

Credit Assessment, Loss Forecasting, and Pandemic Pathways

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Global Challenge

How does one navigate a credit portfolio through so much uncertainty?

- » Which economies will be stabilizing?
- » When will delayed effects to the economy start demonstrating?
- » Will governments have funds to bolster economy through a second wave?
- » Lock down eases, the pandemic accelerates
- » How many businesses will fail? What new revenue streams will business find?
- » What will the psychological impact be on behavior?
- » What is the new normal?



Challenge: How Do You Manage Risk in a Rapidly Changing World?

COVID-19 Fluid With Many Unknowns



DRIVERS

- » Epidemiological – progression of the epidemic
- » Sociological - response of people, businesses, and governments
- » Global, systemic and physical risks



ECONOMIC IMPACT

- » Depends on extent, timing, and interaction of drivers
- » Is uncertain, unpredictable, and changing fast
- » Impact and recovery will vary across industries + regions



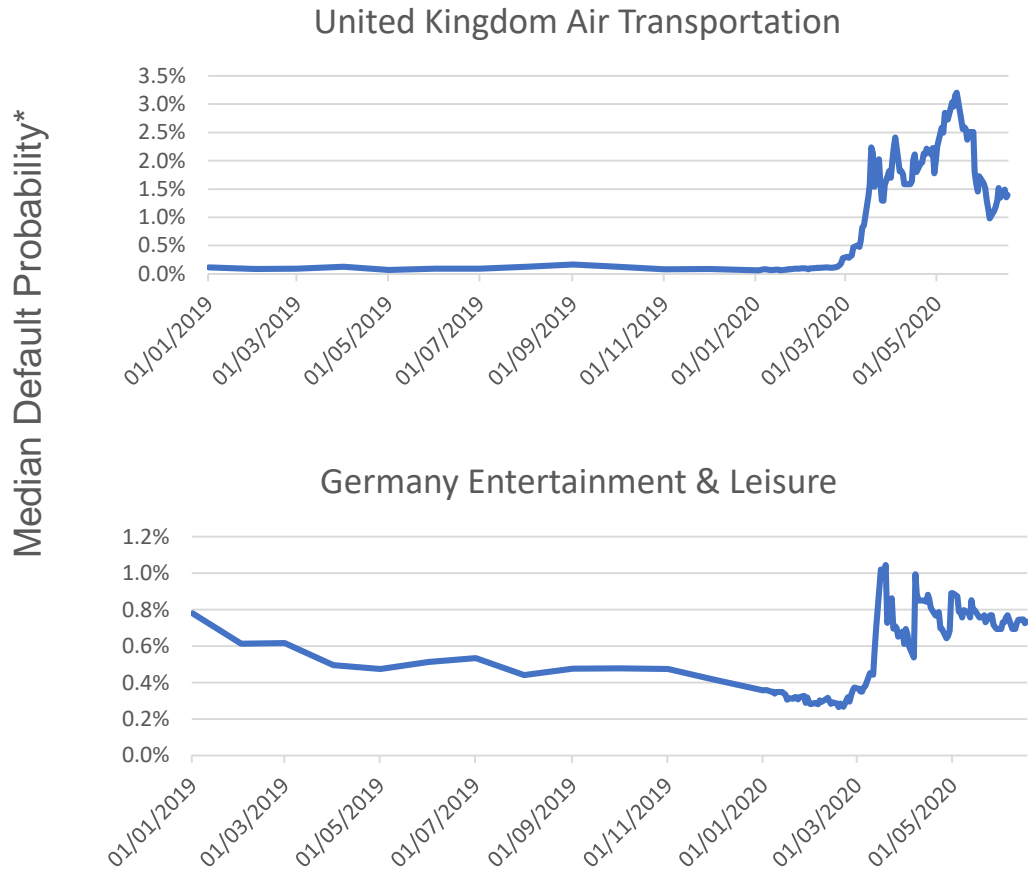
MEASURING & MANAGING RISK

- » Measurement requires timely assessment of current environment
- » Management requires timely assessment of environment under multiple scenarios

Empirical Patterns

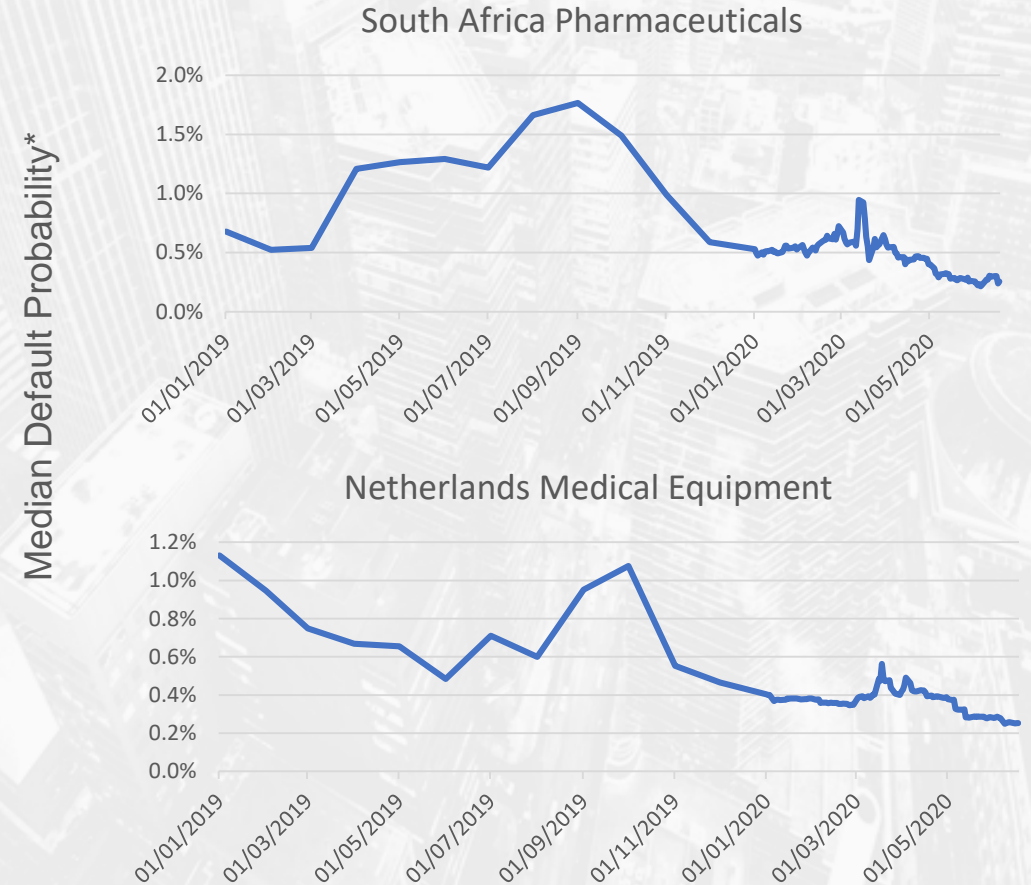
How has COVID-19 impacted industries so far?

Examples of Industries Most Impacted by COVID-19



*Measured using Moody's EDF

Examples of Industries with Mild Impact to COVID-19



*Measured using Moody's EDF

Understanding the Challenges

Traditional 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



Who needs help?

- » Credit Analysts
- » Portfolio Managers
- » Lenders
- » Enterprise Risk Managers
- » Regulators
- » Credit Strategies Desk

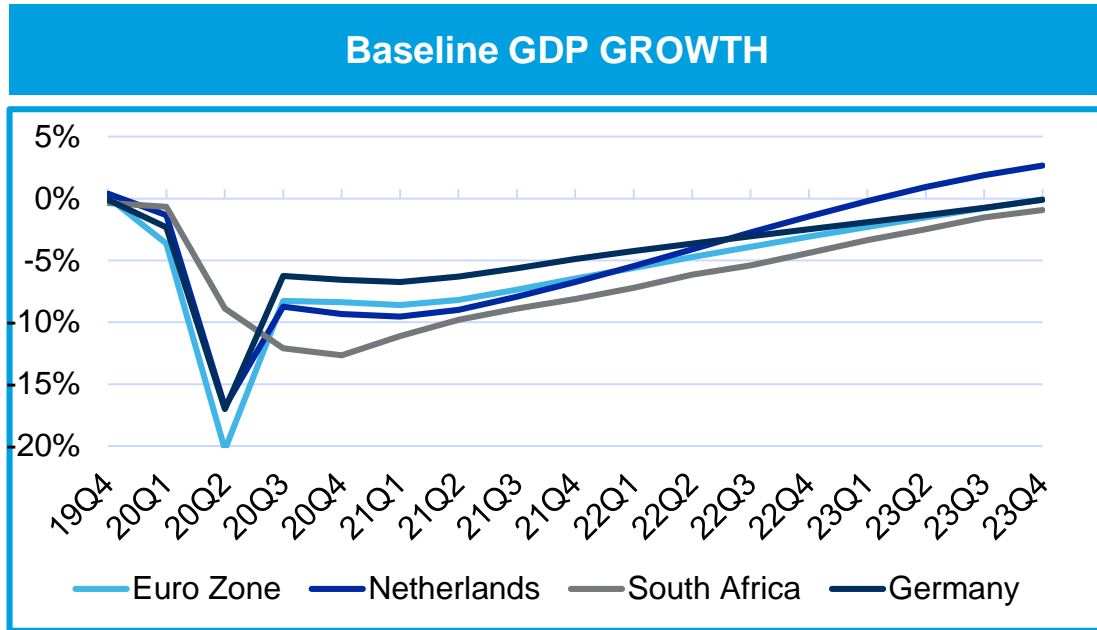
Timely and Dynamic Analytics and Data

Requirements for navigating this uncertain environment

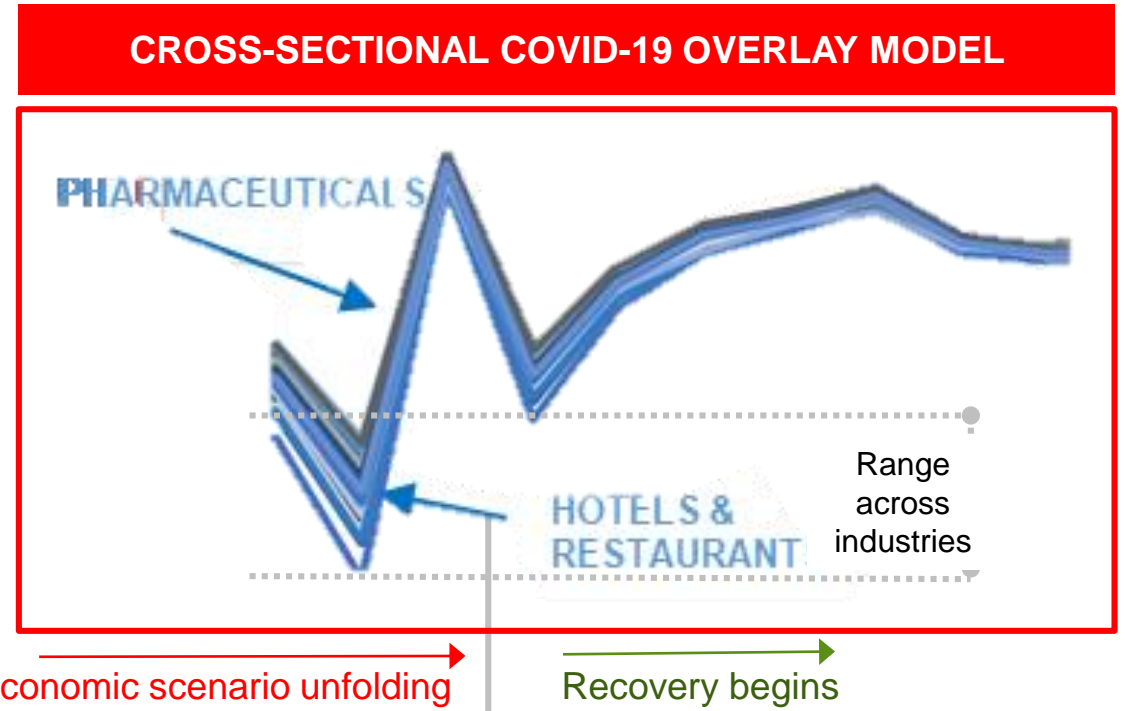
- ① Granular current state assessment of credit
 - ② Assessment of trajectories that consider:
 - Epidemiological paths – severity, length of economic shutdown accounting for government reaction (e.g., draconian social distancing)
 - Cross-industry sensitivity of COVID-19
- With applications toward:
- ③
 - An overlay to internal rating
 - An overlay to stress testing/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



Source: Moody's Analytics June S3 Economic Scenarios



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:

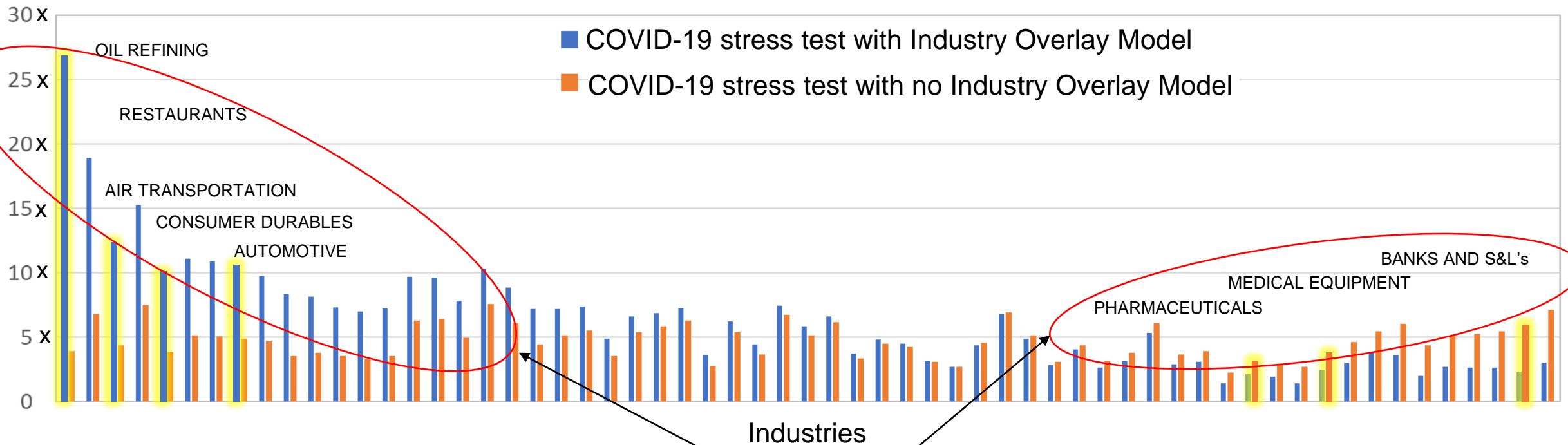
- GDP Now model "-41.9%"
- Blue Chip Forecasts Range "-23%" to "-40%"



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*



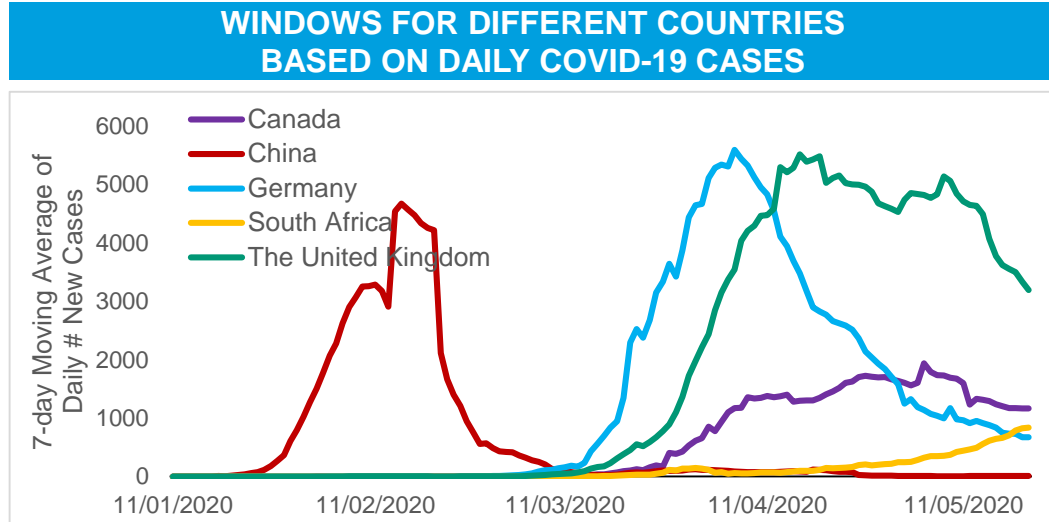
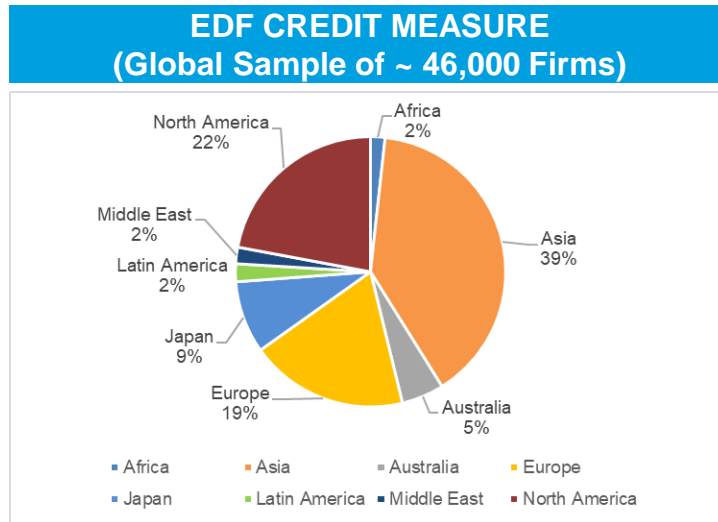
*Ratio of average **projected** expected loss (Moody's EDF x LGD) to expected loss (Moody's EDF x LGD) on December 31st
By industry, EDF sample

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

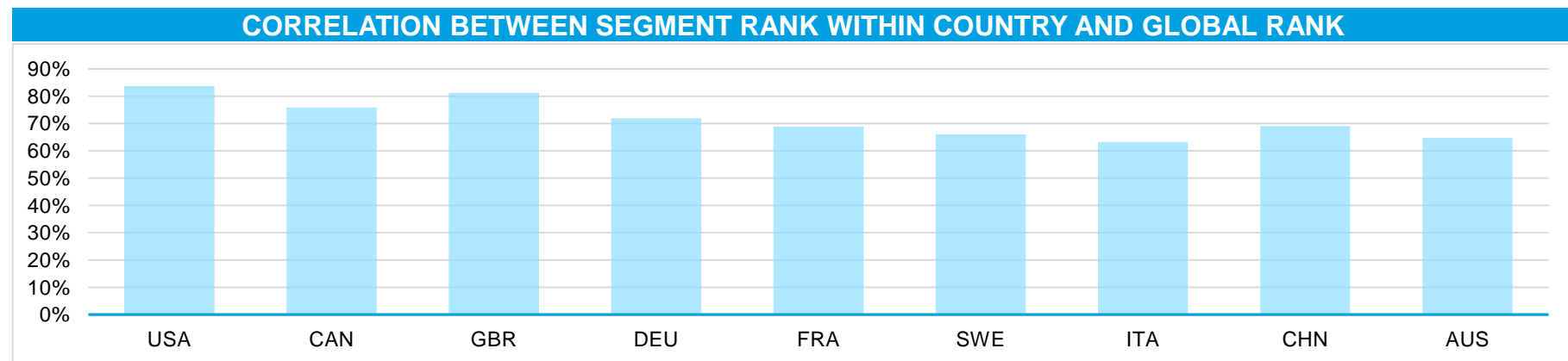
Incorporating Epidemiological Dynamics

Similarities across segments after controlling for variation in epidemiology

Input



Output



Significant Fiscal and Monetary Response

With economic policy uncertainty hitting record highs

South Africa

FISCAL

Since the outbreak of COVID-19, the government has been assisting workers and companies facing distress by providing wage support through the Unemployment Insurance Fund (UIF), temporary social grants and funding to SMEs.

On April 21, a social and **economic support package of R500 billion was approved, representing 10% of GDP**. Moreover, a loan guarantee scheme for SMEs was announced for R200 billion in partnership with the major banks, National Treasury and the SARB.

MONETARY

The South African Reserve Bank (SARB) has been cutting the policy rate reaching to 3.75% on May 21 (compared to 6.25% before COVID-19). It has also implemented several measures intended to ease liquidity conditions, relax bank capital requirements and provide debt relief to borrowers.

Source: IMF <https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19#J>

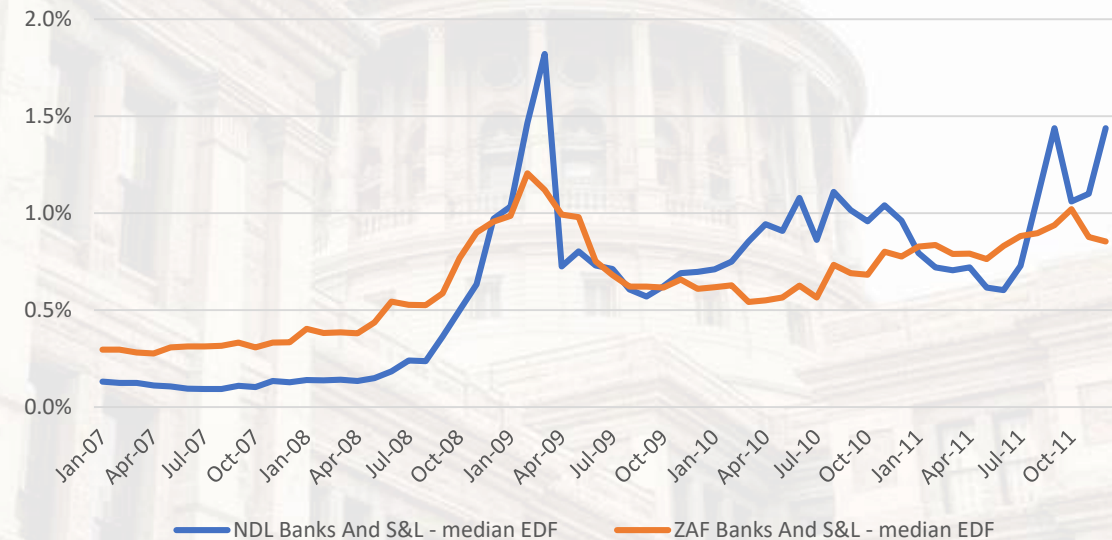
Program Effectiveness

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

- South Africa response to mitigate the Great Recession effects comprised different policies such as increasing public sector investment in infrastructure, expanding public goods programs to boost short term employment and skills development, introducing wage subsidies to promote youth employment, maintaining existing levels of social expenditure.
- In response to the Global Financial Crisis, the Dutch government launched three different economic stimulus packages, equivalent approximately to 2% of GDP.

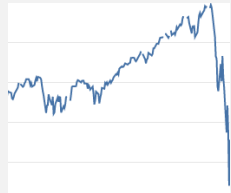
We face a range of fiscal and monetary scenarios with varying uncertain timelines and varying levels of effectiveness.

The Banking Sector 2007-2011



COVID-19 Analytics and Data

WHAT'S HAPPENED SO FAR

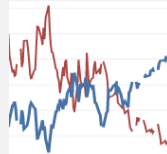


Shocks to the markets and the economy



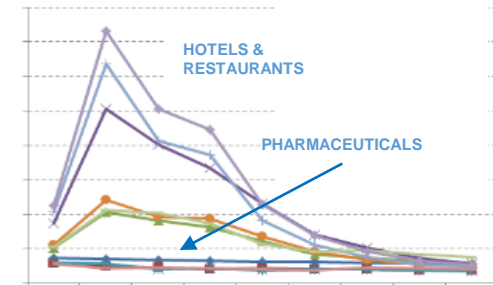
Elevated :

- default probabilities
- expected loss

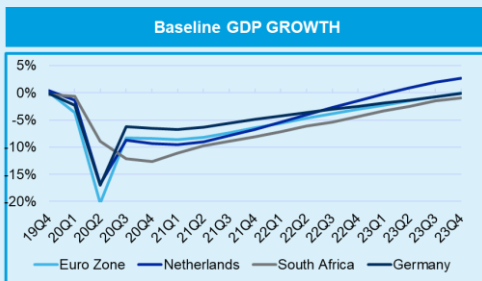


Varying performance of segments, industries & names

NAME-LEVEL PROJECTIONS



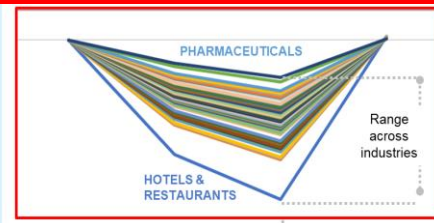
WHAT MIGHT HAPPEN NEXT?



Source: Moody's Analytics June S3 Economic Scenarios

Varying industry impact

Cross Industry COVID-19 Overlay Model



2020 Expected Defaults Select Industries: December 31st Launch-Off

Impact of Cross-Sectional COVID-19 Overlay

Average One-year Default Probabilities (Dec 2019 to Dec 2020)

Industry	Netherlands IG Moody's EDF Implied Rating					South African IG Moody's EDF Implied Rating					US Moody's Rated IG				
	EDF 31-Dec-19	Baseline	Baseline With C-S COVID19 Overlay	S4	S4 With C-S COVID19 Overlay	EDF 31-Dec-19	Baseline	Baseline With C-S COVID19 Overlay	S4	S4 With C-S COVID19 Overlay	EDF 31-Dec-19	Baseline	Baseline With C-S COVID19 Overlay	S4	S4 With C-S COVID19 Overlay
CONSUMER DURABLES RETL/WHSL	0.03%	0.39%	0.84%	0.87%	1.97%	0.05%	0.14%	0.20%	0.18%	0.28%	0.35%	0.95%	2.07%	1.53%	3.95%
PHARMACEUTICALS	0.03%	0.21%	0.13%	0.41%	0.24%	0.03%	0.06%	0.05%	0.07%	0.06%	0.11%	0.40%	0.20%	0.79%	0.33%
FOOD & BEVERAGE	0.02%	0.23%	0.20%	0.53%	0.45%	0.03%	0.12%	0.10%	0.17%	0.15%	0.03%	0.10%	0.10%	0.17%	0.18%
CHEMICALS	0.02%	0.42%	0.37%	1.11%	0.94%	0.06%	0.18%	0.16%	0.27%	0.23%	0.07%	0.49%	0.84%	1.44%	2.50%
BANKS AND S&LS	0.23%	1.85%	1.31%	3.56%	2.43%	0.28%	0.79%	0.61%	1.07%	0.81%	0.39%	2.58%	1.30%	6.28%	3.07%

Consumer Durables relative performance deteriorates with C-S COVID Overlay

Banks relative performance improves with C-S COVID Overlay

US performance measurably deteriorated compared to SA and NL. SA and NL scenario more mild, and C-S COVID-19 Overlay recognizes US more sensitive to pandemic.

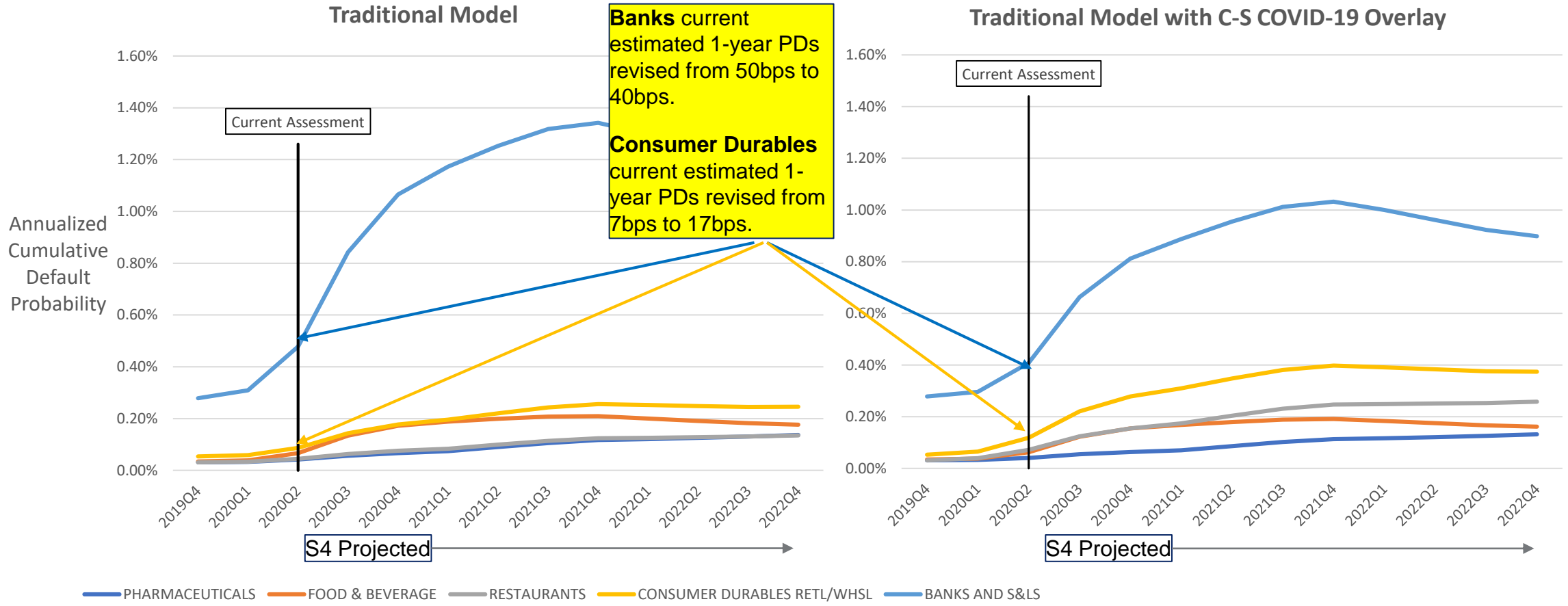
NOTES
 • C-S COVIS Overlay as of June 20, 2020

U.S. Baseline: real GDP is projected to fall almost 6% in 2020. Activity forecasted to exhibit a W recovery, bouncing in 2020 Q3 but weakening in 2020 Q4. Sustained recovery is assumed from 2021 onwards.
South Africa Baseline: sudden sharp recession, projecting real GDP to fall 5% in 2020. Recovery starts late in 2020 Q4 and Unemployment peaks at 33% at the end of 2020.
Netherlands Baseline: real GDP is projected to fall 6.4% in 2020, bouncing in 2020 Q3 after a sharp decrease in 2020 Q2 but weakening in 2020 Q4. Sustained recovery starts in 2021 Q1. Unemployment peaks at 7.6% in 2021 Q2.

U.S. 96th% Downside (S4): assumes the crisis to last significantly longer with more cases and deaths than anticipated. Business closures wind down much more slowly than in the Baseline, and a more pronounced double deep recession is projected. Strong recovery does not begin until 2022.
South Africa 96th% Downside (S4): the crisis lasts longer than expected with more cases and death than anticipated. Deep contraction in GDP, decreasing almost 13% in 2020. Unemployment peaks at 36.4% in 2021 Q1.
Netherlands 96th% Downside (S4): assumes the coronavirus pandemic to become worse than expected. Double deep recession projected, with real GDP falling 12% in 2020. Activity starts recovering in 2021 Q2. Unemployment peaks at 10.5% in 2021 Q2.

C-S COVID-19 Overlay: Current and S4 96% Downside Projected PDs

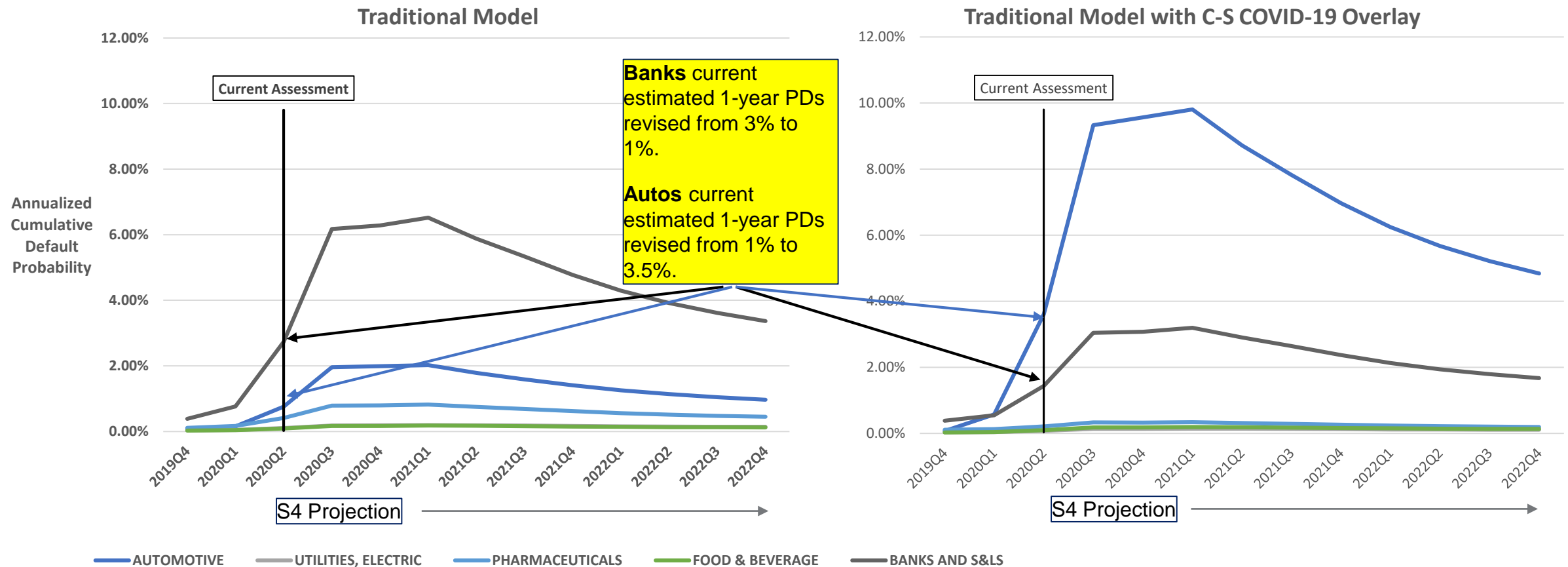
South Africa, EDF Implied Moody's IG Rated, Dec 31st, 2019 Launch-Off



- NOTES**
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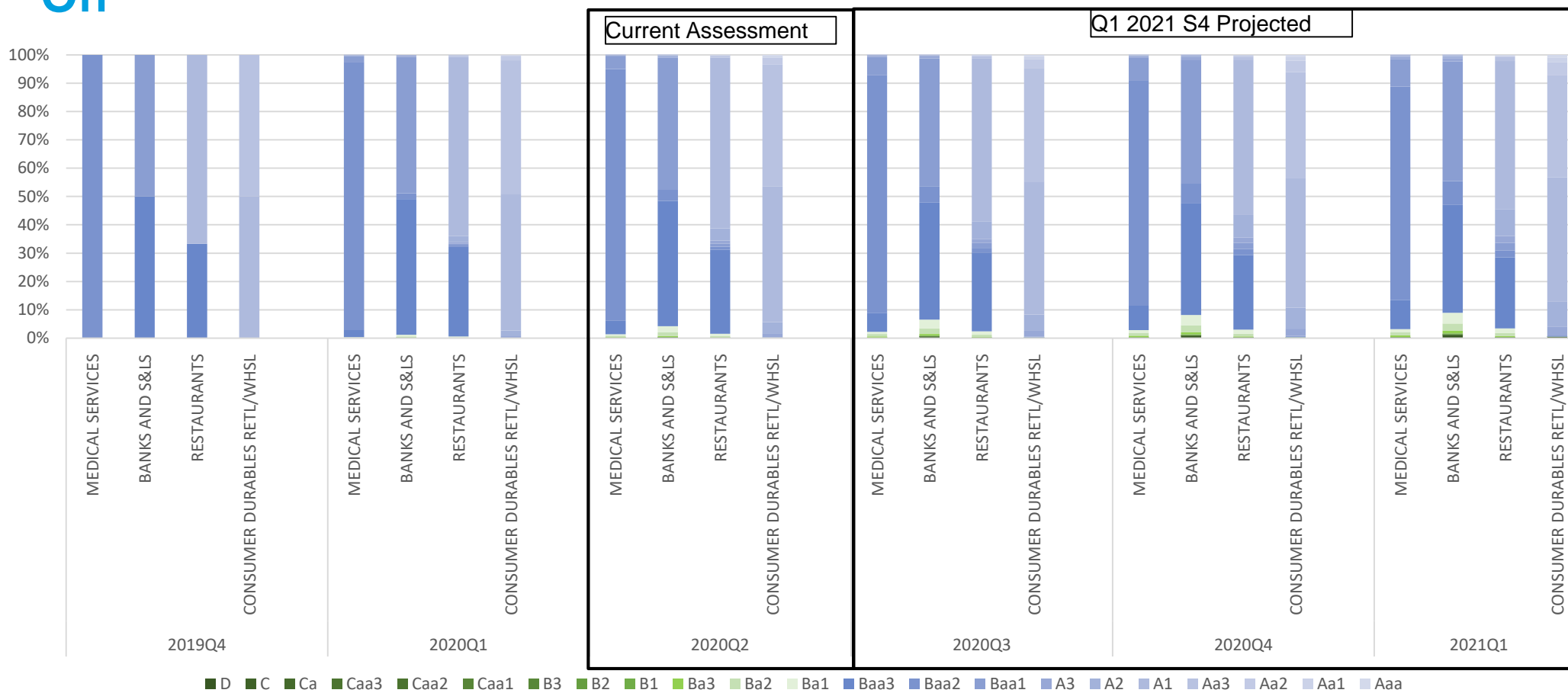
US Moody's IG Rated Dec 31st, 2019 Launch-Off



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Current and S4 96% Downside Projected Rating Composition

South Africa EDF Implied IG Rated Select Industries Dec 31st, 2019 Launch-Off



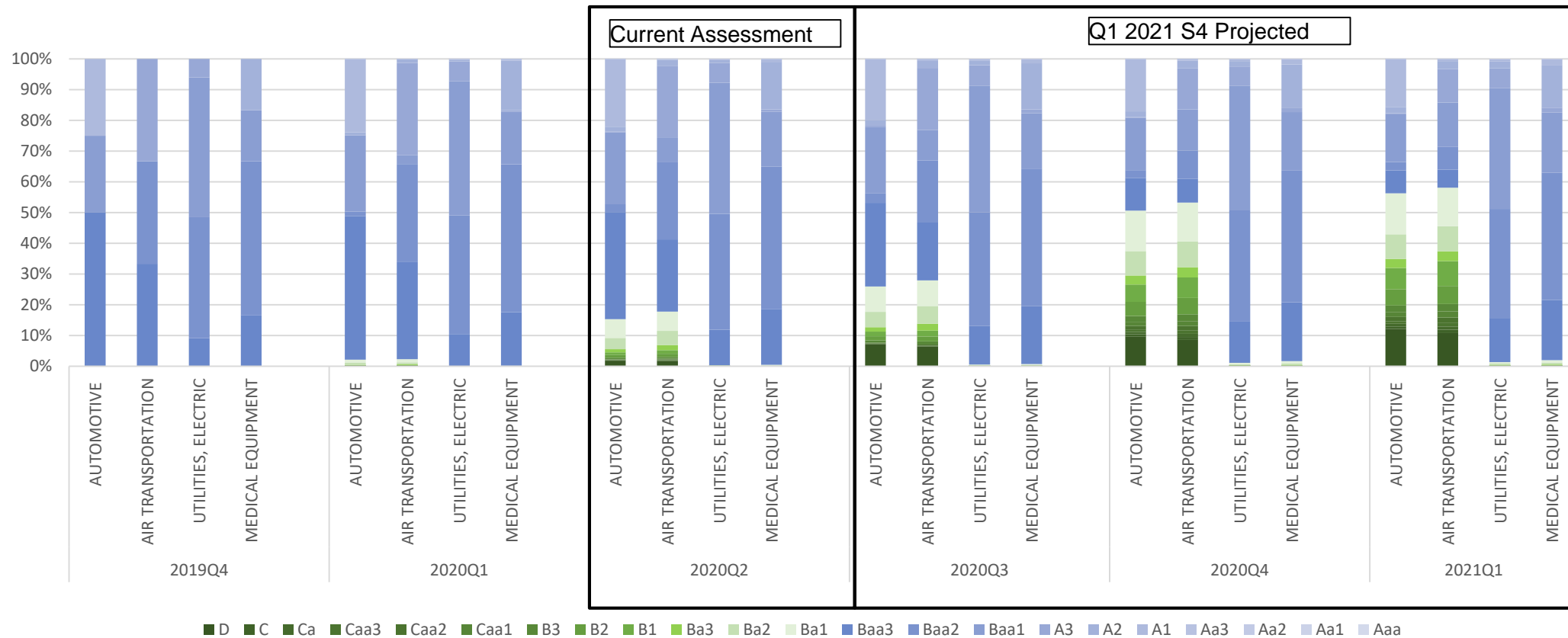
Consumer Durables experience a 60% downward migration.

Restaurants will experience ~10% migration into HY and default.

- NOTES**
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 - **South Africa 96th% Downside (S4):** the crisis lasts longer than expected with more cases and death than anticipated. Deep contraction in GDP, decreasing almost 13% in 2020. Unemployment peaks at 36.4% in 2021 Q1.

Current and S4 96% Downside Projected Rating Composition

US IG Moody's rated Select Industries Dec 31st, 2019 Launch-Off



Automotive and Air Transport experience material deterioration with majority falling below IG and entering default.

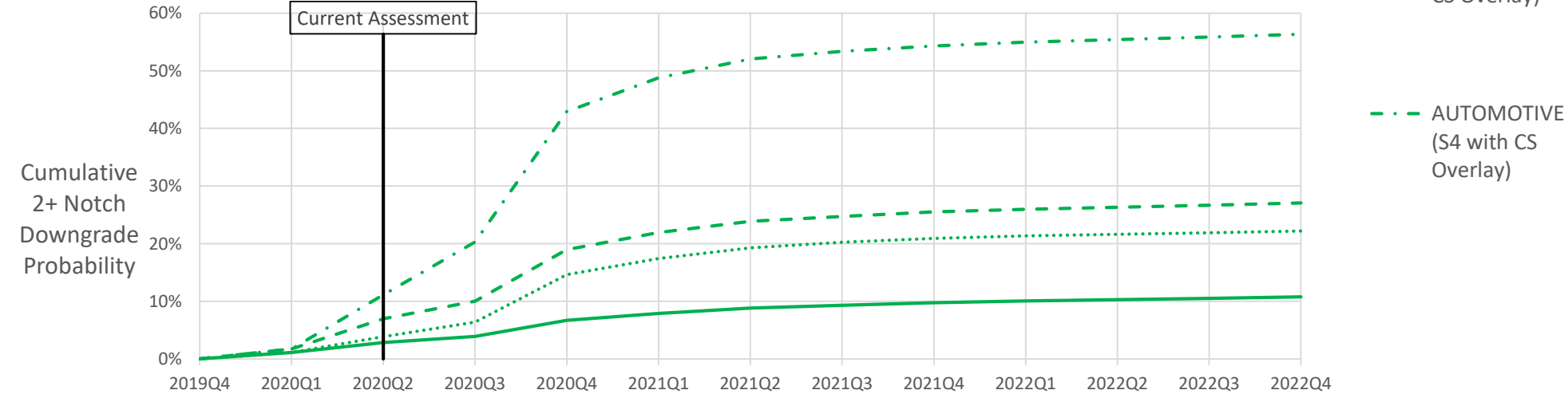
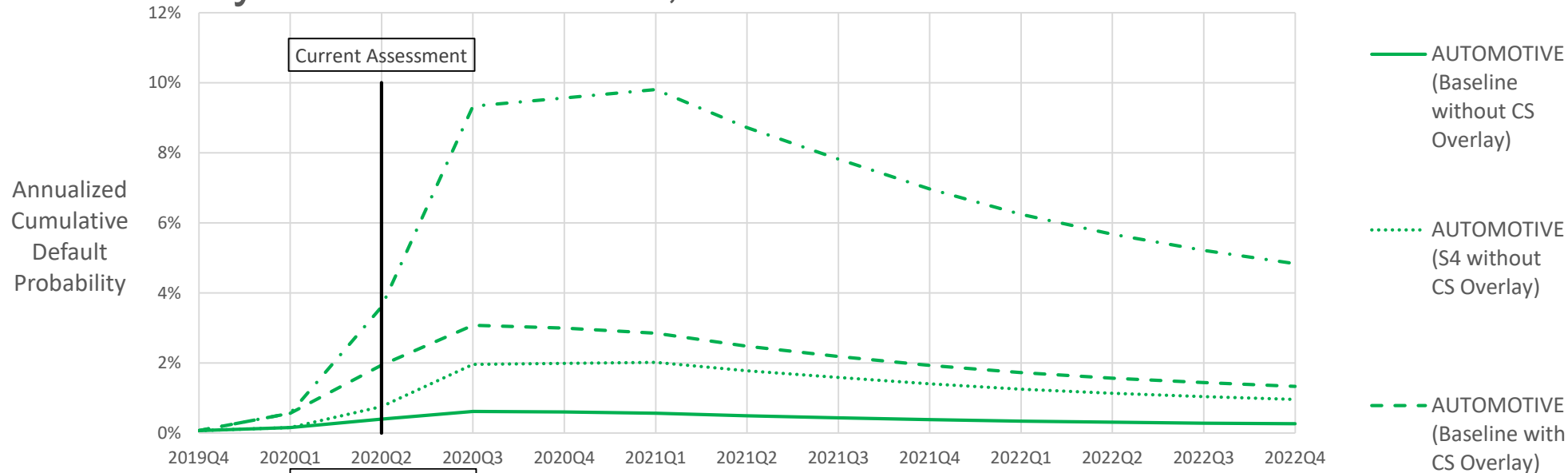
Utilities and Medical Equipment not impacted much by downturn.

NOTES

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US Automotive Current Assessments and Projections

IG Moody's Rated - Dec. 31, 2019 Launch-off

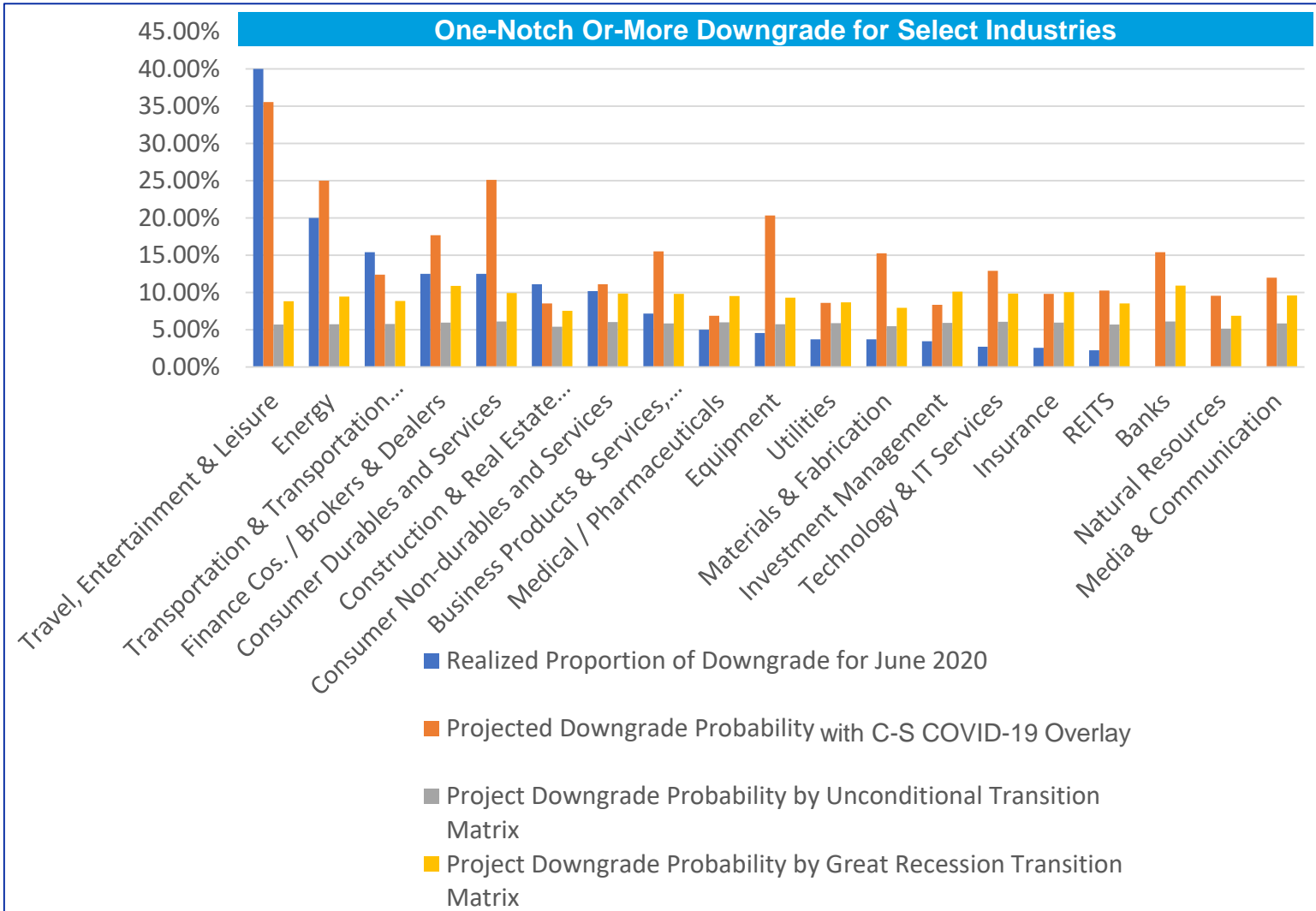


NOTES

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Performance - December 2019 to June 2020

Credit Migration and Cross-Sectional COVID-19 Overlay



Accuracy Ratio			
Method	Number of downgrade notch	IG Firms	HY Firms
Cross-Sectional COVID -19 Overlay	1	0.409	0.384
	2	0.343	0.562
Unconditional Transition Matrix	1	-0.062	0.231
	2	-0.033	0.003
Great Recession Transition Matrix	1	-0.051	0.129
	2	0.089	0.228

NOTES

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

EDF data as of Dec 31 2019

Probability of downgrade from Dec 2019 to June 2020 are projected based on the realized macroeconomic statistics

Beyond COVID-19

Preparing for the “Unknown Unknowns”

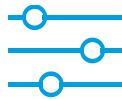
- » Navigating the uncertainty of COVID-19 is causing a re-evaluation of common risk factors
 - ❖ **global, systemic and physical risks** are the new normal
- » In the Covid-19 aftermath, some economies focus on ramping up **R& D towards climate resilience and mitigation and sustainable value creation.**
- » Understanding the evolving dynamics of **environmental (physical) risks and systems** may inform our views on concentration risks and they may be **“accumulating” through time.**
- » Will there be a shift in how we work and leisure and the entire commercial real estate landscape?
- » How can we design analytics to help us navigate this change?



Key Take-aways



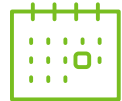
Managing credit portfolios in the current environment is a challenge we've never experienced.



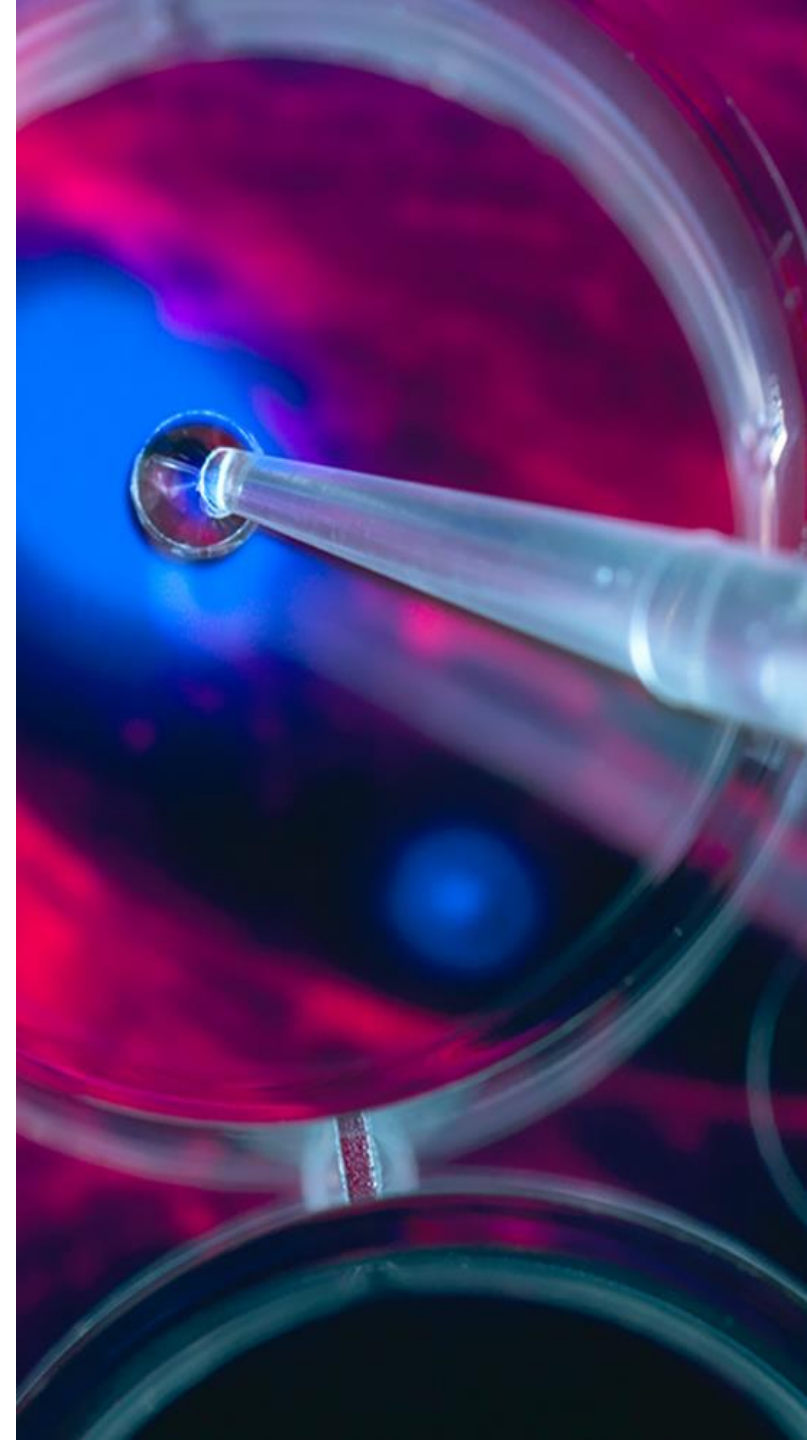
Requires a unique data set and analytics updated frequently



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



With multiple applications to help manage risk



A microscopic view of a cell, likely a bacterium, with a pipette tip positioned over it. The cell is illuminated with blue and red light, creating a vibrant, high-contrast image. The background is dark, making the cell and the pipette tip stand out.

MOODY'S

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