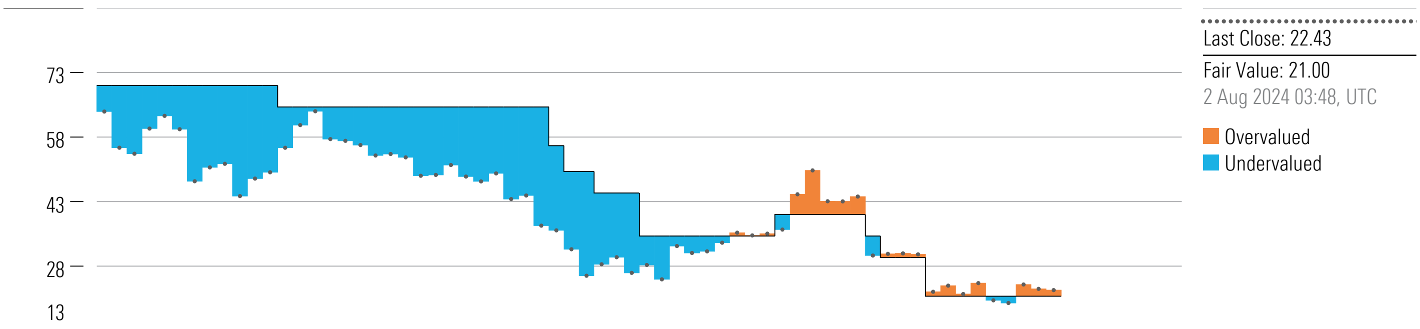
Morningstar Equity Analyst Report | Report as of 4 Apr 2025 01:57, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ - ALL MARKETS

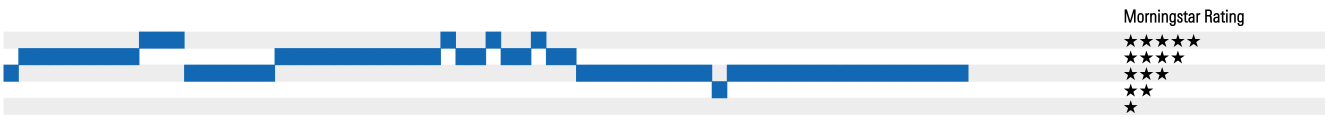
Intel Corp INTC ★★★ 3 Apr 2025 21:37, UTC

Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Equity Style Box	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
22.43 USD 3 Apr 2025	21.00 USD 2 Aug 2024 03:48, UTC	1.07	97.81 USD Bil 3 Apr 2025	None	Large Blend	Very High	Standard	2 Apr 2025 05:00, UTC

Price vs. Fair Value



	2020	2021	2022	2023	2024	YTD	
	0.71	0.79	0.59	1.26	0.95	1.07	Price/Fair Value
	-14.55	6.16	-45.84	92.92	-59.35	11.87	Total Return %



Total Return % as of 03 Apr 2025. Last Close as of 03 Apr 2025. Fair Value as of 2 Aug 2024 03:48, 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.

Intel: Joint-Venture Partnership With TSMC Might Be One of Its Best Outcomes

Analyst Note Brian Colello, CPA, Strategist, 4 Apr 2025

We are maintaining our $21 fair value estimate for no-moat Intel despite the positive report that Intel and Taiwan Semi, or TSMC, "tentatively agree" to form a chipmaking (that is, foundry) joint venture, per a report from The Information. Intel rose 2% on the news on April 3 (and was up as much as 6% midday), in contrast to the broader Nasdaq index down 5.4% amid US tariff concerns.

The reported deal involves TSMC taking a 20% stake in the JV in exchange for TSMC's industry know-how (rather than a capital contribution), while other US semiconductor firms may join the JV as well. The report suggests that Intel might be having reservations about entering such a deal, but at first glance, this might be a decent outcome for Intel under new CEO Lip-Bu Tan. We continue to believe that the best-case scenario for Intel shareholders is if Intel can receive support for its foundry business (from governments, chipmaking peers, or elsewhere) while maintaining its chip design (that is, product) business.

We believe that one of Intel's largest foundry hurdles has been that large potential foundry customers already have tight relationships with TSMC and would not want to risk damaging them, even if Intel were to gain parity or be slightly ahead in chip manufacturing capabilities. If nothing else, TSMC's participation in this type of JV would alleviate this concern. Similarly, these large potential customers (AMD, Nvidia, Apple) all compete with Intel products, so using an Intel foundry might put their design

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Sector	Industry
Technology	Semiconductors

Business Description

Intel is a leading digital chipmaker, focused on the design and manufacturing of microprocessors for the global personal computer and data center markets. Intel pioneered the x86 architecture for microprocessors and was the prime proponent of Moore's law for advances in semiconductor manufacturing. Intel remains the market share leader in central processing units in both the PC and server end markets. Intel has also been expanding into new adjacencies, such as communications infrastructure, automotive, and the Internet of Things. Further, Intel expects to leverage its chip manufacturing capabilities into an outsourced foundry model where it constructs chips for others.

secrets at risk or, at the very least, prop up an ongoing rival. These risks might be mitigated if TSMC were to take the operating lead within such a foundry.

Despite our optimism regarding such a JV, neither Intel nor TSMC commented on such a deal, and we consider The Information's report as preliminary. We may revisit our fair value estimate if additional positive details about such an arrangement were to be announced.

Business Strategy & Outlook Brian Colello, CPA, Strategist, 12 Mar 2025

Intel's best days are behind it, as it currently has a chip manufacturing disadvantage against Taiwan Semiconductor, or TSMC, and its processor partners, such as AMD, Nvidia, and Apple. It is possible that the best outcome for Intel investors is a breakup of its chip design (Intel products segment) and manufacturing (Intel Foundry) businesses.

Intel is focused on improving Intel Products, even if it means moving away from Intel Foundry and toward its former rival, TSMC. Foundry isn't giving up on focus on manufacturing improvements, such as Intel 18A, is the proper move, but we don't foresee Foundry catching TSMC in process leadership any time soon. Even if successful, Intel's Products competitors will be stronger than when the firm was dominant a decade ago. In turn, we assign Intel a no-moat rating.

We view Intel's former dominance as stemming from two areas. First, its execution of Moore's Law, which predicts transistor density on integrated circuits will double about every two years, meaning subsequent chips have substantial power, cost, and size improvements. In recent years, however, Intel was unable to keep pace. Intel's second advantage comes from its control of x86, the instruction set for virtually the entire history of the PC. Microsoft Windows was written with x86 processors in mind, which virtually guaranteed that almost all PC hardware would run on x86 processors. AMD was granted an x86 license but was a subpar second source for decades, and Intel thrived.

Lately, however, AMD forged a tight partnership with TSMC, allowing AMD to improve its competitiveness versus Intel in both PC and server CPUs. Even if Intel revives its manufacturing roadmap, we don't foresee AMD recoiling from the market. Meanwhile, Apple and its partners made the hard switch to ARM-based CPUs, and the Windows ecosystem is starting to support a similar switch.

Even if Intel achieves its aspirations of reaching five manufacturing node improvements in four years, (culminating with Intel 18A), there is no guarantee of a booming market for PC or server CPUs. Meanwhile, we think Intel is far behind Nvidia, and even AMD, in artificial intelligence products.

Bulls Say Brian Colello, CPA, Strategist, 17 Mar 2025

- Intel is one of the largest semiconductor companies in the world and still holds leading market share

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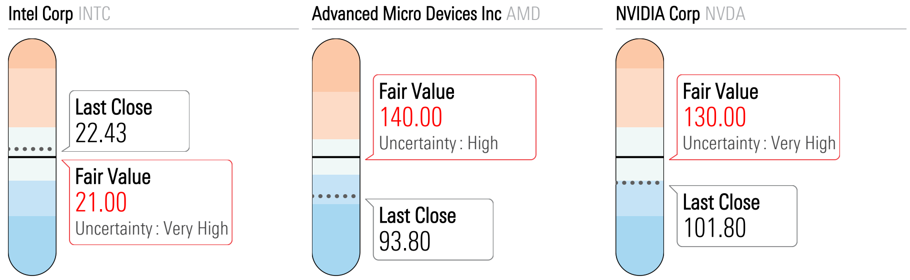
Competitors



	Intel Corp INTC	Advanced Micro Devices Inc AMD	NVIDIA Corp NVDA
Economic Moat	None	Narrow	Wide
Currency	USD	USD	USD
Fair Value	21.00 2 Aug 2024 03:48, UTC	140.00 5 Feb 2025 03:20, UTC	130.00 21 Nov 2024 03:43, UTC
1-Star Price	36.75	217.00	227.50
5-Star Price	10.50	84.00	65.00
Assessment	Fairly Valued 3 Apr 2025	Undervalued 3 Apr 2025	Fairly Valued 3 Apr 2025
Morningstar Rating	★★★3 Apr 2025 21:37, UTC	★★★★3 Apr 2025 21:35, UTC	★★★3 Apr 2025 21:37, UTC
Analyst	Brian Colello, Strategist	Brian Colello, Strategist	Brian Colello, Strategist
Capital Allocation	Standard	Exemplary	Exemplary
Price/Fair Value	1.07	0.67	0.78
Price/Sales	1.77	6.54	20.99
Price/Book	0.96	2.90	34.07
Price/Earning	—	94.28	37.56
Dividend Yield	1.14%	0.00%	—
Market Cap	97.81 Bil	152.39 Bil	2,483.92 Bil
52-Week Range	18.51 — 40.78	93.64 — 187.28	75.61 — 153.13
Investment Style	Large Blend	Large Blend	Large Growth

positions within the PC and server processor markets.

- Intel's Products business segment remains an innovative, profitable design team, and shifting more production to Taiwan Semi might enable the firm to fend off recent market share losses.
- Intel Foundry is one of only three companies that can come close to building leading edge processors, and additional financial support might enable the business to emerge as a viable manufacturer down the road.

Bears Say Brian Colello, CPA, Strategist, 17 Mar 2025

- There are no guarantees that Intel can execute on its manufacturing aspirations, such as the release of Intel 18A in 2025.
- Even if Intel can improve upon its manufacturing roadmap, AMD now sits as a far more credible chip designer in the x86 space for PC and server CPUs, while ARM-based CPUs are a much greater threat than in years past.

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- Nvidia's GPUs have captured most of the artificial intelligence accelerator market, and we don't foresee Intel making a dent in AI accelerators any time soon.

Economic Moat Brian Colello, CPA, Strategist, 12 Mar 2025

We assign Intel a no-moat rating. The company's returns on invested capital have fallen in recent years, and we do not foresee excess returns on capital in the years ahead. The deterioration stems from the firm's manufacturing struggles and hefty investment phase in new manufacturing processes. We acknowledge that, if Intel were to perfectly execute on its aggressive technological roadmap, it may warrant an economic moat rating in the future. However, this outcome is likely years down the road with no guarantee of success.

Intel's chip design team has decades of experience in processor designs, mostly around central processing units, or CPUs, that, in our opinion, would likely warrant a narrow moat rating in isolation. However, we view the chip manufacturing business as being at a cost and technological disadvantage today, as the firm has stumbled and lost its lead to Taiwan Semiconductor, or TSMC, the world's largest foundry. In our view, Intel's manufacturing headwinds more than offset any competitive advantages that its chip design expertise may warrant.

Intel is perhaps best known for its CPUs for PC desktops and notebooks within its Client Computing Group (CCG) business segment. We think that Intel has a competitive advantage in PC CPU chip designs, not only because of chip design expertise honed over decades, but also because Intel is one of two prominent firms (along with AMD) to hold an x86 instruction set architecture license.

Intel initially developed x86 in the 1970s and emerged as the instruction set required for IBM PCs and, later, Microsoft's operating systems. Intel and AMD are the primary licensees of x86 and owners of x86 intellectual property, as they have a cross-licensing agreement that covers the x86 patent portfolio and would be terminated if either firm was acquired or had a change of control. The exclusivity of the x86 license serves as a significant barrier to entry for other chipmakers (such as Qualcomm, Apple, or others) that cannot make an x86 processor without a license.

For many years, effectively all PC software (including Microsoft's Windows, Apple's Mac operating systems, and any desktop software applications running on both operating systems) was designed for the x86 architecture. Software makers could not easily deviate from building x86-optimized applications, while Microsoft and Apple would have a heavy lift to convert their operating systems to alternate instruction sets (such as those by ARM, which is the dominant instruction set for mobile devices, used in processors from Qualcomm, Samsung, Apple's iPhones, and others). In turn, Apple (for the Mac) and PC vendors (for Windows machines) had little choice than to buy x86 processors from (mostly) Intel or (on occasion) AMD to run their PCs.

Today, however, Apple has already done the heavy lifting of converting its Mac software to ARM and has now built excellent in-house processors for its Mac lineup. Further, an increasing portion of software is hosted in the cloud and can run on multiple operating systems and isn't tied to only x86 devices. Microsoft has dabbled in ARM-based versions of Windows but has increased its support of ARM recently, enabling Qualcomm to enter the PC CPU market, and others (perhaps Nvidia) are likely on the way.

We still think it would be a heavy lift for any on-device software makers to port their software to be compatible with ARM-based PCs, but we think the writing is on the wall here to move such software to the cloud or on to ARM-based devices like the Mac. Thus, we don't think the x86 architecture is as moaty as it once was, although we still foresee x86-based processors from Intel and AMD as making up a significant portion of the PC market for the next several years.

Intel also had a historical cost advantage in the PC processor market because of its manufacturing leadership along Moore's Law, which was coined by one of Intel's chief founders, Gordon Moore, and suggests that the number of transistors per unit area doubles approximately every two years. For decades, Intel held a manufacturing advantage that drove PC hardware makers to buy Intel chips, which gave Intel a bigger R&D budget to invest in the next wave of chip innovations, thus coming out with even better processors and keeping the positive flywheel going.

These dynamics have flipped in recent years, however, as Intel has stumbled in internal manufacturing and could no longer keep up with Moore's Law. Meanwhile, AMD has partnered closely with TSMC, the world's largest outsourced chip manufacturer or foundry. TSMC now has a market lead in making cutting edge chips, and AMD is bringing more competitive products to the PC market. In turn, AMD has gained market share over Intel in PCs in recent years.

We view Intel's cost disadvantage as the primary reason for our moat downgrades for Intel from wide to narrow to none. If Intel did not own fabs and instead outsourced production to a foundry like TSMC, it likely would have been far more profitable in 2022 and 2023 during the slowdown in PC demand. Some investors have called for Intel to go fabless, likely to break out the crown jewel chip design team. However, we consider this narrow moat design team as buried within a much larger, struggling, non-moaty manufacturing business.

Intel is investing heavily in new process nodes to strive for manufacturing parity, if not leadership, with TSMC. If Intel is successful, it could regain some lost x86 PC market share. However, we no longer view AMD as an also-ran in PC CPUs, and even if Intel were to improve, we still think AMD could retain enough customers to maintain a healthy PC business. Further, the rise of ARM processor vendors represents an emerging threat that Intel did not face in its heyday a decade ago and earlier.

In server CPUs within Intel's Data Center and AI, or DCAI, segment, we see similar dynamics. Intel captured a dominant market position thanks to both x86 know-how and leading-edge manufacturing, but lost its edge on the latter front, allowing the AMD/TSMC partnership to gain credibility and market share in server CPUs.

We also think that any cloud-based software vendors face high switching costs to move their software from x86 servers and on to ARM-based servers, although the switching costs are likely far lower between hosting software on an Intel x86 server versus an AMD one. Still, like the PC market, we see ARM-based processors as a threat, as Amazon, Nvidia, and others are developing ARM-based processors to run traditional server workloads as well as AI applications. Optimizing data center architectures and workloads for ARM-based servers, rather than x86 ones, is again a heavy lift, from what we can gather. However, we recognize that leading hyperscalers (Microsoft, Amazon, and so on) may have the incentive to do so if they can use ARM-based processors to elevate their data centers and devices. Ultimately, we don't foresee a mass exodus away from x86 architectures in the data center for the next several years.

Intel owns some other businesses and segments that hold valuable intangible assets around design expertise. Both Altera and Mobileye were narrow-moat companies when independent. However, most of Intel's revenue comes from CCG and DCAI, and we foresee the PC and server CPU markets as driving Intel's fate for the next few years. We view Intel's current cost disadvantage as offsetting any chip design competitive advantages the firm may have in areas like Altera's field programmable gate arrays, or FPGAs, Mobileye's automotive products, or any semis developed for the communications infrastructure or networking end markets.

Fair Value and Profit Drivers Brian Colello, CPA, Strategist, 17 Mar 2025

Our fair value estimate is $21 per share, which implies a 2025 enterprise value/adjusted EBITDA multiple of 12 times, and 2025 and 2026 adjusted price/earnings ratios of 82 times and 29 times, respectively.

Intel's revenue fell 14% in 2023, due to a significant pause in PC spending after a couple of strong years of upgrades during the covid-19 pandemic, but also because of market share losses and more cautious spending among data center customers. Intel didn't see a huge rebound in 2024 either and sales fell another 2%. We anticipate that market share losses and a lack of meaningful foundry business will cause Intel's revenue to fall 5% in 2025 and only grow at a low-single digit pace thereafter. This pace is below management's target of 10%-12%.

Looking at Intel's Client Computing Group, or CCG, which includes the firm's PC CPU business, we anticipate a 12% revenue decline in 2025 and low single digit revenue declines thereafter. We anticipate that Intel will continue to lose share to AMD and emerging ARM-based CPU vendors.

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In Data Center and AI, or DCAI, we project a 5% revenue decline in 2025, again due to market share loss, and flattish revenue thereafter. We are pessimistic about Intel's ability to sell server CPUs if wallet share continues to shift to AI servers, rather than traditional ones, while we are no longer anticipating any meaningful revenue from AI accelerators in the years ahead.

Intel is building its foundry business from the ground up. We model $0.9 billion of revenue from Foundry in 2025, growing to just under $4 billion in 2029 once the company's hefty manufacturing expansion plans are established. Intel has a $15 billion pipeline of foundry business, although it's possible that any foundry upside might be met by greater competition in its other core markets. It's conceivable that if Intel were to lose more share in CCG over time, it might be able to partially (if not fully) offset such losses by winning foundry business with these customers.

Intel's manufacturing missteps and a soft PC market have caused GAAP gross margins to crater from 62% in 2018 to 33% in 2024 (and non-GAAP gross margin to fall from 63% to 36%). We think this is the bottom for Intel's business as we model a 34% GAAP gross margin in 2025, expanding to 49% in 2029. Such expansion should occur as Intel moves production to TSMC while improving upon its foundry business. On a non-GAAP basis, we model a 36.5% gross margin in 2025, expanding to 50% in 2029.

On an operating margin basis, GAAP operating margin has also plummeted from 33% in 2018 to a negative 22% operating loss in 2024. We foresee a 6% and 1% operating loss in 2025 and 2026, respectively, but improvement to a nearly 20% operating margin in 2029. On an adjusted operating margin basis, we expect a 2% margin in 2025, 8% in 2026, and a recovery to 27% in 2029.

Risk and Uncertainty Brian Colello, CPA, Strategist, 12 Mar 2025

We assign Intel with a Morningstar Uncertainty Rating of Very High. Intel continually faces execution risk associated with keeping pace with Moore's Law and creating cutting-edge processors, both in terms of chip design and chip manufacturing. On the latter front, Intel stumbled in recent years, causing the firm to lose market share and suffer notable operating losses. We foresee execution risk associated with Intel's aggressive plans to achieve five processor nodes in four years, culminating with Intel 18A in 2025.

In PCs, Intel now squares off against a more formidable AMD, which has adopted chiplet designs and partnered with TSMC to develop high-end processors on par with (or better than) Intel's recent offerings. Outside of the x86 processor battles between Intel and AMD, we see a risk of Microsoft following Apple's lead and potentially pushing its PC operating system, Windows, toward greater compatibility with ARM-based processors. New ARM entrants could pose credible threats to both AMD and Intel. All the while, the PC market remains cyclical, and Intel will have to navigate the cycles accordingly.

In the data center, Intel again faces execution risk against the TSMC/AMD partnership, to stop its recent market share bleeding as well as the risk of ARM-based processors gaining prominence. We also foresee a wallet shift away from traditional cloud computing workloads (requiring Intel's CPUs) toward AI accelerator workloads (requiring GPUs from Nvidia). Intel's Gaudi product lineup didn't make a dent in the AI market versus Nvidia, and we have little hope that Intel will emerge as a meaningful vendor of AI accelerators in the years ahead.

On the environmental, social, and governance front, we do not foresee any material issues on the horizon. Perhaps the greatest risk is the potential scarcity of experienced chip design talent within the industry.

Capital Allocation Brian Colello, CPA, Strategist, 12 Mar 2025

We assign Intel a Standard Capital Allocation Rating. The rating reflects our assessments of a weak balance sheet (considering recent operating losses), fair investments associated with the firm's strategy and execution, and mixed shareholder distribution policies.

Intel does not have a sound balance sheet today, in our view, given the company's recent inability to generate free cash flow and its aspirations for hefty capital investments into its next wave of chip manufacturing across the globe. As of December 2024, Intel held $22.1 billion of cash and investments, as compared with $50 billion of debt. Intel was regularly earning $10 billion-plus of free cash flow per year in its heyday but burned free cash flow in each year from 2022 to 2024. Financial contributions from partners will be needed to prevent further free cash flow burn in 2025.

Intel has a mixed track record of acquisitions, in our view. Mobileye, acquired for $15.3 billion in 2017, did well, although the business (publicly traded) carries a lower market cap (as of March 2025) than what Intel paid for it. Intel's acquisition of Habana Labs ($2 billion in December 2019) was crucial in its AI accelerator strategy, but still did not allow for the firm to make up for a hardware, software, or networking advantage amassed by Nvidia in this space.

We consider Intel's acquisition of Altera ($16.7 billion in 2015) as mixed—while Altera remains a prominent field programmable gate array, or FPGA, chip designer, we have little evidence that it has fared better under the Intel umbrella, and perhaps it fared worse than its rival Xilinx (since acquired by AMD). Intel's proposed deal for Tower Semiconductor ($5.4 billion) made strategic sense to us as Intel will need to raise its game in foundry services for others, but the deal was terminated as it failed to receive approval in China.

Intel's internal investments are a sound strategic move, in our view. We believe Intel Foundry should continue to invest in leading-edge chip manufacturing, unlike AMD's decision a decade ago to spin out its fabs into GlobalFoundries. In our view, Intel has little choice but to strive to get back on track in chip manufacturing to come close to parity with TSMC. Such investments will strain the balance sheet, however, and will still require a host of government incentives and investment partnerships to come to fruition. It's conceivable that Intel might try to spin off the foundry business.

On the capital distribution front, negative free cash flow forced Intel to slash its previously healthy dividend.

Analyst Notes Archive

Intel: Remains Focused on Products as Lip-Bu Tan Becomes CEO; Maintain $21 Fair Value Estimate
Brian Colello, CPA,Strategist,12 Mar 2025

We maintain our $21 fair value estimate and Standard Capital Allocation Ratings for no-moat Intel as the company announced former board member, and well-respected semiconductor industry veteran, Lip-Bu Tan as its new CEO. Reuters reported in December that Tan was being considered for the role. We view Tan as a wise hire for Intel who will likely accelerate the company's split between its chip design (Intel products) and manufacturing (Intel foundry) businesses—certainly internally and perhaps with a corporate breakup as well. Investors applauded the move with shares up 12% after-hours.Tan achieved tremendous success as the CEO of wide-moat Cadence Design Systems from 2009 to 2021, while serving on its board from 2004 to 2023. Intel elected Tan to its board in August 2022, although Tan resigned in August 2024. A Reuters report later that month suggested Tan faced "differences with CEO Pat Gelsinger" and left out of frustrations with "the company's large workforce, its approach to contract manufacturing and Intel's risk-averse and bureaucratic culture." Gelsinger exited Intel in December 2024, as the board likely had similar concerns. We believe his departure heightened the possibility of an Intel breakup, and now Tan's hire raises this likelihood. We can only assume that Tan will nudge Intel toward more outsourced manufacturing with Taiwan Semi, likely to the detriment of Intel foundry, which might lead to a spinoff. Further streamlining of the business might also be in play.Our best-case scenario for Intel involves outside support for Intel foundry (driven either directly or indirectly by the US government), which we view as a drag that offsets a profitable Intel products business. A breakup of products and foundry, perhaps with a rumored sale of products to reported suitors like Qualcomm or Broadcom, would likely unlock additional value for current shareholders.

Intel: Maintain $21 Fair Value Estimate Amid Breakup Reports and Proposals Brian Colello, CPA,Strategist,18 Feb 2025

We maintain our $21 fair value estimate for no-moat Intel even though shares have appreciated in recent days based up news reports associated with a potential breakup of the business, including a potential partnership with Taiwan Semiconductor Manufacturing, Intel's main competitor on the manufacturing front. Our valuation is based on a discounted cash flow estimate for a combined Intel, but it also effectively equates to a reasonable valuation for the chip design business while assigning no value to the manufacturing footprint, which is costly to update and maintain, is depreciating rapidly, and may lose business with its best customer (Intel's chip design business). The best-case scenario for Intel investors, in our opinion, is a spinoff of design with some sort of government bailout or cash

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infusion for foundry. Shares appear a little overvalued, especially if no deal were to come to fruition.TSMC's initial public comments were not enthusiastic toward ownership of Intel's fabs, and we suspect that TSMC inherently has a desire to control its manufacturing technologies. However, threats of tariffs on chips manufactured in Taiwan (which are essentially all advanced processors designed by Apple, AMD, Nvidia, and others) will likely change the economics. It's possible that an investment in Intel's fabs, in combination with similar investments by TSMC's key customers, might be a questionable investment but perhaps the right one if it can keep tariffs off the table. Our best estimation at this point is that Intel's current manufacturing expertise (including Intel 18A) will be used for Intel products while TSMC and its customers take over some of these existing and future fabs to run US-based manufacturing. We surmise that the percentage of future production at Intel's fabs will not only depend on technological expertise but more so from how geopolitics will tip the scales toward US versus Taiwanese manufacturing.

Intel Earnings: Maintain $21 Fair Value as Intel Forges Ahead With Interim Management Brian Colello, CPA,Strategist,31 Jan 2025

Intel's fourth-quarter results (the first issued under new leadership) were mixed. Fourth-quarter revenue and earnings were ahead of guidance, while we view Intel's first-quarter guidance as a bit light. We maintain our $21 fair value estimate for no-moat Intel and view shares as fairly valued.Revenue in the December quarter was $14.3 billion, down 7% year over year but up 7% sequentially and at the high end of guidance of $13.3 billion-$14.3 billion. Client revenue (that is, PC processors) fared well, up 9% sequentially, although Intel cautioned that it's likely that some of the upside came from buying ahead of potential tariffs. Data center and AI revenue rose 1% sequentially as Intel conceded that it still has catching up to do to recover share lost to AMD in prior periods. Adjusted gross margin came in at an admirable 42.1%, down 670 basis points year over year but ahead of guidance of 39.5%.Intel expects revenue in the March quarter to be $12.2 billion at the midpoint of guidance, which would be down 4% year over year and down 14% sequentially, a bit worse than the roughly 10% sequential decline the firm normally sees due to seasonal weakness. Macroeconomic headwinds and tariff concerns are also reflected in the soft guidance. Adjusted gross margin is forecast to be 36%, down 910 basis points year over year, as Intel will face a negative product mix and might be more aggressive on price in an effort to combat share loss.Intel's most important manufacturing node, Intel 18a, remains on pace to launch in the second half of 2025 with Intel's Panther Lake mobile CPU. However, its first data center chip on 18a, Clearwater Forest, was pushed out to the first half of 2026. Intel is also hitting the reset button on artificial intelligence, as its next-gen accelerator, Falcon Shores, will no longer come to market, and Intel will work on building full-rack solutions to arrive in future years.

Intel: We Maintain Our $21 Fair Value Estimate Amid CEO Pat Gelsinger's Exit Brian Colello, CPA,Strategist,2 Dec 2024

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We maintain our $21 fair value estimate for no-moat Intel upon the announcement that CEO Pat Gelsinger has retired and will not be leading Intel's turnaround in the months ahead. Intel's stock rallied about 4% to $25 per share on the news. Given Gelsinger's loyalty to Intel, we attribute the appreciation to the market's greater optimism that Intel will be broken up and, in turn, will unlock shareholder value. We remain skeptical of this playbook, however. For any potential upside for Intel associated with spinning out its industry-leading PC and server processor design business, we fear the overhang of a massive, costly manufacturing, or foundry, business that will lose its primary customer (that is, Intel's internal CPU design team). This overhang would only worsen, in our view, if Intel's manufacturing development of Intel 18A in 2025 is not progressing as well as advertised, or if the US government Chips Act funding won't be as supportive as initially envisioned.From our point of view, Gelsinger's strategy for Intel was the proper one—continue to focus on leading-edge CPU development while investing in advanced manufacturing so that Intel's foundry (that is, fabrication facilities, or fabs) remained the best option for Intel's design team. This integrated device model served Intel well for decades when it had both best-of-breed CPU design and fabs. Gelsinger's exit may fast-track a breakup of design versus fabs. Again, however, for any upside we foresee in the design business, we view the fabs as being all the less attractive for a potential buyer.The best bull-case scenario we foresee is if the design team were spun out of Intel (perhaps to remain independent, or perhaps merging with another fabless firm like Qualcomm, as has been speculated). Given the US government's focus on onshore chip manufacturing, perhaps an even larger package of funding or incentives could prop up the fab business and make it less of an overhang on the entire Intel entity today.

Intel Earnings: We Maintain Our $21 Fair Value Estimate as Firm Still Has a Tough Road Ahead Brian Colello, CPA,Strategist,1 Nov 2024

No-moat Intel reported decent third-quarter revenue (albeit with dreadful operating losses because of a host of write-offs), but gave investors a nice fourth-quarter revenue outlook that suggests demand for the company’s products is not in freefall. We suspect that the positive revenue results drove the stock up over 8% after-hours, while the variety of write-offs and restructuring was likely ignored as it is well known that Intel needs to reorganize its operations. Still, we are only cautiously optimistic about Intel’s revenue performance and maintain our $21 fair value estimate. We reiterate our Very High Morningstar Uncertainty Rating—while we acknowledge that Intel has upside if it can deliver on its aggressive manufacturing road map. We are equally concerned about severe downside if its manufacturing efforts were to fail.Revenue in the September quarter was $13.28 billion, down 6% year over year, but up 3.5% sequentially and toward the high end of guidance of $12.5 billion-$13.5 billion. Intel’s data center and artificial intelligence segment was the bright spot with revenue up 10% sequentially and 9% year over year thanks to improved demand for server processors. Client Computing Group's revenue was down 1% sequentially and down 7% year over year. Adjusted gross margin fell materially to 18% versus 39% a quarter ago and guidance of 38%, mostly due to the $3.1 billion write-off of equipment associated with the company's older Intel 7 processers, which was not in prior guidance. Intel incurred an adjusted operating loss of negative $0.46 per share, thanks to this write-off (while ignoring other write-offs that drove GAAP operating loss to negative $3.88 per share).Intel expects revenue in the December quarter to be $13.8 billion, down 10% year over year, but up 4% sequentially and ahead of FactSet consensus estimates. Intel doesn't expect similar write-offs next quarter, guiding to 39.5% adjusted gross margin and $0.12 of non-GAAP EPS.

Intel and Qualcomm: We Maintain Our Fair Value Estimates Despite WSJ's Reports of Takeover Talks Brian Colello, CPA,Strategist,20 Sep 2024

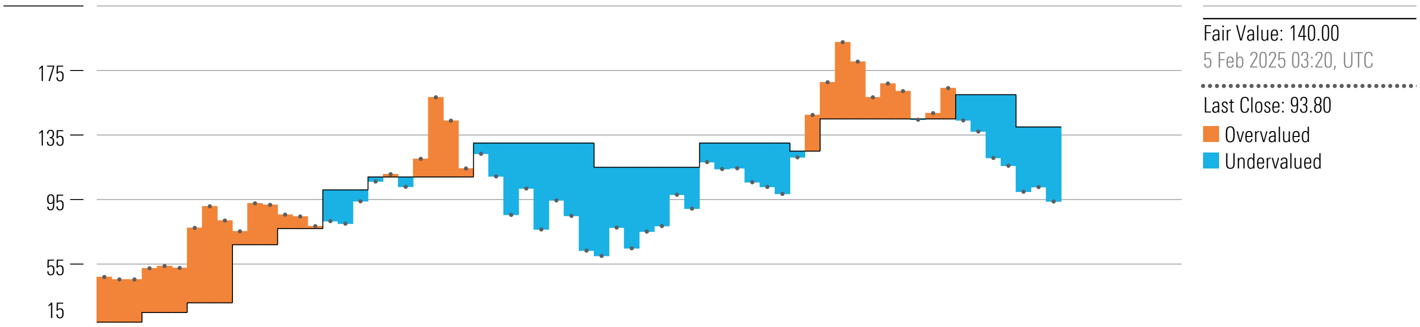
We intend to maintain our $21 fair value estimate for no-moat Intel and $180 for narrow-moat Qualcomm following The Wall Street Journal's report on Sept. 20 that Qualcomm "made a takeover approach to rival Intel in recent days." No deal price was discussed in the report, and we agree with the Journal's assessment that there would be significant antitrust scrutiny around such a deal, so we're hesitant to believe that a bid to take over Intel that would appeal to Intel shareholders is imminent. Intel's shares rose 3% on Sept. 20 while Qualcomm fell 3%, perhaps signaling to the latter firm that Qualcomm shareholders might not be thrilled with such a takeover.We're not necessarily surprised that talks are being made, as Intel is in the middle of a significant transformation that will likely include the shedding of additional assets and the internal split of its chip design and foundry businesses. However, a takeover by Qualcomm would not resolve Intel's fundamental problem of being at a competitive disadvantage in chip manufacturing to Taiwan Semi. We're not confident that ownership by Qualcomm would stop the bleeding in terms of Intel's share losses to AMD in server or PC central processing units either.If Qualcomm were to pay a paltry premium, then Qualcomm's steadier chip and licensing businesses might bring additional cash into Intel to allow it to achieve its manufacturing aspirations, hopefully to be capped off with Intel 18A in 2025. However, Qualcomm's "value add" in this deal might merely come from strategically looking at Intel's business with fresh eyes, perhaps leading to faster spinoffs of Altera and/or Mobileye, or more aggressively shifting Intel's chip designs to TSMC. The latter move would again invite significant scrutiny, however, given the U.S. government's CHIPS Act awards to Intel and, more generally, substantial geopolitical interest in the US and Europe of having leading-edge chip manufacturing on its shores.

Morningstar Equity Analyst Report | Report as of 4 Apr 2025 01:57, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ - ALL MARKETS

Intel Corp INTC ★★★ 3 Apr 2025 21:37, UTC

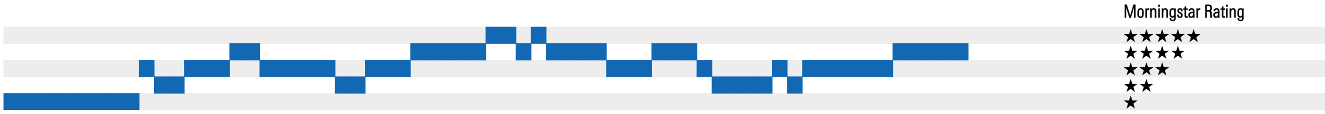
Competitors Price vs. Fair Value

Advanced Micro Devices Inc AMD



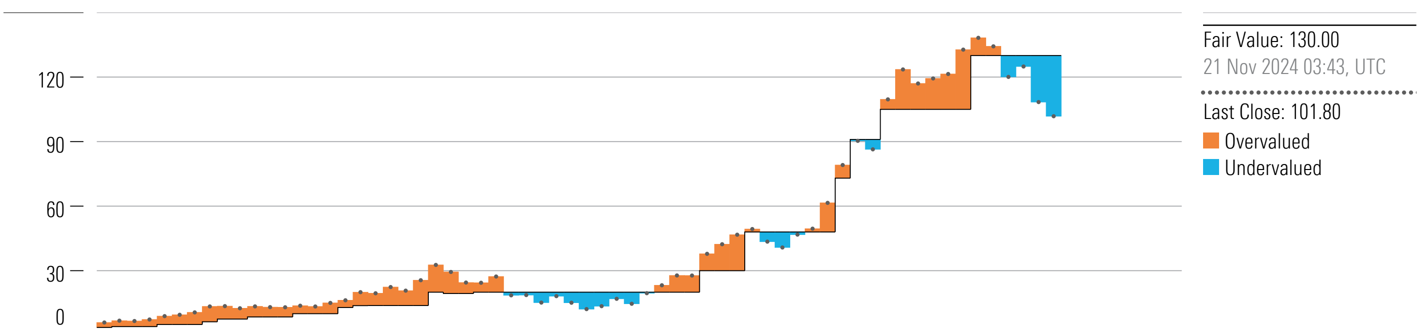
	2020	2021	2022	2023	2024	YTD
Price/Fair Value	1.37	1.32	0.56	1.18	0.75	0.67
Total Return %	99.98	56.91	-54.99	127.59	-18.06	-22.34

Morningstar Rating



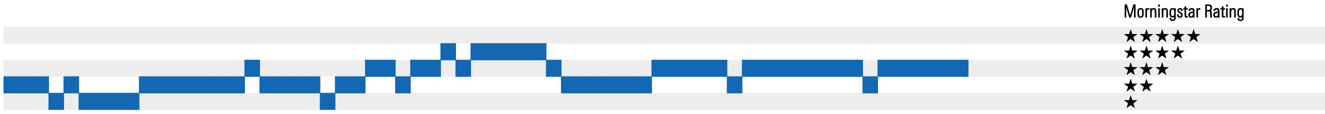
Total Return % as of 03 Apr 2025. Last Close as of 03 Apr 2025. Fair Value as of 5 Feb 2025 03:20, UTC.

NVIDIA Corp NVDA



	2020	2021	2022	2023	2024	YTD
Price/Fair Value	1.54	1.52	0.73	1.03	1.03	0.78
Total Return %	122.20	125.41	-50.26	238.98	171.24	-24.19

Morningstar Rating



Total Return % as of 03 Apr 2025. Last Close as of 03 Apr 2025. Fair Value as of 21 Nov 2024 03:43, UTC.

Morningstar Equity Analyst Report | Report as of 4 Apr 2025 01:57, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ - ALL MARKETS

Intel Corp INTC ★★★ 3 Apr 2025 21:37, UTC

Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Equity Style Box	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
22.43 USD 3 Apr 2025	21.00 USD 2 Aug 2024 03:48, UTC	1.07	97.81 USD Bil 3 Apr 2025	None	Large Blend	Very High	Standard	2 Apr 2025 05:00, UTC

Morningstar Valuation Model Summary

Financials as of 30 Jan 2025	Actual			Forecast				
Fiscal Year, ends 31 Dec	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
Revenue (USD Mil)	63,054	54,228	53,101	52,473	54,263	55,648	56,523	57,992
Operating Income (USD Mil)	2,336	31	-4,708	-1,743	1,413	4,751	7,759	11,042
EBITDA (USD Mil)	15,369	9,695	-299	11,157	15,663	20,351	24,709	29,342
Adjusted EBITDA (USD Mil)	15,369	9,695	-299	11,157	15,663	20,351	24,709	29,342
Net Income (USD Mil)	8,014	1,689	-18,756	-2,282	642	5,440	8,237	11,281
Adjusted Net Income (USD Mil)	7,593	4,420	-566	2,069	4,424	9,148	11,768	14,820
Free Cash Flow To The Firm (USD Mil)	887	-13,188	-20,447	-10,200	-4,922	6,652	10,580	14,412
Weighted Average Diluted Shares Outstanding (Mil)	4,123	4,212	4,280	4,319	4,319	4,319	4,319	4,319
Earnings Per Share (Diluted) (USD)	1.94	0.40	-4.38	-0.53	0.15	1.26	1.91	2.61
Adjusted Earnings Per Share (Diluted) (USD)	1.84	1.05	-0.13	0.48	1.02	2.12	2.72	3.43
Dividends Per Share (USD)	1.46	0.74	0.38	0.00	0.00	0.00	0.00	0.00

Margins & Returns as of 30 Jan 2025		Actual			Forecast					
	3 Year Avg	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**5 Year Avg**
Operating Margin %	-6.0	3.7	0.1	-8.9	-3.3	2.6	8.5	13.7	19.0	7.6
EBITDA Margin %	—	24.4	17.9	-0.6	21.3	28.9	36.6	43.7	50.6	—
Adjusted EBITDA Margin %	—	24.4	17.9	-0.6	21.3	28.9	36.6	43.7	50.6	36.2
Net Margin %	-6.5	12.7	3.1	-35.3	-4.4	1.2	9.8	14.6	19.5	8.1
Adjusted Net Margin %	6.4	12.0	8.2	-1.1	3.9	8.2	16.4	20.8	25.6	15.0
Free Cash Flow To The Firm Margin %	-20.5	1.4	-24.3	-38.5	-19.4	-9.1	12.0	18.7	24.9	5.4

Growth & Ratios as of 30 Jan 2025		Actual			Forecast					
	3 Year CAGR	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**5 Year CAGR**
Revenue Growth %	-12.4	-20.2	-14.0	-2.1	-1.2	3.4	2.6	1.6	2.6	1.8
Operating Income Growth %	—	-89.4	-98.7	-15287.1	-63.0	-181.1	236.3	63.3	42.3	—
EBITDA Growth %	-63.6	-50.8	-36.9	-103.1	-3831.6	40.4	29.9	21.4	18.8	-744.2
Adjusted EBITDA Growth %	-121.2	-50.8	-36.9	-103.1	-3831.6	40.4	29.9	21.4	18.8	-350.2
Earnings Per Share Growth %	—	-60.0	-79.4	-1192.8	-87.9	-128.1	747.5	51.4	37.0	—
Adjusted Earnings Per Share Growth %	—	-65.3	-43.0	-112.6	-462.3	113.8	106.8	28.6	25.9	—

Valuation as of 30 Jan 2025	Actual			Forecast				
	2022	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
Price/Earning	14.4	47.9	-154.2	46.7	22.0	10.6	8.2	6.5
Price/Sales	1.7	3.9	1.6	1.9	1.8	1.8	1.7	1.7
Price/Book	1.1	2.0	0.9	1.0	1.0	0.9	0.9	0.8
Price/Cash Flow	—	—	—	—	—	—	—	—
EV/EBITDA	8.2	24.3	-377.8	11.3	8.0	6.2	5.1	4.3
EV/EBIT	54.0	7,603.3	-24.0	-72.2	89.0	26.5	16.2	11.4
Dividend Yield %	5.5	1.5	1.9	—	—	—	—	—
Dividend Payout %	79.3	70.5	-283.6	0.0	0.0	0.0	0.0	0.0
Free Cash Flow Yield %	—	—	—	—	—	—	—	—

Operating Performance / Profitability as of 30 Jan 2025	Actual			Forecast				
Fiscal Year, ends 31 Dec	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
ROA %	4.4	0.9	-9.6	-1.2	0.4	2.9	4.3	5.6
ROE %	7.8	1.5	-17.9	-2.2	0.6	5.1	7.2	8.9
ROIC %	2.7	0.6	-1.3	-0.8	0.0	1.0	2.3	3.5

Morningstar Equity Analyst Report | Report as of 4 Apr 2025 01:57, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ - ALL MARKETS

Intel Corp INTC ★★★ 3 Apr 2025 21:37, UTC

Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Equity Style Box	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
22.43 USD 3 Apr 2025	21.00 USD 2 Aug 2024 03:48, UTC	1.07	97.81 USD Bil 3 Apr 2025	None	Large Blend	Very High	Standard	2 Apr 2025 05:00, UTC

Financial Leverage (Reporting Currency)

Fiscal Year, ends 31 Dec	Actual 2022	Actual 2023	Actual 2024	Forecast 2025	Forecast 2026	Forecast 2027	Forecast 2028	Forecast 2029
Debt/Capital %	27.8	18.9	—	33.9	30.3	27.4	24.3	21.5
Assets/Equity	1.8	1.7	1.9	1.9	1.8	1.7	1.7	1.6
Net Debt/EBITDA	0.9	2.5	—	1.8	1.6	0.8	0.2	-0.4
Total Debt/EBITDA	2.7	5.1	—	4.5	3.0	2.2	1.6	1.3
EBITDA/ Net Interest Expense	-2.8	-14.5	0.6	-15.4	-19.0	-22.0	-24.1	-26.1

Forecast Revisions as of 30 Jan 2025

Prior data as of 20 Dec 2024

	2025 Current	2025 Prior	2026 Current	2026 Prior	2027 Current	2027 Prior
Fair Value Estimate Change (Trading Currency)	21.00	21.00	—	—	—	—
Revenue (USD Mil)	52,473	52,644	54,263	53,363	55,648	57,205
Operating Income (USD Mil)	-1,743	-5,611	1,413	105	4,751	3,670
EBITDA (USD Mil)	11,157	-2,564	15,663	11,553	20,351	17,072
Net Income (USD Mil)	2,069	-607	4,424	3,007	9,148	6,804
Earnings Per Share (Diluted) (USD)	-0.53	-4.61	0.15	-0.25	1.26	0.72
Adjusted Earnings Per Share (Diluted) (USD)	0.48	-0.14	1.02	0.70	2.12	1.59
Dividends Per Share (USD)	0.00	0.38	0.00	0.00	0.00	0.00

Key Valuation Drivers as of 30 Jan 2025

Cost of Equity %	9.0
Pre-Tax Cost of Debt %	8.0
Weighted Average Cost of Capital %	8.1
Long-Run Tax Rate %	21.0
Stage II EBI Growth Rate %	5.0
Stage II Investment Rate %	27.8
Perpetuity Year	10

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

Discounted Cash Flow Valuation as of 30 Jan 2025

	USD Mil
Present Value Stage I	9,796
Present Value Stage II	24,454
Present Value Stage III	83,195
Total Firm Value	**117,445**
Cash and Equivalents	22,062
Debt	50,011
Other Adjustments	0
Equity Value	**89,496**
Projected Diluted Shares	4,292
Fair Value per Share (USD)	**21.00**

Morningstar Equity Analyst Report | Report as of 4 Apr 2025 01:57, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ - ALL MARKETS Page 16 of 22

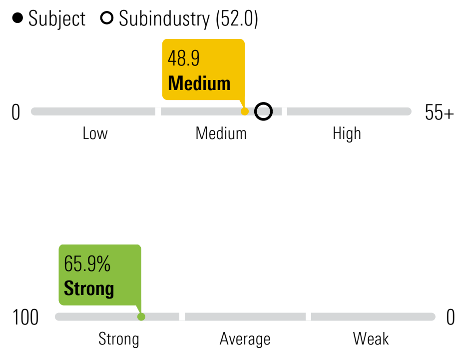
Intel Corp INTC ★★★ 3 Apr 2025 21:37, UTC

Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Equity Style Box	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
22.43 USD 3 Apr 2025	21.00 USD 2 Aug 2024 03:48, UTC	1.07	97.81 USD Bil 3 Apr 2025	None	Large Blend	Very High	Standard	2 Apr 2025 05:00, UTC

ESG Risk Rating Breakdown

Exposure	
Company Exposure[1]	48.9
– Manageable Risk	45.2
Unmanageable Risk[2]	**3.7**

Management	
Manageable Risk	45.2
– Managed Risk[3]	29.7
Management Gap[4]	**15.4**
Overall Unmanaged Risk	**19.2**



- 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 65.9% 4. Management Gap assesses risks that are not managed, but are considered manageable 5. ESG Risk Rating Assessment = Overall Unmanaged Risk = Management Gap plus Unmanageable Risk

ESG Risk Rating Assessment[5]

ESG Risk Rating is of Apr 02, 2025. Highest Controversy Level is as of Mar 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 02 Apr 2025

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

Company Name	Exposure	Range	Management	Range	ESG Risk Rating	Range
Intel Corp	48.9 | Medium	0 – 55+	65.9 | Strong	100 – 0	19.2 | Low	0 – 40+
Advanced Micro Devices Inc	31.4 | Low	0 – 55+	64.4 | Strong	100 – 0	12.5 | Low	0 – 40+
NVIDIA Corp	30.2 | Low	0 – 55+	62.9 | Strong	100 – 0	12.5 | Low	0 – 40+
Taiwan Semiconductor Co Ltd	49.4 | Medium	0 – 55+	54.9 | Strong	100 – 0	24.7 | Medium	0 – 40+
—	— | —	0 – 55+	— | —	100 – 0	— | —	0 – 40+

Morningstar Equity Analyst Report | Report as of 4 Apr 2025 01:57, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ - ALL MARKETS

Appendix

Historical Morningstar Rating

Intel Corp INTC 3 Apr 2025 21:37, 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
★★★★★	★★★★★	★★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★

Advanced Micro Devices Inc AMD 3 Apr 2025 21:35, 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
★★	★★	★★★	★	★	★	★	★	★	★	★	★

NVIDIA Corp NVDA 3 Apr 2025 21:37, 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
★★	★★	★★	★	★	★	★	★★	★	★★	★★	★★

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.

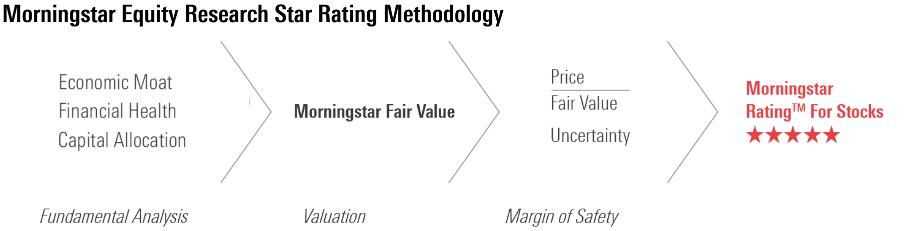
Because a dollar earned today is worth more than a dollar earned tomorrow, we discount our projections of cash flows in stages I, II, and III to arrive at a total present value of expected future cash flows. Because we are modeling free cash flow to the firm—representing cash available to provide a return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

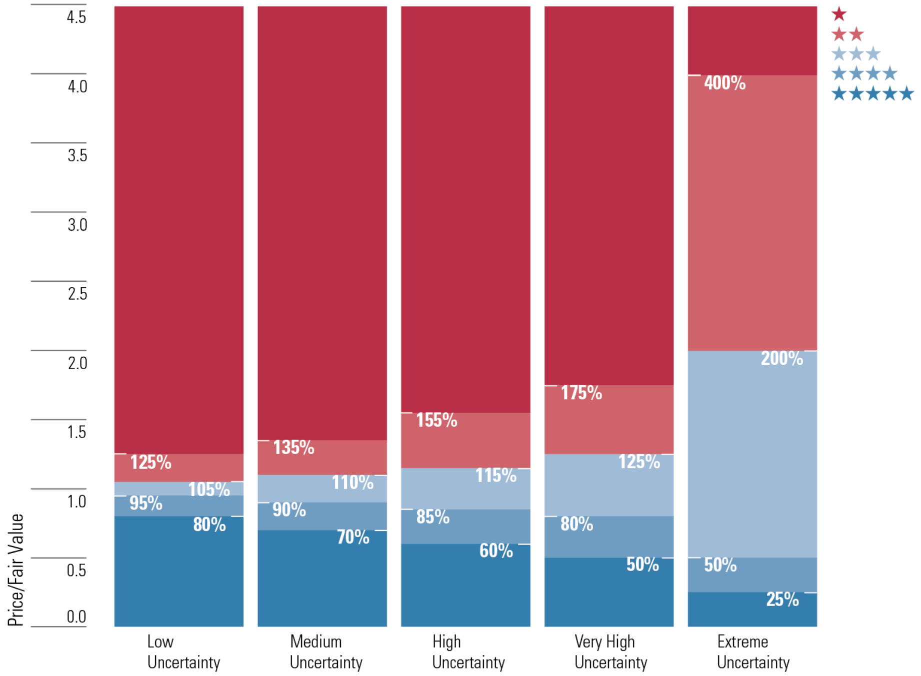
4. Market Price

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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