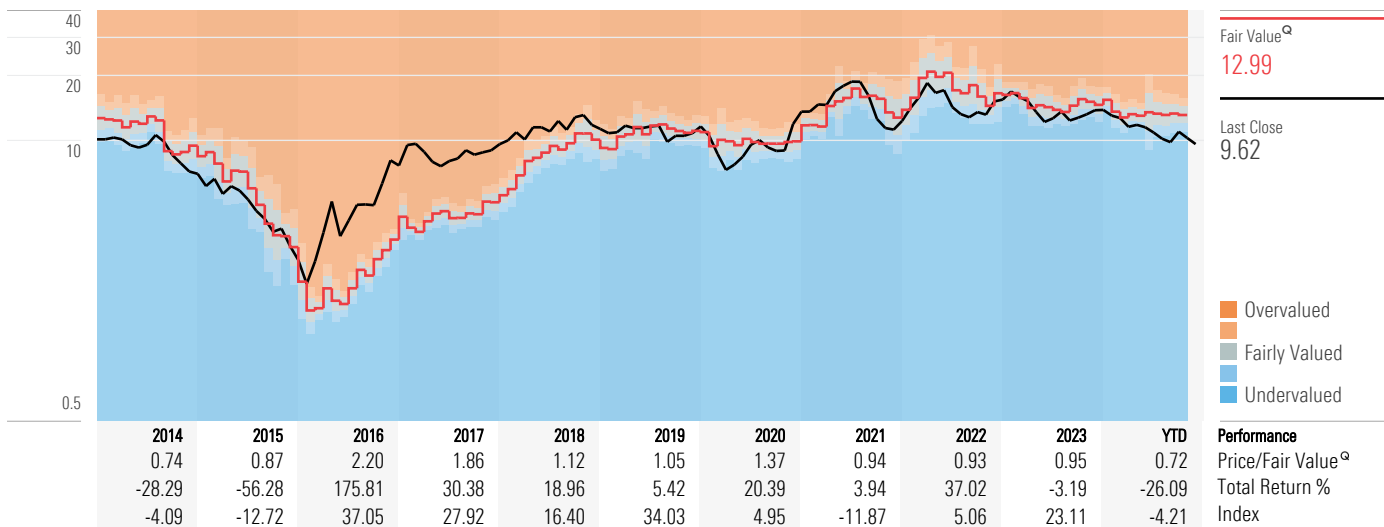


Vale SA XVALO ★★★★★ Q 5 Dec 2024 06:38, UTC

Economic Moat ^Q	Uncertainty ^Q	Price/Fair Value ^Q	ESG Risk Rating Assessment ¹	Trailing Dividend Yield %	Market Cap	Investment Style	Sector	Industry
None	Medium	0.74	6 Nov 2024 06:00, UTC	13.52	—	Large Value	Basic Materials	Other Industrial Metals & Mining



As of 04 Dec 2024 | Index: Morningstar Brazil GR BRL. Fair Value data as of 3 Dec 2024 06:37, UTC.

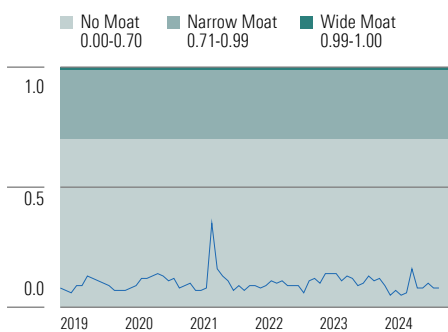
¹The ESG Risk Rating Assessment is a representation of Sustainalytics' ESG Risk Rating. Jeffrey Ptak, Chief Ratings Officer for Morningstar Research Services LLC oversees the methodology that supports Quantitative Fair Value Estimates and Quantitative Star Ratings. Mr Ptak is guided by the Morningstar Research Services' Code of Ethics and 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 29 Nov 2024

Metrics		Percentile in Sector
Earnings Yield (%)	21.9	97.0
Sales Yield (%)	97.0	73.0
Book Value Yield (%)	91.0	60.0
Return on Assets (%)*	10.4	93.0
Revenue(Bil)*	41.0	99.0
Market Value (Bil)	41.3	98.0
Enterprise Value (Bil)	53.3	98.0
EV/M Ratio	1.3	77.0
Volatility TTM (%)	22.8	14.0
Drawdown TTM (%)	22.0	18.0
Volume (Mil)	26.6	98.0

*30 Sep 2024

Economic Moat ^Q History as of 30 Nov 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 5 Dec 2024

Vale SA receives a 5-star quantitative star rating, illustrating our stance that this share class offers a compelling opportunity for investors. The stock currently trades at a 28% discount to our quantitative fair value estimate of 12.99 EUR per share; however, some caution is warranted due to this estimate's medium uncertainty rating.

The firm's valuation metrics strengthen our estimated fair value. A company's valuation metrics provide insights into the market's expectations for its future growth and profitability. Reflecting the firm's valuation is its book value yield of 91.0%, which lies in the top 40% globally. The market price is low relative to the book (accounting) value of the company's equity, which contributes to our view that shares are undervalued.

The firm's favorable dividend structure is an additional encouraging factor. Dividends represent a stable form of future cash flows returned to shareholders, reducing the perceived risk of a business. The firm's forward dividend yield, for example,

ranks in the top 1% compared with peers globally. Expected dividend payments over the coming year relative to the current share price are favorable, which further promotes our favorable price/fair value ratio.

In addition to the aforementioned drivers, our model considers momentum as part of its comprehensive analysis. This share class has been a laggard relative to the broader universe over the past year. This underperformance makes the stock appear cheap, which portends a buying opportunity in light of other contributors to our model.

Economic Moat ^Q as of 5 Dec 2024

This company lacks a competitive advantage, receiving a quantitative economic moat rating of none. Additionally, the firm's moderate financial health score suggests it is acceptably positioned against adverse economic circumstances.

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Vale SA XVALO ★★★★★ Q 5 Dec 2024 06:38, UTC

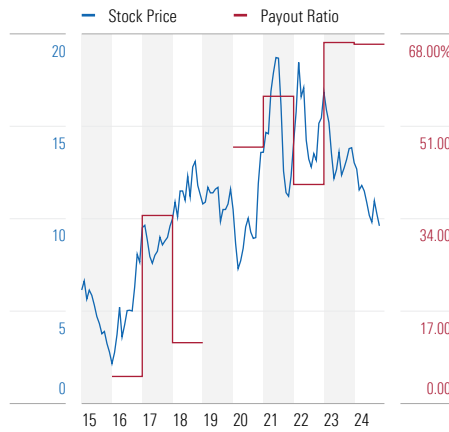
Economic Moat ^Q	Uncertainty ^Q	Price/Fair Value ^Q	ESG Risk Rating Assessment ¹	Trailing Dividend Yield %	Market Cap	Investment Style	Sector	Industry
None	Medium	0.74	6 Nov 2024 06:00, UTC	13.52	—	Large Value	Basic Materials	Other Industrial Metals & Mining

Earnings as of 29 Nov 2024

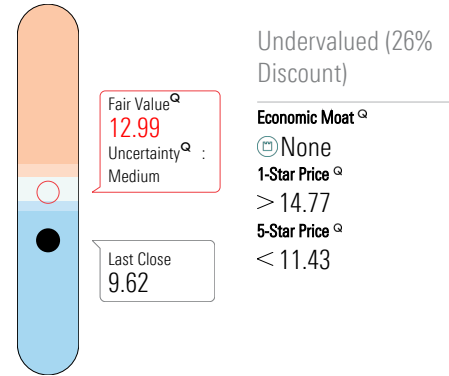
Earnings	%	Percentile in Sector
Dividend Yield*	13.2	99.0
Payout Ratio*	64.5	73.0
Price to Earnings	4.7	7.0
Price to Cash Flow	8.7	28.0
ROIC**	18.9	96.0

*29 Nov 2024
**30 Sep 2024

Dividends as of 4 Dec 2024



Valuation ^Q as of 3 Dec 2024



Financials (Fiscal Year End 31 Dec 2024)

2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	09/2024	Fiscal
37.54	25.61	27.49	33.97	36.58	37.57	40.02	54.50	43.84	41.78	40.99	Revenue (Bil)
8.78	2.61	8.19	11.41	13.04	14.13	18.55	30.84	17.79	15.86	14.13	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	9.28	Net Income (Bil)
0.13	-2.35	0.77	1.05	1.32	-0.33	0.95	4.47	4.05	1.83	2.16	Diluted Earnings/Share
12.81	4.49	6.58	12.45	12.90	12.11	14.32	25.68	11.49	13.17	11.24	Operating Cash Flow (Bil)
11.81	8.37	4.95	3.83	3.78	3.70	4.43	5.03	5.45	5.92	6.24	Capital Spending (Bil)
-2.78	-5.13	2.52	7.99	10.68	8.48	13.12	20.63	7.31	8.15	6.28	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 4 Dec 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	0.72	Price/Fair Value ^Q
1.18	0.57	1.71	1.67	1.94	1.81	2.20	1.32	1.78	1.61	1.07	Price/Sales
—	—	—	8.02	16.00	18.43	30.41	4.20	3.84	7.03	4.72	Price/Earnings
4.05	3.77	10.48	4.58	5.01	8.51	4.36	2.57	5.85	5.39	3.49	Price/Cash Flow
1.17	0.84	1.11	1.30	1.66	1.54	2.37	2.10	2.08	1.66	1.17	Price/Book

Operating Performance (Fiscal Year End 31 Dec 2024)

2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	09/2024	Fiscal (%)
0.55	-11.83	4.25	5.56	7.32	-1.87	5.31	24.74	21.31	8.82	10.43	Return on Assets
1.81	-57.03	30.11	18.54	15.69	-4.00	12.88	63.93	53.42	21.20	24.32	Return on Equity
2.37	-23.57	11.42	12.29	12.19	0.53	11.61	44.01	36.88	16.49	18.89	Rtn on Invested Capital

Dividends as of 4 Dec 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	13.52	Trailing Dividend Yield
0.00	—	—	—	—	0.75	0.00	0.00	7.25	5.51	1.06	Buyback Yield

Appendix

Economic Moat [®]History as of 30 Nov 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	0.09	0.05	0.07	0.05	0.06	0.16	0.08	0.08	0.10	0.08	0.08	—
2023	0.10	0.14	0.14	0.14	0.11	0.13	0.12	0.09	0.10	0.13	0.11	0.12
2022	0.09	0.08	0.09	0.11	0.10	0.11	0.09	0.09	0.09	0.06	0.11	0.12
2021	0.10	0.07	0.07	0.08	0.35	0.16	0.13	0.11	0.07	0.09	0.07	0.09
2020	0.07	0.08	0.09	0.12	0.12	0.13	0.14	0.13	0.11	0.12	0.08	0.09
2019	0.08	0.07	0.06	0.09	0.09	0.13	0.12	0.11	0.10	0.09	0.07	0.07

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, Jeffrey Ptak, Chief Ratings Officer for Morningstar Research Services LLC is responsible for overseeing the methodology that supports the quantitative equity ratings used in this report. As an employee of Morningstar Research Services LLC, a subsidiary of Morningstar, Inc., Mr Ptak is guided by the Morningstar Research Services' Code of Ethics and the Morningstar, Inc. 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*

Under Review – Morningstar will assign a rating of "Under Review" in three scenarios: when there is occurrence of a corporate event, when the closing price is unavailable for at least 7 days, or when the quantitative Fair Value to Price Ratio does not fall into the expected range of 0.25-4.

Not Rated – Morningstar will assign a rating of 'Not Rated' when closing price data is unavailable for at least 30 days.

Momentum Flag – 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.

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

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Sustainalytics' ESG Risk Ratings measure the degree to which company's economic value at risk is driven by environment, social and governance (ESG) factors.

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/

Ratings should not be used as the sole basis in evaluating a company or security. Ratings involve unknown risks and uncertainties which may cause our expectations not to occur or to differ significantly from what was expected and should not be considered an offer or solicitation to buy or sell a security.

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