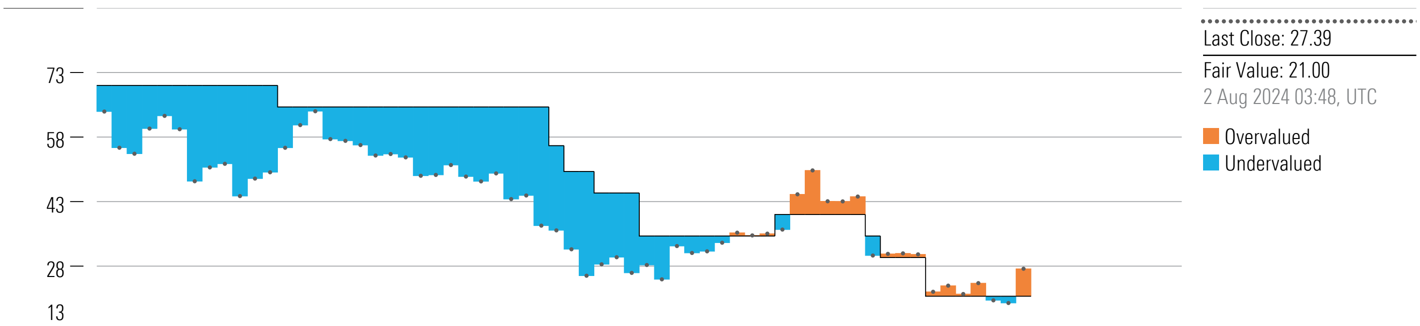
Morningstar Equity Analyst Report | Report as of 19 Feb 2025 01:02, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ - ALL MARKETS

Intel Corp INTC ★★ 18 Feb 2025 22:34, UTC

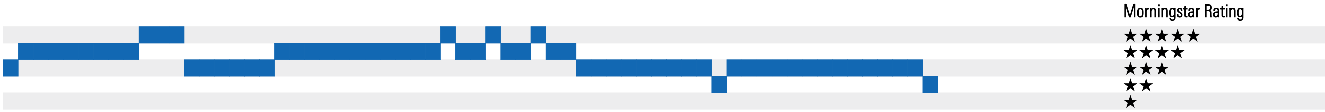
Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Equity Style Box	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
27.39 USD 18 Feb 2025	21.00 USD 2 Aug 2024 03:48, UTC	1.30	118.60 USD Bil 18 Feb 2025	None	Large Value	Very High	Standard	5 Feb 2025 06:00, UTC

Price vs. Fair Value



2020	2021	2022	2023	2024	YTD	
0.71	0.79	0.59	1.26	0.95	1.30	Price/Fair Value
-14.55	6.16	-45.84	92.92	-59.35	36.61	Total Return %

Morningstar Rating



Total Return % as of 18 Feb 2025. Last Close as of 18 Feb 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: Maintain $21 Fair Value Estimate Amid Breakup Reports and Proposals

Analyst Note 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 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

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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.

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.

Business Strategy & Outlook Brian Colello, CPA, Strategist, 26 Apr 2024

We expect Intel will remain the market share leader in central processing units, or CPUs, in PCs and servers for years to come. However, Intel's best days are likely 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. We think Intel's aspirations to regain parity with TSMC is the right path forward but faces some execution risk. Even if successful, Intel's competitors will be stronger than when the firm was dominant a decade ago. In turn, we assign Intel a no-moat rating, a disappointing erosion from previous narrow- and wide-moat ratings.

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 has forged a tight partnership with TSMC, and the duo has emerged as a credible second source to Intel, allowing AMD to gain market share 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, which might lead a path forward for the Windows ecosystem to make a similar switch.

Even if Intel achieves its aspirations of reaching five manufacturing node improvements in four years, there is no guarantee of a booming market for PC or server CPUs. Meanwhile, the market for artificial intelligence accelerators, such as Intel's Gaudi products, should skyrocket, but we view Nvidia, and even AMD, as better positioned in the AI market.

Bulls Say Brian Colello, CPA, Strategist, 17 Sep 2024

- Intel is one of the largest semiconductor companies in the world and holds the lion's share of the PC and server processor markets.
- Intel is making some smart moves in its turnaround plans, such as shedding some noncore businesses, spinning off shares of its attractive automotive business (Mobileye), and seeking innovative co-investment partnerships with financial firms.
- The AI semiconductor market is booming, and Intel is one of the few merchant firms with a diverse

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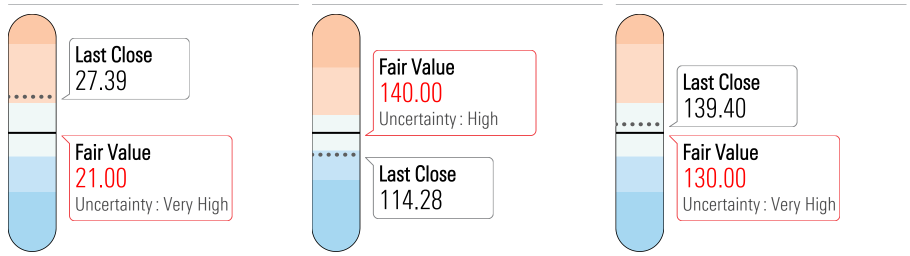
Competitors



	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	Overvalued 18 Feb 2025	Undervalued 18 Feb 2025	Fairly Valued 18 Feb 2025
Morningstar Rating	★★18 Feb 2025 22:34, UTC	★★★★18 Feb 2025 22:33, UTC	★★★18 Feb 2025 22:33, UTC
Analyst	Brian Colello, Strategist	Brian Colello, Strategist	Brian Colello, Strategist
Capital Allocation	Standard	Exemplary	Exemplary
Price/Fair Value	1.30	0.82	1.07
Price/Sales	1.90	7.18	30.48
Price/Book	1.03	3.19	51.64
Price/Earning	—	103.57	54.82
Dividend Yield	1.59%	0.00%	—
Market Cap	118.60 Bil	185.19 Bil	3,413.91 Bil
52-Week Range	18.51—46.63	106.50—227.30	66.25—153.13
Investment Style	Large Value	Large Blend	Large Growth

enough portfolio to serve a larger portion of the market.

Bears Say Brian Colello, CPA, Strategist, 17 Sep 2024

- Intel encountered significant manufacturing delays in years past, and there is no guarantee that it can execute well in its aggressive aspirations to develop five process nodes in four years.
- Even if Intel can regain manufacturing parity with TSMC, AMD now sits as a far more credible chip designer in the x86 space for PC and server CPUs.
- Nvidia's GPUs have captured most of the artificial intelligence accelerator market, and cloud computing spending may continue to shift toward these GPUs, and away from Intel's products, over time.

Economic Moat Brian Colello, CPA, Strategist, 23 Aug 2023

We assign Intel a no-moat rating. The company's returns on invested capital have fallen in recent years, and the firm did not earn excess returns on capital in 2022, nor do we expect it will do so in 2023. The

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deterioration stems from the firm's manufacturing struggles and hefty investment phase in new manufacturing processes. We don't believe the company will generate excess returns on capital in the next three to five years (even when considering government subsidies and other incentives). We are also not entirely confident in excess returns on capital looking five to 10 years out if its research and development (R&D) efforts are not successful, again given the capital-intensive nature of cutting-edge chip manufacturing. We acknowledge that, if Intel were to perfectly execute on its aggressive technological roadmap, it may warrant an economic moat rating in the future. Intel's roadmap is on track currently, but the company has stumbled before, and we would like to see further progress before we award Intel with a narrow moat rating once again.

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

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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 and may increase these investments over time. 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. Further, AMD has focused on a chiplet strategy with TSMC that is improving yields and flexibility, boosting AMD's portfolio even further. 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 and now 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

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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. Still, we recognize that mega-cap tech firms and cloud leaders (Microsoft, Apple, Amazon) 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, 80% 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.

Longer term, Intel is building its foundry services business (IFS) from the ground up. Intel could conceivably carve out a moat here in the long run if it can again attain manufacturing process leadership, but it will be a highly capital-intensive initiative, so we’re not holding out hope for a moat in IFS just yet.

Fair Value and Profit Drivers Brian Colello, CPA, Strategist, 17 Sep 2024

Our fair value estimate is $21 per share, which implies a 2024 enterprise value/adjusted EBITDA multiple of 22 times, and a 2025 adjusted price/earnings ratio of 20 times (the 2024 price/earnings ratio is not meaningful).

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. We don’t foresee a huge rebound in 2024 and we model a further decline of 3.5%. We anticipate that Intel will achieve only 1.5% revenue growth in PC CPUs in 2024, and we still expect Intel to earn $0.5 billion in AI accelerator revenue from its Gaudi products. However, spending on server CPUs has been muted as cloud customers have focused their spending on AI accelerators (mostly from Nvidia) instead. Meanwhile, its ancillary businesses will face severe

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headwinds in telecom spending, which will weigh on overall growth.

Medium-term, we think that Intel will benefit from a recovery in server CPU spending, further Gaudi growth, and a jump-start in foundry revenue. For total revenue, we model 10% growth in 2025 and 9% growth in 2026. On a longer-term, midcycle basis, we think the 6%-8% range is reasonable, although it is below management's target of 10%-12%. We anticipate minimal long-term, midcycle growth in PC and data center CPUs, but should achieve nice growth with Mobileye, Gaudi (within the DCAI segment), and Intel Foundry.

Looking at Intel's Client Computing Group, which includes the firm's PC CPU business, we anticipate 1.5% revenue growth in 2024 and a 3% CAGR over the next five years. We no longer forecast a massive rebound in CCG—we think Intel may benefit from the rise of the AI PC, but Qualcomm and others may supply CPUs into these devices as well.

In Data Center and AI, or DCAI, we project compound average revenue growth of 7% per year over the next five years with long-term midcycle growth in the mid-single-digit range. We acknowledge that Intel may achieve upside in DCAI if its Gaudi AI accelerators can gain adoption, but we are also pessimistic about Intel's ability to sell server CPUs if wallet share continues to shift to AI servers, rather than traditional ones. Intel also faces the risk of share loss in server CPUs to AMD, Nvidia, and in-house solutions.

Intel is building its foundry business from the ground up. We model $2.2 billion of revenue from Foundry in 2025, growing to nearly $4 billion in 2028 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 40% in 2023 (and non-GAAP gross margin to fall from 63% to 44%). We think gross margins will fare even worse, falling to 37% and 40% on a GAAP and non-GAAP basis, respectively, in 2024, and 37% and 41% in 2025. Longer term, we foresee a recovery and model a 2028 adjusted gross margin of 48%, which is still below management's target of 52%-56% margins when Foundry reaches breakeven (which we think will occur in 2027).

On an operating margin basis, GAAP operating margin has also plummeted from 33% in 2018 to breakeven (0.2%) in 2023. We foresee a 12% operating loss in 2024 and breakeven again in 2025. Longer term, we anticipate improvement to a 15% operating margin in 2028. On an adjusted operating margin basis, we expect breakeven in 2024, a 10% margin in 2025, and a recovery to 22% in 2028, just short of management's target of 23%-28% when Foundry reaches breakeven (which we think may

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happen in 2027 or 2028).

Risk and Uncertainty Brian Colello, CPA, Strategist, 17 Sep 2024

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 by the end of 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. If this were to occur, 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 is growing rapidly but still represents a tiny portion of the AI market versus Nvidia. Nvidia's software tools, CUDA, around its GPUs raises the bar for rivals like Intel to catch up.

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, 26 Apr 2024

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 March 2024, Intel held $21.3 billion of cash and investments, as compared with $52.4 billion of debt. As EBITDA has plummeted in recent quarters, the firm's net debt/ EBITDA ratio is predictably higher and would be at concerning levels if Intel were to never turn it around. Ultimately, we think that Intel will work its way out of these financial jeopardies in the next two to three years or so, especially if it can properly execute on its manufacturing targets.

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Intel Corp INTC ★★ 18 Feb 2025 22:34, UTC

Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Equity Style Box	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
27.39 USD 18 Feb 2025	21.00 USD 2 Aug 2024 03:48, UTC	1.30	118.60 USD Bil 18 Feb 2025	None	Large Value	Very High	Standard	5 Feb 2025 06:00, UTC

Intel has a mixed track record of acquisitions, in our view. Mobileye, acquired for $15.3 billion in 2017, has perhaps fared the best, as Intel is now spinning out its shares and the business holds a higher valuation than when the company acquired it. Intel's acquisition of Habana Labs ($2 billion in Dec 2019) may bear fruit, as its Gaudi AI accelerators are gaining adoption for AI workloads, albeit not nearly at the same pace as industry-leading GPUs from Nvidia. 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 don't believe the company can fully abandon 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 reach parity (or better) 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 someday, but given its hefty operating losses and the ongoing turnaround, we wouldn't expect this to happen for several more years, if at all.

On the capital distribution front, Intel paid a healthy dividend to investors in years past, which we considered as appropriate for a well-running firm. Today, however, Intel's manufacturing missteps caused the company to slash its dividend by about two thirds. We think this is the right move, but considering the company's ongoing investments, we could make a case that Intel should suspend its dividend entirely, at least until the firm returns to several periods of generating positive free cash flow.

Analyst Notes Archive

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

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Intel Corp INTC ★★ 18 Feb 2025 22:34, UTC

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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

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

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Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Equity Style Box	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
27.39 USD 18 Feb 2025	21.00 USD 2 Aug 2024 03:48, UTC	1.30	118.60 USD Bil 18 Feb 2025	None	Large Value	Very High	Standard	5 Feb 2025 06:00, UTC

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,

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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.

Intel: Maintain Our $21 Fair Value Estimate as Company Receives Customer and Government Support Brian Colello, CPA,Strategist,17 Sep 2024

We maintain our $21 fair value estimate for no-moat Intel as the company disclosed several business updates to investors and employees on Sept. 16. However, we raise our Morningstar Uncertainty Rating for Intel to Very High from High, as we anticipate increased business volatility as its strategic plans take shape. Shares rallied up 6% during the trading day and about another 8% after hours, but we still view shares as fairly valued.We're generally encouraged by two pieces of news, more so because they help validate Intel as a viable business in the future. First, Intel announced a strategic collaboration with Amazon Web Services for custom chip designs, including artificial intelligence fabric chips, on Intel's upcoming advanced 18A process, which is expected to arrive in 2025. This announcement helps offset a recent negative report from Reuters that Broadcom tested out Intel's 18A manufacturing process but could not obtain sufficient manufacturing yields. Intel has previously announced that it has several large 18A partners in the pipeline, but disclosing AWS, by name, as a partner helps validate the technology, in our view, and gives us another positive data point to suggest that 18A will arrive in 2025.Second, the United States government awarded up to $3 billion in direct funding under the Chips Act for the Secure Enclave program with the US Department of Defense. This award should help to assuage some investor concerns that Intel will remain a durable business to put US taxpayer dollars to good use.We think Intel's stock price may have found a bit of a floor in recent weeks, as the book value of the company's fabs can likely justify Intel's stock price in the high-teens or low-$20 range. However, foundry losses might still be substantial in the future, particularly if Intel conceded even more market share to AMD in the quarters ahead.

Intel Earnings: Cutting Fair Value Estimate to $21 from $30 Amid Ugly News and Many Concerns Brian Colello, CPA,Strategist,2 Aug 2024

No-moat Intel reported disappointing second-quarter results while providing investors with a gloomy third-quarter forecast, suspending its dividend, and outlining a hefty cost-cutting program considering softer demand. Intel's stock fell as much as 20% afterhours, and we think the severe negative reaction was justified. We have cut our fair value estimate to $21 from $30 and do not see the selloff as a buying opportunity, as we are concerned about Intel's competitive positioning. Even though Intel is doing the proper work to focus on leading-edge chip manufacturing, it appears that many of its customers in

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Intel Corp INTC ★★ 18 Feb 2025 22:34, 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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various end markets might be leaving Intel behind.In the June quarter, revenue was $12.8 billion, up 1% sequentially, down 1% year over year, and below the midpoint of guidance of $12.5 billion-$13.5 billion. However, the horror came from the adjusted gross margin of only 38.7%, down 640 basis points sequentially and worse than guidance of 43.5%. Intel shifted production of its latest PC processors from a low-volume (but lower-cost) facility in Oregon to its high-volume (but much higher-cost, for now) plant in Ireland. Intel thinks this was the proper long-term shift, but we fear that Intel rushed this processor (former codename Meteor Lake) to prime-time production in the face of intense competition for the artificial intelligence PC, perhaps speaking to the relative lack of competitiveness of prior-gen CPUs.Intel expects September-quarter revenue of $13.0 billion, well below our prior forecast and FactSet consensus estimates of $14.4 billion. Adjusted gross margin should remain disappointing at 38%. Intel is seeing an inventory buildup for both PC CPUs and CPUs used in servers, the latter due to a capital expenditure mix shift at cloud companies toward AI servers. Given Intel's high fixed costs and massive manufacturing transitions, any revenue shortfalls leave the firm with nowhere to hide on the profitability front next quarter.

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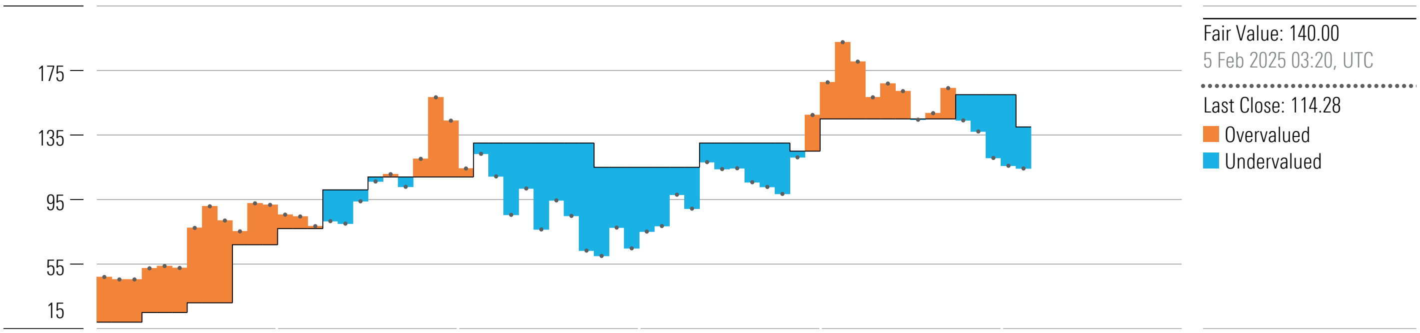
Intel Corp INTC ★★ 18 Feb 2025 22:34, UTC

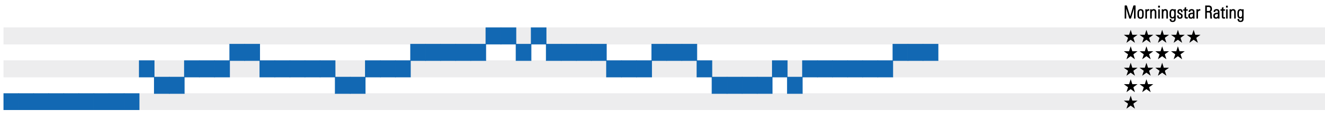
Competitors Price vs. Fair Value

Advanced Micro Devices Inc AMD



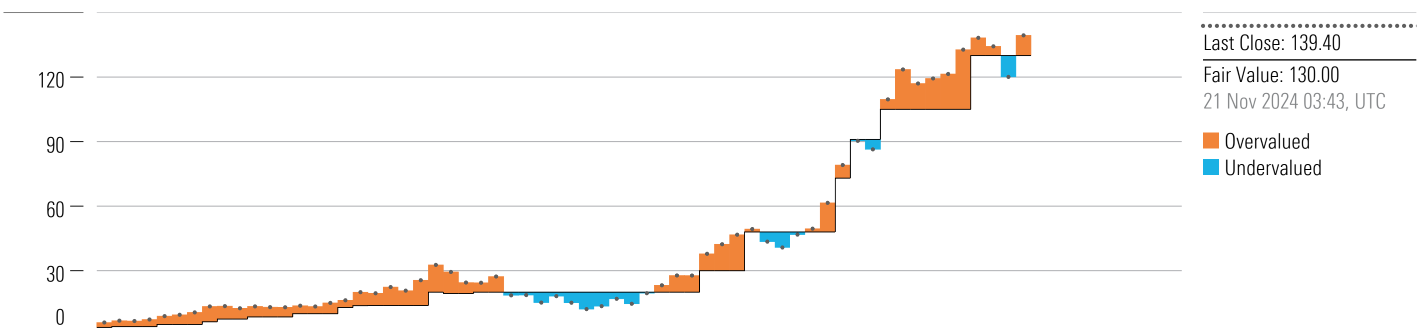
2020	2021	2022	2023	2024	YTD	
1.37	1.32	0.56	1.18	0.75	0.82	Price/Fair Value
99.98	56.91	-54.99	127.59	-18.06	-5.39	Total Return %

Morningstar Rating



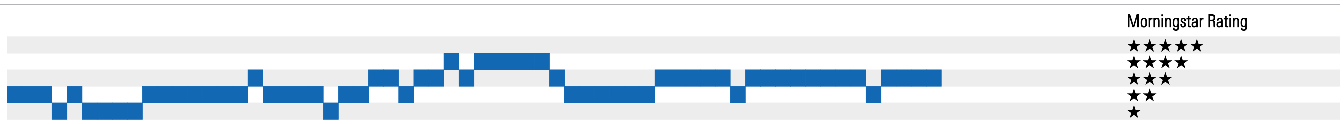
Total Return % as of 18 Feb 2025. Last Close as of 18 Feb 2025. Fair Value as of 5 Feb 2025 03:20, UTC.

NVIDIA Corp NVDA



2020	2021	2022	2023	2024	YTD	
1.54	1.52	0.73	1.03	1.03	1.07	Price/Fair Value
122.20	125.41	-50.26	238.98	171.24	3.81	Total Return %

Morningstar Rating



Total Return % as of 18 Feb 2025. Last Close as of 18 Feb 2025. Fair Value as of 21 Nov 2024 03:43, UTC.

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Morningstar Historical Summary

Financials as of 31 Dec 2024

Fiscal Year, ends 31 Dec	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	YTD	TTM
Revenue (USD Bil)	55	59	63	71	72	78	79	63	54	53	53	53
Revenue Growth %	-0.9	7.3	5.7	12.9	1.6	8.2	1.5	-20.2	-14.0	-2.1	-2.1	-2.1
EBITDA (USD Bil)	23.26	21.46	29.13	32.87	35.37	37.95	34.09	21.30	11.24	1.20	1.20	1.20
EBITDA Margin %	42.0	36.1	46.4	46.4	49.2	48.7	43.1	33.8	20.7	2.3	2.3	2.3
Operating Income (USD Bil)	14.36	14.88	18.43	23.24	22.43	23.88	22.08	2.34	0.03	-4.71	-4.71	-4.71
Operating Margin %	25.9	25.1	29.4	32.8	31.2	30.7	27.9	3.7	0.1	-8.9	-8.9	-8.9
Net Income (USD Bil)	11.42	10.32	9.60	21.05	21.05	20.90	19.87	8.01	1.69	-18.76	-18.76	-18.76
Net Margin %	20.6	17.4	15.3	29.7	29.3	26.8	25.1	12.7	3.1	-35.3	-35.3	-35.3
Diluted Shares Outstanding (Mil)	4,894	4,875	4,835	4,701	4,473	4,232	4,090	4,123	4,212	4,280	4,280	4,280
Diluted Earnings Per Share (USD)	2.33	2.12	1.99	4.48	4.71	4.94	4.86	1.94	0.40	-4.38	-4.38	-4.38
Dividends Per Share (USD)	0.96	1.04	1.08	1.20	1.26	1.32	1.39	1.46	0.74	0.38	0.38	0.38

Valuation as of 31 Jan 2025

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Recent Qtr	TTM
Price/Sales	3.1	3.1	3.6	3.2	3.9	2.7	2.7	1.6	4.0	1.6	1.6	1.6
Price/Earnings	14.9	17.0	16.2	14.6	14.0	9.8	10.0	8.2	-128.2	-5.4	-5.4	-4.4
Price/Cash Flow	8.7	9.3	9.7	7.5	9.0	6.0	6.2	8.0	14.4	8.8	8.8	10.0
Dividend Yield %	2.79	2.87	2.33	2.56	2.11	2.65	2.7	5.52	1.47	1.87	1.87	1.93
Price/Book	2.9	2.7	3.0	3.0	3.5	2.7	2.3	1.1	2.1	0.9	0.9	0.8
EV/EBITDA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Operating Performance / Profitability as of 31 Dec 2024

Fiscal Year, ends 31 Dec	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	YTD	TTM
ROA %	11.8	9.6	8.1	16.8	15.9	14.4	12.4	4.6	0.9	-9.7	-9.7	-9.7
ROE %	19.5	16.2	14.2	29.3	27.7	26.4	22.5	8.1	1.6	-18.3	-18.3	-18.3
ROIC %	15.1	12.2	10.4	21.4	20.3	18.9	16.2	5.7	0.9	-12.7	-12.7	-12.7
Asset Turnover	0.6	0.6	0.5	0.6	0.5	0.5	0.5	0.4	0.3	0.3	0.3	0.3

Financial Leverage

Fiscal Year, ends 31 Dec	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Recent Qtr	TTM
Debt/Capital %	24.7	23.8	26.6	25.2	24.6	29.5	26.0	27.1	30.8	31.8	31.8	—
Equity/Assets %	60.2	58.4	56.0	58.3	56.8	52.9	56.6	55.7	55.1	50.5	50.5	—
Total Debt/EBITDA	1.0	1.2	0.9	0.8	0.8	1.0	1.1	2.0	4.4	41.6	41.6	—
EBITDA/Interest Expense	69.0	29.3	45.1	70.2	72.3	60.3	57.1	42.9	12.8	1.2	1.2	1.2

Morningstar Analyst Historical/Forecast Summary as of 30 Jan 2025

Financials

			Estimates		
Fiscal Year, ends 31 Dec 2024	2023	2024	2025	2026	2027
Revenue (USD Mil)	54,228	53,101	52,473	54,263	55,648
Revenue Growth %	-14.0	-2.1	-1.2	3.4	2.6
EBITDA (USD Mil)	9,695	-299	11,157	15,663	20,351
EBITDA Margin %	17.9	-0.6	21.3	28.9	36.6
Operating Income (USD Mil)	31	-4,708	-1,743	1,413	4,751
Operating Margin %	0.1	-8.9	-3.3	2.6	8.5
Net Income (USD Mil)	4,420	-566	2,069	4,424	9,148
Net Margin %	8.2	-1.1	3.9	8.2	16.4
Diluted Shares Outstanding (Mil)	4,212	4,280	4,319	4,319	4,319
Diluted Earnings Per Share(USD)	1.05	-0.13	0.48	1.02	2.12
Dividends Per Share(USD)	0.74	0.38	0.00	0.00	0.00

Forward Valuation

			Estimates		
	2023	2024	2025	2026	2027
Price/Sales	3.9	1.6	2.3	2.2	2.1
Price/Earnings	47.9	-154.2	57.1	26.9	12.9
Price/Cash Flow	—	—	—	—	—
Dividend Yield %	1.5	1.9	—	—	—
Price/Book	2.0	0.9	1.2	1.2	1.1
EV/EBITDA	24.3	-377.8	13.1	9.4	7.2

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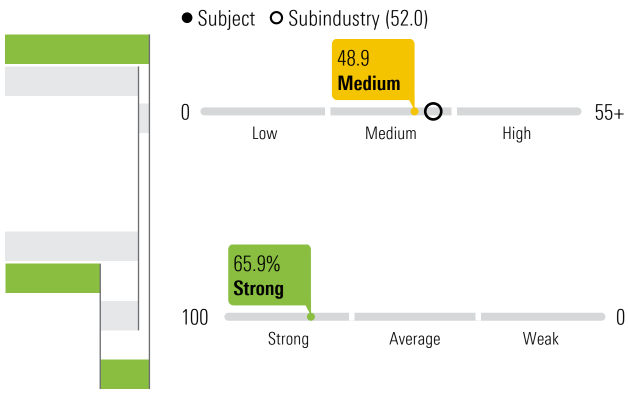
Intel Corp INTC ★★ 18 Feb 2025 22:34, UTC

Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Equity Style Box	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
27.39 USD 18 Feb 2025	21.00 USD 2 Aug 2024 03:48, UTC	1.30	118.60 USD Bil 18 Feb 2025	None	Large Value	Very High	Standard	5 Feb 2025 06:00, 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 Feb 05, 2025. Highest Controversy Level is as of Feb 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 05 Feb 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		
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+	63.7 | Strong	100	0	12.2 | Low	0	40+
Taiwan Semiconductor Co Ltd	53.0 | Medium	0	55+	35.8 | Average	100	0	35.6 | High	0	40+
—	— | —	0	55+	— | —	100	0	— | —	0	40+

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Appendix
Historical Morningstar Rating

Intel Corp INTC 18 Feb 2025 22:34, 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 18 Feb 2025 22:33, 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 18 Feb 2025 22:33, 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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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.

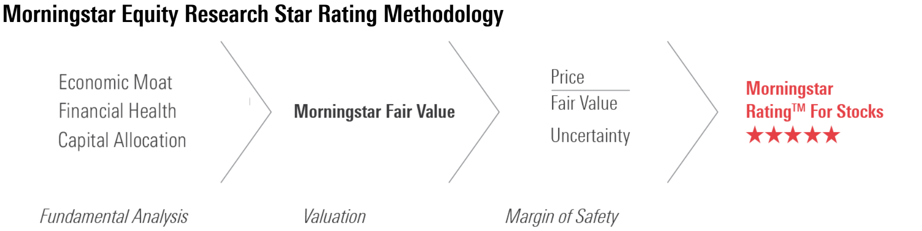
Because a dollar earned today is worth more than a dollar earned tomorrow, we discount our projections of cash flows in stages I, II, and III to arrive at a total present value of expected future cash flows. Because we are modeling free cash flow to the firm—representing cash available to provide a return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

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.

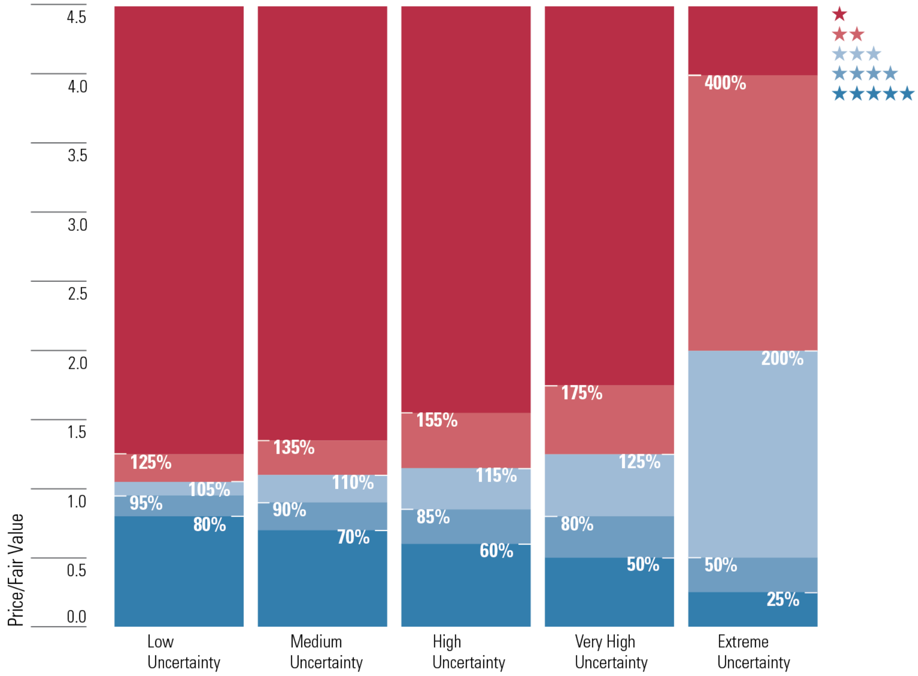
4. Market Price

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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Research Methodology for Valuing Companies

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

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

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