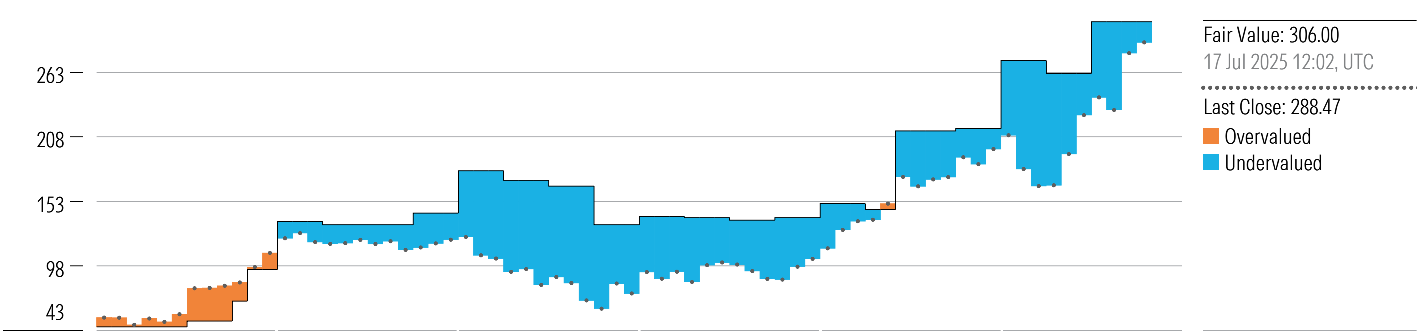
Morningstar Equity Analyst Report | Report as of 2 Oct 2025 00:01, UTC | Reporting Currency: TWD | Trading Currency: USD | Exchange: NEW YORK STOCK EXCHANGE, INC.

Taiwan Semiconductor Manufacturing Co Ltd ADR TSM ★★★ 1 Oct 2025 22:22, UTC

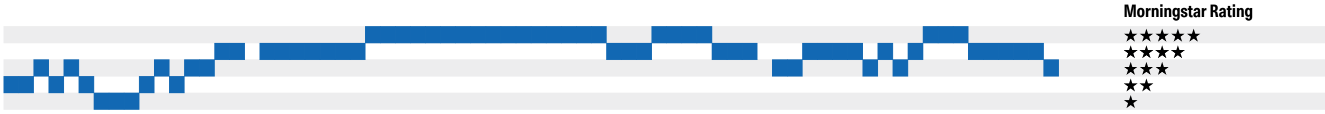
Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Equity Style Box	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
288.47 USD 1 Oct 2025	306.00 USD 17 Jul 2025 12:02, UTC	0.94	1.50 USD Tril 1 Oct 2025	Wide	Large Growth	Medium	Standard	3 Sep 2025 05:00, UTC

Price vs. Fair Value



	2020	2021	2022	2023	2024	YTD
Price/Fair Value	1.15	0.84	0.56	0.75	0.92	0.94
Total Return %	90.64	12.06	-36.57	42.08	92.12	47.22

Morningstar Rating



Total Return % as of 01 Oct 2025. Last Close as of 01 Oct 2025. Fair Value as of 17 Jul 2025 12:02, UTC.

Contents

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

TSMC: Nvidia's Collaboration With Intel Has Minimal Impact on Long-Term Outlook; Shares Undervalued

Analyst Note Phelix Lee, Equity Analyst, 19 Sep 2025

The share price of Taiwan Semiconductor Manufacturing Company has been steady amid Intel and Nvidia's plan to codevelop multiple generations of custom data center and PC products. Nvidia will acquire USD 5 billion of Intel's common stock at USD 23.28 per share.

Why it matters: Nvidia has not committed to shifting massive portions of its chip production to Intel Foundry from TSMC. Given the lack of a timeframe for Intel and Nvidia's plan, we believe there's minimal impact on TSMC's 2-nanometer and A16 outlook.

- Although Intel has raised USD 15.9 billion since Lip-Bu Tan became CEO in March, TSMC still has larger scale to keep unit development costs low. The funds raised pale in comparison to TSMC's USD 40 billion annual capital expenditure budget.

The bottom line: We maintain our TWD 1,800 (USD 306 per ADR) fair value estimates for TSMC. The company remains our top pick given its quasi monopoly on advanced chips. We expect that a broader clientele in artificial intelligence will also limit the downside of Nvidia using Intel Foundry more.

Between the lines: Nvidia's stake may be useful for Intel to complete intellectual property development with Synopsys. The IP blocks are useful for customers designing products for Intel's 14A node.

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Taiwan Semiconductor Manufacturing Co Ltd ADR TSM ★★★ 1 Oct 2025 22:22, UTC

Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Equity Style Box	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
288.47 USD 1 Oct 2025	306.00 USD 17 Jul 2025 12:02, UTC	0.94	1.50 USD Tril 1 Oct 2025	Wide	Large Growth	Medium	Standard	3 Sep 2025 05:00, UTC

Sector	Industry
Technology	Semiconductors

Business Description

Taiwan Semiconductor Manufacturing Co. is the world's largest dedicated chip foundry, with mid-60s market share in 2024. TSMC was founded in 1987 as a joint venture of Philips, the government of Taiwan, and private investors. It went public in Taiwan in 1994 and as an ADR in the US in 1997. TSMC's scale and high-quality technology allow the firm to generate solid operating margins, even in the highly competitive foundry business. Furthermore, the shift to the fabless business model has created tailwinds for TSMC. The foundry leader has an illustrious customer base, including Apple, AMD, and Nvidia, that looks to apply cutting-edge process technologies to its semiconductor designs. TSMC employs more than 83,000 people.

- However, Nvidia seems to be testing the waters at Intel as it retains the option to mass-produce next-generation products using TSMC's A14 node. Separately, Qualcomm's CEO Cristiano Amon mentioned that Intel has yet to roll out suitable nodes for them, which we see as reassurance of TSMC's outlook.

Business Strategy & Outlook Phelix Lee, Equity Analyst, 17 Jul 2025

Taiwan Semiconductor Manufacturing Company is the world's largest dedicated contract chip manufacturer, or foundry, with mid-60s market share in 2024. It makes integrated circuits for customers based on their proprietary IC designs. TSMC has long benefited from semiconductor firms around the globe transitioning from integrated device manufacturers to fabless designers. Like all foundries, it assumes the costs and capital expenditures of running factories amid a highly cyclical market for its customers. Foundries tend to add excessive capacity during times of burgeoning demand, which can result in underutilization during downturns that hampers profitability.

The rise of fabless semiconductor firms has been maintaining the growth of foundries, which has in turn encouraged increased competition. However, most of these newer competitors are confined to low-end manufacturing due to prohibitive costs and engineering know-how associated with leading-edge technology. To prolong the excess returns enabled by leading-edge process technology, or nodes, TSMC initially focuses on logic products, mostly used on central processing units and mobile chips, then focuses on more cost-conscious applications. This strategy has been successful, illustrated by the fact that the firm is one of the two foundries still possessing leading-edge nodes when dozens of peers lagged.

We note two long-term growth factors for TSMC. First, the consolidation of semiconductor firms is expected to create demand for integrated systems made with the most advanced nodes. Second, organic growth of artificial intelligence, Internet of Things, and high-performance computing applications may last for decades. AI and HPC play a central role in quickly processing human and machine inputs to solve complex problems like autonomous driving and language processing, which accentuated the need for more energy-efficient chips. Cheaper semiconductors have made integrating sensors, controllers, and motors to improve home, office, and factory efficiency possible.

Bulls Say Phelix Lee, Equity Analyst, 17 Jul 2025

- TSMC should consistently earn higher gross margins than competitors thanks to its economies of scale and premium pricing justified by cutting-edge process technologies.
- TSMC wins when customers compete to offer the most advanced processing systems using the latest process technologies.
- TSMC will benefit from more semiconductor firms embracing the fabless business model and internet giants designing their own data center chips.

Bears Say Phelix Lee, Equity Analyst, 17 Jul 2025

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Taiwan Semiconductor Manufacturing Co Ltd ADR TSM ★★★ 1 Oct 2025 22:22, UTC

Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Equity Style Box	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
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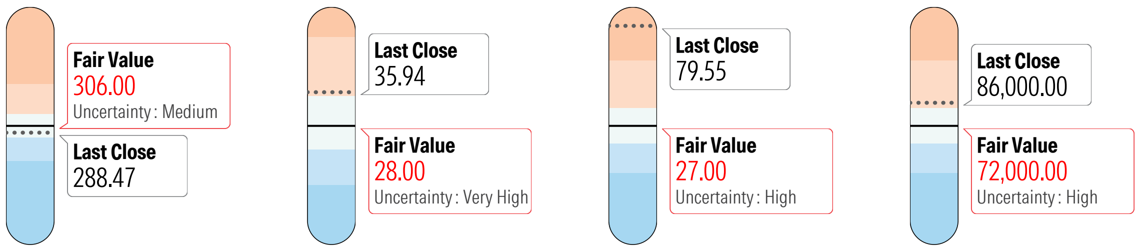
Competitors



	Taiwan Semicon...ing Co Ltd ADR TSM	Intel Corp INTC	Semiconductor ...rnational Corp 00981	Samsung Electronics Co Ltd 005930
Economic Moat	Wide	None	None	None
Currency	USD	USD	HKD	KRW
Fair Value	306.00 17 Jul 2025 12:02, UTC	28.00 18 Sep 2025 19:15, UTC	27.00 11 Sep 2025 04:58, UTC	72,000.00 2 May 2025 04:13, UTC
1-Star Price	413.10	49.00	41.85	111,600.00
5-Star Price	214.20	14.00	16.20	43,200.00
Assessment	Fairly Valued 1 Oct 2025	Overvalued 1 Oct 2025	Overvalued 1 Oct 2025	Overvalued 1 Oct 2025
Morningstar Rating	★★★1 Oct 2025 22:22, UTC	★★1 Oct 2025 22:16, UTC	★1 Oct 2025 20:41, UTC	★★1 Oct 2025 20:06, UTC
Analyst	Phelix Lee, Equity Analyst	Brian Colello, Senior Equity Analyst	Phelix Lee, Equity Analyst	Phelix Lee, Equity Analyst
Capital Allocation	Standard	Standard	Poor	Standard
Price/Fair Value	0.94	1.28	2.95	1.19
Price/Sales	13.37	2.81	9.25	1.50
Price/Book	9.01	1.54	3.84	1.44
Price/Earning	30.69	—	179.66	18.68
Dividend Yield	1.05%	0.00%	0.00%	1.74%
Market Cap	1,496.16 Bil	170.97 Bil	—	—
52-Week Range	134.25—290.48	17.67—36.30	—	—
Investment Style	Large Growth	Large Blend	Large Blend	Large Blend

- Although TSMC is the foundry leader, each generation of process technology matures and commoditizes quickly, forcing the company to deal with pricing pressure.
- TSMC's new approach to diversify production geographically may add cost pressures with little added resilience to stability.
- Samsung and Intel are committed to heavy capital spending under the support of the US government. SMIC and other state-supported Chinese foundries also lurk as potential threats.

Economic Moat Phelix Lee, Equity Analyst, 17 Apr 2025

We believe TSMC's wide moat stems from its cost advantage and intangible assets, which are realized from its leading position in process technology, or nodes. TSMC's long-standing leadership in node advancement comes from its ability to correctly and consistently prioritize the right areas in which to innovate for nodes, while maintain fiscal discipline. Process technology leadership enables TSMC to improve power, performance, and area, or PPA, cost per chip, and time to market, which are critical for the competitiveness of computing devices. It also justifies higher prices than peers. As such, we believe that TSMC's leading position in the advanced processes will contribute to attracting and retaining more customers, more stable utilization of ever-expanding production capacities, and lower production costs, generating a higher return than peers because of the cost advantage, and as a result, ensuring sufficient profits to fund research and development and capital expenditures on subsequent nodes. This virtuous cycle of intangible assets brought by heavy R&D and cost advantages brought by better PPA prevents smaller peers from catching up, in our view. In fact, TSMC has been leading node advancement and maintaining over 50% market share since the early 2000s, and its gross and operating margins have been about twice as high as those of its closest peers for years.

We believe TSMC's wide moat is justified by a wider gap between it and smaller peers. Because of technical hurdles, node advancement has been growing more costly, prompting some smaller players to give up on catching up with the industry leaders and other firms to divest. While there were six companies with cutting-edge nodes when the industry introduced 16/14 nanometer fabs around 2015, there are currently only two, TSMC and Samsung Electronics, selling 5 nm chips, as smaller peers such as GlobalFoundries and UMC decided not to introduce sub-14 nm processes. TSMC's historical and projected return on invested capital, stable market share, and superior margins all support our wide moat rating.

Multiple technical barriers and high capital requirements form TSMC's wide moat. Semiconductor manufacturing is inherently capital-intensive. While for every foundry each successive node requires exponentially more R&D and capital expenditures, customers are only willing to pay a premium to first movers. Though node advancements are viewed as evolutionary, manufacturing methods may change drastically in every few generations of process technology. In CPUs and mobile systems on chips, where adoption of new nodes first occurs, planar processes are only used up to the 22/20 nm process. Fin field-effect transistor, or FinFET, is used from 16/14 nm onward. After FinFET comes gate all around, or GAA, which will be adopted on TSMC's 2 nm and Samsung's 3 nm nodes. Successive technologies improve electrical performance and miniaturization to fit as many transistors as possible onto chips, thus improving performance relative to costs. Breakthroughs in semiconductor manufacturing aim to improve PPA.

FinFET is the first major barrier that eliminated most foundries from advancing further. Only the largest foundries—TSMC, Samsung, GlobalFoundries, UMC, SMIC, and more recently Intel as a new entrant to the space—possess FinFET-related intangible assets. Only TSMC, Intel, Samsung, and GlobalFoundries can meet customers' stringent constraints in mass production. UMC has suspended expansion of 14 nm capacity while SMIC is still ramping up. Manufacturers that decide to halt FinFET R&D have little choice other than divesting, as did Panasonic in 2019, Fujitsu's 12-inch operations in 2019, and IBM in 2014.

GAA is the new technology hurdle and major potential intangible asset that foundries must overcome to master 3 nm and later nodes. TSMC plans to implement GAA from 2 nm, with mass production to start in the second half of 2025. We do not expect foundries apart from Samsung and Intel Foundry to commercialize GAA-derived products owing to prohibitive costs, with R&D alone estimated to exceed USD 1 billion. The adoption of GAA should lead to better and more stable electrical performance even as circuitries become more intricate. Currently, only TSMC, Intel, and Samsung have unveiled timetables to introduce GAA-derived products. We think TSMC's dominant market share and strategy to focus on high-end products put it in the best position to outspend competitors in terms of R&D to advance through GAA and beyond.

Close relationships with industry giants help justify investments in process advancement. One of TSMC's intangible assets is its strong relationships with leaders in multiple subsectors, like Apple in mobile chips, Nvidia in graphic processors, and Xilinx in reprogrammable chips. Combined with its leadership in process technology, TSMC can readily justify hefty investments in new process nodes by convincing customers to share detailed road maps, while smaller foundries have to build facilities first and wait for orders that TSMC cannot fill. Over the decades, TSMC has helped AMD to maintain competitiveness in PCs, Apple and Qualcomm to advance smartphone technology, and now Nvidia, Marvell, and Xilinx, among others, to develop AI, HPC, and automotive electronics for the next decade and beyond. TSMC's technological independence ensures its R&D efforts are customer-agnostic and readily expanded to legacy applications as cost and reliability improve. Without advance process technology, it is difficult for smaller foundries like SMIC and UMC to convince customers to risk their own road map.

The Open Innovation Platform nudges customers closer to TSMC. TSMC's OIP bridges intellectual property owners with potential licensees. These licensees are typically TSMC's 500-plus customers outside the top 10, constituting about 30% of sales. OIP becomes more valuable for all users when intellectual property owners join in search of potential licensees and potential licensees look for solutions to optimize their products. While other foundries have similar platforms, TSMC's dominant market share and technical leadership would naturally gravitate users to its OIP. Even though TSMC offers OIP for free, it indirectly benefits from licensees eventually placing foundry orders. In order to keep licensees inside the ecosystem, the company releases some of its technical data—including FinFET and GAA data—to intellectual property owners to entice them to base their future designs on it. It also cooperates with top electronic design automation tool vendors like Cadence and Synopsys to manage intellectual property libraries and generic product modules. This way, licensees would not use other foundries as the latter have different production parameters.

Fair Value and Profit Drivers Phelix Lee, Equity Analyst, 17 Jul 2025

Our base-case fair value estimate is USD 306 per ADR, at which TSMC would trade at a forward price/

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earnings ratio of 24 times per 2026 estimates. We use a weighted average cost of capital of 8.2% to discount our forecast cash flow for TSMC.

We project the company's top-line CAGR at 15.7% over the next five years. Even with its dominant market share, we believe TSMC can deliver above-industry growth through a higher proportion of more valuable 10 nm to 1.4 nm logic and 28 nm to 7 nm specialty products, which are currently only produced by it and Samsung at scale. We expect Internet of Things and automotive applications are sources of incremental demand in newer specialty products. In terms of node advancement, mass production of 2 nm manufacturing is expected to begin in 2025 and 14A in 2028.

We project 2025 gross and operating margins to be higher year on year at 57% and 46%, respectively, as profitability of 3 nm production improves and revenue of high-gross-margin AI products grows faster than expected. While quarterly margins may fluctuate while the company ramps up production of a new node, long-run margins should be stable, as we expect TSMC's moat to support its pricing power for years to come. Management also aligns its interests to the 53% gross margin target by listing it as one of the criteria for performance-linked bonuses.

High-performance computing is TSMC's largest growth driver. We believe increasing in-house design of cloud computing and AI chips by US and Chinese internet giants to benefit TSMC for the next few years.

One recurring threat to TSMC's long-term growth is the loss of key personnel to competitors. In the past, TSMC has managed the issue by offering above-average salaries to employees. But to counter Chinese semiconductor companies that are poaching talent, TSMC rolled out a performance share scheme in 2021, which links financial performance and environmental, social, and governance initiatives to staff remuneration. We think this better aligns employees' interest with more stakeholders. TSMC's scheme is one of Taiwan's first to include ESG goals.

Risk and Uncertainty Phelix Lee, Equity Analyst, 17 Jul 2025

We assign TSMC a Medium Morningstar Uncertainty Rating. TSMC operates in the semiconductor industry, which is one of the most cyclical ones. TSMC derives about a third of its revenue from the smartphone market. The industry alternates between shortages and oversupply. Foundries cannot always raise prices during shortages yet have to deal with high fixed costs in all downturns. Compared with its peers, TSMC's earnings volatility has been lower, with no earnings per share decline larger than 20% in the past 10 years. We expect this to continue as a result of TSMC's dominant share in high-end products and customers' preference for TSMC as their primary (sometimes sole) foundry.

TSMC has client concentration risk, with the largest customer contributing 22% of revenue in 2024 and the top four clients about 50%. We believe Apple has been TSMC's largest customer for the last five years, owing to consistent wins of A series processors on multiple devices. Due to short product lifecycles, the possibility of Apple choosing Samsung as the foundry for an upcoming chip will also linger. The advent of AI may propel Nvidia to replace Apple as the larger customer in the next two or three years.

Currency risk is limited as most transactions are made in USD. Intellectual property theft is a major risk. The most high-profile incident was TSMC's settlement with SMIC, in which the firm received shares and cash from SMIC after a series of legal disputes from 2003 to 2009, as reported by Reuters.

TSMC's expansion requires a lot of land, electricity, and water. TSMC's land acquisition may be slowed by objections from locals. The firm works with government agencies to ensure the supply of electricity and water, and with suppliers to enhance its waste and water treatment systems.

The current CEO doubles as chair after the previous chair's retirement in June 2024. While near-term implications should be minimal, we hope the CEO can balance managing day-to-day operations with government relations.

Capital Allocation Phelix Lee, Equity Analyst, 17 Apr 2025

We downgrade TSMC to a Standard Morningstar Capital Allocation Rating from Exemplary, as we view the company's decision in March 2025 to invest another USD 100 billion in Arizona production sites as not commercially driven. The decision contrasts with TSMC previously saying both construction and manufacturing are more expensive in the US than Taiwan.

That said, there is no immediate danger to the company's 25% ROE target as high-performance computing and autonomous driving remain strong growth drivers. TSMC's ROIC and ROE are far higher than those of UMC and SMIC, with the latter averaging less than 10% over the last 10 years. TSMC's earnings are also more stable than peers', with a 2012-24 EPS compound annual growth rate at 16% without major decreases (more than 20%) year on year. UMC had four major decreases and SMIC had three in the same period. We believe such impressive financial performance is evidence of management's ability to expand capacity without being distracted by short-term supply demand imbalances and focus on cementing long-term technological leadership instead of pursuing short-term opportunistic pricing during shortages. Moreover, TSMC is more disciplined in expansion than peers. It tends to direct 30%-50% of revenue to capital expenditures each year. UMC and SMIC's capital expenditures appear to be more arbitrary, with historical capital expenditures/sales ratios fluctuating between 9% and 62% and between 31% and 150%, respectively. TSMC also appears to match capital expenditures with future demand better than its peers, with a more stable depreciation/sales ratio in the mid-20s.

TSMC's more stable earnings lead to more consistent dividends. The company has been paying dividends nonstop since 2004 (for 2003 earnings) without any cuts. In fact, TSMC's annual dividend per share has increased for six consecutive years with a payout ratio at around 50%, which is a feat given the industry's cyclicality and heavy investments needed. The company has two main shareholder return policies. The first is to at least maintain, if not increase, the dividend per share every year. The second is to prioritize dividends over share repurchases. Dividends have been paid quarterly since 2019. We forecast dividends to increase to TWD 18 per share by full-year 2025. In contrast, SMIC has never declared a dividend since its IPO in 2004, and UMC's dividend history is marked with ups and downs in line with its earnings.

TSMC has not made material acquisitions in recent years. This is reasonable, considering that other foundries look unattractive in the face of TSMC's unparalleled manufacturing capabilities and the company has no plans to compete with customers in IC design or replace downstream packaging, assembly, and testing firms.

Analyst Notes Archive

Semiconductor Manufacturers Unfazed by Revocation of US Validated End-User Status Phelix Lee,Equity Analyst,3 Sep 2025

The US Bureau of Industry and Security revoked the "validated end-user" status of Taiwan Semiconductor Manufacturing Company, Samsung Electronics, and SK Hynix. This requires them to apply for export licenses to ship certain equipment into China from 2026. Why it matters: We see negligible earnings downside from losing VEU status as the three companies can prepare by redirecting equipment orders to China from other regions, and stockpile parts for the next four months. Longer-term, the trio can limit expansion plans to outside of China. We expect licenses to be granted for parts and equipment for maintenance or replacement. This means TSMC can keep producing 16- and 28-nanometer chips, Samsung and SK Hynix can keep making NAND, DDR4, and early DDR5 memory products. In case of no licenses, the revocation will have the least impact on TSMC as its Nanjing site only accounts for 3% of total capacity. SK Hynix is hit the hardest as we estimate 30% of its DRAM and 30% of its NAND products are made in China. Samsung is less affected as it does not produce DRAM in China. The bottom line: We maintain our fair value estimates for TSMC, Samsung, and SK Hynix at TWD 1,800 (USD 306 per ADR), KRW 72,000, and KRW 270,000 per share, respectively, as we do not see long-term repercussions from losing VEU status. TSMC is our top pick given its quasimonopoly on advanced chips. Between the lines: The US is taking longer than we expect to unveil Section 232 tariffs for semiconductors. With President Donald Trump floating the idea of waiving tariffs for companies that invest in the US, we think TSMC has the best chance of a waiver, followed by Samsung.

TSMC Earnings: Lift Valuation by 6% as It Shrugs off Tariff Blows Amid Insatiable AI Demand Phelix Lee,Equity Analyst,17 Jul 2025

TSMC raised its full-year revenue growth guidance by 30% in USD terms from the mid-20s. Its June-quarter revenue was TWD 934 billion (USD 30.1 billion), up 11% sequentially. Gross margin fell 17 basis points from the prior quarter to 58.6%. Why it matters: Strong demand from AI and higher utilization in mature process nodes support TSMC's higher full-year guidance. Data center customers are investing regardless of tariffs, and have already shown excitement to move to upcoming nodes. Management's comments back our view that 2026 capital expenditure would be modestly higher than 2025's USD 38 billion-USD 42 billion. They have said the full-year outlook and capital spending budgets factor in conservatism from tariffs and other geopolitical risks, but demand remains robust. We're more confident in TSMC reaching gross margins in the high 50s long-term as we see the 2 nm node is priced with larger markups than 3 nm, and TSMC is broadening the appeal of 3 nm-7 nm nodes to cost-conscious customers as equipment finishes depreciation. The bottom line: We hike our fair value estimates for TSMC to TWD 1,800 from TWD 1,700 (USD 306 from USD 262) on better guidance and our long-term outlook. TSMC is undervalued as the market is overestimating tariff effects and underestimating the longevity of AI investments. We boost our revenue and EPS estimates for 2025-29 by 5% and 9%, respectively, on a higher AI contribution and better outlook in industrial and smart-home markets. Coming up: The US may announce a trade deal with Taiwan by the Aug. 1 deadline, but it may have a limited effect on TSMC. It has ample 4 nm capacity that can be used by US clients, should tariffs spiral from expectations of about 20%, judging by trade deals already made. Between the lines: TSMC's capital spending in 2026 should focus on meeting AI demand. The cautious 2026 outlook of its supplier ASML could mean TSMC is outspending Intel and Samsung even more, reducing the latter's chances of catching up.

TSMC Earnings: Cutting Our Fair Value Estimate by 6% as Tariffs Hit Non-AI Outlook Phelix Lee,Equity Analyst,17 Apr 2025

TSMC's first-quarter 2025 revenue was TWD 839 billion (USD 25.5 billion), down 3% sequentially. Gross margin dipped 21 basis points sequentially to 58.8%. The numbers were at the high end of management's guidance. Why it matters: We think it is reasonable for TSMC to reiterate its full-year guidance of mid-20s revenue growth and capital expenditure of USD 38 billion-USD 42 billion. This is because the firm is spending on advanced capacity to meet strong artificial intelligence demand, especially in the US. Second-quarter sales guidance is exceptionally strong at 12% sequential growth, which could mean customers are shipping as many chips as possible during the 90-day tariff pause. The effects of tariffs are likely to be felt in 2026 when current inventories are depleted. Management projects gross margin dilution by overseas fabs to widen by 100 basis points to 300-400 basis points around 2028 or 2029, citing inflation and tariffs. We assume TSMC is passing on incremental tariff costs without the markup and resulting in no harm to returns on investments. The bottom line: We trim our fair value estimates for TSMC to TWD 1,700 (USD 262 per ADR) from TWD 1,800 (USD 273) on lower 2026 revenue and EPS. TSMC is undervalued in our view and is our top pick among semiconductor foundries. We keep our 2025 assumptions unchanged as TSMC's guidance is still for mid-20s revenue growth in 2025 and orders committed today take up to six months to fulfill. We expect tariffs to hit revenue by 4% in 2026 in non-AI segments, with minimal change to the structural outlook. Coming up: The US has begun an inquiry to determine sectoral tariffs for semiconductors and consumer electronics. We currently assume a 10% tariff as TSMC produces mainly in Taiwan and will review our forecasts once the rates are finalized. Bears say: The market may have underestimated the fall in demand for consumer electronics if sectoral tariffs turn out to be higher than the 25% levied on automotive parts.

TSMC: Capital Allocation Rating Downgraded to Standard Following USD 100 Billion Investment Decision Phelix Lee,Equity Analyst,4 Mar 2025

TSMC plans to invest another USD 100 billion into Arizona chipmaking facilities. The latest plans include three fabrication plants, or fabs, two advanced packaging facilities, and a research and development center. This brings TSMC's cumulative investment budget in the US to USD 165 billion.Why it matters: We see the new fabs as a stronger signal that TSMC's investments are not commercially driven. TSMC has previously said construction and manufacturing are both more expensive in the US as well as its preference to keeping R&D and manufacturing close in Taiwan. TSMC will have to convince customers to pay even more for the new fabs to maintain corporatewide profitability. We anticipate lower levels of US government support as the so-called Department of Government Efficiency vows to cut billions in federal spending. The announcement should extend TSMC's investment roadmap to around 2040, considering the initial USD 65 billion involves three fabs that are scheduled to complete by 2030. The new fabs will serve artificial intelligence and likely also smartphone applications. The bottom line: We downgrade our Capital Allocation Rating on wide-moat TSMC to Standard from Exemplary amid heightened pressure to base investments on geopolitical instead of financial returns. We maintain our fair value estimate of TWD 1,800 per share (USD 273 per ADR). TSMC's balance sheet remains strong with a long-standing net cash position. Distribution is also appropriate at about 40% EPS on average. We make no change to our earnings forecasts as the USD 100 billion is unlikely to be spent until the third Arizona fab, announced in 2024, nears completion around late 2028 or early 2029.

TSMC: Holding Our TWD 1,800 Fair Value Despite DeepSeek Prompting a Rethink of AI Investments Phelix Lee,Equity Analyst,28 Jan 2025

US-traded ADRs of TSMC tumbled 13% after Chinese artificial intelligence firm DeepSeek released its open-source reasoning model R1 that achieves capabilities on par with that of OpenAI and Google at a fraction of the latter's costs.Why it matters: This affects sentiment as to TSMC's earlier guidance of a mid-40s five-year AI revenue compound annual growth rate. DeepSeek's model exacerbated concerns as to whether adding more computation power is the best way to improve models, and whether AI spending by the likes of Amazon and Microsoft is durable. We anticipate elevated short-term volatility to TSMC's share price as cloud service and app developers leverage R1's open-source nature to improve their own offerings. These efficiency gains may temporarily depress the demand for computation power. However, we believe TSMC will benefit from more durable AI spending in the long run, as more potent models improve the likelihood of profitable innovations, which incentivizes reinvestment. Another growth driver is cheaper models, which reduce barriers to entry and attract numerous smaller app developers. The bottom line: We maintain our fair value estimate of TWD 1,800 per share (USD 273 per ADR) for TSMC. We see the stock as undervalued, and the share price pullback presents an entry opportunity for long-term investors. Our forecasts do not assume Chinese AI companies gain access to TSMC's cutting-edge processes. We believe demand from the US and other Western countries is enough to support TSMC's AI revenue growth for the next five years. Big picture: TSMC is still supply-constrained. We foresee minimal effect on TSMC's profitability as its factories should remain fully utilized in case of a mild reduction in AI investments. Meta's surprisingly large 2025 capital spending budget and the Stargate venture's USD 500 billion announcement support our view regarding strong AI investments in the long term.

Taiwan Semi Earnings: Growth May Be Too Reliant on Artificial Intelligence; Shares Still Attractive

Phelix Lee,Equity Analyst,16 Jan 2025

Taiwan Semiconductor's fourth-quarter 2024 revenue was TWD 868 billion (USD 26.9 billion), up 39% year on year. Gross margin increased 6 percentage points from the year-ago quarter to 59%. The numbers beat management guidance. Why it matters: Management provided upbeat guidance for 2025 and beyond. TSMC expects its revenue to grow in the mid-20s in 2025 and average 20% over the next few years. This is higher than the previous guidance of midteens multiyear average growth and ahead of our 15% sales CAGR forecast. AI chips made up 15% of TSMC's revenue in 2024 and by management's mid-40s growth expectations, it will balloon to 50% of our TSMC revenue forecast by 2029. The upbeat AI outlook led us to raise 2025-28 revenue estimates by up to 21%. TSMC budgets capital spending at USD 38 billion to USD 42 billion for 2025, or over 35% of revenue. This is a 28%-41% jump from 2024's USD 29.8 billion and lends credence to TSMC's latest revenue outlook. The figure is slightly ahead of our TWD 1.22 trillion (USD 37.1 billion) forecast in October. The bottom line: We hike our fair value estimate for TSMC up to TWD 1,800 per share (USD 273 per ADR) from TWD 1,380 (USD 215) owing to a rosier outlook in AI demand and stronger-than-expected 2025 revenue guidance. TSMC's shares are attractive and it is our top pick among semiconductor foundries. Bears say: Both large and small AI businesses are adding computing power to their arsenals with little regard to returns. Once some companies go bust, it may prompt a steep cut to AI data center spending.

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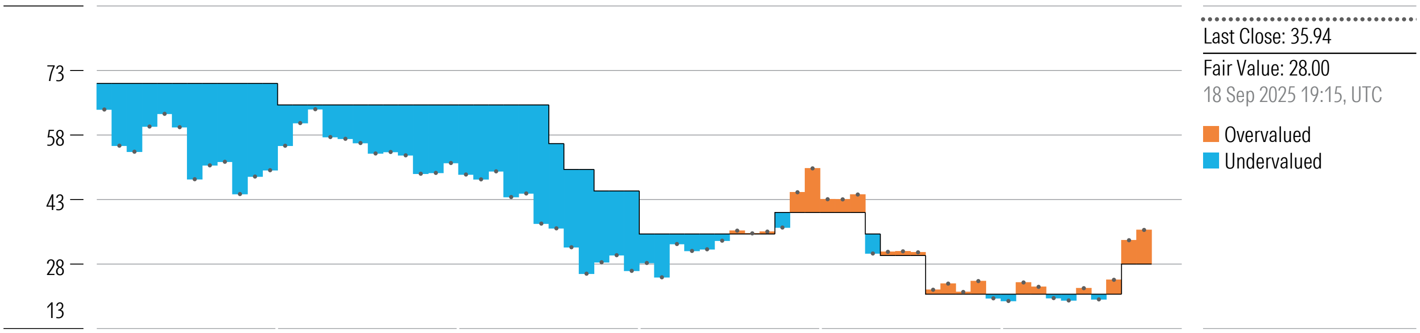
Taiwan Semiconductor Manufacturing Co Ltd ADR TSM ★★★ 1 Oct 2025 22:22, UTC

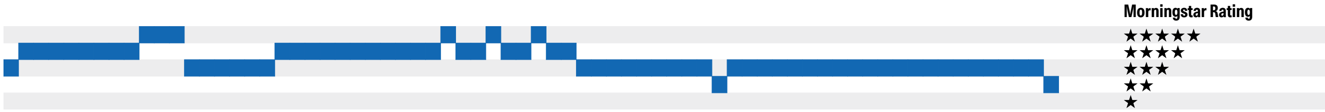
Competitors Price vs. Fair Value

Intel Corp INTC



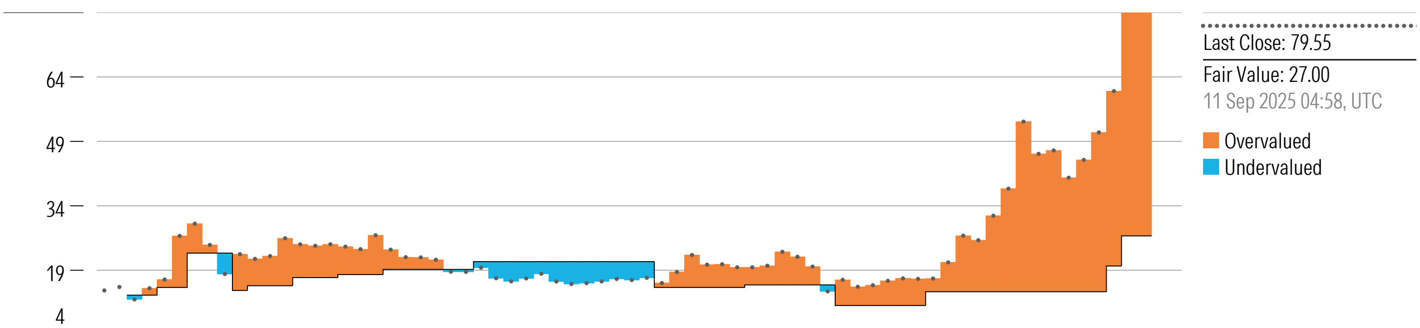
2020	2021	2022	2023	2024	YTD	
0.71	0.79	0.59	1.26	0.95	1.28	Price/Fair Value
-14.55	6.16	-45.84	92.92	-59.35	79.25	Total Return %

Morningstar Rating



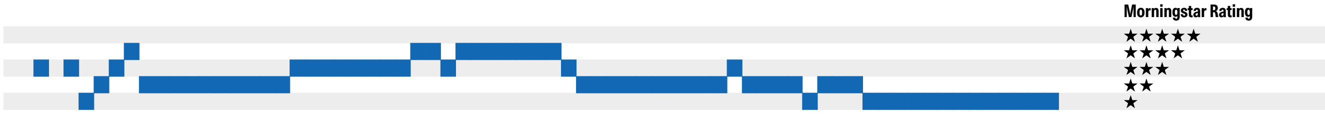
Total Return % as of 01 Oct 2025. Last Close as of 01 Oct 2025. Fair Value as of 18 Sep 2025 19:15, UTC.

Semiconductor Manufacturing International Corp 00981



2020	2021	2022	2023	2024	YTD	
1.45	0.97	0.80	1.27	2.26	2.95	Price/Fair Value
86.77	-16.32	-10.40	18.78	59.62	150.95	Total Return %

Morningstar Rating



Total Return % as of 30 Sep 2025. Last Close as of 30 Sep 2025. Fair Value as of 11 Sep 2025 04:58, UTC.

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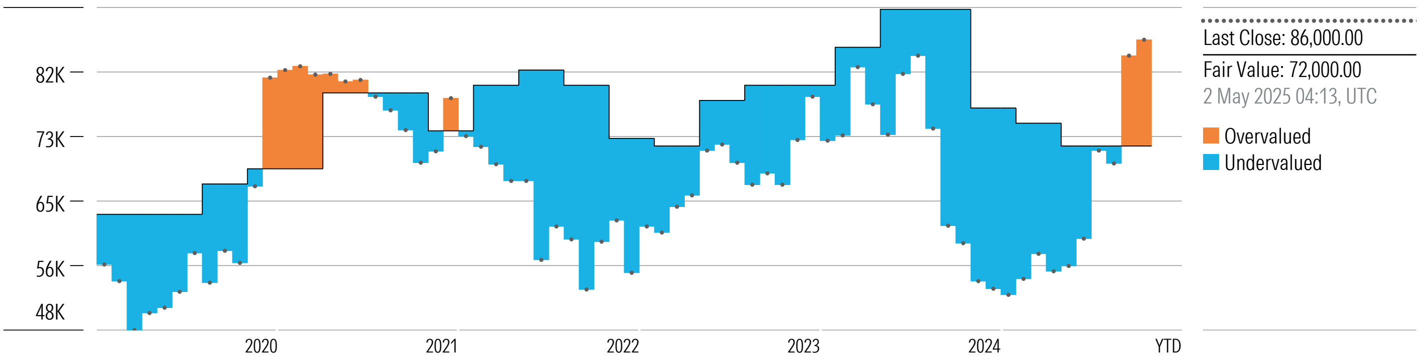
Taiwan Semiconductor Manufacturing Co Ltd ADR TSM ★★★ 1 Oct 2025 22:22, UTC

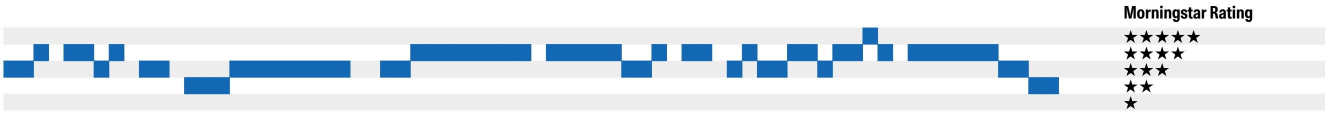
Competitors Price vs. Fair Value

Samsung Electronics Co Ltd 005930



	2020	2021	2022	2023	2024	YTD
Price/Fair Value	1.17	1.06	0.76	0.98	0.69	1.19
Total Return %	50.04	-1.75	-27.60	44.56	-30.39	63.03

Morningstar Rating



Total Return % as of 01 Oct 2025. Last Close as of 01 Oct 2025. Fair Value as of 2 May 2025 04:13, UTC.

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Taiwan Semiconductor Manufacturing Co Ltd ADR TSM ★★★ 1 Oct 2025 22:22, UTC

Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Equity Style Box	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
288.47 USD 1 Oct 2025	306.00 USD 17 Jul 2025 12:02, UTC	0.94	1.50 USD Tril 1 Oct 2025	Wide	Large Growth	Medium	Standard	3 Sep 2025 05:00, UTC

Morningstar Valuation Model Summary

Financials as of 17 Jul 2025	Actual			Forecast				
Fiscal Year, ends 31 Dec	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
Revenue (TWD Bil)	2,264	2,162	2,894	3,767	4,387	4,906	5,353	5,996
Operating Income (TWD Bil)	1,140	921	1,322	1,737	2,128	2,267	2,467	2,757
EBITDA (TWD Bil)	1,590	1,463	1,991	2,493	3,005	3,264	3,591	4,022
Adjusted EBITDA (TWD Bil)	1,590	1,463	1,991	2,493	3,005	3,264	3,591	4,022
Net Income (TWD Bil)	1,035	838	1,172	1,531	1,953	2,071	2,269	2,535
Adjusted Net Income (TWD Bil)	1,035	838	1,172	1,531	1,953	2,071	2,269	2,535
Free Cash Flow To The Firm (TWD Bil)	322	18	122	572	469	494	498	514
Weighted Average Diluted Shares Outstanding (Bil)	26	26	26	26	26	26	26	26
Earnings Per Share (Diluted) (TWD)	39.93	32.34	45.20	59.05	75.33	79.88	87.52	97.76
Adjusted Earnings Per Share (Diluted) (TWD)	39.93	32.34	45.20	59.05	75.33	79.88	87.52	97.76
Dividends Per Share (TWD)	10.25	11.00	11.25	18.00	18.50	19.00	19.50	20.00

Margins & Returns as of 17 Jul 2025		Actual			Forecast					
	3 Year Avg	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**5 Year Avg**
Operating Margin %	46.6	50.4	42.6	45.7	46.1	48.5	46.2	46.1	46.0	46.8
EBITDA Margin %	—	70.2	67.7	68.8	66.2	68.5	66.5	67.1	67.1	—
Adjusted EBITDA Margin %	—	70.2	67.7	68.8	66.2	68.5	66.5	67.1	67.1	67.1
Net Margin %	41.7	45.7	38.8	40.5	40.7	44.5	42.2	42.4	42.3	42.4
Adjusted Net Margin %	41.7	45.7	38.8	40.5	40.7	44.5	42.2	42.4	42.3	42.4
Free Cash Flow To The Firm Margin %	6.4	14.2	0.8	4.2	15.2	10.7	10.1	9.3	8.6	10.8

Growth & Ratios as of 17 Jul 2025		Actual			Forecast					
	3 Year CAGR	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**5 Year CAGR**
Revenue Growth %	22.2	42.6	-4.5	33.9	30.2	16.5	11.8	9.1	12.0	15.7
Operating Income Growth %	26.1	73.1	-19.2	43.5	31.4	22.5	6.5	8.8	11.7	15.8
EBITDA Growth %	24.5	45.3	-8.0	36.1	25.2	20.5	8.6	10.0	12.0	15.3
Adjusted EBITDA Growth %	22.1	45.3	-8.0	36.1	25.2	20.5	8.6	10.0	12.0	15.1
Earnings Per Share Growth %	24.7	71.1	-19.0	39.8	30.6	27.6	6.0	9.6	11.7	16.7
Adjusted Earnings Per Share Growth %	24.7	71.1	-19.0	39.8	30.6	27.6	6.0	9.6	11.7	16.7

Valuation as of 17 Jul 2025	Actual			Forecast				
	2022	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
Price/Earning	11.5	19.7	28.7	29.8	23.3	22.0	20.1	18.0
Price/Sales	5.1	7.1	9.6	9.1	7.8	7.0	6.4	5.7
Price/Book	4.0	4.8	7.8	8.5	6.7	5.4	4.5	3.7
Price/Cash Flow	—	—	—	—	—	—	—	—
EV/EBITDA	6.9	10.1	13.0	13.1	10.8	10.0	9.1	8.1
EV/EBIT	9.7	16.0	19.6	18.8	15.3	14.4	13.2	11.8
Dividend Yield %	2.2	1.7	0.9	1.0	1.1	1.1	1.1	1.1
Dividend Payout %	25.7	34.0	24.9	30.5	24.6	23.8	22.3	20.5
Free Cash Flow Yield %	—	—	—	—	—	—	—	—

Operating Performance / Profitability as of 17 Jul 2025	Actual			Forecast				
Fiscal Year, ends 31 Dec	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
ROA %	20.9	15.2	17.5	19.7	21.1	19.1	18.0	17.3
ROE %	35.0	24.1	27.1	28.4	28.5	24.5	22.2	20.7
ROIC %	25.8	17.6	23.3	27.4	27.2	23.4	20.9	19.5

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Taiwan Semiconductor Manufacturing Co Ltd ADR TSM ★★★ 1 Oct 2025 22:22, UTC

Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Equity Style Box	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
288.47 USD 1 Oct 2025	306.00 USD 17 Jul 2025 12:02, UTC	0.94	1.50 USD Tril 1 Oct 2025	Wide	Large Growth	Medium	Standard	3 Sep 2025 05:00, UTC

Financial Leverage (Reporting Currency)	Actual			Forecast				
Fiscal Year, ends 31 Dec	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
Debt/Capital %	7.1	5.9	3.6	2.0	1.9	1.7	1.6	1.5
Assets/Equity	1.7	1.6	1.5	1.4	1.3	1.3	1.2	1.2
Net Debt/EBITDA	-0.4	-0.5	-0.7	-0.5	-0.7	-0.9	-1.1	-1.3
Total Debt/EBITDA	0.6	0.7	0.5	0.4	0.3	0.3	0.3	0.2
EBITDA/ Net Interest Expense	-149.0	-30.3	-25.9	-32.7	-36.7	-43.1	-36.0	-36.4

Forecast Revisions as of 17 Jul 2025	2025		2026		2027	
Prior data as of 17 Apr 2025	**Current**	**Prior**	**Current**	**Prior**	**Current**	**Prior**
Fair Value Estimate Change (Trading Currency)	306.00	1,699.06	—	—	—	—
Revenue (TWD Bil)	3,767	3,597	4,387	4,183	4,906	4,696
Operating Income (TWD Bil)	1,737	1,739	2,128	2,004	2,267	2,152
EBITDA (TWD Bil)	2,493	2,490	3,005	2,866	3,264	3,123
Net Income (TWD Bil)	1,531	1,472	1,953	1,777	2,071	1,909
Earnings Per Share (Diluted) (TWD)	59.05	56.77	75.33	68.53	79.88	73.63
Adjusted Earnings Per Share (Diluted) (TWD)	59.05	56.77	75.33	68.53	79.88	73.63
Dividends Per Share (TWD)	18.00	18.00	18.50	18.50	19.00	19.00

Key Valuation Drivers as of 17 Jul 2025	
Cost of Equity %	7.5
Pre-Tax Cost of Debt %	5.5
Weighted Average Cost of Capital %	8.2
Long-Run Tax Rate %	15.0
Stage II EBI Growth Rate %	10.0
Stage II Investment Rate %	55.0
Perpetuity Year	20

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

Discounted Cash Flow Valuation as of 17 Jul 2025	**TWD Mil**
Present Value Stage I	2,030,059
Present Value Stage II	12,812,834
Present Value Stage III	28,607,056
Total Firm Value	**43,449,949**
Cash and Equivalents	2,364,524
Debt	987,825
Other Adjustments	130,000
Equity Value	**44,956,648**
Projected Diluted Shares	26
Fair Value per Share (USD)	**306.00**

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Taiwan Semiconductor Manufacturing Co Ltd ADR TSM ★★★ 1 Oct 2025 22:22, UTC

Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Equity Style Box	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
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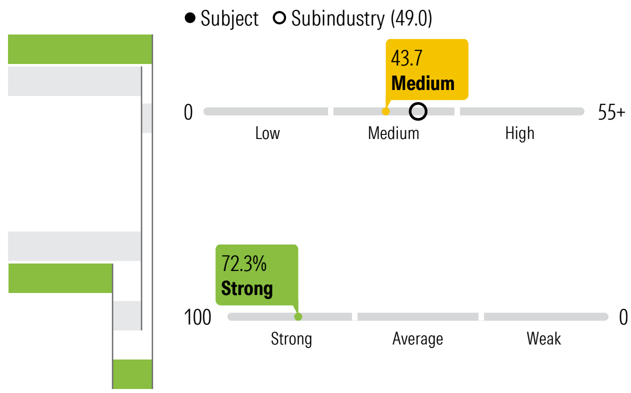
ESG Risk Rating Breakdown

Exposure		
Company Exposure[1]	43.7	
– Manageable Risk	40.4	
Unmanageable Risk[2]	**3.2**	
Management		
Manageable Risk	40.4	
– Managed Risk[3]	29.3	
Management Gap[4]	**11.2**	
Overall Unmanaged Risk	**14.4**	



- 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 72.3% 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 Sep 03, 2025. Highest Controversy Level is as of Sep 08, 2025. Sustainalytics Subindustry: Semiconductor Design and Manufacturing. 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 03 Sep 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		
Taiwan Semiconduct...nufacturing Co Ltd	43.7 | Medium	0	55+	72.3 | Strong	100	0	14.4 | Low	0	40+
Semiconductor Ma...ternational Corp	54.2 | Medium	0	55+	38.8 | Average	100	0	35.1 | High	0	40+
Intel Corp	48.9 | Medium	0	55+	66.6 | Strong	100	0	18.8 | Low	0	40+
Samsung Electronics Co Ltd	38.3 | Medium	0	55+	63.3 | Strong	100	0	15.7 | Low	0	40+
United Microelectronics Corp	47.5 | Medium	0	55+	68.8 | Strong	100	0	17.3 | Low	0	40+

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Appendix
Historical Morningstar Rating

Taiwan Semiconductor Manufacturing Co Ltd ADR TSM 1 Oct 2025 22:22, 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
★★	★★★	★★	★	★	★	★★	★★★	★★	★★★	★★	★★

Intel Corp INTC 1 Oct 2025 22:16, 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
★★★★★	★★★★★	★★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★

Semiconductor Manufacturing International Corp 00981 1 Oct 2025 20:41, 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
★★	★★	★★	★★★★	★★★	★★	★	★★★	—	★★★	—	—

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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
—	—	★★	★★	★★★	★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★
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
—	★★★	★★★	—	★★★★	★★★	★★★★	★★★★	—	★★★★	★★★	★★★

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.

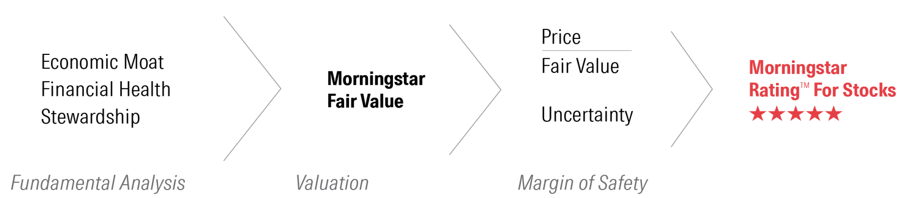
Because a dollar earned today is worth more than a dollar earned tomorrow, we discount our projections of cash flows in stages I, II, and III to arrive at a total present value of expected future cash flows. Because we are modeling free cash flow to the firm—representing cash available to provide a return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

Morningstar Equity Research Star Rating Methodology



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outcomes for the intrinsic value of a company, and anything 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.

Qualitative Analysis Uncertainty Ratings	Margin of Safety ★★★★★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

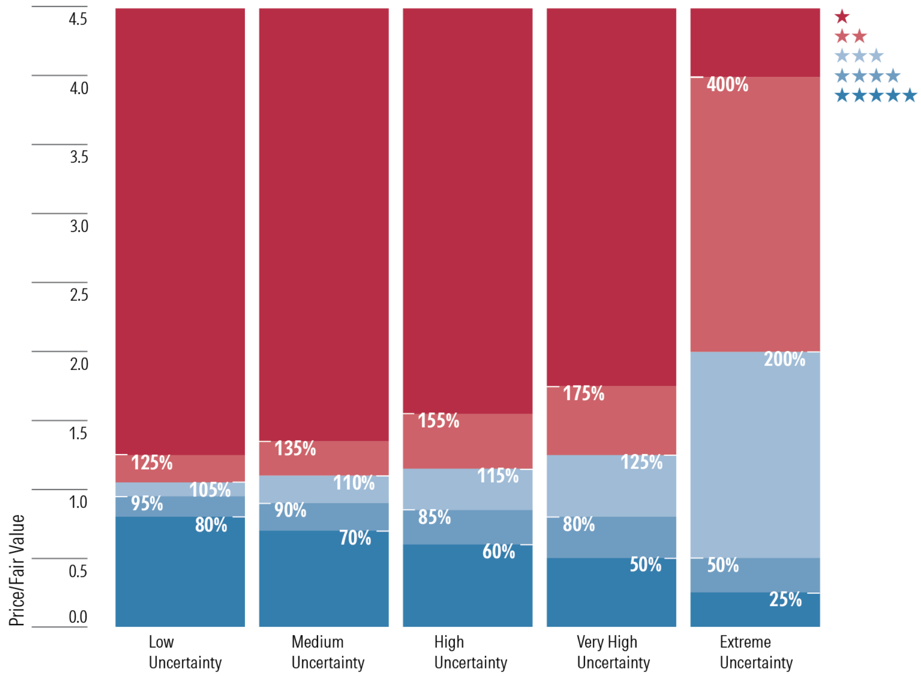
Our uncertainty rating is based on the interquartile range, or the middle 50% of potential outcomes, covering the 25th percentile–75th percentile. This means that when a stock hits 5 stars, we expect there is a 75% chance that the intrinsic value of that stock lies above the current market price. Similarly,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



Morningstar Star Rating for Stocks

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,

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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.

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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