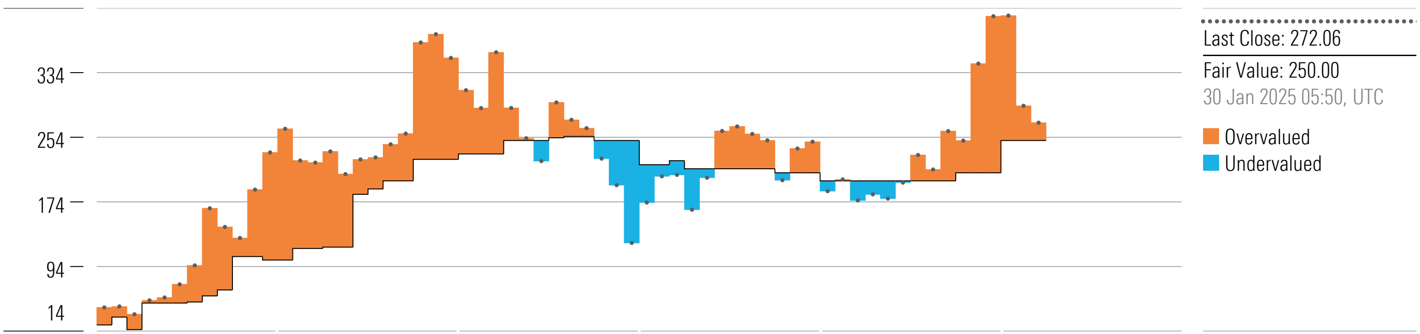
Morningstar Equity Analyst Report | Report as of 27 Mar 2025 12:48, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ - ALL MARKETS

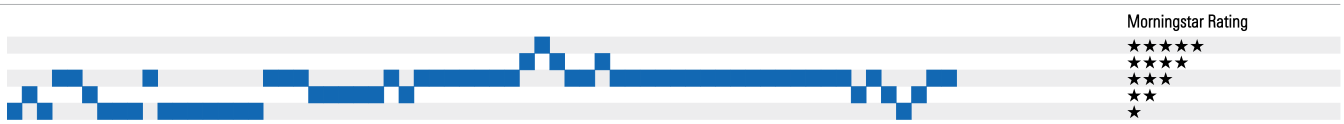
Tesla Inc TSLA ★★★ 26 Mar 2025 21:42, UTC

Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Equity Style Box	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
272.06 USD 26 Mar 2025	250.00 USD 30 Jan 2025 05:50, UTC	1.09	875.09 USD Bil 26 Mar 2025	Narrow	Large Growth	Very High	Exemplary	5 Mar 2025 06:00, UTC

Price vs. Fair Value



	2020	2021	2022	2023	2024	YTD	
	2.31	1.55	0.49	1.18	1.92	1.09	Price/Fair Value
	743.44	49.76	-65.03	101.72	62.52	-32.63	Total Return %



Total Return % as of 26 Mar 2025. Last Close as of 26 Mar 2025. Fair Value as of 30 Jan 2025 05:50, UTC.

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The primary analyst covering this company does not own its stock.

[1]The ESG Risk Rating Assessment is a representation of Sustainalytics' ESG Risk Rating.

Tesla: We See Offsetting Impacts From US Tariffs

Analyst Note Seth Goldstein, CFA, Strategist, 27 Mar 2025

US President Donald Trump announced 25% tariffs on automobiles and auto parts. The tariff applies only on the value of content made outside of the US. Tesla shares were up slightly on the news.

Why it matters: Tariffs will likely raise auto prices for consumers as automakers pass along increased costs. Tesla should see less impact from this specific announcement as the company domestically manufactures nearly all its autos sold in the US.

- However, Tesla is not immune from the effects of tariffs. The company does source auto parts, including raw materials such as steel and aluminum, from other countries, which are subject to tariffs that will raise Tesla's cost to produce its vehicles.

The bottom line: We maintain our $250 fair value estimate for narrow-moat Tesla. At current prices, we view Tesla shares as fairly valued with the stock trading slightly above our fair value estimate but in 3-star territory.

- We view the latest tariff news as slightly positive for Tesla as it will likely raise the cost for Tesla's competitors by a larger amount. If all automakers raised prices to offset higher costs, Tesla would see less of a price increase, which could result in higher sales volumes.
- While this would help Tesla, it supports our view that Tesla will see deliveries begin to grow in the second half of the year. However, we still forecast deliveries will slightly decline in 2025 as we expect a first-quarter decline will not be fully offset by second-half growth.

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Sector	Industry
Consumer Cyclical	Auto Manufacturers

Business Description

Tesla is a vertically integrated battery electric vehicle automaker and developer of autonomous driving software. The company has multiple vehicles in its fleet, which include luxury and midsize sedans, crossover SUVs, a light truck, and a semi truck. Tesla also plans to begin selling more affordable vehicles, a sports car, and offer a robotaxi service. Global deliveries in 2024 were a little below 1.8 million vehicles. The company sells batteries for stationary storage for residential and commercial properties including utilities and solar panels and solar roofs for energy generation. Tesla also owns a fast-charging network.

Coming up: Tesla is set to report first-quarter deliveries next week. Through the first two months of the year, deliveries are down in Tesla's three key markets: the US, China, and Europe. We attribute much of the decline to consumers waiting for the new Model Y and more affordable vehicle.

Business Strategy & Outlook Seth Goldstein, CFA, Strategist, 11 Mar 2025

Tesla is one of the largest battery electric vehicle automakers in the world. In less than a decade, the company went from a startup to a globally recognized luxury automaker with its Model S and Model X vehicles. Tesla competes in the entry-level luxury car and midsize crossover sport utility vehicle markets with its Model 3 and Model Y vehicles. It also sells a light truck—the Cybertruck—and a semi truck. The company plans to launch an affordable SUV, luxury sports car, and robotaxi in the future.

Tesla aims to retain its market leader status as EVs grow from a niche market to reaching mass consumer adoption. We forecast EVs will reach 40% of global auto sales by 2030. To meet growing demand, Tesla opened two new factories in 2022, increasing its production capacity. Tesla also invests around 4% of its sales in research and development, focusing on improving its market-leading technology and reducing manufacturing costs. For EVs to see mass adoption, long-range EVs need to reach cost parity with internal combustion engines across all vehicle categories. To reduce costs, Tesla focuses on automation and efficiency in its manufacturing process, such as reducing the total number of parts that need to be assembled in a vehicle. The company also designs some of its own batteries. Tesla's goal is to reduce costs by more than 50% over time.

EVs also need readily available fast-chargers throughout a region to see mass-market adoption. Tesla continues to expand its supercharging network, which consists of fast chargers built along highways and in cities throughout the US, EU, and China.

Tesla is attempting to take a larger share of its customers' auto-related spending, which includes selling autonomous driving software, insurance, and charging. The company also aims to launch a robotaxi service using its autonomous driving software. We expect autonomous vehicles, including Tesla's robotaxi service, to make up 50% of ride-hailing rides in the US and Canada by 2030 as robotaxis are cheaper than human drivers.

It also sells solar panels and batteries to consumers and utilities. As the battery-based energy storage market expands, Tesla is well positioned to grow accordingly.

Bulls Say Seth Goldstein, CFA, Strategist, 11 Mar 2025

- Tesla has the potential to disrupt the automotive and power generation industries with its technology for EVs, AVs, batteries, and solar generation systems.
- Tesla will see higher profit margins as it reduces unit production costs over the next several years.
- Tesla's full self-driving software should generate growing profits in the coming years as the technology

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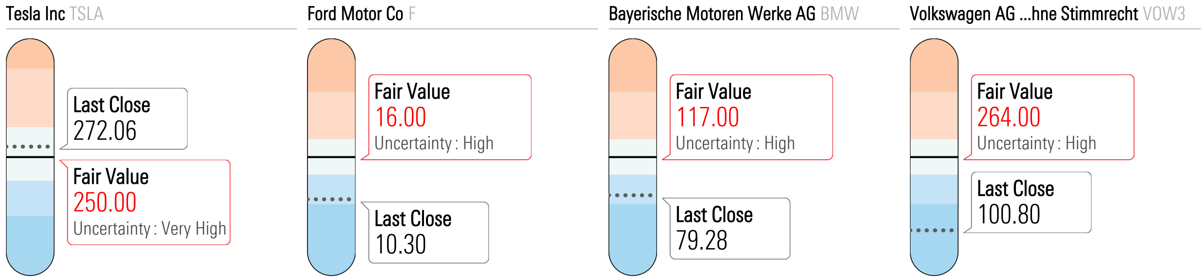
Competitors



	Tesla Inc TSLA	Ford Motor Co F	Bayerische Motoren Werke AG BMW	Volkswagen AG ...hne Stimmrecht VOW3
Economic Moat	Narrow	None	None	None
Currency	USD	USD	EUR	EUR
Fair Value	250.00 30 Jan 2025 05:50, UTC	16.00 11 Feb 2025 00:56, UTC	117.00 26 Nov 2024 19:25, UTC	264.00 18 Sep 2024 16:19, UTC
1-Star Price	437.50	24.80	181.35	409.20
5-Star Price	125.00	9.60	70.20	158.40
Assessment	Fairly Valued 26 Mar 2025	Undervalued 26 Mar 2025	Undervalued 26 Mar 2025	Undervalued 26 Mar 2025
Morningstar Rating	★★★26 Mar 2025 21:42, UTC	★★★★26 Mar 2025 21:32, UTC	★★★★27 Mar 2025 01:42, UTC	★★★★★27 Mar 2025 01:52, UTC
Analyst	Seth Goldstein, Strategist	David Whiston, Strategist	Rella Suskin, Equity Analyst	Rella Suskin, Equity Analyst
Capital Allocation	Exemplary	Standard	Standard	Poor
Price/Fair Value	1.09	0.64	0.68	0.38
Price/Sales	9.74	0.22	0.32	0.16
Price/Book	12.00	0.91	0.53	0.30
Price/Earning	123.86	5.60	6.42	4.31
Dividend Yield	0.00%	7.28%	7.57%	8.99%
Market Cap	875.09 Bil	40.82 Bil	49.33 Bil	50.53 Bil
52-Week Range	138.80—488.54	9.06—14.85	65.26—115.35	78.86—128.60
Investment Style	Large Growth	Mid Value	Large Value	Large Value

continues to improve, leading to a robotaxi service, increased adoption by Tesla drivers, and licensing from other auto manufacturers.

Bears Say Seth Goldstein, CFA, Strategist, 11 Mar 2025

- Traditional automakers and new entrants are investing heavily in EV development, which will result in Tesla seeing a deceleration in sales growth and being forced to cut prices due to increased competition, eroding profit margins.
- Tesla's large investment into autonomous driving software will be value destructive as the robotaxi product will face delays and competition from Waymo, who already offers a robotaxi service.
- Tesla CEO Elon Musk's political activities will turn consumers away from buying a Tesla in key markets including the US and Europe, leading to lower sales and profits.

Economic Moat Seth Goldstein, CFA, Strategist, 11 Mar 2025

We award Tesla a narrow moat rating. Tesla's moat stems from two of our five moat sources: intangible assets and cost advantage. The company's strong brand cachet as a luxury automaker commands premium pricing, while its EV manufacturing expertise allows the company to make its vehicles cheaper than its competitors.

Intangible Assets

Tesla's brand cachet is not likely to be impaired anytime soon as other automakers move into the battery electric vehicle space because we expect the company to keep innovating to stay ahead of startup and established competitors. The Model S Plaid, the most upgraded version of Tesla's luxury sedan, offers 390 miles of range, at the high end for electric vehicles. It does 0-60 mph in under 2 seconds and has 1,020 horsepower, putting the Model S Plaid in a rare class of performance among all autos, regardless of powertrain. By focusing on the luxury auto market first, Tesla was able to create tremendous media publicity for the company that reaches beyond its customers. This generated strong consumer demand for its subsequent vehicles at lower price points, such as the Model 3 and Model Y. As other new vehicles are launched, such as the affordable SUV, we expect the company's strong brand will continue to generate consumer demand.

Tesla has a more high-tech vehicle with the ability to do drivetrain updates and other updates via Wi-Fi or a cellular connection, and customers do not have to visit a store for many service needs. Tesla will instead pick up the vehicle from home and often return it the same day, while providing a fully loaded loaner for no charge, or visit the customer's home or work and service the car there. This experience is much easier than many other automakers' service, which helps Tesla's brand equity. Further, this has been accomplished with little to no spending on advertising, which is rare for a consumer brand. This strong brand equity has carried over to Tesla's energy generation and storage business, where the company can charge a premium for its fully integrated solar panel, inverter, and home battery storage systems sold to consumers.

Tesla's proprietary technology contributes to its intangible asset-driven competitive advantage. This form of intangible assets applies to EVs due to their innovative, highly engineered nature and because patents for EV technologies hold somewhat less value due to the ability of competitors to create alternatively designed, but ultimately similar, products. Since launching the Model S in 2012, Tesla has been the industry leader in electric vehicles, producing the best EVs on the market. The company invests nearly 6% of sales in R&D to maintain its best-in-class range, which is well ahead of the competition on a miles per kilowatt-hour basis and continues to improve other vehicle specs such as power. Tesla is also investing heavily in its proprietary autonomous vehicle technology and building one of the world's largest supercomputers to train self-driving artificial intelligence. With R&D spending in line with its peers, we think Tesla will be able to maintain its proprietary technological advantage.

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Tesla will face increasing competition in the coming years. Automakers plan to electrify their fleets by adding EV versions of existing vehicles and creating new platforms. However, we see EVs becoming a greater proportion of auto sales, growing to 30% by 2030 from 3% in 2020, which will expand the market as EVs rapidly take share from internal combustion engine vehicles. As new models are introduced, Tesla's technological advantage and the strength of its brand will remain intact, which will allow the company to continue to charge a premium price for its EVs.

Cost Advantage

We think Tesla benefits from a cost advantage in electric vehicles production thanks to its manufacturing scale. Tesla's total vehicle volume has grown from just over 100,000 in 2017 to nearly 1.8 million deliveries in 2024. During the same period, the company's average cost of goods sold per vehicle has fallen over 55%, from $84,000 to just over $35,000. While some of this is due to manufacturing a greater proportion of midsize cars and SUVs versus luxury autos, the majority of the COGS decline has come from the company's focus on reducing manufacturing costs due to scale. Legacy automakers are gradually transitioning to BEV production from internal combustion engines, but we expect they will be saddled with legacy ICE costs for a long time. Even as legacy automakers begin to produce more EVs, we expect Tesla will continue to have lower costs as it has outlined a plan to reduce battery cell costs by 56% over the next several years. With Tesla's cost per vehicle set to fall, incumbent automakers may take years to catch up to Tesla, if ever, as they won't want to build many new factories from scratch like Tesla is doing.

We think Tesla's combination of intangible assets and cost advantage will persist in the future and allow the firm to generate excess returns on capital. We see the potential for Tesla to outearn its cost of capital over at least the next 20 years, which is the measurement we use for a wide moat rating. However, the second 10-year period carries significant uncertainty for both Tesla and the broader automotive industry, given the rapid advancement of autonomous vehicle technologies that could transform how consumers use vehicles. As such, we view a narrow moat rating, which assumes a 10-year excess return duration, as more appropriate.

Fair Value and Profit Drivers Seth Goldstein, CFA, Strategist, 11 Mar 2025

Our Tesla fair value estimate is $250. We use a weighted average cost of capital of just under 9%. Our equity valuation adds back nonrecourse and nondilutive convertible debt.

In 2024, Tesla's deliveries came in at 1.79 million, slightly below the 1.81 achieved in 2023. In 2025, we forecast deliveries will slightly fall again. We expect first half deliveries will be imapcted by the new Model Y not being solid in all markets, especially in the beginning of the year. However, we forecast a better second half of the year as the affordable vehicle is launched by midyear. As the company is ramping up production of the new vehicles, we expect automotive gross margins excluding credits will remain in the mid-teens, below management's long-term goal of 20%.

Longer term, we assume Tesla delivers roughly 4.6 million vehicles per year in 2030. Our forecast is well below management's aspirational goal of selling 20 million vehicles by the end of this decade. However, it is a little more than 2.5 times the 1.8 million vehicles delivered in 2024.

Our forecast assumes Tesla slightly grows its Model 3 and Model Y deliveries and ramps up volume of the Cybertruck to around 50,000 deliveries per year, far below management's goal of 250,000. We forecast Tesla will launch its affordable SUV priced in the mid-$30,000 range with some deliveries coming in 2025 and a ramp-up in 2026 at a pace similar to the Model 3 ramp-up in 2018, the first full year the vehicle was sold. We think deliveries of the affordable SUV will exceed those of the Model Y and Model 3, as the lower price point of this vehicle should attract a larger consumer base.

We think Tesla will be successful in continuing to reduce its manufacturing costs on a per vehicle basis. We forecast segment gross margin will recover to the low 20s by the end of the decade, above the 19% generated in 2023 but below the 29% achieved in 2022.

We assume revenue growth and margin expansion from autonomous software sold on a subscription basis. We also assume the successful growth of the insurance business and increased profits from the charging business result in long-term profit growth and margin expansion in the services and other segment.

In energy generation and storage, we assume the business averages annual revenue growth at a 30% range during our 10-year forecast, primarily driven by accelerating demand for energy storage systems. While we forecast ESS prices to decline, the fall will largely be driven by cheaper battery costs, which should not affect profitability. As volume grows, unit costs should fall. Combined with recurring revenue from long-term power purchase agreements and AI trading software, we expect the business will turn profitable and generate gross margins in line with peers such as Enphase and SolarEdge.

We assume overhead expenses continue to decline as a percentage of sales as the company benefits from operating leverage as deliveries grow. As a result, we forecast companywide operating margin will return to the midteens by the end of the decade, in line with the 17% achieved in 2022 and well above the 9% in 2023.

To fund this growth, we assume Tesla will have around $110 billion in capital expenditures over the next decade.

Our base case also adds the present value of Tesla's robotaxi business, Dojo's AI training services, and the Optimus humanoid robot sales. We expect robotaxis will enter the ride-hailing market by 2028 and rollout on a city-by-city basis, similar to how Waymo, Uber, and Lyft increased their service locations.

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Tesla will take an asset-light approach, selling vehicles and then running the software. Our robotaxi valuation account for around $65 per share, or a little more than 20%, of our Tesla valuation. Dojo and Optimus combine for roughly $20 per share, less than 10% of our fair value estimate.

Given the wide range of outcomes for Tesla, we also model additional scenarios. Our downside scenario fair value estimate is $100 per share. In a downside scenario, we assume Tesla delivers a little over 3.5 million vehicles in 2030. We also assume cost reductions do not materialize as planned and Tesla is forced to cut prices amid increasing competition. This keeps gross margin in the high teens, in line with the 19% generated in 2023. We also assume Tesla gets no benefit from autonomous driving software and sees slower growth in the insurance business. We assign no value to the company's ancillary businesses including robotaxis, Dojo's AI training services, and humanoid robots.

Our upside scenario fair value estimate is $500 per share. In an upside scenario, we assume Tesla delivers around 7 million vehicles per year by 2030 and the company benefits from cost reductions in excess of our base-case forecast. We also assume greater adoption of autonomous driving software and faster growth in the insurance business. We assume greater adoption of robotaxi and humanoid robots, driving higher profits from these businesses.

Risk and Uncertainty Seth Goldstein, CFA, Strategist, 11 Mar 2025

We assign Tesla a Very High Morningstar Uncertainty Rating as we see a wide range of potential outcomes for the company.

The automotive market is highly cyclical and subject to sharp demand declines based on economic conditions. As an EV market leader, Tesla is subject to growing competition from traditional automakers and new entrants. As new lower-priced EVs enter the market, Tesla may be forced to continue to cut prices, reducing the firm's industry-leading profits. With more EV choices, consumers may view Tesla less favorably. The company is also investing heavily in R&D to develop autonomous driving software with no guarantee these investments will bear fruit. Tesla's CEO effectively owns a little more than 20% of the company's stock and uses it as collateral for personal loans, which raises the risk of a large sale to repay debt.

Tesla also faces political risk related to the political activities of CEO Elon Musk. Musk serves as an advisor to US President Donald Trump and campaigned for the far-right Alternative for Germany party. These activities risk turning away some consumers from buying a Tesla.

Tesla faces ESG risks. As an automaker, Tesla is subject to potential product defects that could result in recalls, including its autonomous driving software. We see a moderate impact should this occur. Another risk involves employee retention. If Tesla is unable to retain key employees, such as CEO Elon Musk, its image as an innovative company could decline. We see a low probability but moderate materiality.

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Additional ESG risks include potential patent litigation as the company relies on new technology to improve its EVs and energy storage systems. We see a low probability but moderate materiality should this occur. Tesla may also face regulatory issues in some US states due to laws that require automakers and dealers to be separate. We see a moderate probability but low materiality.

Capital Allocation Seth Goldstein, CFA, Strategist, 11 Mar 2025

We award Tesla an Exemplary Capital Allocation Rating based on our framework that assesses its balance sheet, investment decisions, and shareholder distributions.

We rate the balance sheet as sound. Tesla's revenue is subject to high cyclicality, and the majority of the company's debt and financial lease obligations are due within the next three years. However, with a healthy balance sheet and cash far exceeding total debt, Tesla should be able to easily meet its financial obligations.

We view management's investments as exceptional. Tesla's aspiration is to increase its EV volume from a little under 1.8 million vehicles in 2024 to 20 million by 2030. To do so, the company built new factories around the world, including in China, the EU, and US. Given strong consumer demand, we think the capacity expansion plans make sense. We are also in favor of the company's focus on reducing its manufacturing costs on a per unit basis while investing to maintain its technological advantage. To reduce costs, Tesla makes its own batteries, with plans to increase its own battery cell production from an annual capacity of 100 gigawatt-hours in 2022 to 3 terawatt-hours by 2030. The battery will also be incorporated into the structural design of the EV. Tesla's battery improvements aim to reduce cost on a per kWh basis, increase range, and reduce investment on a per GWh basis.

We are in favor of the focus on reducing costs, as this should enable Tesla to keep its cost advantage intact as large legacy automakers electrify further this decade. Reduced manufacturing costs should enable Tesla to increase profit margins for its existing vehicles and produce an affordable sedan and SUV in the future at a profitable level. We also think management is smart to look at adding ancillary revenue streams such as autonomous driving software, which can be a product differentiator if Tesla is successful, as well as selling insurance. We are in favor of the move to open Tesla's charging network to non-Tesla vehicles as it can drive additional revenue and profits from charging stations by increasing the capacity utilization of each station.

We see shareholder distributions as appropriate. Tesla does not pay a dividend and to date has not repurchased shares. Instead, it has used the capital markets to issue stock, most recently at value-accretive levels. Given that Tesla is investing heavily in expanding its vehicle and battery production capacity, we think the best use of capital is internal reinvestment to fund organic growth rather than shareholder distribution. However, with solid free cash flow generation and little debt, management said it may consider share repurchases in the future. Tesla is currently preparing to begin selling an affordable vehicle and building the required plants to ramp up production. Once this is complete and the initial factories are ramped up, we think share repurchases, at least to offset dilution from stock-based compensation, would make sense with excess cash flow.

Elon Musk has been Tesla's CEO since 2008. Before co-founding Tesla, he co-founded and sold the internet payment system PayPal. Musk also co-founded SpaceX, Neuralink, and The Boring Co. Further, Musk purchased Twitter, now called X, in late 2022 and was CEO until mid-2023. For Tesla, Musk's compensation comes entirely from stock awards. Under the plan created in 2018, Musk earned 304 million stock option awards (split-adjusted, at a price of $23.34 per share) in 12 tranches based on meeting revenue, EBITDA, and market capitalization targets, which was completed by the end of 2022. This compensation package was voided by a Delaware judge following a shareholder lawsuit, though Tesla may appeal the ruling. For future compensation awards, while we understand the revenue and EBITDA targets for a growing company, we would prefer a return on invested capital metric be added.

Analyst Notes Archive

Tesla: Shares Rally on China Full Self-Driving Approval Seth Goldstein, CFA,Strategist,24 Mar 2025

Tesla announced it completed regulatory approval for its autonomous driving assistance software. Tesla shares were up 10% at the time of writing on the news. Why it matters: Tesla's electric vehicle competitors in China are launching their own Level 2 autonomous driving systems, where the vehicle assists drivers with steering and acceleration or deceleration. Tesla's ability to get its FSD software approved for use reduces the risk that consumers in China will choose another vehicle due to the autonomous driving software. This should help Tesla improve deliveries in China, which fell during the first two months of the year. The bottom line: We maintain our $250 fair value estimate. Our valuation includes a higher FSD adoption rate, which assumed Tesla would eventually be allowed to offer the software in China, which is one of the company's largest markets. At current prices, we view Tesla shares as fairly valued with the stock trading a little above our fair value estimate but in 3-star territory. We recommend investors wait for the stock to offer a margin of safety before considering an entry point. Big picture: Tesla's FSD approval should help improve near-term deliveries in China. However, in other markets Tesla charges a monthly subscription fee for use of its FSD software. This is in contrast to competitor BYD, which offers its Level 2 autonomous driving software for free. As Tesla has only received approval for its Level 2 FSD software, we question if consumers are willing to pay a monthly subscription fee for software that may only be marginally better than the free version BYD can offer. Eventually, Tesla may have to cut its FSD price in China. While FSD would still be a driver of deliveries in China, a lower price reduces Tesla's total addressable market in China.

Tesla: CEO Musk Holds All-Hands Meeting to Reinforce Strategy Seth Goldstein, CFA,Strategist,21 Mar 2025

Tesla CEO Elon Musk held an all-hands meeting to reinforce the firm's strategy to expand into artificial intelligence and robotics. He also stated a near-term plan to increase deliveries through the new Model Y, which is launching in more countries worldwide. The shares were up in March 21 trading.Why it matters: Tesla shares are down around 50% from their all-time high in December. Market sentiment turned negative following lower delivery numbers in the US and China in the first two months of 2025 and a January decline in Europe. With the event, Musk aimed to demonstrate that his primary focus is still running Tesla. We see increased political risk for Tesla in Musk's new role as an advisor to US President Donald Trump, as there is the potential that some consumers may choose to not buy a Tesla due to Musk's political activities. Musk highlighted Tesla's quality and aim to focus on a great customer experience. We think this emphasizes his view that consumers will buy the best vehicle regardless of the CEO's politics. Given that autos are a larger purchase, we think the majority of consumers agree.The bottom line: We maintain our $250 fair value estimate for narrow-moat Tesla. We view the stock as fairly valued, trading just below our fair value estimate and in 3-star territory. We recommend investors wait for a wider margin of safety before considering an entry point. Musk discussed Tesla's new V4 superchargers, which can deliver charging power up to 500 kilowatts. Earlier this week, competitor BYD announced a new battery that can charge in 5 minutes. We think the new V4 superchargers could add 200 miles of range in 10 minutes versus 15 minutes today. Tesla plans to produce 5,000 humanoid robots this year. We think they will initially be used for performing tasks at Tesla's factories. The robots are key to Tesla's goal of transitioning to an AI and robotics company, but we think vehicles will still be the primary product over the next decade.

Tesla: Cybertrucks Recalled Due to Exterior Panel Issue Seth Goldstein, CFA,Strategist,20 Mar 2025

Tesla is recalling the vast majority of its Cybertrucks in the US to fix an issue where an exterior panel could detach while the vehicle is driving. Tesla's shares were down a little more than 1% at the time of writing on the news. Why it matters: The Cybertruck is a luxury truck. While Tesla aims for the vehicle to reinforce its brand of luxury vehicles that come equipped with the latest technology, a recall of this higher-end product risks damaging the electric carmaker's brand. The bottom line: We maintain our $250 fair value estimate for narrow-moat Tesla. We view the stock as fairly valued, with shares trading less than 10% below our fair value estimate and in 3-star territory. We recommend investors wait for a larger margin of safety before considering an entry point. We view product recalls as fairly common in the automotive industry, especially for smaller issues that do not affect vehicle safety, such as an exterior panel detachment. We see little impact on Tesla's brand or vehicle deliveries from the recall. We think this kind of issue is more likely for newer vehicles, such as the Cybertruck. We expect Tesla will fix the cause of the issue in its manufacturing process. The recall does not change our view that the Cybertruck will eventually see around 50,000 deliveries per year. Coming up: We expect Tesla will see a decline in first-quarter deliveries. This is due to lower delivery numbers in the US and China in the first two months of the year and a January decline in Europe. We forecast 2025 deliveries will be slightly lower than 2024, owing to a down first quarter. As the new Model Y will be available in the three key regions during the entire second quarter and Tesla plans to launch its more affordable SUV by midyear, we expect deliveries will grow in the second half of the year.

Electric Vehicles Will Make up One In Three Autos Sold by 2030, Driving Lithium Prices Higher Seth Goldstein, CFA,Strategist,14 Mar 2025

Battery electric vehicle sales stalled in the US and Europe in 2024 after a postpandemic rise. With sales growing in China and globally, many companies throughout the EV supply chain stand to benefit from the transition to EVs. Why it matters: The stalled EV growth in the US and Europe led to a near-term slowdown in many industries in the EV supply chain, especially automotive-focused semiconductors and lithium. As a result, the market questions if these industries will benefit from the EV transition. While we generally agree with consensus on global EV adoption, we're more bullish than the market on many companies in the EV supply chain. The market disconnect between the macro growth and company valuations creates strong opportunities for investors. The bottom line: We forecast EVs will account for one in three autos sold globally by 2030, up from just under 14% in 2024. As more affordable long-range EVs are sold in the US and Europe over the next couple of years and fast-charging networks are built, we expect EV sales growth will accelerate. Our top picks are auto OEMs no-moat BYD, no-moat General Motors, no-moat Renault, and narrow-moat Tesla. In auto suppliers, we like narrow-moat BorgWarner. In batteries, our top pick is no-moat Contemporary Amperex Technology. Our top lithium picks are narrow-moat Albemarle and narrow-moat SQM. In semiconductors, we like wide-moat NXP and narrow-moat Onsemi. In utilities, our top picks are no-moat Consolidated Edison and narrow-moat Edison International. Between the lines: One of the largest beneficiaries of EVs is lithium. Strong global EV growth will lead the market from oversupply back to balance, driving prices higher from multiyear lows. For low-cost lithium producers, we see strong upside versus current valuations. We forecast lithium prices will double to $20,000 per metric ton from current levels by the end of 2026 based on our estimate of the long-term marginal cost of production.

We Forecast Autonomous Vehicles Will Be 50% of US and Canada Ride-Hails by 2035 Seth Goldstein, CFA,Strategist,10 Mar 2025

Robotaxi adoption is set to grow. Waymo and Tesla stand at the forefront of this technological shift, which offers both an opportunity and threat to ride-hailing vendors, Uber and Lyft. Why it matters: The market questions the winners and losers from robotaxis entering the ride-hail market. We see Alphabet's Waymo and Tesla's robotaxi as the biggest winners. However, traditional ride-hailing providers Uber and Lyft should also benefit from the transition. The bottom line: We forecast robotaxis will grow from less than 1% of the ride-hailing market today to 50% by 2035. Currently, Waymo is the only robotaxi provider, but we see Tesla entering the market in the coming years. We forecast Tesla and Waymo will lead the robotaxi transition. Robotaxis will see rapid adoption because they offer cheaper ride-hailing rides to consumers and are safer than the average human driver. They will also make around 50% more trips per day than the average human driver, meaning they will require fewer vehicles to capture market share. Wide-moat Alphabet is our top pick, trading in 4-star territory, as it offers the most upside of the names under our coverage with robotaxi exposure. Narrow-moat Tesla, narrow-moat, Uber, and no-moat Lyft trade in 3-star territory. Tesla would disproportionately benefit in a disruption scenario. Between the lines: We see two drivers that will speed up autonomous vehicle deployment: AV vendors becoming profitable and the creation of US federal regulations. Under the Trump administration, we expect a federal regulation will emerge, replacing the state-by-state approval process that is currently required. AV vendors using an asset-light model will improve profitability. This business model where AV vendors sell the AV and then run the AV software is the most profitable option based on our unit economics analysis, and also benefits the ride-hailing vendors, who will partner with AV vendors.

Tesla: Stock Plunges on Fears Deliveries Will See Large Drop Seth Goldstein, CFA,Strategist,10 Mar 2025

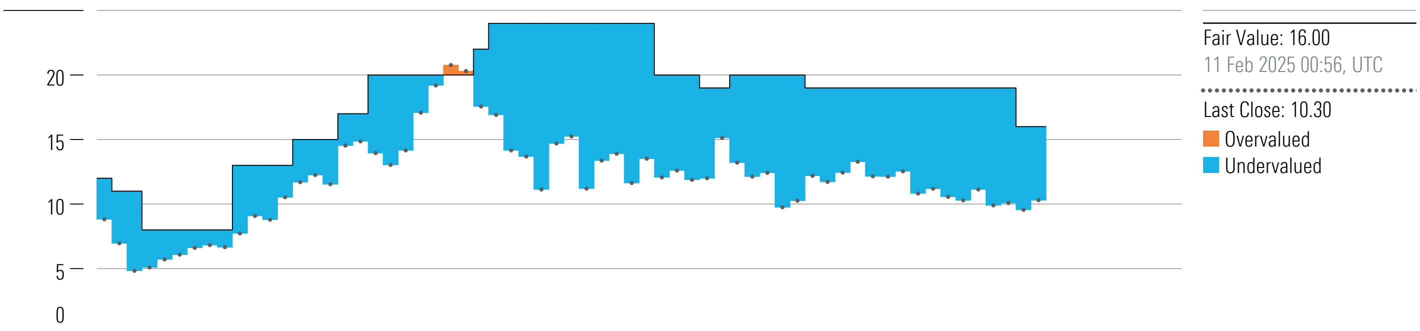
Tesla shares were down 9% at the time of writing as the market reacted to an analyst downgrade and market fears that increased competition and CEO Elon Musk's political activities will lead to lower deliveries and profits in 2025. Why it matters: Tesla's primary business is selling autos. While management's long-term vision is to transition to robotics, autonomous driving software, and ride-hailing, we expect autos will remain the primary business through at least the rest of the decade. In Tesla's three key auto markets, the US, China, and Europe, the company faces strong competition in the long-range entry-level luxury electric vehicle market. In the US and Europe, Tesla has historically offered the best combination of range and price, but other brands are now comparable. CEO Elon Musk serves as an advisor to US President Donald Trump, and Musk also actively campaigned for the far-right Alternative for Germany party in recent German elections. These moves risk turning consumers away from Tesla's brand. The bottom line: We maintain our $250 fair value estimate for narrow-moat Tesla. We view Tesla shares as fairly valued and trading just a little below our fair value estimate and in 3-star territory. We recommend investors wait for a larger margin of safety before considering an entry point. We see elevated risk for Tesla. However, we think it is still too early to conclude Musk's political actions will hurt Tesla sales in 2025. In the US, Wards Intelligence's auto data shows year-over-year sales growth in February. In China, February sales were hit by the timing of the Lunar New Year. We also view the first quarter of 2025 as somewhat of a transition for Tesla. The new Model Y will not be released for most of the quarter in Tesla's key markets. Additionally, Tesla plans to launch its more affordable SUV later in the year, so some consumers could be waiting to buy that vehicle.

Morningstar Equity Analyst Report | Report as of 27 Mar 2025 12:48, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ - ALL MARKETS

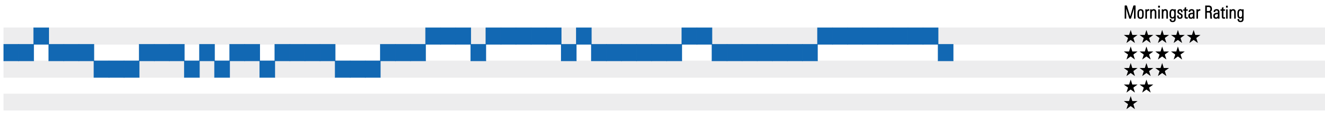
Tesla Inc TSLA ★★★ 26 Mar 2025 21:42, UTC

Competitors Price vs. Fair Value

Ford Motor Co F

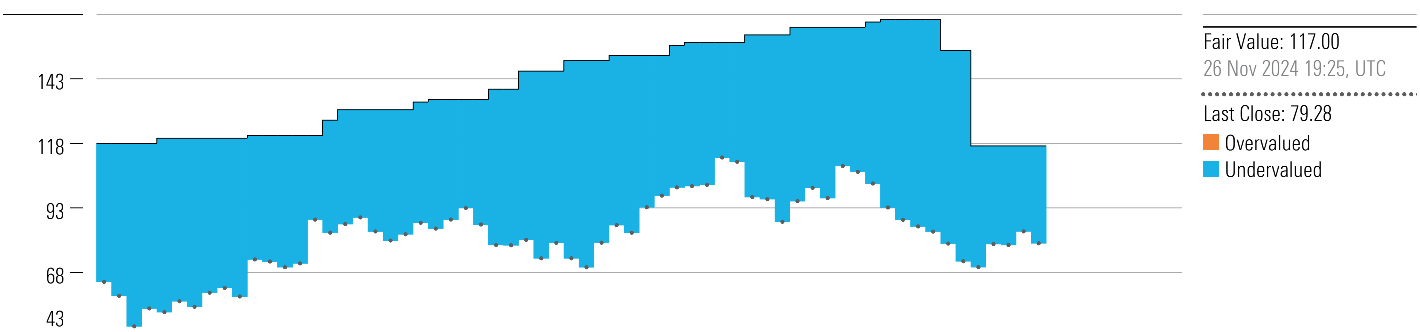


	2020	2021	2022	2023	2024	YTD
Price/Fair Value	0.68	1.04	0.48	0.64	0.52	0.64
Total Return %	-3.87	137.43	-41.60	15.56	-12.39	7.07

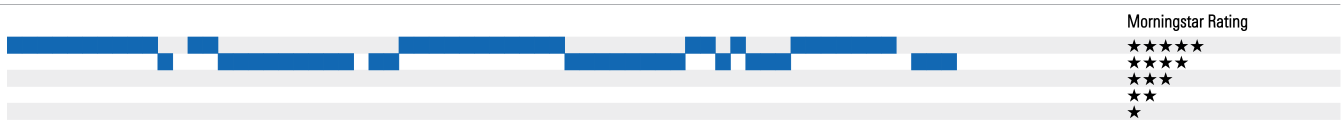


Total Return % as of 26 Mar 2025. Last Close as of 26 Mar 2025. Fair Value as of 11 Feb 2025 00:56, UTC.

Bayerische Motoren Werke AG BMW



	2020	2021	2022	2023	2024	YTD
Price/Fair Value	0.60	0.66	0.55	0.62	0.68	0.68
Total Return %	2.17	25.14	0.78	31.06	-15.68	0.38



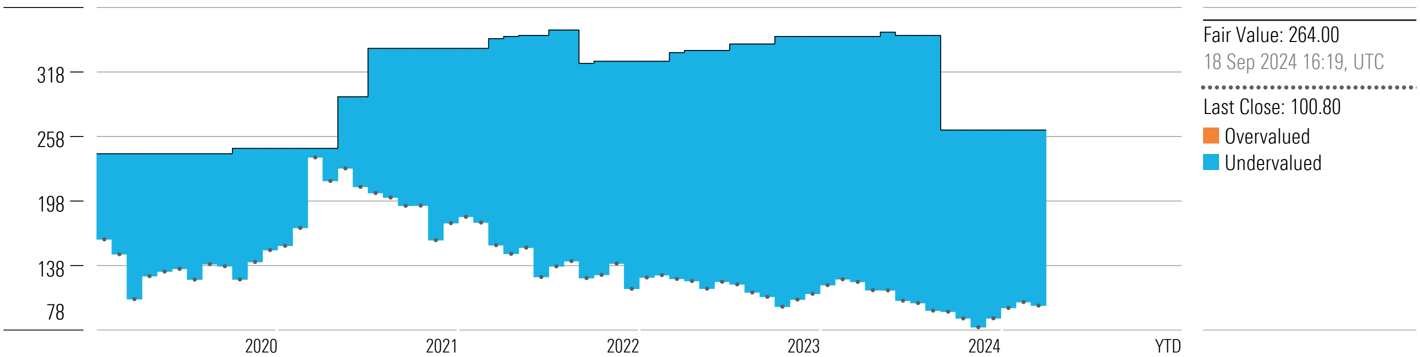
Total Return % as of 26 Mar 2025. Last Close as of 26 Mar 2025. Fair Value as of 26 Nov 2024 19:25, UTC.

Morningstar Equity Analyst Report | Report as of 27 Mar 2025 12:48, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ - ALL MARKETS

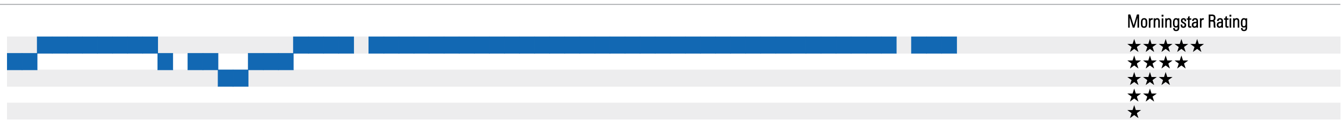
Tesla Inc TSLA ★★★ 26 Mar 2025 21:42, UTC

Competitors Price vs. Fair Value

Volkswagen AG Vorz-Inhaber-Akt ohne Stimmrecht VOW3



0.62	0.52	0.35	0.32	0.34	0.38	Price/Fair Value
-10.76	19.63	-19.41	3.56	-12.25	13.21	Total Return %



Total Return % as of 26 Mar 2025. Last Close as of 26 Mar 2025. Fair Value as of 18 Sep 2024 16:19, UTC.

Morningstar Equity Analyst Report | Report as of 27 Mar 2025 12:48, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ - ALL MARKETS Page 15 of 24

Tesla Inc TSLA ★★★ 26 Mar 2025 21:42, UTC

Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Equity Style Box	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
272.06 USD 26 Mar 2025	250.00 USD 30 Jan 2025 05:50, UTC	1.09	875.09 USD Bil 26 Mar 2025	Narrow	Large Growth	Very High	Exemplary	5 Mar 2025 06:00, UTC

Morningstar Valuation Model Summary

Financials as of 11 Mar 2025	Actual			Forecast				
Fiscal Year, ends 31 Dec	2022	2023	2024	2025	2026	2027	2028	2029
Revenue (USD Mil)	53,823	96,773	97,690	102,496	113,500	135,941	162,272	201,235
Operating Income (USD Mil)	6,496	8,891	7,760	9,222	11,905	16,595	20,977	29,417
EBITDA (USD Mil)	9,569	13,730	7,771	14,297	17,529	23,340	29,037	39,424
Adjusted EBITDA (USD Mil)	11,065	16,633	16,645	17,621	20,822	26,523	32,200	42,438
Net Income (USD Mil)	5,524	14,999	7,091	8,416	10,628	14,427	17,946	24,486
Adjusted Net Income (USD Mil)	7,111	10,889	8,458	9,954	12,046	15,650	19,041	25,291
Free Cash Flow To The Firm (USD Mil)	6,414	4,589	-8,356	9,088	7,809	11,606	16,671	26,145
Weighted Average Diluted Shares Outstanding (Mil)	3,386	3,485	3,525	3,525	3,525	3,525	3,525	3,525
Earnings Per Share (Diluted) (USD)	1.63	4.30	0.00	2.39	3.01	4.09	5.09	6.95
Adjusted Earnings Per Share (Diluted) (USD)	2.10	3.12	0.00	2.82	3.42	4.44	5.40	7.17
Dividends Per Share (USD)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Margins & Returns as of 11 Mar 2025		Actual			Forecast					
	3 Year Avg	2022	2023	2024	2025	2026	2027	2028	2029	5 Year Avg
Operating Margin %	9.9	12.1	9.2	7.9	9.0	10.5	12.2	12.9	14.6	11.8
EBITDA Margin %	—	17.8	14.2	8.0	14.0	15.4	17.2	17.9	19.6	—
Adjusted EBITDA Margin %	—	20.6	17.2	17.0	17.2	18.4	19.5	19.8	21.1	19.2
Net Margin %	11.0	10.3	15.5	7.3	8.2	9.4	10.6	11.1	12.2	10.3
Adjusted Net Margin %	11.0	13.2	11.3	8.7	9.7	10.6	11.5	11.7	12.6	11.2
Free Cash Flow To The Firm Margin %	2.7	11.9	4.7	-8.6	8.9	6.9	8.5	10.3	13.0	9.5

Growth & Ratios as of 11 Mar 2025		Actual			Forecast					
	3 Year CAGR	2022	2023	2024	2025	2026	2027	2028	2029	5 Year CAGR
Revenue Growth %	45.8	70.7	79.8	1.0	4.9	10.7	19.8	19.4	24.0	15.6
Operating Income Growth %	57.3	225.8	36.9	-12.7	18.8	29.1	39.4	26.4	40.2	30.5
EBITDA Growth %	42.8	128.2	43.5	-43.4	84.0	22.6	33.2	24.4	35.8	40.0
Adjusted EBITDA Growth %	39.0	78.4	50.3	0.1	5.9	18.2	27.4	21.4	31.8	20.6
Earnings Per Share Growth %	—	635.2	163.8	-100.0	—	26.3	35.8	24.4	36.4	—
Adjusted Earnings Per Share Growth %	—	138.9	48.8	-100.0	—	21.0	29.9	21.7	32.8	—

Valuation as of 11 Mar 2025	Actual			Forecast				
	2022	2023	2024	2025	2026	2027	2028	2029
Price/Earning	58.7	79.6	—	96.5	79.5	61.3	50.4	37.9
Price/Sales	7.2	8.2	13.3	8.5	7.7	6.4	5.4	4.3
Price/Book	13.8	13.8	—	113.8	50.4	28.6	18.6	12.6
Price/Cash Flow	—	—	—	—	—	—	—	—
EV/EBITDA	33.8	46.4	76.8	48.4	40.9	32.1	26.5	20.1
EV/EBIT	57.5	86.8	164.7	92.4	71.6	51.3	40.6	29.0
Dividend Yield %	—	—	—	—	—	—	—	—
Dividend Payout %	0.0	0.0	—	0.0	0.0	0.0	0.0	0.0
Free Cash Flow Yield %	—	—	—	—	—	—	—	—

Operating Performance / Profitability as of 11 Mar 2025	Actual			Forecast				
Fiscal Year, ends 31 Dec	2022	2023	2024	2025	2026	2027	2028	2029
ROA %	8.9	14.1	7.6	13.9	13.8	15.0	14.5	14.6
ROE %	17.5	23.6	727.3	89.6	53.1	41.9	34.3	31.9
ROIC %	22.2	22.3	14.9	8.8	11.3	15.7	20.0	28.7

Morningstar Equity Analyst Report | Report as of 27 Mar 2025 12:48, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ - ALL MARKETS Page 16 of 24

Tesla Inc TSLA ★★★ 26 Mar 2025 21:42, UTC

Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Equity Style Box	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
272.06 USD 26 Mar 2025	250.00 USD 30 Jan 2025 05:50, UTC	1.09	875.09 USD Bil 26 Mar 2025	Narrow	Large Growth	Very High	Exemplary	5 Mar 2025 06:00, UTC

Financial Leverage (Reporting Currency)	Actual			Forecast				
Fiscal Year, ends 31 Dec	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
Debt/Capital %	1.5	1.2	1.0	0.8	0.8	0.7	0.9	1.6
Assets/Equity	2.0	1.7	95.2	6.4	3.8	2.8	2.4	2.2
Net Debt/EBITDA	-1.7	-1.4	-3.0	3.1	2.0	0.9	0.1	-0.6
Total Debt/EBITDA	0.5	0.6	0.8	0.4	0.4	0.3	0.3	0.5
EBITDA/ Net Interest Expense	35.1	-18.3	-13.7	-14.9	-17.1	-21.2	-26.7	-49.1

Forecast Revisions as of 11 Mar 2025	2025		2026		2027	
Prior data as of 29 Jan 2025	**Current**	**Prior**	**Current**	**Prior**	**Current**	**Prior**
Fair Value Estimate Change (Trading Currency)	250.00	250.45	—	—	—	—
Revenue (USD Mil)	102,496	106,642	113,500	122,359	135,941	153,730
Operating Income (USD Mil)	9,222	9,381	11,905	13,871	16,595	19,252
EBITDA (USD Mil)	17,621	18,049	20,822	23,204	26,523	30,216
Net Income (USD Mil)	9,954	10,129	12,046	13,528	15,650	17,800
Earnings Per Share (Diluted) (USD)	2.39	2.44	3.01	3.47	4.09	4.72
Adjusted Earnings Per Share (Diluted) (USD)	2.82	2.90	3.42	3.87	4.44	5.09
Dividends Per Share (USD)	0.00	0.00	0.00	0.00	0.00	0.00

Key Valuation Drivers as of 11 Mar 2025	
Cost of Equity %	9.0
Pre-Tax Cost of Debt %	5.8
Weighted Average Cost of Capital %	8.8
Long-Run Tax Rate %	23.0
Stage II EBI Growth Rate %	9.0
Stage II Investment Rate %	15.0
Perpetuity Year	15

Additional estimates and scenarios available for download at https://pitchbook.com/.

Discounted Cash Flow Valuation as of 11 Mar 2025	**USD Mil**
Present Value Stage I	175,940
Present Value Stage II	98,210
Present Value Stage III	288,295
Total Firm Value	**562,444**
Cash and Equivalents	0
Debt	8,213
Other Adjustments	310,948
Equity Value	**865,179**
Projected Diluted Shares	3,525
Fair Value per Share (USD)	**250.00**

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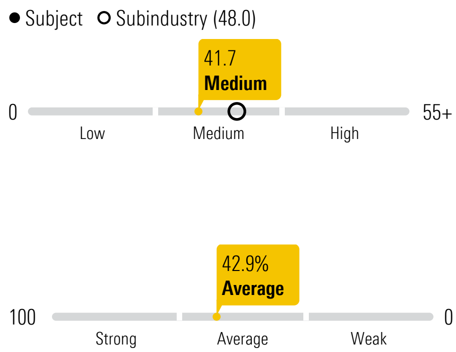
Tesla Inc TSLA ★★★ 26 Mar 2025 21:42, UTC

Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Equity Style Box	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
272.06 USD 26 Mar 2025	250.00 USD 30 Jan 2025 05:50, UTC	1.09	875.09 USD Bil 26 Mar 2025	Narrow	Large Growth	Very High	Exemplary	5 Mar 2025 06:00, UTC

ESG Risk Rating Breakdown

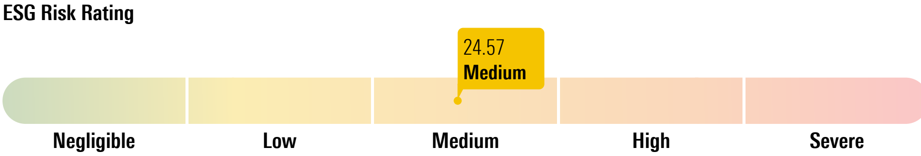
Exposure	
Company Exposure[1]	41.7
– Manageable Risk	39.8
Unmanageable Risk[2]	**1.8**
Management	
Manageable Risk	39.8
– Managed Risk[3]	17.1
Management Gap[4]	**22.8**
Overall Unmanaged Risk	**24.6**



- Exposure represents a company's vulnerability to ESG risks driven by their business model
- Exposure is assessed at the Subindustry level and then specified at the company level
- Scoring ranges from 0-55+ with categories of low, medium, and high-risk exposure

- Management measures a company's ability to manage ESG risks through its commitments and actions
- Management assesses a company's efficiency on ESG programs, practices, and policies
- Management score ranges from 0-100% showing how much manageable risk a company is managing

ESG Risk Rating



ESG Risk Ratings measure the degree to which a company's value is impacted by environmental, social, and governance risks, by evaluating the company's ability to manage the ESG risks it faces.

1. A company's Exposure to material ESG issues 2. Unmanageable Risk refers to risks that are inherent to a particular business model that cannot be managed by programs or initiatives 3. Managed Risk = Manageable Risk multiplied by a Management score of 42.9% 4. Management Gap assesses risks that are not managed, but are considered manageable 5. ESG Risk Rating Assessment = Overall Unmanaged Risk = Management Gap plus Unmanageable Risk

ESG Risk Rating Assessment[5]

ESG Risk Rating is of Mar 05, 2025. Highest Controversy Level is as of Mar 08, 2025. Sustainalytics Subindustry: Automobiles. Sustainalytics provides Morningstar with company ESG ratings and metrics on a monthly basis and as such, the ratings in Morningstar may not necessarily reflect current Sustainalytics' scores for the company. For the most up to date rating and more information, please visit: sustainalytics.com/esg-ratings/.

Peer Analysis 05 Mar 2025

Peers are selected from the company's Sustainalytics-defined Subindustry and are displayed based on the closest market cap values

Company Name	Exposure		Management		ESG Risk Rating	
Tesla Inc	41.7 | Medium	0 – 55+	42.9 | Average	100 – 0	24.6 | Medium	0 – 40+
Ford Motor Co	55.2 | High	0 – 55+	52.5 | Strong	100 – 0	27.6 | Medium	0 – 40+
Volkswagen AG	53.8 | Medium	0 – 55+	52.7 | Strong	100 – 0	26.8 | Medium	0 – 40+
Bayerische Motoren Werke AG	47.1 | Medium	0 – 55+	52.1 | Strong	100 – 0	23.8 | Medium	0 – 40+
General Motors Co	53.0 | Medium	0 – 55+	50.8 | Strong	100 – 0	27.0 | Medium	0 – 40+

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Appendix

Historical Morningstar Rating

Tesla Inc TSLA 26 Mar 2025 21:42, UTC

Dec 2025 —	Nov 2025 —	Oct 2025 —	Sep 2025 —	Aug 2025 —	Jul 2025 —	Jun 2025 —	May 2025 —	Apr 2025 —	Mar 2025 ★★★	Feb 2025 ★★★	Jan 2025 ★★
Dec 2024 ★	Nov 2024 ★★	Oct 2024 ★★★	Sep 2024 ★★	Aug 2024 ★★★	Jul 2024 ★★★	Jun 2024 ★★★	May 2024 ★★★	Apr 2024 ★★★	Mar 2024 ★★★	Feb 2024 ★★★	Jan 2024 ★★★
Dec 2023 ★★★	Nov 2023 ★★★	Oct 2023 ★★★	Sep 2023 ★★★	Aug 2023 ★★★	Jul 2023 ★★★	Jun 2023 ★★★	May 2023 ★★★	Apr 2023 ★★★★	Mar 2023 ★★★	Feb 2023 ★★★	Jan 2023 ★★★★
Dec 2022 ★★★★★	Nov 2022 ★★★★	Oct 2022 ★★★	Sep 2022 ★★★	Aug 2022 ★★★	Jul 2022 ★★★	Jun 2022 ★★★	May 2022 ★★★	Apr 2022 ★★★	Mar 2022 ★★	Feb 2022 ★★★	Jan 2022 ★★
Dec 2021 ★★	Nov 2021 ★★	Oct 2021 ★★	Sep 2021 ★★	Aug 2021 ★★★	Jul 2021 ★★★	Jun 2021 ★★★	May 2021 ★	Apr 2021 ★	Mar 2021 ★	Feb 2021 ★	Jan 2021 ★
Dec 2020 ★	Nov 2020 ★	Oct 2020 ★★★	Sep 2020 ★	Aug 2020 ★	Jul 2020 ★	Jun 2020 ★★	May 2020 ★★★	Apr 2020 ★★★	Mar 2020 ★	Feb 2020 ★★	Jan 2020 ★

Ford Motor Co F 26 Mar 2025 21:32, UTC

Dec 2025 —	Nov 2025 —	Oct 2025 —	Sep 2025 —	Aug 2025 —	Jul 2025 —	Jun 2025 —	May 2025 —	Apr 2025 —	Mar 2025 ★★★★	Feb 2025 ★★★★★	Jan 2025 ★★★★★
Dec 2024 ★★★★★	Nov 2024 ★★★★★	Oct 2024 ★★★★★	Sep 2024 ★★★★★	Aug 2024 ★★★★★	Jul 2024 ★★★★★	Jun 2024 ★★★★	May 2024 ★★★★	Apr 2024 ★★★★	Mar 2024 ★★★★	Feb 2024 ★★★★	Jan 2024 ★★★★
Dec 2023 ★★★★	Nov 2023 ★★★★★	Oct 2023 ★★★★★	Sep 2023 ★★★★	Aug 2023 ★★★★	Jul 2023 ★★★★	Jun 2023 ★★★★	May 2023 ★★★★	Apr 2023 ★★★★	Mar 2023 ★★★★★	Feb 2023 ★★★★	Jan 2023 ★★★★★
Dec 2022 ★★★★★	Nov 2022 ★★★★★	Oct 2022 ★★★★★	Sep 2022 ★★★★★	Aug 2022 ★★★★	Jul 2022 ★★★★★	Jun 2022 ★★★★★	May 2022 ★★★★★	Apr 2022 ★★★★	Mar 2022 ★★★★	Feb 2022 ★★★★	Jan 2022 ★★★
Dec 2021 ★★★	Nov 2021 ★★★	Oct 2021 ★★★★	Sep 2021 ★★★★	Aug 2021 ★★★★	Jul 2021 ★★★★	Jun 2021 ★★★	May 2021 ★★★★	Apr 2021 ★★★★	Mar 2021 ★★★	Feb 2021 ★★★★	Jan 2021 ★★★
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Dec 2025	Nov 2025	Oct 2025	Sep 2025	Aug 2025	Jul 2025	Jun 2025	May 2025	Apr 2025	Mar 2025	Feb 2025	Jan 2025
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Dec 2021	Nov 2021	Oct 2021	Sep 2021	Aug 2021	Jul 2021	Jun 2021	May 2021	Apr 2021	Mar 2021	Feb 2021	Jan 2021
—	★★★★★	★★★★★	★★★★★	★★★★★	★★★★	★★★★	★★★★	★★★	★★★	★★★★	★★★★
Dec 2020	Nov 2020	Oct 2020	Sep 2020	Aug 2020	Jul 2020	Jun 2020	May 2020	Apr 2020	Mar 2020	Feb 2020	Jan 2020
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Research Methodology for Valuing Companies

Overview

At the heart of our valuation system is a detailed projection of a company's future cash flows, resulting from our analysts' research. Analysts create custom industry and company assumptions to feed income statement, balance sheet, and capital investment assumptions into our globally standardized, proprietary discounted cash flow, or DCF, modeling templates. We use scenario analysis, indepth competitive advantage analysis, and a variety of other analytical tools to augment this process. Moreover, we think analyzing valuation through discounted cash flows presents a better lens for viewing cyclical companies, high-growth firms, businesses with finite lives (e.g., mines), or companies expected to generate negative earnings over the next few years. That said, we don't dismiss multiples altogether but rather use them as supporting cross-checks for our DCF-based fair value estimates. We also acknowledge that DCF models offer their own challenges (including a potential proliferation of estimated inputs and the possibility that the method may miss shortterm market-price movements), but we believe these negatives are mitigated by deep analysis and our longterm approach.

Morningstar's equity research group ("we," "our") believes that a company's intrinsic worth results from the future cash flows it can generate. The Morningstar Rating for stocks identifies stocks trading at a discount or premium to their intrinsic worth—or fair value estimate, in Morningstar terminology. Five-star stocks sell for the biggest risk adjusted discount to their fair values, whereas 1-star stocks trade at premiums to their intrinsic worth.

Four key components drive the Morningstar rating: (1) our assessment of the firm's economic moat, (2) our estimate of the stock's fair value, (3) our uncertainty around that fair value estimate and (4) the current market price. This process ultimately culminates in our singlepoint star rating.

1. Economic Moat

The concept of an economic moat plays a vital role not only in our qualitative assessment of a firm's long-term investment potential, but also in the actual calculation of our fair value estimates. An economic moat is a structural feature that allows a firm to sustain excess profits over a long period of time. We define economic profits as returns on invested capital (or ROIC) over and above our estimate of a firm's cost of capital, or weighted average cost of capital (or WACC). Without a moat, profits are more susceptible to competition. We have identified five sources of economic moats: intangible assets, switching costs, network effect, cost advantage, and efficient scale.

Companies with a narrow moat are those we believe are more likely than not to achieve normalized excess returns for at least the next 10 years. Wide-moat companies are those in which we have very high confidence that excess returns will remain for 10 years, with excess returns more likely than not to remain for at least 20 years. The longer a firm generates economic profits, the higher its intrinsic value. We believe low-quality, no-moat companies will see their normalized returns gravitate toward the firm's cost of capital more quickly than companies with moats.

When considering a company's moat, we also assess whether there is a substantial threat of value destruction, stemming from risks related to ESG, industry disruption, financial health, or other idiosyncratic issues. In this context, a risk is considered potentially value destructive if its occurrence would eliminate a firm's economic profit on a cumulative or midcycle basis. If we deem the probability of occurrence sufficiently high, we would not characterize the company as possessing an economic moat.

2. Estimated Fair Value

Combining our analysts' financial forecasts with the firm's economic moat helps us assess how long returns on invested capital are likely to exceed the firm's cost of capital. Returns of firms with a wide economic moat rating are assumed to fade to the perpetuity period over a longer period of time than the returns of narrow-moat firms, and both will fade slower than no-moat firms, increasing our estimate of their intrinsic value.

Our model is divided into three distinct stages:

Stage I: Explicit Forecast

In this stage, which can last five to 10 years, analysts make full financial statement forecasts, including items such as revenue, profit margins, tax rates, changes in workingcapital accounts, and capital spending. Based on these projections, we calculate earnings before interest, after taxes (EBI) and the net new investment (NNI) to derive our annual free cash flow forecast.

Stage II: Fade

The second stage of our model is the period it will take the company's return on new invested capital—the return on capital of the next dollar invested ("RONIC")—to decline (or rise) to its cost of capital. During the Stage II period, we use a formula to approximate cash flows in lieu of explicitly modeling the income statement, balance sheet, and cash flow statement as we do in Stage I. The length of the second stage depends on the strength of the company's economic moat. We forecast this period to last anywhere from one year (for companies with no economic moat) to 10–15 years or more (for wide-moat companies). During this period, cash flows are forecast using four assumptions: an average growth rate for EBI over the period, a normalized investment rate, average return on new invested capital (RONIC), and the number of years until perpetuity, when excess returns cease. The investment rate and return on new invested capital decline until a perpetuity value is calculated. In the case of firms that do not earn their cost of capital, we assume marginal ROICs rise to the firm's cost of capital (usually attributable to less reinvestment), and we may truncate the second stage.

Stage III: Perpetuity

Once a company's marginal ROIC hits its cost of capital, we calculate a continuing value, using a standard perpetuity formula. At perpetuity, we assume that any growth or decline or investment in the business neither creates nor destroys value and that any new investment provides a return in line with estimated WACC.

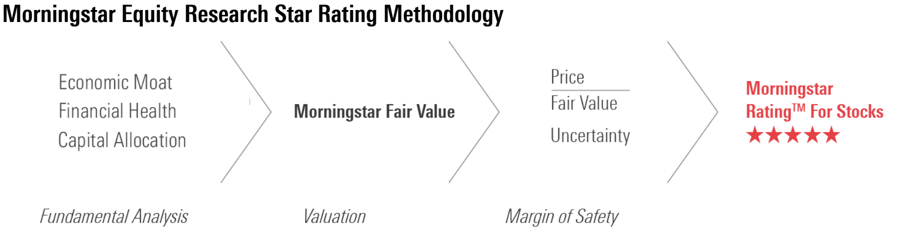
Because a dollar earned today is worth more than a dollar earned tomorrow, we discount our projections of cash flows in stages I, II, and III to arrive at a total present value of expected future cash flows. Because we are modeling free cash flow to the firm—representing cash available to provide a return to all capital providers—we discount future cash flows using the WACC, which is a weighted average of the costs of equity, debt, and preferred stock (and any other funding sources), using expected future proportionate long-term, market-value weights.

3. Uncertainty Around That Fair Value Estimate

Morningstar's Uncertainty Rating is designed to capture the range of potential outcomes for a company's intrinsic value. This rating is used to assign the margin of safety required before investing, which in turn explicitly drives our stock star rating system. The Uncertainty Rating is aimed at identifying the confidence we should have in assigning a fair value estimate for a given stock.

Our Uncertainty Rating is meant to take into account anything that can increase the potential dispersion of future outcomes for the intrinsic value of a company, and any-

Morningstar Equity Research Star Rating Methodology



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thing that can affect our ability to accurately predict these outcomes. The rating begins with a suggested rating produced by a quantitative process based on the trailing 12-month standard deviation of daily stock returns. An analyst overlay is then applied, with analysts using the suggested rating, historical rating data, and their own knowledge of the company to inform them as they make the final Uncertainty Rating decision. Ultimately, the rating decision rests with the analyst. Analysts take into account many characteristics when making their final decision, including cyclical factors, operational and financial factors such as leverage, company-specific events, ESG risks, and anything else that might increase the potential dispersion of future outcomes and our ability to estimate those outcomes.

Our recommended margin of safety—the discount to fair value demanded before we'd recommend buying or selling the stock—widens as our uncertainty of the estimated value of the equity increases. The more uncertain we are about the potential dispersion of outcomes, the greater the discount we require relative to our estimate of the value of the firm before we would recommend the purchase of the shares. In addition, the Uncertainty Rating provides guidance in portfolio construction based on risk tolerance.

Our Uncertainty Ratings are: Low, Medium, High, Very High, and Extreme.

	Margin of Safety	
Qualitative Analysis Uncertainty Ratings	★★★★★Rating	★Rating
Low	20% Discount	25% Premium
Medium	30% Discount	35% Premium
High	40% Discount	55% Premium
Very High	50% Discount	75% Premium
Extreme	75% Discount	300% Premium

Our uncertainty rating is based on the interquartile range, or the middle 50% of potential outcomes, covering the 25th percentile–75th percentile. This means that when a stock hits 5 stars, we expect there is a 75% chance that the intrinsic value of that stock lies above the current market price. Similarly, when a stock hits 1 star, we expect there is a 75% chance that the intrinsic value of that stock lies below the current market price.

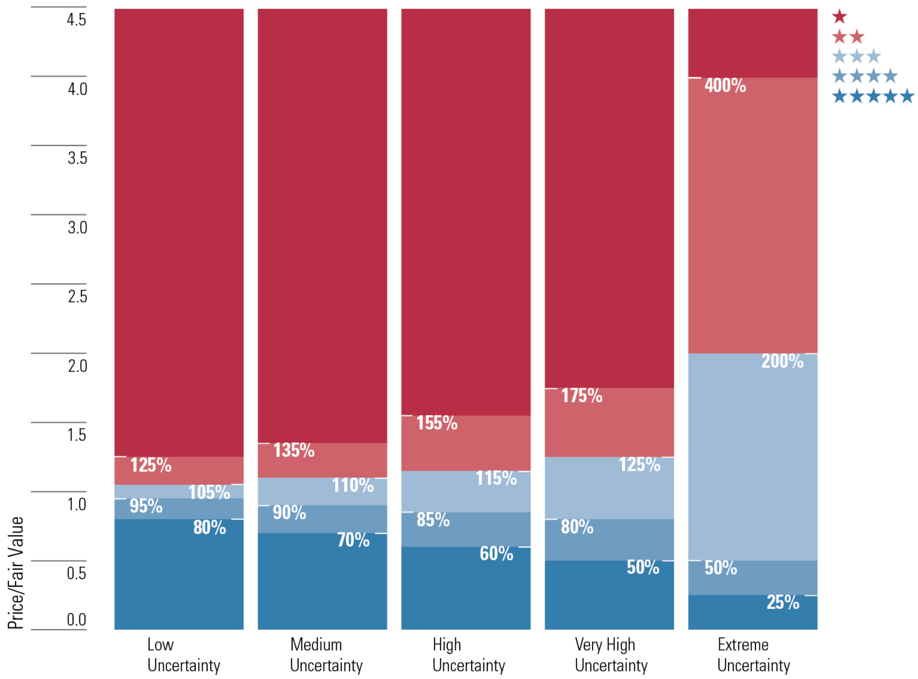
4. Market Price

The market prices used in this analysis and noted in the report come from exchange on which the stock is listed which we believe is a reliable source.

For more details about our methodology, please go to https://shareholders.morningstar.com

Morningstar Star Rating for Stocks

Morningstar Equity Research Star Rating Methodology



Once we determine the fair value estimate of a stock, we compare it with the stock's current market price on a daily basis, and the star rating is automatically re-calculated at the market close on every day the market on which the stock is listed is open. Our analysts keep close tabs on the companies they follow, and, based on thorough and ongoing analysis, raise or lower their fair value estimates as warranted.

Please note, there is no predefined distribution of stars. That is, the percentage of stocks that earn 5 stars can fluctuate daily, so the star ratings, in the aggregate, can serve as a gauge of the broader market's valuation. When there are many 5-star stocks, the stock market as a whole is more undervalued, in our opinion, than when very few companies garner our highest rating.

We expect that if our base-case assumptions are true the market price will converge on our fair value estimate over time generally within three years (although it is impossible to predict the exact time frame in which market prices may adjust).

Our star ratings are guideposts to a broad audience and individuals must consider their own specific investment goals, risk tolerance, tax situation, time horizon, income needs, and complete investment portfolio, among other factors.

The Morningstar Star Ratings for stocks are defined below:

★★★★★ We believe appreciation beyond a fair risk adjusted return is highly likely over a multiyear time frame. Scenario analysis developed by our analysts indicates that the current market price represents an excessively pessimistic outlook, limiting downside risk and maximizing upside potential.

★★★★ We believe appreciation beyond a fair risk-adjusted return is likely.

★★★ Indicates our belief that investors are likely to receive a fair risk-adjusted return (approximately cost of equity).

★★ We believe investors are likely to receive a less than fair risk-adjusted return.

★ Indicates a high probability of undesirable risk-adjusted returns from the current market price over a multiyear time frame, based on our analysis. Scenario analysis by our analysts indicates that the market is pricing in an excessively optimistic outlook, limiting upside potential and leaving the investor exposed to Capital loss.

Other Definitions

Last Price: Price of the stock as of the close of the market of the last trading day before date of the report.

Capital Allocation Rating: Our Capital Allocation (or Stewardship) Rating represents our assessment of the quality of management's capital allocation, with particular emphasis on the firm's balance sheet, investments, and shareholder distributions. Analysts consider compan-

Research Methodology for Valuing Companies

ies' investment strategy and valuation, balance sheet management, and dividend and share buyback policies. Corporate governance factors are only considered if they are likely to materially impact shareholder value, though either the balance sheet, investment, or shareholder distributions. Analysts assign one of three ratings: "Exemplary", "Standard", or "Poor". Analysts judge Capital Allocation from an equity holder's perspective. Ratings are determined on a forward looking and absolute basis. The Standard rating is most common as most managers will exhibit neither exceptionally strong nor poor capital allocation.

Capital Allocation (or Stewardship) analysis published prior to Dec. 9, 2020, was determined using a different process. Beyond investment strategy, financial leverage, and dividend and share buyback policies, analysts also considered execution, compensation, related party transactions, and accounting practices in the rating.

Capital Allocation Rating: Our Capital Allocation (or Stewardship) Rating represents our assessment of the quality of management's capital allocation, with particular emphasis on the firm's balance sheet, investments, and shareholder distributions. Analysts consider companies' investment strategy and valuation, balance sheet management, and dividend and share buyback policies. Corporate governance factors are only considered if they are likely to materially impact shareholder value, though either the balance sheet, investment, or shareholder distributions. Analysts assign one of three ratings: "Exemplary", "Standard", or "Poor". Analysts judge Capital Allocation from an equity holder's perspective. Ratings are determined on a forward looking and absolute basis. The Standard rating is most common as most managers will exhibit neither exceptionally strong nor poor capital allocation.

Capital Allocation (or Stewardship) analysis published prior to Dec. 9, 2020, was determined using a different process. Beyond investment strategy, financial leverage, and dividend and share buyback policies, analysts also considered execution, compensation, related party transactions, and accounting practices in the rating.

Sustainalytics ESG Risk Rating Assessment: The ESG Risk Rating Assessment is provided by Sustainalytics; a Morningstar company.

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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