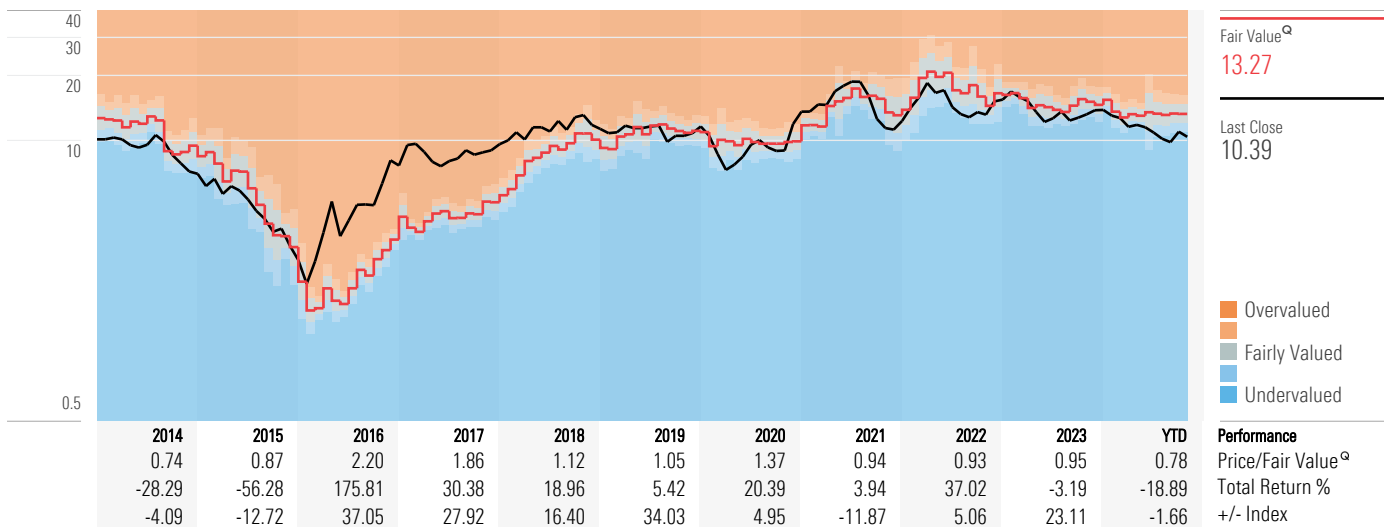


Vale SA XVALO ★★★★★ Q 11 Oct 2024 22:45, UTC

Economic Moat ^Q	Uncertainty ^Q	Price/Fair Value ^Q	ESG Risk Rating Assessment ¹	Trailing Dividend Yield %	Market Cap	Investment Style	Sector	Industry
None	High	0.78	2 Oct 2024 05:00, UTC	12.23	—	Large Value	Basic Materials	Other Industrial Metals & Mining



As of 11 Oct 2024 | Index: Morningstar Brazil GR BRL. Fair Value data as of 11 Oct 2024 00:00, UTC.

¹The ESG Risk Rating Assessment is a representation of Sustainalytics' ESG Risk Rating. Lee Davidson, Chief Analytics Officer for Morningstar, Inc, oversees the methodology that supports Quantitative Fair Value Estimates and Quantitative Star Ratings. Mr. Davidson is guided by the Morningstar, Inc. Code of Ethics in carrying out his responsibilities. For information regarding Conflicts of Interests, visit <http://global.morningstar.com/equitydisclosures>.

Key Metrics as of 10 Oct 2024

Metrics	Value	Percentile in Sector
Earnings Yield (%)	20.5	97.0
Sales Yield (%)	89.1	71.0
Book Value Yield (%)	78.8	55.0
Return on Assets (%)*	10.9	94.0
Revenue(Bil)*	42.1	99.0
Market Value (Bil)	47.0	98.0
Enterprise Value (Bil)	58.0	99.0
EV/MV Ratio	1.2	73.0
Volatility TTM (%)	22.2	14.0
Drawdown TTM (%)	32.9	39.0
Volume (Mil)	25.8	98.0

*30 Jun 2024

Business Description

Vale is a large global miner and the world's largest producer of iron ore and pellets. In recent years the company has sold noncore assets such as its fertilizer, coal, and steel operations to concentrate on iron ore, nickel, and copper. Earnings are dominated by the bulk materials division, primarily iron ore and iron ore pellets. The base metals division is much smaller, consisting of nickel mines and smelters along with copper mines producing copper in concentrate. In 2024, Vale sold a minority 10% stake in energy transition metals, its base metals business, likely the first step in separating base metals and iron ore.

Valuation ^Q as of 11 Oct 2024

Morningstar affirms a 5-star quantitative rating for Vale. We calculate this outcome using the company's underlying model-driven valuation and uncertainty scores.

The stock's last closing price was 10.36, a discount of 21.31% to its Quantitative Fair Value estimate of 13.17. This discount has ranged between 29.91% and 2.42% over the past year. The stock's price to fair value ratio is at the 60th percentile in our global equity coverage universe for this methodology and at the 76th percentile relative to its peers in the basic materials sector.

Vale furthermore holds a High quantitative uncertainty rating.

The company's quantitative star rating dates to after 10/08/2024, before which it was 4-star. Similarly, the firm's uncertainty rating changed from Very High to High after 07/25/2024.

We examine the financials and market statistics for Vale to determine these ratings. Its earnings yield is 20.47% and its annualized trailing 12-month volatility is 22.21%. These fall at the 95th and 25th percentiles in the equity universe and at the 95th

and 14th in the basic materials sector, respectively.

Economic Moat ^Q as of 11 Oct 2024

With a Morningstar quantitative moat rating of None, the quantitative moat score for Vale falls at the 12th percentile in the basic materials sector and at the 15th in the equity coverage universe. The company has maintained its None quantitative moat rating since after 11/23/2023, when it was downgraded from Narrow.

We also assign a Moderate quantitative financial health rating to Vale. The company's raw score on this metric, termed Distance to Default, ranks at the 59th percentile overall and 75th in the basic materials sector. Furthermore, this financial health rating has stayed Moderate over the last year.

Supporting these ratings are the company's book value yield and enterprise value-to-market value ratio. The book value yield of 78.81%, ranks at the 62nd percentile in the covered equity universe and at the 55th percentile among its peers. Meanwhile, its enterprise value-to-market value ratio of 1.23, falls at the 66th percentile in the universe and the 73rd percentile in the basic materials sector.


Fundamentals as of 11 Oct 2024

Vale reports earnings per share of 2.25. Its return on invested capital is 20.12%. The company maintains a dividend yield of 11.58%, paying out 62.81% of earnings. These values are calculated over a trailing 12-month period.

As of last market close, Vale has a price-to-earnings ratio of 5.05, falling at the 7th percentile in its sector (where a lower percentile means a lower ratio) and ranging between 4.53 and 7.57 over the past year. The company's price-to-free cash flow ratio is 7.96, falling at the 26th percentile in its sector and ranging between 6.54 and 14.97 over the

Vale SA XVALO ★★★★★

Q 11 Oct 2024 22:45, UTC

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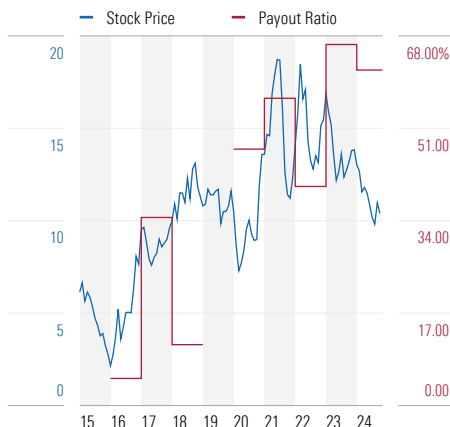
Earnings as of 10 Oct 2024

Earnings	%	Percentile in Sector
Dividend Yield*	11.6	98.0
Payout Ratio*	62.8	72.0
Price to Earnings	5.1	7.0
Price to Cash Flow	8.0	26.0
ROIC**	20.1	97.0

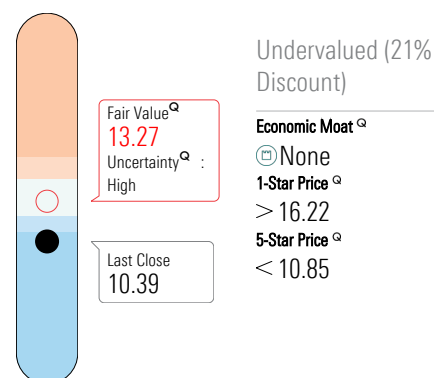
*30 Sep 2024

**30 Jun 2024

Dividends as of 11 Oct 2024



Valuation ^Q as of 11 Oct 2024



past year.

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<https://www.vale.com>

Financials (Fiscal Year End 31 Dec 2024)

2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	06/2024	Fiscal
37.54	25.61	27.49	33.97	36.58	37.57	40.02	54.50	43.84	41.78	42.06	Revenue (Bil)
8.78	2.61	8.19	11.41	13.04	14.13	18.55	30.84	17.79	15.86	15.16	Operating Income (Bil)
23.39	10.20	29.79	33.59	35.65	37.62	46.35	56.59	40.57	37.95	37.95	Operating Margin (%)
0.66	-12.13	3.98	5.51	6.86	-1.68	4.88	22.45	18.79	7.98	9.70	Net Income (Bil)
0.13	-2.35	0.77	1.05	1.32	-0.33	0.95	4.47	4.05	1.83	2.26	Diluted Earnings/Share
12.81	4.49	6.58	12.45	12.90	12.11	14.32	25.68	11.49	13.17	12.44	Operating Cash Flow (Bil)
11.81	8.37	4.95	3.83	3.78	3.70	4.43	5.03	5.45	5.92	6.31	Capital Spending (Bil)
-2.78	-5.13	2.52	7.99	10.68	8.48	13.12	20.63	7.31	8.15	7.02	Free Cash Flow (Bil)
5.15	5.15	5.15	5.20	5.13	5.13	5.13	4.89	4.48	4.34	4.34	Avg Shares Outstand(Bil)

Valuation as of 11 Oct 2024

2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Current	Calendar
0.74	0.87	2.20	1.86	1.12	1.05	1.37	0.94	0.93	0.95	0.78	Price/Fair Value ^Q
1.18	0.57	1.71	1.67	1.94	1.81	2.20	1.32	1.78	1.61	1.15	Price/Sales
—	—	—	8.02	16.00	18.43	30.41	4.20	3.84	7.03	4.97	Price/Earnings
4.05	3.77	10.48	4.58	5.01	8.51	4.36	2.57	5.85	5.39	3.62	Price/Cash Flow
1.17	0.84	1.11	1.30	1.66	1.54	2.37	2.10	2.08	1.66	1.29	Price/Book

Operating Performance (Fiscal Year End 31 Dec 2024)

2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	06/2024	Fiscal (%)
0.55	-11.83	4.25	5.56	7.32	-1.87	5.31	24.74	21.31	8.82	10.89	Return on Assets
1.81	-57.03	30.11	18.54	15.69	-4.00	12.88	63.93	53.42	21.20	25.60	Return on Equity
2.37	-23.57	11.42	12.29	12.19	0.53	11.61	44.01	36.88	16.49	20.12	Rtn on Invested Capital

Dividends as of 11 Oct 2024

2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Current	Calendar (%)
0.81	0.30	0.05	0.42	0.15	0.26	0.45	2.79	1.45	1.22	1.27	Dividend Per Share
8.81	9.71	0.62	3.81	1.99	1.92	2.68	18.84	4.78	8.06	12.23	Trailing Dividend Yield
0.00	—	—	—	—	0.75	0.00	0.00	7.25	5.51	2.12	Buyback Yield

Appendix

Economic Moat [®]History as of 11 Oct 2024 (No Moat: 0.00-0.70, Narrow Moat: 0.70-0.99, Wide Moat: 0.99-1.00)

Year	January	February	March	April	May	June	July	August	September	October	November	December
2024	0.06	0.01	0.02	0.03	0.04	0.29	0.06	0.06	0.09	0.16	—	—
2023	0.07	0.14	0.16	0.22	0.08	0.15	0.12	0.04	0.11	0.12	0.09	0.16
2022	0.06	0.04	0.06	0.07	0.06	0.08	0.05	0.04	0.03	0.01	0.08	0.11
2021	0.11	0.06	0.04	0.06	0.85	0.26	0.12	0.10	0.04	0.07	0.04	0.08
2020	0.03	0.04	0.06	0.09	0.11	0.14	0.15	0.07	0.08	0.17	0.06	0.07
2019	0.04	0.03	0.02	0.05	0.04	0.15	0.12	0.05	0.04	0.04	0.03	0.03

Quantitative Equity Report Overview

The quantitative report on equities consists of data, statistics and quantitative equity ratings on equity securities. Morningstar, Inc.'s quantitative equity ratings are forward looking and are generated by a statistical model that is based on Morningstar Inc.'s analyst-driven equity ratings and quantitative statistics. Given the nature of the quantitative report and the quantitative ratings, there is no one analyst in which a given report is attributed to; however, Mr. Lee Davidson, Head of Quantitative Research for Morningstar, Inc., is responsible for overseeing the methodology that supports the quantitative equity ratings used in this report. As an employee of Morningstar, Inc., Mr. Davidson is guided by Morningstar, Inc.'s Code of Ethics and Personal Securities Trading Policy in carrying out his responsibilities.

Quantitative Equity Ratings

Morningstar's quantitative equity ratings consist of: (i) Quantitative Fair Value Estimate, (ii) Quantitative Star Rating, (iii) Quantitative Uncertainty, (iv) Quantitative Economic Moat, and (v) Quantitative Financial Health (collectively the "Quantitative Ratings").

The Quantitative Ratings are calculated daily and derived from the analyst-driven ratings of a company's peers as determined by statistical algorithms. Morningstar, Inc. ("Morningstar", "we", "our") calculates Quantitative Ratings for companies whether or not it already provides analyst ratings and qualitative coverage. In some cases, the Quantitative Ratings may differ from the analyst ratings because a company's analyst-driven ratings can significantly differ from other companies in its peer group.

i. **Quantitative Fair Value Estimate:** Intended to represent Morningstar's estimate of the per share dollar amount that a company's equity is worth today. Morningstar calculates the Quantitative Fair Value Estimate using a statistical model derived from the Fair Value Estimate Morningstar's equity analysts assign to companies. Please go to <http://global.morningstar.com/equitydisclosures> for information about Fair Value Estimate Morningstar's equity analysts assign to companies.

ii. **Quantitative Economic Moat:** Intended to describe the strength of a firm's competitive position. It is calculated using an algorithm designed to predict the Economic Moat rating a Morningstar analyst would assign to the stock. The rating is expressed as Narrow, Wide, or None.

Narrow – assigned when the probability of a stock receiving a "Wide Moat" rating by an analyst is greater than 70% but less than 99%.

Wide – assigned when the probability of a stock receiving a "Wide Moat" rating by an analyst is greater than 99%.

None – assigned when the probability of an analyst receiving a "Wide Moat" rating by an analyst is less than 70%.

iii. **Quantitative Star Rating:** Intended to be the summary rating based on the combination of our Quantitative Fair Value Estimate, current market price, Quantitative Uncertainty Rating, and momentum. The rating is expressed as One-Star, Two-Star, Three-Star, Four-Star, and Five-Star.

★ – the stock is overvalued with a reasonable margin of safety.

*Log (Quant FVE/Price) < -1*Quantitative Uncertainty*

*Micro-Caps: Log (Quant FVE/Price) < -1.5*Quantitative Uncertainty*

★★ – the stock is somewhat overvalued.

*Log (Quant FVE/Price) between (-1*Quantitative Uncertainty, -0.5*Quantitative Uncertainty)*

*Micro-Caps: Log (Quant FVE/Price) between (-1.5*Quantitative Uncertainty, -0.75*Quantitative Uncertainty)*

★★★ – the stock is approximately fairly valued.

*Log (Quant FVE/Price) between (-0.5*Quantitative Uncertainty, 0.5*Quantitative Uncertainty)*

*Micro-Caps: Log (Quant FVE/Price) between (-0.75*Quantitative Uncertainty, 0.75*Quantitative Uncertainty)*

★★★★ – the stock is somewhat undervalued.

*Log (Quant FVE/Price) between (0.5*Quantitative Uncertainty, 1*Quantitative*

Uncertainty)

*Micro-Caps: Log (Quant FVE/Price) between (0.75*Quantitative Uncertainty, 1.5*Quantitative Uncertainty)*

★★★★★ – the stock is undervalued with a reasonable margin of safety.

*Log (Quant FVE/Price) > 1*Quantitative Uncertainty*

*Micro-Caps: Log (Quant FVE/Price) > 1.5*Quantitative Uncertainty*

After the initial calculation for the star rating, there is a final filtering step based on the momentum of the company. We rank the companies based on their 12-1 month momentum, then restrict those below the 30th percentile to a maximum of 3 stars.

iv. **Quantitative Uncertainty:** Intended to represent Morningstar's level of uncertainty about the accuracy of the Quantitative Fair Value Estimate. Generally, the lower the Quantitative Uncertainty, the narrower the potential range of outcomes for that particular company. The rating is expressed as Low, Medium, High, Very High, and Extreme.

Low – the interquartile range for possible fair values is less than 10%

Medium – the interquartile range for possible fair values is less than 15% but greater than 10%

High – the interquartile range for possible fair values is less than 35% but greater than 15%

Very High – the interquartile range for possible fair values is less than 80% but greater than 35%

Extreme – the interquartile range for possible fair values is greater than 80%

v. **Quantitative Financial Health:** Intended to reflect the probability that a firm will face financial distress in the near future. The calculation uses a predictive model designed to anticipate when a company may default on its financial obligations. The rating is expressed as Weak, Moderate, and Strong.

Weak – assigned when Quantitative Financial Health < 0.2

Moderate – assigned when Quantitative Financial Health is between 0.2 and 0.7

Strong – assigned when Quantitative Financial Health > 0.7

Other Definitions

i. **Last Close** – Price of the stock as of the close of the market of the last trading day before date of the report.

ii. **Quantitative Valuation** – Using the below terms, intended to denote the relationship between the security's **Last Price** and Morningstar's quantitative fair value estimate for that security.

Undervalued – Last Price is below Morningstar's quantitative fair value estimate.

Fairly Valued – Last Price is in line with Morningstar's quantitative fair value estimate.

Fairly Valued – Last Price is in line with Morningstar's quantitative fair value estimate.

Overvalued – Last Price is above Morningstar's quantitative fair value estimate.

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Sustainalytics analyzes over 1,300 data points to assess a company's exposure to and management of ESG risks. In other words, ESG Risk Ratings measures a company's unmanaged ESG Risks represented as a quantitative score. Unmanaged Risk is measured on an open-ended scale starting at zero (no risk) with lower scores representing less unmanaged risk and, for 95% of cases, the unmanaged ESG Risk score is below 50.

Based on their quantitative scores, companies are grouped into one of five Risk Categories (negligible, low, medium, high, severe). These risk categories are absolute, meaning that a 'high risk' assessment reflects a comparable degree

of unmanaged ESG risk across all subindustries covered.

The ESG Risk Rating Assessment is a visual representation of Sustainalytics ESG Risk Categories on a 1 to 5 scale. Companies with Negligible Risk = 5 Globes, Low Risk = 4, Medium Risk = 3 Globes, High Risk = 2 Globes, Severe Risk = 1 Globe. For more information, please visit sustainalytics.com/esg-ratings/

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