

# Nordic Banks beyond COVID-19: Challenges for Credit Risk, Stress Testing and ESG/Climate Risk Integration

# Agenda

1. Brief overview of the outlook for Nordic Banks
2. Credit risk impact of COVID-19 on corporate industries
3. ESG and climate risk focus – credit after COVID-19
4. Q&A

# Today's Speakers

Louise Lundberg – Senior Credit Officer, **Moody's Investors Service**

Metin Epozdemir, CFA – Risk and Finance, **Moody's Analytics**

Leonardo Checchi – ESGC & Credit Risk SME, **Moody's Analytics**

# Today's Speakers



Louise Lundberg  
Senior Credit Officer  
**Moody's Investors Service**



Metin Epozdemir, CFA  
Risk and Finance  
**Moody's Analytics**



Leonardo Checchi  
ESGC & Credit Risk SME  
**Moody's Analytics**



A nighttime photograph of a city skyline, likely Hong Kong, featuring numerous illuminated skyscrapers. In the foreground, a complex multi-level highway interchange is visible, with light trails from vehicles. The sky is dark with some clouds.

# Part 1: Brief overview of the outlooks for Nordic banks



# Access is everything™



## Expertise

A comprehensive view of the global markets through our ratings and research.



## Credibility

Over 100 years of experience delivering forward-looking, independent, stable and transparent opinions.



## Engagement

Meaningful interactions across multiple channels between our analysts and market participants.



# Agenda

1. Banking sector outlooks for the Nordics
2. Impact on asset quality and profitability
3. Lower for longer interest rates

1

## Banking sector outlooks for the Nordics



# Overview of Banking System Outlooks

Most European Banking System Outlooks were changed to negative

## Banking System Outlook Updates (17 March – 16 April)

Banking System	Overall System Outlook	Changed from	Operating environment	Asset risk	Capital	Profitability and efficiency	Funding and liquidity
Sweden	Stable	Stable	Deteriorating	Deteriorating	Stable	Deteriorating	Stable
Denmark	Negative	Stable	Deteriorating	Deteriorating	Stable	Deteriorating	Stable
Norway	Negative	Stable	Deteriorating	Deteriorating	Stable	Deteriorating	Stable
Finland	Negative	Stable	Deteriorating	Deteriorating	Stable	Deteriorating	Stable
Belgium	Negative	Stable	Deteriorating	Deteriorating	Stable	Deteriorating	Stable
France	Negative	Stable	Deteriorating	Deteriorating	Stable	Deteriorating	Stable
Germany	Negative	Negative	Deteriorating	Deteriorating	Stable	Deteriorating	Stable
Italy	Negative	Stable	Deteriorating	Deteriorating	Deteriorating	Deteriorating	Stable
Netherlands	Negative	Stable	Deteriorating	Deteriorating	Stable	Deteriorating	Stable
Spain	Negative	Stable	Deteriorating	Deteriorating	Stable	Deteriorating	Stable
Switzerland	Stable	Stable	Deteriorating	Stable	Stable	Deteriorating	Stable
United Kingdom	Negative	Negative	Deteriorating	Deteriorating	Stable	Deteriorating	Stable

Source: Moody's Investors Service

# Moody's Bank Ratings in the Nordics

As of September 2020

Sweden Aaa - Stable Outlook				
Banks	BCA	Long-Term Deposit	Outlook	Short-Term
Bluestep Bank AB (publ)	baa2	A3	Stable	P-2
Hoist Finance AB (publ)	ba3	Baa3*	Negative	P-3
Lansforsakringar Bank AB (publ)	a3	A1	Stable	P-1
SBAB Bank AB (publ)	baa1	A1	Stable	P-1
SEB AB	a3	Aa2	Stable	P-1
Skandiabanken AB	baa2	A2	Stable	P-1
Sparbanken Syd	baa3	Baa1	Negative	P-2
Stadshypotek AB	a2	-	Stable	P-1
Svenska Handelsbanken AB	a2	Aa2	Stable	P-1
Swedbank AB	baa1	Aa3	Stable	P-1
Swedbank Mortgage AB	baa1	Aa3*	Stable	--
Volvofinans Bank AB	baa2	A3	Negative	P-2

Denmark Aaa - Stable Outlook				
Banks	BCA	Long-Term Deposit	Outlook	Short-Term
Danske Bank A/S	baa2	A2	Negative	P-1
Jyske Bank A/S	baa1	A2	Stable	P-1
Nykredit Bank A/S	baa3	A3	Stable	P-2
Nykredit Realkredit A/S	baa1	A3*	Stable	P-2*
Ringkjøbing Landbobank A/S	a3	Aa3	Stable	P-1
Spar Nord Bank A/S	baa1	A1	Stable	P-1
Sydbank A/S	baa1	A1	Stable	P-1

Finland Aa1 - Stable Outlook				
Banks	BCA	Long-Term Deposit	Outlook	Short-Term
Aktia Bank p.l.c.	a3	A1	Stable	P-1
Nordea Bank Abp	a3	Aa3	Stable	P-1
OP Corporate Bank plc	a3	Aa3	Stable	P-1

Note: ratings as of 15 September 2020

\* Long-Term Issuer Rating, \*\* Senior Secured

Source: Moody's Investors Service

Norway    Aaa - Stable Outlook				
Banks	BCA	Long-Term Deposit	Outlook	Short-Term
DNB Bank ASA	a3	Aa2	Stable	P-1
Fana Sparebank	baa2	A3	Stable	P-2
Helgeland Sparebank	baa2	A3	Stable	P-2
KLP Banken AS	baa1	A3	Stable	P-2
OBOS-banken AS	baa3	Baa1	Stable	P-2
Santander Consumer Bank AS	baa3	A3	Stable	P-2
Sbanken ASA	baa1	A3	Stable	P-2
SpareBank 1 BV	baa1	A2	Stable	P-1
SpareBank 1 Nord-Norge	a3	Aa3	Stable	P-1
SpareBank 1 Ostlandet	a3	Aa3	Stable	P-1
SpareBank 1 SMN	baa1	A1	Stable	P-1
SpareBank 1 SR-Bank ASA	baa1	A1	Stable	P-1
Sparebanken More	baa1	A2	Stable	P-1
Sparebanken Oest	baa1	A2	Stable	P-1
Sparebanken Sogn og Fjordane	baa1	A2	Stable	P-1
Sparebanken Sor	baa1	A1	Stable	P-1
Sparebanken Vest	baa1	A1	Positive	P-1
Nordic Covered Bond Issuers	CRA	Issuer Rating	Outlook	Short-Term
Eika Boligkreditt AS	A3(cr)	Baa1	Stable	P-2(cr)
SpareBank 1 Boligkreditt AS	A2(cr)	A2	Stable	P-1(cr)

Nordic Specialised Lenders				
Banks	BCA	Senior Unsecured	Outlook	Short-Term
Danmarks Skibskredit A/S	--	Baa2**	--	--
Eksportfinans ASA	baa3	Baa1	Stable	--
Kommunalbanken AS	a1	Aaa	Stable	--
KommuneKredit	--	Aaa	Stable	--
Kommuninvest i Sverige Aktiebolag	--	Aaa	Stable	--
Municipality Finance Plc	--	Aa1*	Stable	--
Swedish Export Credit Corporation	a1	Aa1	Stable	--

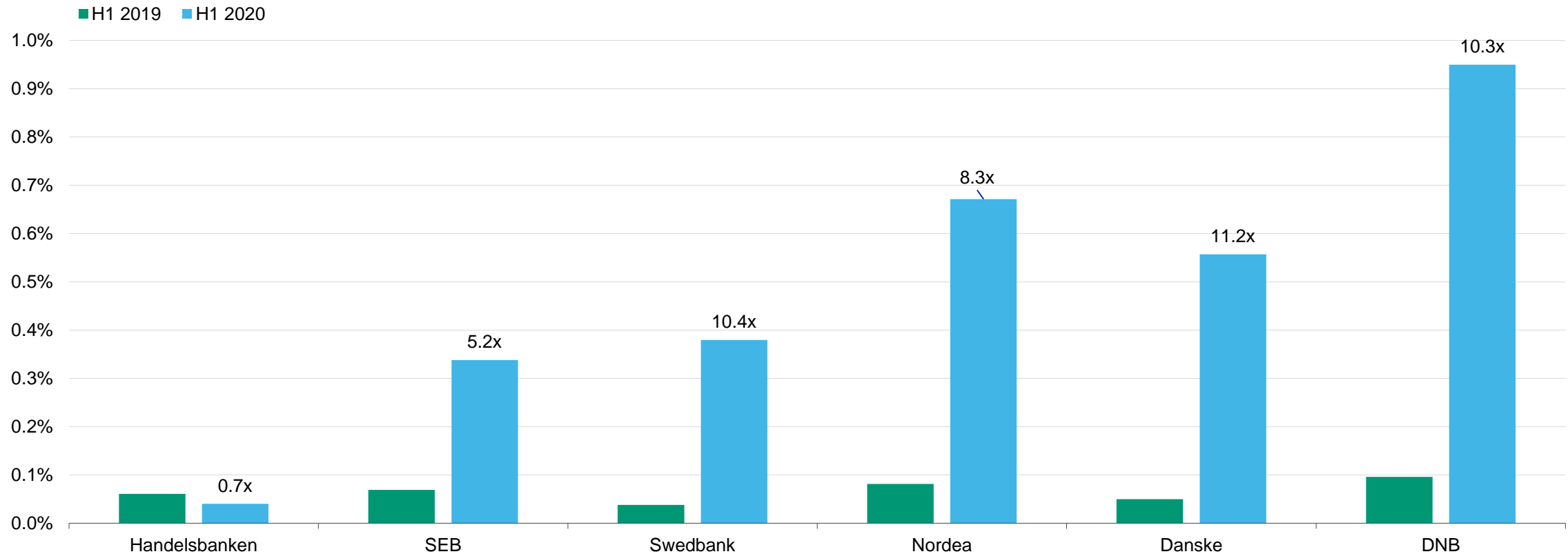
2

Impact on asset quality and  
profitability



# Provisions increased, but from very low levels

Provisions increased multiple times vs H1 2019

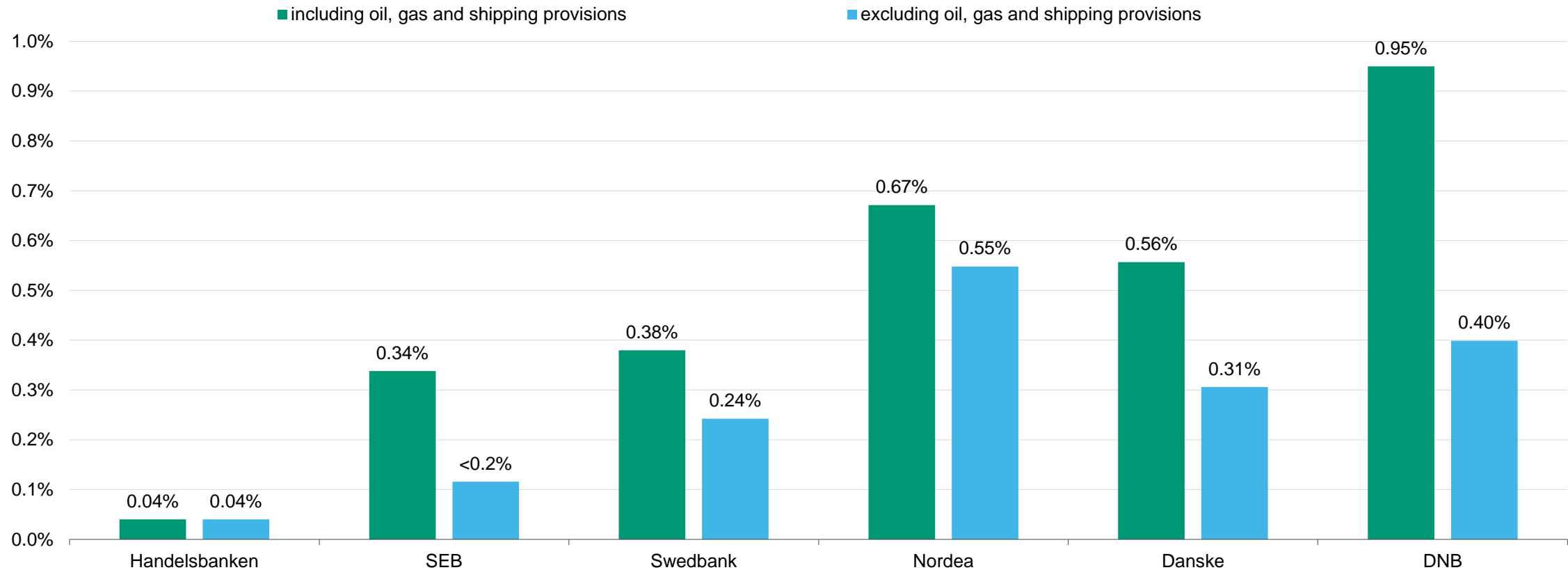


Note: Provisioning costs as % of credit exposures

Source: Moody's Investors Service, Banks' financial statements

# Oil and offshore is a troubled segment

Provisioning levels including and excluding oil, gas and shipping

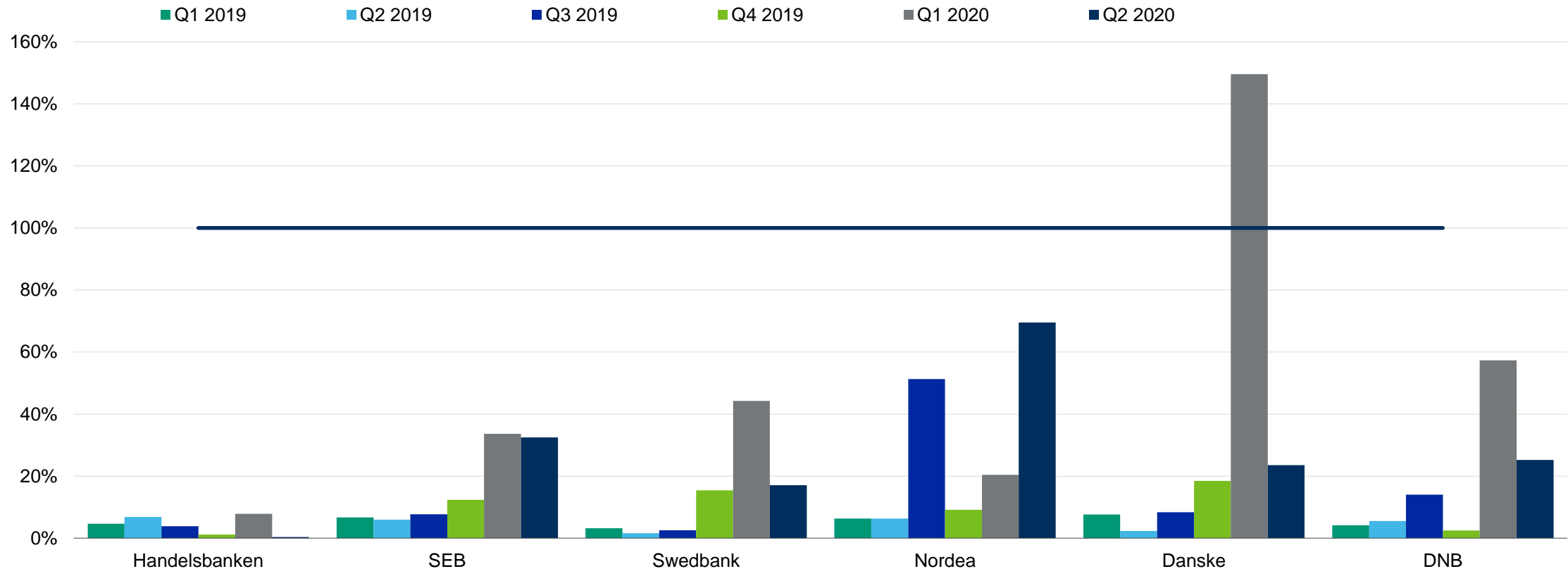


Note: SEB's non-oil provisions are Moody's estimates due to only partial disclosure.

Source: Moody's Investors Service, Banks' financial statements

# But an earnings and not a capital event

Provisions as a % of pre-provision income



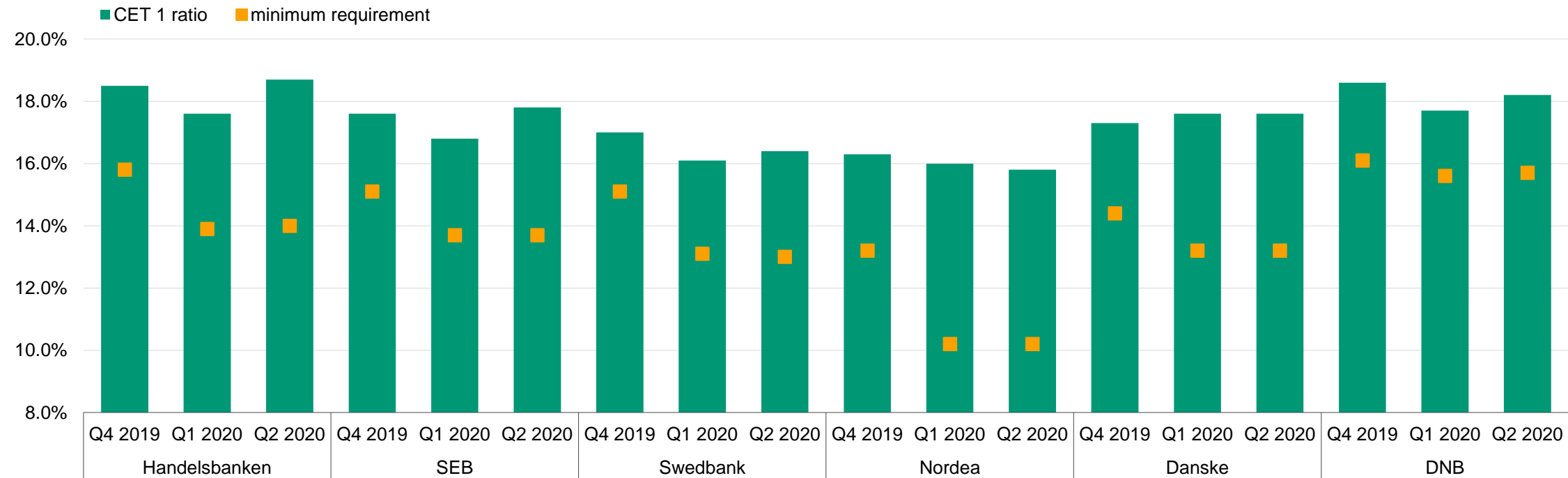
Note: i For Nordea, excluding AQR-related provisions, provisions / PPI falls to less than 10% for Q3 2019. ii PPI excludes the impact of money-laundering fines imposed on Swedbank in Q1 2020 and SEB in Q2 2020, and impairment of capitalised IT systems for Nordea in Q3 2019.

Source: Moody's Investors Service, Banks' financial statements



# Capital buffers remain robust

## Quarterly evolution of CET1 ratios and requirements



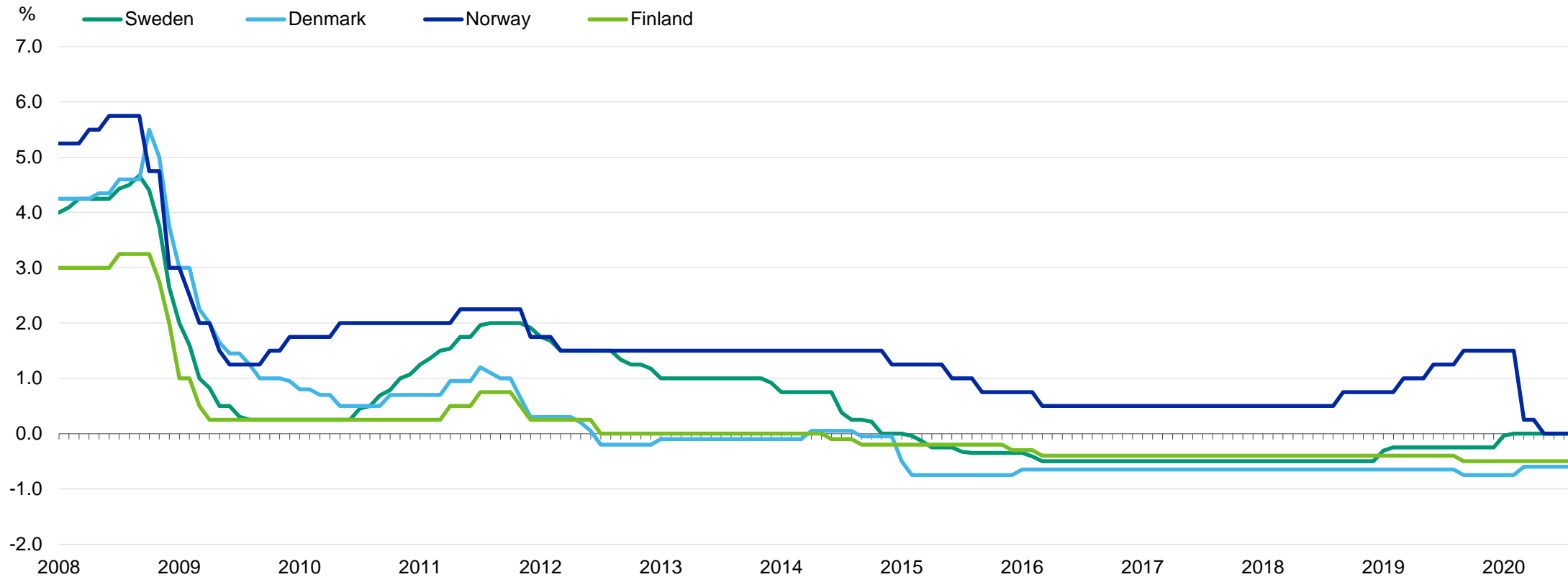
Note: CET1 requirements dropped in Q1 2020 due to the relaxations by various authorities, including relaxation of countercyclical buffers (CCyB). DNB's capital requirement fell less than peers.

Source: Moody's Investors Service, Banks' financial statements

3

Low for longer interest  
rates

# Central bank policy rates for the Nordic countries fell sharply



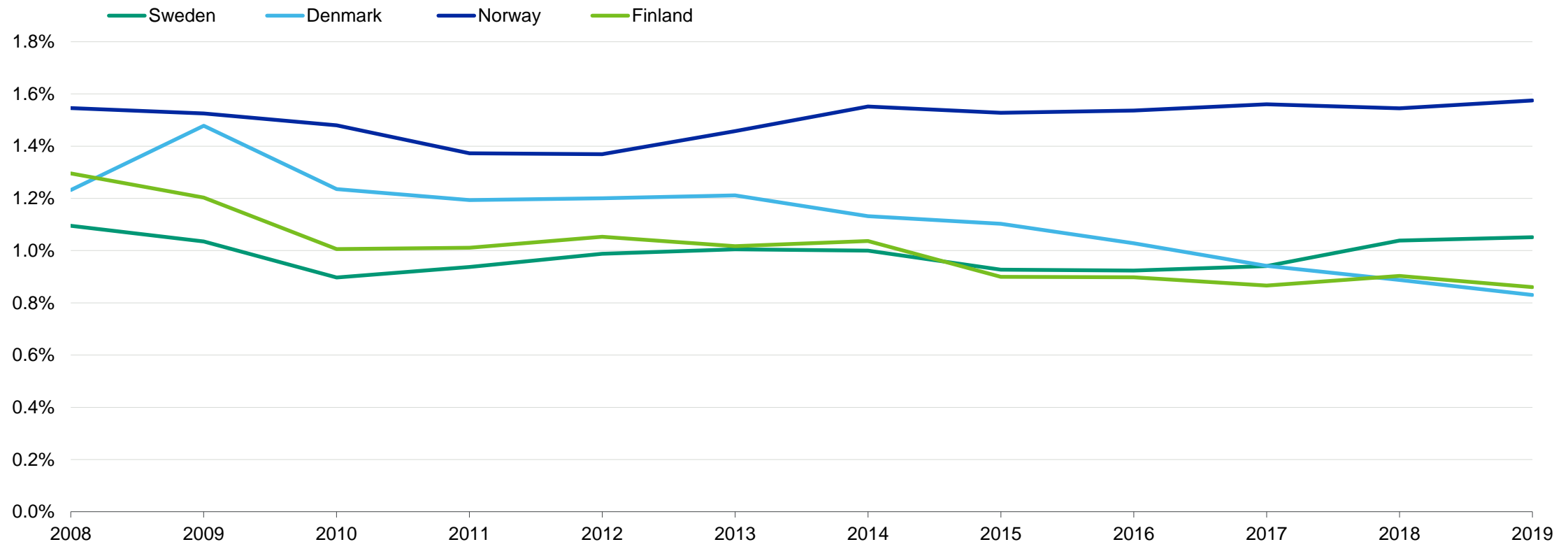
Note: Sweden: repo rate; Denmark: certificates of deposits; Norway: banks' overnight deposits; Finland: ECB deposit facility rate

Source: Central banks



# Net interest margins (NIMs)

NIMs have remained resilient in Sweden and Norway but fallen in Denmark and Finland



Note: Net interest margin = net interest income as % of average interest-bearing assets

Source: Moody's Investors Service

A nighttime photograph of a city skyline, likely Hong Kong, featuring numerous illuminated skyscrapers. In the foreground, a complex multi-level highway interchange is visible, with light trails from moving vehicles. The sky is dark with some clouds.

MOODY'S  
INVESTORS SERVICE

Access is everything™

Louise Lundberg  
Vice President – Senior Credit Officer  
Phone: +46 (0)8 517 712 80  
[Louise.lundberg@moodys.com](mailto:Louise.lundberg@moodys.com)

[moodys.com](http://moodys.com)

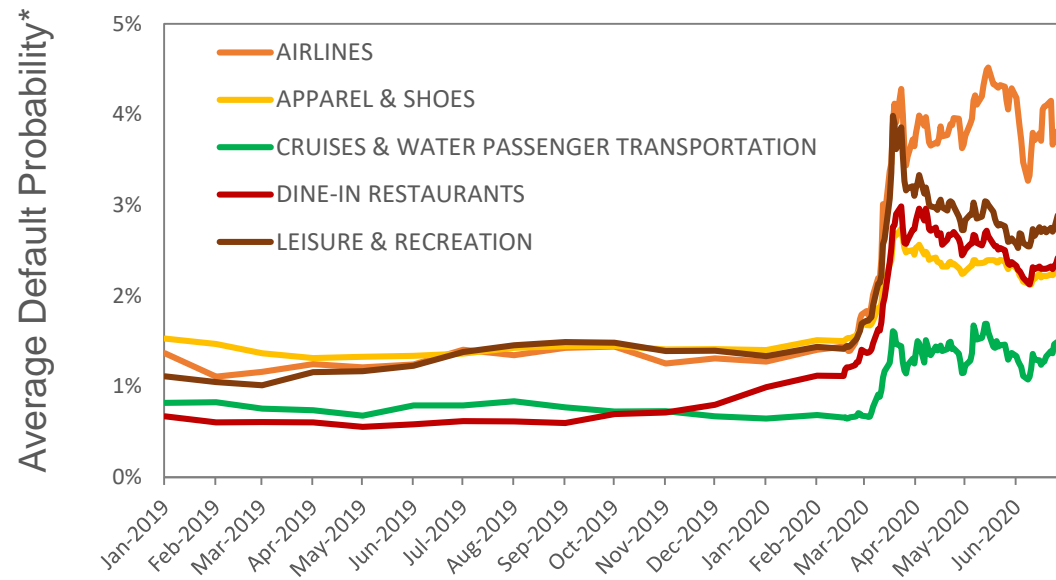


# Part 2: Impact of COVID-19 on Corporate Credit

# Empirical Patterns

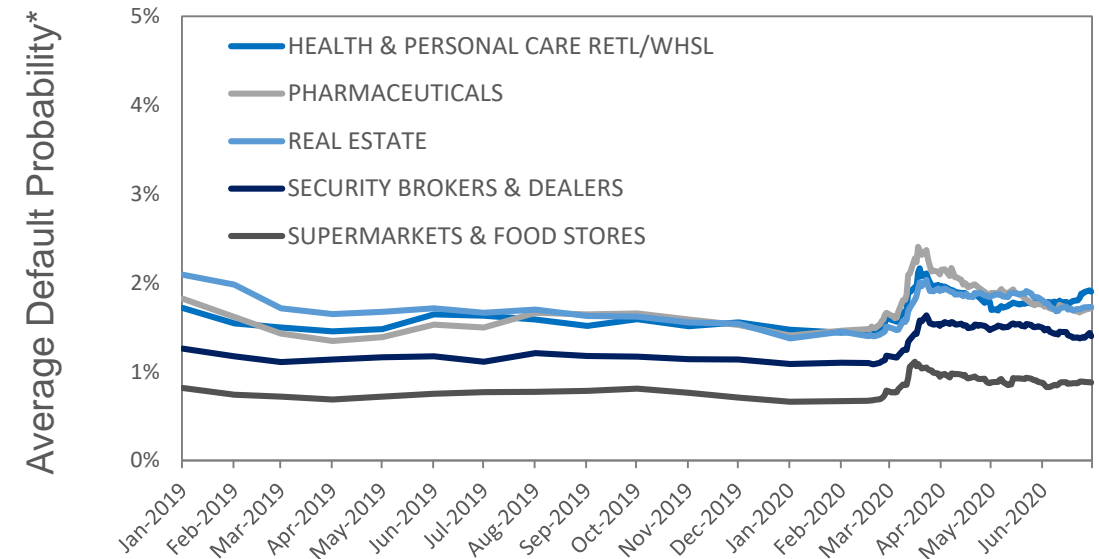
Globally, which industries have been impacted most severely?

**Industries Most Impacted by COVID-19**



\*Measured using Moody's EDF based on Global Sample with EDF < 10% as of 12/31/2019

**Industries with Mild Impact to COVID-19**



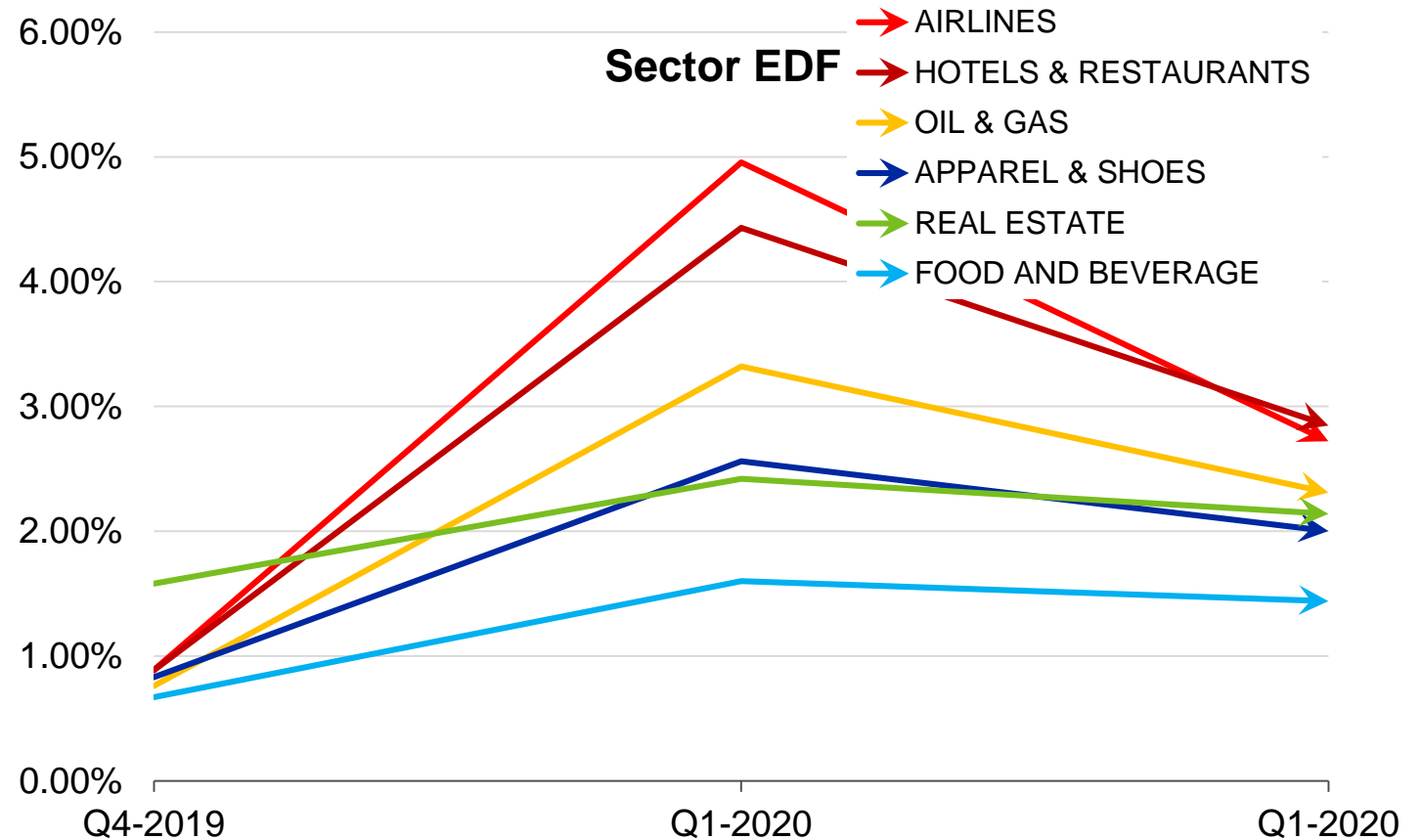
\*Measured using Moody's EDF based on Global Sample with EDF < 10% as of 12/31/2019



# COVID – 19 Impact on Corporate Default Risk

## Variation across sectors (Sweden)

- » All Industries across the board has seen an increase in risk
- » Relative riskiness of the industry sectors has changed
- » Air Transportation, Oil, Gas & Coal Expl/Prod, Hotels & Restaurants, Consumer Products, Entertainment & Leisure experienced large swings in Q1 and Q2.
- » Utilities, Real Estate and Paper industries have seen relatively less impact
- » Implications for IFRS 9 Provisions of Banks

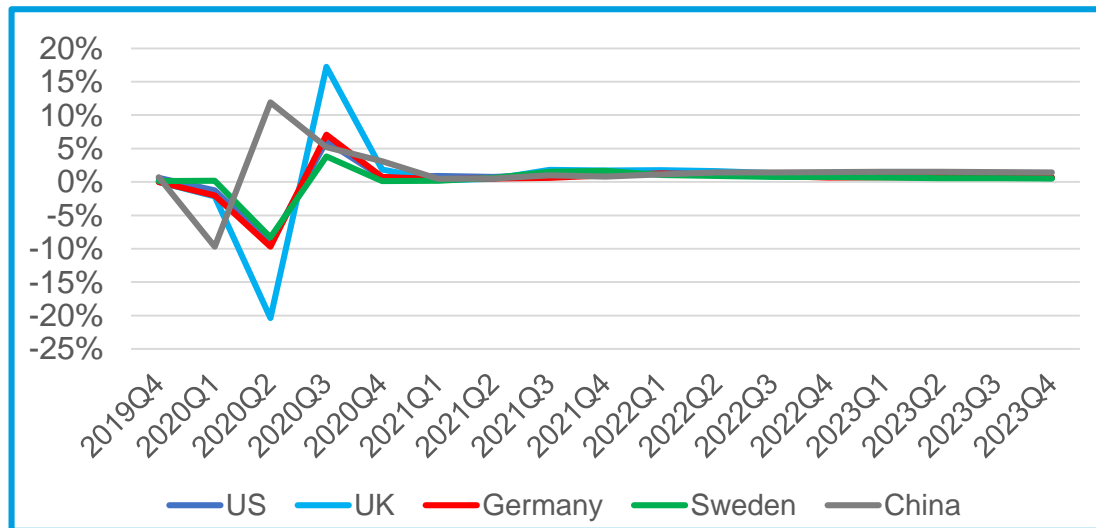


Source: Moody's Analytics EDF™ Credit Measure and Point in Time Converter Model, aggregated values for Sweden

# Forecasting Corporate Credit Risk

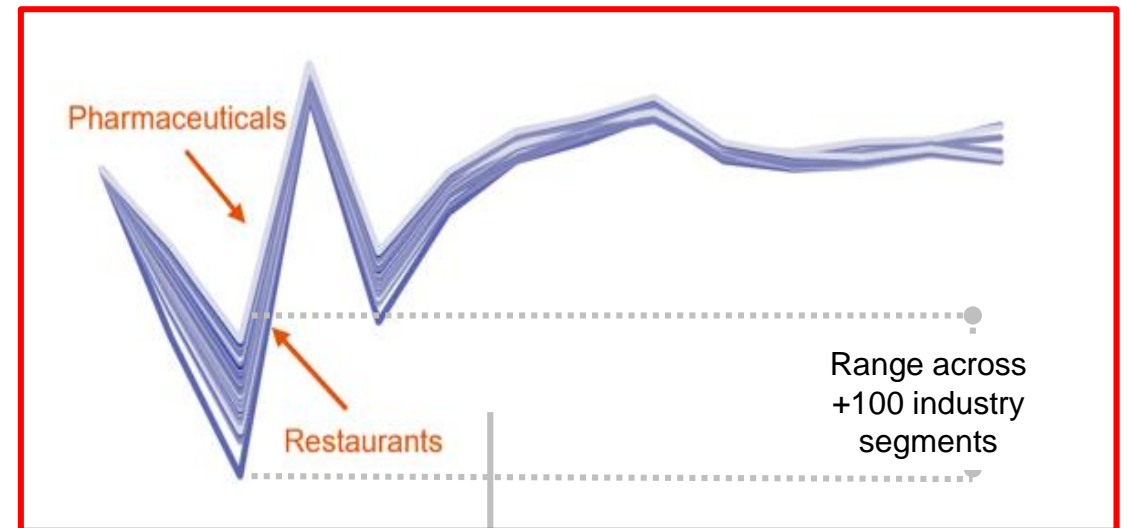
Industry overlay model to capture the pandemic impact

## QUARTERLY GDP GROWTH



Source: Moody's Analytics August Economic Scenarios

## CROSS-SECTIONAL COVID-19 OVERLAY MODEL



Economic scenario unfolding

Recovery begins

There is a Wide Range of Economic Forecasts

Sources: Moody's Analytics  
SEB, ECB

SEB

**Unprecedented halt, despite record stimulus** "...According to the main scenario in SEB's new Nordic Outlook forecast, GDP in the developed countries will shrink by 7 per cent in 2020, followed by an upturn of 5 per cent in 2021. "

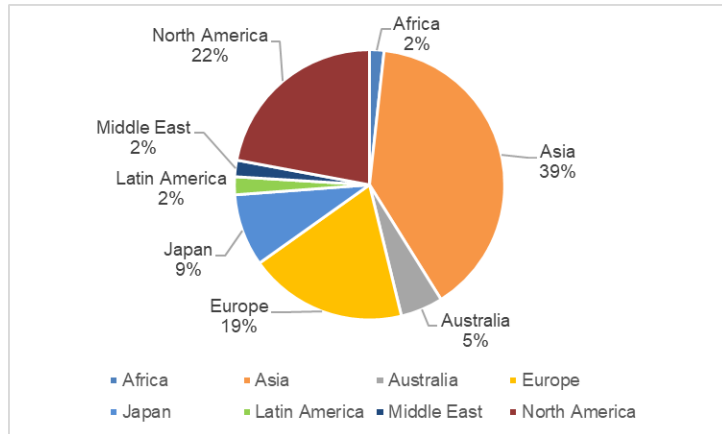


"Global real GDP (excluding the euro area), after contracting by 3.7% in 2020, is projected to rebound and grow at 6.2% in 2021 and 3.8% in 2022. The recovery in the level of activity, however, is incomplete. Some forms of social distancing are assumed to remain in place ..."

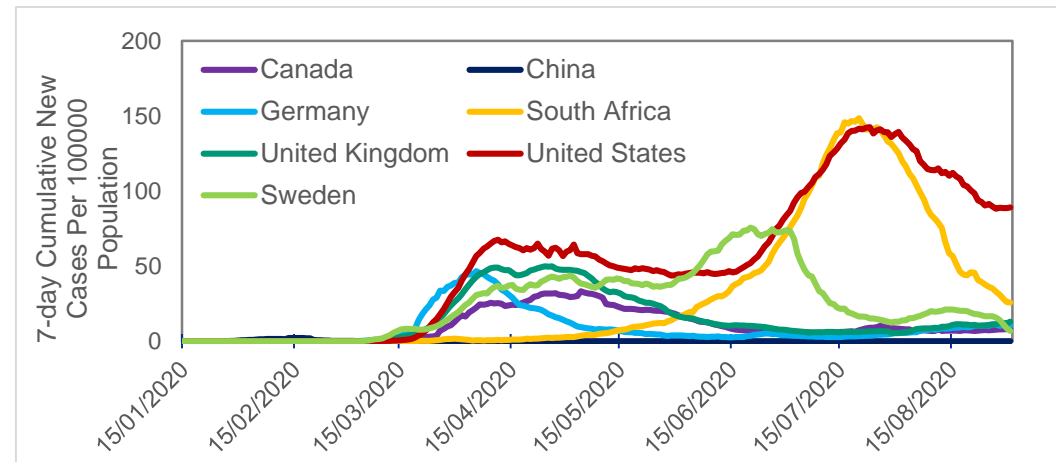
# Incorporating Epidemiological Dynamics

Similarities across segments after controlling for epidemic variation

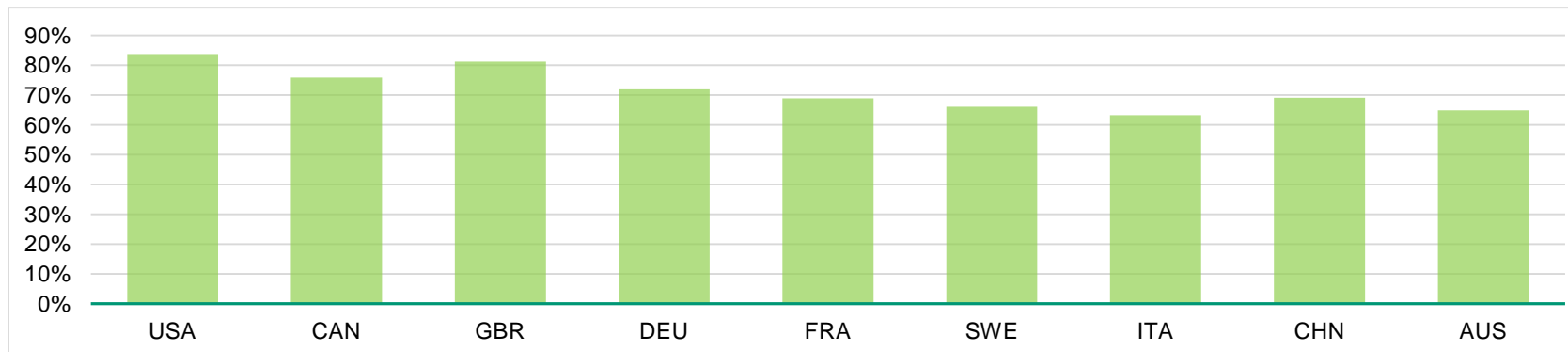
**EDF CREDIT MEASURE**  
(Global Sample of ~ 46,000 Firms)



**WINDOWS FOR DIFFERENT COUNTRIES**  
BASED ON DAILY COVID-19 CASES



**CORRELATION BETWEEN SEGMENT RANK WITHIN COUNTRY AND GLOBAL RANK**



# Expected Defaults: Sweden, Select Industries:

Average One-year Default Probabilities (Dec 2019 to Dec 2020)															
Industry	Sweden Public Firms					Germany Public Firms					UK Public Firms				
	EDF	Baseline	Baseline	S4	S4	EDF	Baseline	Baseline	S4	S4	EDF	Baseline	Baseline	S4	S4
	31-Dec-19		With C-S COVID19 Overlay		With C-S COVID19 Overlay	31-Dec-19		With C-S COVID19 Overlay		With C-S COVID19 Overlay	31-Dec-19		With C-S COVID19 Overlay		With C-S COVID19 Overlay
Leisure & Recreation	2.09%	2.85%	4.15%	3.98%	6.40%	0.13%	0.28%	0.55%	0.35%	0.70%	0.20%	0.82%	1.63%	0.98%	1.95%
Clothing and Non Durables Retl/Whsl	2.96%	3.92%	6.12%	5.11%	8.61%	4.54%	7.47%	10.37%	8.61%	12.09%	2.07%	4.55%	5.83%	5.19%	6.68%
Computer Software	1.14%	1.61%	1.58%	2.33%	2.27%	1.01%	1.84%	1.79%	2.18%	2.12%	1.03%	2.29%	2.27%	2.63%	2.61%
Investment Management	0.28%	0.40%	0.35%	0.69%	0.56%	0.55%	1.06%	0.98%	1.28%	1.18%	0.17%	0.75%	0.61%	0.88%	0.72%

Leisure & Recreation  
relative  
performance  
deteriorates  
with C-S  
COVID Overlay

Investment  
Management  
relative  
performance  
improves with  
C-S COVID  
Overlay

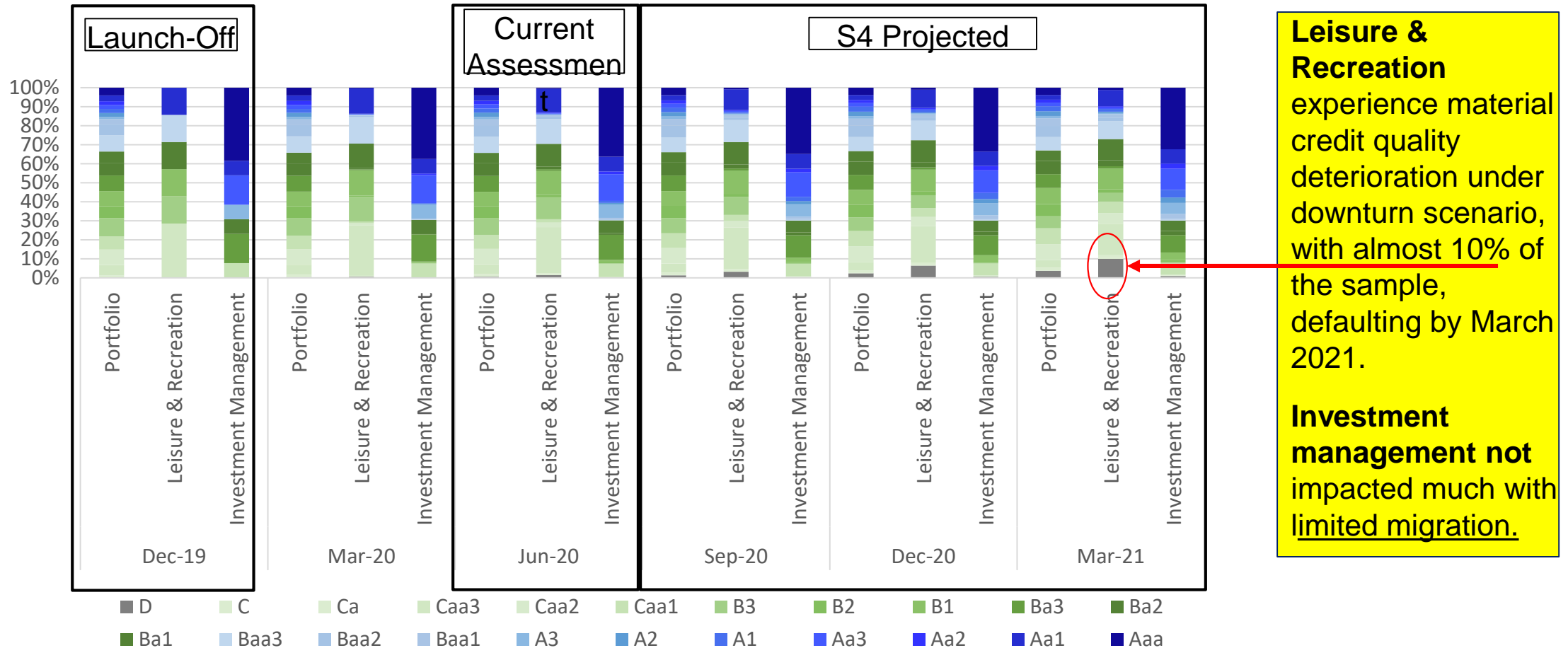
## NOTES

- August vintage scenarios (*realized shocks for 2020 Q1 and 2020 Q2, projected shocks for 2020 Q3 and 2020 Q4.*)
- Cross-Sectional COVID Overlay Model as of September, 2020.

- » While all industries exhibit deterioration under the S4 Scenario, the Cross-Sectional COVID19 Overlay recognizes industries most impacted.
- » Traditional stress testing models are calibrated using historic relationships between macroeconomic variables and credit losses. They will not capture the current variation due to COVID-19 in loss across industries.

# Impact on the Composition of Ratings - Sweden

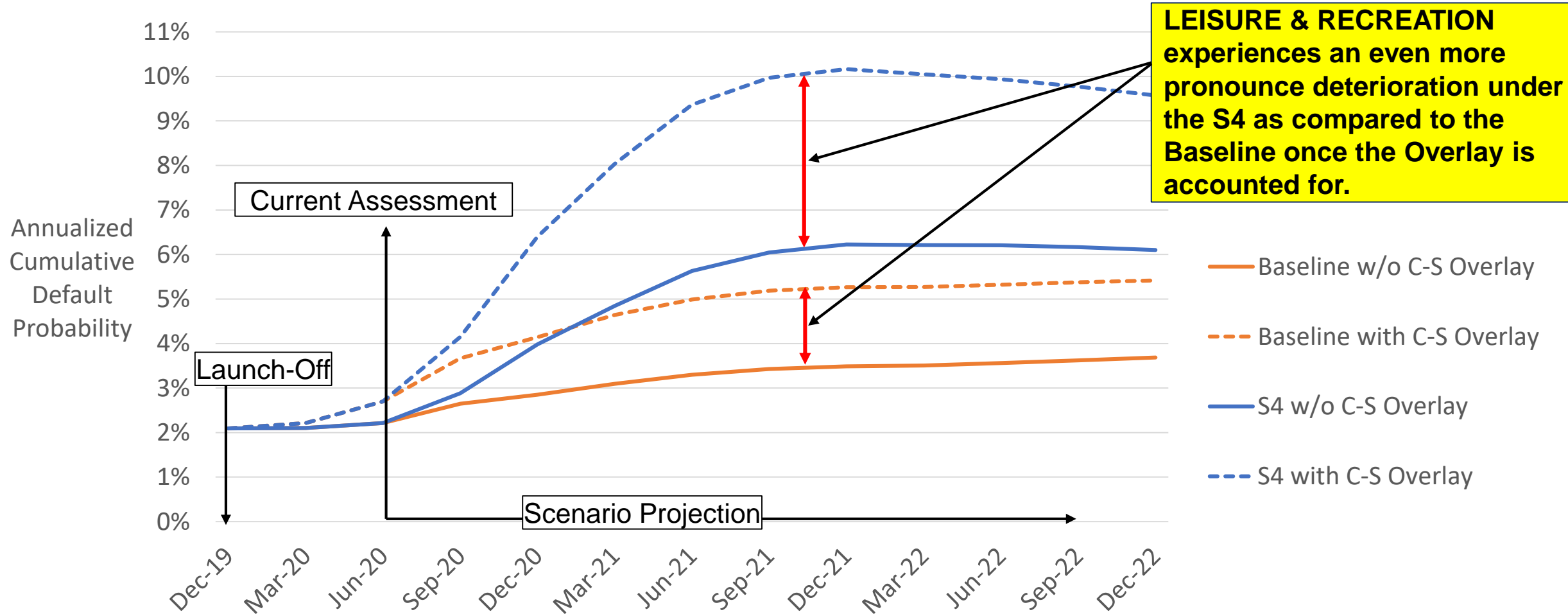
Realized through June and projected under S4 with C-S Overlay





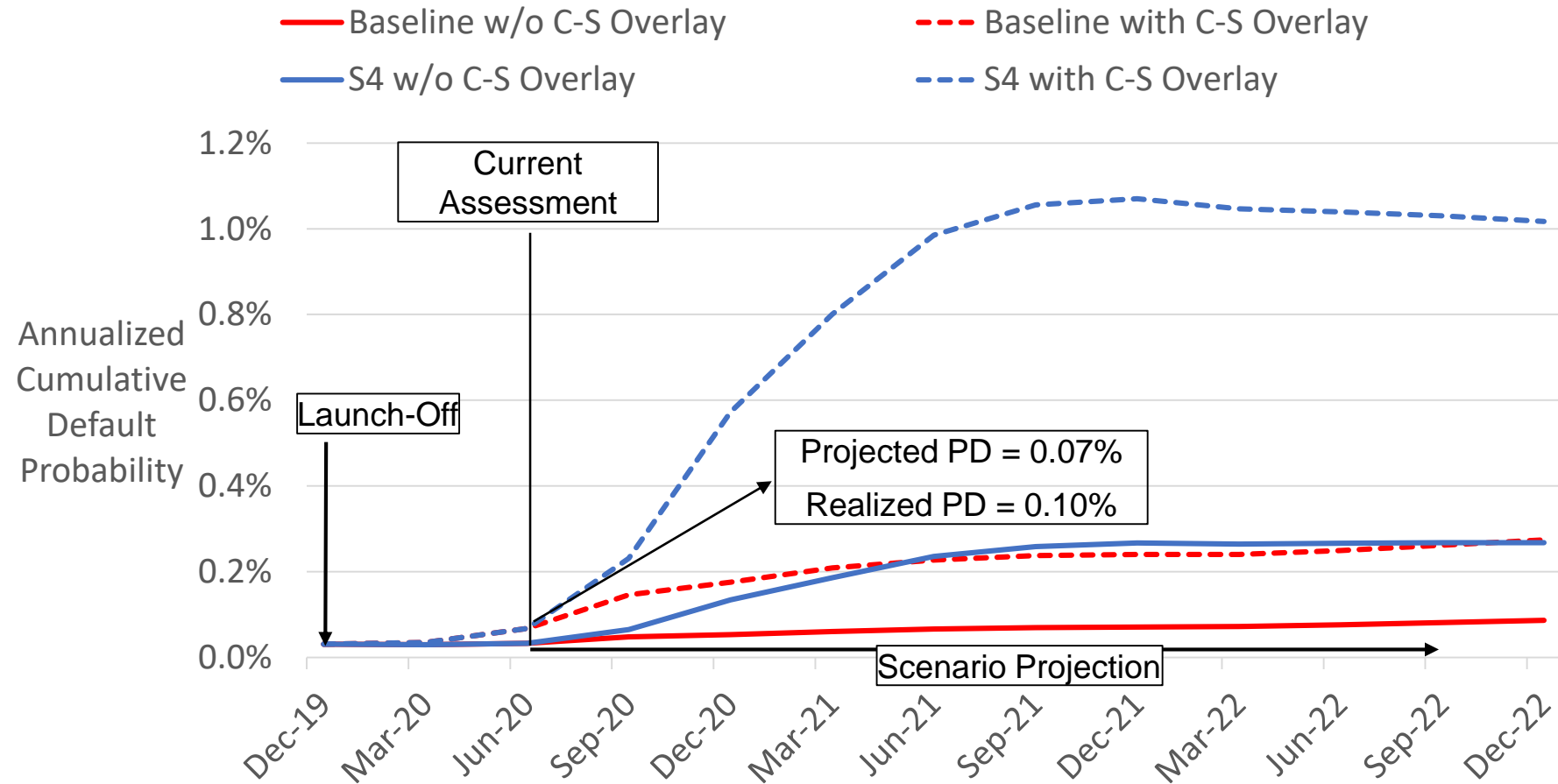
# Default Probability Assessment and Projection

## Leisure & Recreation Sector – Sweden



# PD Current Assessment and Projection

Hennes & Mauritz AB



# Remarkable Fiscal and Monetary Response

A range of responses with varying timelines and effectiveness



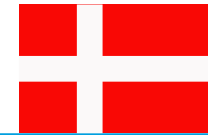
The first confirmed COVID-19 case was reported on January 31, 2020.



The first confirmed case was reported on January 29, 2020



The first confirmed COVID-19 case was reported on February 26, 2020.



First confirmed cases of COVID-19 on February 27, 2020.

- » **Fiscal:** Capital injections, liquidity support and guarantees amounts to SEK 564 billion to SEK 852 billion (11.2 to 17.0 percent of 2019 GDP, respectively)
- » More funding to the **media, cultural and sports sectors and for education** and training, initiatives for **green jobs**, capital injections to **SAS**, credit guarantees for Swedish **airlines**
- » **Monetary:** reduction of the lending rate for overnight loans, lending of up to SEK 500 billion to companies via banks; a new lending facility to banks for unlimited amounts, increase of purchases of securities of up to SEK 500 billion this year and next, swap facility with US FED, **USD 60bn...**

- » **Fiscal:** Tax and spending measures (close to 3% of GDP), **healthcare** and **testing**, protection and **medical equipment**, grants to **SMEs** and **self-employed**
- » Automatic stabilizers to increase the fiscal deficit by about **4-5.0 percentage points of GDP**.
- » **Monetary:** Support liquidity through investing in short-term Finnish corporate commercial paper (€1 billion); removing the systemic risk buffer (increases Finnish banks' international lending capacity to households and firms, Export Credit Agency is expanding its lending and guarantee capacity to SMEs by €10bn...

- » **Fiscal:** Close to NOK 160 billion, or **5.5 % of 2019** mainland GDP, expenditure measures, revenue measures
- » Guarantee and loan schemes, subsidy for business, support, **construction and transportation, education**
- » **Monetary:** Policy rate reduction to to 0.0 percent, additional liquidity to banks (loans), swap facility of USD 30 billion between (US Federal Reserve.
- » Easing of countercyclical capital buffer and the liquidity coverage ratio, temporary easing of mortgage regulations, urging institutions to not distribute profits.

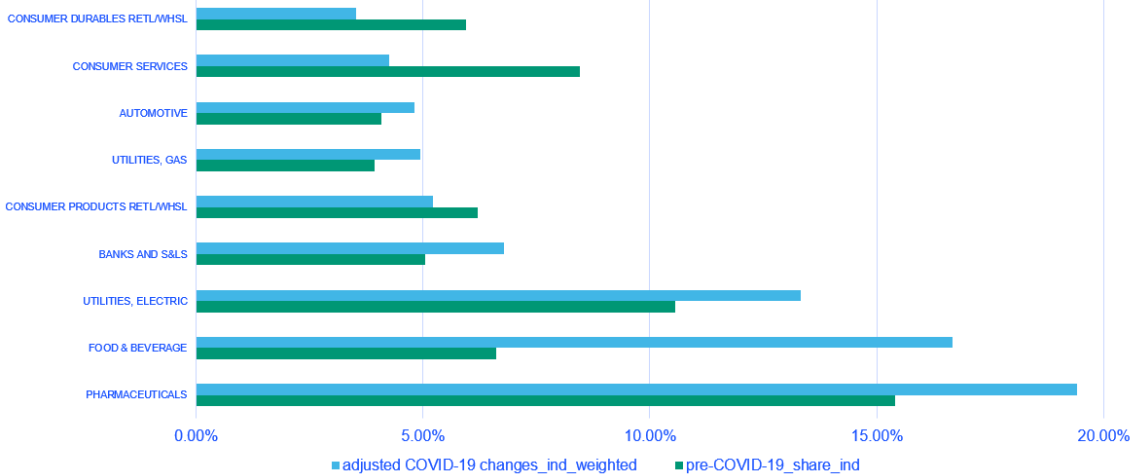
- » **Fiscal:** Discretionary support DKK 131.4 billion (**5.7% of 2019 GDP**): **Healthcare**, support workers and businesses
- » **Fiscal:** 5.1 % of 2019 GDP in countercyclical support (automatic stabilizers).
- » Recapitalize **Scandinavian Airlines** with up to DKK 6 billion.
- » **Monetary:** Increased the policy rate by 15bps to -0.6 percent. Swap line with ECB (EUR 24 billion). Agreement with the Federal Reserve to establish a USD 30 billion swap line, an 'extraordinary lending facility'
- » ...

# Quantifying Targeted Stimulus Across Segments

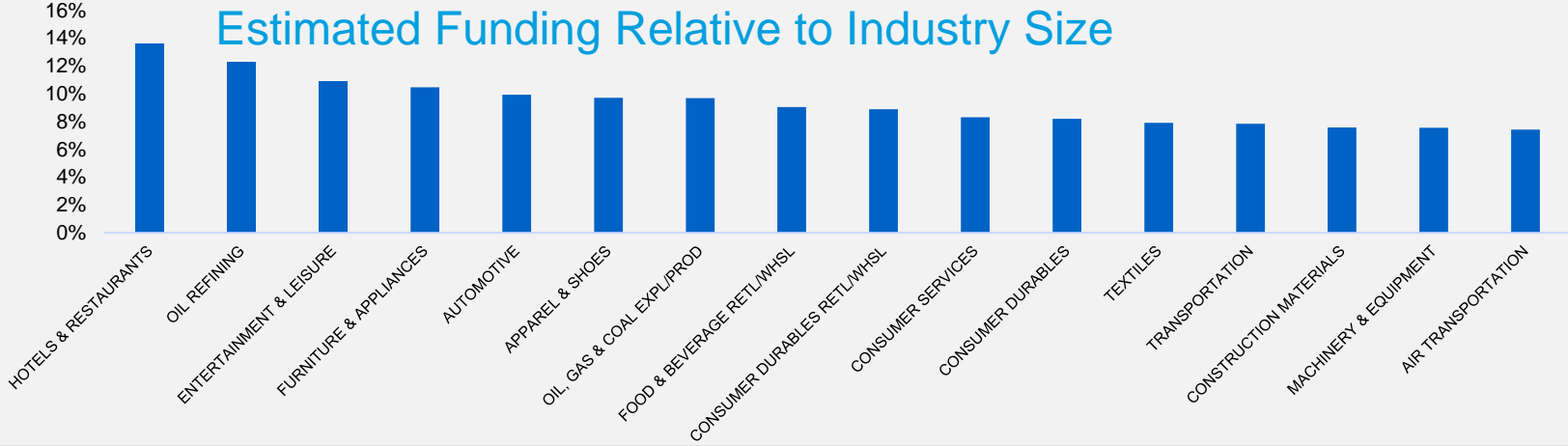
Aid Directly Targeting Corporate Segments  
Industries Most Severely Impacted by COVID-19

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



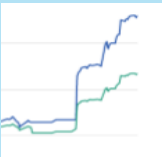
Determine industries modeled to be the most impacted by the stimulus plan.



# COVID-19 Analytics and Data

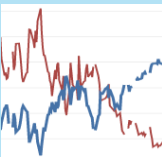
## Combining Cross Sectional and Fiscal & Monetary Overlays

### ASSESSING WHAT HAS HAPPENED SO FAR



Elevated :

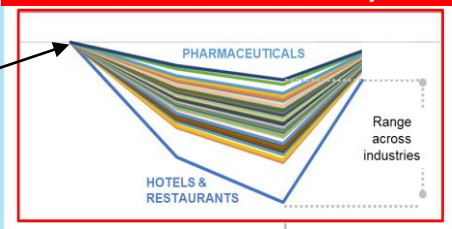
- default probabilities
- expected loss



Varying performance of segments, industries & names

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

#### Cross-Sectional COVID-19 Overlay Model

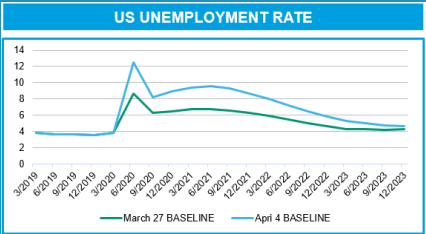


### CURRENT INTERNAL RATING ASSESSMENT

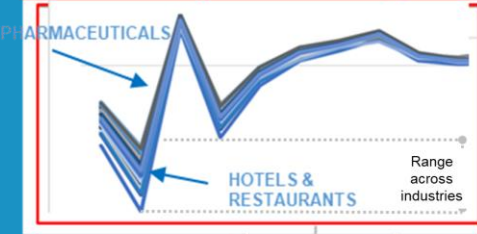
Current-State Internal Rating Assessment				
Industry	Investment Grade		High-Yield	
	Rating Dec 31, 2019	Rating Assessment April 29, 2020	Rating Dec 31, 2019	Rating April 29, 2020
PHARMACEUTICALS	Baa2	Baa3	B2	B3
HOTELS & RESTAURANTS	Baa2	Ba2	B2	B3
AIR TRANSPORTATION	Baa2	Ba2	B1	B2
CAST MEDIA	A2	Baa1	B3	B4
MERCHANDISE DURABLES	Baa2	Ba1	B2	B3

### PROJECTING WHAT MIGHT HAPPEN NEXT?

#### Varying macro scenarios

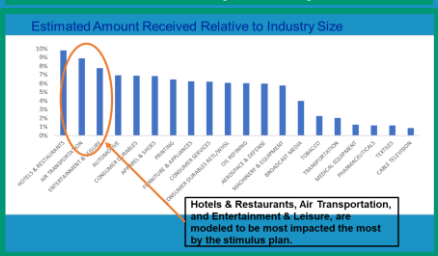


#### Cross-Sectional COVID-19 Overlay Model



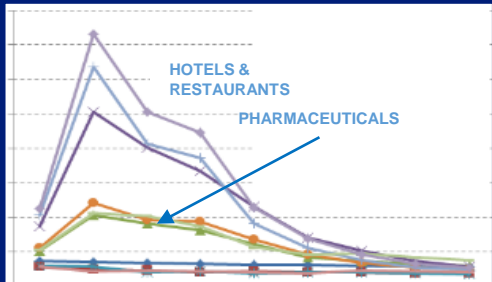
Economic scenario unfolding      Recovery begins

#### Fiscal & Monetary Overlay Model



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

### PROJECTED RATING AND LOSS MEASURES





Metin Epozdemir  
Director, Risk and Finance  
Phone: +44 (207) 772-1567  
[Metin.Epozdemir@moodys.com](mailto:Metin.Epozdemir@moodys.com)

# Part 3: ESG and climate risk focus – credit after COVID-19

# What is the main challenge on ESG and climate risk?

**ESG data/ coverage/ methodology**

**Lack of standard/ taxonomy**

**Identification of the right KPIs**

**Physical/ transition risk assessment**

**Integration of ESG-drivers within credit risk**

**Coverage of ESG data on unlisted firms/ SMEs**

# Moody's Analytics interviewed 50+ institutions

## To understand ESG/Climate Risk best practices and challenges

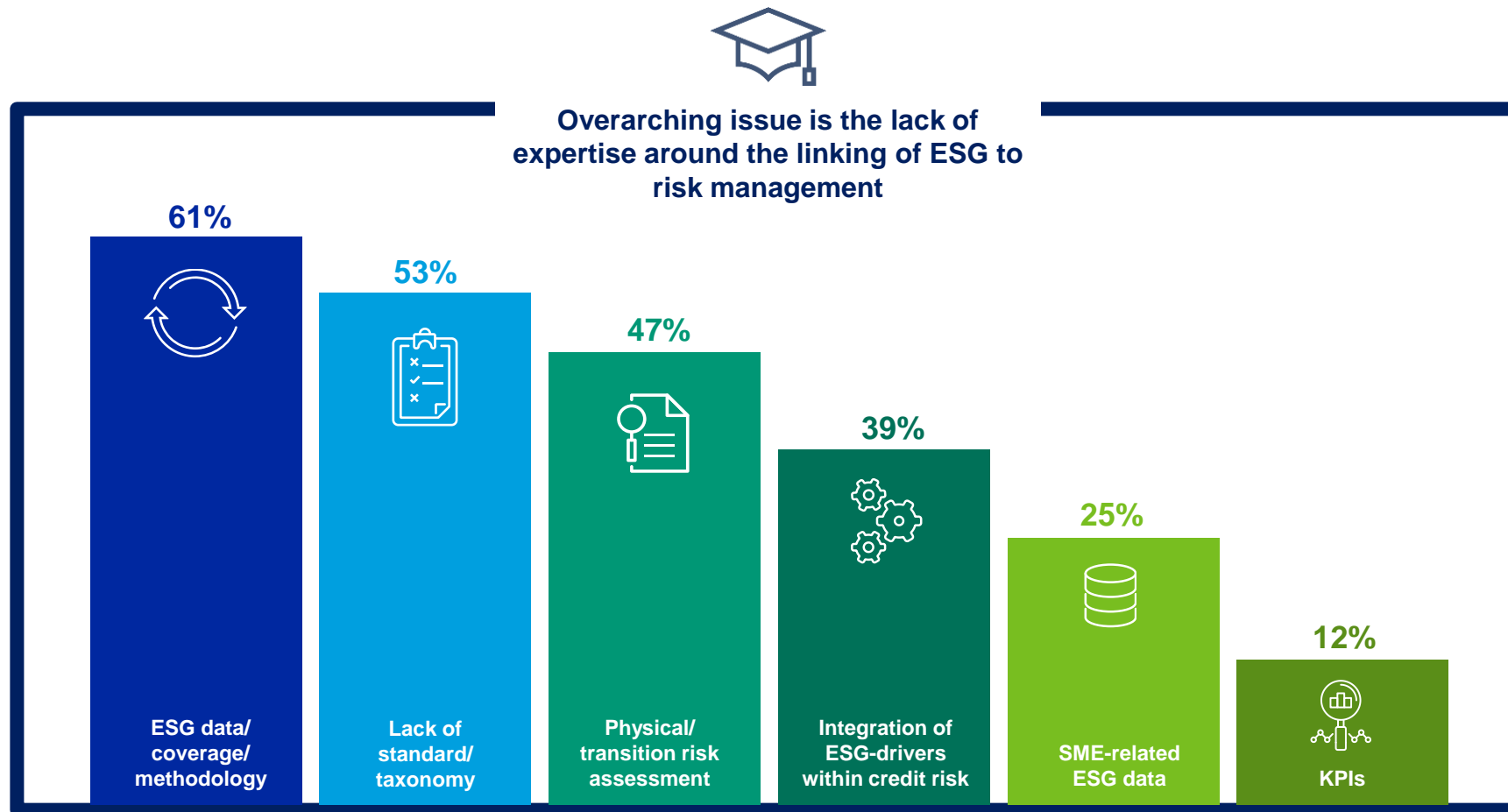


Illustration of key challenges mentioned; based on a sample of 50+ interviewees; does not include less frequently mentioned challenges.

# The increasing relevance of ESGC

Pushed forward by COVID event

## ESG/ Climate Change



Over the past 12-18 months, the topic of ESG / climate change has gained exponential momentum within financial/ non-financial institutions through:

- stakeholder focus
- social pressure
- regulatory landscape changes

**Stressed ESG scores**

## Paradigm Shift



The financial services industry is witnessing a 'paradigm' shift; the topic of ESG has been:

- embedded by **banking regulatory requirements**
- used to strategically address institutions' lending / investment decisions

**Shape resource allocation**

## Challenges



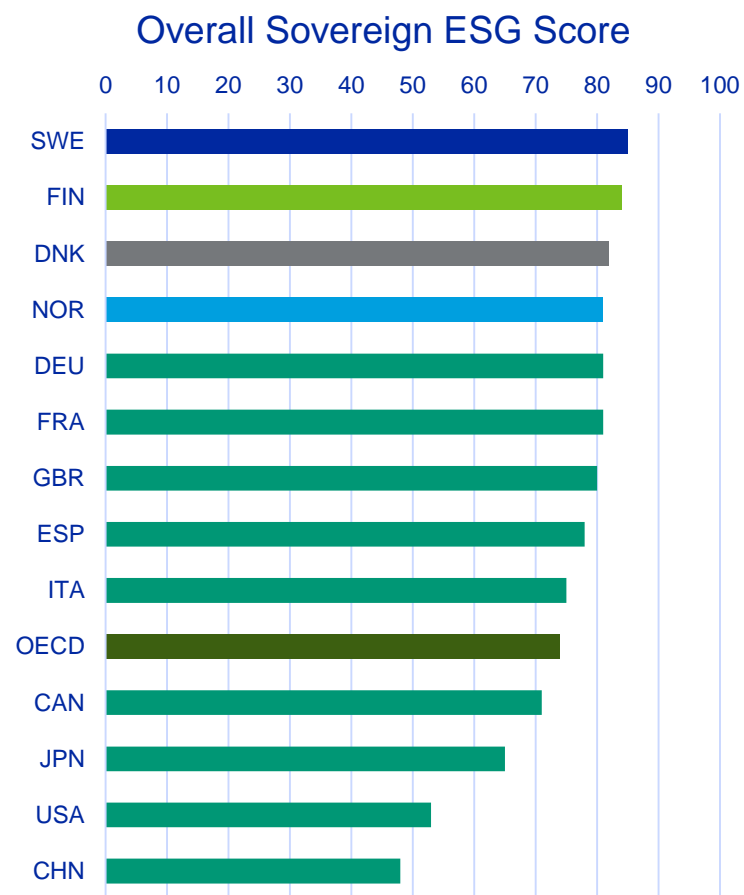
Despite regional variance in the advancement of understanding ESG/ climate change-related issues, there is a Europe-wide challenge around successfully integrating these factors within the risk management frameworks

**Speed up the transformation**



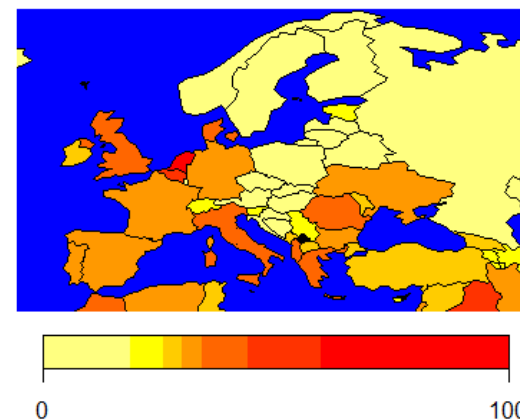
# Is ESGC a material risk for Nordics banks?

North European Nations Are Leaders in Sustainability

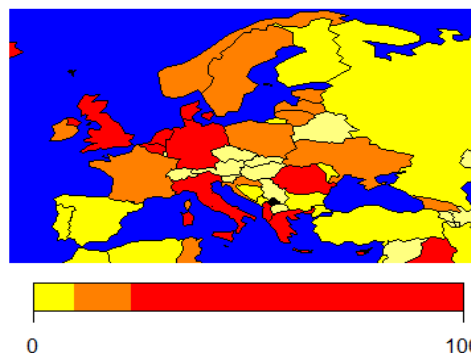


Source: Vigeo Eiris, 427, Moody's Analytics

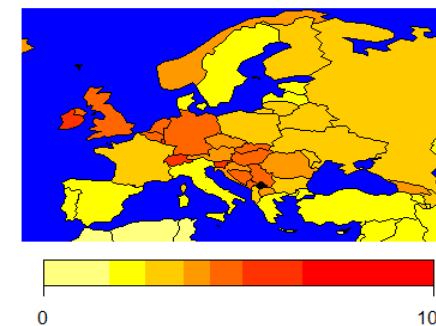
Overall Climate Risk



Sea Level Rise Risk



Extreme Precipitation Risk



# The challenges of building climate-related financial metrics

## Identification

- » Lack of information and weak data quality
- » Lack of common standards and granular indicators
- » Inconsistent historical information and coverage
- » Weak understanding of ESG/climate risk implication

## Quantification

- » New modelling practices
- » Combination of systemic and idiosyncratic risks
- » Integration of climate risk scenarios

## Management

- » Do all automakers need to become like Tesla?
- » Is it only a regulatory compliance project?



- » **Multiple leading sources** of information on climate related information
- » **Economic and Business Analytics consulting** already engaged with European Financial Institutions on climate-related scorecard
- » **Climate risk scenario capabilities**
- » **Established evaluation approaches** for financial risk
- » **Building expertise** around TCFD

# Key aspects to consider

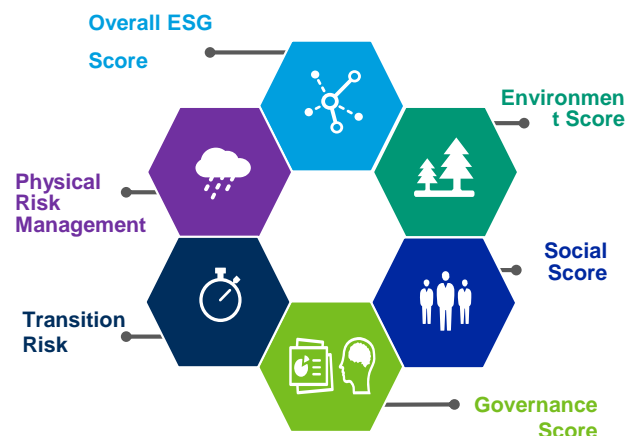
Moody's framework targeting the key ESGC challenges



FROM CLIMATE RISK TO CLIMATE-RELATED FINANCIAL RISK METRICS

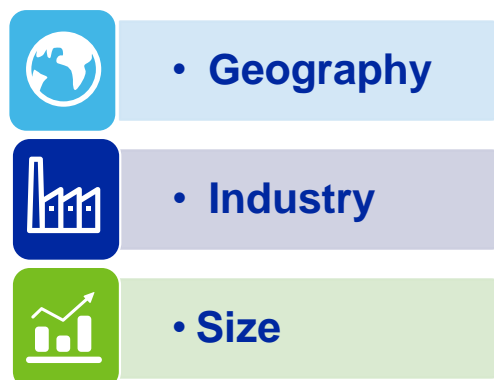
## 1 Granular ESGC Scores

» Granular scores and sub-scores most relevant to your portfolio



## 2 Full coverage

» Identification of comparable entities and estimation of ESGC scores



## 3 Systemic cost

» Quantification of the systemic cost of transition and associated global warming related physical risk



## 4 Idiosyncratic features

» Estimation of firm's exposure to physical / transition risk

Industry	Global ETS score	Global SOC score	Global GDI score
Agriculture & Food			
Chemicals			
Real Estate			
Electronics			
Holding			
Intermediates (Industry)			
Wholesale			
Services			
Transportation			
Utility and Energy			

Shortlist of 4 selected Level 3 drivers out of Human Rights, HRs, Business Behavior, Community involvement				
Industry	Discrimination Prevention	Responsible Reorganization	Product safety	Economic Development
Agriculture & Food				
Chemicals				
Real Estate				
Electronics				
Holding				
Intermediates (Industry)				
Wholesale				
Services				
Transportation				
Utility and Energy				

# Linking ESGC to credit risk

Credit risk is the key banking risk for a climate-adjusted framework

## ESG/Climate Risk Metrics

- Coastal Zone
- Flood Zone
- ESG drivers
- Transition risk
- Physical risk management
- Emission Level
- Emission Intensity
- Embedded Emissions
- Energy Usage
- Energy Intensity
- Energy Mix
- Water Usage
- Water Intensity
- Water Source

## Credit risk assessment

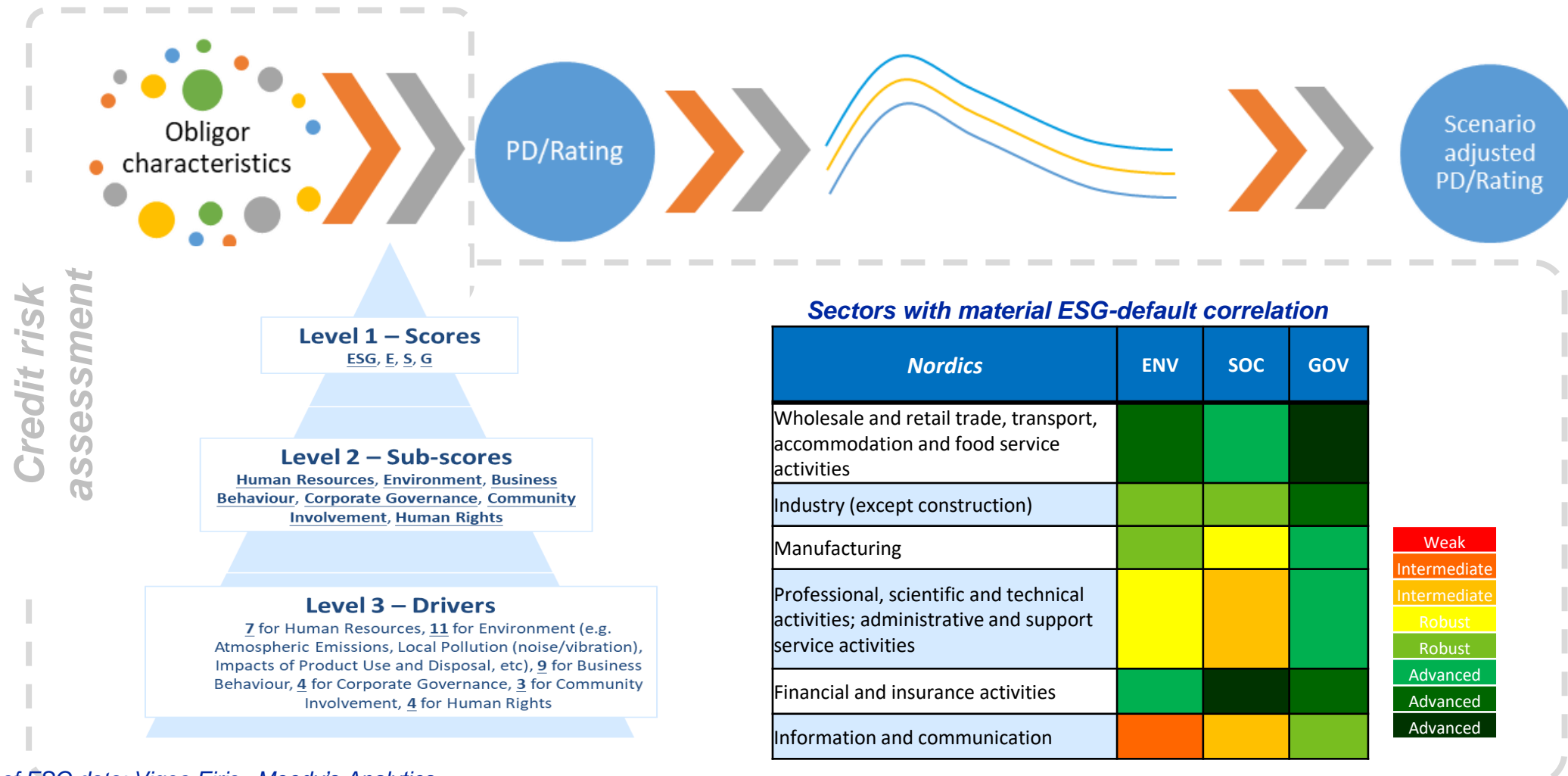
## Climate Scenarios

## Credit risk forecast



# Linking ESGC to credit risk

Nordic leadership in ESG reflected – but not in all E and S scores



Source of ESG data: Vigeo Eiris, Moody's Analytics



# Nordics: A Closer Look at Economic Activities

Nordics: leadership in ESG reflected – but not in all countries/industries

Denmark	ENV	SOC	GOV
Wholesale and retail trade, transport, accommodation and food service activities	Intermediate	Intermediate	Robust
Industry (except construction)	Robust	Robust	Robust
Manufacturing	Intermediate	Intermediate	Robust
Professional, scientific and technical activities; administrative and support service activities	Robust	Robust	Robust
Financial and insurance activities	Weak	Robust	Robust
Information and communication	Intermediate	Intermediate	Robust

Finland	ENV	SOC	GOV
Industry (except construction)	Advanced	Advanced	Advanced
Manufacturing	Robust	Robust	Advanced
Wholesale and retail trade, transport, accommodation and food service activities	Robust	Robust	Advanced
Real estate activities	Robust	Intermediate	Advanced
Professional, scientific and technical activities; administrative and support service activities	Advanced	Advanced	Advanced
Construction	Intermediate	Intermediate	Robust
Information and communication	Robust	Robust	Advanced
Financial and insurance activities	Intermediate	Robust	Robust

**Sectors with material ESG-default correlation**

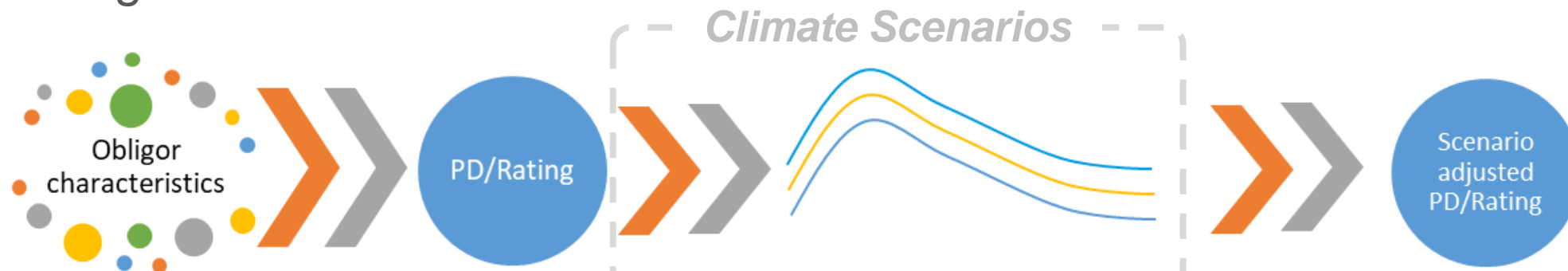
Norway	ENV	SOC	GOV
Industry (except construction)	Intermediate	Robust	Advanced
Professional, scientific and technical activities; administrative and support service activities	Intermediate	Intermediate	Advanced
Manufacturing	Intermediate	Robust	Advanced
Financial and insurance activities	Intermediate	Robust	Advanced
Information and communication	Robust	Robust	Advanced
Agriculture, forestry and fishing	Weak	Intermediate	Robust

Weak
Intermediate
Intermediate
Robust
Robust
Advanced
Advanced
Advanced

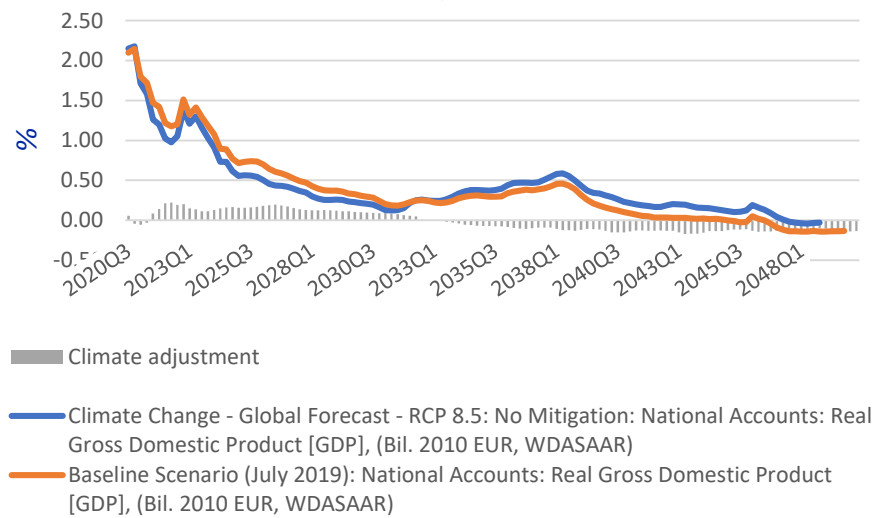
Sweden	ENV	SOC	GOV
Public administration, defence, education, human health and social work activities	Weak	Weak	Robust
Industry (except construction)	Robust	Robust	Advanced
Wholesale and retail trade, transport, accommodation and food service activities	Robust	Robust	Robust
Manufacturing	Robust	Robust	Advanced
Professional, scientific and technical activities; administrative and support service activities	Weak	Intermediate	Robust
Real estate activities	Intermediate	Intermediate	Robust
Information and communication	Weak	Intermediate	Robust
Construction	Robust	Robust	Advanced
Financial and insurance activities	Intermediate	Intermediate	Robust
Arts, entertainment and recreation; other service activities; activities of household and extra-territorial organizations and bodies	Weak	Intermediate	Robust

# Linking CC to credit risk

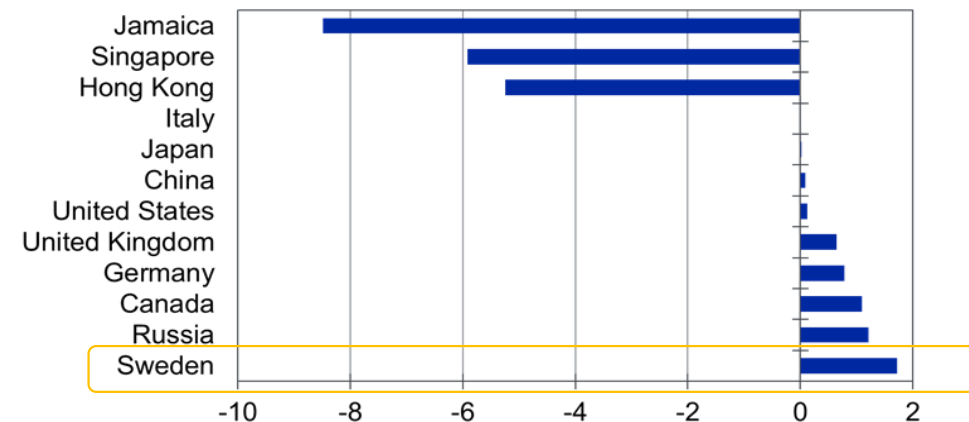
Nordics: minor GDP implications, but certain sectors can achieve material positive/negative results



Annualized growth GDP, Finland



Colder Countries Benefit, 3°C increase on Tourism



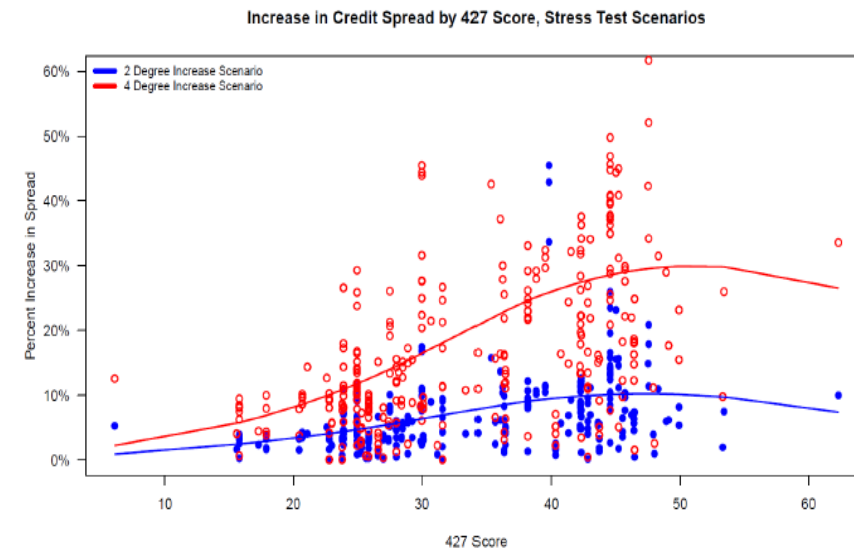
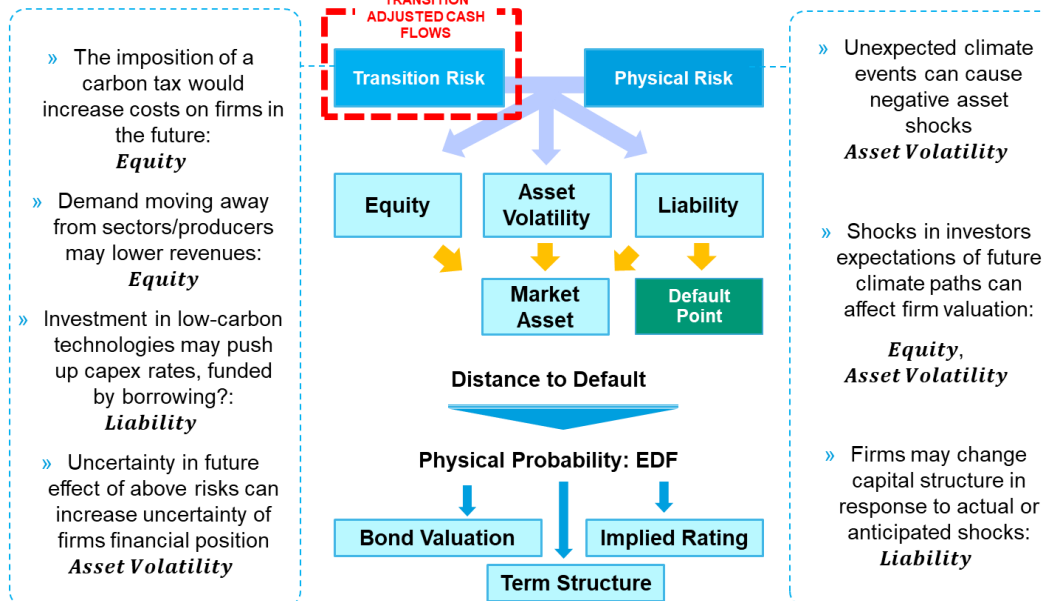
Source of data: Moody's Analytics

# Linking CC to credit risk

Nordics: material financial implications don't necessarily follow climate risk exposure



Credit risk forecast



# Linking CC to credit risk

Nordics: material variability of energy transition scores across the sectors

» Economic forecasts from Moody's Climate Change Macroeconomic scenarios

» GCAM provides Prices, Quantities, Costs, and Demand Elasticities by detailed Sector and Region

» Vigeo Eiris Energy Transition Scores and underlying drivers

» Data underlying these scores and from outside sources (e.g. Scope 1,2, and 3 Emissions)

» Calibrating the impact over Equity / Asset volatility / Liability

» Computing the calculation of EDF / Credit Spread / Bond values and estimation of the PD term structure

Nordics Sample (164 firms)				
Industry	Carbon emission (Scope 1 and 2)	ET score average	ET score StDev	Max ET score
Industrials	57,967,887	35.6	16.2	66.0
Utilities	47,891,976	32.8	16.1	60.0
Transport	43,214,256	27.0	5.7	34.0
Chemicals & Pharmaceuticals	22,400,488	31.7	15.6	60.0
Travel, Tourism & Leisure	4,620,959	16.4	18.2	52.0
Technology & Telecommunications	3,329,749	37.9	20.9	71.0
Financials & Insurance	2,585,970	29.4	18.8	62.0
Business Services	2,580,800	26.6	12.5	44.0
Food & Beverage	1,467,561	20.3	13.1	46.0
Construction	1,278,836	27.5	13.7	45.0
Retail	1,165,945	45.7	7.8	61.0

Industrial Sample (34 firms)				
Industry	Carbon emission (Scope 1 and 2)	ET score	ET score StDev	Max ET score
Denmark	2,142,784	31.3	17.3	55.0
Finland	16,435,861	42.0	10.8	65.0
Norway	32,744,868	17.8	17.9	46.0
Sweden	6,644,374	39.9	11.9	66.0
Industrial	57,967,887	35.6	16.2	66.0

Weak
Limited
Robust
Advanced

Source of ESG data: Vigeo Eiris , Moody's Analytics

# Linking CC to credit risk

Nordics: it's not only about sea level rising and precipitation risk in Norway

» Economic forecasts from Moody's Climate Change Macroeconomic scenarios

» Damage Estimates from specific Integrated Assessment Models (IAMs).

» Four Two Seven Climate Exposure Scores

» UN Sustainability Index Data on historical Natural Disaster Damages by Country

» Economic Damages associated with historical climate-related disasters

» Historical Public EDF Asset Returns associated with historical climate-related events

» Public Computing the calculation of EDF / Credit Spread / Bond values and estimation of the PD term structure

» **Water Stress, Floods and Sea level** can be material risks for Nordic banks portfolios as such variability can amplify the economic impact

Nordics Sample (14.760 facilities)			
Climate Hazards	Score	x times	Risk
Average of Heat Stress Score	7.3		Low Risk
StdDevp of Heat Stress Score	5.3	1.7	Low Risk
Max of Heat Stress Score	39.9	6.5	Medium Risk
Average of Water Stress Score	26.4		Low Risk
StdDevp of Water Stress Score	5.6	1.2	Medium Risk
Max of Water Stress Score	49.2	2.9	Medium Risk
Average of Floods Score	17.2		Low Risk
StdDevp of Floods Score	17.4	2.0	Medium Risk
Max of Floods Score	99.8	6.8	Red Flag
Average of Hurricanes & Typhoons Score	0.3		Low Risk
StdDevp of Hurricanes & Typhoons Score	2.0	7.9	Low Risk
Max of Hurricanes & Typhoons Score	25.0	10+	Red Flag
Average of Sea Level Rise Score	26.3		Low Risk
StdDevp of Sea Level Rise Score	23.4	1.9	Medium Risk
Max of Sea Level Rise Score	93.5	4.6	Red Flag
Average of Socioeconomic Risk Score	3.3		Low Risk
StdDevp of Socioeconomic Risk Score	1.8	1.5	Low Risk
Max of Socioeconomic Risk Score	5.3	2.6	Low Risk

Source of physical risk scores: 427, Moody's Analytics



# Is ESGC a material risk for Nordics banks?

Nordics are leaders in Sustainability & ESG but devil is in the detail

## ESG/ Climate Change



Internal credit risk assessment / PD might under / over - estimate the probability of default as much as the portfolio is exposed to **sensitive sectors with low ESG scores**

## Paradigm Shift



New business, strategic and organizational framework need to be established:

- **Loan origination process** enhanced with respect to ESG scores
- **Risk Management** with Climate Scenario Analysis
- **Consistent End-to-End framework** to facilitate the transition to low carbon economy

## Challenges



Quantify the climate risk requires forward looking approaches that consider:

- **Systemic cost of transition and of the associated global warming**
- **Variability of physical and transition risk management**

Leonardo Checchi  
Director, ESGC & Credit Risk SME  
Phone: +44 (780) 053-1816  
[Leonardo.Checchi@moodys.com](mailto:Leonardo.Checchi@moodys.com)

# Questions and Answers

---

Nordic Banks beyond COVID-19

# Thank You

---

Nordic Banks beyond COVID-19

© 2020 Moody's Corporation, Moody's Investors Service, Inc., Moody's Analytics, Inc. and/or their licensors and affiliates (collectively, "MOODY'S"). All rights reserved.

**CREDIT RATINGS ISSUED BY MOODY'S INVESTORS SERVICE, INC. AND ITS RATINGS AFFILIATES ("MIS") ARE MOODY'S CURRENT OPINIONS OF THE RELATIVE FUTURE CREDIT RISK OF ENTITIES, CREDIT COMMITMENTS, OR DEBT OR DEBT-LIKE SECURITIES, AND MOODY'S PUBLICATIONS MAY INCLUDE MOODY'S CURRENT OPINIONS OF THE RELATIVE FUTURE CREDIT RISK OF ENTITIES, CREDIT COMMITMENTS, OR DEBT OR DEBT-LIKE SECURITIES. MOODY'S DEFINES CREDIT RISK AS THE RISK THAT AN ENTITY MAY NOT MEET ITS CONTRACTUAL FINANCIAL OBLIGATIONS AS THEY COME DUE AND ANY ESTIMATED FINANCIAL LOSS IN THE EVENT OF DEFAULT OR IMPAIRMENT. SEE MOODY'S RATING SYMBOLS AND DEFINITIONS PUBLICATION FOR INFORMATION ON THE TYPES OF CONTRACTUAL FINANCIAL OBLIGATIONS ADDRESSED BY MOODY'S RATINGS. CREDIT RATINGS DO NOT ADDRESS ANY OTHER RISK, INCLUDING BUT NOT LIMITED TO: LIQUIDITY RISK, MARKET VALUE RISK, OR PRICE VOLATILITY. CREDIT RATINGS AND MOODY'S OPINIONS INCLUDED IN MOODY'S PUBLICATIONS ARE NOT STATEMENTS OF CURRENT OR HISTORICAL FACT. MOODY'S PUBLICATIONS MAY ALSO INCLUDE QUANTITATIVE MODEL-BASED ESTIMATES OF CREDIT RISK AND RELATED OPINIONS OR COMMENTARY PUBLISHED BY MOODY'S ANALYTICS, INC. CREDIT RATINGS AND MOODY'S PUBLICATIONS DO NOT CONSTITUTE OR PROVIDE INVESTMENT OR FINANCIAL ADVICE, AND CREDIT RATINGS AND MOODY'S PUBLICATIONS ARE NOT AND DO NOT PROVIDE RECOMMENDATIONS TO PURCHASE, SELL, OR HOLD PARTICULAR SECURITIES. NEITHER CREDIT RATINGS NOR MOODY'S PUBLICATIONS COMMENT ON THE SUITABILITY OF AN INVESTMENT FOR ANY PARTICULAR INVESTOR. MOODY'S ISSUES ITS CREDIT RATINGS AND PUBLISHES MOODY'S PUBLICATIONS WITH THE EXPECTATION AND UNDERSTANDING THAT EACH INVESTOR WILL, WITH DUE CARE, MAKE ITS OWN STUDY AND EVALUATION OF EACH SECURITY THAT IS UNDER CONSIDERATION FOR PURCHASE, HOLDING, OR SALE.**

MOODY'S CREDIT RATINGS AND MOODY'S PUBLICATIONS ARE NOT INTENDED FOR USE BY RETAIL INVESTORS AND IT WOULD BE RECKLESS AND INAPPROPRIATE FOR RETAIL INVESTORS TO USE MOODY'S CREDIT RATINGS OR MOODY'S PUBLICATIONS WHEN MAKING AN INVESTMENT DECISION. IF IN DOUBT YOU SHOULD CONTACT YOUR FINANCIAL OR OTHER PROFESSIONAL ADVISER.

ALL INFORMATION CONTAINED HEREIN IS PROTECTED BY LAW, INCLUDING BUT NOT LIMITED TO, COPYRIGHT LAW, AND NONE OF SUCH INFORMATION MAY BE COPIED OR OTHERWISE REPRODUCED, REPACKAGED, FURTHER TRANSMITTED, TRANSFERRED, DISSEMINATED, REDISTRIBUTED OR RESOLD, OR STORED FOR SUBSEQUENT USE FOR ANY SUCH PURPOSE, IN WHOLE OR IN PART, IN ANY FORM OR MANNER OR BY ANY MEANS WHATSOEVER, BY ANY PERSON WITHOUT MOODY'S PRIOR WRITTEN CONSENT.

CREDIT RATINGS AND MOODY'S PUBLICATIONS ARE NOT INTENDED FOR USE BY ANY PERSON AS A BENCHMARK AS THAT TERM IS DEFINED FOR REGULATORY PURPOSES AND MUST NOT BE USED IN ANY WAY THAT COULD RESULT IN THEM BEING CONSIDERED A BENCHMARK.

All information contained herein is obtained by MOODY'S from sources believed by it to be accurate and reliable. Because of the possibility of human or mechanical error as well as other factors, however, all information contained herein is provided "AS IS" without warranty of any kind. MOODY'S adopts all necessary measures so that the information it uses in assigning a credit rating is of sufficient quality and from sources MOODY'S considers to be reliable including, when appropriate, independent third-party sources. However, MOODY'S is not an auditor and cannot in every instance independently verify or validate information received in the rating process or in preparing the Moody's publications.

To the extent permitted by law, MOODY'S and its directors, officers, employees, agents, representatives, licensors and suppliers disclaim liability to any person or entity for any indirect, special, consequential, or incidental losses or damages whatsoever arising from or in connection with the information contained herein or the use of or inability to use any such information, even if MOODY'S or any of its directors, officers, employees, agents, representatives, licensors or suppliers is advised in advance of the possibility of such losses or damages, including but not limited to: (a) any loss of present or prospective profits or (b) any loss or damage arising where the relevant financial instrument is not the subject of a particular credit rating assigned by MOODY'S.

To the extent permitted by law, MOODY'S and its directors, officers, employees, agents, representatives, licensors and suppliers disclaim liability for any direct or compensatory losses or damages caused to any person or entity, including but not limited to by any negligence (but excluding fraud, willful misconduct or any other type of liability that, for the avoidance of doubt, by law cannot be excluded) on the part of, or any contingency within or beyond the control of, MOODY'S or any of its directors, officers, employees, agents, representatives, licensors or suppliers, arising from or in connection with the information contained herein or the use of or inability to use any such information.

NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE ACCURACY, TIMELINESS, COMPLETENESS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF ANY CREDIT RATING OR OTHER OPINION OR INFORMATION IS GIVEN OR MADE BY MOODY'S IN ANY FORM OR MANNER WHATSOEVER.

Moody's Investors Service, Inc., a wholly-owned credit rating agency subsidiary of Moody's Corporation ("MCO"), hereby discloses that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by Moody's Investors Service, Inc. have, prior to assignment of any rating, agreed to pay to Moody's Investors Service, Inc. for ratings opinions and services rendered by it fees ranging from \$1,000 to approximately \$2,700,000. MCO and MIS also maintain policies and procedures to address the independence of MIS's ratings and rating processes. Information regarding certain affiliations that may exist between directors of MCO and rated entities, and between entities who hold ratings from MIS and have also publicly reported to the SEC an ownership interest in MCO of more than 5%, is posted annually at [www.moody.com](http://www.moody.com) under the heading "Investor Relations — Corporate Governance — Director and Shareholder Affiliation Policy."

Additional terms for Australia only: Any publication into Australia of this document is pursuant to the Australian Financial Services License of MOODY'S affiliate, Moody's Investors Service Pty Limited ABN 61 003 399 657AFSL 336969 and/or Moody's Analytics Australia Pty Ltd ABN 94 105 136 972 AFSL 383569 (as applicable). This document is intended to be provided only to "wholesale clients" within the meaning of section 761G of the Corporations Act 2001. By continuing to access this document from within Australia, you represent to MOODY'S that you are, or are accessing the document as a representative of, a "wholesale client" and that neither you nor the entity you represent will directly or indirectly disseminate this document or its contents to "retail clients" within the meaning of section 761G of the Corporations Act 2001. MOODY'S credit rating is an opinion as to the creditworthiness of a debt obligation of the issuer, not on the equity securities of the issuer or any form of security that is available to retail investors.

Additional terms for Japan only: Moody's Japan K.K. ("MJKK") is a wholly-owned credit rating agency subsidiary of Moody's Group Japan G.K., which is wholly-owned by Moody's Overseas Holdings Inc., a wholly-owned subsidiary of MCO. Moody's SF Japan K.K. ("MSFJ") is a wholly-owned credit rating agency subsidiary of MJKK. MSFJ is not a Nationally Recognized Statistical Rating Organization ("NRSRO"). Therefore, credit ratings assigned by MSFJ are Non-NRSRO Credit Ratings. Non-NRSRO Credit Ratings are assigned by an entity that is not a NRSRO and, consequently, the rated obligation will not qualify for certain types of treatment under U.S. laws. MJKK and MSFJ are credit rating agencies registered with the Japan Financial Services Agency and their registration numbers are FSA Commissioner (Ratings) No. 2 and 3 respectively.

MJKK or MSFJ (as applicable) hereby disclose that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by MJKK or MSFJ (as applicable) have, prior to assignment of any rating, agreed to pay to MJKK or MSFJ (as applicable) for ratings opinions and services rendered by it fees ranging from JPY125,000 to approximately JPY250,000,000.

MJKK and MSFJ also maintain policies and procedures to address Japanese regulatory requirements.