Moody's Analytics

Better Faster Decisions

Navigating an Insurance Company's Credit Portfolio Through COVID-19

Amnon Levy, PhD, Portfolio Research | **Tim Daly**, Strategic Account Management
Masha Muzyka, Enterprise Risk Solutions - Moderator

May 2020

Goals for Today

- Discuss approaches for assessing credit impact of COVID pandemic
- Review historical experience of fiscal and monetary measure impact
- Propose an approach for measuring combined impact of the pandemic and counteracting stimulus on credit portfolios
- Live Q&A

Today’s Speakers

Amnon Levy

Head of Portfolio Management

Tim Daly

Head of Strategic Accounts- North America

Masha Muzyka

Enterprise Risk Solutions

Moderator

New Global Challenge- The Restart

How does one navigate a credit portfolio through continued uncertainty?

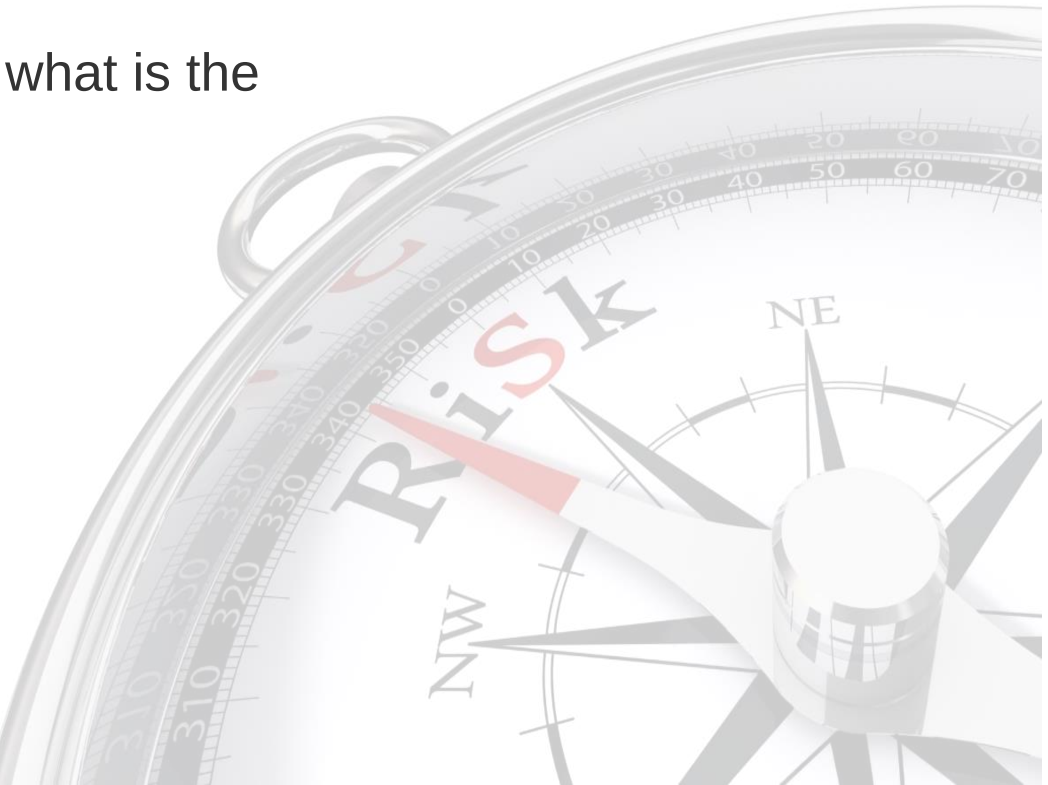
- How quickly will economies rebound from eased restrictions?
- How long will financial market volatility threaten growth?
- Does the US have additional fiscal space for more stimulus?
- How will global supply chain dynamics change and what is the impact on businesses?
- What does the next normal look like?

REUTERS

World economic prospects darken, rebound delayed: Reuters poll

CNBC

Congress will 'probably' have to pass another coronavirus stimulus bill, Mitch McConnell says



Challenge: How Do You Manage Risk into the Next Normal?

Uncertainty likely to persist

DRIVERS

- Epidemiological – progression of the epidemic
- Sociological - response of people, businesses, and governments

ECONOMIC IMPACT

- Depends on extent, timing, and interaction of drivers
- Is uncertain, unpredictable, and changing fast
- Varies across industries + regions

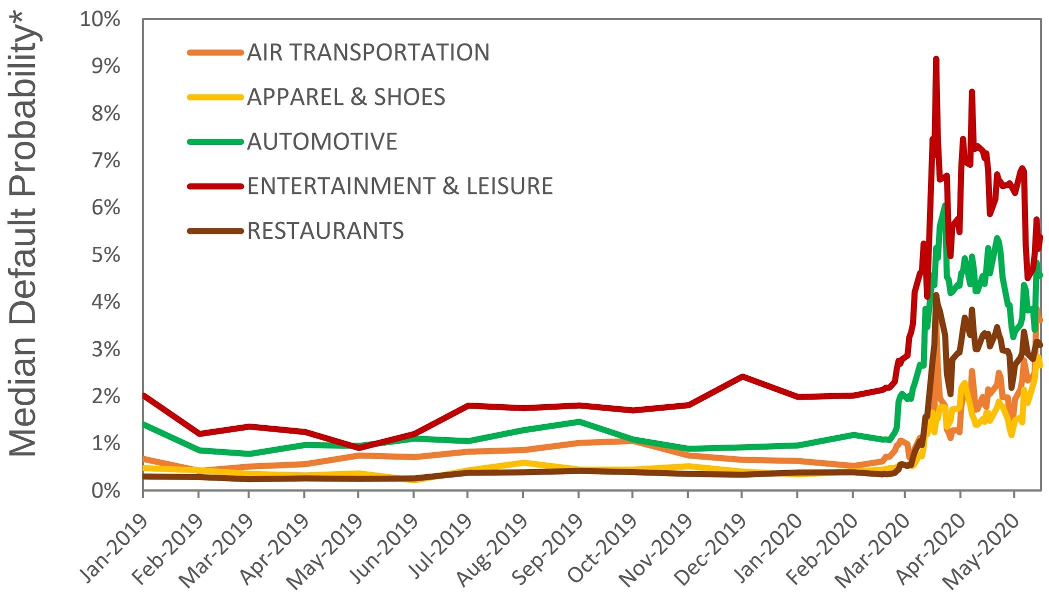
MEASURING & MANAGING RISK

- Measurement requires timely assessment of current environment
- Management requires timely assessment of environment under multiple epidemiological and sociological scenarios

Empirical Patterns

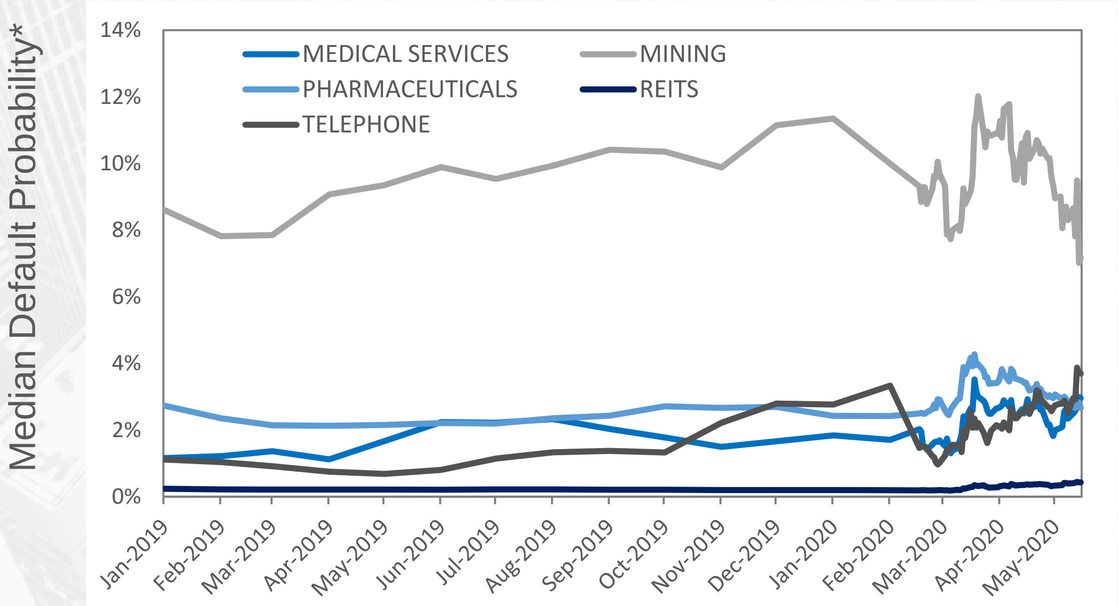
How has COVID-19 impacted industries so far?

Industries Most Impacted by COVID-19



*Measured using Moody's EDF

Industries with Mild Impact to COVID-19



*Measured using Moody's EDF

Understanding the Challenges

Credit measures don’t lend themselves to COVID 19

Traditional Internal Ratings

» Rely on fundamental name-level analysis
» Cannot be updated as frequent as virus evolution
» How do you incorporate past events into your forward looking view

Loss Forecasting & Accounting Models

» Leverage broad-brush scenarios
» Can’t differentiate across virus impacted industries
» How do you stress social & health impact

Fiscal & Monetary Impact

» How do you assess virus trajectory
» How do you assess impact of fiscal stimulus

Who needs help?

» Credit Analysts
» Investment Managers
» Risk Managers
» Regulators
» Credit Strategies Desk

Timely and Dynamic Analytics and Data

Requirements for navigating this uncertain environment

1. Granular, quantitative and repeatable current internal credit rating for benchmarking or overlay

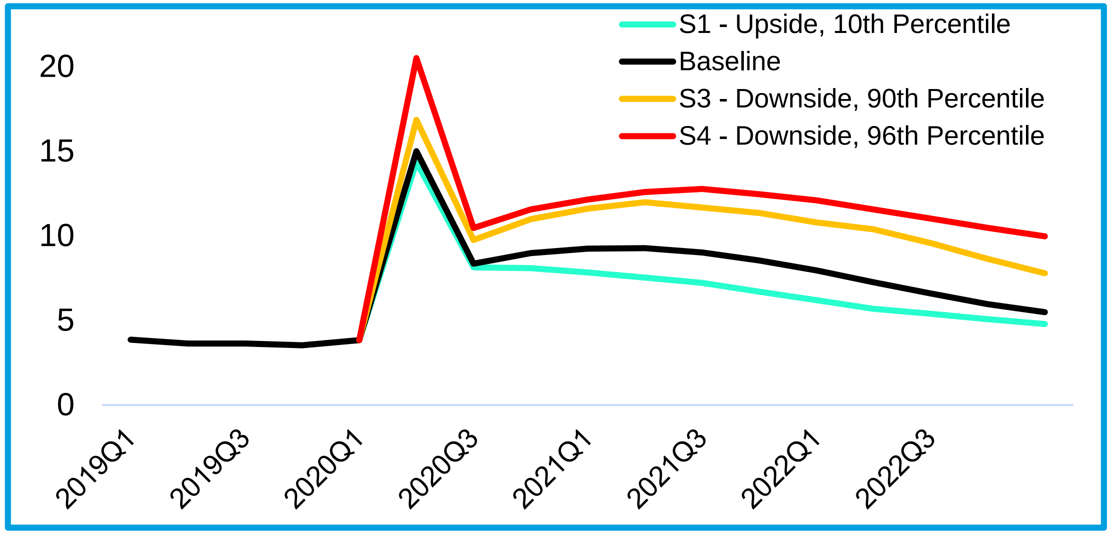
2. Assessment of trajectories that consider**:**
   – Epidemiological paths – severity, length of economic shutdown accounting for government reaction (e.g., draconian social distancing)
   – Cross-Sectional sensitivity of COVID-19
   – Targeted fiscal/monetary policies (e.g., airline bailout)

3. With applications toward**:**
   – An overlay to internal rating
   – An overlay to stress testing/CECL/IFRS 9 models
   – Early warning indicators
   – A complement to other credit portfolio and capital planning processes

Economic Impact Defined by Broad Brush Scenarios

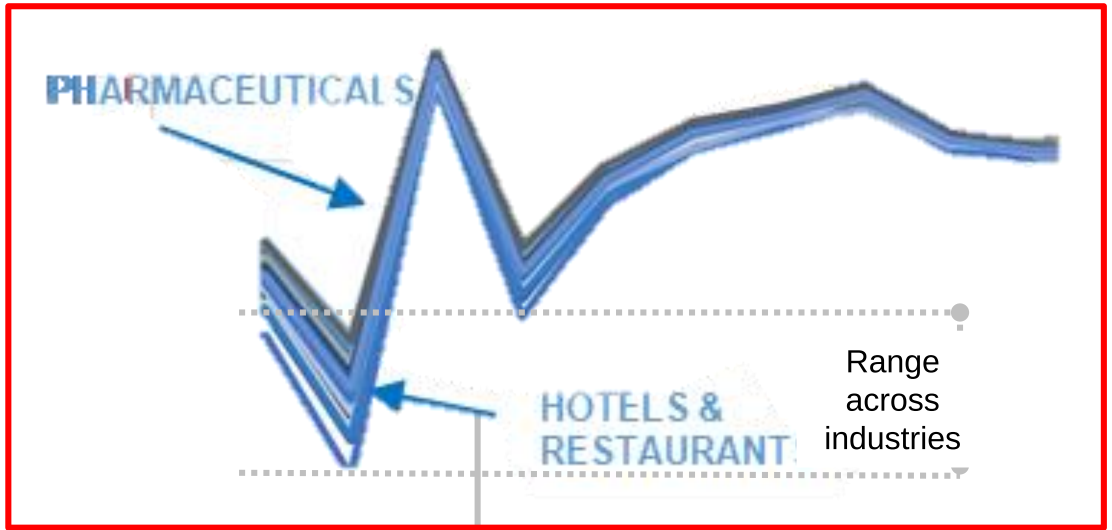
Require Industry Overlay Model

US UNEMPLOYMENT RATE



Source: Moody's Analytics May Economic Scenarios

CROSS-SECTIONAL COVID-19 OVERLAY MODEL



Economic scenario unfolding

Recovery begins

There is a Wide Range of Economic Forecasts

Sources: Atlanta Fed,
The Wall Street Journal

THE WALL STREET JOURNAL.

Why the Economic Recovery Will Be More of a 'Swoosh' Than V-Shaped

…a large drop followed by a painfully slow recovery, similar in shape to the Nike logo

FEDERAL RESERVE BANK *of* ATLANTA

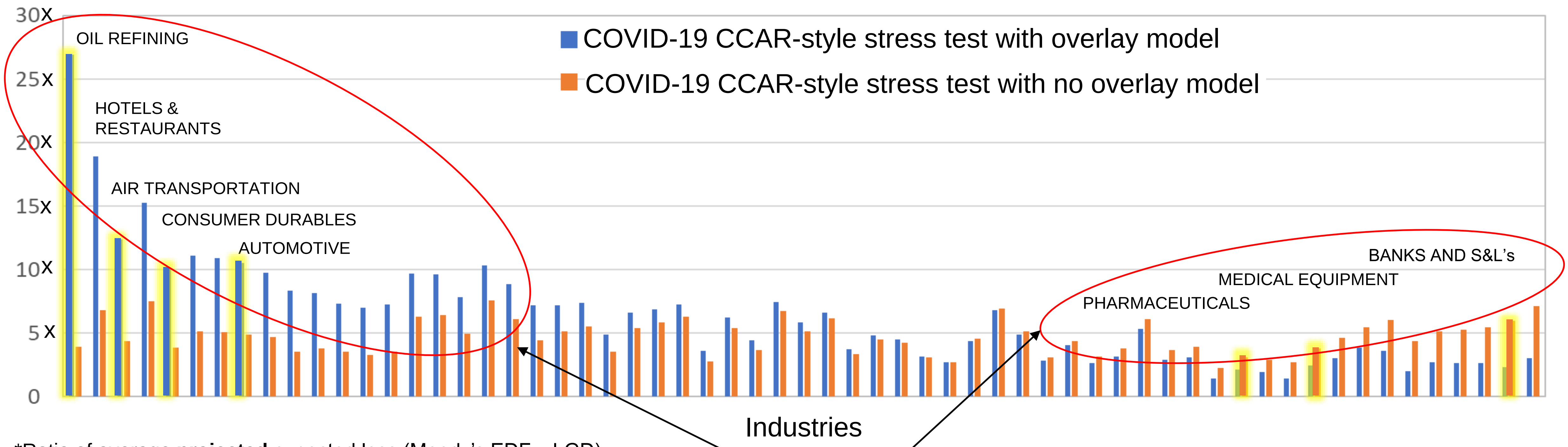
2020 Q2, quarterly GDP growth, annualized rate:

- GDPNow model "-41.9%"
- Blue Chip Forecasts Range "-23%" to "-40%"

New Analytics and Data to Navigate COVID-19

Naïve models calibrated to historic dynamics will be misleading

Increase in Expected Loss Under COVID-19 Scenario*



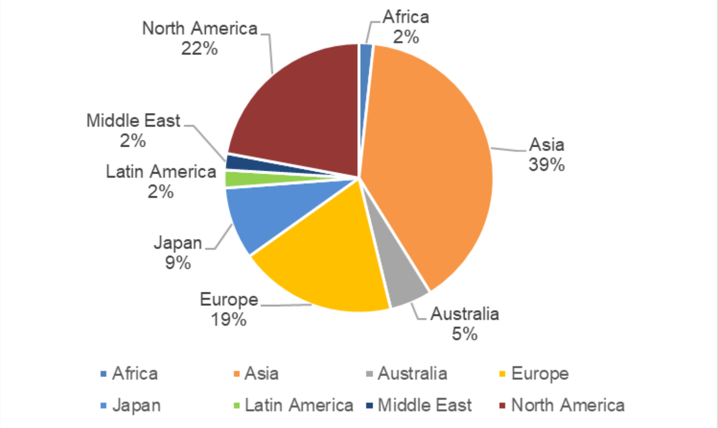
*Ratio of average **projected** expected loss (Moody's EDF x LGD) to expected loss (Moody's EDF x LGD) on December 31st
By industry, US EDF sample

Cross-sectional dynamics will be impacted by COVID-19 segments and name-level sensitivity as well as macro dynamics (e.g., Oil scenarios)

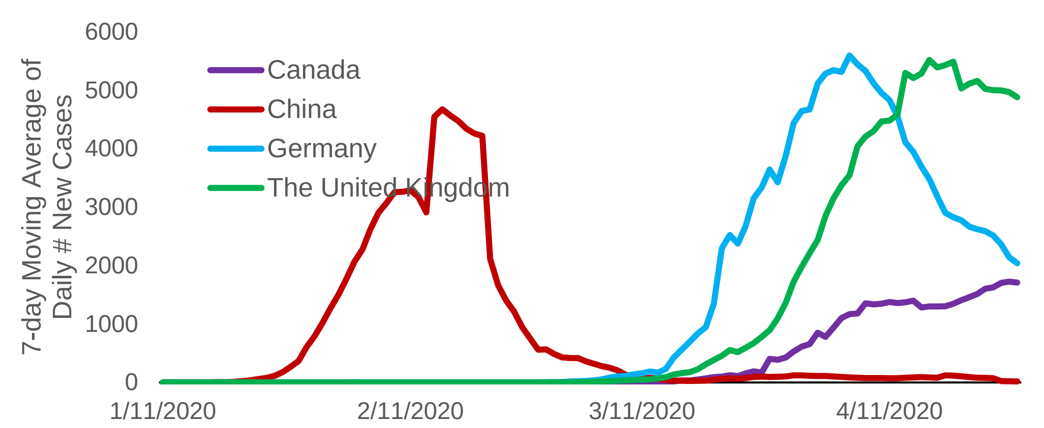
Incorporating Epidemiological Dynamics

Similarities across segments after controlling for variation in epidemiology

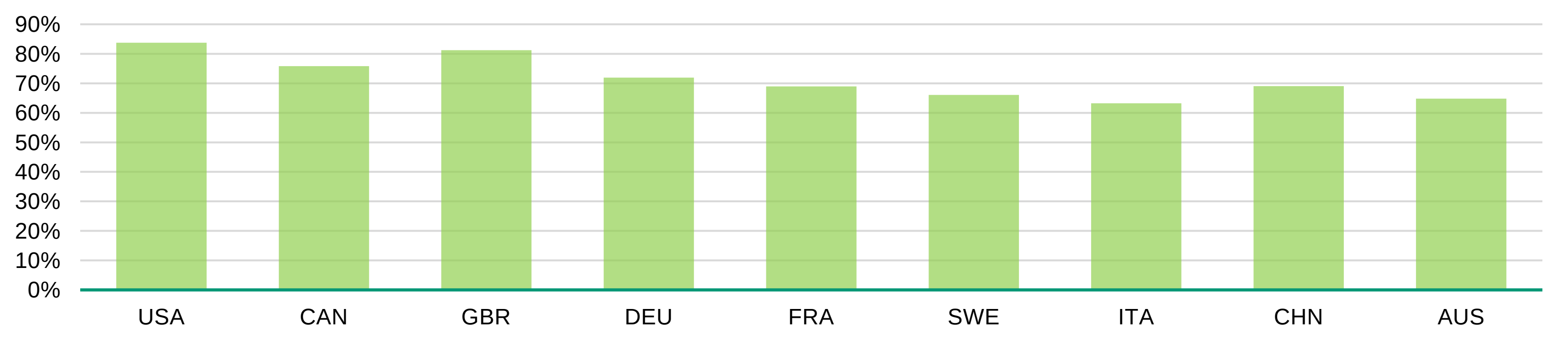
EDF CREDIT MEASURE
(Global Sample of ~ 46,000 Firms)



WINDOWS FOR DIFFERENT COUNTRIES
BASED ON DAILY COVID-19 CASES



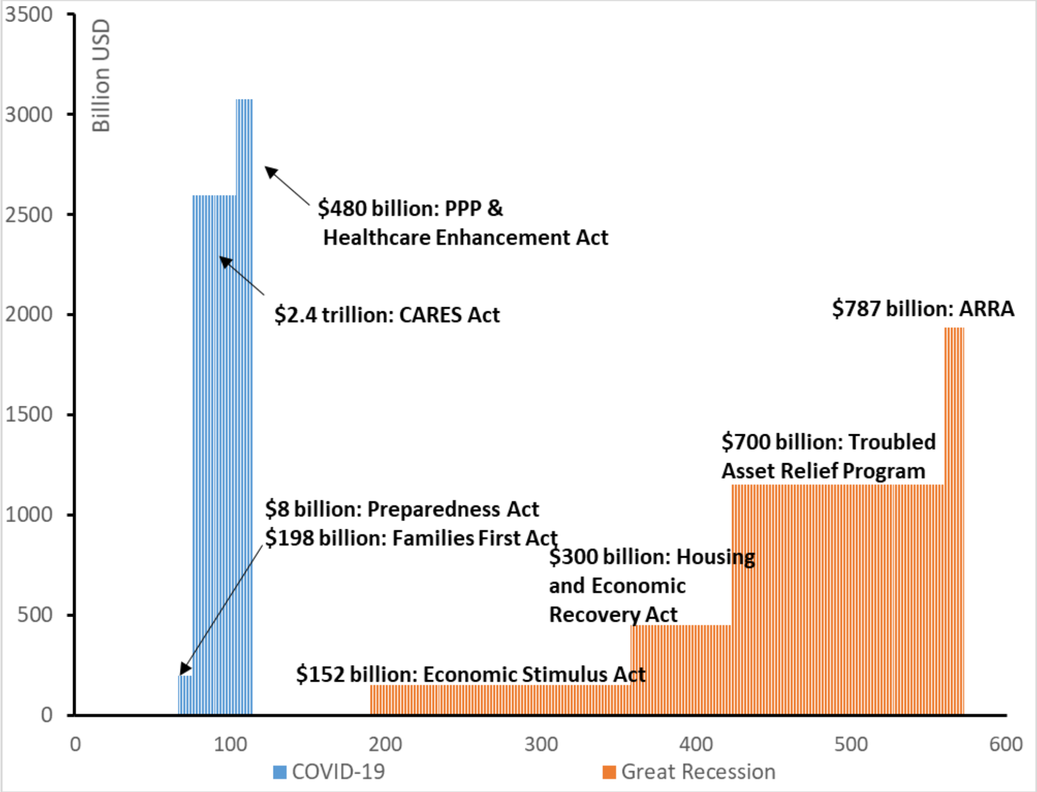
CORRELATION BETWEEN SEGMENT RANK WITHIN COUNTRY AND GLOBAL RANK



Remarkable Fiscal and Monetary Response

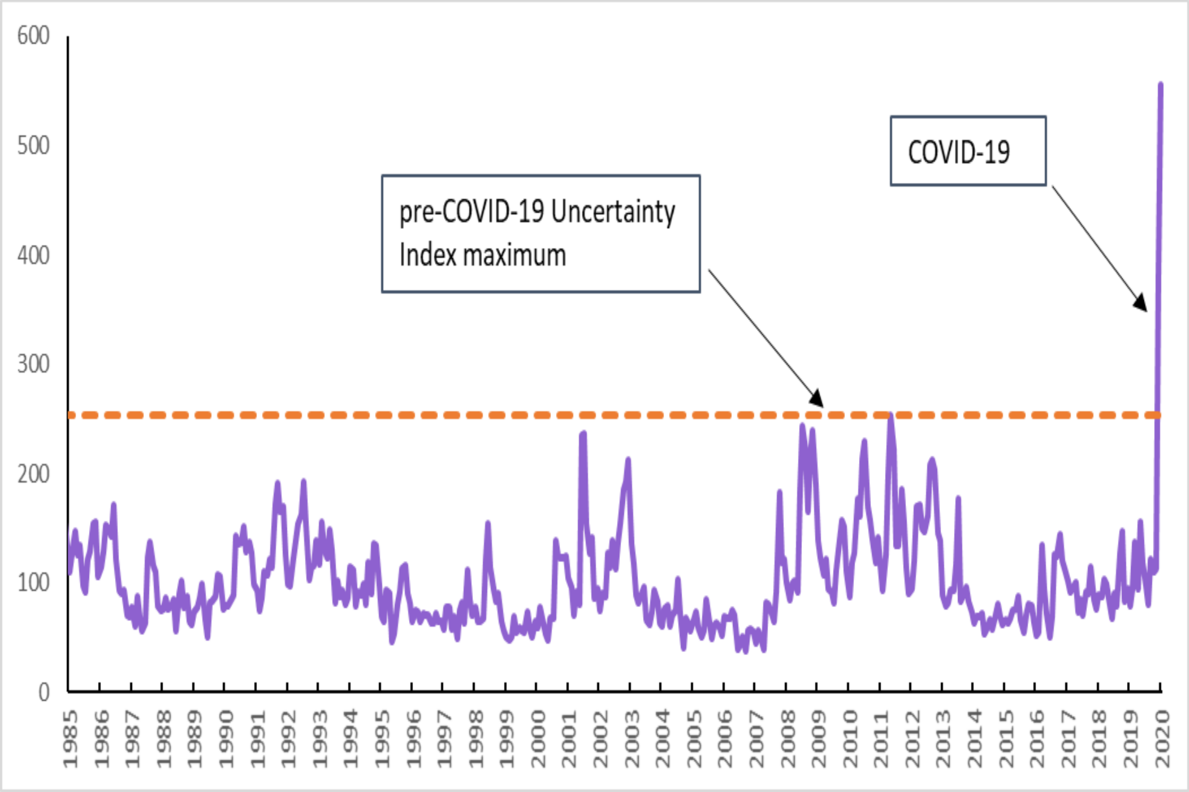
With economic policy uncertainty hitting record highs

COVID-19 FISCAL ACTION COMPARED TO THE GREAT RECESSION



Source: Moody's Analytics

ECONOMIC POLICY UNCERTAINTY INDEX



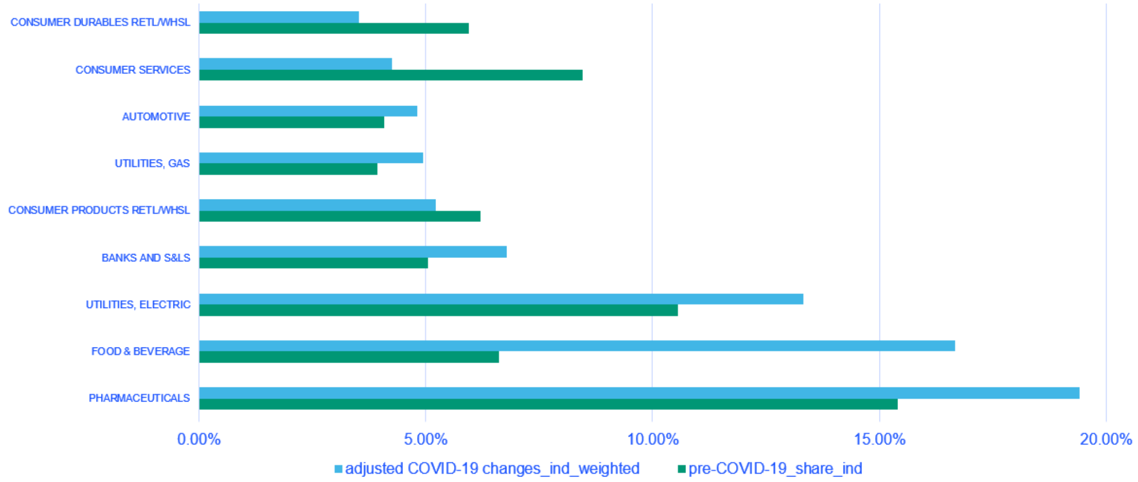
As reported by FRED Economic Data (https://fred.stlouisfed.org/series/USEPUINDXD).

Quantifying Targeted Stimulus Across Segments

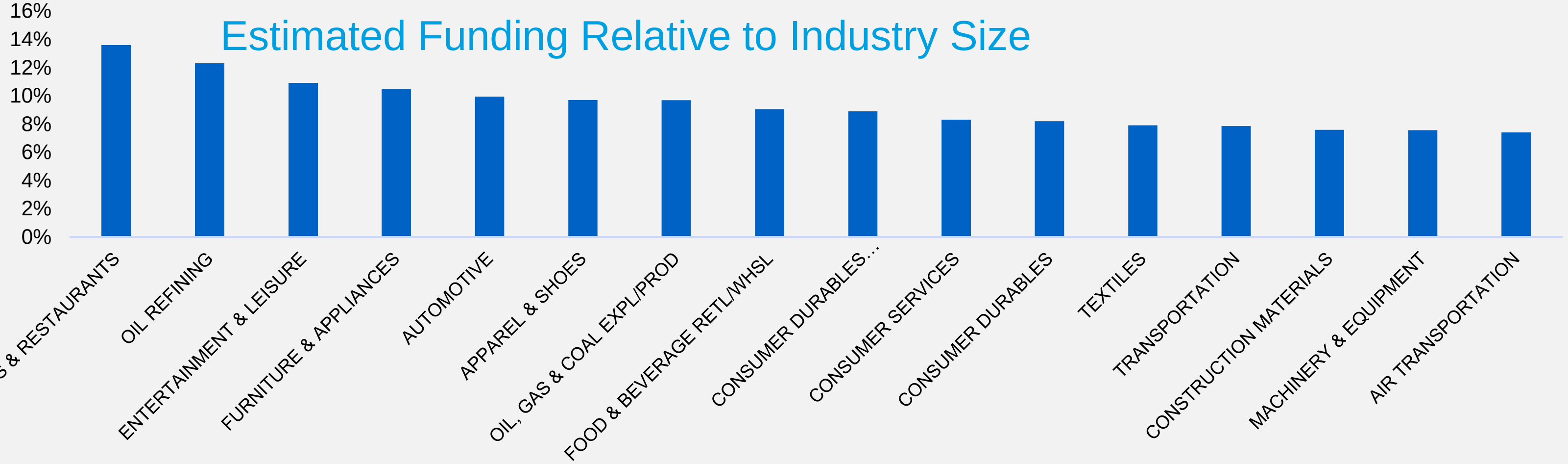
Aid Directly Targeting Corporate Segments
Industries Most Severely Impacted by COVID-19

CONSUMER PRODUCTS RETL/WHSL	AUTOMOTIVE	CABLE TELEVISION	OIL REFINING	FOOD & BEVERAGE RETL/WHSL
OIL, GAS & COAL EXPL/PROD	CONSUMER DURABLES RETL/WHSL	CONSUMER PRODUCTS	BUSINESS PRODUCTS WHSL	CONSTRUCTION
HOTELS & RESTAURANTS	MACHINERY & EQUIPMENT	TRANSPORTATION	CONSUMER SERVICES	BROADCAST MEDIA
FOOD & BEVERAGE	ENTERTAINMENT & LEISURE	APPAREL & SHOES	PAPER	FURNITURE & APPLIANCES
ELECTRICAL EQUIPMENT	CONSTRUCTION MATERIALS	CONSUMER DURABLES	TRANSPORTATION EQUIPMENT	TEXTILES

Aid to Individuals – Consumer Behavior Changes



Hotels & Restaurants, Oil refining, and Entertainment & Leisure, are modeled to be most impacted the most by the stimulus plan.

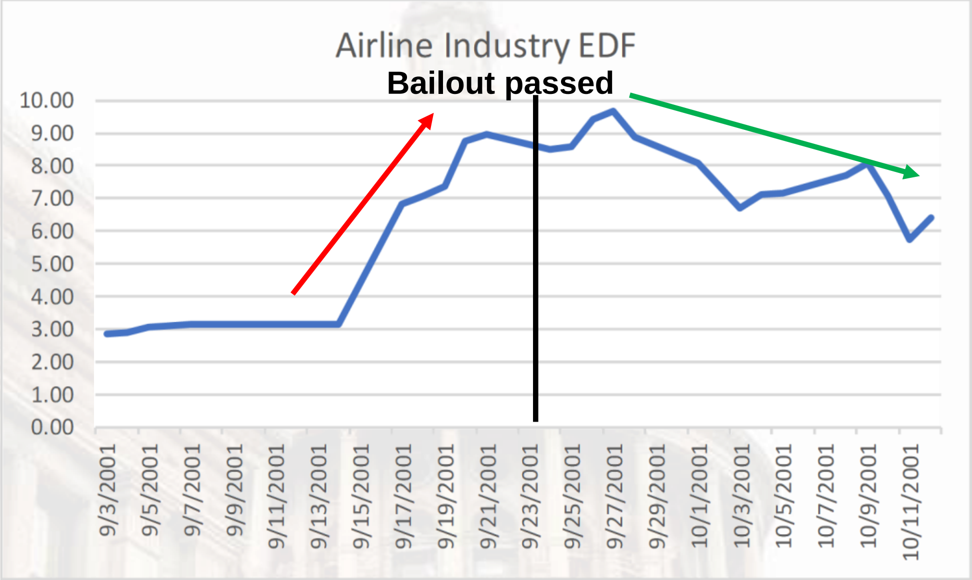


Quantifying Program Impact

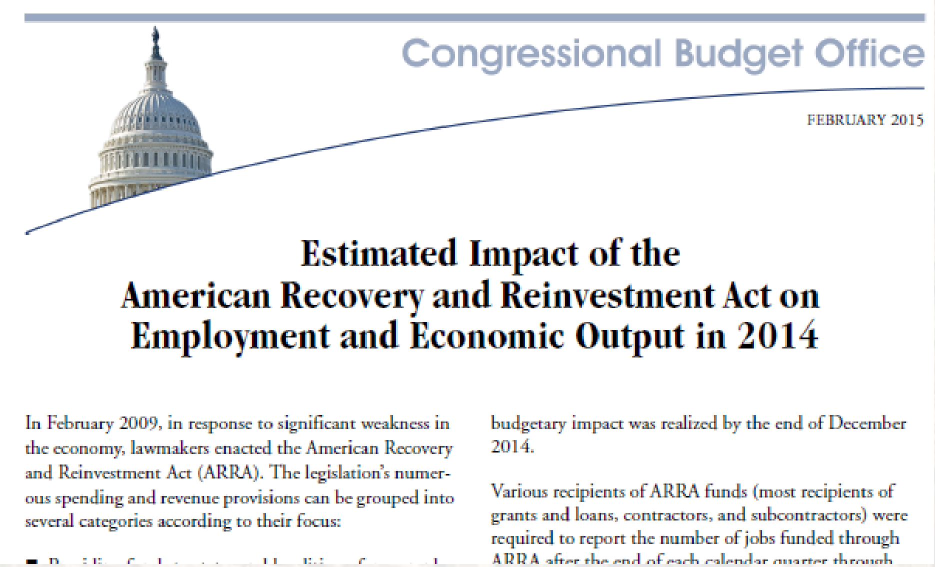
Historically, fiscal and monetary programs range in timing and the mechanisms that support targeted segments.

- 2001 Airline bailouts took several weeks to be understood with $15B bailout on September 22nd.
- CBO estimated as much as 50% of the 2009 ARRA was deployed after 2010.
- In 2008/2009 there were multiple rounds of funding authorized by congress.

We face a range of fiscal and monetary scenarios with varying uncertain timelines and varying levels of effectiveness.



NOTE Impact of fiscal policy can be quantified – significant increase in EDF after 9/11, mitigated after Congress approved bailout package



Congressional Budget Office

FEBRUARY 2015

Estimated Impact of the American Recovery and Reinvestment Act on Employment and Economic Output in 2014

In February 2009, in response to significant weakness in the economy, lawmakers enacted the American Recovery and Reinvestment Act (ARRA). The legislation's numerous spending and revenue provisions can be grouped into several categories according to their focus:

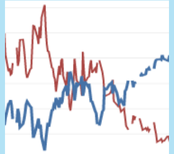
budgetary impact was realized by the end of December 2014.

Various recipients of ARRA funds (most recipients of grants and loans, contractors, and subcontractors) were required to report the number of jobs funded through

COVID-19 Analytics and Data

ASSESSING WHAT HAS HAPPENED SO FAR

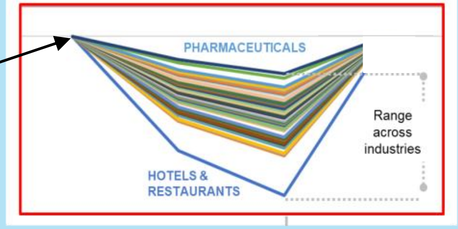
Elevated :
- default probabilities
- expected loss



Varying performance of segments, industries & names

MOST RECENT, REASONABLE, AND WELL-UNDERSTOOD CREDIT ASSESSMENT OF PORTFOLIO

Cross-Sectional COVID-19 Overlay Model



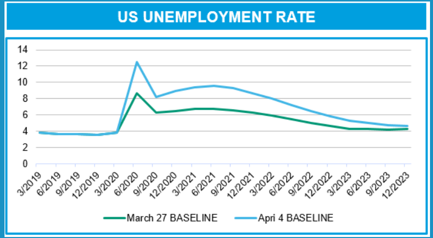
CURRENT INTERNAL RATING ASSESSMENT

Current-State Internal Rating Assessment

	Investment Grade		High-Yield	
Industry	Rating Dec 31, 2019	Rating Assessment April 29, 2020	Rating Dec 31, 2019	Ra Asse April 2
	Baa2	Baa3	B2	I
INING	Baa2	Ba2	B2	C
NSPORTATION	Baa2	Ba2	B1	I
CAST MEDIA	A2	Baa1	B3	C
MER DURABLES	Baa2	Ba1	B2	C

PROJECTING WHAT MIGHT HAPPEN NEXT?

Varying macro scenarios



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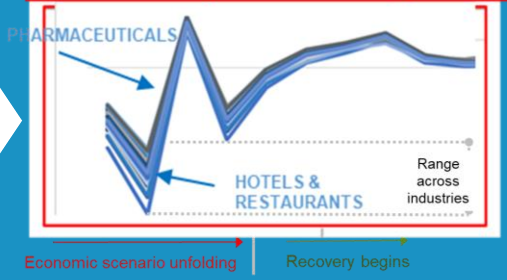
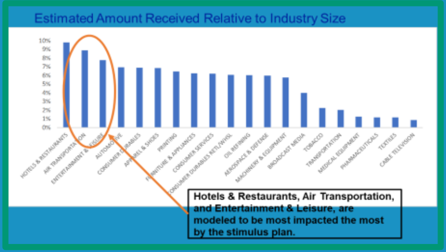
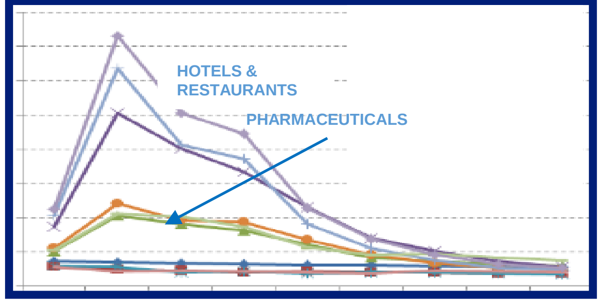


Fiscal & Monetary Overlay Model



PROJECTED RATINGS, OTTI, RBC, SPREADS AND LOSS MEASURES



Current Internal Rating Assessment

Average ratings anchored off of Dec 31, 2019 using Cross-Sectional COVID-19 Overlay

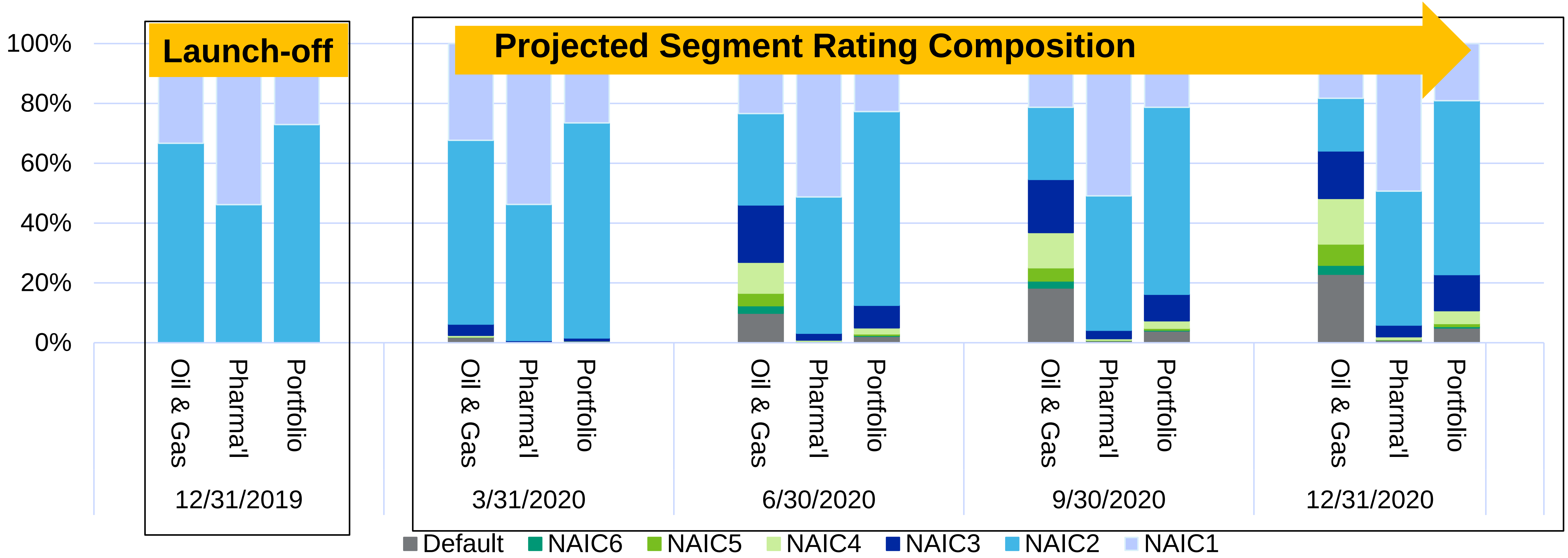
	Investment Grade Portfolio			High-Yield		
	Internal Rating	Estimated Internal Rating Assessment		Internal Rating	Estimated Internal Rating Assessment	
Industry	**Dec. 31, 2019**	**Mar. 31, 2020**	**Jun. 30, 2020 (projected)**	**Dec. 31, 2019**	**Mar. 31, 2020**	**Jun. 31, 2020 (projected)**
Oil Refining	Baa2	Ba2	Ba3	B1	B2	Caa1
Consumer Durables	Baa2	Ba1	Ba1	Ba2	B2	B3
Restaurants	A3	Baa1	Baa1	Ba2	B1	Caa1
Pharmaceuticals	Baa2	Baa2	Baa2	Ba3	Ba2	Ba2
Food & Beverage	Baa2	Baa2	Baa2	B2	B2	B2
Utilities, Electric	Baa2	Baa3	Baa3	Ba2	Ba2	Ba2

Rating assessments on March 31 and June 20, 2020 for hypothetical investment grade and high-yield portfolios based on a December 31, 2019 rating anchoring date; a date representing a reasonable, well-understood state of the portfolio. Numbers for March 31 using realized factors on that date, with June 30 including projected factors. For exposition, we highlight industries with varying impact to COVID-19.

Source: Moody's Analytics

Projected Segment NAIC Rating Composition

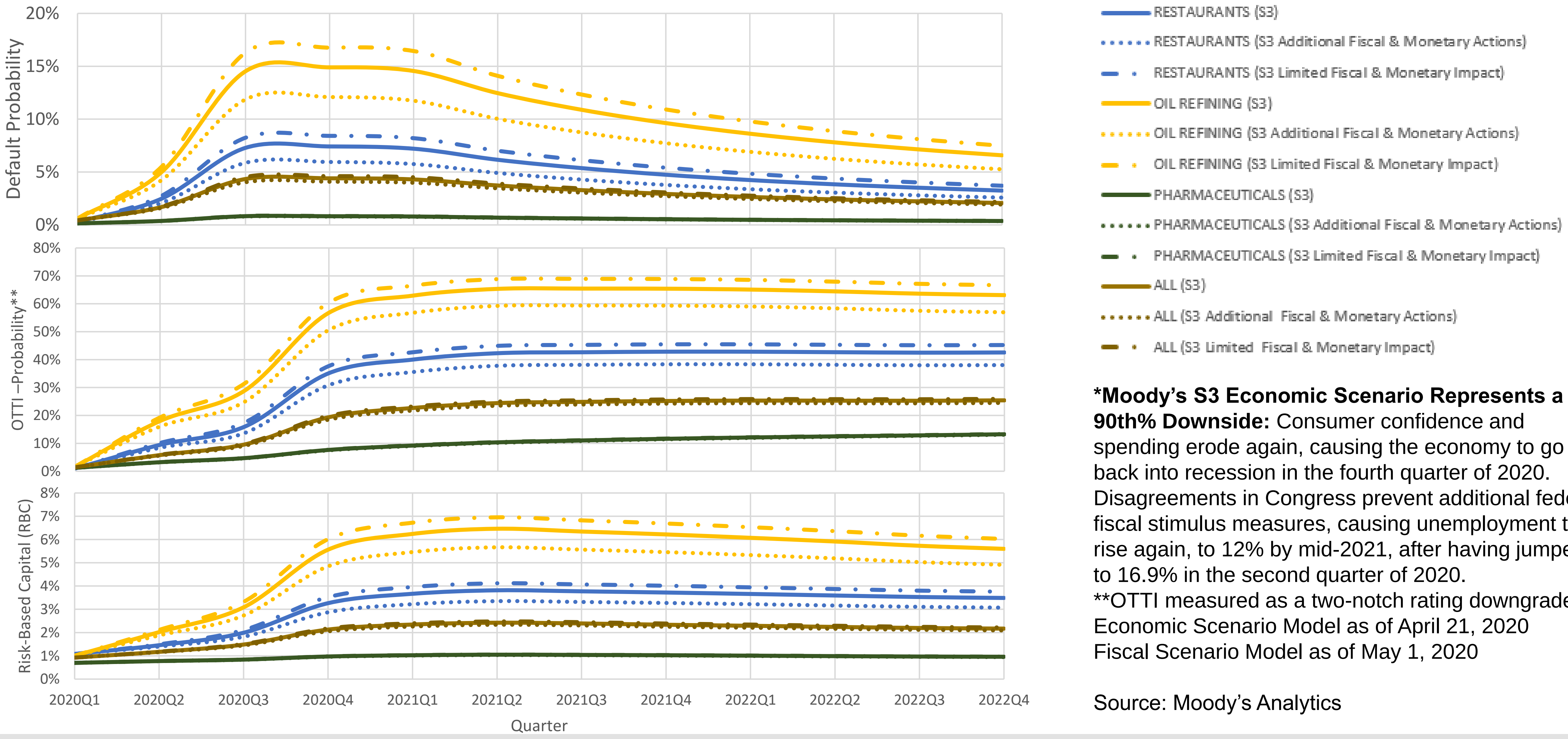
Along Moody's S3* Scenario with Cross-Sectional Overlay



***Moody's S3 Economic Scenario Represents a 90th% Downside:** Consumer confidence and spending erode again, causing the economy to go back into recession in the fourth quarter of 2020. Disagreements in Congress prevent additional federal fiscal stimulus measures, causing unemployment to rise again, to 12% by mid-2021, after having jumped to 16.9% in the second quarter of 2020.
Source: Moody's Analytics

Projections with Cross-Sectional and Fiscal & Monetary Overlays

Moody's S3* Economic Scenario - Dec. 31, 2019 Launch-off



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**OTTI measured as a two-notch rating downgrade
Economic Scenario Model as of April 21, 2020
Fiscal Scenario Model as of May 1, 2020

Source: Moody's Analytics

Similar Business Models, but Differentiated Impact

Fair Value Spread Projection

Yum Brands

Owner of KFC, Pizza Hut, Taco Bell and other fast food chains.

Cyclicality parameter: 29%

Over 50,000 locations world-wide and 5.2 billion in total assets

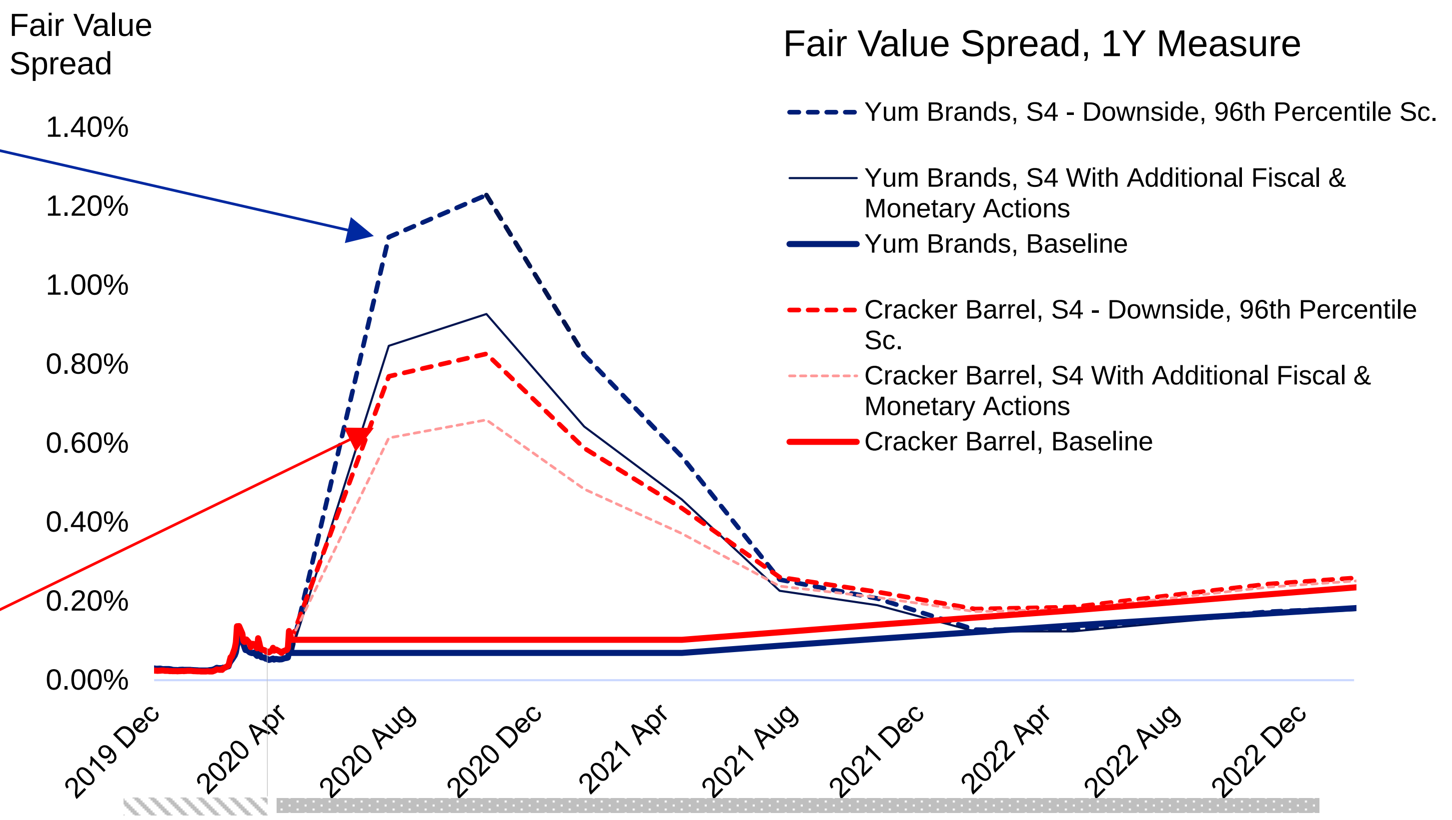
Firms with a similar business model – Yum is larger, has a lower PD, but somewhat **more cyclical.** Larger firms are more susceptible to systematic shocks than firms with narrower product and limited footprint.

Cracker Barrel

A comfort food chain with delivery and take-out menu.

Cyclicality parameter: 13%

660 locations and 1.6 billion USD in total assets.



Spread change from Dec 2019 to May 2020

Today

Baseline projection is aligned with the EDF term structure and Market Price of Risk as of May 2020

Fast Food versus Sit-Down Restaurants

Fair Value Spread Projection

Yum Brands

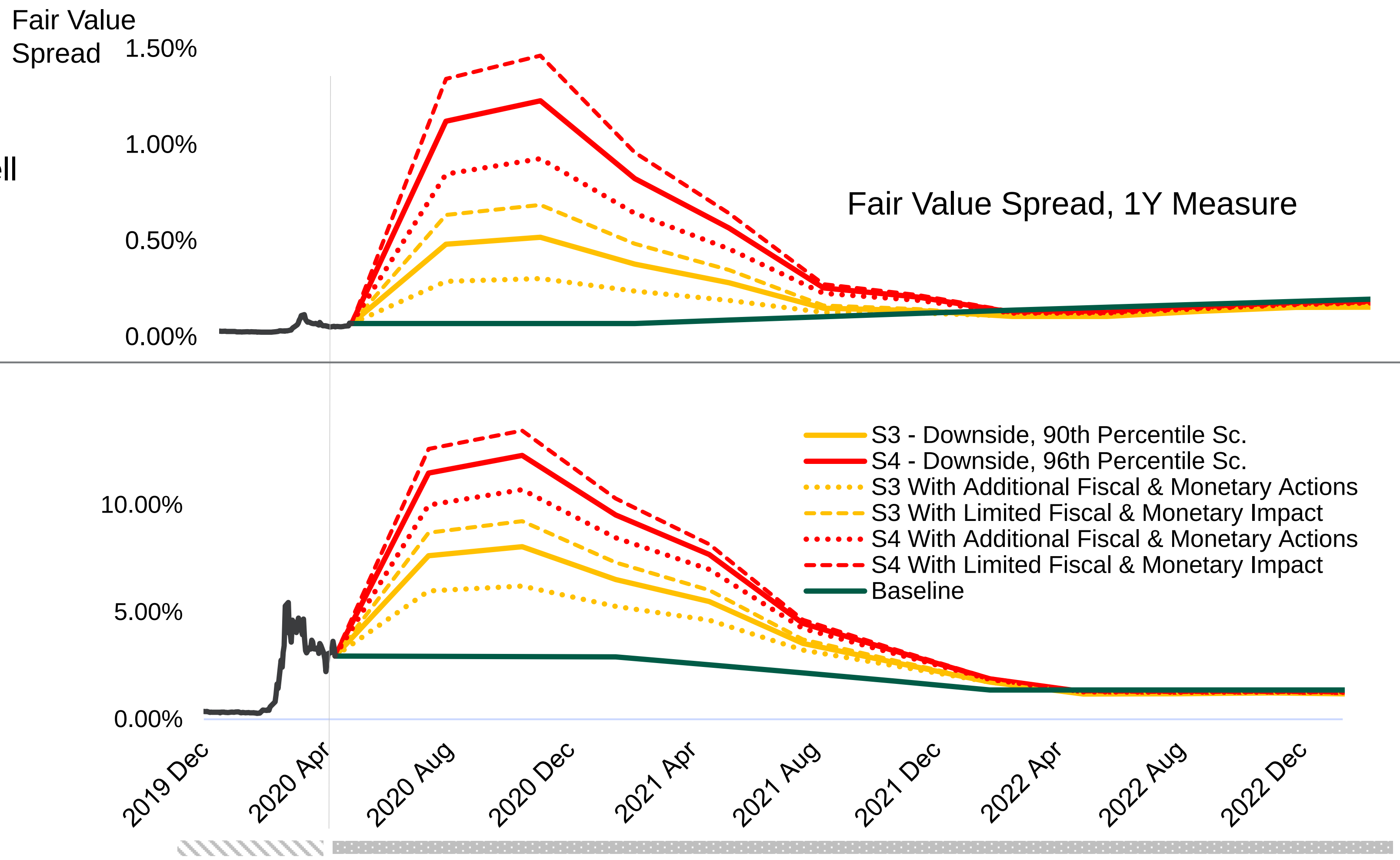
Owner of KFC, Pizza Hut, Taco Bell and other fast food chains.

Small increase in EDF from December 2019 to May 2020.

Cheesecake Factory

A sit-down restaurant chain

The annual EDF increased from 33bps in December 2019 to 2.29% in May 2020.



Spread change from Dec 2019 to May 2020

Today

Baseline projection is aligned with the EDF term structure and Market Price of Risk as of May 2020

Current Internal Rating Assessment

API schematics aligned with internal system entry points

USER INPUTS

Counterparty/Instrument

- Current exposure amount
- Name for entities with publicly traded equity
- Country/State, Industry and size for private companies
- Internal ratings and default probabilities at a reasonable and well-understood starting point, say, December 31, 2019

Mapping between internal and Moody's rating

Realized Cross-Sectional COVID-19 Scenario between, say, Dec 31st, March 31st, and current.

INTERMEDIATE OUTPUTS

Instrument (or segment) transition probabilities for each rating category to March 31st, and current

FINAL OUTPUTS

Dec. 31st

- Exposure (dollar or percentage) to each internal rating category within the portfolio/segment.
- Portfolio or segment internal rating composition.

March 31st and Current

- Portfolio or segment internal rating composition and default probability term structure
- Portfolio or segment rating downgrade probability term structure

Projected Ratings and Loss Measures

API schematics aligned with internal system entry points

USER INPUTS

Counterparty/Instrument

- Current exposure amount
- Name for entities with publicly traded equity
- Country/State, Industry and size for private companies
- Current Internal rating and default probabilities (possibly from Moody's Current Internal Rating Assessment)

Mapping between internal and Moody's rating

Quarterly macro scenarios

Cross-Sectional COVID-19 and Fiscal & Monetary Overlay Models

INTERMEDIATE OUTPUTS

Instrument (or segment) transition probabilities for each rating categories along quarterly scenario

FINAL OUTPUTS

Current

- Exposure (dollar or percentage) to each internal rating category within the portfolio/segment.
- Portfolio or segment internal rating composition.

Quarterly projection along scenario

- Average portfolio or segment internal rating and default probablities
- Average portfolio or segment probability of rating downgrade

Beyond COVID-19

Preparing for the “Unknown Unknowns”

- Navigating the uncertainty of COVID-19 is causing a re-evaluation of common risk factors.
- Exposure to climate risk – supply chain risk driven by common exposure to typhoon risks off the coast of Malaysia
- Emerging concentration risks are shifting our views of geospatial dynamics
- How can we design analytics to help us navigate this change?

Key Take Aways

Managing credit portfolios in the current environment is a challenge we've never experienced.

Requires a unique data set and analytics updated frequently

Across a range of economic paths, inclusive of fiscal stimulus actions

With multiple applications to help insurance companies manage risk

Moody's Analytics

Better Faster Decisions

moodysanalytics.com