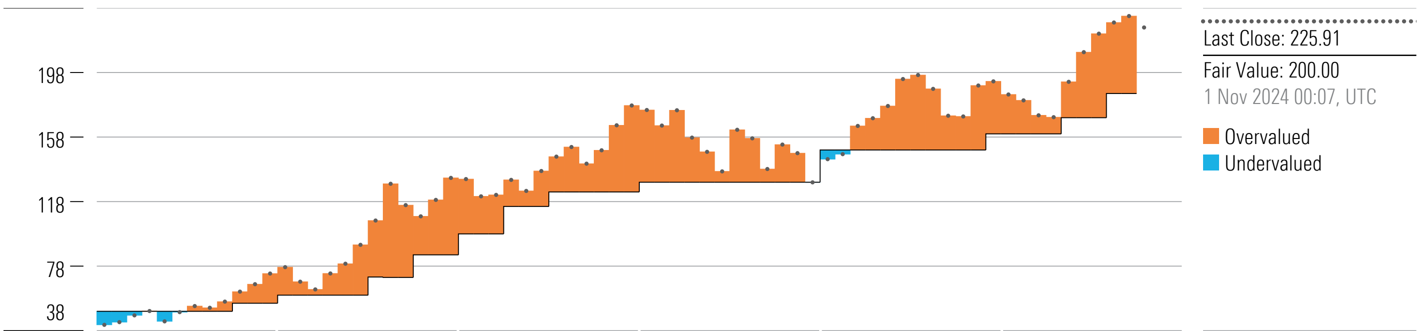
Morningstar Equity Analyst Report | Report as of 1 Nov 2024 00:15, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ - ALL MARKETS

Apple Inc AAPL ★★ 1 Nov 2024 00:09, UTC

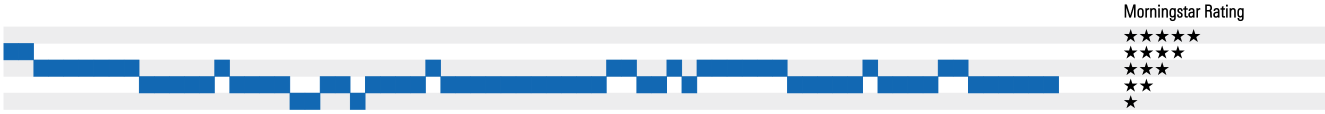
Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Equity Style Box	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
225.91 USD 31 Oct 2024	200.00 USD 1 Nov 2024 00:07, UTC	1.13	3.43 USD Tril 31 Oct 2024	Wide	Large Blend	Medium	Exemplary	2 Oct 2024 05:00, UTC

Price vs. Fair Value



	2019	2020	2021	2022	2023	YTD	
	1.33	1.56	1.43	1.00	1.20	1.13	Price/Fair Value
	88.09	81.85	34.48	-26.32	48.91	17.72	Total Return %

Morningstar Rating



Total Return % as of 31 Oct 2024. Last Close as of 31 Oct 2024. Fair Value as of 1 Nov 2024 00:07, 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.

Apple Earnings: Our Valuation Rises to Reflect Stronger Long-Term Growth, but Less of an AI Impact

Analyst Note William Kerwin, CFA, Equity Analyst, 1 Nov 2024

We raise our fair value estimate for wide-moat Apple to $200 from $185 as we raise our longer-term growth expectations. We've also revised down our short-term forecast for iPhone revenue to reflect less of an impact from artificial intelligence on unit sales over the next two years. We believe Apple Intelligence will spur a return to mid-single-digit growth for iPhone revenue, but we believe the impact will be drawn out over the next two fiscal years. In the longer term, we expect iPhone unit sales and Apple's services segment to drive solid growth and for margin expansion to help drive double-digit earnings growth over the next five years.

Nevertheless, we find shares overvalued. We believe iPhone revenue growth, Apple's largest driver, is slowing throughout cycles in a mature smartphone market and with growth headwinds out of China. We expect only a moderate slowdown in good growth, but we believe the expectations priced into the stock are lofty and reflect the overexuberance surrounding AI.

September-quarter revenue rose 6% year over year and 11% sequentially, in line with our expectations. IPhone revenue rose 6% year over year, which reflects a positive inflection and which we attribute in part to excitement around the iPhone 16 lineup, which had 10 days of sales in the quarter. Services remained Apple's highest growth area, rising 12% year over year. These combined to make up 75% of revenue.

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Sector	Industry
Technology	Consumer Electronics

Business Description

Apple is among the largest companies in the world, with a broad portfolio of hardware and software products targeted at consumers and businesses. Apple's iPhone makes up a majority of the firm sales, and Apple's other products like Mac, iPad, and Watch are designed around the iPhone as the focal point of an expansive software ecosystem. Apple has progressively worked to add new applications, like streaming video, subscription bundles, and augmented reality. The firm designs its own software and semiconductors while working with subcontractors like Foxconn and TSMC to build its products and chips. Slightly less than half of Apple's sales come directly through its flagship stores, with a majority of sales coming indirectly through partnerships and distribution.

December-quarter revenue guidance was below our expectations, with management expecting low to mid-single-digit year-over-year growth. We've lowered our iPhone revenue forecast for fiscal 2025 to reflect a slower ramp in iPhone 16 unit sales. We believe the release of Apple Intelligence will drive consumers to buy new iPhones. Still, a staggered release schedule will dampen what we previously expected to be a surge in demand in fiscal 2025. We forecast stronger growth in fiscal 2026 behind a more developed and widely available AI offering.

Business Strategy & Outlook William Kerwin, CFA, Equity Analyst, 2 Feb 2024

We believe Apple has cemented a long-term position atop the consumer electronics industry with a focus on a premium ecosystem of tightly integrated hardware, software, and services. We see the flagship iPhone as the linchpin of this ecosystem, from which Apple derives pricing power, switching costs, and a network effect. In our view, every other Apple device and service sees its greatest value from further locking in customers to this walled garden. This approach earns the firm a wide economic moat rating.

We are impressed with Apple's core design prowess, across both hardware and software, that we think is the product of immense cumulative research and development investments. We like Apple's latest push to bring most of its chip development in-house. To us, this gives the firm more opportunity for product customization and a better ability to differentiate. In our view, Apple reduces its own cyclicality compared with other consumer electronics players by melding its semiconductors, hardware, and software together.

Over the medium term, we expect Apple to focus on progressing its internal chip development, artificial intelligence capabilities, and further developing new form factors like its Vision Pro headset. Each one of these initiatives will hedge the firm against disruption risk, in our view. We also anticipate the company will continue returning tremendous amounts of cash back to shareholders, which is supported by its strong balance sheet.

We hold concerns over geopolitical and regulatory risk for Apple but don't see these threatening the firm's moat. Apple's supply chain is heavily concentrated in China and Taiwan, and disruptions to the status quo in these regions could limit its supply. Apple has thus far been adept at managing its complex supply chain and is actively diversifying into new regions. Apple has also been targeted by regulations, particularly out of Europe, which chip away at its differentiation by opening up its App Store and iMessage services. We don't foresee more damaging regulation on the horizon and believe the firm is adequately reinforcing its stickiness with customers by adding new devices and services with which to lock them in.

Bulls Say William Kerwin, CFA, Equity Analyst, 1 Nov 2024

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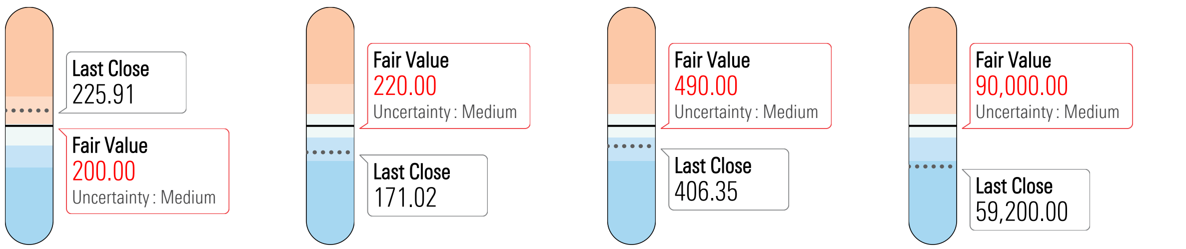
Competitors

	Apple Inc AAPL	Alphabet Inc Class A GOOGL	Microsoft Corp MSFT	Samsung Electronics Co Ltd 005930



	Apple Inc AAPL	Alphabet Inc Class A GOOGL	Microsoft Corp MSFT	Samsung Electronics Co Ltd 005930
Economic Moat	Wide	Wide	Wide	Narrow
Currency	USD	USD	USD	KRW
Fair Value	200.00 1 Nov 2024 00:07, UTC	220.00 30 Oct 2024 02:50, UTC	490.00 31 Jul 2024 06:07, UTC	90,000.00 8 May 2024 06:21, UTC
1-Star Price	270.00	297.00	661.50	121,500.00
5-Star Price	140.00	154.00	343.00	63,000.00
Assessment	Overvalued 30 Oct 2024	Undervalued 30 Oct 2024	Undervalued 30 Oct 2024	Undervalued 31 Oct 2024
Morningstar Rating	★★1 Nov 2024 00:09, UTC	★★★★30 Oct 2024 21:41, UTC	★★★★30 Oct 2024 21:38, UTC	★★★★★31 Oct 2024 12:10, UTC
Analyst	William Kerwin, Equity Analyst	Malik Ahmed Khan, Equity Analyst	Dan Romanoff, Senior Equity Analyst	Kazunori Ito, Director
Capital Allocation	Exemplary	Exemplary	Exemplary	Standard
Price/Fair Value	1.13	0.79	0.88	0.66
Price/Sales	9.26	6.42	12.71	1.25
Price/Book	52.51	6.81	11.18	1.07
Price/Earning	35.02	23.64	35.58	14.44
Dividend Yield	0.43%	0.23%	0.69%	2.44%
Market Cap	3,426.86 Bil	2,105.26 Bil	3,020.04 Bil	402,126.02 Bil
52-Week Range	164.08—237.49	120.21—191.75	324.39—468.35	55,700.00—88,800.00
Investment Style	Large Blend	Large Blend	Large Blend	Large Blend

- Apple offers an expansive ecosystem of tightly integrated hardware, software, and services, which locks in customers and generates strong profitability.
- We like Apple's move to in-house chip development, which we think has accelerated its product development and increased its differentiation.
- Apple has a stellar balance sheet and sends great amounts of cash flow back to shareholders.

Bears Say William Kerwin, CFA, Equity Analyst, 1 Nov 2024

- Apple is prone to consumer spending and preferences, which creates cyclicality and opens the firm up to disruption.
- Apple's supply chain is highly concentrated in China and Taiwan, which opens up the firm to geopolitical risk. Attempts to diversify into other regions may pressure profitability or efficiency.
- Regulators have a keen eye on Apple, and recent regulations have chipped away at parts of Apple's sticky ecosystem.

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Economic Moat William Kerwin, CFA, Equity Analyst, 1 Feb 2024

We assign Apple a wide economic moat rating, stemming from customer switching costs, intangible assets, and a network effect. In our view, Apple's iOS ecosystem extends far-reaching, sticky tendrils into customers' wallets, entrenching customers with software capabilities and integration across disparate devices like the iPhone, Mac, iPad, Apple Watch, and more. We also see immense design prowess at Apple, most impressively from deep integration of hardware, software, and semiconductors to create best-of-breed products. Finally, we see a virtuous cycle between Apple's affluent customer base and vast ecosystem of developer partners. These moat sources elicit great profitability and returns on invested capital. In our view, Apple can leverage these moat sources into continued economic profits over the next 20 years, more likely than not.

Apple's most important moat source to us arises from the switching costs for its ecosystem of software, driven by iOS on the iPhone. Apple enjoys terrific customer retention and satisfaction, even despite pricing its products at a significant premium to its competition. First, Apple offers software capabilities that are only available to iPhone users: iMessage messaging and FaceTime calling, AirDrop sharing, Apple Pay digital wallet, and location sharing are among the most used. Apple's products become even more entrenched when a customer adopts two or more. Users that combine the iPhone with a Mac, an iPad, and/or an Apple Watch are offered more features that in turn create a higher cost to switching. Among these, we highlight iMessages shared across devices, health data shared securely between the Watch and iPhone, seamless transfer of media, copy and paste between devices, and complementary app interfaces across multiple devices.

In our view, Apple's ability to widen its portfolio of user devices helps augment its existing switching costs. The Apple Watch and AirPods are good recent examples of new products we see raising stickiness of customers. A Watch user can answer calls, read and respond to messages, and keep a tab on notifications, but must have an iPhone to use these capabilities. AirPods connect with marked ease to Apple devices but have to be manually re-paired each use if joined to a non-Apple device. As customers use more point devices, we believe they are less likely to leave Apple's ecosystem. We view Apple's nascent push into augmented and virtual reality (AR and VR) as the next step in this strategy. The firm's Vision Pro headset offers yet another auxiliary form factor that relies on the iPhone as the focal computing point.

Furthermore, we see Apple's adept ability to introduce and succeed with new form factors (like smartwatches and VR headsets) as defending the firm from disruption risk. After Apple itself disrupted the mobile phone market by creating the modern smartphone, we believe it is critical for the firm to stay on the cutting edge and stave off disruptive threats to its own portfolio. We believe developing auxiliary products integrated with the iPhone is doing just that.

Beyond locking customers into a software ecosystem, we believe Apple's design expertise represents significant intangible assets that allow the firm to deliver top tier performance for its devices across hardware, software, and semiconductors. We see an enormous research and development budget totaling in the tens of billions of dollars enabling and maintaining this design prowess.

Apple boasts impressive semiconductor design capabilities with which it augments the performance of its iPhone, Mac, iPad, and Watch offerings. We see chips as the highest-value component of consumer electronics. In designing its own chips, Apple is able to customize its specific devices for performance, power efficiency, and available features. Its A-series chips for the iPhone integrate neural engines for artificial intelligence, or AI, capabilities like facial recognition and are optimized for power efficiency to deliver best-in-class battery life. Its M-series chips for the Mac offer more memory than standardized PC chips from Intel or AMD, helping enable quicker compute and graphics performance. Owning its chip design also allows Apple to prioritize security. It embeds Secure Enclave in every Mac chip, which is a totally encrypted and physically separated part of the chip that protects biometric data and encryption keys.

By owning its chip design, Apple tightens the integration between its hardware devices and its sticky software ecosystem. Apple's custom chip families allow for common platforms across devices and new software features that further rope in customers. For example, Apple's focus on featuring significant neural engines on its chips allow for AI applications on devices, including facial recognition, voice assistance (Siri), live transcription, autocorrect, and highly adaptable software suggestions based on user preferences and history. We believe the common platform across chips for iPhone, Mac, iPad, and Watch also aid third-party app developers to create more integrated experiences for customers. Offering a better platform for developers leads to more apps designed for Apple devices, more features on third-party apps across devices, and a stickier proposition to customers, in our view.

Apple's chip capabilities are bolstered by a robust relationship with Taiwan Semiconductor, or TSMC, the largest foundry in the world. In our view, this relationship enables Apple to pursue more powerful and more efficient chips ahead of its competitors. Apple's iPhone is typically the first product to feature the newest process technology from TSMC, like the iPhone 15 Pro in 2023 being the first to feature 3-nanometer chips. Additionally, Apple pays TSMC for dedicated capacity, enabling Apple to be guaranteed a certain level of supply to meet demand for new iPhones, Macs, and the like.

We see Apple's chip design and software design prowess as impressive when taken separately but even more valuable in tandem. We believe the firm stands to benefit from quicker time-to-market for new features across both hardware and software by developing the two together and specified for its own devices. This compares with taking more general chips from the likes of Intel and being reliant on another firm's development for your own software ambitions (as Apple used to be for its Mac lineup before introducing the M-series chips). This integrated approach also stands out against Apple's primary smartphone competitor, Samsung, which owns its hardware assembly but outsources its chips and software to Qualcomm and Google (Android), respectively.

Apple focuses on the premium ends of its markets with best-of-breed devices that it sells at significant premiums. Customers have shown a consistent desire to pay up for this performance, generating unit market share gains for Apple even as its prices rise compared with competitors. Apple's share gains have been broad-based, across both developed and emerging markets (like China and India), consumers and enterprises, and every major product line, including iPhone, Mac, and iPad. We believe further share gains are in Apple's future, particularly as it sees the strongest preference among younger users.

Apple's moat is reinforced with a network effect between its large, committed user base and expansive ecosystem of application developers. We believe that more developers and more talented developers are drawn to Apple's large install base, while consumers are drawn to the wide selection of applications to which they gain access by purchasing an Apple device. In our view, this is accentuated by a richer base of Apple users, compared with those of competing PC or mobile vendors that spend more on apps and generate more developer profits. We also think that Apple's unified software ecosystem across iPhone, Mac, iPad, Watch, and more is an attractive proposition for developers. A developer can more easily gain multiple footholds in a user with tight integration and overlap between Apple's products and OSes, compared with designing disparate interfaces for an Android phone and Windows PC, for example. We think this network effect can be enhanced with more touchpoints in the Apple ecosystem, like the Vision Pro, that plug right into the existing development frameworks. We don't believe Apple's network precludes the existence of a network effect for a competing app store, like Google Play, but see Apple's rich network augmenting its user experience and supplementing its switching costs.

Apple's ability to deliver cutting-edge products with tightly integrated hardware and software, along with its software ecosystem's ability to lock in customers, results in impressive profit margins. On top of 45% gross margins, which are impressive for a consumer hardware provider, Apple's asset-light model with outsourced manufacturing generates robust returns on invested capital, to the tune of roughly 50%. In our view, Apple's sticky ecosystem and phenomenal engineering capabilities will enable it to continue earning strong economic profits over the next 20 years.

Fair Value and Profit Drivers William Kerwin, CFA, Equity Analyst, 31 Oct 2024

Our fair value estimate for Apple is $200 per share. Our valuation implies a fiscal 2025 price/earnings multiple of 27 times, a fiscal 2025 enterprise value/revenue multiple of 7 times, and a fiscal 2025 free cash flow yield of 4%. Against our estimate of fiscal 2026 earnings, our valuation implies a price/earnings multiple of 23 times.

We project 7% compound annual revenue growth for Apple through fiscal 2029. The iPhone will be the greatest contributor to revenue over our forecast, and we project 6% growth for iPhone revenue over the next five years. We expect this to be driven primarily by unit sales growth, with modest pricing increases. We think pricing increases will be driven primarily by a mix shift toward the more premium Pro models.

Services are Apple's next biggest revenue contributor over our forecast, and we forecast 10% services revenue growth. Services are driven in large part by revenue from Google for its status as the default search engine on the Safari browser as well as Apple's cut of App Store revenues. We expect solid growth in Google revenue but see a more mixed outlook for App Store results, where we forecast growth in overall app revenue but progressively lower cuts going toward Apple as the result of regulatory pressures. Elsewhere, we see mostly double-digit growth across revenue from Apple Music, Apple TV+, Apple Pay, AppleCare, and Apple's other services.

We see the highest growth opportunity in Apple's wearables revenue, to the tune of 13% through fiscal 2029. We see high-single-digit growth for Apple Watch and AirPods revenue, with both products continuing to gain share. We expect strong, double-digit growth for Apple's nascent Vision Pro, but expect this to remain a small minority of total revenue. We project roughly $4 billion in Vision Pro revenue in fiscal 2029.

Across Apple's other primary hardware products, Mac and iPad, we see midcycle growth in the low-single digits. We expect Mac to see stronger short-term revenue from a cyclical rebound in consumer PC spending as well as existing Mac customers refreshing Intel-based notebooks to the new M-series lineup.

We forecast gross margins to rise to 49% in fiscal 2029, up from 46% in fiscal 2024. We believe Apple can see margin expansion from a higher mix of higher-margin hardware, like iPhone Pro models, and services. We also expect Apple to continue using R&D to trim costs as well as develop new features, especially by creating more cost-efficient semiconductors and bringing more chip development in-house.

Operating margins rise almost exclusively due to gross margin expansion in our forecast, reaching 35% in fiscal 2029 from 32% in fiscal 2024. We anticipate strong growth in research and development expenditures, which are key to Apple's value and moat. We think the firm can eke out modest leverage on other operating expenses.

Risk and Uncertainty William Kerwin, CFA, Equity Analyst, 1 Feb 2024

We assign Apple with a Medium Uncertainty Rating. We see the firm's greatest risk as its reliance on consumer spending, for which there is great competition and cyclicality. Apple is at constant risk of disruption, just as the iPhone disrupted BlackBerry in the budding smartphone market. The iPhone could be unseated by a new device or "superapp." We view the firm defending against this risk, however, by introducing new form factors (like a watch and an augmented reality headset) and selling an ecosystem of software and services on top of hardware.

We also see geopolitical risk arising from Apple's supply chain. It is heavily dependent on Foxconn and Taiwan Semiconductor, or TSMC, for its assembly and chip production, respectively. The majority of iPhones are produced at a megafactory in China by Foxconn, and the majority of Apple chips are produced in Taiwan by TSMC. If there were a souring of relations between the US and China, or if China threatened Taiwan, Apple could see a severe hit to its supply. Additionally, the Chinese government has recommended government officials not conduct business on iPhones, which presents a current and potential future risk to Apple's revenue in China.

Apple also faces regulatory scrutiny. The European Union has enacted regulations forcing Apple to offer third-party app stores, adopt open messaging standards, and restricting Apple from gatekeeping its repair materials to third parties. Similarly, there are ongoing antitrust cases in the US that could affect Apple's walled garden ecosystem. All these help to chip away at the firm's differentiation, but we believe the firm is offsetting these by adding new stick points in customers, like new services and devices.

Finally, we see low environmental, social, and governance risk for Apple. The firm has committed to full carbon neutrality by 2030, and we believe it will achieve its goal. The potential future loss of talented human capital could be another risk on this front.

Capital Allocation William Kerwin, CFA, Equity Analyst, 31 Oct 2024

We assign Apple an Exemplary capital allocation rating, with Apple's investments as the primary driver to our rating. We see Apple's ability to develop updated and brand new technology internally as exceptional. Beyond iterations of products like the iPhone and Mac, Apple's internal chip and software development are particularly impressive to us. We believe Apple's semiconductors are strong, and the firm's ability to tailor chips to specific devices creates compelling value to customers. Apple's chips allow the firm to prioritize artificial intelligence applications and other proprietary software and features that generic chips from the likes of Intel may not.

We also believe Apple has invested in new products at the right time, seemingly perfecting the strategy of being a fast and premium follower. The Apple Watch is a prime example, and one where Apple now holds the largest share of its market. New products also create another touch point by which Apple can lock in customers and raise its switching costs, reinforcing its wide moat. In our view, these also hedge against disruption risk by expanding Apple's ecosystem and creating prowess in new form factors that may eventually succeed the smartphone. We see the Vision Pro as the newest example of this strategy and one that will also leverage Apple's silicon expertise.

On top of strong investments, Apple boasts a robust balance sheet and uses it to reward shareholders. Apple's cash generation is fantastic, and we like its goal of becoming net cash-neutral, which should help avoid the opportunity cost of holding significant amounts of cash. We also like the firm's dividend and buyback program, a combination that routinely sends all of Apple's free cash flow back to shareholders.

Underpinning Apple's capital allocation strategy, we are pleased with the firm's board of directors and Tim Cook as a chief executive. We believe Cook has been instrumental in pivoting Apple into an ecosystem company and has made savvy bets on new form factors, semiconductor design, and services. We like his compensation structure that offers a relatively low, flat salary with the majority of his pay coming from incentive-based compensation. Apple's board is made up of blue-chip current and former executives across industries. The board has good expertise across finance, biotechnology, and consumer products, which likely informs Apple's strategy in existing and new markets.

Analyst Notes Archive

Apple: iPhone 16 Event Affirms Our Confidence in Strong Fiscal 2025 Growth Despite Overvalued Shares William Kerwin, CFA, Equity Analyst, 10 Sep 2024

We keep our $185 per share fair value estimate for wide-moat Apple after an impressive fall product event aligned with our long-term expectations. We continue to see Apple as a differentiated consumer technology provider with tight integration between its hardware and software driving a wide economic moat. The iPhone is the linchpin of this ecosystem. We were pleased with the new iPhone 16 lineup and believe these models will spur a strong growth cycle for Apple in fiscal 2025 as consumers look to use generative artificial intelligence features. Still, we believe overly bullish expectations are baked into Apple's stock price. To us, investors would need to expect 20% iPhone revenue growth in fiscal 2025 to justify the firm's current valuation. Our own forecast is closer to 10% iPhone revenue growth in fiscal 2025, and we see shares as overvalued.

Apple unveiled its iPhone 16 lineup, releasing in the US on Sept. 20. As we expected, generative AI features were at the heart of the announcements. Apple Intelligence, the firm's suite of AI features, requires the most advanced hardware to operate, and we were pleased to hear that it will be available on all iPhone 16 models, as well as the iPhone 15 Pro and Pro Max. Apple is marketing its generative AI features as personal, creative, and productive, with the ability to rewrite emails, summarize and prioritize notifications, and take actions across applications. We see these features as powerful and attractive, and believe they will spur consumers to purchase new iPhones sooner, driving better revenue growth in fiscal 2025.

Outside of AI, Apple announced evolutionary advancements to iPhone chip performance, durability, battery life, display, and the cameras that we saw positively. Importantly, the iPhone 16 models are

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starting at the same prices as the iPhone 15 lineup did in 2023, even with significant hardware improvements. This adheres to our forecast for fiscal 2025 revenue to be primarily driven by unit sales growth.

Apple Earnings: Higher iPhone Forecast Lifts Valuation to $185 From $170; Shares Still Out of Reach

William Kerwin, CFA, Equity Analyst, 2 Aug 2024

We raised our fair value estimate for shares of wide-moat Apple to $185 from $170 after raising our medium-term iPhone revenue forecast. We continue to expect strong revenue growth in fiscal 2025 as users upgrade their iPhones to take advantage of Apple's generative artificial intelligence features, requiring the latest and greatest hardware. We now forecast double-digit iPhone revenue growth in fiscal 2025 and another strong year of revenue growth in fiscal 2026. IPhone revenue remains the primary driver of Apple's results. We see it as the linchpin to the firm's walled garden ecosystem of hardware, software, and services, which underpins our wide moat rating and long-term growth thesis. However, we continue to see shares as overvalued. Apple's current stock price implies closer to 20% iPhone revenue growth in fiscal 2025, which we see as lofty given headwinds to growth in China and slowing consumer phone upgrade cycles.

Apple's June-quarter revenue and September-quarter guidance were above our model, driven by better performance for the iPhone than we feared. June-quarter revenue of $85.8 billion rose 5% year over year. IPhone revenue declined 1% year over year, and we believe guidance implies a return to year-over-year iPhone revenue growth in the September quarter. IPhone growth has been hampered in the past several quarters by greater domestic competition in the Chinese market, as well as extending hardware upgrade cycles in other markets. We expect generative-AI functionality to drive a return to growth in fiscal 2025. Services continued double-digit year-over-year growth, and we see this as Apple's second-largest driver at roughly 25% of total revenue.

We remain impressed with Apple's profitability and ability to expand margins. June-quarter gross margin rose 180 basis points year over year to 46.3%. We expect a rising mix of services revenue and higher levels of vertical integration to drive incremental margin expansion over the next five years.

Apple: Generative AI Announcements Fit With Our Expectations and We Maintain Our Valuation

William Kerwin, CFA, Equity Analyst, 10 Jun 2024

We maintain our $170 fair value estimate for shares of wide-moat Apple after we viewed the opening keynote of its worldwide developers' conference positively and in line with our expectations. Apple unveiled long-awaited generative AI features, grouped under the moniker Apple Intelligence. After seeing the features, we continue to have confidence in a strong iPhone upgrade cycle in fiscal 2025, and we make no changes to our forecast or valuation. Customers will need an iPhone 15 Pro model or better to make full use of Apple Intelligence, which should drive new sales and upgrades, in our view.

Apple also announced upgrades across its device operating systems, within which we liked the focus on customization and privacy. Apple shares had a tepid reaction to the keynote, which suggests to us that generative AI and upgrade cycle expectations were baked in to share prices. We see shares as moderately overvalued at current levels.

We were pleased with the newly announced Apple Intelligence suite of features, which is Apple's first foray into the field of generative AI. Apple touted a strategy of generative AI that is personal, private, and integrated, which aligns with the firm's overall approach. Upgrades to features mostly fit our expectations, with better Siri functionality, writing assistance using large language models, image generation, and streamlined notifications among the highlights. We were particularly impressed with the ability of Siri to pull data between apps and take actions all without redirecting the user. Apple prioritized on-device model processing, which is more secure for user data. It also announced Apple-operated servers using Apple semiconductors, which can process larger generative AI queries without storing user data. To us, this hybrid approach is practical and fits with Apple's overall privacy strategy. Finally, Apple is partnering with Open AI to integrate ChatGPT into its software for larger questions not tied to a specific application.

Apple: We Expect New Models and New Chip to Spur Return to iPad Growth, in Line With Our Thesis William Kerwin, CFA, Equity Analyst, 7 May 2024

We maintain our $170 fair value estimate for the shares of wide-moat Apple, as our forecast is unchanged following the release of updated iPad models. We'd been expecting new iPad models this spring, and the upgrades matched our general expectations for performance improvement. We were impressed by Apple's newest chip, the M4, which will slot into the iPad Pro. We retain our view that these updated models will spur new refreshes and end what we expect to be three years of revenue declines for the iPad. We project year-over-year and sequential iPad growth over the next three quarters. We see the stock as fairly valued.

Apple unveiled upgraded models for the iPad Pro and iPad Air for the first time in 18 months, which is longer than the product's typical historical upgrade cadence. The iPad Pro remains Apple's marquee tablet, and the firm touted its size and performance, saying it is significantly thinner and 4 times faster than the previous Pro model. This performance is attributed in large part to the brand-new M4 chip, which is the company's most advanced to date. Apple made sure to highlight the graphics processing unit and neural engine on the chip as it staves off worries over its lack of announcements regarding generative artificial intelligence. Apple highlighted updated apps for film and music editing that make increasing use of AI features as well. The Pro also touts a brand-new screen from Apple, the Ultra Retina XDR, which uses two OLED panels. We were impressed by the new Apple Pencil Pro, an upgraded version of its existing Pencil product with added sensors and functionality.

Apple's lower-priced Air model got upgrades as well, including a new size and better performance. For the first time, the iPad Air will offer a 13-inch screen size, which matches what's available with the Pro model. The Air will also now use Apple's M2 chip, which offers lower performance than the Pro model's M4 but a big leap from the prior-generation Air models that used the M1.

Apple Earnings: Higher Medium-Term iPhone Forecast Brings Our Valuation Up to $170 From $160
William Kerwin, CFA, Equity Analyst, 3 May 2024

We raise our fair value estimate for wide-moat Apple to $170 per share from $160, behind higher expectations for iPhone and services revenue in the medium term. Apple's March-quarter results were aligned with our model, although June-quarter guidance was below our rosy expectations. We expect a soft fiscal 2024 for Apple, driven by headwinds to iPhone revenue in China and slower iPhone refreshes globally. However, we raised our forecast for iPhone revenue growth in fiscal 2025 in anticipation of a stronger refresh cycle for the iPhone 16 in fall 2024 (Apple's first fiscal quarter.) We expect Apple's generative artificial intelligence product announcements this year will drive improved growth next year. Shares rose after hours in line with our valuation raise, which we attribute to lower iPhone downside out of China than investors may have feared. Shares look fairly valued to us.

March-quarter revenue declined 4% year over year to $90.8 billion, in line with our model. IPhone revenue is Apple's primary driver, and it fell 10% year over year. The year-over-year comparison was affected by $5 billion in revenue last year, pushed into the March quarter due to supply constraints in the December quarter. Adjusting for this, iPhone and total Apple revenue was closer to flat year over year. We still view current iPhone revenue levels as soft, with more domestic competition in China and slowing refresh cycles globally as headwinds to growth. Apple's services revenue continues a strong growth trajectory and rose 14% year over year. We believe that services growth is benefitting from higher payments from Google for its default position in Safari and the broadly higher utilization of Apple's ecosystem despite softer iPhone unit sales.

June-quarter guidance missed our optimistic expectations but aligned with FactSet consensus estimates. Apple is guiding for low-single-digit year-over-year growth, which we think implies flat iPhone revenue and double-digit services growth.

Apple: We're Comfortable With Our Thesis in Light of Antitrust Lawsuit William Kerwin, CFA, Equity Analyst, 21 Mar 2024

We maintain our $160 fair value estimate, medium uncertainty rating, and wide moat rating for Apple after the company was hit with an antitrust suit from the US Department of Justice. We are not surprised by the suit, as it had been rumored for months and follows similar action against other large technology firms like Alphabet's Google. We also don't foresee the suit resulting in a significant demolition of Apple's business or wide moat. In our base case, we assume the suit will result in some opening up of Apple's walled garden ecosystem, similar to what we expect from the European Union's

Digital Markets Act. We continue to believe that most Apple users opt in to the firm's premium closed ecosystem, and we don't foresee significant attrition from Apple's products and services even under a more open environment. The shares dipped more than 3% intraday in March 21 trading, a stark difference from other technology stocks' positive performance. We see Apple as fairly valued.

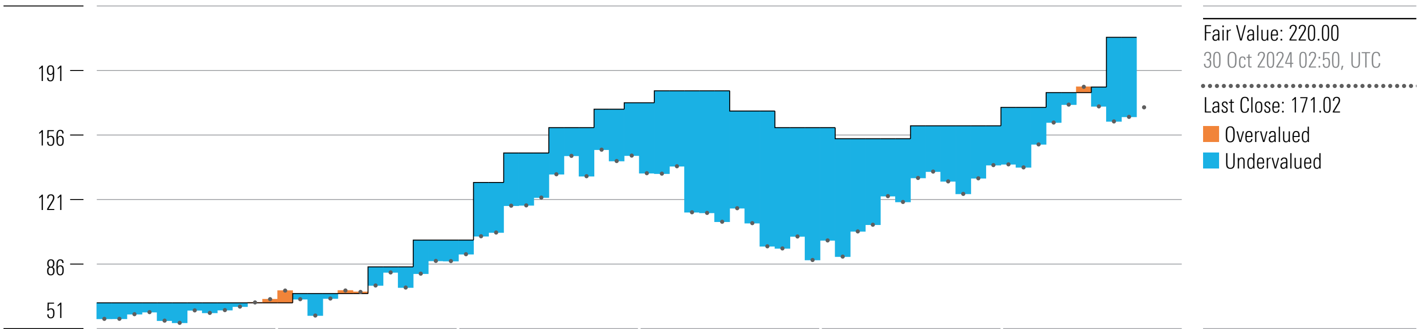
The antitrust suit is wide-ranging, with mentions of the App Store, Apple Pay, iMessage, and the Apple Watch. It appears to target Apple's core strategy of wrapping customers into its iPhone ecosystem with auxiliary products (like Apple Watch) and services (like Apple Pay.) We could reasonably foresee Apple opening up portions of this ecosystem in the future—allowing third-party payment services, for example—and it has already planned to move to a more interoperable messaging standard. We don't model a massive impact from the suit, as we believe users will generally continue to choose Apple's easy-to-use ecosystem even against potentially more widely available other options. We also expect the suit to take years to bear out, with the additional risk of a potential new administration in the US changing the priorities of litigators.

Morningstar Equity Analyst Report | Report as of 1 Nov 2024 00:15, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ - ALL MARKETS Page 14 of 24

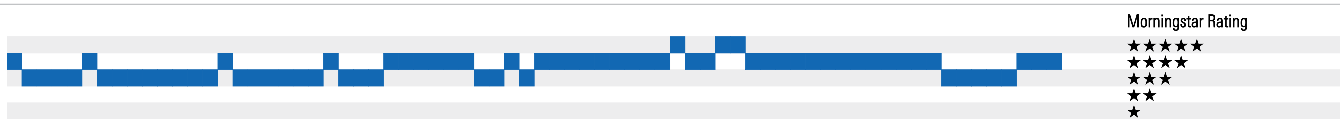
Apple Inc AAPL ★★ 1 Nov 2024 00:09, UTC

Competitors Price vs. Fair Value

Alphabet Inc Class A GOOGL

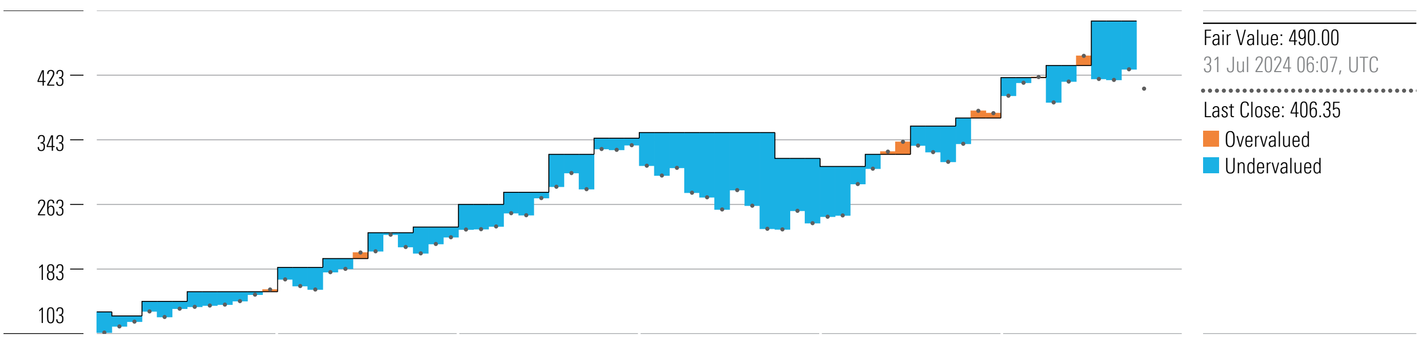


	2019	2020	2021	2022	2023	YTD
Price/Fair Value	1.03	0.89	0.83	0.55	0.87	0.79
Total Return %	28.18	30.85	65.30	-39.09	58.32	22.71

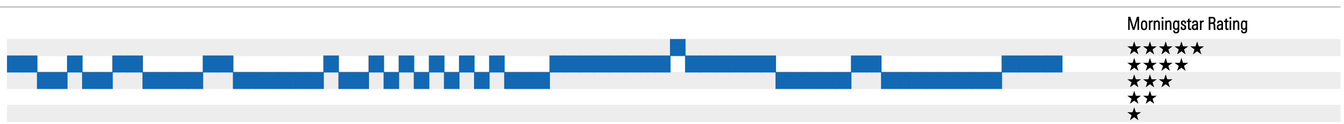


Total Return % as of 31 Oct 2024. Last Close as of 31 Oct 2024. Fair Value as of 30 Oct 2024 02:50, UTC.

Microsoft Corp MSFT



	2019	2020	2021	2022	2023	YTD
Price/Fair Value	1.02	0.95	0.97	0.75	1.02	0.88
Total Return %	57.12	42.37	52.24	-27.94	57.96	8.66



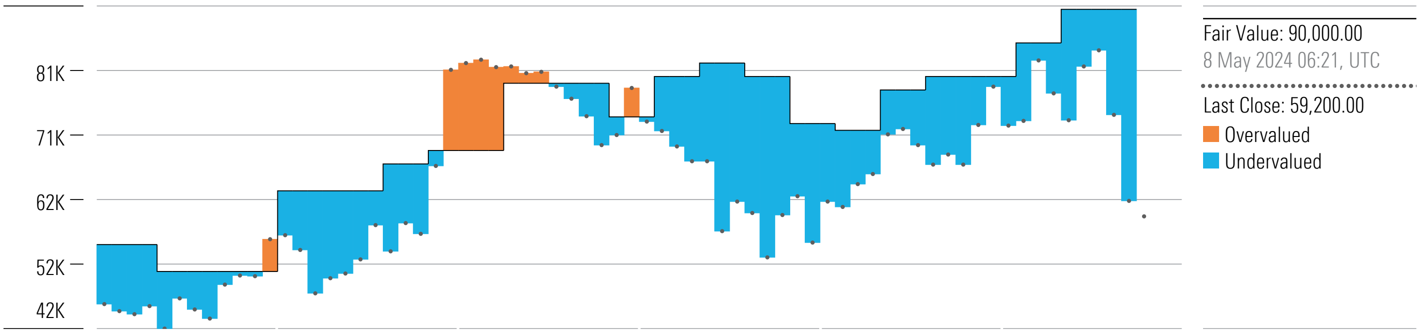
Total Return % as of 31 Oct 2024. Last Close as of 31 Oct 2024. Fair Value as of 31 Jul 2024 06:07, UTC.

Morningstar Equity Analyst Report | Report as of 1 Nov 2024 00:15, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ - ALL MARKETS

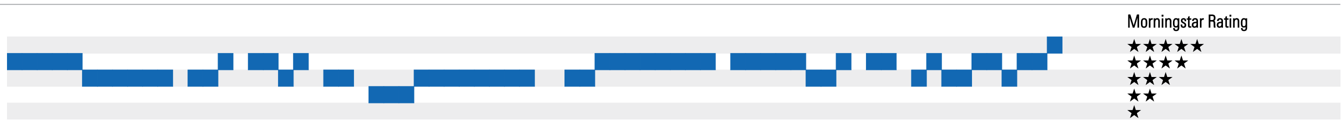
Apple Inc AAPL ★★ 1 Nov 2024 00:09, UTC

Competitors Price vs. Fair Value

Samsung Electronics Co Ltd 005930



	2019	2020	2021	2022	2023	YTD
Price/Fair Value	1.09	1.17	1.06	0.76	0.98	0.66
Total Return %	47.84	50.04	-1.75	-27.60	44.56	-23.21



Total Return % as of 31 Oct 2024. Last Close as of 31 Oct 2024. Fair Value as of 8 May 2024 06:21, UTC.

Morningstar Equity Analyst Report | Report as of 1 Nov 2024 00:15, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ - ALL MARKETS Page 16 of 24

Apple Inc AAPL ★★ 1 Nov 2024 00:09, UTC

Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Equity Style Box	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
225.91 USD 31 Oct 2024	200.00 USD 1 Nov 2024 00:07, UTC	1.13	3.43 USD Tril 31 Oct 2024	Wide	Large Blend	Medium	Exemplary	2 Oct 2024 05:00, UTC

Morningstar Historical Summary

Financials as of 30 Jun 2024

Fiscal Year, ends 30 Sep	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	YTD	TTM
Revenue (USD Bil)	183	234	216	229	266	260	275	366	394	383	296	386
Revenue Growth %	7.0	27.9	-7.7	6.3	15.9	-2.0	5.5	33.3	7.8	-2.8	0.8	0.4
EBITDA (USD Bil)	62	85	73	77	87	82	81	123	133	129	102	135
EBITDA Margin %	33.8	36.2	34.0	33.4	32.8	31.5	29.5	33.7	33.8	33.7	34.5	35.1
Operating Income (USD Bil)	53	71	60	61	71	64	66	109	119	114	94	121
Operating Margin %	28.7	30.5	27.8	26.8	26.7	24.6	24.2	29.8	30.3	29.8	31.6	31.3
Net Income (USD Bil)	40	53	46	48	60	55	57	95	100	97	79	102
Net Margin %	21.6	22.9	21.2	21.1	22.4	21.2	20.9	25.9	25.3	25.3	26.7	26.4
Diluted Shares Outstanding (Bil)	24	23	22	21	20	19	18	17	16	16	15	16
Diluted Earnings Per Share (USD)	1.61	2.31	2.08	2.30	2.98	2.97	3.28	5.61	6.11	6.13	5.11	6.57
Dividends Per Share (USD)	0.45	0.50	0.55	0.60	0.68	0.75	0.80	0.85	0.90	0.94	0.73	0.97

Valuation as of 31 Oct 2024

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Recent Qtr	TTM
Price/Sales	3.7	2.6	3.0	3.9	3.0	5.2	8.5	8.2	5.4	7.9	9.4	8.9
Price/Earnings	17.1	11.4	13.9	18.4	13.2	24.7	40.5	31.6	21.3	31.4	35.5	37.2
Price/Cash Flow	11.3	7.5	9.7	14.0	10.2	19.7	28.8	28.8	17.4	27.5	31.9	29.4
Dividend Yield %	1.67	1.93	1.93	1.45	1.79	1.04	0.61	0.49	0.7	0.49	0.42	0.43
Price/Book	5.8	4.9	4.7	6.4	7.0	14.2	34.1	46.1	40.7	47.8	53.2	60.2
EV/EBITDA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Operating Performance / Profitability as of 30 Jun 2024

Fiscal Year, ends 30 Sep	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	YTD	TTM
ROA %	18.0	20.5	14.9	13.9	16.1	15.7	17.3	28.1	28.4	27.5	—	30.6
ROE %	33.6	46.3	36.9	36.9	49.4	55.9	73.7	147	175	172	—	160.6
ROIC %	26.2	31.3	22.0	19.9	24.4	25.8	29.3	48.8	52.2	52.6	—	60.4
Asset Turnover	0.8	0.9	0.7	0.7	0.7	0.7	0.8	1.1	1.1	1.1	—	1.2

Financial Leverage

Fiscal Year, ends 30 Sep	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Recent Qtr	TTM
Debt/Capital %	20.6	30.9	37.0	42.0	46.7	50.4	62.1	65.4	68.4	63.2	56.4	—
Equity/Assets %	48.1	41.1	39.9	35.7	29.3	26.7	20.2	18.0	14.4	17.6	20.1	—
Total Debt/EBITDA	0.6	0.8	1.2	1.5	1.3	1.3	1.5	1.1	1.0	1.0	1.0	—
EBITDA/Interest Expense	161.0	115.3	50.4	33.0	26.9	22.9	28.2	46.5	45.4	32.9	—	—

Morningstar Analyst Historical/Forecast Summary as of 31 Oct 2024

Financials

			Estimates		
Fiscal Year, ends 30 Sep 2024	2023	2024	2025	2026	2027
Revenue (USD Mil)	383,285	391,035	418,441	452,999	482,937
Revenue Growth %	-2.8	2.0	7.0	8.3	6.6
EBITDA (USD Mil)	125,820	134,661	144,970	159,150	172,261
EBITDA Margin %	32.8	34.4	34.7	35.1	35.7
Operating Income (USD Mil)	114,301	123,216	134,043	148,241	161,496
Operating Margin %	29.8	31.5	32.0	32.7	33.4
Net Income (USD Mil)	96,995	93,736	112,386	124,522	135,657
Net Margin %	25.3	24.0	26.9	27.5	28.1
Diluted Shares Outstanding (Bil)	16	15	15	14	14
Diluted Earnings Per Share(USD)	6.13	6.08	7.49	8.59	9.75
Dividends Per Share(USD)	0.94	0.98	1.02	1.10	1.18

Forward Valuation

			Estimates		
	2023	2024	2025	2026	2027
Price/Sales	7.0	8.8	8.2	7.6	7.1
Price/Earnings	38.0	37.2	30.2	26.3	23.2
Price/Cash Flow	—	—	—	—	—
Dividend Yield %	0.4	0.4	0.4	0.5	0.5
Price/Book	59.3	61.1	64.2	109.7	-1,506.1
EV/EBITDA	21.6	25.8	24.0	21.8	20.2

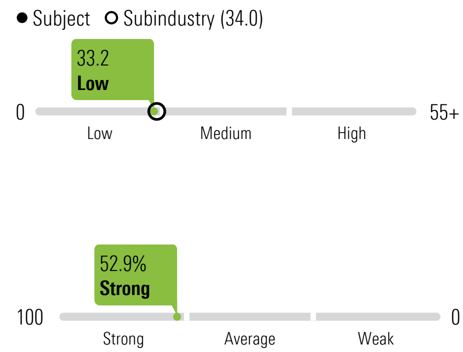
Morningstar Equity Analyst Report | Report as of 1 Nov 2024 00:15, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ - ALL MARKETS

Apple Inc AAPL ★★ 1 Nov 2024 00:09, UTC

Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Equity Style Box	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
225.91 USD 31 Oct 2024	200.00 USD 1 Nov 2024 00:07, UTC	1.13	3.43 USD Tril 31 Oct 2024	Wide	Large Blend	Medium	Exemplary	2 Oct 2024 05:00, UTC

ESG Risk Rating Breakdown

Exposure		
Company Exposure[1]	33.2	
– Manageable Risk	31.0	
Unmanageable Risk[2]	**2.2**	
Management		
Manageable Risk	31.0	
– Managed Risk[3]	16.4	
Management Gap[4]	**14.6**	
Overall Unmanaged Risk	**16.8**	



- 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 52.9% 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 Oct 02, 2024. Highest Controversy Level is as of Oct 08, 2024. Sustainalytics Subindustry: Technology Hardware. Sustainalytics provides Morningstar with company ESG ratings and metrics on a monthly basis and as such, the ratings in Morningstar may not necessarily reflect current Sustainalytics' scores for the company. For the most up to date rating and more information, please visit: sustainalytics.com/esg-ratings/.

Peer Analysis 02 Oct 2024

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

Company Name	Exposure			Management			ESG Risk Rating		
Apple Inc	33.2 | Low	0	55+	52.9 | Strong	100	0	16.8 | Low	0	40+
Alphabet Inc	40.5 | Medium	0	55+	44.1 | Average	100	0	23.9 | Medium	0	40+
Microsoft Corp	33.8 | Low	0	55+	62.2 | Strong	100	0	14.2 | Low	0	40+
Samsung Electronics Co Ltd	32.1 | Low	0	55+	62.1 | Strong	100	0	13.3 | Low	0	40+
Wondershare Technology Group Co Ltd	33.3 | Low	0	55+	4.9 | Weak	100	0	31.8 | High	0	40+

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Appendix
Historical Morningstar Rating

Apple Inc AAPL 30 Oct 2024 21:40, UTC

Dec 2024	Nov 2024	Oct 2024	Sep 2024	Aug 2024	Jul 2024	Jun 2024	May 2024	Apr 2024	Mar 2024	Feb 2024	Jan 2024
—	—	★★	★★	★★	★★	★★	★★	★★★	★★★	★★	★★
Dec 2023	Nov 2023	Oct 2023	Sep 2023	Aug 2023	Jul 2023	Jun 2023	May 2023	Apr 2023	Mar 2023	Feb 2023	Jan 2023
★★	★★	★★★	★★	★★	★★	★★	★★	★★★	★★★	★★★	★★★
Dec 2022	Nov 2022	Oct 2022	Sep 2022	Aug 2022	Jul 2022	Jun 2022	May 2022	Apr 2022	Mar 2022	Feb 2022	Jan 2022
★★★	★★★	★★	★★★	★★	★★	★★★	★★★	★★	★★	★★	★★
Dec 2021	Nov 2021	Oct 2021	Sep 2021	Aug 2021	Jul 2021	Jun 2021	May 2021	Apr 2021	Mar 2021	Feb 2021	Jan 2021
★★	★★	★★	★★	★★	★★	★★	★★★	★★	★★	★★	★★
Dec 2020	Nov 2020	Oct 2020	Sep 2020	Aug 2020	Jul 2020	Jun 2020	May 2020	Apr 2020	Mar 2020	Feb 2020	Jan 2020
★	★★	★★	★	★	★★	★★	★★	★★	★★★	★★	★★
Dec 2019	Nov 2019	Oct 2019	Sep 2019	Aug 2019	Jul 2019	Jun 2019	May 2019	Apr 2019	Mar 2019	Feb 2019	Jan 2019
★★	★★	★★	★★★	★★★	★★★	★★★	★★★	★★★	★★★	★★★★	★★★★

Alphabet Inc Class A GOOGL 30 Oct 2024 21:41, UTC

Dec 2024	Nov 2024	Oct 2024	Sep 2024	Aug 2024	Jul 2024	Jun 2024	May 2024	Apr 2024	Mar 2024	Feb 2024	Jan 2024
—	—	★★★★	★★★★	★★★★	★★★	★★★	★★★	★★★	★★★	★★★★	★★★★
Dec 2023	Nov 2023	Oct 2023	Sep 2023	Aug 2023	Jul 2023	Jun 2023	May 2023	Apr 2023	Mar 2023	Feb 2023	Jan 2023
★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★★
Dec 2022	Nov 2022	Oct 2022	Sep 2022	Aug 2022	Jul 2022	Jun 2022	May 2022	Apr 2022	Mar 2022	Feb 2022	Jan 2022
★★★★★	★★★★	★★★★	★★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★
Dec 2021	Nov 2021	Oct 2021	Sep 2021	Aug 2021	Jul 2021	Jun 2021	May 2021	Apr 2021	Mar 2021	Feb 2021	Jan 2021
★★★★	★★★	★★★★	★★★	★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★
Dec 2020	Nov 2020	Oct 2020	Sep 2020	Aug 2020	Jul 2020	Jun 2020	May 2020	Apr 2020	Mar 2020	Feb 2020	Jan 2020
★★★	★★★	★★★★	★★★	★★★	★★★	★★★	★★★	★★★	★★★★	★★★	★★★
Dec 2019	Nov 2019	Oct 2019	Sep 2019	Aug 2019	Jul 2019	Jun 2019	May 2019	Apr 2019	Mar 2019	Feb 2019	Jan 2019
★★★	★★★	★★★	★★★	★★★	★★★	★★★★	★★★	★★★	★★★	★★★	★★★★

Microsoft Corp MSFT 30 Oct 2024 21:38, UTC

Dec 2024	Nov 2024	Oct 2024	Sep 2024	Aug 2024	Jul 2024	Jun 2024	May 2024	Apr 2024	Mar 2024	Feb 2024	Jan 2024
—	—	★★★★	★★★★	★★★★	★★★★	★★★	★★★	★★★	★★★	★★★	★★★
Dec 2023	Nov 2023	Oct 2023	Sep 2023	Aug 2023	Jul 2023	Jun 2023	May 2023	Apr 2023	Mar 2023	Feb 2023	Jan 2023
★★★	★★★	★★★★	★★★★	★★★	★★★	★★★	★★★	★★★	★★★★	★★★★	★★★★
Dec 2022	Nov 2022	Oct 2022	Sep 2022	Aug 2022	Jul 2022	Jun 2022	May 2022	Apr 2022	Mar 2022	Feb 2022	Jan 2022
★★★★	★★★★	★★★★	★★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★
Dec 2021	Nov 2021	Oct 2021	Sep 2021	Aug 2021	Jul 2021	Jun 2021	May 2021	Apr 2021	Mar 2021	Feb 2021	Jan 2021
★★★	★★★	★★★	★★★★	★★★	★★★★	★★★	★★★★	★★★	★★★★	★★★	★★★★
Dec 2020	Nov 2020	Oct 2020	Sep 2020	Aug 2020	Jul 2020	Jun 2020	May 2020	Apr 2020	Mar 2020	Feb 2020	Jan 2020
★★★	★★★	★★★★	★★★	★★★	★★★	★★★	★★★	★★★	★★★★	★★★★	★★★
Dec 2019	Nov 2019	Oct 2019	Sep 2019	Aug 2019	Jul 2019	Jun 2019	May 2019	Apr 2019	Mar 2019	Feb 2019	Jan 2019
★★★	★★★	★★★	★★★★	★★★★	★★★	★★★	★★★★	★★★	★★★	★★★★	★★★★

Morningstar Equity Analyst Report | Report as of 1 Nov 2024 00:15, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ - ALL MARKETS Page 19 of 24

Samsung Electronics Co Ltd 005930 31 Oct 2024 12:10, UTC

Dec 2024	Nov 2024	Oct 2024	Sep 2024	Aug 2024	Jul 2024	Jun 2024	May 2024	Apr 2024	Mar 2024	Feb 2024	Jan 2024
—	—	★★★★★	★★★★	★★★★	★★★	★★★★	★★★★	★★★	★★★	★★★★	★★★
Dec 2023	Nov 2023	Oct 2023	Sep 2023	Aug 2023	Jul 2023	Jun 2023	May 2023	Apr 2023	Mar 2023	Feb 2023	Jan 2023
—	★★★★	★★★★	—	★★★★	★★★	★★★	★★★★	★★★★	★★★★	★★★★	★★★★
Dec 2022	Nov 2022	Oct 2022	Sep 2022	Aug 2022	Jul 2022	Jun 2022	May 2022	Apr 2022	Mar 2022	Feb 2022	Jan 2022
—	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★	★★★	—
Dec 2021	Nov 2021	Oct 2021	Sep 2021	Aug 2021	Jul 2021	Jun 2021	May 2021	Apr 2021	Mar 2021	Feb 2021	Jan 2021
—	★★★	★★★	★★★	★★★	★★★	★★★	★★★	★★★	★★	★★	★★
Dec 2020	Nov 2020	Oct 2020	Sep 2020	Aug 2020	Jul 2020	Jun 2020	May 2020	Apr 2020	Mar 2020	Feb 2020	Jan 2020
—	★★★	★★★	—	★★★★	★★★	★★★★	★★★★	—	★★★★	★★★	★★★
Dec 2019	Nov 2019	Oct 2019	Sep 2019	Aug 2019	Jul 2019	Jun 2019	May 2019	Apr 2019	Mar 2019	Feb 2019	Jan 2019
—	★★★	★★★	★★★	★★★	★★★	★★★	★★★★	★★★★	★★★★	★★★★	★★★★

Research Methodology for Valuing Companies

Overview

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

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

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

1. Economic Moat

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

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

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

2. Estimated Fair Value

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

Our model is divided into three distinct stages:

Stage I: Explicit Forecast

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

Stage II: Fade

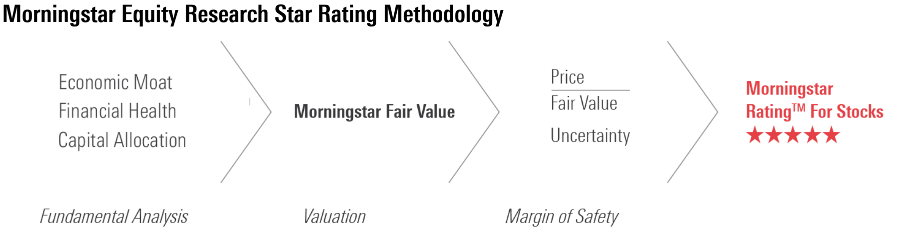
The second stage of our model is the period it will take the company's return on new invested capital—the return on capital of the next dollar invested ("RONIC")—to decline (or rise) to its cost of capital. During the Stage II period, we use a formula to approximate cash flows in lieu of explicitly modeling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

Stage III: Perpetuity

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

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

Morningstar Equity Research Star Rating Methodology



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-

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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.

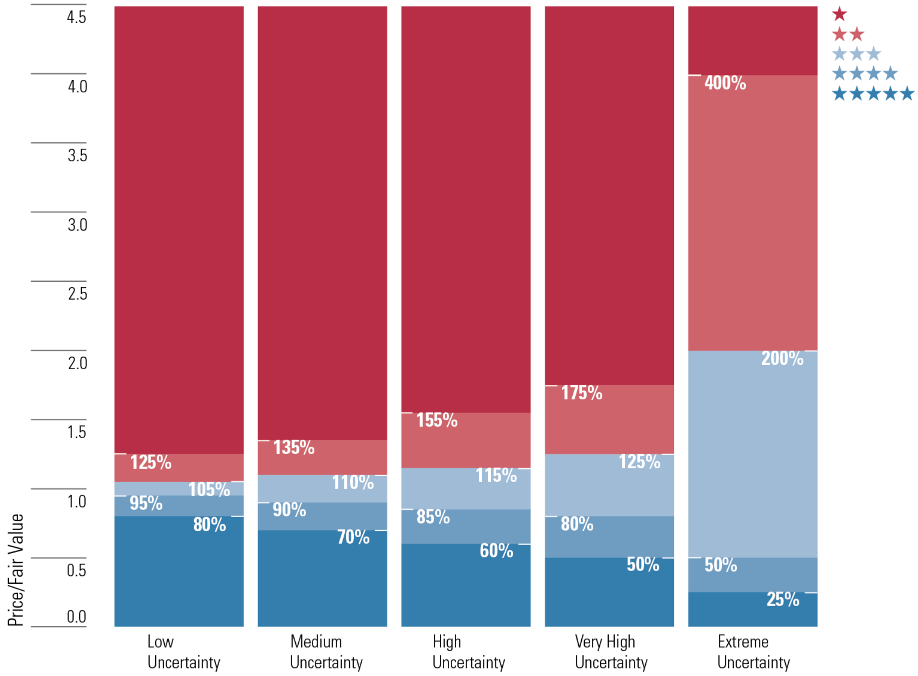
4. Market Price

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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