



Disclaimer

This is a publication of a third party. Merck KGaA, Darmstadt, Germany is not responsible for its content. Whenever this document refers to Merck it refers to Merck KGaA, Darmstadt, Germany or the group of companies affiliated with Merck KGaA, Darmstadt, Germany. In the United States and Canada the group of companies affiliated with Merck KGaA, Darmstadt, Germany operates under individual business names (EMD Serono, MilliporeSigma, EMD Performance Materials).

MOODY'S

INVESTORS SERVICE

CREDIT OPINION

22 October 2021

Update

 Rate this Research

RATINGS

Merck KGaA

Domicile	Darmstadt, Germany
Long Term Rating	A3
Type	LT Issuer Rating - Fgn Curr
Outlook	Stable

Please see the [ratings section](#) at the end of this report for more information. The ratings and outlook shown reflect information as of the publication date.

Contacts

Marie Fischer-Sabatie +33.1.5330.3391
Senior Vice President
marie.fischer-sabatie@moodys.com

Jeanine Arnold +33.1.5330.1062
Associate Managing Director
jeanine.arnold@moodys.com

CLIENT SERVICES

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

Merck KGaA

Update following upgrade to A3

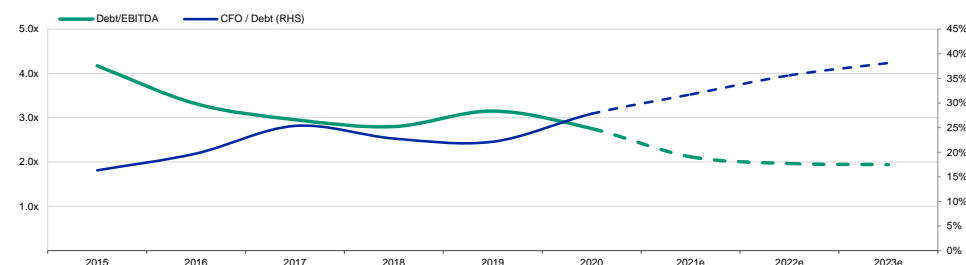
Summary

Merck KGaA's (Merck) A3 rating reflects its long-standing good operational diversification because of its presence in three different industries, namely pharmaceutical equipment with its Life Science division (43% of 2020 revenue), pharmaceuticals with its Healthcare division (38%), and semiconductors and displays with its Electronics division (19%); solid and steady growth prospects of its business sectors, which drive satisfactory cash flow generation; a portfolio of new drugs skewed toward biopharmaceuticals and, consequently, less exposed to generic competition; and a track record of conservative financial policies.

However, the A3 rating also factors in increasing competitive pressure on Merck's largest-selling drugs, namely Rebif and Erbitux; strong competition in the Liquid Crystal segment, a subsegment of the Electronics division; and a degree of event risk related to future strategic investments.

Exhibit 1

We expect Merck's credit ratios to further improve over the next 18 months
Moody's-adjusted debt/EBITDA and CFO/debt



Projected ratios represent Moody's forward view, not the view of the issuer, and do not incorporate significant acquisitions or divestitures.

Source: Moody's Financial Metrics and Moody's Investors Service estimates

Credit strengths

- » Good operational diversification with a presence in three business sectors
- » Solid and steady growth prospects of its business sectors, which drive satisfactory cash flow generation
- » Portfolio of new drugs skewed toward biopharmaceuticals
- » Track record of conservative financial policies

Credit challenges

- » Largest-selling drugs face increasing competition
- » Falling prices of liquid crystals, which weigh on the performance of its Electronics division
- » Degree of event risk related to future strategic investments

Rating outlook

The stable rating outlook reflects our expectation that Merck will continue to grow its earnings and that future strategic investments will continue to fuel revenue growth in the mid- to high-single digits in percentage terms while maintaining a Moody's-adjusted EBITDA margin above 25% and stable free cash flow (FCF) generation. We expect the company to maintain its conservative financial policies and also expect any significant increases in leverage to fund strategic M&A to result in weaker metrics only for a temporary period of time.

Factors that could lead to an upgrade

Upward rating pressure could develop if Merck's Moody's-adjusted debt/EBITDA trends toward 2.0x and Moody's-adjusted cash flow from operations (CFO)/debt is above 35% on a sustained basis. An upgrade would also require that Merck maintains its diversified business profile, a track record of solid operating performance at its three business sectors and conservative financial policies.

Factors that could lead to a downgrade

Downward rating pressure could develop if Merck's Moody's-adjusted debt/EBITDA increases above 3.0x or its Moody's-adjusted CFO/debt remains below 25%. Negative pressure could also develop if the company's financial policies become more aggressive or its liquidity weakens.

Key indicators

Exhibit 2

Merck KGaA

	Dec-17	Dec-18	Dec-19	Dec-20	12-18 months Forward View
Revenue (EUR Billion)	€14.5	€14.8	€16.2	€17.5	€20 - €21
Debt / EBITDA	3.0x	2.8x	3.2x	2.8x	2.0x - 2.5x
CFO / Debt	25.3%	22.8%	22.1%	27.8%	27% - 32%
Pharmaceutical Cash Coverage of Debt	6%	3%	18%	4%	8% - 15%

Projected ratios represent Moody's forward view, not the view of the issuer, and do not incorporate significant acquisitions or divestitures. All ratios are based on adjusted financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations.

Source: Moody's Financial Metrics and Moody's Investors Service estimates

Profile

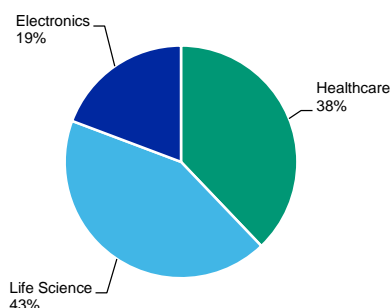
Founded in 1668 and based in Darmstadt, Germany, Merck is a diversified global healthcare, life sciences and electronics company. It develops and manufactures original drugs, healthcare products, specialty value-added chemicals, semiconductor materials and life science solutions. Merck generated €17.5 billion of revenue in 2020. The Merck family owns 70% of the group's capital, with the rest being listed.

As Exhibits 3 and 4 show, Merck has good operational and geographic diversification.

This publication does not announce a credit rating action. For any credit ratings referenced in this publication, please see the ratings tab on the issuer/entity page on www.moody's.com for the most updated credit rating action information and rating history.

Exhibit 3

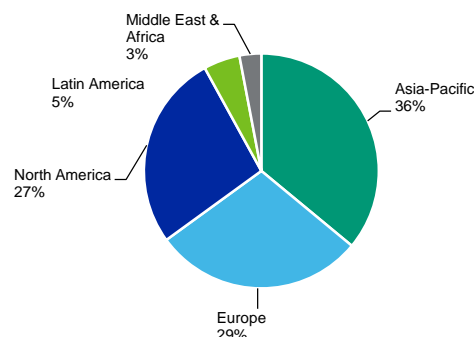
Good operational diversification supports Merck's credit quality Breakdown of 2020 revenue by division



Source: Company 2020 annual report

Exhibit 4

Merck's earnings are well diversified geographically Breakdown of 2020 revenue by geography



Source: Company 2020 annual report

Detailed credit considerations

Operational diversification in business sectors with solid growth prospects will continue to support Merck's business profile

Merck has maintained a diversified operating profile and continued to develop its three business sectors in recent years. In 2019, Merck acquired Versum Materials, Inc. (Versum), a leading supplier of semiconductor materials, gases and equipment. This transaction enabled Merck to become a leading provider of electronic materials for the semiconductor and display industries and to add a new segment to its Electronics division.

In the Life Science division, growth has been mostly organic in recent years, with Merck's presence in several high-growth segments, such as bioprocessing, and boosted by the coronavirus pandemic since 2020. This resulted in the Life Science division becoming the largest business sector of the group with a contribution of 43% to the 2020 group revenue.

In the Healthcare sector, Merck has been facing increasing competition for its two largest-selling drugs, Rebif for multiple sclerosis and Eribix for certain types of cancer, but has been able to mitigate it with the launch of two new drugs in the same therapeutic areas, Mavencic for multiple sclerosis and Bavencio, which has already been approved for kidney and bladder cancer. We expect the new products, as well as Merck's established products in fertility (Gonal-F) and Cardiovascular Metabolism & Endocrinology, to enable Merck to offset the declining sales of Rebif and Eribix.

Investments will increase over 2021-25 but an M&A strategy now more focused on bolt-on transactions mitigates execution risks

Merck's new strategic plan involves an increase of about 50% of its investments (including acquisitions) over 2021-25 compared with investments made in the past five years (2016-20). Most of these investments (at least 70%) will be directed to segments with high growth prospects: Process Solutions in Life Science, new products in Healthcare, and Semiconductor Solutions. We expect that the group's financial profile could therefore soften somewhat in 2022-23, but would still remain adequate for the A3 rating. We project that leverage (Moody's-adjusted gross debt/EBITDA) will be around 2x as of year-end 2021 and Moody's-adjusted CFO/debt will be in the low 30s in percentage terms, which will leave Merck with some flexibility for incremental investments.

These investments will include additional capital spending of about €500 million annually, which will be mainly allocated to capacity expansion at its Life Science division. We also expect Merck to invest in late-stage molecules to strengthen its Healthcare pipeline, either through acquisitions or in-licensing transactions. With regard to M&A, the company has announced a shift in its acquisition strategy with a focus on bolt-on transactions for future acquisitions rather than the larger, and sometimes transforming, deals that Merck used to make in the past, which overall is likely to reduce related execution risks.

Earnings growth to continue in 2021-22

Over the next 12-18 months, we forecast sales to increase by about 6%, driven by all three divisions of Merck's portfolio. The performance of the Life Science division was strong in 2020, with organic growth in revenue and company EBITDA of 12% and 17%,

respectively. The strong growth was mainly fueled by a surge in demand for products used in COVID-19 vaccines, therapies and diagnostics. Over the next 12-18 months, we expect the Life Science division to grow at high-single digits in percentage terms, driven, in particular, by Process Solutions. Growth in the latter will continue to be boosted in 2021-22 by the demand for critical materials for COVID-19 vaccine and therapy production.

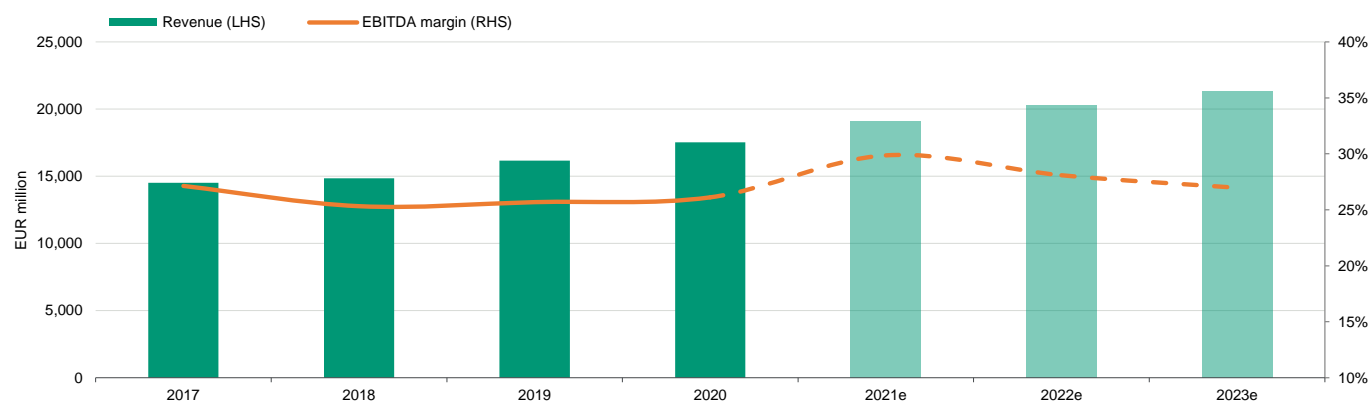
We expect the Healthcare division to report growth in the mid-single digits in percentage terms over the next 12-18 months, driven by the continued recovery in the fertility segment and the continued rollout of new products, such as Mavenclad and Bavencio, which will offset the pressure on the existing drugs that have lost patent protection.

The Electronics division, which reported a moderate decline (-3.2% on an organic basis) in 2020, has returned to growth and, over the next 12-18 months, we expect it to record low single-digit organic growth in percentage terms, driven by an improvement in the Semiconductor Solutions business, while liquid crystals sales will continue to decline.

Exhibit 5

We expect revenue growth in 2021-23, supported by all three divisions

Revenue and Moody's-adjusted EBITDA margin



Source: Moody's Financial Metrics and Moody's Investors Service estimates

Moderate exposure to generic competition, but competition is increasing for Rebif and Erbitux

Although Merck's two main drugs, Rebif and Erbitux, have already faced patent expiration on their active ingredients and will continue to do so over the next few years, the group has employed active life cycle management, notably with the new formulation of Rebif (patent expiry in 2024) and Rebidose, a new single-use pre-filled pen for the self-administration of Rebif. In addition, both Erbitux (for which the European Union patent expired in June 2014) and Rebif are biological drugs, which have been difficult to copy so far. However, with an increasing number of biosimilars being launched, we expect these products to face increasing competition.

In 2020, Rebif's revenue fell by 9% at a constant exchange rate, and we expect future sales to decline by about 10% per year. Competition has been increasing in multiple sclerosis, with the launch of Zeposia (manufactured by [Bristol-Myers Squibb Company](#) [A2 stable]) and Vumerity ([Biogen Inc.](#) [Baa1 stable]) in recent years. Merck's new multiple sclerosis drug Mavenclad has returned to solid growth since the third quarter of 2020, after a pandemic-induced slowdown in its ramp-up, and has been offsetting Rebif's sales decline. Sales of Erbitux, one of Merck's largest pharmaceutical products, grew in 2020, benefiting from a temporary supply agreement with [Eli Lilly and Company](#) (A2 stable), but its sales are likely to decline over the next few years because of pricing pressure and increasing competition. We expect Bavencio, Merck's new drug to treat several forms of cancer, to mitigate the future drop in Erbitux's sales.

Merck's fertility products, including Gonal-F, were affected by the pandemic and their sales declined in 2020 (Gonal-F sales declined 12.7% organically in 2020) but they have recovered during 2021 as the pandemic subsides. Gonal-F is facing biosimilar competition in some markets, but it has continued to perform strongly.

ESG considerations

Merck's ESG Credit Impact Score is moderately negative CIS-3

Exhibit 6

ESG Credit Impact Score

CIS-3

Moderately Negative

For an issuer scored CIS-3 (Moderately Negative), its ESG attributes are overall considered as having a limited impact on the current rating, with greater potential for future negative impact over time. The negative influence of the overall ESG attributes on the rating is more pronounced compared to an issuer scored CIS-2.



Source: Moody's Investors Service

CIS-3. Merck's ESG Credit Impact Score is Moderately Negative (**CIS-3**). There has been a limited credit impact to date, but there is a potential for social risk factors to strain the rating over time. The company's diversified businesses, which in addition to branded pharma include life sciences, surface materials and electronics, mitigate these risks.

Exhibit 7

ESG Issuer Profile Scores

ENVIRONMENTAL

E-3

Moderately Negative



SOCIAL

S-3

Moderately Negative



GOVERNANCE

G-2

Neutral-to-Low



Source: Moody's Investors Service

Environmental

E-3. Merck's score reflects its moderate exposure to waste and pollution risks, with the company recognizing environmental protection liabilities on its balance sheet.

Social

S-3. Merck has moderate exposure to social risks. It has large businesses in life sciences (about 40% of its revenue) and electronics (about 20%), which are less exposed to litigation risk and policy risk related to pricing than branded pharma businesses.

Governance

G-2. Merck's exposure to governance risks is neutral to low. Although there is a high ownership concentration, it is mitigated by the company's long track record of conservative financial policies, illustrated by a moderate dividend payout and the inclusion of some hybrid funding for large acquisitions. Merck has an active acquisition strategy, but it has a track record of focusing on rapid leverage reduction after large transactions.

ESG Issuer Profile Scores and Credit Impact Scores for the rated entity/transaction are available on Moodys.com. To view the latest scores, please click [here](#) to go to the landing page for the entity/transaction on MDC and view the ESG Scores section.

Liquidity analysis

Merck has a solid liquidity. As of June 2021, it had €1.8 billion of cash on balance sheet and access to a fully undrawn €2.0 billion revolving credit facility maturing in 2025 without a maintenance covenant or a significant adverse change clause. We project that

Merck will generate FCF of about €1 billion annually on average in 2021-23. Merck's debt maturity profile is well spread, and its next debt maturities are \$1 billion and €550 million bonds that mature in 2022.

Structural considerations

The Baa2 junior subordinate rating assigned to Merck's hybrid notes is two notches below its A3 issuer rating. This difference reflects the deeply subordinated nature of the hybrid securities in relation to the senior unsecured obligations of the company and its subsidiaries, while the hybrid securities are only senior to common shares. The hybrid securities have a maturity of at least 60 years and no events of default. The hybrid notes qualify for basket C and a 50% equity treatment of the borrowing for our calculations of the credit ratios.

Methodology and scorecard

The principal methodology used was our [Pharmaceutical Industry](#) rating methodology, published in June 2017. Merck's actual long-term issuer rating is in line with the scorecard-indicated outcome of A3.

Merck's Life Science business sector has been increasing its contribution to group revenue and EBITDA in recent years and is now the largest contributor, slightly ahead of the Healthcare division. Should Life Science remain the clear largest contributor in the coming years, we could consider shifting Merck from the Pharmaceutical Industry methodology to the Medical Products and Devices methodology.

Exhibit 8

Rating factors

Merck KGaA

Pharmaceutical Industry Scorecard [1][2]		Current LTM 6/30/2021	Moody's 12-18 Month Forward View As of October 2021 [3]	
Factor 1 : Scale (25%)	Measure	Score	Measure	Score
a) Revenue (USD Billion)	\$22.1	A	\$23 - \$24	A
Factor 2 : Business Profile (40%)				
a) Product and Therapeutic Diversity	A	A	A	A
b) Geographic Diversity	Aa	Aa	Aa	Aa
c) Patent Exposures	A	A	A	A
d) Pipeline Quality	Ba	Ba	Ba	Ba
Factor 3 : Leverage & Cash Coverage (25%)				
a) Debt / EBITDA	2.3x	A	2.0x - 2.5x	A
b) (Cash Flow from Operation) / Debt	36.6%	A	27% - 32%	Baa
c) Pharmaceutical Cash Coverage of Debt	18.9%	Baa	8% - 15%	Ba
Factor 4 : Financial Policy (10%)				
a) Financial Policy	A	A	A	A
Rating:				
a) Scorecard-Indicated Outcome		A3		A3
b) Actual Rating Assigned		A3		A3

(1) All ratios are based on adjusted financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations. (2) As of LTM 6/30/2021. (3) This represents Moody's forward view, not the view of the issuer, and unless noted in the text, does not incorporate significant acquisitions and divestitures.

Source: Moody's Financial Metrics and Moody's Investors Service estimates

Ratings

Exhibit 9

Category	Moody's Rating
MERCK KGAA	
Outlook	Stable
Issuer Rating	A3
Senior Unsecured MTN -Dom Curr	(P)A3
Jr Subordinate -Dom Curr	Baa2
Other Short Term -Dom Curr	(P)P-2
MERCK FINANCIAL SERVICES GMBH	
Outlook	Stable
Bkd Senior Unsecured -Dom Curr	A3
Bkd Other Short Term -Dom Curr	(P)P-2
EMD FINANCE LLC	
Outlook	Stable
Bkd Senior Unsecured	A3

Source: Moody's Investors Service

Appendix

Exhibit 10

Peer comparison

Merck KGaA

	Merck KGaA A3 Stable			Danaheer Corporation Baa1 Stable			Thermo Fisher Scientific Inc. Baa1 Stable			Eli Lilly and Company A2 Stable			Bristol-Myers Squibb Company A2 Stable		
	FYE Dec-19	FYE Dec-20	LTM Jun-21	FYE Dec-19	FYE Dec-20	LTM Jun-21	FYE Dec-19	FYE Dec-20	LTM Jun-21	FYE Dec-19	FYE Dec-20	LTM Jun-21	FYE Dec-19	FYE Dec-20	LTM Jun-21
(in USD million)															
Revenue	18,082	20,012	22,118	17,911	22,284	26,720	25,542	32,218	38,250	22,320	24,540	26,726	26,145	42,518	44,384
EBITDA	4,645	5,226	6,366	4,903	6,855	9,511	6,964	10,337	13,173	7,769	8,212	8,131	9,765	18,202	18,584
Total Debt	14,691	15,434	14,875	23,728	23,601	22,820	20,519	24,420	21,251	22,424	24,363	24,222	49,735	53,856	50,231
Cash + Marketable Securities	640	1,372	1,926	19,912	6,035	7,322	2,399	10,325	7,023	2,439	3,681	3,271	15,393	16,450	14,016
EBITDA Margin %	25.7%	26.1%	28.8%	27.4%	30.8%	35.6%	27.3%	32.1%	34.4%	34.8%	33.5%	30.4%	37.3%	42.8%	41.9%
EBITDA / Interest Expense	9.2x	11.4x	14.1x	30.7x	20.8x	29.2x	9.7x	17.4x	22.8x	15.3x	17.6x	17.8x	13.9x	12.4x	13.0x
Pharmaceutical Cash Coverage of Debt	4.4%	8.9%	18.9%	83.9%	25.6%	32.1%	11.7%	42.3%	33.0%	13.3%	17.0%	27.9%	32.5%	31.3%	28.2%
Debt / EBITDA	3.2x	2.8x	2.3x	4.8x	3.4x	2.4x	2.9x	2.4x	1.6x	2.9x	3.0x	3.0x	5.1x	3.0x	2.7x
CFO / Debt	22.1%	27.8%	36.6%	17.5%	27.7%	36.3%	25.2%	35.0%	49.5%	23.1%	27.2%	29.8%	18.2%	27.9%	26.3%

All figures and ratios are calculated using Moody's estimates and standard adjustments. FYE = Financial year end. LTM = Last 12 months.

Source: Moody's Financial Metrics™

Exhibit 11

Debt adjustment breakdown

Merck KGaA

	FYE Dec-17	FYE Dec-18	FYE Dec-19	FYE Dec-20	LTM Jun-21
(in EUR million)					
As Reported Total Debt	10,709	8,805	13,119	12,039	11,968
Pensions	1,105	1,966	1,461	2,069	2,069
Leases	476	494	0	0	0
Hybrid Securities	(745)	(746)	(1,493)	(1,494)	(1,494)
Non-Standard Public Adjustments	99	0	0	0	0
Moody's Adjusted Total Debt	11,644	10,519	13,088	12,614	12,543

All figures are calculated using Moody's estimates and standard adjustments.

Source: Moody's Financial Metrics™

Exhibit 12

EBITDA adjustment breakdown

Merck KGaA

	FYE Dec-17	FYE Dec-18	FYE Dec-19	FYE Dec-20	LTM Jun-21
(in EUR million)					
As Reported EBITDA	4,220	3,591	4,111	4,958	5,717
Unusual Items - Income Statement	(427)	28	(20)	(424)	(424)
Pensions	0	(15)	58	45	45
Leases	146	153	0	0	0
Moody's Adjusted EBITDA	3,939	3,757	4,149	4,579	5,338

All figures are calculated using Moody's estimates and standard adjustments.

Source: Moody's Financial Metrics™

Exhibit 13

Summary ratios historical and Moody's projected
Merck KGaA

(in EUR million)	FYE Dec-17	FYE Dec-18	FYE Dec-19	FYE Dec-20	Dec-21 (F)	Dec-22 (F)	Dec-23 (F)
INCOME STATEMENT							
Revenue	14,517	14,836	16,152	17,534	19,117	20,248	21,354
EBITDA	3,939	3,757	4,149	4,579	5,709	5,687	5,759
EBITDA margin %	27.1%	25.3%	25.7%	26.1%	29.9%	28.1%	27.0%
EBITA	3,293	3,109	3,441	3,738	4,851	4,847	4,939
EBITA margin %	22.7%	21.0%	21.3%	21.3%	25.4%	23.9%	23.1%
BALANCE SHEET							
Cash & Cash Equivalents	386	1,883	570	1,109	1,834	1,699	2,771
Total Debt	11,644	10,519	13,088	12,614	12,093	11,182	11,182
CASH FLOW							
Capital Expenditures	(1,441)	(1,147)	(1,157)	(1,707)	(1,785)	(2,189)	(2,364)
Retained Cash Flow (RCF)	2,825	2,071	2,728	3,075	3,579	3,604	3,560
Free Cash Flow (FCF)	863	459	1,010	1,083	1,269	915	1,016
FINANCIAL RATIOS							
Debt / EBITDA	3.0x	2.8x	3.2x	2.8x	2.1x	2.0x	1.9x
Cash Flow from Operations (CFO) / Debt	25.3%	22.8%	22.1%	27.8%	31.7%	35.6%	38.1%
Pharmaceutical Cash Coverage of Debt	3.3%	17.9%	4.4%	8.9%	15.3%	15.3%	24.9%
RCF / Net Debt	25.1%	24.0%	21.8%	26.7%	34.9%	38.0%	42.3%
FCF / Debt	7.4%	4.4%	7.7%	8.6%	10.5%	8.2%	9.1%

Projected ratios represent Moody's forward view, not the view of the issuer, and do not incorporate significant acquisitions or divestitures.

Source: Moody's Financial Metrics and Moody's Investors Service estimates

© 2021 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 PUBLISHED BY MOODY'S ANALYTICS, INC. AND/OR ITS AFFILIATES. MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND PUBLICATIONS 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.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 61 003 399 657 AFSL 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 JPY550,000,000.

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

REPORT NUMBER

1306602

CLIENT SERVICES

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