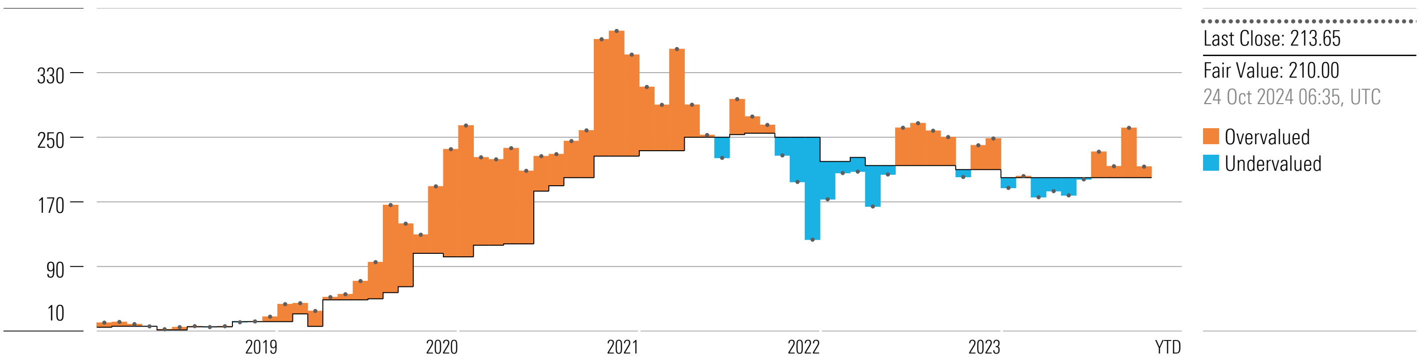
Morningstar Equity Analyst Report | Report as of 24 Oct 2024 06:44, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ - ALL MARKETS

Tesla Inc TSLA ★★★ 24 Oct 2024 06:41, UTC

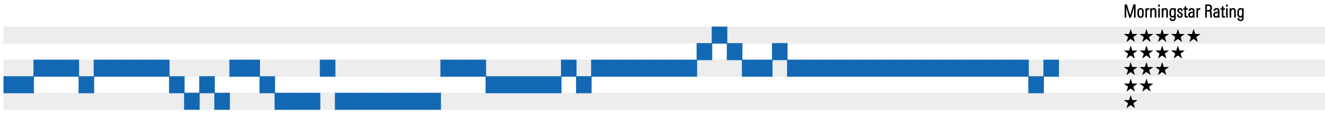
Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Equity Style Box	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
213.65 USD 23 Oct 2024	210.00 USD 24 Oct 2024 06:35, UTC	1.02	682.53 USD Bil 23 Oct 2024	Narrow	Large Growth	Very High	Exemplary	2 Oct 2024 05:00, UTC

Price vs. Fair Value



	2019	2020	2021	2022	2023	YTD
Price/Fair Value	1.28	2.31	1.55	0.49	1.18	1.02
Total Return %	25.70	743.44	49.76	-65.03	101.72	-14.02

Morningstar Rating



Total Return % as of 23 Oct 2024. Last Close as of 23 Oct 2024. Fair Value as of 24 Oct 2024 06:35, 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 Earnings: Margin Recovery Underway as Long-Term Objectives Intact

Analyst Note Seth Goldstein, CFA, Strategist, 24 Oct 2024

Tesla delivered third-quarter earnings above consensus estimates. During the first half of the year, Tesla's profit margins fell to multiyear low levels, largely due to a decline in the automotive segment. In the third quarter, Tesla's automotive business generated 160 basis points of gross profit margin expansion to 20.1% driven by deliveries growth; lower cost per vehicle—including lower raw materials costs; and higher autonomous driving software revenue. In our view, the results signal that the first half of 2024 was likely the bottom for Tesla's automotive gross profits, as we expect fourth-quarter results will also exceed 20%.

We're raising our fair value estimate to $210 per share from $200 following the strong results. The increase is due to our forecast for slightly higher near-term deliveries and higher 2024 gross profit margins in the automotive segment. We've also raised our outlook for the energy generation and storage segment due to the strong demand for utility-scale batteries, known as the Megapack.

Tesla's stock was up 12% in after-hours trading as the market reacted positively to the strong results and management's improved 2024 outlook. At current prices, we view shares as slightly overvalued, with the stock trading a little less than 15% above our updated fair value estimate but in 3-star territory.

Management affirmed its timeline for the new more affordable vehicle to enter production in the first

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Tesla Inc TSLA ★★★ 24 Oct 2024 06:41, UTC

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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 a robotaxi. Global deliveries in 2023 were a little over 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.

half of 2025. Management said the price would come in below $30,000 after incentives. This is in line with our view that the vehicle will be priced in the mid-$30,000 range. We expect a smaller impact on deliveries from this vehicle in 2025 as management begins production. As a result, we forecast 2025 deliveries will grow at a low-single-digit rate, well below CEO Elon Musk's 2025 deliveries guidance of 20%-30% growth. However, we forecast double-digit deliveries growth in 2026, driven by the new vehicle as production ramps up.

Business Strategy & Outlook Seth Goldstein, CFA, Strategist, 24 Oct 2024

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, they need to reach cost and function parity with internal combustion engines. 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 began designing its own batteries. Tesla's goal is to reduce costs by more than 50% over time.

To reach functional parity, EVs will need to have adequate range, reduced charging times, and availability of charging infrastructure. Tesla’s extended-range EVs are already at range parity with ICE vehicles. The firm also continues to expand its supercharging network, which consists of fast chargers built along highways and in cities throughout the US, EU, and China. The range and supercharger network help eliminate road trip anxiety, the functional barrier to mass-market EV adoption.

Tesla is attempting to take a larger share of its customers’ auto-related spending, which includes selling autonomous driving software, insurance, and charging.

It also sells solar panels and batteries used for energy generation and storage 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, 24 Oct 2024

- Tesla has the potential to disrupt the automotive and power generation industries with its technology

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Tesla Inc TSLA ★★★ 24 Oct 2024 06:41, UTC

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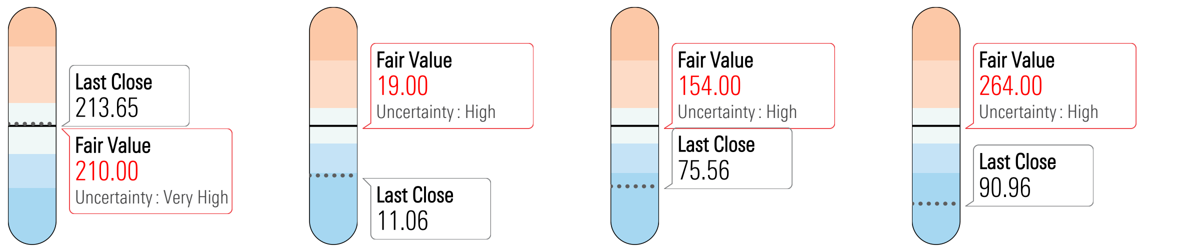
Competitors



	Tesla Inc TSLA	Ford Motor Co F	Bayerische Motoren Werke AG BMW	Volkswagen AG ...hne Stimmrecht VOW3
Economic Moat	Narrow	None	Narrow	None
Currency	USD	USD	EUR	EUR
Fair Value	210.00 24 Oct 2024 06:35, UTC	19.00 30 Nov 2023 22:43, UTC	154.00 11 Sep 2024 13:17, UTC	264.00 18 Sep 2024 16:19, UTC
1-Star Price	367.50	29.45	238.70	409.20
5-Star Price	105.00	11.40	92.40	158.40
Assessment	Fairly Valued 23 Oct 2024	Significantly Undervalued 23 Oct 2024	Significantly Undervalued 23 Oct 2024	Significantly Undervalued 23 Oct 2024
Morningstar Rating	★★★24 Oct 2024 06:41, UTC	★★★★★23 Oct 2024 21:29, UTC	★★★★★24 Oct 2024 00:09, UTC	★★★★★24 Oct 2024 00:21, 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	1.02	0.58	0.49	0.34
Price/Sales	7.67	0.25	0.28	0.14
Price/Book	9.76	1.01	0.53	0.28
Price/Earning	58.90	6.74	4.19	2.67
Dividend Yield	0.00%	5.43%	7.94%	9.96%
Market Cap	682.53 Bil	43.97 Bil	48.26 Bil	45.60 Bil
52-Week Range	138.80—271.00	9.49—14.85	68.58—115.35	87.72—128.60
Investment Style	Large Growth	Mid Value	Large Value	Large Value

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

Bears Say Seth Goldstein, CFA, Strategist, 24 Oct 2024

- 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 reliance on batteries made in China for its lower-price Model 3 vehicles will hurt sales as these autos do not qualify for US subsidies.
- Tesla's energy generation and storage business will see increased competition from battery producers

who are willing to take lower profits to win market share.

Economic Moat Seth Goldstein, CFA, Strategist, 24 Oct 2024

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 Cybertruck or the platform that will produce the affordable SUV (known as the $25,000 vehicle), 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.

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 over 1.8 million deliveries in 2023. During the same period, the company's average cost of goods sold per vehicle has fallen over 55%, from $84,000 to just over $36,000. 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, 24 Oct 2024

We're raising our fair value estimate to $210 from $200 following Tesla's third-quarter earnings call, as we've increased our outlook for the energy generation and storage business and slightly raised our near-term deliveries forecast. We use a weighted average cost of capital of just under 9%. Our equity valuation adds back nonrecourse and nondilutive convertible debt.

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In 2024, we forecast Tesla's deliveries will be just above the 1.81 million achieved in 2023. We forecast lower average selling prices following price cuts throughout 2023 and in early 2024. We forecast automotive gross margin will be just under 20% in 2024, slightly above 2023 results.

Longer term, we assume Tesla delivers nearly 5 million vehicles per year in 2030. This includes fleet sales, an expanding opportunity for Tesla. Our forecast is well below management's aspirational goal of selling 20 million vehicles by the end of this decade. However, it is nearly 3 times the 1.8 million vehicles delivered in 2023.

Our forecast assumes Tesla slightly grows its Model 3 and Model Y deliveries and ramps up volume of the Cybertruck to around 100,000 deliveries per year, far below management's goal of 250,000. We forecast Tesla will launch its affordable SUV with initial deliveries coming in late 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 roughly a 33% annual growth rate 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. This figure assumes

Tesla captures a 2.5% share across the combined markets of the US, EU, and China and charges $0.40 per mile with a 30% take rate, in line with other apps. Finally, we add the present value of Dojo's AI training services and the present value of humanoid robot sales. These ancillary businesses account for a little more than 10% of our total valuation combined.

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 a more than 8 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, 24 Oct 2024
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 faces environmental, social, and governance 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 favorable brand image could decline. Should the company not be able to retain production line employees, it could see delays. We see a low probability but moderate materiality for both risks.

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 Oct 2024

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 over 1.8 million vehicles in 2023 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 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.

Tom Zhu, Tesla's vice president of Greater China, was recently appointed to also oversee the company's US vehicle assembly operations as well as sales operations in the US and Europe. With Zhu's expanded role, he is now the second-highest ranking executive at Tesla after Musk. Given's Musk's large responsibilities outside of Tesla, we think the move makes sense as Zhu can be the key decision-maker for most of Tesla's operations. Additionally, this may set up Zhu to ultimately move into the CEO role at Tesla if Musk were to retire.

Analyst Notes Archive

Tesla: Robotaxi Event Features Two Vehicle Prototypes Seth Goldstein, CFA, Strategist, 11 Oct 2024
We're maintaining our $200 fair value estimate and narrow moat rating for Tesla following the company's robotaxi event. We view the shares as slightly overvalued, trading a little less than 20% above our fair value estimate but in 3-star territory.

In our view, the key takeaway is Tesla's plan to launch an unsupervised version of its full self-driving autonomous driving software in California and Texas next year for its current vehicles. Tesla currently offers a supervised version of its FSD autonomous driving software, so moving to an unsupervised version is a key step toward a robotaxi launch as the robotaxis will run on Tesla's unsupervised FSD software.

The event featured two robotaxi prototypes. The first is a smaller two-door vehicle, the Cybercab. The second is a larger vehicle that can hold up to 20 people, the Robovan. The company aims to begin production of these vehicles by the end of 2026, though CEO Elon Musk noted that his timelines are often optimistic. Management wants to sell the Cybercab for less than $30,000. The Cybercab will feature an induction-only—or wireless—charging system with no plug, which means it can theoretically charge in more locations, even while driving on the road. In reality, however, we don't expect wireless charging infrastructure to be readily available in mass locations before Tesla's vehicle production timeline. This could limit adoption of these vehicles unless a plug is added.

The Cybercab prototypes appeared to be on a smaller frame than the current Model 3 or Model Y. This could ultimately be used for a smaller, more affordable vehicle platform in the future in addition to Cybercabs. However, for Tesla's new vehicle launch, currently scheduled to enter production next year, we expect the Model 3/Y platform will be the vehicle's base.

Tesla: Third-Quarter Deliveries Return to Growth Versus 2023 Following First-Half Decline Seth Goldstein, CFA, Strategist, 2 Oct 2024

Tesla announced third-quarter deliveries of 462,890 vehicles, which is up over 6% compared with the prior year's quarter. The deliveries number was in line with our outlook for the cadence of the year and sets up Tesla to hit our full-year deliveries forecast of just below 1.8 million vehicles, roughly flat with the 1.81 million deliveries number for 2023. Tesla also announced energy storage deployments of 6.4 gigawatt hours. This puts the company on track for our forecast of 26.5 GWh of energy deployments for the year. With our outlook largely intact, we're maintaining our Tesla fair value estimate of $200 following the third-quarter deliveries and grid storage deployments results. Our narrow moat rating is also unchanged.

Tesla shares were down 3% at the time of writing as the market reacted to the company's delivery numbers coming in around consensus estimates but below the high end of the guidance range. At current prices, we view Tesla shares as overvalued, with the stock trading in 2-star territory and around 25% above our fair value estimate.

Tesla has two key events in October. The Robotaxi event is scheduled for Oct. 10. We expect Tesla to reveal plans for its Robotaxi service. We hope the company will showcase a dedicated Robotaxi prototype and lay out management's current timeline with key milestones to track progress.

Tesla will report third-quarter earnings on the evening of Oct. 23. Given the higher deliveries numbers and falling raw materials costs, we expect Tesla to report automotive gross profit margins at or above the 18.5% reported in the first two quarters of the year. We hope Tesla will share the latest timeline for its more affordable vehicle, which is currently scheduled to begin production next year.

Tesla: Management Aims to Roll Out FSD to China and Europe in First Quarter of 2025 Seth Goldstein, CFA, Strategist, 5 Sep 2024

Tesla's artificial intelligence team announced its product release roadmap, which includes plans to launch its full self-driving software in Europe and China in the first quarter of 2025, pending regulatory approval. Our forecast already assumes 50% adoption rate growth in FSD in 2025 versus 2024. Accordingly, we see no reason to change our outlook based on this announcement. We're maintaining our $200 fair value estimate and narrow moat rating for Tesla.

The market reacted positively to the news, with the shares up 5% at the time of writing on Sept. 5. We view Tesla as slightly overvalued, trading roughly 15% above our fair value estimate but in 3-star territory.

The announcement comes a little more than a month before Tesla's robotaxi event, which is scheduled for Oct. 10. During the event, we expect Tesla will reveal its robotaxi progress, including a potential prototype vehicle. We also hope management will detail its roadmap to get from the current FSD software to a robotaxi product.

The key to Tesla's ability to offer a robotaxi will be the continuous improvement of the FSD software. With regard to this, another key part of the AI team roadmap comes in the September and October FSD updates. FSD version 12.5.2m, which will be released this month, aims to triple the miles between driver interventions. In October, Tesla plans to launch FSD version 13, whose goal is to double the miles between driver interventions from the September update. This near-term roadmap shows Tesla's intent to quickly improve the FSD software.

Tesla Earnings: Affordable Vehicle Still on Track for 2025 Launch and 2026 Ramp Seth Goldstein, CFA, Strategist, 24 Jul 2024

Tesla's second-quarter results were largely in line with our view for the cadence of the year. Operating profits were down roughly 33% year over year due largely to lower average automotive selling prices, but up 37% sequentially versus the first quarter, driven by strong energy generation and storage profits and lower corporate expenses. With our outlook largely unchanged, we maintain our $200 per share fair value estimate. Our narrow moat rating also remains unchanged.

Tesla shares were down 8% in after-hours trading. We think the market is reacting to earnings coming in below FactSet consensus estimates, as well as management's lack of details for two key growth projects: the affordable vehicle and the full self-driving. At current prices, we view Tesla shares as slightly overvalued, with the stock trading in 3-star territory but a little over 10% above our fair value estimate. Accordingly, we recommend investors wait for a larger pullback and for shares to trade below our fair value estimate and offer a margin of safety before we would recommend an entry point.

With regard to the affordable vehicle, management declined to offer vehicle-specific details and said that Tesla would reserve these details for product rollout events. However, management did say the vehicle remains on track to begin production in 2025. In our view, Tesla maintaining the vehicle production timeline is the key takeaway. As this vehicle is likely to be a less expensive version of the Model 3/Y platform, we doubt there will be as unique technology versus more premium product rollouts such as the Cybertruck, or the Roadster that should be launched in the coming years. As a result, we continue to view 2026 as the year when Tesla deliveries return to double-digit growth, driven by the affordable vehicle.

Tesla: Shares Plunge on Report of Robotaxi Unveiling Delay Seth Goldstein, CFA, Strategist, 11 Jul 2024

Tesla shares fell over 6% at the time of writing on a Bloomberg report that Tesla plans to move the unveiling of its robotaxi to October from August. The report cites Tesla's desire to build additional prototypes as the reason for the delay. We see no reason to change our outlook based on the delayed investor event. Accordingly, we maintain our $200 fair value estimate for Tesla. Our narrow moat rating is also unchanged.

Despite the selloff, we view Tesla shares as slightly overvalued, with the stock trading at more than 20% above our fair value estimate and in 2-star territory. Accordingly, we recommend investors wait for a larger pullback and for shares to trade below our fair value estimate with a solid margin of safety before we would recommend a good entry point into the stock.

While Tesla will delay the investor event, we hope management will share full self-driving updates on the upcoming earnings call, currently scheduled for July 23. In our view, the improvement of this software will be a differentiator for consumers to choose Tesla over other luxury vehicles. Even if this just becomes a level 3 autonomous driving product and not a level 4 or level 5 product, which are the levels required for robotaxis, we think it could improve the driving experience enough to drive vehicle deliveries growth.

Additionally, we will look for an update on the more affordable vehicle that Tesla is working to launch in the coming years. Longer term, we view the sale of affordable vehicles as the more important deliveries growth driver for Tesla. As such, it would not surprise us to see Tesla's deliveries remaining fairly flat in 2025 compared with 2024 levels, but we expect a return to growth in 2026 with the start of affordable vehicle deliveries.

Tesla: Deliveries Fall 5% Year on Year During Second Quarter Seth Goldstein, CFA, Strategist, 2 Jul 2024

Tesla reported 443,956 vehicles delivered during the second quarter, which is a 5% decline year over year versus the prior-year quarter. We've updated our model to assume lower 2024 deliveries. We now expect a slight decline versus our prior forecast for deliveries to be slightly up on the year. Separately, we've updated our model to assume higher energy storage deployments, as we expect higher growth in this business following Tesla's record 9.4 GWh deployments during the second quarter. Having updated our model to reflect these changes, we maintain our $200 fair value estimate for Tesla. Our narrow moat rating is also unchanged.

Tesla shares were up nearly 5% on the news in pre-market trading, as the market reacted favorably to

Tesla's deliveries. At current prices, we view Tesla shares as slightly overvalued, with the stock trading a little above our fair value estimate but in 3-star territory.

Tesla plans to report second-quarter results on July 23. Based on our current outlook for the cadence of the year, we expect the company will report lower revenue and profits versus the prior-year quarter. However, sequentially, we expect Tesla will begin to see stabilizing automotive gross profit margins versus the first quarter, as the company will begin to see lower unit production costs and benefit from lower raw materials costs. While we forecast lower revenue and profits, we see margin recovery in the second half of the year, setting up Tesla to return to profit growth in 2025.

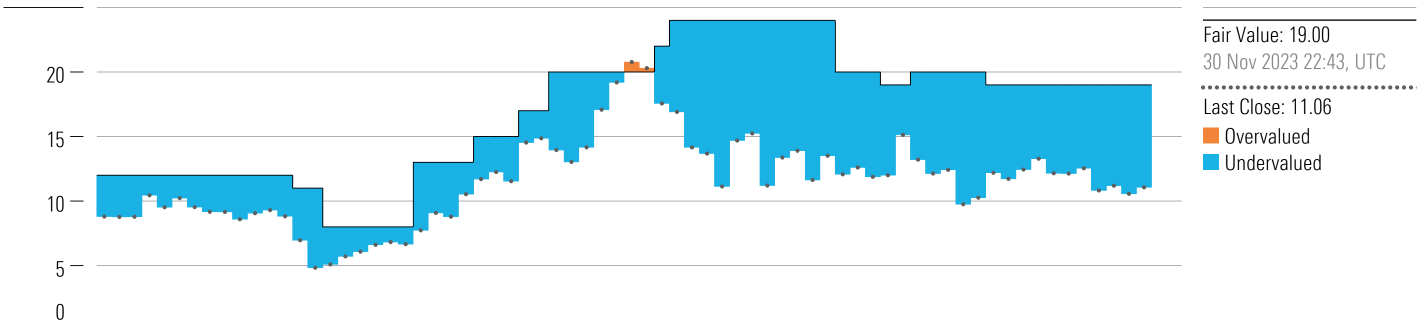
Longer term, we view the sale of affordable vehicles as the more important deliveries growth driver for Tesla. As such, it would not surprise us to see Tesla's deliveries remaining fairly flat in 2025 compared with 2024 levels, but we expect a return to growth in 2026 with the start of affordable vehicle deliveries. M

Morningstar Equity Analyst Report | Report as of 24 Oct 2024 06:44, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ - ALL MARKETS

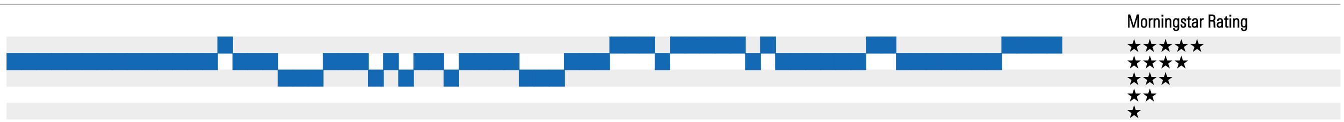
Tesla Inc TSLA ★★★ 24 Oct 2024 06:41, UTC

Competitors Price vs. Fair Value

Ford Motor Co F

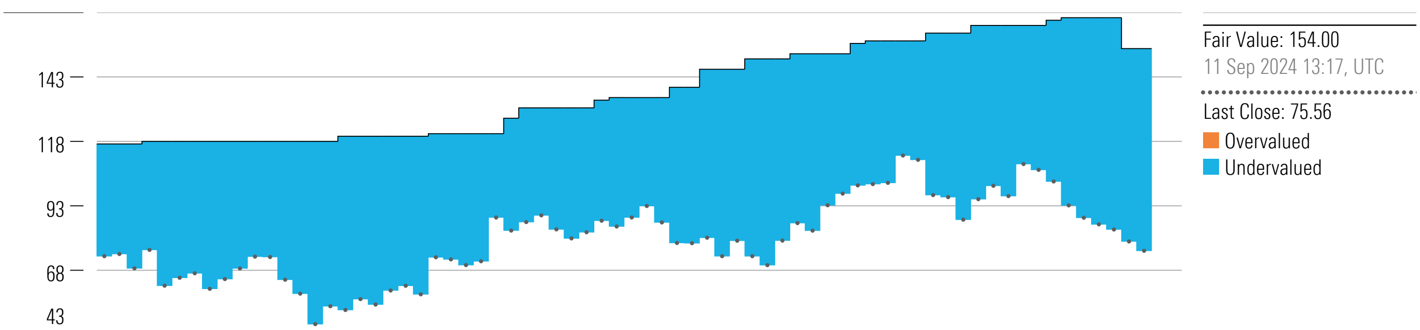


2019	2020	2021	2022	2023	YTD	
0.78	0.68	1.04	0.48	0.64	0.58	Price/Fair Value
29.41	-3.87	137.43	-41.60	15.56	-4.10	Total Return %

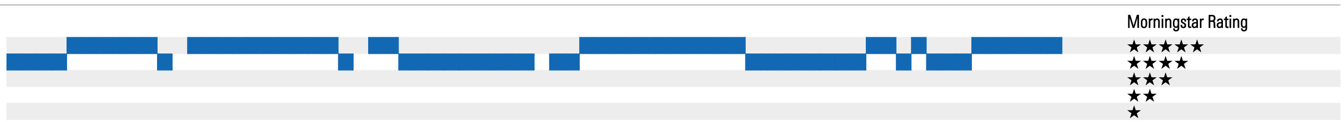


Total Return % as of 23 Oct 2024. Last Close as of 23 Oct 2024. Fair Value as of 30 Nov 2023 22:43, UTC.

Bayerische Motoren Werke AG BMW



2019	2020	2021	2022	2023	YTD	
0.62	0.60	0.66	0.55	0.62	0.49	Price/Fair Value
8.40	2.17	25.14	0.78	31.06	-19.07	Total Return %



Total Return % as of 23 Oct 2024. Last Close as of 23 Oct 2024. Fair Value as of 11 Sep 2024 13:17, UTC.

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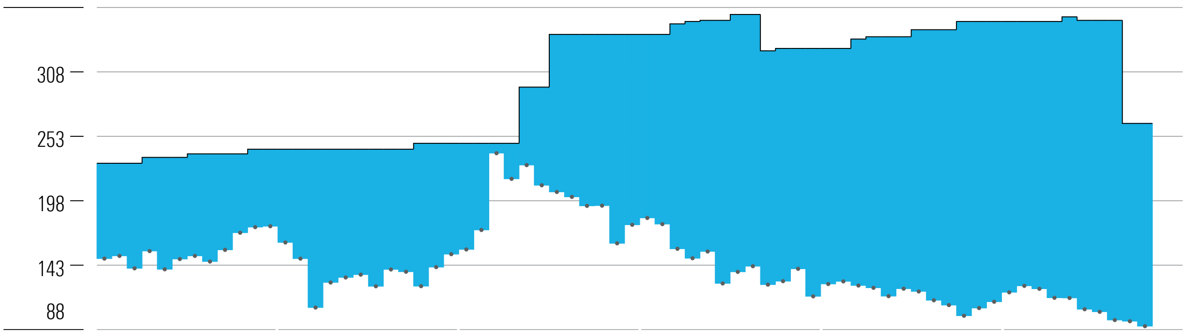
Tesla Inc TSLA ★★★ 24 Oct 2024 06:41, UTC

Competitors Price vs. Fair Value

Volkswagen AG Vorz-Inhaber-Akt ohne Stimmrecht VOW3



Fair Value: 264.00
18 Sep 2024 16:19, UTC

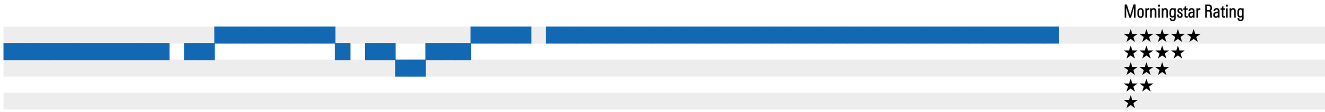
Last Close: 90.96

Overvalued

Undervalued

	2019	2020	2021	2022	2023	YTD
Price/Fair Value	0.73	0.62	0.52	0.35	0.32	0.34
Total Return %	30.36	-10.76	19.63	-19.41	3.56	-10.54

Morningstar Rating



Total Return % as of 23 Oct 2024. Last Close as of 23 Oct 2024. Fair Value as of 18 Sep 2024 16:19, UTC.

Morningstar Equity Analyst Report | Report as of 24 Oct 2024 06:44, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ - ALL MARKETS Page 16 of 24

Tesla Inc TSLA ★★★ 24 Oct 2024 06:41, UTC

Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Equity Style Box	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
213.65 USD 23 Oct 2024	210.00 USD 24 Oct 2024 06:35, UTC	1.02	682.53 USD Bil 23 Oct 2024	Narrow	Large Growth	Very High	Exemplary	2 Oct 2024 05:00, UTC

Morningstar Historical Summary

Financials as of 30 Jun 2024

Fiscal Year, ends 31 Dec	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	YTD	TTM
Revenue (USD Bil)	3.20	4.05	7.00	11.76	21.46	24.58	31.54	53.82	81.46	96.77	46.80	95.32
Revenue Growth %	58.9	26.5	73.0	68.0	82.5	14.5	28.3	70.7	51.3	18.8	-3.0	1.4
EBITDA (USD Bil)	0.05	-0.33	0.40	-0.10	1.56	2.17	4.22	9.63	17.66	14.80	6.13	12.93
EBITDA Margin %	1.5	-8.3	5.7	-0.9	7.3	8.9	13.4	17.9	21.7	15.3	13.1	13.6
Operating Income (USD Bil)	-0.19	-0.72	-0.67	-1.63	-0.25	0.08	1.99	6.50	13.83	8.89	3.40	7.23
Operating Margin %	-5.8	-17.7	-9.5	-13.9	-1.2	0.3	6.3	12.1	17.0	9.2	7.3	7.6
Net Income (USD Bil)	-0.29	-0.89	-0.67	-1.96	-0.98	-0.86	0.72	5.52	12.58	15.00	2.61	12.39
Net Margin %	-9.2	-22.0	-9.6	-16.7	-4.6	-3.5	2.2	10.3	15.5	15.5	5.6	13.0
Diluted Shares Outstanding (Mil)	1,868	1,923	2,163	2,490	2,559	2,661	3,249	3,386	3,475	3,485	3,483	3,490
Diluted Earnings Per Share (USD)	-0.16	-0.46	-0.31	-0.79	-0.38	-0.33	0.21	1.63	3.62	4.30	0.76	3.56
Dividends Per Share (USD)	—	—	—	—	—	—	—	—	—	—	—	—

Valuation as of 30 Sep 2024

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Recent Qtr	TTM
Price/Sales	9.6	8.0	5.0	4.7	3.2	3.0	25.5	25.6	5.7	9.0	9.6	9.6
Price/Earnings	-137.0	-45.0	-33.4	-36.5	-31.4	-89.3	1,428.6	344.8	38.2	80.0	73.5	73.5
Price/Cash Flow	175.4	-52.4	100.0	-49.8	41.2	33.1	163.9	120.5	26.5	70.9	79.4	79.4
Dividend Yield %	—	—	—	—	—	—	—	—	—	—	—	—
Price/Book	29.2	24.0	12.9	11.2	12.7	12.5	42.2	40.3	9.8	14.8	12.6	12.6
EV/EBITDA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Operating Performance / Profitability as of 30 Jun 2024

Fiscal Year, ends 31 Dec	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	YTD	TTM
ROA %	-7.1	-12.8	-4.4	-7.6	-3.3	-2.7	1.6	9.7	17.4	15.9	2.4	12.2
ROE %	-37.3	-89.1	-23.1	-43.7	-21.3	-15.1	4.8	21.1	33.6	28.0	4.0	21.1
ROIC %	-9.8	-22.2	-6.5	-10.2	-2.9	-2.0	4.3	15.6	27.9	23.3	2.9	17.0
Asset Turnover	0.8	0.6	0.5	0.5	0.7	0.8	0.7	0.9	1.1	1.0	0.4	0.9

Financial Leverage

Fiscal Year, ends 31 Dec	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Recent Qtr	TTM
Debt/Capital %	67.3	67.7	60.9	72.5	69.3	65.6	32.8	18.6	7.8	9.4	12.5	—
Equity/Assets %	15.6	13.4	21.0	14.8	16.6	19.3	42.6	48.6	54.3	58.7	58.9	—
Total Debt/EBITDA	51.6	-8.7	21.5	-118.9	8.9	6.7	3.1	0.9	0.3	0.6	2.0	—
EBITDA/Interest Expense	0.5	-2.8	2.0	-0.2	2.4	3.2	5.6	25.9	92.4	94.8	37.8	49.5

Morningstar Analyst Historical/Forecast Summary as of 23 Oct 2024

Financials

Fiscal Year, ends 31 Dec 2023	2022	2023	Estimates 2024	2025	2026
Revenue (USD Mil)	81,462	96,773	100,089	110,175	126,906
Revenue Growth %	51.3	18.8	3.4	10.1	15.2
EBITDA (USD Mil)	19,213	16,633	16,253	20,794	25,649
EBITDA Margin %	23.6	17.2	16.2	18.9	20.2
Operating Income (USD Mil)	13,832	8,891	9,297	12,390	16,464
Operating Margin %	17.0	9.2	9.3	11.3	13.0
Net Income (USD Mil)	14,170	10,889	8,875	12,202	15,340
Net Margin %	17.4	11.3	8.9	11.1	12.1
Diluted Shares Outstanding (Mil)	3,475	3,485	3,497	3,497	3,497
Diluted Earnings Per Share(USD)	4.08	3.12	2.54	3.49	4.39
Dividends Per Share(USD)	0.00	0.00	0.00	0.00	0.00

Forward Valuation

	2022	2023	Estimates 2024	2025	2026
Price/Sales	4.8	8.2	6.8	6.2	5.4
Price/Earnings	30.2	79.6	84.1	61.2	48.7
Price/Cash Flow	—	—	—	—	—
Dividend Yield %	—	—	—	—	—
Price/Book	9.6	13.8	10.7	9.3	7.9
EV/EBITDA	19.5	46.4	40.4	31.6	25.6

Morningstar Equity Analyst Report | Report as of 24 Oct 2024 06:44, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ - ALL MARKETS Page 17 of 24

Tesla Inc TSLA ★★★ 24 Oct 2024 06:41, UTC

Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Equity Style Box	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
213.65 USD 23 Oct 2024	210.00 USD 24 Oct 2024 06:35, UTC	1.02	682.53 USD Bil 23 Oct 2024	Narrow	Large Growth	Very High	Exemplary	2 Oct 2024 05:00, UTC

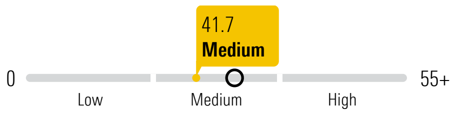
ESG Risk Rating Breakdown

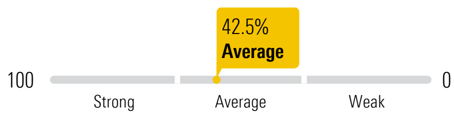
Exposure	
Company Exposure[1]	41.7
– Manageable Risk	39.8
Unmanageable Risk[2]	**1.8**

Management	
Manageable Risk	39.8
– Managed Risk[3]	16.9
Management Gap[4]	**22.9**

Overall Unmanaged Risk	**24.7**

● Subject ○ Subindustry (48.0)

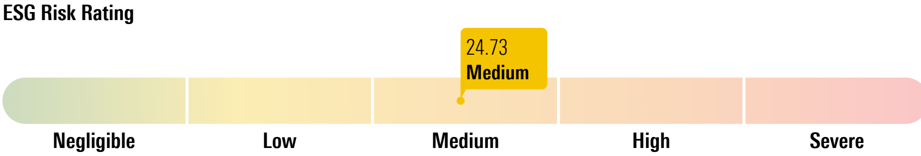




- Exposure represents a company's vulnerability to ESG risks driven by their business model
- Exposure is assessed at the Subindustry level and then specified at the company level
- Scoring ranges from 0-55+ with categories of low, medium, and high-risk exposure

- 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 42.5% 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 Oct 02, 2024. Highest Controversy Level is as of Oct 08, 2024. 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 02 Oct 2024

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+)	42.5 | Average (100–0)	24.7 | Medium (0–40+)
Ford Motor Co	50.6 | Medium (0–55+)	57.7 | Strong (100–0)	22.5 | Medium (0–40+)
Volkswagen AG	49.4 | Medium (0–55+)	56.8 | Strong (100–0)	22.4 | Medium (0–40+)
Bayerische Motoren Werke AG	46.9 | Medium (0–55+)	53.2 | Strong (100–0)	22.9 | Medium (0–40+)
General Motors Co	53.4 | Medium (0–55+)	48.7 | Average (100–0)	28.3 | Medium (0–40+)

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Appendix

Historical Morningstar Rating

Tesla Inc TSLA 23 Oct 2024 21:37, UTC

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
★	★	★★★	★	★	★	★★	★★★	★★★	★	★★	★
Dec 2019	Nov 2019	Oct 2019	Sep 2019	Aug 2019	Jul 2019	Jun 2019	May 2019	Apr 2019	Mar 2019	Feb 2019	Jan 2019
★★	★★★	★★★	★★★	★★★	★★★	★★	★★★	★★★	★★★	★★	★★

Ford Motor Co F 23 Oct 2024 21:29, UTC

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
★★★★	★★★★	★★★★	★★★	★★★	★★★	★★★★	★★★★	★★★★	★★★★★	★★★★	★★★★
Dec 2019	Nov 2019	Oct 2019	Sep 2019	Aug 2019	Jul 2019	Jun 2019	May 2019	Apr 2019	Mar 2019	Feb 2019	Jan 2019
★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★

Bayerische Motoren Werke AG BMW 24 Oct 2024 00:09, UTC

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
—	★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Dec 2019	Nov 2019	Oct 2019	Sep 2019	Aug 2019	Jul 2019	Jun 2019	May 2019	Apr 2019	Mar 2019	Feb 2019	Jan 2019
—	★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★	★★★★	★★★★	★★★★

Morningstar Equity Analyst Report | Report as of 24 Oct 2024 06:44, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ - ALL MARKETS Page 19 of 24

Volkswagen AG Vorz-Inhaber-Akt ohne Stimmrecht VOW3 24 Oct 2024 00:21, UTC

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
—	★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★	★★★★
Dec 2019	Nov 2019	Oct 2019	Sep 2019	Aug 2019	Jul 2019	Jun 2019	May 2019	Apr 2019	Mar 2019	Feb 2019	Jan 2019
—	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★

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.

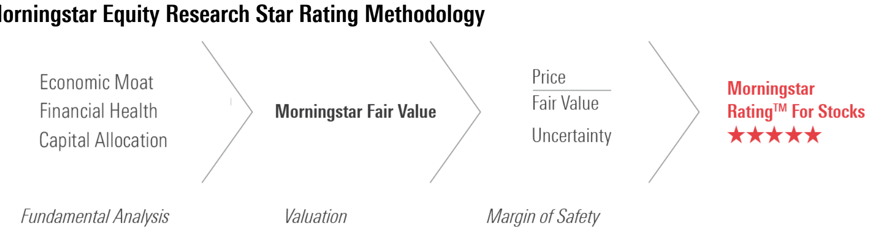
Because a dollar earned today is worth more than a dollar earned tomorrow, we discount our projections of cash flows in stages I, II, and III to arrive at a total present value of expected future cash flows. Because we are modeling free cash flow to the firm—representing cash available to provide a return 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.

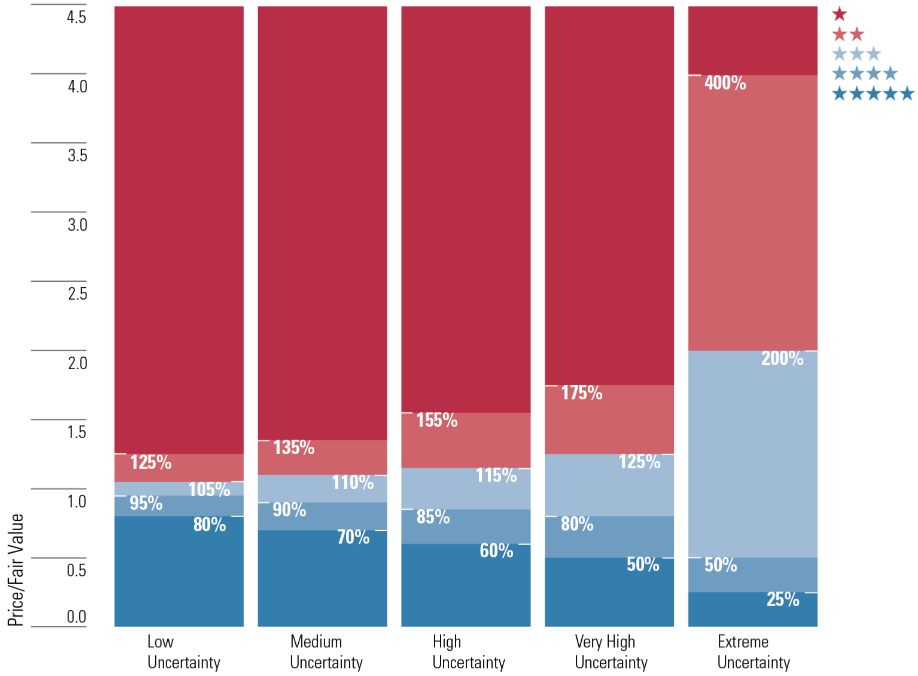
4. Market Price

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-

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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.

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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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