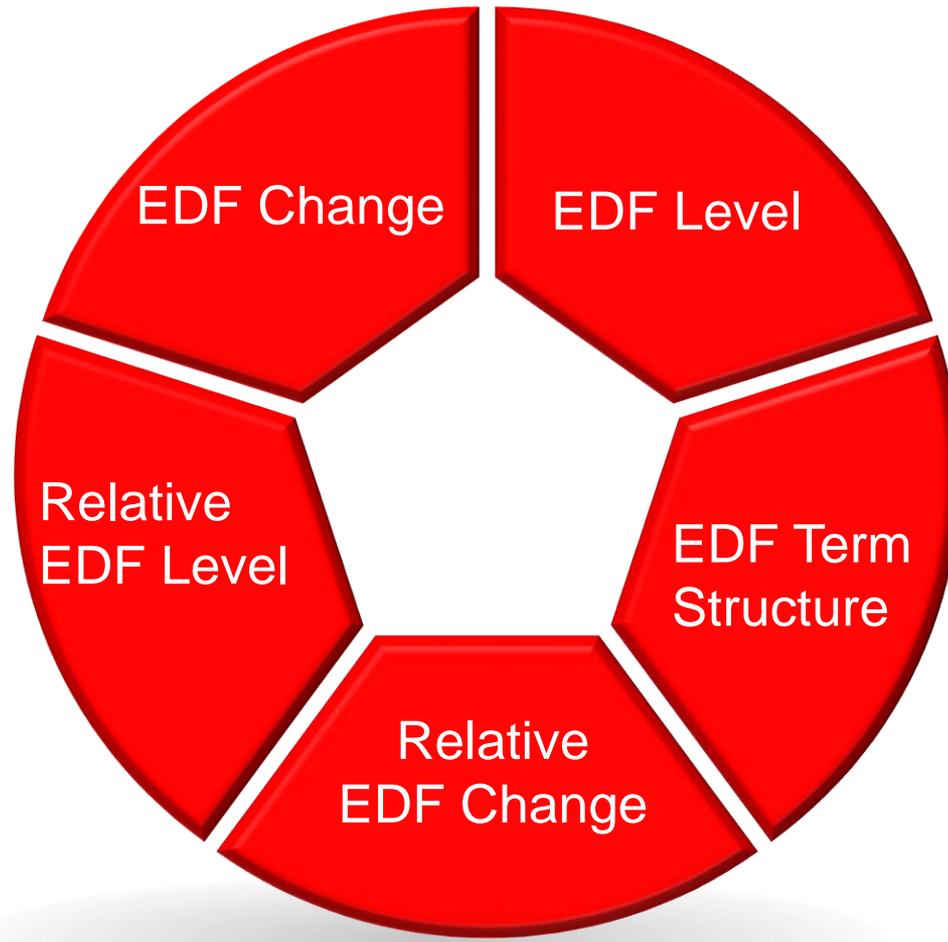


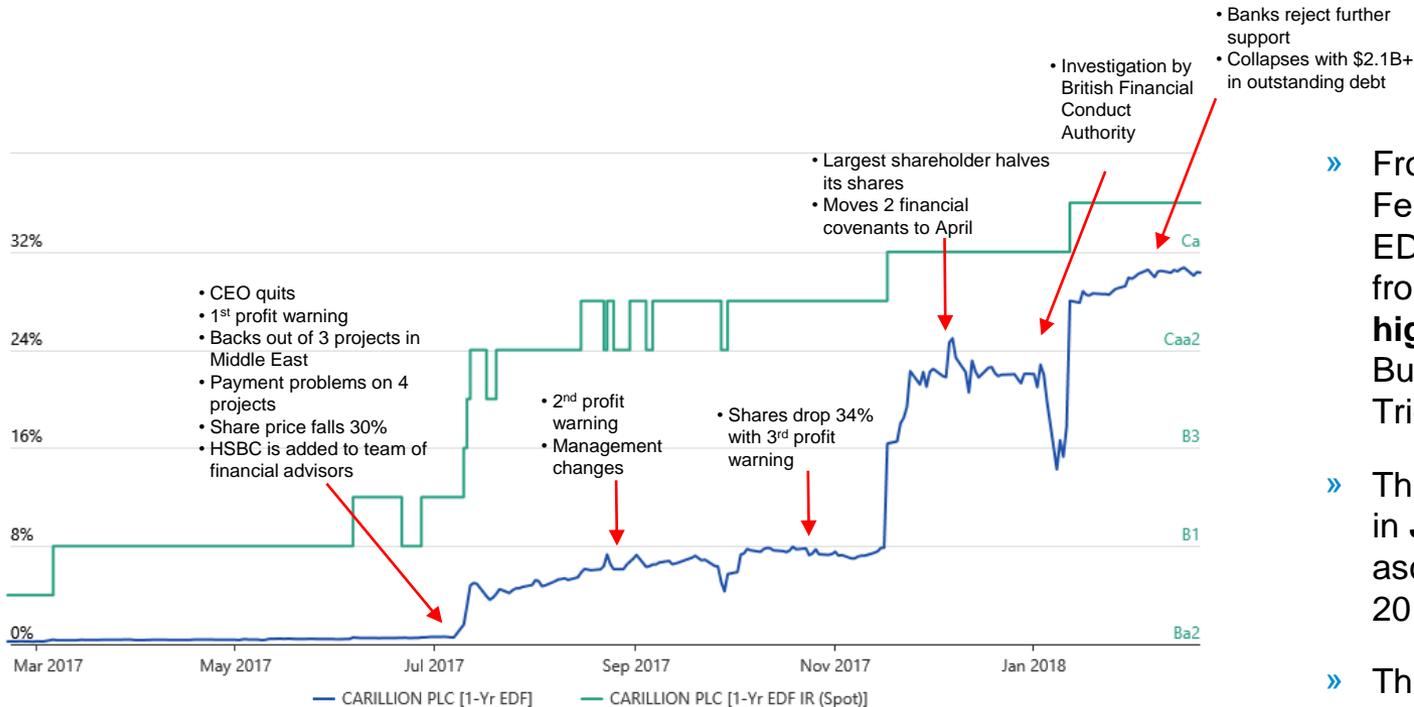
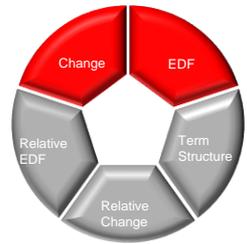
The Early Warning Toolkit in Practice: Carillion PLC

Carillion demonstrated High Risk for all 5 Early Warning factors



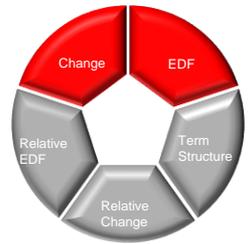
Based in the UK, **Carillion** was a multinational construction company and facilities management provider. It had 43,000 employees globally and held roughly 450 governmental contracts across the UK ministries of education, justice, defense and transportation. In 2016, it had \$7.3B in sales and a market capitalization of nearly \$1.4B. In January 2018, the firm collapsed with more than \$2.1B in outstanding debt, leaving UK taxpayers, subcontractors and suppliers to bear the burden.

Carillion's EDF first signaled heightened credit risk in July 2017



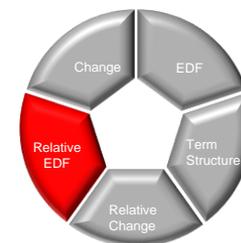
- » From February 2017 to February 2018, Carillion's EDF measure worsened from 0.22% to 30.31% (**10x higher** than the Global Business Services Group Trigger Level of 3.05%)
- » The EDF first rose sharply in **July 2017** and began its ascent again in November 2017.
- » The rating implied by its EDF measure also deteriorated steadily from Ba3 to C, when it ultimately defaulted.

The EDF remained above its industry EDF trigger level* since July 2017

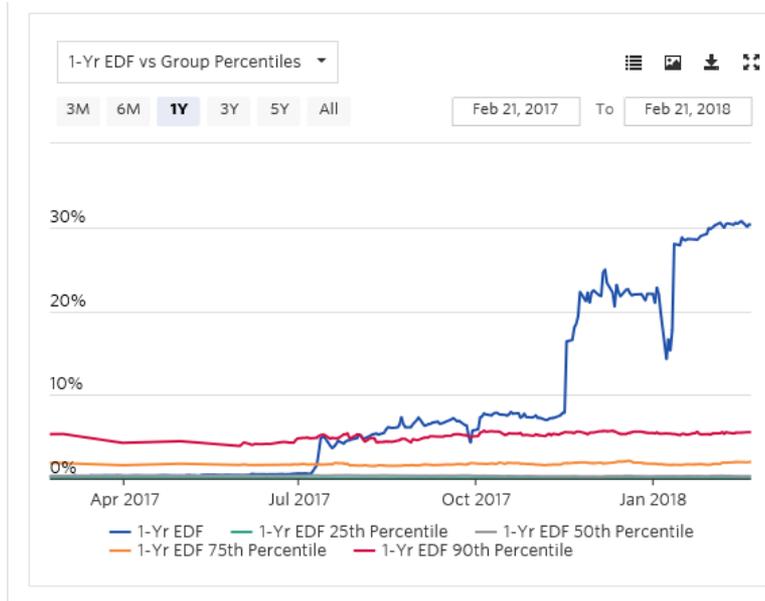


**Level above which firms have historically been at highest risk of default*

Carillion's EDF measure was amongst the riskiest names in its industry peer group over the last year



EDF Level vs Peers

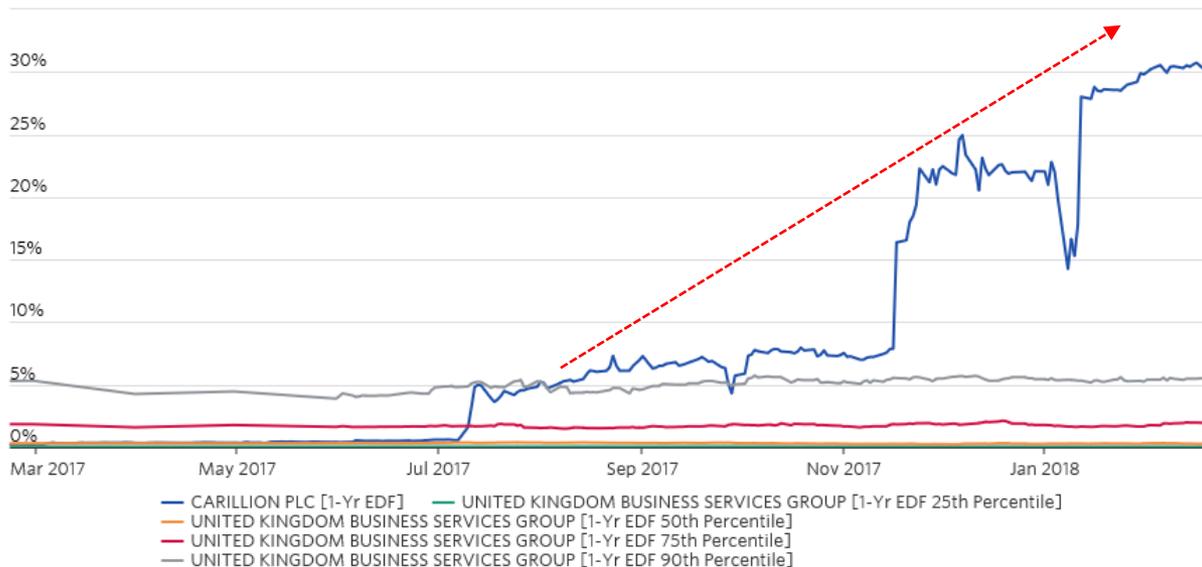
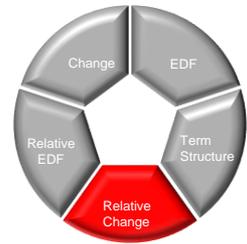


EDF Level vs Driver Percentiles



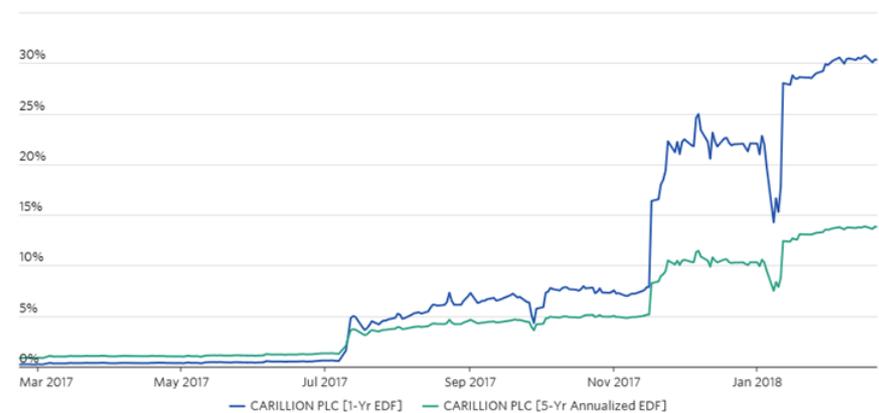
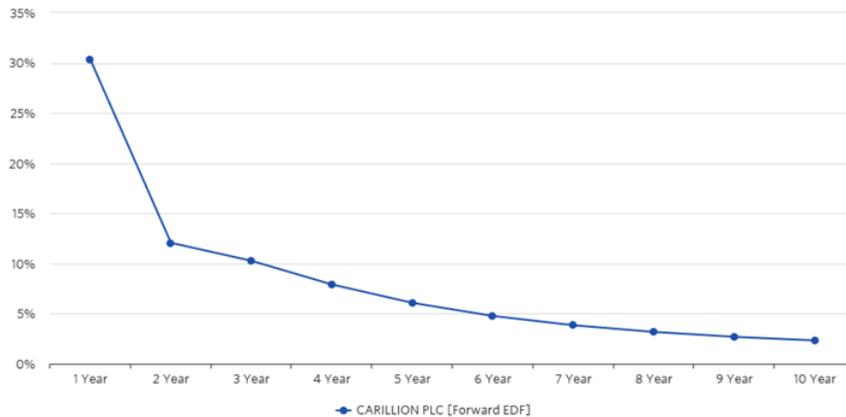
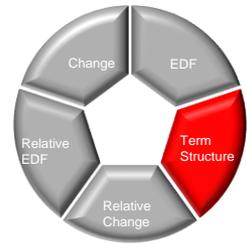
- » Moody's Analytics research shows that a company is 10x more likely to default if its EDF is greater than the median of its peer industry group.
- » Carillion's EDF was trending above the 90th percentile of its peer group since August 2017, where it remained until January 2018 when it defaulted.
- » Asset volatility was in line with the 1st percentile, while market leverage was in the riskiest 99th percentile compared to its peer group.

Carillion's EDF measure was trending substantially higher than the 90th percentile



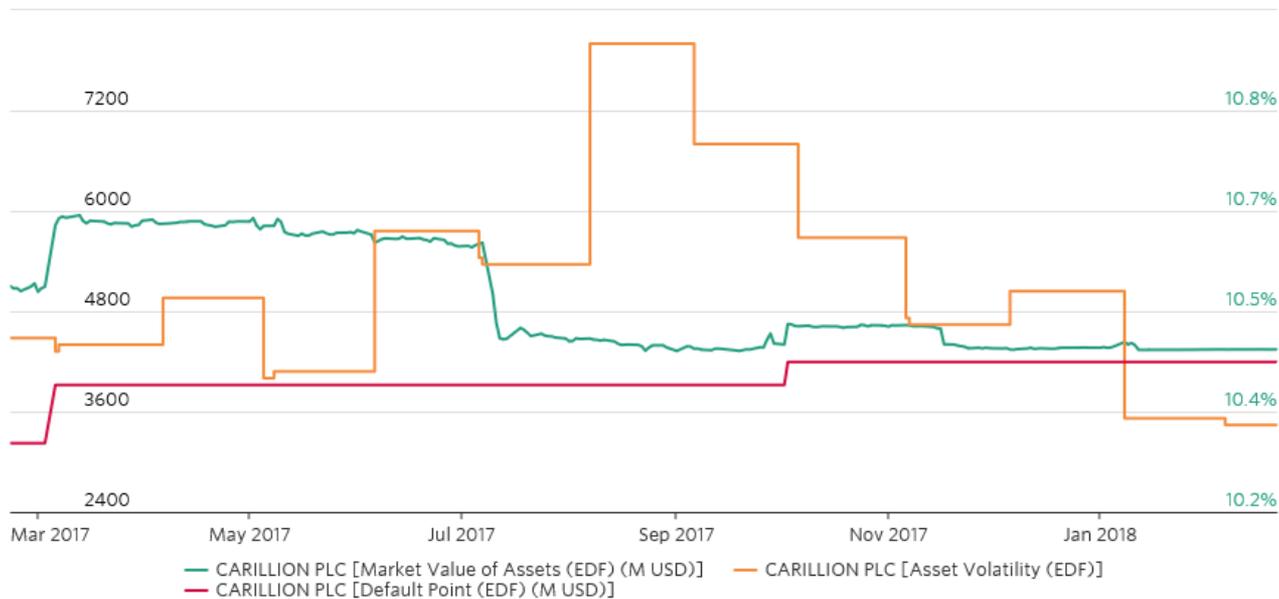
- » Carillion's EDF was trending above the 50th percentile as of May 2017, and crossed the 75th percentile by July 2017.
- » As of August 2017, the EDF slightly crossed the 90th percentile, and began its rapid ascent in November 2017.
- » The EDF improved slightly in December 2018 – potentially due to speculation of bank support – and spiked again in January 2018 when the firm ultimately defaulted.

Carillion's term structure demonstrated a downward sloping shape



- » A company's term structure tends to be upward-sloping during an economic expansion, unless it is in distress. Our research shows that firm's that experience inverted term structures (1yr EDF > 5yr EDF) are 13x more likely to default than firms that experience a normal upwards sloping term structure.
- » Carillion's 1yr EDF surpassed its 5yr EDF in July 2017, where it remained for the six months prior to its default.

Carillion's high default risk was reflected by its debt levels outpacing its cash flow...



- » Over the last year, B&W's market leverage worsened by 53%.
- » The main reason for this was added short term and long term liabilities to its books, coupled with a market value of assets lessened by 15%.
- » Over the last year, Carillion lost money on large contracts and accumulated substantial amounts of debt to offset its losses – due primarily to taking on too many high risk projects.

...while its slight improvement in business risk was not enough to improve the EDF



- » A company's business risk can be measured by the volatility of its assets. Higher volatility reflects greater uncertainty about a firm's future cash flows.
- » Over the last year, Carillion's asset volatility improved by nearly 2%, and was trending downward since its high point in September 2017.

MOODY'S

ANALYTICS

Ryan Donahue
Product Strategist
212.553.3903 tel
Ryan.Donahue@moodys.com

Client Services

Americas: +1.212.553.1653
clientservices@moodys.com

EMEA: +44.207.772.5454
clientservices.emea@moodys.com

APAC: +852.3551.3077
clientservices.asia@moodys.com

Japan: +81.3.5408.4100
clientservices.japan@moodys.com

© 2018 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. 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.

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 for 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 SUCH 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 appraisal and rating services rendered by it fees ranging from \$1,500 to approximately \$2,500,000. 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 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. It would be reckless and inappropriate for retail investors to use MOODY'S credit ratings or publications when making an investment decision. If in doubt you should contact your financial or other professional adviser.

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 appraisal and rating services rendered by it fees ranging from JPY200,000 to approximately JPY350,000,000.

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