows the application of the overlay models on projected expected credit losses — applicable in CCAR/EBA/ECB stress testing and IFRS 9/CECL — in blue and green. We can see that under the 90% Downside, forward-looking scenario, where lockdowns persist through June 2020, the Restaurants and other coronavirus-sensitive industries are affected materially. Oil, Gas & Coal Expl/Prod is hit hard, reinforced by conflicts across oil-producing countries that put downward pressure on oil prices, creating an even-more challenging environment for related segments. The Fiscal & Monetary Overlay model gives a quantitative assessment of additional stimulus, as highlighted in black. The last three columns demonstrate how dynamics play out under a 96th-percentile scenario, overlaid with fiscal scenarios.

Impact of COVID-19 Across Industries
U.S. one-year default probabilities along Cross-Sectional and Fiscal & Monetary Overlay Scenarios

NOTES

US Moody's IG rated firms as of Dec 31st, 2019.

Economic Scenario Model as of April 21, 2020

Fiscal/Monetary Scenario Model as of May 1st, 2020

Industry	EDF Dec 31, 2019	EDF May 1, 2020 (Baseline)	90th% Downside Scenario (S3)	90th% Downside Scenario (S3) Additional Fiscal & Monetary Actions	90th% Downside Scenario (S3) Limited Fiscal & Monetary Impact	96th% Downside Scenario (S4)	96th% Downside Scenario (S4) Additional Fiscal & Monetary Actions	96th% Downside Scenario (S4) Limited Fiscal & Monetary Impact
All	0.05%	0.11%	0.30%	0.23%	0.32%	0.47%	0.44%	0.48%
OIL REFINING	0.06%	0.38%	1.54%	1.01%	1.90%	2.87%	2.41%	3.07%
AIR TRANSPORTATION	0.05%	0.24%	1.10%	0.66%	1.45%	2.20%	1.67%	2.50%
HOTELS & RESTAURANTS	0.03%	0.08%	0.44%	0.27%	0.55%	0.75%	0.65%	0.80%
PHARMACEUTICALS	0.03%	0.05%	0.07%	0.06%	0.08%	0.11%	0.10%	0.11%
FOOD & BEVERAGE	0.02%	0.03%	0.05%	0.04%	0.05%	0.07%	0.06%	0.07%
UTILITIES, ELECTRIC	0.01%	0.02%	0.03%	0.03%	0.03%	0.04%	0.03%	0.04%

Baseline: sudden sharp recession, projecting real GDP to fall almost 6% in 2020. Activity forecasted to exhibit a W recovery, bouncing in 2020 Q3 but falling again in 2020 Q4. Sustained recovery from 2021 Q1.
EDFs: are market based and include expected impact of existing Fiscal and Monetary plans (e.g., CARES Act).

90th% Downside: longer recession, with 50% industries lockdown in April, 40% in May and 40% in June. Activity weakly recovers in 2020 Q3 but falls again in 2020 Q4 (double dip recession). Sustained recovery from 2021 Q2.

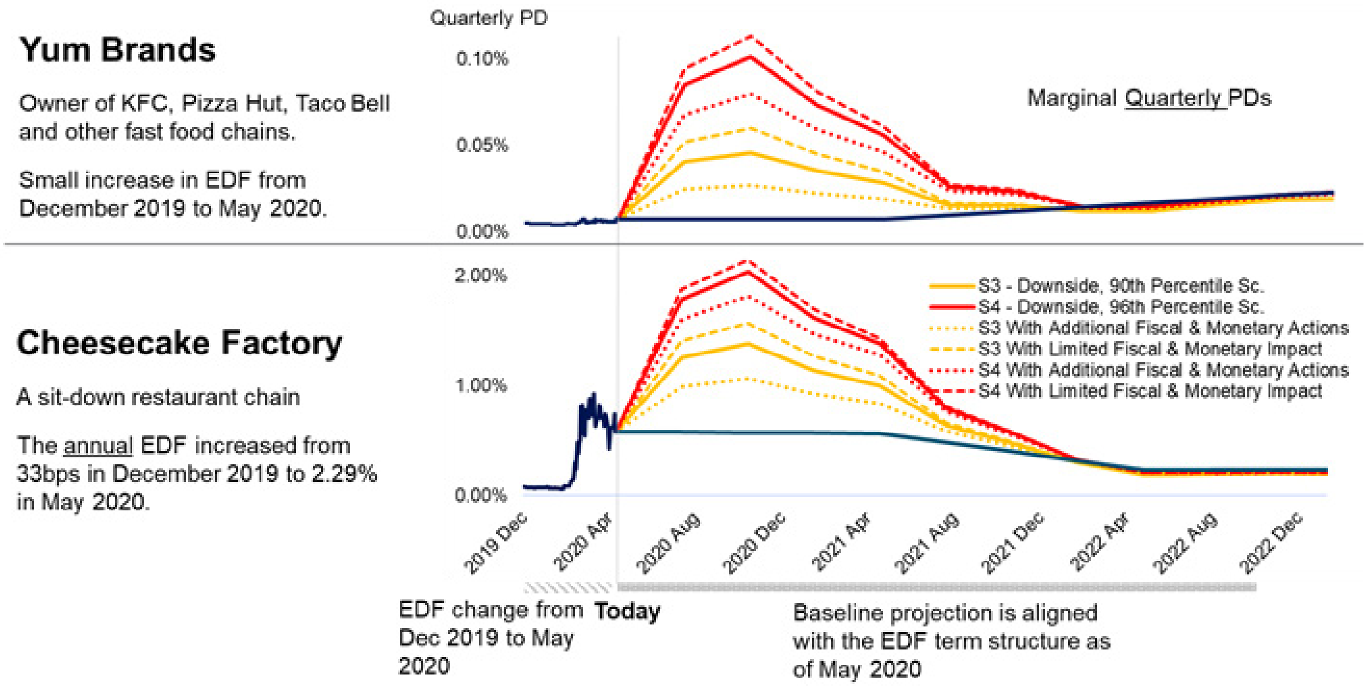
Additional Fiscal & Monetary Actions: additional stimulus in 2020 Q2/3, similar in size and scope of what has been released so far.

96th% Downside: longer recession relative to 90th downside scenario, with 85% industries lockdown in April, 75% in May and 50% in June. More pronounced double deep recession. Sustained recovery from 2021 Q4.

Limited Fiscal & Monetary Impact: implementation challenges result in existing stimulus packages not being impactful as expected. The scenario assumes 40% impact based on studies including CBO assessment of 2009 ARRA Act.

Use Case 4: Cross-firm quantification – Yum Brands vs. Cheesecake Factory. The figure below shows projected default probabilities along Baseline 90th and 96th-percentile S3 and S4 Downside Moody's Analytics economic scenarios with Cross-Sectional COVID-19 and Fiscal & Monetary Overlay models. The case highlights how the models can quantify dynamics across two firms with differing business models, where Yum Brands focuses on fast food, and has weathered fairly well, compared to Cheesecake Factory that relies on a sit-down model. Interestingly, we see that even under the S4 96% Scenario, Yum brands remains reasonably robust.

Fast Food versus Sit-Down Restaurants



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