

DATA REPORT

17 February 2022

CLIENT SERVICES

Americas 1-212-553-1653
Asia Pacific 852-3551-3077
Japan 81-3-5408-4100
EMEA 44-20-7772-5454

ABOUT CAPITAL MARKETS RESEARCH

Analyses from Moody's Capital Markets Research, Inc. (CMR) focus on explaining signals from the credit and equity markets. The publications address whether market signals, in the opinion of the group's analysts, accurately reflect the risks and investment opportunities associated with issuers and sectors. CMR research thus complements the fundamentally-oriented research offered by Moody's Investors Service (MIS), the rating agency.

CMR is part of Moody's Analytics, which is one of the two operating businesses of Moody's Corporation. Moody's Analytics (including CMR) is legally and organizationally separated from Moody's Investors Service and operates on an arm's length basis from the ratings business. CMR does not provide investment advisory services or products.

View the CMR FAQ **⊘** Contact us **⊘** Follow us on Twitter **⊘** Cross-Sector

Market Data Highlights

The latest market data from Weekly Market Outlook. Click <u>here</u> for access to the full WMO.

SPREADS





Figure 2: 5-Year Median Spreads-Global Data (High Yield)



Moody's Analytics markets and distributes all Moody's Capital Markets Research, Inc. materials. Moody's Capital Markets Research, Inc. is a subsidiary of Moody's Corporation. Moody's Analytics does not provide investment advisory services or products. For further detail, please see the last page.

CDS MOVERS

Figure 3. CDS Movers - US (February 9, 2022 – February 16, 2022)

CDS Implied Rating Rises	CDS Impli	ed Ratings	_
Issuer	Feb. 16	Feb. 9	Senior Ratings
Coca-Cola Company (The)	Aa1	Aa2	A1
Occidental Petroleum Corporation	Ba1	Ba2	Ba2
Tenet Healthcare Corporation	B1	B2	Caa1
Crown Castle International Corp.	Baa2	Baa3	Baa3
Kinder Morgan Energy Partners, L.P.	A2	А3	Baa2
Calpine Corporation	B2	В3	B2
Sysco Corporation	Baa2	Baa3	Baa1
DTE Energy Company	Aa2	Aa3	Baa2
ONEOK, Inc.	Baa2	Baa3	Baa3
Boston Properties Limited Partnership	Baa2	Baa3	Baa1

CDS Implied Rating Declines	CDS Impli	ed Ratings	_
Issuer	Feb. 16	Feb. 9	Senior Ratings
CenterPoint Energy, Inc.	Baa2	A3	Baa2
PepsiCo, Inc.	A2	A1	A1
Philip Morris International Inc.	A2	A1	A2
General Electric Company	Baa3	Baa2	Baa1
Eli Lilly and Company	Aa2	Aa1	A2
FirstEnergy Corp.	Baa3	Baa2	Ba1
Emerson Electric Company	Baa1	A3	A2
Danaher Corporation	A3	A2	Baa1
Archer-Daniels-Midland Company	A2	A1	A2
United Rentals (North America), Inc.	Ba2	Ba1	Ba2

CDS Spread Increases	-		CDS Spreads	
Issuer	Senior Ratings	Feb. 16	Feb. 9	Spread Diff
Lumen Technologies, Inc.	B2	469	342	128
Goodyear Tire & Rubber Company (The)	B2	314	232	82
Rite Aid Corporation	Caa2	1,145	1,073	72
Qwest Corporation	Ba2	254	185	69
American Airlines Group Inc.	Caa1	774	720	54
American Axle & Manufacturing, Inc.	B2	494	449	44
TEGNA Inc.	Ba3	474	437	37
Pitney Bowes Inc.	В3	669	632	37
Liberty Interactive LLC	B2	567	531	36
Beazer Homes USA, Inc.	В3	406	370	36

CDS Spread Decreases		CDS Spreads		
Issuer	Senior Ratings	Feb. 16	Feb. 9	Spread Diff
Talen Energy Supply, LLC	Caa2	4,168	4,202	-33
Domtar Corporation	Ba3	415	440	-25
Newell Brands Inc.	Ba1	108	131	-23
Mattel, Inc.	B1	115	136	-22
SITE Centers Corp.	Baa3	103	120	-17
Crown Castle International Corp.	Baa3	81	91	-11
Howmet Aerospace Inc.	Ba2	166	174	-8
Murphy Oil Corporation	Ba3	338	346	-8
Wendy's International, LLC	Caa2	128	136	-8
Levi Strauss & Co.	Ва2	121	129	-7

Source: Moody's, CMA

Figure 4. CDS Movers - Europe (February 9, 2022 – February 16, 2022)

CDS Implied Rating Rises	CDS Implied Ratings		_
Issuer	Feb. 16	Feb. 9	Senior Ratings
ENGIE SA	A1	A2	Baa1
Norddeutsche Landesbank GZ	Baa1	Baa2	A3
Autoroutes du Sud de la France (ASF)	A2	А3	A3
National Bank of Greece S.A.	Ba3	B1	В3
Bank of Scotland plc	A1	A2	A1
Electrabel SA	Baa2	Baa3	Baa1
Jaguar Land Rover Automotive Plc	B2	В3	B1
Alliander N.V.	Aa3	A1	Aa3
thyssenkrupp AG	Ba3	B1	B1
Coca-Cola HBC Finance B.V.	A1	A2	Baa1

CDS Implied Rating Declines	CDS Impli	ed Ratings	_
Issuer	Feb. 16	Feb. 9	Senior Ratings
Spain, Government of	A1	Aa3	Baa1
HSBC Holdings plc	Baa1	A3	A3
Portugal, Government of	A1	Aa3	Baa2
UniCredit S.p.A.	Baa3	Baa2	Baa1
UniCredit Bank AG	Aa2	Aa1	A2
Orange	A2	A1	Baa1
UniCredit Bank Austria AG	Aa2	Aa1	Baa1
BASF (SE)	Aa3	Aa2	A3
UBS AG	A2	A1	Aa3
Danone	Aa3	Aa2	Baa1

CDS Spread Increases		CDS Spreads		
Issuer	Senior Ratings	Feb. 16	Feb. 9	Spread Diff
Novafives S.A.S.	Caa2	898	801	97
Banca Monte dei Paschi di Siena S.p.A.	Caa1	369	322	46
Vedanta Resources Limited	B3	800	761	40
Avon Products, Inc.	Ba3	324	290	34
Clariant AG	Ba1	117	86	31
Premier Foods Finance plc	B3	262	235	27
celand Bondco plc	Caa2	572	548	24
Rolls-Royce plc	Ba3	207	183	23
Atlantia S.p.A.	Ba3	155	135	20
CECONOMY AG	Ba1	247	227	20

CDS Spread Decreases	_		CDS Spreads	
Issuer	Senior Ratings	Feb. 16	Feb. 9	Spread Diff
Piraeus Financial Holdings S.A.	Caa2	515	534	-19
Boparan Finance plc	Caa1	1,324	1,339	-15
Stagecoach Group Plc	Baa3	78	92	-14
Casino Guichard-Perrachon SA	Caa1	731	744	-13
Permanent tsb p.l.c.	Baa2	213	225	-12
Norddeutsche Landesbank GZ	A3	61	71	-10
NIBC Bank N.V.	Baa1	58	67	-9
Brisa Concessao Rodoviaria S.A.	Baa1	68	74	-5
Sappi Papier Holding GmbH	Ba2	329	333	-5
Unibail-Rodamco-Westfield SE	Baa2	142	145	-3

Source: Moody's, CMA

Figure 5. CDS Movers - APAC (February 9, 2022 – February 16, 2022)

CDS Implied Rating Rises	CDS Implied Ratings		_
Issuer	Feb. 16	Feb. 9	Senior Ratings
China Development Bank	Baa1	Baa2	A1
SoftBank Group Corp.	B1	B2	Ba3
Bank of China Limited	Baa1	Baa2	A1
SK Hynix Inc.	Baa2	Baa3	Baa2
LG Electronics Inc.	Baa2	Baa3	Baa2
Amcor Pty Ltd	Baa2	Baa3	Baa2
Hitachi, Ltd.	Aaa	Aa1	A3
Nippon Yusen Kabushiki Kaisha	A2	A3	Ba3
Japan, Government of	Aaa	Aaa	A1
China, Government of	A3	A3	A1

CDS Implied Rating Declines	CDS Implied Ratings		_
Issuer	Feb. 16	Feb. 9	Senior Ratings
Sumitomo Mitsui Banking Corporation	Aa2	Aa1	A1
Mitsubishi Corporation	Aa1	Aaa	A2
Oversea-Chinese Banking Corp Ltd	A1	Aa3	Aa1
Hong Kong SAR, China, Government of	Aa2	Aa1	Aa3
DBS Bank Ltd.	Aa3	Aa2	Aa1
Nissan Motor Co., Ltd.	Baa3	Baa2	Baa3
Woori Bank	Aa2	Aa1	A1
Korea Expressway Corporation	Aa3	Aa2	Aa2
Flex Ltd.	Baa3	Baa2	Baa3
GS Caltex Corporation	Aa3	Aa2	Baa1

CDS Spread Increases	_		CDS Spreads	
Issuer	Senior Ratings	Feb. 16	Feb. 9	Spread Diff
SoftBank Group Corp.	Ba3	332	312	20
Pakistan, Government of	B3	415	401	14
Flex Ltd.	Baa3	89	77	12
Nissan Motor Co., Ltd.	Baa3	86	77	9
Halyk Savings Bank of Kazakhstan	Ba2	315	306	9
Woolworths Group Limited	Baa2	61	54	7
MTR Corporation Limited	Aa3	34	29	5
Qantas Airways Ltd.	Baa2	161	156	5
India, Government of	Baa3	102	99	4
State Bank of India	Baa3	103	99	4

CDS Spread Decreases		CDS Spreads		
Issuer	Senior Ratings	Feb. 16	Feb. 9	Spread Diff
Tata Motors Limited	B1	239	252	-12
SK Innovation Co. Ltd.	Baa3	102	107	-5
ORIX Corporation	A3	29	31	-2
China Development Bank	A1	61	62	-1
Bank of China Limited	A1	63	64	-1
Tokyo Electric Power Company Holdings, Inc.	Ba1	45	46	-1
Japan Tobacco Inc.	A2	19	20	-1
Mitsui & Co., Ltd.	A3	24	25	-1
Panasonic Corporation	Baa1	29	30	-1
Hitachi, Ltd.	A3	19	20	-1

Source: Moody's, CMA

ISSUANCE

Figure 6. Market Cumulative Issuance - Corporate & Financial Institutions: USD Denominated

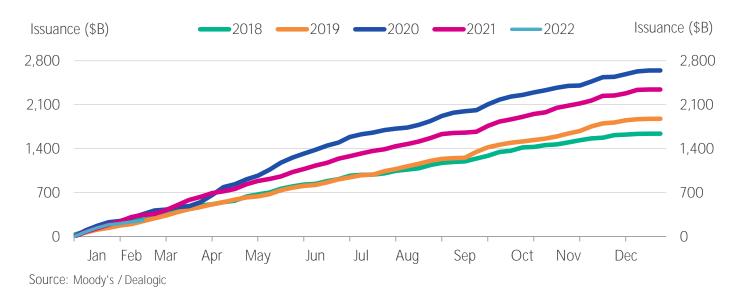


Figure 7. Market Cumulative Issuance - Corporate & Financial Institutions: Euro Denominated

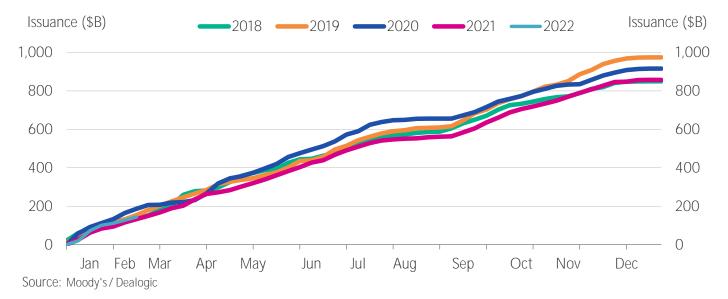


Figure 8. Issuance: Corporate & Financial Institutions

		USD Denominated	
	Investment-Grade	High-Yield	Total*
	Amount \$B	Amount \$B	Amount \$B
Weekly	18.725	3.470	23.745
Year-to-Date	204.438	43.891	258.733

		Euro Denominated	
	Investment-Grade	High-Yield	Total*
	Amount \$B	Amount \$B	Amount \$B
Weekly	14.742	1.600	16.513
Year-to-Date	129.846	12.951	143.795

^{*} Difference represents issuance with pending ratings.

Source: Moody's/ Dealogic

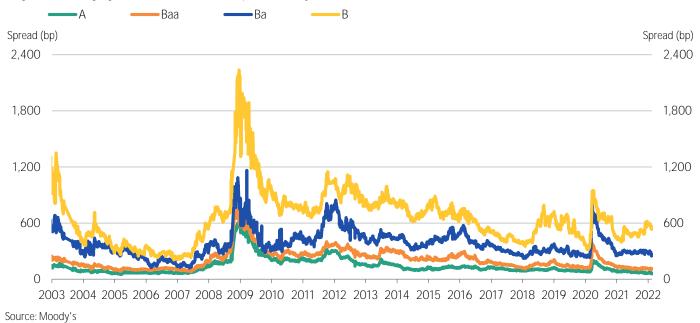
EMERGING MARKET CREDIT SPREADS

Figure 9. Emerging Market Median OAS

Emerging Market		Median	Spreads		Bond Counts			
Duration	Α	Baa	Ba	В	Α	Baa	Ba	В
>=1 and <3	63	108	209	428	86	152	42	38
>=3 and <5	60	111	265	545	100	122	56	48
>=5 and <7	84	164	302	596	56	98	30	26
>=7	115	219	395	626	131	258	57	31
Emerging Market Sovereign		Median	Spreads			Bond (Counts	
Duration	Α	Baa	Ba	В	Α	Baa	Ba	В
>=1 and <3	43	73	69	449	22	36	16	20
>=3 and <5	21	98	188	536	28	38	23	25
>=5 and <7	26	129	289	602	21	36	18	21
>=7	57	208	381	627	84	135	42	30
Emerging Market Corporate		Median	Spreads			Bond (Counts	
Duration	Α	Baa	Ba	В	Α	Baa	Ba	В
>=1 and <3	73	121	254	407	64	116	26	18
>=3 and <5	79	118	318	554	72	84	33	23
>=5 and <7	105	189	321	555	35	62	12	5
>=7	148	237	413	605	47	123	15	1

Source: Moody's

Figure 10: Emerging Markets Median Credit Spreads (3-5 year duration)



MEDIAN CREDIT SPREADS

Figure 11. Global Financial Institutions Median Credit Spreads

			N	dedian Spread	ds		
Duration	Aaa	Aa	Α	Baa	Ba	В	Caa
>=1 and <3	13	31	51	89	215	428	-
>=3 and <5	9	29	62	111	245	557	675
>=5 and <7	18	29	85	131	318	442	548
>=7	25	50	128	172	242	463	298
				Debt Counts	6		
Duration	Aaa	Aa	Α	Baa	Ba	В	Caa
>=1 and <3	428	361	513	342	68	13	-
>=3 and <5	274	318	390	301	55	23	2
>=5 and <7	160	162	207	156	30	13	7
>=7	133	339	476	298	19	1	3
				Issuer Count	S		
Duration	Aaa	Aa	Α	Baa	Ba	В	Caa
>=1 and <3	31	96	191	182	37	12	-
>=3 and <5	36	102	177	162	37	21	2
>=5 and <7	28	69	103	93	22	11	7
>=7	33	98	168	125	12	1	2

Source: Moody's

Figure 12. Global Corporate Median Credit Spreads

			N	Aedian Spread	ds		
Duration	Aaa	Aa	Α	Baa	Ba	В	Caa
>=1 and <3	18	41	44	72	220	418	558
>=3 and <5	22	41	50	80	279	445	604
>=5 and <7	28	56	73	114	299	375	575
>=7	78	115	128	171	296	376	401
				Debt Counts			
Duration	Aaa	Aa	Α	Baa	Ba	В	Caa
>=1 and <3	23	96	571	937	179	85	22
>=3 and <5	23	114	511	961	230	189	42
>=5 and <7	13	74	414	805	273	252	74
>=7	54	247	1491	2038	207	50	1
				Issuer Counts	8		
Duration	Aaa	Aa	Α	Baa	Ba	В	Caa
>=1 and <3	5	49	273	538	121	67	20
>=3 and <5	5	50	280	562	169	173	40
>=5 and <7	5	34	230	491	202	206	67
>=7	5	52	345	613	111	34	1
rce: Moody's							

MEDIAN 5-YEAR CDS SPREADS

Figure 13. Global Median CDS Spreads By Rating Category

Global M	1ed	ian S	pread:	s by	Fine	Rat	ing (Categ	ory
----------	-----	-------	--------	------	------	-----	-------	-------	-----

Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	
17	24	32	36	40	45	51	59	68	_
	Baa3	Ba1	Ba2	Ba3	B1	B2	В3	Caa	
							132		-

Global Median Spreads by Broad Rating Category

Aaa	Aa	Α	Baa	Ba	В	Caa
23	32	45	68	199	369	592

Global Issuer Counts by Broad Rating Category

Aaa	Aa	Α	Baa	Ba	В	Caa
10	48	172	344	86	45	26

Source: Moody's, CMA

Figure 14. Median CDS Spreads By Region

Median CDS Spreads

Region	Aaa	Aa	Α	Baa	Ba	В	Caa
North America	23	32	42	69	211	374	602
Europe	9	32	44	66	171	265	543
Asia Pacific (ex.Japan)	16	30	57	79	154	327	-
Japan	-	-	22	30	47	68	-

Issuer Counts

Region	Aaa	Aa	Α	Baa	Ba	В	Caa
North America	4	19	85	209	54	30	12
Europe	6	29	84	122	23	12	12
Asia Pacific (ex.Japan)	3	18	31	36	5	2	-
Japan	-	-	32	14	3	1	-

Source: Moody's, CMA

Figure 15. Global Median CDS Spreads by Sector

Median CDS Spreads

Sector	Aaa	Aa	Α	Baa	Ba	В	Caa
Corporates	24	32	40	66	197	300	597
Financials	10	31	49	76	205	366	369
Sovereigns	10	11	53	85	116	415	1688
Banks	-	34	50	76	248	271	328

Issuer Counts

Sector	Aaa	Aa	Α	Baa	Ba	В	Caa
Corporates	4	22	143	317	78	45	21
Financials	9	44	92	77	16	3	5
Banks	-	32	57	31	7	1	4
Sovereigns	9	7	6	13	4	1	1

Source: Moody's, CMA

Figure 16. Global Financial Institutions Median CDS Spreads by Region

Median CDS Spreads

Region	Aaa	Aa	Α	Baa	Ba	В	Caa
North America	12	40	54	76	265	366	-
Europe	9	31	48	74	115	271	328
Asia Pacific (ex.Japan)	15	29	57	91	110	415	-
Japan	-	-	29	67	-	-	-

Issuer Counts

Region	Aaa	Aa	Α	Baa	Ba	В	Caa
North America	1	8	24	25	5	1	-
Europe	6	23	42	30	4	1	4
Asia Pacific (ex.Japan)	2	13	14	13	3	1	-
Japan	-	-	11	2	-	-	-

Source: Moody's, CMA

Figure 17. Global Corporates Median CDS Spreads by Region

Median CDS Spreads

Region	Aaa	Aa	Α	Baa	Ba	В	Caa
North America	25	31	41	68	211	381	602
Europe	-	34	39	63	174	262	593
Asia Pacific (ex.Japan)	22	34	57	79	162	239	-
Japan	-	-	21	28	47	68	-

Issuer Counts

Region	Aaa	Aa	Α	Baa	Ba	В	Caa
North America	3	11	61	184	49	29	12
Europe	-	6	42	92	19	11	8
Asia Pacific (ex.Japan)	1	5	17	23	2	1	-
Japan	-	-	21	12	3	1	-

Source: Moody's, CMA

© 2022 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 CREDIT RATINGS AFFILIATES ARE THEIR 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 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 APPLICABLE MOODY'S RATING SYMBOLS AND DEFINITIONS PUBLICATION FOR INFORMATION ON THE TYPES OF CONTRACTUAL FINANCIAL OBLIGATIONS ADDRESSED BY MOODY'S 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 \$5,000,000. 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 cretain 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 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 JPY100,000 to approximately JPY550,000,000.

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

© 2022 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 CREDIT RATINGS AFFILIATES ARE THEIR 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 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 APPLICABLE MOODY'S RATING SYMBOLS AND DEFINITIONS PUBLICATION FOR INFORMATION ON THE TYPES OF CONTRACTUAL FINANCIAL OBLIGATIONS ADDRESSED BY MOODY'S

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 \$5,000,000. 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 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 JPY100,000 to approximately JPY550,000,000.

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

For Publications Issued by Moody's Capital Markets Research, Inc. only:

The statements contained in this research report are based solely upon the opinions of Moody's Capital Markets Research, Inc. and the data and information available to the authors at the time of publication of this report. There is no assurance that any predicted results will actually occur. Past performance is no guarantee of future results.

The analysis in this report has not been made available to any issuer prior to publication.

When making an investment decision, investors should use additional sources of information and consult with their investment advisor. Investing in securities involves certain risks including possible fluctuations in investment return and loss of principal. Investing in bonds presents additional risks, including changes in interest rates and credit risk.

Moody's Capital Markets Research, Inc., is a subsidiary of MCO. Please note that Moody's Analytics, Inc., an affiliate of Moody's Capital Markets Research, Inc. and a subsidiary of MCO, provides a wide range of research and analytical products and services to corporations and participants in the financial markets. Customers of Moody's Analytics, Inc. may include companies mentioned in this report. Please be advised that a conflict may exist and that any investment decisions you make are your own responsibility. The Moody's Analytics logo is used on certain Moody's Capital Markets Research, Inc. products for marketing purposes only. Moody's Analytics, Inc. is a separate company from Moody's Capital Markets Research, Inc.

REPORT NUMBER

1319859

