

# Tracking the Impact of COVID-19 on Credit Risk for European Corporate Firms

# Overview

- » The COVID-19 pandemic has created an unprecedented stressed environment across the globe.
- » Financial institutions are likely to re-assess expected losses while portfolio managers are likely to adjust exposures.
- » The Moody's Analytics Expected Default Frequency (EDF™) provides a timely measure of credit risk and signals the current state of credit cycle.
- » This presentation focuses on [publicly traded European corporates](#), where we have seen significant increase in expected losses and elevated credit risk in leveraged lending.

# Agenda

1. Introduction
2. Impact by Country, Industry, and Rating Class
3. Implications for Credit Loss & Leveraged Lending
4. Summary

1

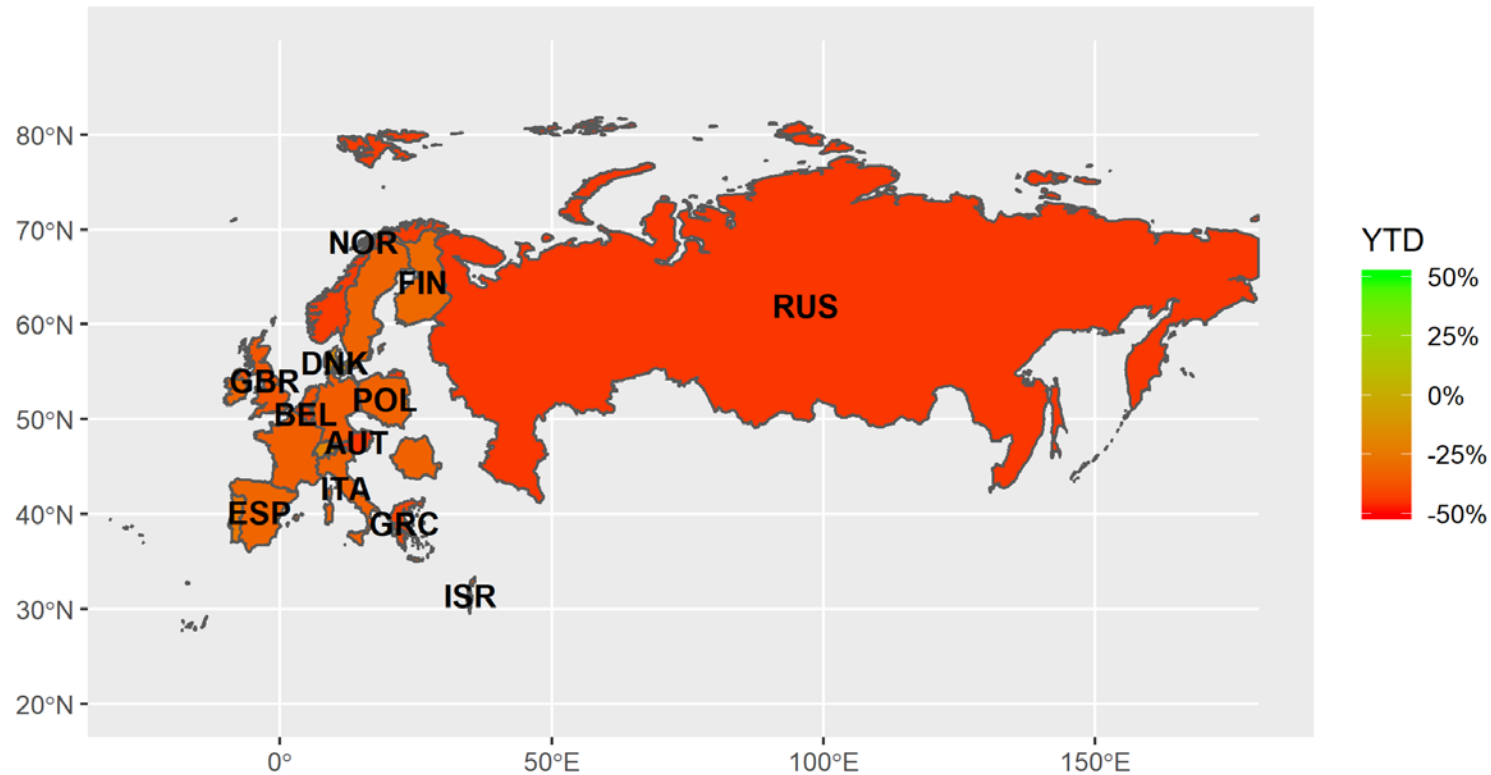
Introduction: A Market  
Perspective

# Timeline of COVID-19: A Market Perspective

03/18/2020: EURO Stoxx 50 closed at its 5-year low.

Market Cap in Europe as of 03/18/2020

Market Cap color coded as year-to-date change by country

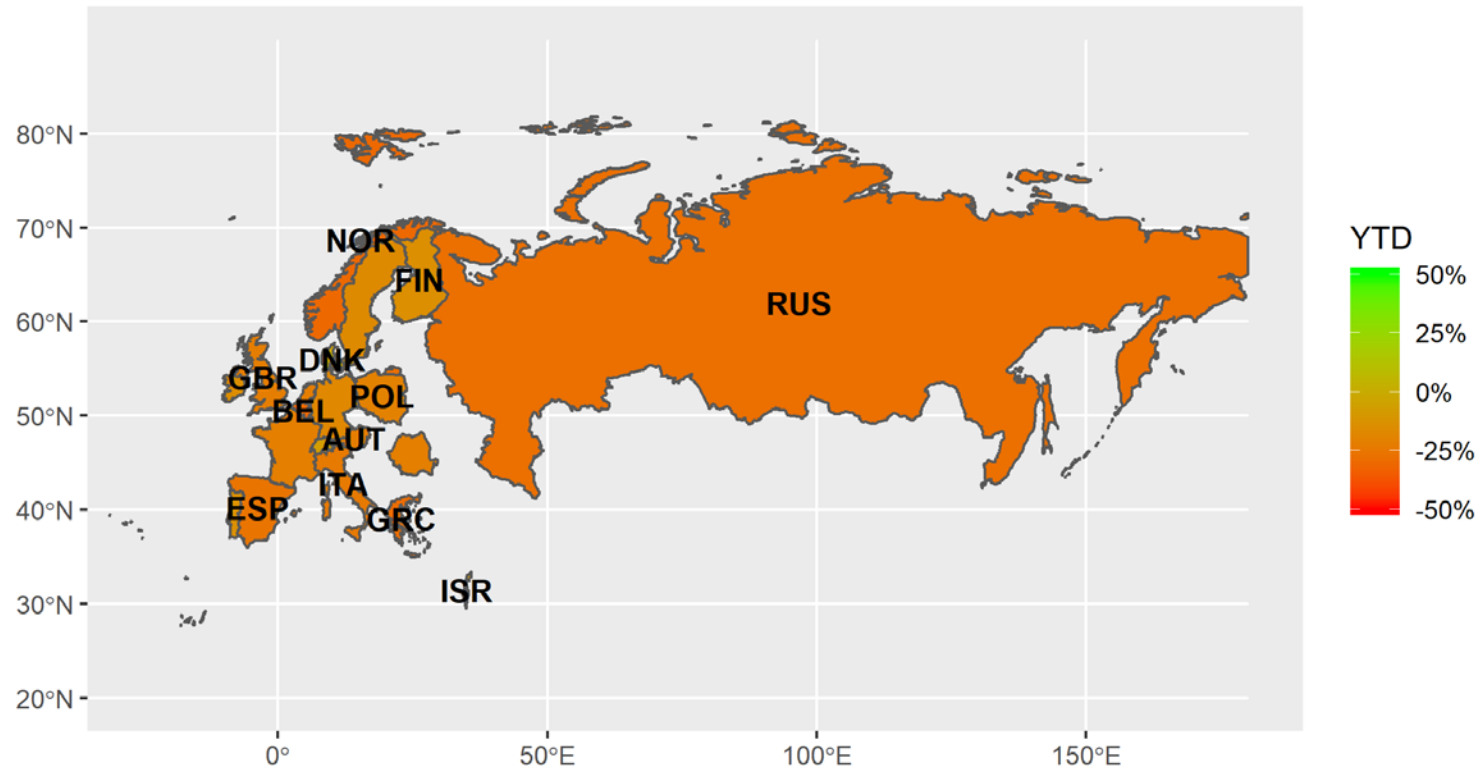


# Timeline of COVID-19: A Market Perspective

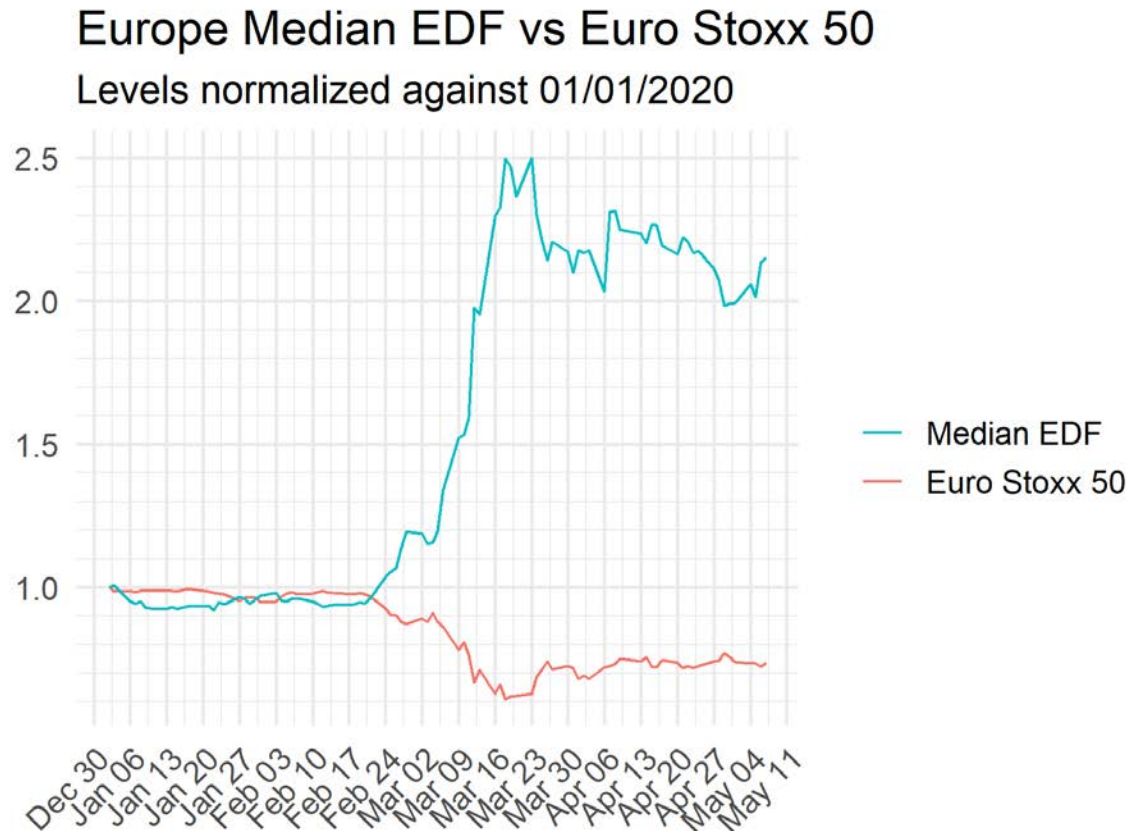
05/07/2020: Market cap has partially recovered from the low, still with significant drawdown year-to-date.

Market Cap in Europe as of 05/07/2020

Market Cap color coded as year-to-date change by country

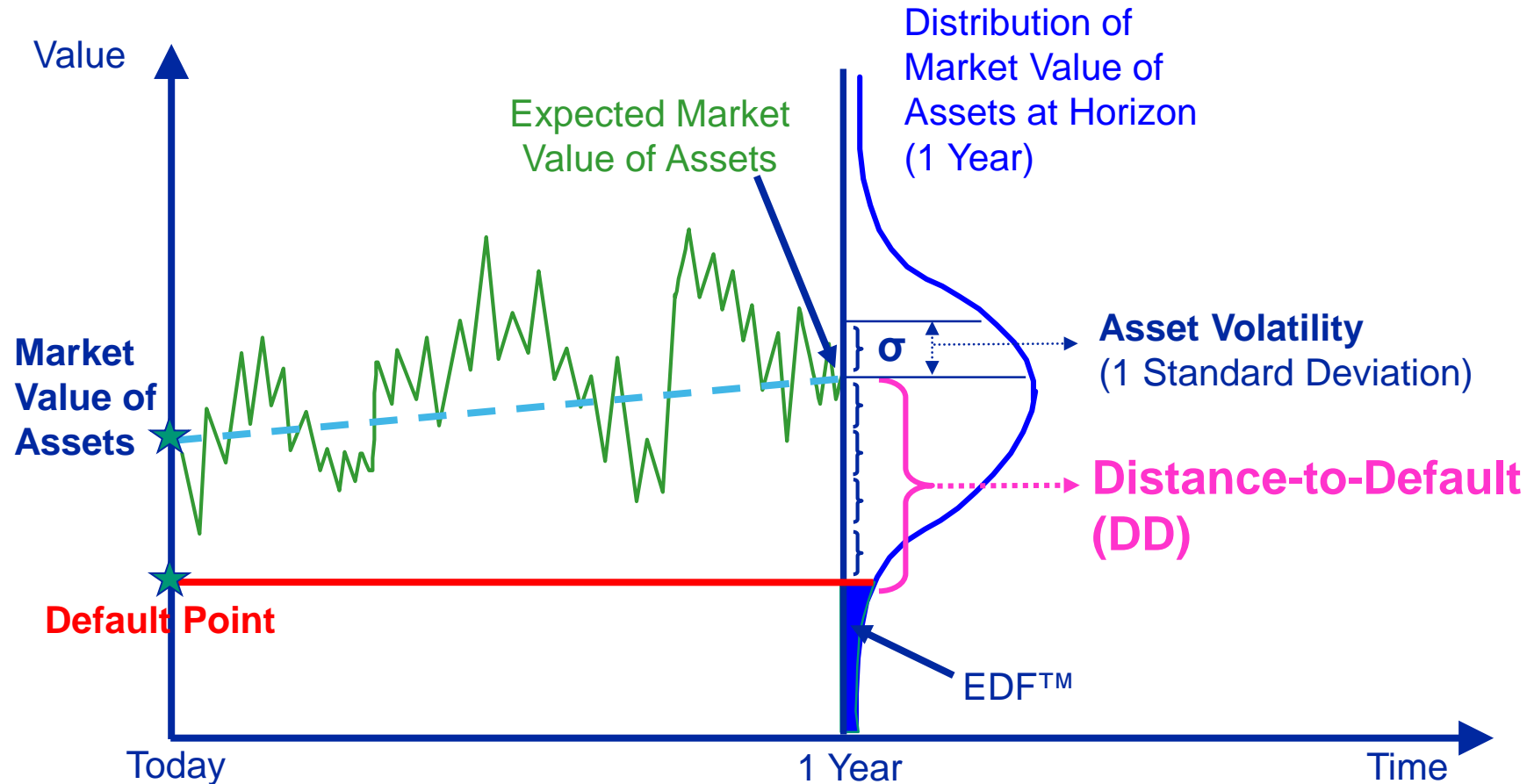


# EDF Measures vs. Stock Market Signals



- » With equity price as a key input, the model responds to the market movement in real time, translating the market signal to credit risk metrics.
- » The breadth and depth of the Moody's Analytics CreditEdge™ coverage, together with the daily update of EDF values, makes the model a very capable tool to monitor and manage the credit risk of their exposure.

# Overview of Structural PD Model



**Distance-to-Default (DD)**  $\approx$  The number of standard deviations the Market Value of Assets is away from the Default Point

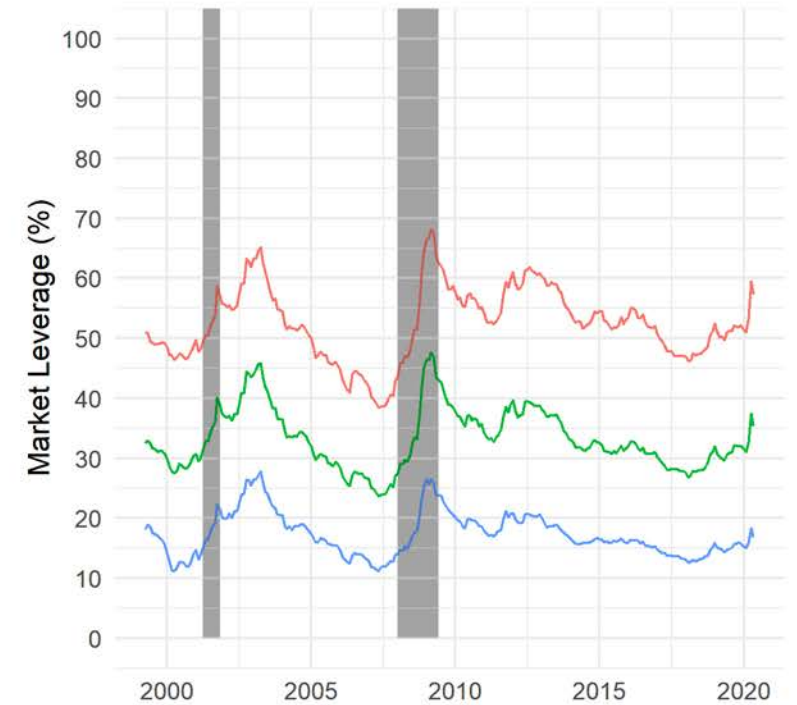
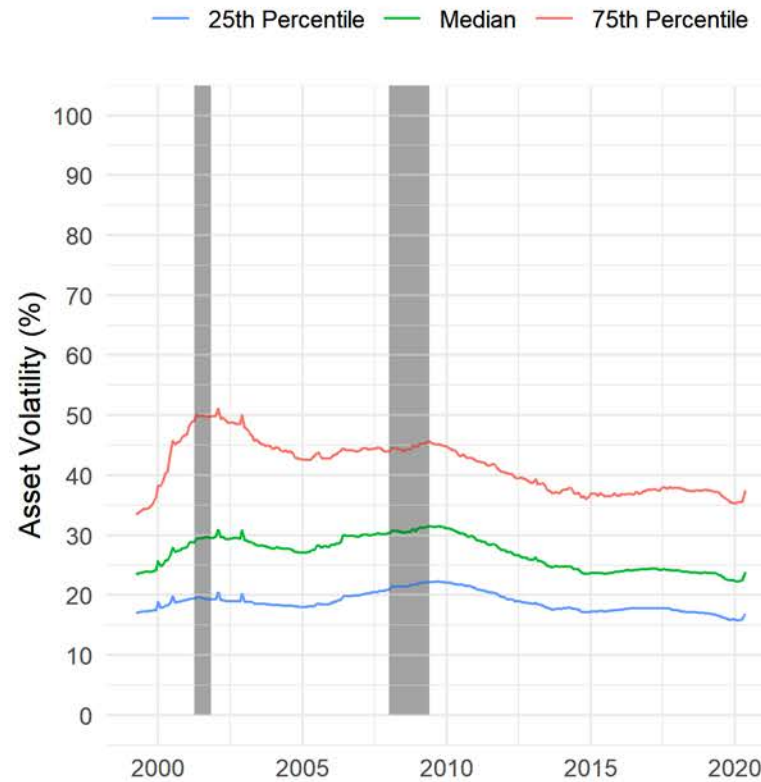
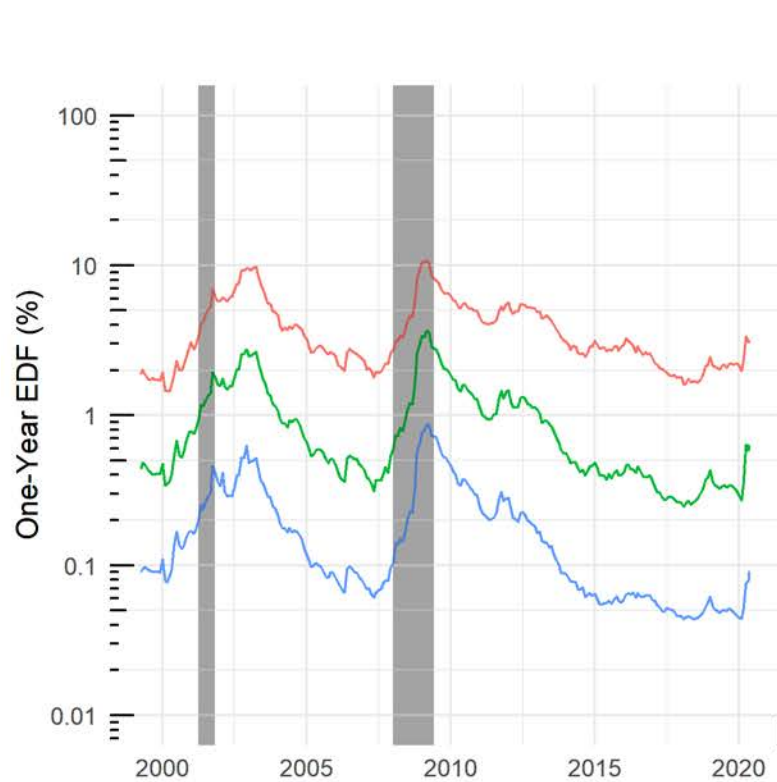


# 2

## EDF Impact by Country, Industry, and Rating Class

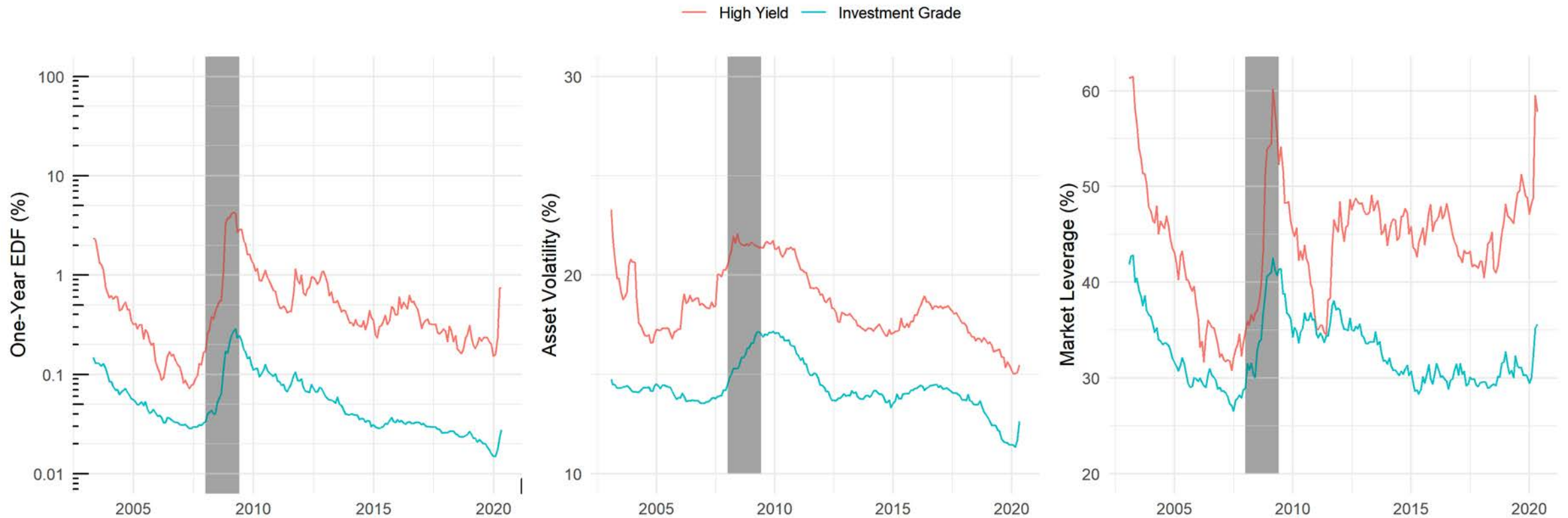
# EDF History and Drivers

## European Corporates



# EDF History and Drivers

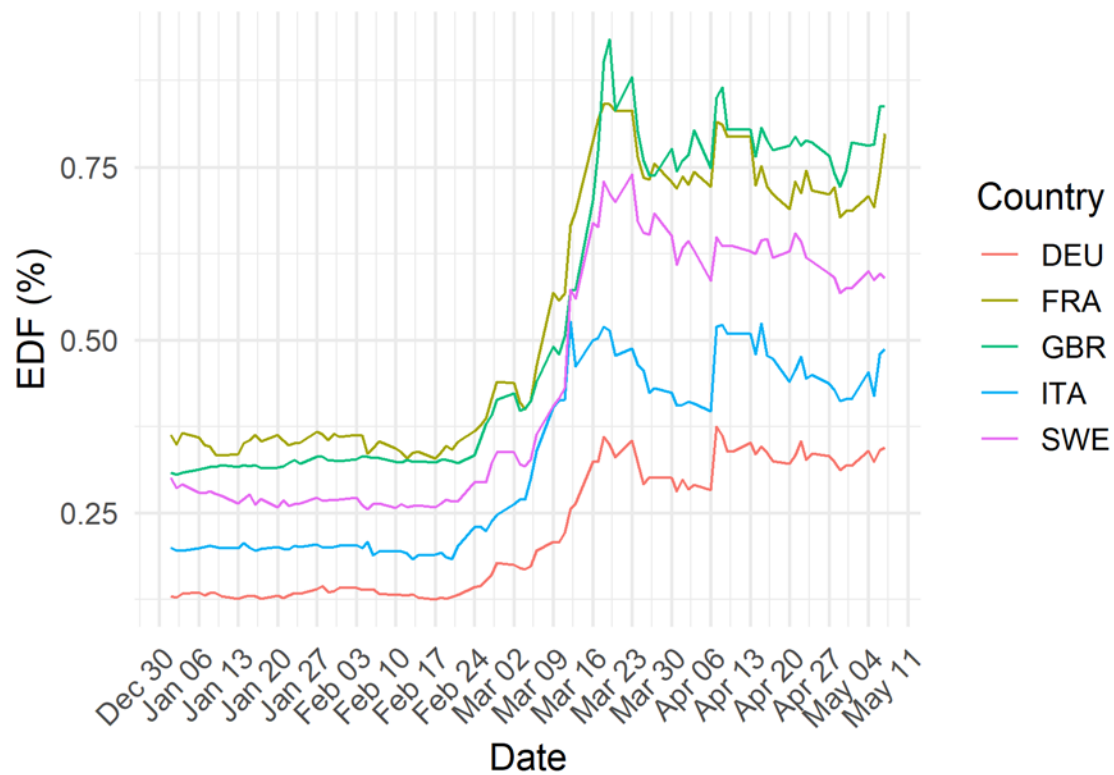
## European Rated Corporates



# EDF Levels by Country

The magnitude of EDF increase ties closely to the severity of outbreak

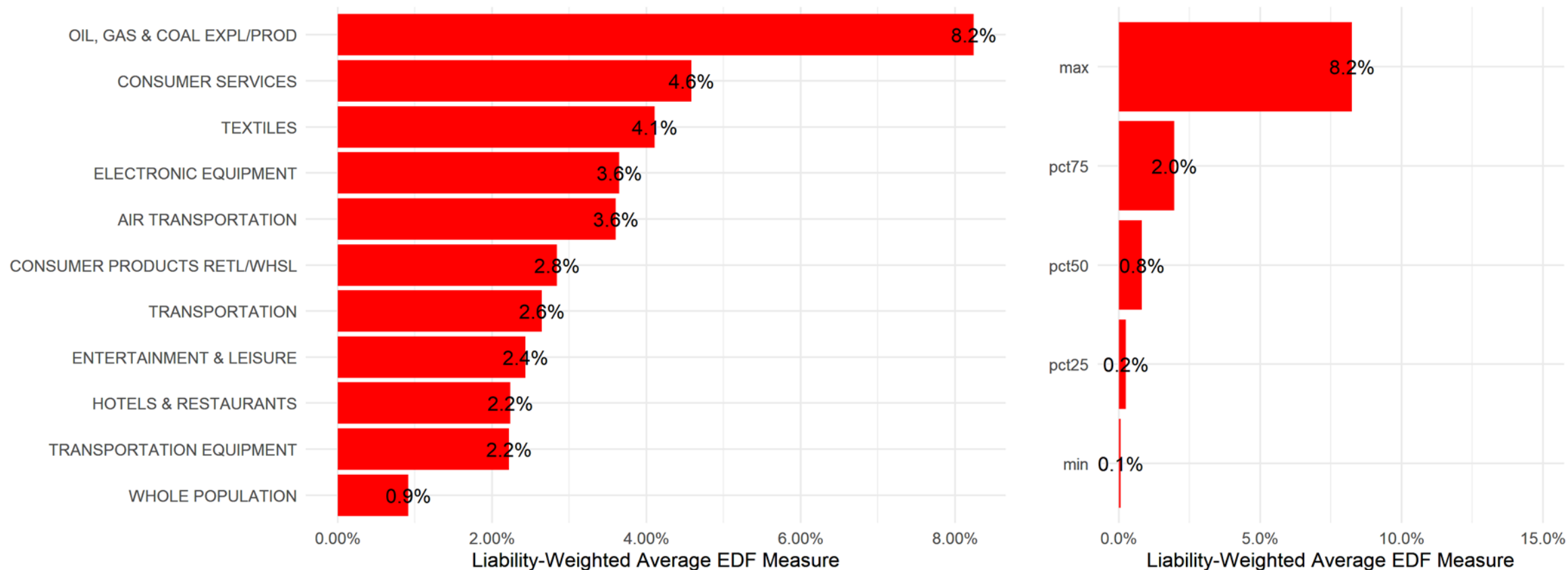
Median EDF since 01/01/2020



| Country /Region | Median EDF(%) 1/1/2020 | Median EDF(%) 5/7/2020 | EDF YTD | Mktcap YTD |
|-----------------|------------------------|------------------------|---------|------------|
| NLD             | 0.12                   | 0.49                   | 300%    | -22%       |
| IRL             | 0.10                   | 0.39                   | 295%    | -15%       |
| ESP             | 0.17                   | 0.49                   | 191%    | -26%       |
| GBR             | 0.31                   | 0.84                   | 172%    | -22%       |
| DEU             | 0.13                   | 0.34                   | 167%    | -18%       |
| BEL             | 0.06                   | 0.16                   | 165%    | -30%       |
| ISR             | 0.18                   | 0.45                   | 151%    | -8%        |
| ITA             | 0.20                   | 0.49                   | 143%    | -24%       |
| DNK             | 0.11                   | 0.27                   | 137%    | -4%        |
| FIN             | 0.10                   | 0.25                   | 134%    | -15%       |
| GRC             | 1.04                   | 2.42                   | 134%    | -29%       |
| FRA             | 0.36                   | 0.80                   | 120%    | -22%       |
| CHE             | 0.04                   | 0.08                   | 116%    | -7%        |
| NOR             | 0.52                   | 1.10                   | 109%    | -30%       |
| SWE             | 0.30                   | 0.59                   | 96%     | -17%       |
| ROU             | 0.32                   | 0.46                   | 45%     | -22%       |
| POL             | 1.16                   | 1.67                   | 44%     | -20%       |
| RUS             | 0.69                   | 0.82                   | 18%     | -28%       |

# EDF Levels by Industry

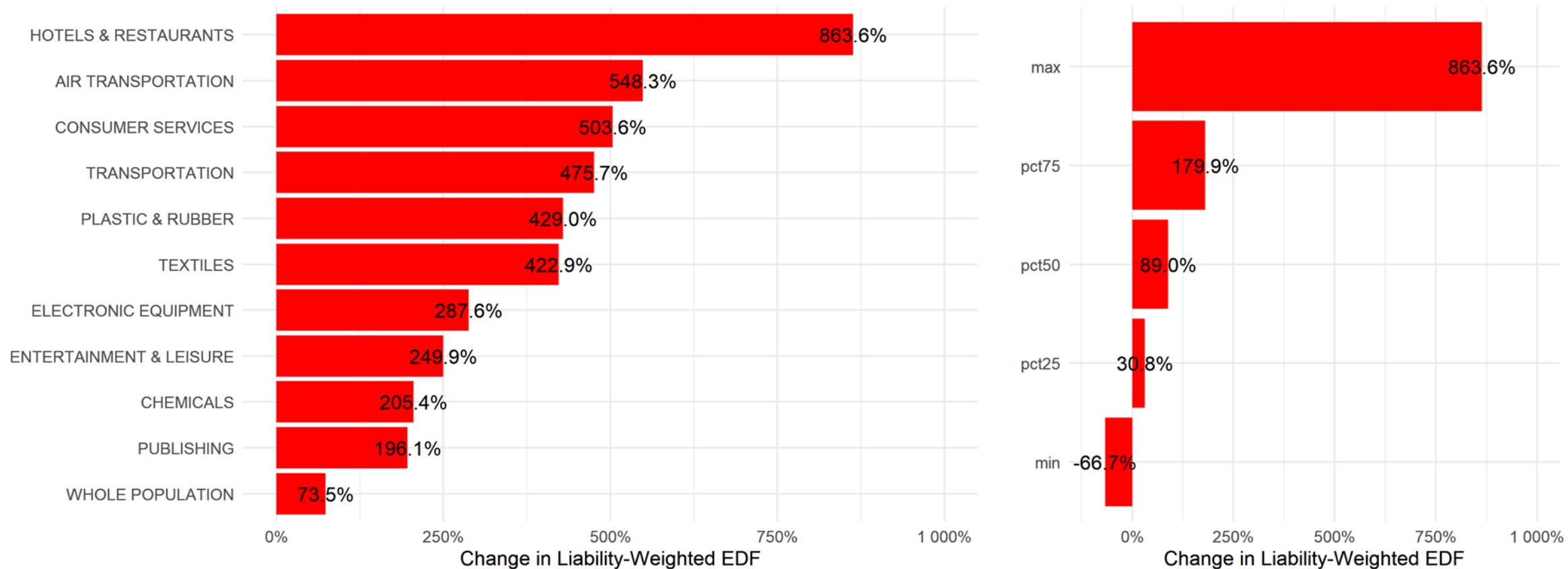
Riskiest industries by liabilities-weighted average EDF credit measures



\* Liability-weighted average EDF calculated based on EDFs as of 05/07/2020

# EDF Levels by Industry

Industries with the largest increases in liabilities-weighted EDF credit measures



\* Increases measured from 01/01/2020 to 05/07/2020

# Case Study

## Air Transportation Industry

| Air Transportation Top 15 EDF Change |   |          |      |          |      |              |                 |
|--------------------------------------|---|----------|------|----------|------|--------------|-----------------|
| PID                                  | Name  | 1/1/2020 |      | 5/7/2020 |      | EDF % Change | Mktcap % Change |
|                                      |   | EDF (%)  | EIR  | EDF (%)  | EIR  |              |                 |
| G14375                               | JOHN MENZIES PLC                                | 0.04     | Baa3 | 6.06     | Caa1 | 14315%       | -77%            |
| W53670                               | INTERNATIONAL CONSOLIDATED AIRLINES GROUP SA    | 0.06     | Ba1  | 1.70     | B2   | 2541%        | -70%            |
| W25769                               | EASYJET PLC                                     | 0.15     | Ba3  | 2.73     | B3   | 1703%        | -63%            |
| G10045                               | DEUTSCHE LUFTHANSA AG                           | 0.07     | Ba1  | 0.71     | Ba3  | 883%         | -52%            |
| G10777                               | AIR FRANCE-KLM SA                               | 0.20     | Ba3  | 1.89     | B2   | 834%         | -59%            |
| G13634                               | BBA AVIATION PLC                                | 0.05     | Baa3 | 0.37     | Ba2  | 657%         | -43%            |
| W11966                               | RYANAIR HOLDINGS PLC                            | 0.06     | Ba1  | 0.37     | Ba2  | 528%         | -37%            |
| W43433                               | AEGEAN AIRLINES SA                              | 0.15     | Ba3  | 0.79     | Ba3  | 413%         | -48%            |
| W02683                               | FRAPORT AG FRANKFURT AIRPORT SERVICES WORLDWIDE | 0.02     | Aa3  | 0.11     | Baa3 | 403%         | -53%            |
| W39325                               | AÉROPORTS DE PARIS SA                           | 0.01     | Aaa  | 0.06     | Baa2 | 387%         | -54%            |
| W29845                               | KNAFAIM HOLDINGS LIMITED                        | 0.49     | B2   | 1.93     | B2   | 291%         | -56%            |
| W40623                               | ICELANDAIR GROUP HF                             | 4.73     | Caa2 | 18.04    | Ca   | 281%         | -79%            |
| W65314                               | ENTER AIR SA                                    | 1.54     | Caa1 | 5.22     | Caa1 | 238%         | -51%            |
| W20226                               | FLUGHAFEN ZÜRICH AG                             | 0.01     | Aa1  | 0.05     | Baa1 | 204%         | -38%            |
| G11677                               | FINNAIR OYJ                                     | 1.75     | Caa1 | 4.96     | Caa1 | 182%         | -44%            |

# Case Study

## Pharmaceutical Industry

| Pharmaceutica Top 15 EDF Change |  |          |      |          |      |              |                 |
|---------------------------------|--|----------|------|----------|------|--------------|-----------------|
| PID                             | Name   | 1/1/2020 |      | 5/7/2020 |      | EDF % Change | Mktcap % Change |
|                                 |  | EDF (%)  | EIR  | EDF (%)  | EIR  |              |                 |
| W35654                          | SYNAIRGEN PLC                                    | 2.84     | Caa2 | 0.31     | Ba1  | -89%         | 1225%           |
| B01435                          | EXPRES2ION BIOTECH HOLDING AB                    | 2.87     | Caa2 | 0.39     | Ba2  | -87%         | 458%            |
| W62502                          | BIOMED LUBLIN WYTWORNIA SUROWIC I SZCZEPIONEK SA | 0.87     | B3   | 0.16     | Baa3 | -82%         | 289%            |
| N26093                          | AR897 LTD.                                       | 2.43     | Caa1 | 0.46     | Ba2  | -81%         | 268%            |
| W63411                          | BIOPHYTIS SA                                     | 28.55    | C    | 6.46     | Caa1 | -77%         | 1603%           |
| N26558                          | KITOV PHARMA LTD                                 | 4.47     | Caa2 | 1.06     | B1   | -76%         | 105%            |
| W37825                          | BYOTROL PLC                                      | 1.39     | Caa1 | 0.36     | Ba2  | -74%         | 228%            |
| W46760                          | READ-GENE SA                                     | 12.30    | Ca   | 3.33     | B3   | -73%         | 245%            |
| W58338                          | KANCERA AB                                       | 0.91     | B3   | 0.25     | Ba1  | -73%         | 303%            |
| W42916                          | BIOTEC PHARMACON ASA                             | 0.21     | Ba3  | 0.06     | Baa2 | -71%         | 304%            |
| W43821                          | E-THERAPEUTICS PLC                               | 0.41     | B2   | 0.13     | Baa3 | -68%         | 369%            |
| W58465                          | BIOSYNEX SA                                      | 0.48     | B2   | 0.15     | Baa3 | -68%         | 400%            |
| N14014                          | PLURISTEM THERAPEUTICS INC                       | 0.90     | B3   | 0.35     | Ba2  | -61%         | 145%            |
| W64184                          | DIURNAL GROUP PLC                                | 1.03     | B3   | 0.43     | Ba2  | -58%         | 63%             |
| G16474                          | N4 PHARMA PLC                                    | 1.62     | Caa1 | 0.70     | Ba3  | -57%         | 127%            |

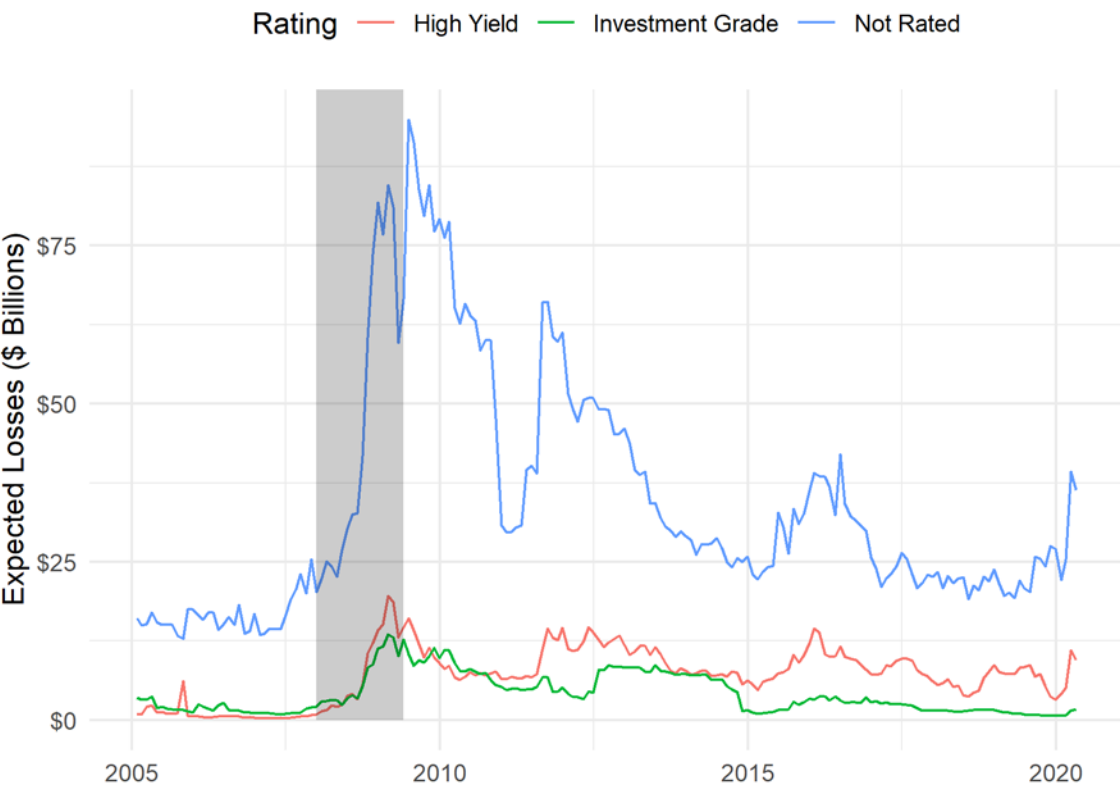
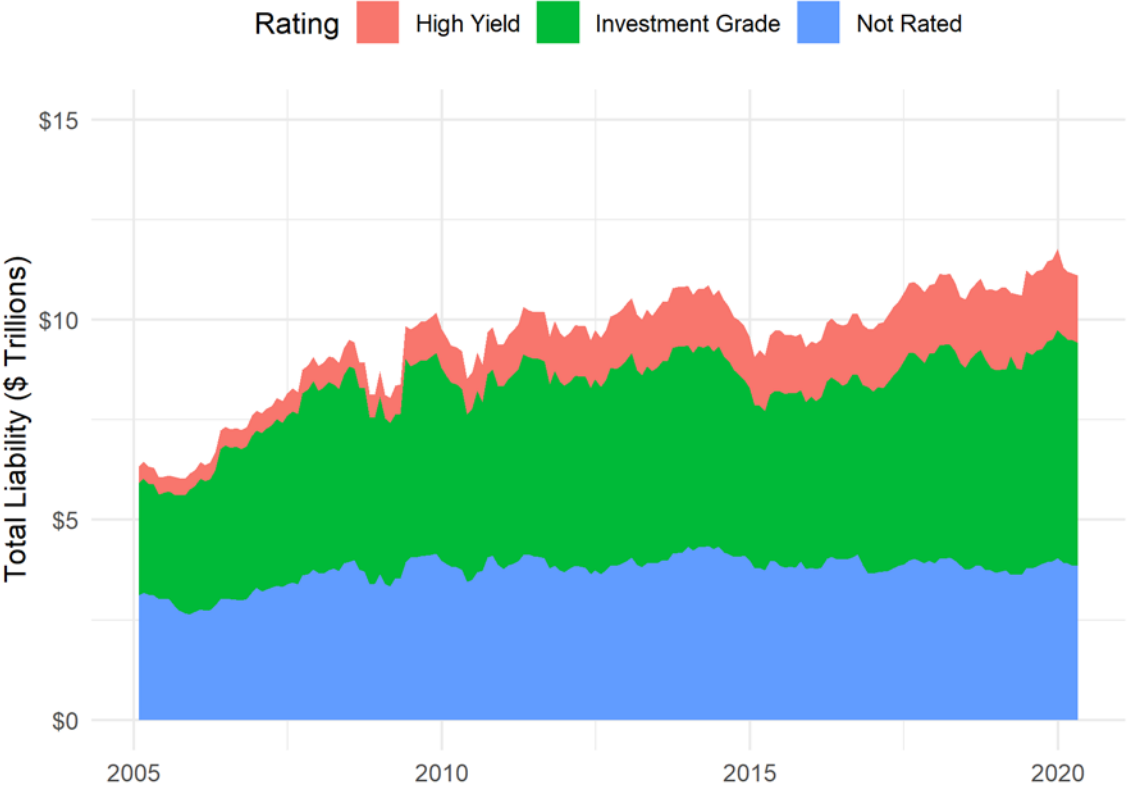


# 3

## Implications on Credit Loss & Leveraged Lending

# Total Liability & Expected Losses

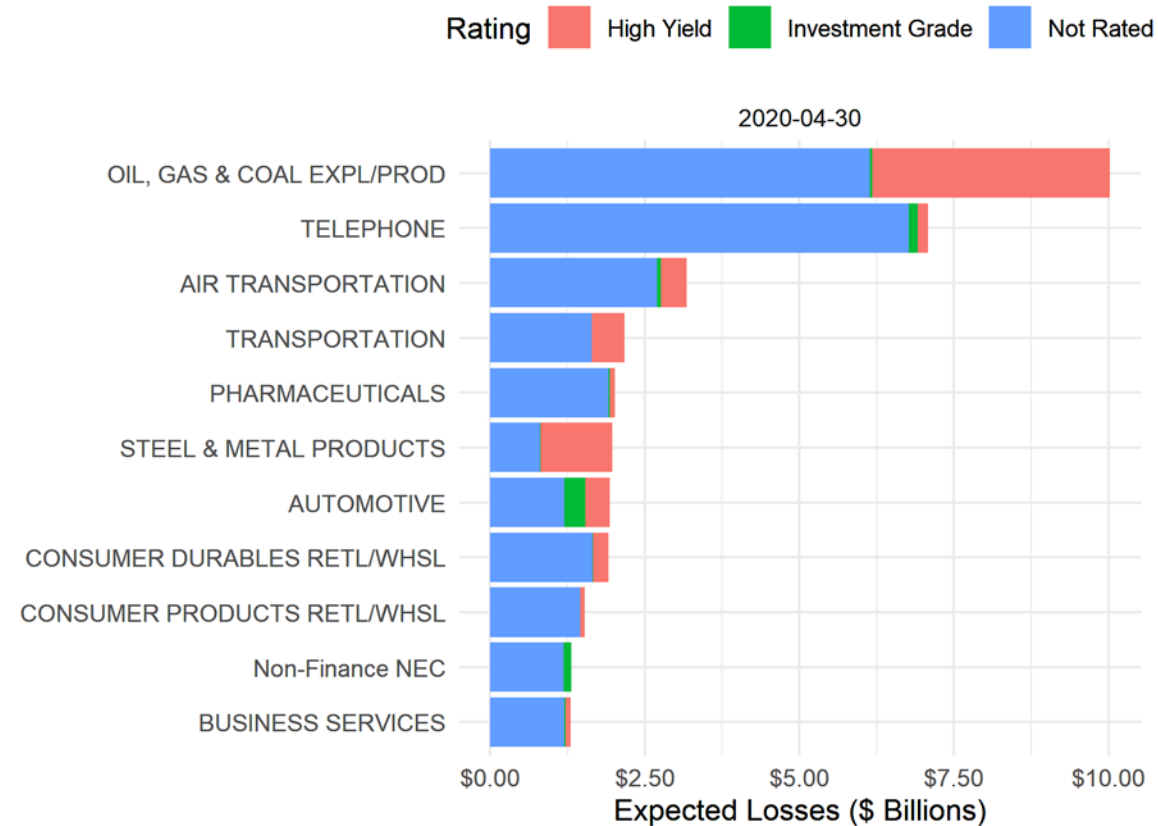
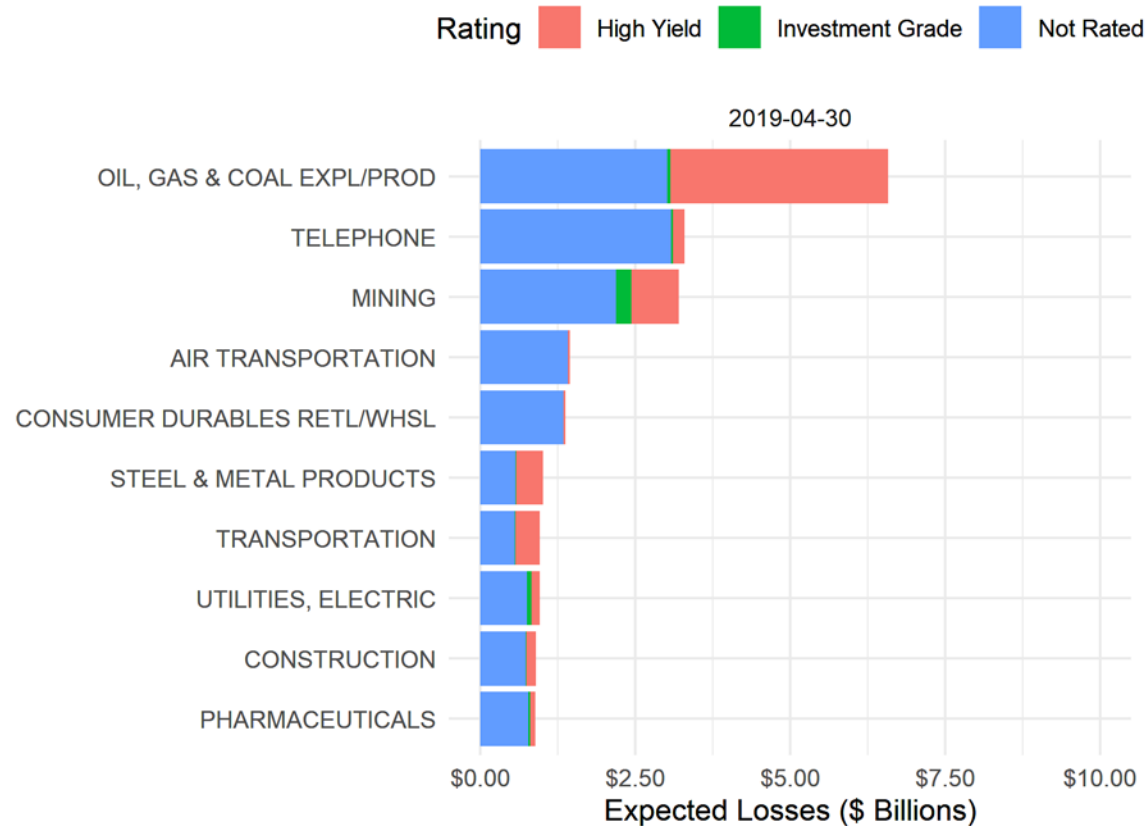
The risk of high yield space increases much more significantly than investment grade.



\* LGD assumed to be 50% in calculation of expected losses

# Expected Loss by Industry and Rating

Over 70% of the total expected losses are concentrated in the top 10 industries, with varied ratings profiles.



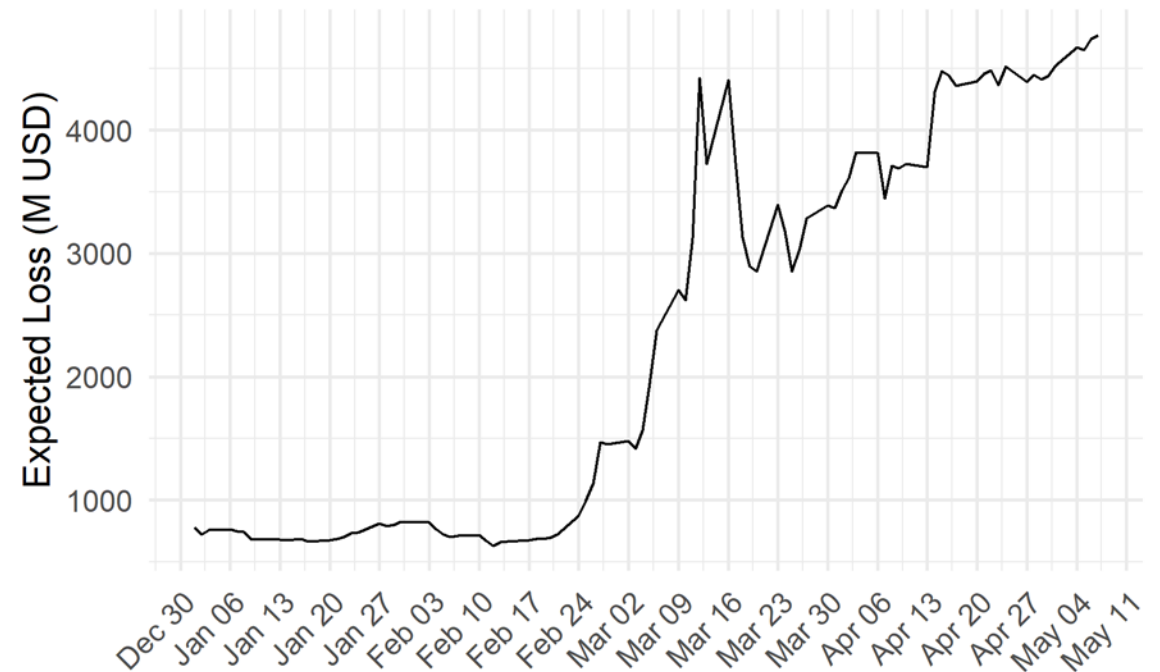
\* LGD assumed to be 50% in calculation of expected losses

# Expected Loss

## Expected loss increased significantly for European Air Transportation

| Change in Expected Losses for European Air Transportation   |   |                         |         |                  |                         |         |                   |
|---|---|-------------------------|---------|------------------|-------------------------|---------|-------------------|
| (* Showing top 15 ranked by total liability as of 5/7/2020, which accounted for more than 90% of the total liability in the industry) |   |                         |         |                  |                         |         |                   |
| PID   | Name  | 1/1/2020                |         |                  | 5/7/2020                |         |                   |
|   |   | Total Liability (M USD) | EDF (%) | EL (M USD)       | Total Liability (M USD) | EDF (%) | EL (M USD)        |
| G10045  | DEUTSCHE LUFTHANSA AG                           | \$ 38,766               | 0.07    | \$ 19.67         | \$ 34,327               | 0.71    | \$ 171.16         |
| G10777  | AIR FRANCE-KLM SA                               | \$ 32,415               | 0.20    | \$ 45.79         | \$ 30,986               | 1.89    | \$ 408.95         |
| W53670  | INTERNATIONAL CONSOLIDATED AIRLINES GROUP SA    | \$ 34,333               | 0.06    | \$ 15.49         | \$ 29,601               | 1.70    | \$ 352.81         |
| W28987  | AEROFLOT-RUSSIAN AIRLINES PJSC                  | \$ 15,551               | 1.13    | \$ 123.18        | \$ 12,487               | 1.54    | \$ 134.51         |
| W39325  | AÉROPORTS DE PARIS SA                           | \$ 11,746               | 0.01    | \$ 0.95          | \$ 11,246               | 0.06    | \$ 4.45           |
| W62512  | AENA S.M.E. SA                                  | \$ 9,300                | 0.01    | \$ 0.67          | \$ 9,154                | 0.02    | \$ 1.46           |
| W11966  | RYANAIR HOLDINGS PLC                            | \$ 8,861                | 0.06    | \$ 3.69          | \$ 8,768                | 0.37    | \$ 22.90          |
| W02683  | FRAPORT AG FRANKFURT AIRPORT SERVICES WORLDWIDE | \$ 8,665                | 0.02    | \$ 1.37          | \$ 8,406                | 0.11    | \$ 6.68           |
| W34033  | NORWEGIAN AIR SHUTTLE ASA                       | \$ 9,821                | 5.18    | \$ 356.31        | \$ 8,387                | 50.00   | \$2,935.30        |
| W25769  | EASYJET PLC                                     | \$ 6,456                | 0.15    | \$ 6.84          | \$ 6,024                | 2.73    | \$ 115.14         |
| W26941  | SAS AB  | \$ 3,177                | 2.11    | \$ 46.99         | \$ 4,722                | 5.91    | \$ 195.32         |
| G11677  | FINNAIR OYJ                                     | \$ 3,683                | 1.75    | \$ 45.24         | \$ 3,469                | 4.96    | \$ 120.33         |
| W29845  | KNAFAM HOLDINGS LIMITED                         | \$ 3,303                | 0.50    | \$ 11.49         | \$ 3,245                | 1.93    | \$ 43.93          |
| W37091  | EL AL ISRAEL AIRLINES LTD.                      | \$ 3,064                | 1.49    | \$ 32.05         | \$ 3,011                | 1.96    | \$ 41.32          |
| G13634  | BBA AVIATION PLC                                | \$ 3,477                | 0.05    | \$ 1.20          | \$ 2,852                | 0.37    | \$ 7.46           |
| <b>Total</b>  |   | <b>\$192,616</b>        |         | <b>\$ 710.94</b> | <b>\$176,685</b>        |         | <b>\$4,561.72</b> |
| <b>Loss Rate</b>  |   |                         |         | <b>0.37%</b>     |                         |         | <b>2.58%</b>      |

Expected Loss European AIR TRANSPORTATION  
Assuming 70% LGD

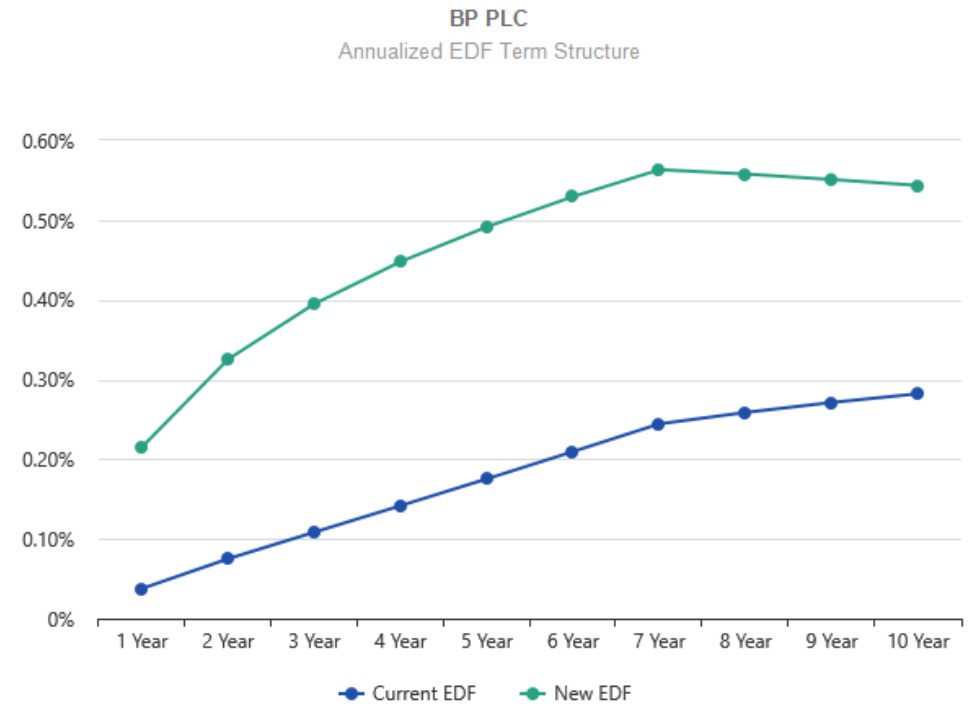


# What-if Analysis

What happens to BP's EDF if volatility is back to all-time high?

Drivers & Market Data All amounts are in millions (except for Share Price) Auto-Refresh Market Data Overrides Daily

| Driver                     | Current    | Override                                | Change     | % Change |
|----------------------------|------------|---|------------|----------|
| Asset Volatility           | 10.27%     | <input type="text" value="13.32%"/>     | 3.05%      | 29.66%   |
| Market Leverage            | 47.63%     | <input type="text" value="51.87%"/>     | 4.23%      | 8.89%    |
| Market Value of Assets     | 204,927.41 | <input type="text" value="188,202.65"/> | -16,724.76 | -8.16%   |
| Market Capitalization      | 63,999.78  | <input type="text" value="63,999.78"/>  | 0.00       | 0.00%    |
| Share Price                | 3.16       | <input type="text" value="3.16"/>       | 0.00       | 0.00%    |
| Shares Outstanding         | 20,259.50  | <input type="text" value="20,259.50"/>  | 0.00       | 0.00%    |
| Default Point              | 97,614.80  | <input type="text" value="97,614.79"/>  | 0.00       | 0.00%    |
| Short-Term Liabilities     | 55,553.88  | <input type="text" value="55,553.88"/>  | 0.00       | 0.00%    |
| Long-Term Liabilities      | 83,895.82  | <input type="text" value="83,895.82"/>  | 0.00       | 0.00%    |
| Adjusted Total Liabilities | 139,449.70 | <input type="text" value="139,449.70"/> | 0.00       | 0.00%    |



May 11, 2020 © Copyright 2020 Moody's Analytics, Inc. and/or its licensors and affiliates. All Rights reserved.

# What-if Analysis

What if the same exercise is carried out for the entire rated sample?



4

Summary

# Summary

- » Moody's Analytics EDF measures have shown acute and accurate responses to COVID-19, providing timely early warning signals for various countries, industries, and firms.
- » The change in EDF credit measure across countries is closely tied to the severity of outbreak, with western European countries receiving more significant impact than Eastern.
- » The consumer and leisure related industries experienced the largest increases in EDF credit measure, however oil remains the riskiest sector by liability-weighted EDF measure given the shock in both demand and price.
- » As in most events that impact credit risk, there are losers (for example, the Airline industry) and winners (for example, certain pharmaceutical companies).
- » The expected loss for European corporates has seen significant increase, with an unprecedented divergence between the risk of high yield and investment grade spaces.



# Relevant Reports on CreditEdge

CreditEdge

MOODY'S ANALYTICS

PORTFOLIOS ANALYTICS ALERTS HELP

MY CREDITEDGE

Help Center > Applied Research

Search CreditEdge's Help Center

## Applied Research

Topical articles and practical application of CreditEdge

– Risk Managers

- ★ EDF Report March 2020: Impact of COVID-19 on European Corporate Credit Risk
- EDF Report March 2020: Impact of COVID-19 on North American Corporate Credit Risk
- Preparing for a Turn in the Chinese Credit Cycle
- Probability-Weighted Outcomes Under IFRS 9: A Macroeconomic Approach
- IFRS 9 Impairment Regulations: Implementation Challenges and Potential Solutions
- Default Prediction Power of EDFs vs Stock Returns

See all 8 articles

+ Investment Managers

+ Topics@CreditEdge

Michael Zeng  
Michael.Zeng@moodys.com  
+1 (415)-874-6182

Zhong Zhuang  
Zhong.Zhuang@moodys.com  
+1 (415)-874-6297

© 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/OR ITS CREDIT RATINGS AFFILIATES ARE MOODY'S CURRENT OPINIONS OF THE RELATIVE FUTURE CREDIT RISK OF ENTITIES, CREDIT COMMITMENTS, OR DEBT OR DEBT-LIKE SECURITIES, AND MATERIALS, PRODUCTS, SERVICES AND INFORMATION PUBLISHED BY MOODY'S (COLLECTIVELY, "PUBLICATIONS") MAY INCLUDE SUCH CURRENT OPINIONS. MOODY'S INVESTORS SERVICE 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 INVESTORS SERVICE CREDIT RATINGS. CREDIT RATINGS DO NOT ADDRESS ANY OTHER RISK, INCLUDING BUT NOT LIMITED TO: LIQUIDITY RISK, MARKET VALUE RISK, OR PRICE VOLATILITY. CREDIT RATINGS, NON-CREDIT ASSESSMENTS ("ASSESSMENTS"), AND OTHER 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. AND/OR ITS AFFILIATES. MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND PUBLICATIONS DO NOT CONSTITUTE OR PROVIDE INVESTMENT OR FINANCIAL ADVICE, AND MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND PUBLICATIONS ARE NOT AND DO NOT PROVIDE RECOMMENDATIONS TO PURCHASE, SELL, OR HOLD PARTICULAR SECURITIES. MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND PUBLICATIONS DO NOT COMMENT ON THE SUITABILITY OF AN INVESTMENT FOR ANY PARTICULAR INVESTOR. MOODY'S ISSUES ITS CREDIT RATINGS, ASSESSMENTS AND OTHER OPINIONS AND PUBLISHES ITS 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, ASSESSMENTS, OTHER OPINIONS, AND 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, ASSESSMENTS, OTHER OPINIONS OR 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.

MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND 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 its 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, ASSESSMENT, 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 credit rating, agreed to pay to Moody's Investors Service, Inc. for credit ratings opinions and services rendered by it fees ranging from \$1,000 to approximately \$2,700,000. MCO and Moody's investors Service also maintain policies and procedures to address the independence of Moody's Investors Service credit ratings and credit rating processes. Information regarding certain affiliations that may exist between directors of MCO and rated entities, and between entities who hold credit ratings from Moody's Investors Service and have also publicly reported to the SEC an ownership interest in MCO of more than 5%, is posted annually at [www.moodys.com](http://www.moodys.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 credit rating, agreed to pay to MJKK or MSFJ (as applicable) for credit 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.