

## Rating Methodology

# Moody's Global Corporate Finance

January 2009

## Global Steel Industry

### Summary

This rating methodology explains Moody's approach to assessing credit risk in the global steel industry. It replaces the Global Steel Industry rating methodology that was published in October 2005. While reflecting similar core principles as the October 2005 methodology, this updated framework incorporates refinements that better reflect the changing landscape in and dynamics of the global steel industry and the way Moody's applies its industry methodologies.

The goal of this report is to help issuers, investors and other interested market participants understand how Moody's assesses credit risk for companies in the steel industry and to explain how key quantitative and qualitative risk factors map to specific rating outcomes. Our objective is for users to be able to estimate the likely credit rating (senior unsecured rating for investment-grade and Corporate Family Rating for speculative-grade issuers) for a steel company within two alpha-numeric rating notches.

There are four key categories Moody's particularly focuses on to examine credit risk and assign ratings in the steel industry. These four factors encompass 10 specific elements (or sub-factors), each of which maps to specific letter ratings (see Appendix A). The four factors, which will be detailed in this report, are as follows:

- Size and Business Profile
- Operating Performance and Volatility
- Financial Policies
- Financial Strength

In addition to steel producers, this methodology encompasses companies whose revenues and earnings are derived from a margin on metal construction, principally steel and aluminum fabricators or extruders, although they represent a small segment of the rated universe within the steel industry classification.

### Table of Contents:

Summary	1
About the Rated Universe	3
About this Rating Methodology	5
The Key Rating Factors	8
Rating Factor 1: Size and Business Profile (35% weight)	8
Rating Factor 2: Operating Performance and Volatility (25% weight)	11
Rating Factor 3: Financial Policies (25% weight)	13
Rating Factor 4: Financial Strength (15% weight)	15
Rating Methodology Assumptions and Limitations, and Other Rating Considerations	16
Conclusion: Summary of the Grid-Indicated Rating Outcomes	17
Appendix A: Global Steel Methodology Factor Grid	18
Appendix B: Methodology Grid-Indicated Ratings	19
Appendix C: Observations and Outliers for Grid Mapping	21
Appendix D: Steel Industry Overview	26
Appendix E: Key Rating Issues Over the Intermediate Term	28
Moody's Related Research	29

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## Global Steel Industry

In Appendix B we have included a detailed rating grid for the companies included in this methodology. For each company, the grid maps the key rating factors and sub-factors and shows the indicated alpha-numeric rating that is calculated from the overall combination of factors. We also include discussions of “outliers” – companies whose rating for a specific sub-factor differs significantly from the actual ratings, as companies will not always perform consistently with their overall rating on every sub-factor.

The purpose of the rating grid is to provide a reference tool that can be used to approximate credit profiles within the steel sector. The grid provides summarized guidance on the factors that are generally most important in assigning ratings to the sector. Since the grid represents a summary that does not include every rating consideration and does not fit every business model equally well, and our mapping uses historical financial results to illustrate the grid while our ratings also consider forward looking expectations, the grid-indicated rating is not expected to match the actual rating of each company. The text of the rating methodology provides insights on the key rating considerations that are not represented in the grid, as well as the circumstances in which the rating effect for a factor might be significantly different from the weight indicated in the grid.

Readers should also note that this methodology does not attempt to provide an exhaustive list of every factor that can be relevant to steel company ratings. For example, our analysis covers factors that are common across all industries (such as ownership, management, liquidity, legal structure in the corporate organization, corporate governance) as well as factors that can be meaningful on a company specific basis (such as Other Postretirement Employee Benefits, litigation exposure and environmental obligations).

This publication includes the following sections:

- About the Rated Universe: overview of the rated steel industry environment
- About this Rating Methodology: description of our rating methodology, including a detailed explanation of each of the key factors that drive ratings
- Assumptions and Limitations: comments on the rating methodology's assumptions and limitations, including a discussion of other rating considerations that are not included in the grid

In the appendices, we also provide tables that illustrate the application of the methodology grid to the 22 representative rated steel companies with explanatory comments on some of the more significant differences between the grid-implied rating and our actual rating (Appendix C), a brief industry overview (Appendix D), and a discussion of key rating issues for the steel industry over the intermediate term (Appendix E).

## Global Steel Industry

### About the Rated Universe

For purposes of this methodology, we have defined steel issuers as those companies involved in the production and sale of steel, either on a semi-finished or value-added basis. The rated universe includes integrated and minimill producers, as well as companies with specialty metals segments and distribution operations.

Steel companies represented in this methodology represent a diverse group of issuers differentiated by scale, market position and business model. The industry is further differentiated by regional characteristics which can influence market conditions and by the dramatic growth seen in emerging markets such as China and India. These distinguishing characteristics in combination with whether exposure is to emerging or developed country market risk can contribute to greater rating disparity than quantitative measurements might imply.

For example, the Japanese steel market evidences a different business risk profile from that faced by producers in other countries. The resultant business stability and predictability of cash flows for the rated Japanese steel producers therefore mitigates the more modest quantitative financial measurements relative to those of major global peers. The market for steel producers in Western Europe is differentiated from other markets as the three leading steel producers, ArcelorMittal, ThyssenKrupp and Tata (Corus) enjoy substantial market share for some important product grades in a market place with somewhat higher consolidation than elsewhere. In addition these producers are also the major European steel distribution companies, which can lead to a dilution of margins but provide relative stability in underlying cash flows. Operating margins also tend to be lower in European countries than in other markets reflective of the cost of operating in a number of smaller countries with differing local consumption habits and different logistics systems. The U.S. market has historically been vulnerable to significant import levels, which influences the dynamics of supply and price. In addition, companies in the U.S. continue to have ongoing costs and obligations in the area of pensions and retiree health care that are of greater magnitude than global competitors, which may contribute to lower ratings than would otherwise be indicated.

Moody's rates 37 steel companies globally with an aggregate of nearly \$48 billion of rated debt.

- Geographically, based upon country of domicile,
- 41% of the rated issuers are based in the Americas
- 38% are based in Europe, and
- 22% are based in Asia and the Middle East

Roughly 38% of the rated steel companies are rated investment grade with recent years having seen upward rating migration. While ratings in the sector range from A1 to Caa1, the global median rating is currently Ba1 with investment-grade ratings clustered in the mid-Baa range and speculative-grade ratings centered in the mid-Ba rating level. Several issuers stand out with A ratings and are distinguished by a) consistent free cash flow generation capability and low leverage in the case of Nucor, b) strong operating profile and market dominance in its home region in the case of POSCO and c) strong franchise and value-added product mix, backed by technological advantage in the case of Nippon Steel.

The rating grids used for illustrative purposes in this methodology cover 22 of the rated steel companies and were selected to represent a wide range of credit ratings, size, operating characteristics and geographic locations. These 22 companies listed in Appendix B and Appendix C comprise roughly \$33 billion or approximately 70% of the debt of steel issuers rated by Moody's.

## Global Steel Industry

Company	Sr. Unsecured or Corporate Family Rating*	Commercial Paper/ Speculative Grade Liquidity**	Outlook	Domicile	Approximate Rated Debt (\$ Millions)***
Nippon Steel Corporation	A1		Stable	Japan	\$3,512
Nucor Corporation	A1	P-1	Stable	United States	\$3,232
POSCO	A1		Stable	Korea	\$809
JFE Holdings, Inc.	A2		Stable	Japan	\$547
JFE Steel Corporation	A2		Stable	Japan	\$6,120
ArcelorMittal	Baa2	P-2	Stable	Luxembourg	\$8,261
Commercial Metals Company	Baa2	P-2	Stable	United States	\$1,321
Kobe Steel, Ltd.	Baa2		Positive	Japan	\$1,018
ThyssenKrupp AG	Baa2	P-2	Stable	Germany	\$2,620
Allegheny Technologies Incorporated	Baa3		Stable	United States	\$450
Carpenter Technology Corporation	Baa3		Stable	United States	\$299
Companhia Siderurgica Paulista - COSIPA	Baa3		Stable	Brazil	\$375
United States Steel Corporation	Baa3		Stable	United States	\$1,150
Usinas Siderurgicas de Minas Gerais S.A.	Baa3		Stable	Brazil	\$609
Companhia Siderurgica Nacional - CSN	Ba1		Stable	Brazil	\$1,055
Gerdau Ameristeel Corporation	Ba1		Stable	United States	\$428
Gerdau S.A.	Ba1		Stable	Brazil	\$600
Novolipetsk Steel OJSC	Ba1		Negative	Russia	-
Steel Dynamics, Inc.	Ba1		Stable	United States	\$1,780
Tata Steel Ltd.	Ba1		Negative	India	-
AK Steel Holding Corporation	Ba2	SGL-1	Stable	United States	\$550
California Steel Industries, Inc.	Ba2		Review DG	United States	\$150
Magnitogorsk Iron & Steel Works	Ba2		Stable	Russia	-
Severstal OAO	Ba2		Negative	Russia	\$1,950
Erdemir	Ba3		Negative	Turkey	-
Evrast Group S.A.	Ba3		Stable	Luxembourg	\$2,750
Lucchini S.p.A.	Ba3		Stable	Italy	-
Tata Steel U.K.	Ba3		Negative	United Kingdom	\$5,517
TMK	Ba3		Negative	Russia	\$300
Industrial Union of Donbass	B1		Review DG	Ukraine	-
John Maneely Company	B1		Stable	United States	\$1,585
Metinvest B.V.	B1		Negative	Netherlands	-
Azovstal Capital B.V. <sup>1</sup>	B2		Negative	Netherlands	\$175
Essar Steel Algoma Inc.	B3	SGL-3	Stable	Canada	\$749
G Steel Public Company Limited	B3		Negative	Thailand	\$170
Zaporizhstal OJSC	Caa1		Stable	Ukraine	-
Zlomrex S.A.	Caa1		Stable	Poland	\$217

## Notes:

\*For investment grade companies, the senior unsecured rating is listed; for speculative grade companies, the corporate family rating is listed.

\*\*For investment grade companies, the commercial paper rating is listed; for speculative grade companies, the speculative grade liquidity rating is listed.

\*\*\* All rated debt as of September 30, 2008

<sup>1</sup> Azovstal is a subsidiary of Metinvest B.V.

## Global Steel Industry

## About this Rating Methodology

Moody's steel industry rating methodology consists of the six sections listed below. The first three sections pertain to the rating factor discussions. The fourth section (Mapping Issuers to the Grid and Discussion of Grid Outliers) is in Appendix C. The last two sections follow the rating factor discussions.

In order to better reflect the changing landscape in the steel industry, the Business Diversity and Size factor in the October 2005 methodology has been replaced with the Size and Business Profile factor (operational diversity has been expanded to better capture competitive position), while the Cost Position factor has been replaced with Operating Performance and Volatility. Two sub-factors previously used, "other liabilities/equity and raw material costs," have been eliminated and a cash flow volatility sub-factor has been added to shed light on the variability of a company's cash flows.

### 1. Identification of the Key Rating Factors

The grid in this rating methodology focuses on four broad rating factors and weightings. The four broad factors are further broken down into 10 sub-factors.

Rating Factor / Sub-Factor Weighting				
Broad Rating Factors	Broad Rating Factor Weighting	Rating Sub-Factor	Sub-Factor Weighting	
Size and Business Profile	35%	Net Consolidated Sales (\$USD billions) (most recent year-end or LTM period)	25%	
		{ Operational Diversity Regional Diversity Import Threat/Export Reliant }		10%
Operating Performance and Volatility	25%	EBIT Margin (3 year average)	10%	
		Return on Average Tangible Assets (3 year average)	5%	
		Volatility based on the Coefficient of Variation of CFO/Net Sales	10%	
Financial Policies	25%	Debt/Capital (most recent year-end or LTM period)	15%	
		Debt / EBITDA (3 year average)	10%	
Financial Strength	15%	EBIT/Interest (3 year average)	5%	
		CFO-Div/Debt (3 year average)	5%	
		FCF / Debt (3 year average)	5%	
<b>Total</b>	<b>100%</b>		<b>100%</b>	

## Global Steel Industry

### 2. Measurement of the Key Rating Factors

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We explain the measurements we use to assess performance on each of the rating factors and sub-factors. We explain the rationale for using specific rating factors and provide insights on the way these are applied in the rating decision process. Many of the sub-factors are found in or are derived from the company's financial statements; others are calculated using data gathered from various sources, and observations and estimates by Moody's analysts.

Moody's ratings are forward looking and incorporate our expectations of future financial and operating performance. We use both historical and projected financial results in the rating process. Historical operating results help us understand the pattern of a company's performance and how it compares to its peers. Historical data also assists us in, among other things, looking through the earnings volatility associated with the business cycle and evaluating whether projected future results are realistic. We utilize historical data herein to illustrate application of the rating methodology grid. Specifically, the mapping examples, unless otherwise stated, use three-year averages of financial statement information with the latest period on a trailing twelve month basis in order to capture improving or deteriorating trends. The statement periods may not be identical for all issuers (for example issuers in Japan have a March 31 year-end date). For the volatility sub-factor in the Operating Performance and Volatility factor, we generally use results over a five year period (if available) to illustrate the application of the grid and our belief that volatility needs to be examined over a longer time frame given the cyclical and consolidating nature of the steel industry.

All of the quantitative credit metric measures incorporate Moody's standard adjustments<sup>1</sup> to the income statement, statement of cash flows, and balance sheet for off-balance sheet accounts receivable securitization programs, under-funded pension obligations and recurring operating leases, among other items.

### 3. Mapping Factors to Rating Categories

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After identifying the measurement criteria for each sub-factor, we provide a chart that maps the sub-factors to specific alpha rating categories (Aaa, Aa, A, Baa, Ba, B, or Caa).

### 4. Mapping Issuers to the Grid and Discussion of Grid Outliers

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In this section (Appendix B), we provide a table showing how each company maps within the specific sub-factors. The weighted average of the sub-factor ratings produces a grid-indicated rating for each broad factor. We also highlight companies (Appendix C) whose grid-indicated performance on a specific factor or sub-factor is higher or lower by two or more broad rating categories from the actual rating and discuss general reasons for such outliers within a given factor or sub-factor.

### 5. Discussion of Assumptions, Limitations and Other Rating Considerations

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This section discusses limitations in the use of the grid to map against actual ratings as well as limitations and key assumptions that pertain to the overall rating methodology.

<sup>1</sup> For additional information on Moody's standard adjustments, please see "Moody's Approach to Global Standard Adjustments in the Analysis of Financial Statements for Non-Financial Corporations – Part I: Standardized Adjustments to Enable Global Consistency for US and Canadian GAAP Issuers", February 2006; "Moody's Approach to Global Standard Adjustments in the Analysis of Financial Statements for Non-Financial Corporations – Part II: Standardized Adjustments to Enable Global Consistency for Issuers Reporting under International Financial Reporting Standards (IFRS)", February 2006; "Moody's Approach to Global Standard Adjustments in the Analysis of Financial Statements for Non-Financial Corporations – Part III: Standardized Adjustments to Enable Global Consistency for Issuers Reporting under Japanese GAAP", October 2006.

## Global Steel Industry

## 6. Determining the Overall Grid-Indicated Rating

To determine the overall grid-indicated rating, the indicated rating category for each sub-factor (i.e., Aaa, Aa, A, Baa, Ba, B or Caa) is converted into a numeric value based upon the scale below.

Aaa	Aa	A	Baa	Ba	B	Caa
6	5	4	3	2	1	0

The numerical score for each sub-factor is multiplied by the weight for that sub-factor with the results then summed to produce a composite weighted-factor score. The composite weighted factor score is then mapped back to an alphanumeric rating based on the ranges in the grid below.

Factor Numerics	
Composite Rating	
Indicated Rating	Aggregate Weighted Factor Score
Aaa	$x > 5.5$
Aa1	$5.2 < x \leq 5.5$
Aa2	$4.8 < x \leq 5.2$
Aa3	$4.5 < x \leq 4.8$
A1	$4.2 < x \leq 4.5$
A2	$3.8 < x \leq 4.2$
A3	$3.5 < x \leq 3.8$
Baa1	$3.2 < x \leq 3.5$
Baa2	$2.8 < x \leq 3.2$
Baa3	$2.5 < x \leq 2.8$
Ba1	$2.2 < x \leq 2.5$
Ba2	$1.8 < x \leq 2.2$
Ba3	$1.5 < x \leq 1.8$
B1	$1.2 < x \leq 1.5$
B2	$0.8 < x \leq 1.2$
B3	$0.5 < x \leq 0.8$
Caa1	$0.0 < x \leq 0.5$

For example, an issuer with a composite weighted factor score of 3.0 would have a Baa2 grid-indicated rating. We used a similar procedure to derive the grid-indicated factor ratings in the tables embedded in the discussion of each of the four broad rating factors.

## Global Steel Industry

### The Key Rating Factors

Moody's analysis of steel and margin on metal construct companies focuses on four broad factors:

- Size and Business Profile
- Operating Performance and Volatility
- Financial Policies
- Financial Strength

#### Notes on Measurement Criteria

The sub-factors in the tables accompanying the following rating factors use, unless otherwise indicated, historical results for the most recent three years (incorporating Moody's standard adjustments) to illustrate application of the methodology framework. A company's historical debt to EBITDA leverage ratio, for example, can be a lagging indicator as it does not reflect planned capital structure changes. Moody's ratings are forward looking and, where appropriate, anticipate likely future changes to metrics based on assumptions regarding future earnings, acquisitions, cash distributions to shareholders or, more positively, anticipated debt reduction funded from free cash flow and divestiture proceeds.

### Rating Factor 1: Size and Business Profile (35% weight)

#### Why it Matters

**Size:** Given the inherent cyclical nature of the steel industry and price volatility within the industry, the revenue-generating capability of a company is a key variable in analyzing its overall market strength, importance to markets served and staying power. Revenue is an indication of scale and diversity of operations as discussed below, but also incorporates the nature of products produced, i.e. pure commodity, value-added or a blend. Given the general commodity-like nature of steel and its ability to be sold on a global basis, companies with a larger revenue base exhibit a more enduring ability to weather the cyclical nature inherent in the industry and generally have greater flexibility to manage their businesses through differing price and demand scenarios. A large revenue base also leads to important economies of scale such as in raw material purchases, and corporate functions such as finance, legal, tax, and accounting. Larger companies also tend to generate higher cash flows to apply to capital reinvestment and debt reduction and have greater access to capital markets, thereby reducing the cost of capital.

**Business Profile:** This is measured through three principal elements: Operational Diversity, Regional or Geographic Diversity, and the degree to which markets in which companies participate are vulnerable to import threat or are export reliant.

Operational Diversity, which considers the number of locations in which a company operates as well as the diversity of operations that can be performed within a single complex, is an important variable given the greater options afforded a more diversified company. Multiple locations lessen the impact of strikes, equipment failures, power outages and other operational event risks that could significantly curtail output. In addition, operational diversity is expected to enable companies to have greater flexibility to curtail production in the case of a market downturn given multiple sourcing sites. Companies with single or few mill sites have a higher operational risk and would have lesser flexibility to continue to source customer orders, leading to reduced financial flexibility. Operational diversity is often accompanied by product diversity, which reduces reliance on a single product or end-market.

Regional or Geographic Diversity considers the breadth of a company's operating sites both within its home country and internationally and the market position it occupies in its key product areas. Diversity in operating locations is viewed as an important characteristic, helping to mitigate the cash flow volatility from secular, cyclical and seasonal revenue swings that can affect a specific geographic region or industry.

## Global Steel Industry

The threat of imports is relevant due to the downward pricing pressure it can exert on domestic markets (such as the U.S. and Europe for example) while companies which are reliant on exports are vulnerable to the loss of sales in the event that economic conditions deteriorate in global markets served and consumption in domestic markets is insufficient to absorb excess capacity (Russia for example).

### How We Measure It For the Grid

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#### Size:

In measuring size, we use the latest year's revenue or LTM period, if available, in U.S. dollars. The most recent period's revenue is used in order to be better able to measure companies at the same point in the cycle and their overall position moving into the following year.

#### Business Profile:

The numeric scores for each of the three considerations in this sub factor are added together and in the aggregate can range from -1 to 8. These scores are then mapped to the rating ranges from Caa to Aaa.

Operating Diversity, which can range from 0 to 5, is measured by taking a total of the company's distinct operating locations and includes operations that might fall outside the specific activity of making steel. In general, steel producers can be classified into two major types: integrated steel mills and minimills. Integrated producers generally produce several millions of tons in one large operating site with a number of distinct operations contained within the complex, while minimills tend to have lesser production capacity at individual sites but tend to have a number of sites within various regional locations.

To address this distinction and to reflect the diversity within an integrated site, Moody's methodology gives credit for the multiple individual mills that an integrated producer has at a single site, while each individual minimill site counts as a discrete location.

In measuring Regional or Geographic Diversity, which scores from 0 to 3, we look at the distribution of production and sales on a specific market served basis and consider the competitive position of a company in its core products within the regions served. Regional considerations tend to better reflect the nature of the U.S. market, while the rest of the world tends to be on a more country or domestic market basis. Scoring in this element is enhanced by geographic diversification of operating sites outside of a company's home market. Given the commodity-like nature of steel, market position and strength in markets served are important differentiating factors. Companies that are regional or niche players and are not within the top five players in their market will score 0 while companies within multiple geographic regions or domestic markets, which enjoy dominant market share in all core products will score the maximum of 3.

The measurement for import threat / export reliance is at best neutral at 0 and minus 1 if vulnerable.

## Global Steel Industry

## Factor 1: Size and Business Profile (35%)

Sub-Factor:	Aaa	Aa	A	Baa	Ba	B	Caa	Weight
Size (Net Consolidated Sales in USD\$ billions; most recent year-end or LTM period)	≥ 35	≥ 25 Aa < 35	≥ 15 A < 25	≥ 5 Baa < 15	≥ 2.5 Ba < 5	≥ 1 B < 2.5	Caa < 1	25%
Business Profile	Aaa = 8	Aa = 7	A = 5 or 6	Baa = 3 or 4	Ba = 2	B = 1	Caa ≤ 0	10%

Elements of Business Profile (Scoring) :	Sub-Factor Numerical Score		Sub-Factor Numerical Score		Sub-Factor Numerical Score
Operational Diversity (Distinct operating locations)		Regional Diversity		Import Threat/Export Reliant	
a) 1 Location	0	a) Regional or niche player	0	a) if core steel markets served are subject to import threats and/or companies are reliant on exports	-1
b) 2 to 3 Locations	1	b) Within one to two geographic regions and/or domestic markets, the company is among the top five players in only two of its core products	1	b) if core steel markets served are protected from import threats and/or companies are not dependent on exports	0
c) 4 to 5 Locations	2	c) Within two to three geographic regions and/or domestic markets, the company is among the top five players in at least three of its core products	2		
d) 6 to 10 Locations	3	d) Within multiple geographic regions and/or domestic markets, company has the dominant market share in all its core markets	3		
e) 11 to 20 Location	4				
f) >20 Locations	5				

***A chart that illustrates grid mapping results for Factor 1 and a discussion of outliers is included in Appendix C.***

## Global Steel Industry

## Rating Factor 2: Operating Performance and Volatility (25% weight)

### Why it Matters

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Operating performance demonstrates how a company translates its market position, product mix and cost base into operating earnings (measured by EBIT) while the volatility sub-factor captures the degree to which operating cash flow fluctuates with varying revenues in a cyclical industry. Given the industry characteristics of underlying pricing volatility, limited producer pricing power, sensitivity to underlying economic conditions, vulnerability to input cost fluctuations, and a relatively high fixed-cost structure, particularly at integrated producers, elements that are within a company's ability to manage, or not as the case may be, such as cost structure and operating efficiency, are important considerations in the rating analysis.

Factors that measure operating efficiency and earnings performance, together with the degree to which cash generation on a given revenue base experiences volatility help in assessing a company's staying power to operate through economic downturns and its ability to not only continue servicing its debt, but meet other obligations. These other obligations can vary extensively on a geographic basis due to regulatory, environmental compliance, and other differences. Here again, certain distinctions between production methods of the minimills and integrated producers must be kept in mind. Minimills melt scrap in electric arc furnaces, although certain minimill producers are using a larger mix of scrap substitutes and seeking to secure greater self-sufficiency in raw material sources. Integrated producers, however, process iron ore, coke and other materials in blast and basic oxygen furnaces in order to produce molten steel. As a consequence, the cost structures as well as the efficiency of assets employed are important analytical considerations in determining the sustainability of performance.

### How We Measure It For The Grid

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There are three sub-factors that Moody's focuses on when analyzing the operating performance and volatility of the steel industry.

#### EBIT Margin:

This sub-factor is measured as a three-year average of annual EBIT (using Moody's standard adjustments) divided by a three-year average of annual revenue. This is a critical measurement for analyzing the underlying operational profitability of a steel producer. While Moody's looks to maintain some stability in ratings in different operating and economic environments and considers the historical trends over the prior three years, expectations for performance over the next two to three years, based upon trends and economic conditions, are a critical component in the rating process. In its analytical process, Moody's also considers the differing business profiles of companies, some of whom have lower margin distribution segments (as is more common in Europe), or business segments outside of steel. In these cases, Moody's will look at individual segment performance. However, for illustrative purposes, this methodology uses the average EBIT to revenue ratio of the past three years as a proxy for performance through both peak and trough scenarios.

#### Return on Average Tangible Assets:

A three-year average of annual EBIT divided by average tangible assets. This measurement adds further dimension by providing an indication of the efficiency of assets employed. Given the capital-intensive nature of the industry and the need to operate at high capacity utilization rates, this ratio provides a further indication of the ability to generate meaningful returns from the asset base.

#### Volatility:

The sub-factor is measured as the five-year average of cash flow from operations (CFO) to net consolidated sales.

## Global Steel Industry

We use the coefficient of variation of annual cash flow from operations to annual sales (using a 5 year average or as many years up to 5 as are available) as an indicator of the cash a company is capable of generating, after working capital requirements, to support maintenance capital requirements, growth, dividends, and as an indicator of the degree of variability in this metric in light of the cyclical nature of the industry.

### Factor 2: Operating Performance and Volatility (25%)

Sub-Factor:	Aaa	Aa	A	Baa	Ba	B	Caa	Weight
EBIT Margin (3 year average)	Aaa $\geq$ 30%	$\geq$ 20% Aa < 30%	$\geq$ 15% A < 20%	$\geq$ 8.0% Baa < 15%	$\geq$ 5.0% Ba < 8.0%	$\geq$ 2.0% B < 5.0%	Caa < 2%	10%
Return on Average Tangible Assets (3 year average)	Aaa $\geq$ 20%	$\geq$ 15% Aa < 20%	$\geq$ 10% A < 15%	$\geq$ 5% Baa < 10%	$\geq$ 2.5% Ba < 5%	$\geq$ 1% B < 2.5%	Caa < 1%	5%
Volatility based on the Coefficient of Variation of CFO/Net Sales	0% $\leq$ Aaa < 15%	$\geq$ 15% Aa < 25%	$\geq$ 25% A < 40%	$\geq$ 40% Baa < 60%	$\geq$ 60% Ba < 75%	$\geq$ 75% B < 90%	Caa < 0% & $\geq$ 90%	10%

**A chart that illustrates grid mapping results for Factor 2 and a discussion of outliers is included in Appendix C.**

## Global Steel Industry

## Rating Factor 3: Financial Policies (25% weight)

### Why it Matters

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Moody's views a company's financial policies as a critical component in the rating process for steel companies as they provide insight into management's philosophy regarding the company's capital structure and the financial risk under which it is willing to operate. Our analytical process focuses on the use of debt in the capital structure, shareholder policies including dividends and share repurchases, funding requirements for capital expenditures, and how acquisitions have been financed. In the recent robust years for the steel industry, there has been significant acquisition activity as well as company's instituting share repurchase programs. At the same time, many companies have taken advantage of the strong earnings and cash flow generation cycle to reduce debt and other liabilities such as pensions. Leverage ratios help measure the degree to which a company has borrowed against its future operating earnings and cash flow. Stronger ratios indicate greater operational flexibility to manage changes in competitive and economic conditions as well as the ability to reinvest in the business, either through organic growth or acquisitions.

The strategy of maintaining a strong balance sheet in a cyclical industry versus shareholder returns and/or releveraging for acquisitions is an important consideration in the rating process. In addition to quantitative factors, various qualitative considerations such as debt maturity profile and the lumpiness of payments due in any given year are also considered in the analysis of financial policies. Ratios used in this area are felt to be important credit metrics and further provide an indication of a company's financial flexibility. The more modest a company's debt levels, the greater the financial flexibility it has for coping in the industry's valleys. In analyzing these ratios, Moody's looks not only at the ratio but the absolute level of debt. The debt to EBITDA ratio, while a useful metric, can improve on strengthening in earnings, but the company could still be vulnerable to deterioration in its leverage position in a down steel environment absent a reduction in absolute debt levels.

The methodology uses two leverage ratios: debt to capital and debt to EBITDA. These serve to demonstrate the overall level of debt employed in the capital structure as well as the level by which debt may exceed the earnings generation capability of the company. Given industry price volatility, and the swings experienced in cash-flow generation, steel producers are unable to bear the high degree of financial leverage that might be tolerated in other industries in which cash-flow generation is more stable.

### How We Measure It For The Grid

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#### Debt / Capital:

The debt to capital ratio is based on the most recent fiscal year or LTM period, if available. The discussion of this ratio will also incorporate analysis of an issuer's funding sources and debt maturity profile, target capitalization levels and performance against such targets as well as a company's acquisition history and philosophy on share repurchases and special dividends.

While debt to capital is not an ideal measure, it is a simple way to compare the capital structures of companies operating within an industry, and provides some insight into a company's financial policies. It is also a ratio frequently used by companies to dimension the range of leverage in which they look to operate, thereby providing an indication of risk tolerance. It is also a helpful measurement for the steel industry as it provides a sense of the underlying capital strength of a company to weather a downturn.

#### Debt to EBITDA:

Debt to EBITDA is measured by a three-year average, which is illustrative of performance as Moody's looks to capture the inflection points in an industry where we believe the cycles have shortened as the industry consolidation over the last several years has provided producers with greater flexibility to curtail production to meet declining demand, thereby shortening the cycle length. However, the highs and lows will be steeper than

## Global Steel Industry

has been seen historically. For companies that have negative averaged EBITDA, the company would receive a Caa rating for this sub-factor.

Consistent with Moody's standard adjustments, we adjust financial statements for operating leases (applying a 5x rent amount), unfunded pension liabilities, hybrid securities and other standard adjustments. Consistent with our approach to adjust full sets of financial statements, we adjust the components of capitalization for these same items.

### Notes on Measurement Criteria

With respect to adjustments to debt for pension obligations,<sup>2</sup> U.S. companies operate with prefunded pension plans and show the net liability on their balance sheet whereas companies that operate in jurisdictions that have unfunded plans, such as in Germany, show the entire liability on their balance sheet. In accordance with Moody's rating methodology, Moody's treats the underfunded portion of pension obligations of U.S., UK and Canadian companies as debt. For certain other jurisdictions, such as Germany, unfunded pension obligations are adjusted to simulate a funding for those liabilities.

The leverage ratios are calculated on a gross debt basis, in other words, we do not net cash against debt when calculating the ratio. However, Moody's does take into consideration the level of cash maintained by a company and in certain instances will consider the ratios on a net debt basis. This would be more typical when a company maintains cash levels comfortably in excess of working cash requirements as part of a strategic philosophy of its management of debt and cash positions. This tends to be more prevalent in Europe, which may stem from tax considerations or a higher level of caution regarding the availability of funding in the bank or bond markets. While the maintenance of large cash balances is also prevalent in certain South American countries such as Brazil, reflective of the volatility of the currency and economic markets, Moody's views this as necessary liquidity support given the general absence of committed bank facilities.

### Factor 3: Financial Policies (25%)

Sub-Factor:	Aaa	Aa	A	Baa	Ba	B	Caa	Weight
Debt/Capital (most recent year-end or LTM period)	Aaa < 20%	≥ 20% Aa < 30%	≥ 30% A < 40%	≥ 40% Baa < 50%	≥ 50% Ba < 75%	≥ 75% B < 90%	Caa ≥ 90%	15%
Debt/EBITDA (3 year average)	Aaa < 0.75x	≥ 0.75x Aa < 1.25x	≥ 1.25x A < 2.0x	≥ 2.0x Baa < 3.0x	≥ 3.0x Ba < 4.0x	≥ 4.0x B < 5.5x	Caa ≥ 5.5x	10%

**A chart that illustrates grid mapping results for Factor 3 and a discussion of outliers is included in Appendix C.**

<sup>2</sup> Ref: Rating Methodologies: "Analytical Observations Related to U.S. Pension Obligations", January 2003, "Analytical Observations Related to "Underfunded" Pension Obligations when using UK and IAS GAAP", May 2003

## Global Steel Industry

## Rating Factor 4: Financial Strength (15% weight)

### Why it Matters

Interest and cash flow based coverage ratios provide an indication of financial strength and flexibility and are an important component of Moody's rating analysis in the steel sector. The level of EBIT and cash generation dictate a company's ability to service debt, reinvest in its business and access capital markets in a range of economic and competitive environments. Free cash flow measures the company's ability to fund acquisitions, strategic investments, repurchase stock and repay debt. The ratios used are viewed as important in a capital intensive industry such as steel, particularly for integrated producers with a higher fixed cost base and costly blast furnace reline requirements. The sub-factors used are the EBIT to interest ratio and the amount of both cash from operations less dividends and free cash flow that is available relative to debt.

### How We Measure It For The Grid

#### EBIT / Interest:

This measure takes a three-year average of EBIT to interest expense. The ratio is seen as an indication of a company's ability to service its debt obligations out of earnings generation. EBIT is adjusted for non-recurring and unusual charges. EBIT is believed to be a better measure than EBITDA for the steel industry due to the capital intensive nature of the industry and the need to reinvest in the business in order to maintain productivity and efficiency.

#### Cash from Operations minus Dividends / Debt:

This sub-factor looks at a three-year average of cash from operations less dividends to debt

#### Free Cash Flow (FCF) / Debt

This sub-factor uses a three-year average of free cash flow, i.e., cash from operations minus dividends minus capital expenditures to debt.

For the steel industry, Moody's uses metrics that evaluate cash flow and the relationship of debt to cash flow after working capital due to the significant impact working capital movements can have on a steel company's financials. These measurements look to determine the level of cash generation remaining after dividends, which are viewed as only partially discretionary. They also look to determine the level of cash available to cover capital expenditures, where there may be some discretion for adjustment in a particular year, and where cash can be applied to debt obligations. Reflective of the capital-intensive nature of the industry and reinvestment requirements to maintain productivity, Moody's views free cash flow to debt as a meaningful ratio since it indicates the amount of cash flow that is available to service debt.

### Notes on Measurement Criteria

As described elsewhere in this report, EBIT and debt are adjusted and interest expense includes capitalized interest.

### Factor 4: Financial Strength (15%)

Sub-Factor:	Aaa	Aa	A	Baa	Ba	B	Caa	Weight
EBIT/Interest (3 year average)	Aaa ≥ 15x	≥ 10x Aa < 15x	≥ 7x A < 10x	≥ 4.0x Baa < 7.0x	≥ 2.5x Ba < 4.0x	≥ 1.0x B < 2.5x	Caa < 1.0x	5%
CFO-Div/Debt (3 year average)	Aaa ≥ 55%	≥ 45% Aa < 55%	≥ 35% A < 45%	≥ 25% Baa < 35%	≥ 15% Ba < 25%	≥ 10% B < 15%	Caa < 10%	5%
FCF / Debt (3 year average)	Aaa ≥ 30%	≥ 20% Aa < 30%	≥ 14% A < 20%	≥ 8% Baa < 14%	≥ 4% Ba < 8%	≥ 0% B < 4%	Caa < 0%	5%

*A chart that illustrates grid mapping results for Factor 4 and a discussion of outliers is included in Appendix C.*

## Global Steel Industry

## Rating Methodology Assumptions and Limitations, and Other Rating Considerations

The rating methodology grid incorporates a trade-off between simplicity that enhances transparency and greater complexity that would enable the grid to map more closely to actual ratings. The four rating factors in the grid do not constitute an exhaustive treatment of all of the considerations that are important for ratings of companies in the steel sector. In addition, our ratings incorporate expectations for future performance, while the financial information that is used to illustrate the mapping in the grid is mainly historical. In some cases, our expectations for future performance may be informed by confidential information that we cannot publish. In other cases, we estimate future results based upon past performance, industry trends, demand and price outlook, competitor actions and other factors. In either case, predicting the future is subject to the risk of substantial inaccuracy.

In choosing metrics for this rating methodology grid, we did not include certain important factors that are common to all companies in any industry, such as the quality and experience of management, assessments of corporate governance and the quality of financial reporting and information disclosure. The assessment of these factors can be highly subjective and ranking them by rating category in a grid would, in some cases, suggest too much precision in the relative ranking of particular issuers against all other issuers that are rated in various industry sectors.

Ratings may include additional factors that are difficult to quantify or that only have a meaningful effect in differentiating credit quality in some cases. Such factors include environmental obligations, other post retirement benefit obligations, labor composition (union or non-union), productivity, financial controls, and emerging market risk, where ratings might be constrained by the uncertainties associated with the local operating, political and economic environment, including possible government interference.

As an example of these limitations, size is an important variable that is readily represented in a ratings grid. Size can differentiate companies on the rating scale, particularly between investment grade and non-investment grade. However, ratings also consider steel price trends, product mix, end market exposure and supply versus demand positions, which cannot be consistently represented in a simple grid format. These elements can vary significantly on a region by region basis as well as company by company. In addition, there is no consistent public reporting of product, mix or market exposure, making it difficult to capture these important elements in a statistical factor.

Ratings may also reflect circumstances in which the weighting of a particular factor will be different from the weighting suggested by the grid. For example, in some instances a company's approach is sufficiently extreme with regard to matters such as financial strategy and proclivity towards debt-financed acquisitions that the rating effect will be greater than what is indicated by the weighting in the grid for Factor 3, Financial Policies. We also evaluate the effect that features such as pay-in-kind (PIK) interest can have on free cash flow, although we acknowledge that PIK interest can provide important liquidity benefits and greater flexibility in managing fixed costs. For example, ratings can be heavily affected by extremely weak liquidity that magnifies default risk, but two identical companies might be rated the same if their only differentiating feature is that one has a good liquidity position while the other has an extremely good liquidity position. In the steel sector, a cyclical downturn (on top of secular pressure) can create significant stress on liquidity for some issuers including diminished cushion under credit facility maintenance financial covenants. Liquidity pressure may contribute to ratings for some steel issuers that are below the likely level that would exist in the absence of the liquidity pressure.

## Global Steel Industry

### Conclusion: Summary of the Grid-Indicated Rating Outcomes

The methodology grid-indicated ratings map to current assigned ratings as follows (see Appendix B for the details):

- 4.5% or 1 company maps to their assigned rating
- 63.6% or 14 companies have grid-indicated ratings that are within two alpha-numeric notches of their assigned rating
- 31.8% or 7 companies have grid-indicated ratings that are more than two alpha-numeric notches from their assigned rating.

Overall, the framework indicates that there are fewer companies whose grid-indicated rating is below their actual rating (6) than above their actual rating (15). As the financial metrics in the grid are based upon historical data, this reflects the unprecedented strength of the steel industry in recent years where robust demand and strong prices resulted in sharp improvement in earnings and cash flow, despite cost pressures. This historical data reflects performance over the peak of the steel cycle, during which Moody's would expect companies to have grid-indicated ratings above their actual rating. It does not capture Moody's expectation that weakening in demand fundamentals and a material fall-off in steel prices will result in contraction in earnings and cash flow leading to weaker credit metrics over the next several years, while actual ratings incorporate this expectation.

## Global Steel Industry

## Appendix A: Global Steel Methodology Factor Grid

	Factor weight	Sub-factor contribution to total	Aaa	Aa	A	Baa	Ba	B	Caa
<b>Factor 1: Scale and Diversity</b>	<b>35%</b>								
Size (Net Consolidated Sales in USD\$ billions; most recent year-end or LTM period)		25%	Aaa ≥ 35	≥ 25 Aa < 35	≥ 15 A < 25	≥ 5 Baa < 15	≥ 2.5 Ba < 5	≥ 1 B < 2.5	Caa < 1
Business Profile		10%	Aaa = 8	Aa = 7	A = 5 or 6	Baa = 3 or 4	Ba = 2	B = 1	Caa ≤ 0
<b>Factor 2: Operating Performance and Volatility</b>	<b>25%</b>								
EBIT Margin (3 year average)		10%	Aaa ≥ 30%	≥ 20% Aa < 30%	≥ 15% A < 20%	≥ 8.0% Baa < 15%	≥ 5.0% Ba < 8.0%	≥ 2.0% B < 5.0%	Caa < 2%
Return on Average Tangible Assets (3 year average)		5%	Aaa ≥ 20%	≥ 15% Aa < 20%	≥ 10% A < 15%	≥ 5% Baa < 10%	≥ 2.5% Ba < 5%	≥ 1% B < 2.5%	Caa < 1%
Volatility based on the Coefficient of Variation of CFO/Net Sales		10%	Aaa < 15%	≥ 15% Aa < 25%	≥ 25% A < 40%	≥ 40% Baa < 60%	≥ 60% Ba < 75%	≥ 75% B < 90%	Caa < 0% & ≥ 90%
<b>Factor 3: Event Risk and Risk Tolerance</b>	<b>25%</b>								
Debt/Capital (most recent year-end or LTM period)		15%	Aaa < 20%	≥ 20% Aa < 30%	≥ 30% A < 40%	≥ 40% Baa < 50%	≥ 50% Ba < 75%	≥ 75% B < 90%	Caa ≥ 90%
Debt/EBITDA (3 year average)		10%	Aaa < 0.75x	≥ 0.75x Aa < 1.25x	≥ 1.25x A < 2.0x	≥ 2.0x Baa < 3.0x	≥ 3.0x Ba < 4.0x	≥ 4.0x B < 5.5x	Caa ≥ 5.5x
<b>Factor 4: Leverage and Interest Coverage</b>	<b>15%</b>								
EBIT/Interest (3 year average)		5%	Aaa ≥ 15x	≥ 10x Aa < 15x	≥ 7x A < 10x	≥ 4.0x Baa < 7.0x	≥ 2.5x Ba < 4.0x	≥ 1.0x B < 2.5x	Caa < 1.0x
CFO-Div/Debt (3 year average)		5%	Aaa ≥ 55%	≥ 45% Aa < 55%	≥ 35% A < 45%	≥ 25% Baa < 35%	≥ 15% Ba < 25%	≥ 10% B < 15%	Caa < 10%
FCF / Debt (3 year average)		5%	Aaa ≥ 30%	≥ 20% Aa < 30%	≥ 14% A < 20%	≥ 8% Baa < 14%	≥ 4% Ba < 8%	≥ 0% B < 4%	Caa < 0%
	<b>100%</b>	<b>100%</b>							

## Global Steel Industry

## Appendix B: Methodology Grid-Indicated Ratings

Observation: On an individual factor basis, many companies map above their assigned rating although in the aggregate 68.2% map to within 2 notches of their assigned rating. Given the robust steel environment of the past four years, and the differing ways in which companies deployed the substantive cash flows generated, this is to be expected. The individual factor mappings on a historical basis represent performance at the peak of the cycle while the assigned ratings reflect Moody's expectations for performance over a period encompassing strong and weak market conditions. Further, ratings for companies such as Magnitogorsk Iron & Steel Works, Severstal OAO and Evraz Group S.A. consider these companies exposure to a more challenging and higher-risk operating environment in Russia and concentration in ownership.

	Moody's Weight	Nippon Steel	Nucor	POSCO	ArcelorMittal	Commercial Metals Company	Kobe Steel	ThyssenKrupp AG	Allegheny Technologies	Carpenter Technology	United States Steel
<b>Factor 1: Size and Business Profile (35.0%)</b>											
Net Consolidated Sales (\$USD billions) (most recent year-end; or LTM period)	25%	Aaa	A	Aa	Aaa	Baa	A	Aaa	Baa	B	A
Business Profile	10%	Aa	Aa	A	Aa	Ba	A	Aa	Ba	Baa	A
<b>Factor 2: Operating Performance and Volatility (25.0%)</b>											
EBIT Margin (3 year average)	10%	Baa	A	A	Baa	Ba	Baa	Ba	A	A	Baa
Return on Average Tangible Assets (3 year average)	5%	A	Aaa	Aa	A	Aa	Baa	A	Aaa	Aa	A
Volatility-Coefficient of Variation based on CFO/Net Sales	10%	Aa	A	Aaa	Aaa	Baa	A	Aa	Baa	Aa	Aa
<b>Factor 3: Financial Policies (25.0%)</b>											
Debt/Capital (most recent year-end or LTM period)	15%	A	Aa	Aaa	A	Baa	Ba	Baa	Aaa	Aa	A
Debt / EBITDA (3 year average)	10%	A	Aaa	Aaa	Baa	A	Ba	A	Aaa	Aa	A
<b>Factor 4: Financial Strength (15.0%)</b>											
EBIT/Interest (3 year average)	5%	Aaa	Aaa	Aaa	Baa	Aa	A	Baa	Aaa	Aa	A
CFO-Div/Debt (3 year average)	5%	Baa	Aaa	Aaa	Baa	Baa	Ba	Baa	Aaa	Aaa	Aa
FCF / Debt (3 year average)	5%	Baa	Aaa	Aa	A	B	B	B	Aa	Aaa	Aa
Grid-Indicated Rating		A2	A1	Aa3	A2	Ba1	Ba1	Baa1	A3	Baa2	Baa1
Current Rating		A1	A1	A1	Baa2	Baa2	Baa2	Baa2	Baa3	Baa3	Baa3

## Notes:

Green: Positive outlier – grid-indicated performance on a specific factor is at least two broad rating categories higher than the actual rating

Red: Negative outlier – grid-indicated performance on a specific factor is at least two broad rating categories lower than the actual rating

## Global Steel Industry

	Moody's Weight	Usinas Siderurgicas de Minas Gerais	Companhia Siderurgica Nacional	Gerdau Ameristeel	Steel Dynamics	Tata Steel	AK Steel	California Steel Industries	Magnitogorsk Iron & Steel Works	Severstal OAO	Evraz Group	TMK	Essar Steel Algoma
<b>Factor 1: Size and Business Profile (35.0%)</b>													
Net Consolidated Sales (\$USD billions) (most recent year-end or LTM period)	25%	Baa	Ba	Baa	Baa	Aa	Baa	B	Baa	A	Baa	Ba	B
Business Profile	10%	Baa	Baa	A	Baa	Baa	Baa	Caa	Ba	A	A	A	Caa
<b>Factor 2: Operating Performance and Volatility (25.0%)</b>													
EBIT Margin (3 year average)	10%	Aaa	Aaa	A	A	Aa	Baa	Ba	Aa	Aa	Aa	A	Caa
Return on Average Tangible Assets (3 year average)	5%	Aaa	Aaa	Aaa	Aaa	Aaa	A	A	Aaa	Aa	Aaa	Aaa	Caa
Volatility-Coefficient of Variation based on CFO/Net Sales	10%	Aaa	A	Baa	Aaa	A	B	Caa	Aaa	Aaa	Baa	Baa	Baa
<b>Factor 3: Financial Policies (25.0%)</b>													
Debt/Capital (most recent year-end or LTM period)	15%	A	Ba	Baa	Ba	Ba	Baa	Aa	Aa	Aa	Baa	Baa	Ba
Debt / EBITDA (3 year average)	10%	Aa	Baa	Baa	A	Baa	Baa	Baa	Aaa	Aa	A	A	Caa
<b>Factor 4: Financial Strength (15.0%)</b>													
EBIT/Interest (3 year average)	5%	A	B	Baa	Aa	Aa	Baa	Aa	Aaa	Aa	Aa	A	Caa
CFO-Div/Debt (3 year average)	5%	Aa	Caa	Baa	A	A	Baa	Ba	Baa	Aa	Aa	Baa	Ba
FCF / Debt (3 year average)	5%	Aaa	Caa	A	A	Baa	Aa	Caa	Caa	Baa	Aa	Caa	Baa
Grid-Indicated Rating		A3	Ba2	Baa3	Baa2	Baa1	Ba1	B1	A3	A2	Baa1	Ba1	Caa1
Current Rating		Baa3	Ba1	Ba1	Ba1	Ba1	Ba2	Ba2	Ba2	Ba2	Ba3	Ba3	B3

## Notes:

Green: Positive outlier – grid-indicated performance on a specific factor is at least two broad rating categories higher than the actual rating

Red: Negative outlier – grid-indicated performance on a specific factor is at least two broad rating categories lower than the actual rating

## Global Steel Industry

## Appendix C: Observations and Outliers for Grid Mapping

## Factor 1: Ratings Mapping

The following table details the mapping for the Size and Business Profile factor:

Company	Sr. Unsecured or Corporate Family Rating	Net Consolidated Sales* (\$USD billions; most recent yr-end or LTM period )	Net Consolidated Sales Indicated Rating Category	Business Profile	Business Profile Indicated Rating Category
Nippon Steel Corporation	A1	\$42.39	Aaa	7	Aa
Nucor Corporation	A1	\$20.72	A	7	Aa
POSCO	A1	\$34.02	Aa	6	A
ArcelorMittal	Baa2	\$121.17	Aaa	7	Aa
Commercial Metals Company	Baa2	\$9.56	Baa	2	Ba
Kobe Steel, Ltd.	Baa2	\$18.73	A	5	A
ThyssenKrupp AG	Baa2	\$77.18	Aaa	7	Aa
Allegheny Technologies Incorporated	Baa3	\$5.41	Baa	2	Ba
Carpenter Technology Corporation	Baa3	\$1.95	B	3	Baa
United States Steel Corporation	Baa3	\$7.00	A	6	A
Usinas Siderurgicas de Minas Gerais	Baa3	\$8.28	Baa	3	Baa
Companhia Siderurgica Nacional	Ba1	\$3.85	Ba	3	Baa
Gerdau Ameristeel Corporation	Ba1	\$6.50	Baa	5	A
Steel Dynamics, Inc.	Ba1	\$5.42	Baa	3	Baa
Tata Steel Ltd.	Ba1	\$32.67	Aa	4	Baa
AK Steel Holding Corporation	Ba2	\$7.44	Baa	4	Baa
California Steel Industries, Inc	Ba2	\$1.34	B	-1	Caa
Magnitogorsk Iron & Steel Works	Ba2	\$8.20	Baa	2	Ba
Severstal OAO	Ba2	\$15.24	A	5	A
Evrast Group S.A.	Ba3	\$12.81	Baa	5	A
TMK	Ba3	\$4.18	Ba	5	A
Essar Steel Algoma Inc.	B3	\$1.81	B	-1	Caa

Notes:

\* Revenue as of June 30, 2008 or most recent year-end publicly available period

Green: Positive outlier-grid-indicated performance on a specific factor is at least two broad rating categories higher than the actual

Red: Negative outlier-grid-indicated performance on a specific factor is at least two broad rating categories lower than the actual

## Factor 1: Observations and Outliers

The favorable mapping of companies such as ArcelorMittal and ThyssenKrupp reflects the productive capacity of these companies, which in the recent high price environment has translated to significant growth in revenues, while ThyssenKrupp's mappings also reflects the diversity of its business operations and locations beyond those that are purely steel related. In the case of ArcelorMittal, the difference between the mapping in this factor and the rating assigned reflects the risks involved with the integration of acquired businesses, given the aggressive expansion strategy of the company over the last several years. Tata Steel's favorable mapping from a size perspective reflects the growth in the company's footprint following its acquisition of Corus in 2007. A negative outlier in terms of its business profile mapping, California Steel typifies a company that operates a

## Global Steel Industry

single-site facility. All of its processing operations are located at a single site and this operational concentration constrains the rating on this element to Caa.

## Factor 2: Ratings Mapping

The following table details the mapping for the Operating Performance and Volatility factor:

Company	Sr. Unsecured or Corporate Family Rating	EBIT Margin* (%) (3-yr average)	EBIT Margin (%) Indicated Rating Category	ROA* (%) (3-yr average)	ROA (%) Indicated Rating Category	Volatility based on the Coefficient of Variation of CFO/Net Sales**	Volatility Indicated Rating Category
Nippon Steel Corporation	A1	13.0%	Baa	11.8%	A	19.1%	Aa
Nucor Corporation	A1	15.2%	A	29.2%	Aaa	28.5%	A
POSCO	A1	19.4%	A	18.3%	Aa	11.3%	Aaa
ArcelorMittal	Baa2	14.9%	Baa	12.2%	A	10.5%	Aaa
Commercial Metals Company	Baa2	6.8%	Ba	16.4%	Aa	57.1%	Baa
Kobe Steel, Ltd.	Baa2	10.0%	Baa	8.1%	Baa	31.5%	A
ThyssenKrupp AG	Baa2	7.0%	Ba	10.2%	A	20.3%	Aa
Allegheny Technologies Incorporated	Baa3	19.4%	A	27.3%	Aaa	53.9%	Baa
Carpenter Technology Corporation	Baa3	17.8%	A	16.8%	Aa	17.0%	Aa
United States Steel Corporation	Baa3	9.7%	Baa	13.5%	A	17.9%	Aa
Usinas Siderurgicas de Minas Gerais	Baa3	32.6%	Aaa	21.7%	Aaa	14.1%	Aaa
Companhia Siderurgica Nacional	Ba1	39.9%	Aaa	21.6%	Aaa	34.2%	A
Gerdau Ameristeel Corporation	Ba1	15.3%	A	21.9%	Aaa	49.0%	Baa
Steel Dynamics, Inc.	Ba1	16.8%	A	26.2%	Aaa	13.0%	Aaa
Tata Steel Ltd.	Ba1	22.3%	Aa	22.6%	Aaa	25.3%	A
AK Steel Holding Corporation	Ba2	8.2%	Baa	10.1%	A	86.3%	B
California Steel Industries, Inc	Ba2	5.2%	Ba	10.5%	A	94.7%	Caa
Magnitogorsk Iron & Steel Works	Ba2	28.3%	Aa	31.8%	Aaa	14.6%	Aaa
Severstal OAO	Ba2	20.4%	Aa	18.6%	Aa	8.5%	Aaa
Evrast Group S.A.	Ba3	27.0%	Aa	30.5%	Aaa	49.2%	Baa
TMK	Ba3	18.0%	A	20.1%	Aaa	58.4%	Baa
Essar Steel Algoma Inc.	B3	1.0%	Caa	0.9%	Caa	51.4%	Baa

## Notes

\*Averaged over the last two year-end periods and through the LTM ended June 30, 2008 or averaged over the last three most recent publicly available year-end periods

\*\*Volatility is measured with the coefficient of variation that is based on up to 5 year-end periods of CFO/Net Consolidated Sales

Green: Positive outlier-grid-indicated performance on a specific factor is at least two broad rating categories higher than the actual

Red: Negative outlier-grid-indicated performance on a specific factor is at least two broad rating categories lower than the actual

## Global Steel Industry

### Factor 2: Observations and Outliers

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The favorable outliers for EBIT margin reflect earnings improvement over the last three years driven principally by the strong steel and alloy price environment as well as favorable product mix. In the case of Gerdau Ameristeel and Steel Dynamics, performance further benefited from acquisitions, which expanded their business footprint. For similar reasons, most companies map favorably in the return on assets measure as well as the volatility measure, with the exception of California Steel, again driven by the unprecedented strength of steel markets over the last three years. California Steel's unfavorable mapping reflects its more limited product and regional footprint, together with its exposure to slab costs, which increases the volatility in its performance. In the case of Posco, its favorable mapping reflects the company stable performance, which is underpinned by its cost competitiveness and dominant market position in its key markets. Looking forward, we would expect all sub-factors to map more in line with ratings given the deterioration in steel markets, which Moody's expects to be prolonged.

## Global Steel Industry

## Factor 3: Ratings Mapping

The following table details the mapping for the Financial Policies factor:

Company	Sr. Unsecured or Corporate Family Rating	Debt/Capital* (most recent yr-end or LTM period)	Debt/Capital Indicated Rating Category	Debt/EBITDA** (3-yr average)	Debt/EBITDA Indicated Rating Category
Nippon Steel Corporation	A1	35.7%	A	1.7x	A
Nucor Corporation	A1	27.7%	Aa	0.7x	Aaa
POSCO	A1	19.2%	Aaa	0.7x	Aaa
ArcelorMittal	Baa2	35.9%	A	2.1x	Baa
Commercial Metals Company	Baa2	42.0%	Baa	1.4x	A
Kobe Steel, Ltd.	Baa2	57.7%	Ba	3.3x	Ba
ThyssenKrupp AG	Baa2	42.4%	Baa	1.9x	A
Allegheny Technologies Incorporated	Baa3	19.7%	Aaa	0.6x	Aaa
Carpenter Technology Corporation	Baa3	23.1%	Aa	1.0x	Aa
United States Steel Corporation	Baa3	38.8%	A	1.6x	A
Usinas Siderurgicas de Minas Gerais	Baa3	31.9%	A	1.0x	Aa
Companhia Siderurgica Nacional	Ba1	63.3%	Ba	2.3x	Baa
Gerdau Ameristeel Corporation	Ba1	43.6%	Baa	2.2x	Baa
Steel Dynamics, Inc.	Ba1	51.1%	Ba	1.7x	A
Tata Steel Ltd.	Ba1	59.4%	Ba	2.2x	Baa
AK Steel Holding Corporation	Ba2	49.2%	Baa	2.6x	Baa
California Steel Industries, Inc	Ba2	29.1%	Aa	2.8x	Baa
Magnitogorsk Iron & Steel Works	Ba2	20.2%	Aa	0.6x	Aaa
Severstal OAO	Ba2	27.0%	Aa	1.1x	Aa
Evrast Group S.A.	Ba3	47.5%	Baa	1.3x	A
TMK	Ba3	40.2%	Baa	1.4x	A
Essar Steel Algoma Inc.	B3	55.7%	Ba	6.3x	Caa

## Notes

\*As of June 30, 2008 or most recent publicly available year-end period

\*\*Averaged over the last two year-end periods and through the LTM ended June 30, 2008 or averaged over the last three most recent publicly available year-end periods

Green: Positive outlier-grid-indicated performance on a specific factor is at least two broad rating categories higher than the actual

Red: Negative outlier-grid-indicated performance on a specific factor is at least two broad rating categories lower than the actual

## Factor 3: Observations and Outliers

Again, the strong steel price environment and demand growth experienced over the last three years has contributed to most companies' mapping favorably in the sub-factors that comprise the financial policies factor, while others have strengthened within these measurements to be more in line with their rating. Many companies, such as AK Steel, have taken advantage of the strong cycle to reduce debt and improve balance sheet strength, which is expected to provide more of a cushion than seen historically in the current downturn.

## Global Steel Industry

## Factor 4: Ratings Mapping

The following table details the mapping for the Financial Strength factor:

Company	Sr. Unsecured or Corporate Family Rating	Interest Coverage * (3-yr average)	Interest Coverage Indicated Rating Category	CFO - Div to Debt* (3-yr average)	CFO - Div to Debt Indicated Rating Category	FCF/Debt* (3-yr average)	FCF/Debt Indicated Rating Category
Nippon Steel Corporation	A1	28.5x	Aaa	30.1%	Baa	11.7%	Baa
Nucor Corporation	A1	47.8x	Aaa	78.2%	Aaa	50.2%	Aaa
POSCO	A1	25.9x	Aaa	90.7%	Aaa	20.5%	Aa
ArcelorMittal	Baa2	6.7x	Baa	32.8%	Baa	19.6%	A
Commercial Metals Company	Baa2	10.4x	Aa	26.5%	Baa	2.4%	B
Kobe Steel, Ltd.	Baa2	7.4x	A	16.0%	Ba	2.5%	B
ThyssenKrupp AG	Baa2	6.4x	Baa	32.2%	Baa	3.1%	B
Allegheny Technologies Incorporated	Baa3	43.7x	Aaa	85.7%	Aaa	22.9%	Aa
Carpenter Technology Corporation	Baa3	12.3x	Aa	60.4%	Aaa	42.7%	Aaa
United States Steel Corporation	Baa3	8.5x	A	54.2%	Aa	29.5%	Aa
Usinas Siderurgicas de Minas Gerais	Baa3	8.5x	A	52.1%	Aa	31.3%	Aaa
Companhia Siderurgica Nacional	Ba1	2.5x	B	6.5%	Caa	-5.5%	Caa
Gerdau Ameristeel Corporation	Ba1	6.6x	Baa	34.0%	Baa	19.9%	A
Steel Dynamics, Inc.	Ba1	12.8x	Aa	40.3%	A	17.5%	A
Tata Steel Ltd.	Ba1	13.0x	Aa	37.8%	A	11.7%	Baa
AK Steel Holding Corporation	Ba2	4.2x	Baa	31.4%	Baa	23.9%	Aa
California Steel Industries, Inc	Ba2	11.8x	Aa	17.8%	Ba	-3.2%	Caa
Magnitogorsk Iron & Steel Works	Ba2	23.4x	Aaa	28.4%	Baa	-36.9%	Caa
Severstal OAO	Ba2	10.5x	Aa	46.4%	Aa	8.5%	Baa
Evraz Group S.A.	Ba3	10.0x	Aa	46.9%	Aa	25.9%	Aa
TMK	Ba3	7.6x	A	29.6%	Baa	-2.1%	Caa
Essar Steel Algoma Inc.	B3	0.3x	Caa	21.9%	Ba	9.9%	Baa

## Notes

\*Averaged over the last two year-end periods and through the LTM ended June 30, 2008 or averaged over the last three most recent publicly available year-end periods

Green: Positive outlier-grid-indicated performance on a specific factor is at least two broad rating categories higher than the actual

Red: Negative outlier-grid-indicated performance on a specific factor is at least two broad rating categories lower than the actual

## Factor 4: Observations and Outliers

For the EBIT to interest sub-factor, approximately 59% of the representative issuers map two or more rating categories above their actual rating. This reflects a significant shift over the last three years as companies benefited from consecutive years of strong steel market fundamentals and indicates the degree of operating leverage to steel prices. Commercial Metals unfavorable mapping reflects its high working capital requirements, as well as acquisitions during this time frame while ThyssenKrupp's position as a negative outlier reflects its strategy to invest in organic growth rather than in growth via acquisitions.

## Global Steel Industry

## Appendix D: Steel Industry Overview

The steel industry is mature, cyclical, highly competitive on a global basis, and for the most part exhibits minimal product differentiation, with a high degree of commodity product concentration. In addition, end market sales, and hence industry exposure, are difficult to compare on a global basis. For example, a large proportion of sales by U.S. producers goes to the steel distribution sector, which sells to a broad number of end users, while in Europe, many producers have their own distribution segments.

Global steel production has grown approximately 6.8% (CAGR) over the period 2000-2007, with growth in Chinese production increasing more than two-fold from roughly 15% of global production in 2000 to its current position at an estimated 36% of total global production, with roughly 489.2 million tons of crude production in 2007. While global steel production is expected to increase further in 2008, the current economic and financial crisis, which will materially impact fourth quarter 2008 statistics, will result in production and consumption moderation in 2009. Nevertheless, steel will continue to rank among the largest of all materials produced globally.

The significant shift in steel production and consumption patterns in recent years in China and other BRIC countries, together with the substantive consolidation that has occurred, has resulted, in Moody's view, in a fundamental and structural change in the industry. The underlying factors supporting this perspective are: global consolidation, cost platform increases, improved financial discipline, capability and willingness of producers to adjust production to changing demand patterns given their larger base of operations, and increasing industrialization in emerging countries. This has enabled producers to have greater flexibility in responding to downward market movements and has resulted in shorter downtimes in recent years. However, Moody's considers that demonstrated sustainability of structural changes remains in the beginning stages and that the industry will continue to be characterized by cyclicity and volatility.

Companies within this sector have significant variations in scale of operations, both in terms of tons produced and revenues, ranging from ArcelorMittal with production and revenues of 116 million tons and \$105.2 billion, respectively, to companies such as Essar Steel Algoma, with 2007 shipments and revenues of 2.5 million tons and CAD \$1.8 billion, respectively. In addition, all steel is not created equal, with significant variations in grade, properties, and cost. In excess of approximately 3,500 grades of steel are produced and are sold into numerous markets, each of which have their own drivers and supply-demand fundamentals. Despite these substantive differences, issuers in the steel sector broadly share similar characteristics and face a number of common challenges, including:

- **Cyclical demand patterns and variability in earnings**

The steel industry exhibits a high degree of earnings variability. Its fortunes depend on general global economic conditions but it is particularly sensitive to the performance of the construction, automotive, durable goods and other industrial products industries (in order of importance).

- **Exposure to volatile prices**

Steel prices have historically exhibited extreme volatility, reflecting the commodity nature of steel, the limited pricing power of producers, and supply/demand imbalances. This volatility can be exacerbated by exchange rates and import levels in a particular country (such as the U.S.). The large price fluctuations of recent years, from abysmal lows to historic highs, have been the single most important factor affecting financial performance of steel producers. This will continue to be the case going forward.

Global overcapacity and the diversion of production to other countries during times of economic weakness can also significantly affect price movements in specific steel markets. This has been a key factor behind volatility in the U.S. markets, which tend to be the first port of call for products that cannot be sold elsewhere.

## Global Steel Industry

- **Vulnerability to raw material cost fluctuations**

Substantive cost increases for metallics and energy have affected all producers to varying degrees. Moody's believes that there has been a permanent increase in the industry's overall cost platform. With the continued increase in global steel production, particularly in China, availability of raw materials and development of scrap alternatives will command increased management attention.

- **Significant operating leverage**

Reflecting the high fixed costs of the industry, particularly for integrated producers, capacity utilization levels are important factors in the level of earnings generated, or losses incurred by companies in the sector. As with all commodity-based industries, steel companies have historically been loath to reduce production. However, it has been argued that recent industry consolidation has increased producer discipline and there is evidence that this is the case as producers have moved quickly to balance production with falling demand in the current negative economic environment.

## Global Steel Industry

### Appendix E: Key Rating Issues Over the Intermediate Term

#### Ongoing Global Consolidation

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Global consolidation will continue to be a factor shaping the industry over the medium to longer term as companies seek to build size and product diversity and better position themselves to respond to demand and price fluctuations. This is expected to continue to result in greater discipline as to production levels and pricing patterns and could minimize the degree of performance deterioration on the downside.

#### Raw Material Sourcing and Cost

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Moody's sees a potential changing footprint to the relationship between steel producers and raw material suppliers as they look to undertake mutually beneficial joint-venture agreements. To the extent greater certainty of supply and more stable costs result, earnings volatility could be reduced, thereby contributing to greater sustainability of improved financial metrics. In addition, a number of integrated steel producers have recently reverted to backward integration, purchasing iron ore or metallurgical coal assets at the peak of the market. Although volatility in these input costs is not as extreme as steel prices, how this impacts cost profiles over the short-term and beyond remains to be seen. In addition, steel companies with a minimill profile have also been acquisitive in purchasing scrap companies in an effort to maintain certainty of supply. Moody's expects that over the medium to longer term the availability and cost of necessary input material for both the integrated and minimill producers will remain a vulnerability, adding to continued volatility in the industry's cost base.

#### Excess Capacity Pressure

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Although consolidation activity has contributed to a more disciplined approach to supply and demand situations, the continued development of new steel mills globally could cause the extreme volatility experienced in the past to continue, thereby potentially limiting the degree of upward rating movement within the industry. The dramatic steel production growth evident in China over the last several years, which is expected to continue over the medium term, as well as anticipated growth in the BRIC countries in general, has the potential to change the dynamics of the industry absent corresponding consumption growth levels.

#### Substitution of Other Materials

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Intensity of steel usage remains vulnerable to substitution by other materials, particularly aluminum in the case of the automotive industry, a key consuming industry for steel.

## Global Steel Industry

## Moody's Related Research

## Special Comment:

- Global Macro-Risk Scenarios 2009-2010 – From Global Integration to Global Dis-integration?, December 2008 (113063)

## Industry Outlook:

- US Steel Industry Outlook, December 2008 (113650)

To access any of these reports, click on the entry above. Note that these references are current as of the date of publication of this report and that more recent reports may be available. All research may not be available to all clients.

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## Global Steel Industry

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