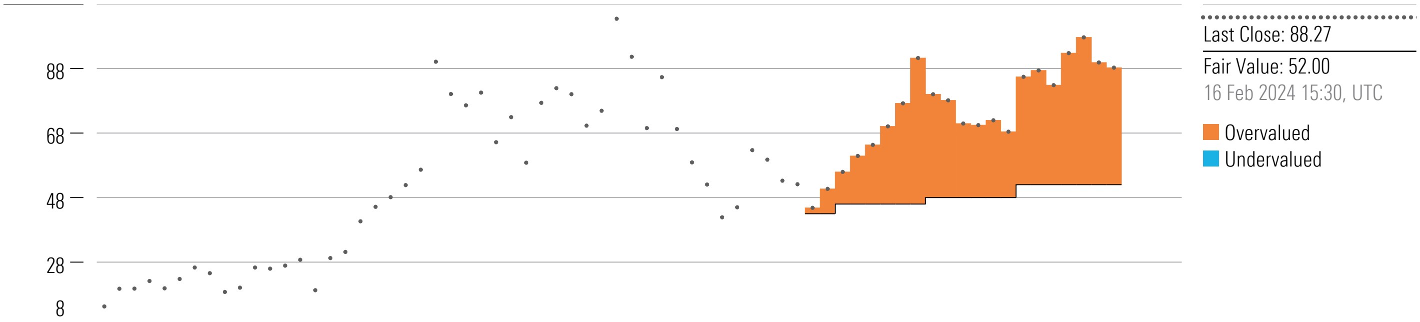
Morningstar Equity Analyst Report | Report as of 9 Aug 2024 22:46, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ - ALL MARKETS

# The Trade Desk Inc Class A TTD ★ 9 Aug 2024 21:43, UTC

| Last Price | Fair Value Estimate | Price/FVE | Market Cap | Economic Moat™ | Equity Style Box | Uncertainty | Capital Allocation | ESG Risk Rating Assessment[1] |
|---|---|---|---|---|---|---|---|---|
| 88.27 USD<br>8 Aug 2024 | 52.00 USD<br>16 Feb 2024 15:30, UTC | 1.91 | 48.57 USD Bil<br>9 Aug 2024 | None | Mid Growth | Very High | Standard | 3 Jul 2024 05:00, UTC |

## Price vs. Fair Value




| | 2019 | 2020 | 2021 | 2022 | 2023 | YTD | |
|---|---|---|---|---|---|---|---|
| | — | — | — | 1.04 | 1.50 | 1.91 | Price/Fair Value |
| | 123.83 | 208.34 | 14.41 | -51.08 | 60.52 | 22.67 | Total Return % |

Morningstar Rating

Total Return % as of 08 Aug 2024. Last Close as of 08 Aug 2024. Fair Value as of 16 Feb 2024 15:30, UTC.

**Contents**



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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.

## The Trade Desk Earnings: Growing Streaming Ad Inventory Is Driving Strong Growth

**Analyst Note** Michael Hodel, CFA, Director, 9 Aug 2024

The Trade Desk continues to execute well, delivering solid revenue growth during the second quarter and providing a third-quarter outlook that calls for more of the same. Total revenue increased 26% versus a year ago, with connected TV advertising driving growth. While we appreciate the opportunity to connect advertisers with the rapidly growing ad inventory on multiple streaming platforms, we believe we've already incorporated this into our $52 fair value estimate.

We estimate TTD's video-related revenue, which includes connected television, grew around 35% year over year, moving to the "high-40%" range of total sales from the "mid-40%" range the firm has reported over the past several quarters. This pace stands in contrast to the sharp deceleration in YouTube ad revenue growth that Alphabet reported (13% versus 21% in the prior quarter). The strong video performance also provides evidence that the increase in inventory on Amazon Prime Video and its proprietary platform hasn't had an outsize impact on the ad market.

Partnerships with Disney, Netflix, Fox, NBC, Roku, and others are clearly producing results as these companies grow their ad-supported customer bases. TTD also considers audio advertising among the most underappreciated inventory available, given the level of engagement podcast and music listeners typically exhibit. Audio-based revenue has been stuck at around 5% of TTD's sales, but management highlighted investments Spotify is making to enable more programmatic ad buying. Looking to the third

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| Sector | Industry |
|---|---|
| Technology | Software - Application |

**Business Description**

The Trade Desk provides a self-service platform that helps advertisers and ad agencies programmatically find and purchase digital ad inventory (display, video, audio, and social) on different devices like computers, smartphones, and connected TVs. It utilizes data to optimize the performance of ad impressions purchased. The firm's platform is referred to as a demand-side platform in the digital ad industry. The firm generates its revenue from fees based on a percentage of what its clients spend on advertising.

quarter, management expects revenue of at least $618 million, implying growth will remain in excess of 25%.

Revenue growth provided strong operating leverage as the operating margin expanded to 16% from 9% a year ago. The adjusted EBITDA margin increased to 41% from 9% a year ago. TTD has generated $233 million of free cash flow through the first half of 2024, down from $296 million last year primarily because of higher working capital needs.

**Business Strategy & Outlook** Michael Hodel, CFA, Director, 12 Mar 2024

The Trade Desk has become one of the leading technology platform providers for advertisers and their ad agencies to purchase ad inventory made available by various publishers or content providers. We expect this demand-side platform provider, which helps ad buyers manage programmatic ad campaigns, will benefit from the ongoing growth of digital advertising spending.

The Trade Desk's independence—it does not own media that could create bias in ad purchases and placement—likely has increased the trust of brands and their ad agencies in the firm's platform. This position contrasts with Google's platforms, which remain dominant but have lost share in serving ads to non-Google publishers, and Amazon's rapidly growing ad business. The Trade Desk also provides methods to enhance data sharing and interoperability. Its platform is integrated with publishers or their supply side platform providers, which allows the firm to better utilize its clients' and the publishers' data to optimize addressable ad campaigns in real time and measure campaign results. Over the past five years, The Trade Desk has increased its client count by about 50% to reach more than 1,100 ad agencies and other ad buyers. Revenue per client has also increased nearly three-fold over this period as the firm has expanded its capabilities and the number of data sources clients can access.

The connection between and translation of data from many different sources has become the top priority for all participants in the digital advertising market as connections have weakened, thanks to changes in Apple's privacy policies and Google's plan to eliminate third-party cookies. The Trade Desk is investing in creating an encrypted user identifier, referred to as UID2. If widely adopted, the integration and utilization of data from multiple sources would become less costly and more efficient, increasing the effectiveness of digital ads. While The Trade Desk does not sell UID2 and only considers it an industrywide initiative, the identifier could attract more advertisers to its platform. However, the firm faces fierce competition from the likes of LiveRamp and Google on this front.

**Bulls Say** Michael Hodel, CFA, Director, 12 Mar 2024

- Advertisers will likely shift a percentage of their budgets from social media toward other website publishers, given the improving performance of contextual campaigns, increasing the need for demand-side platforms.

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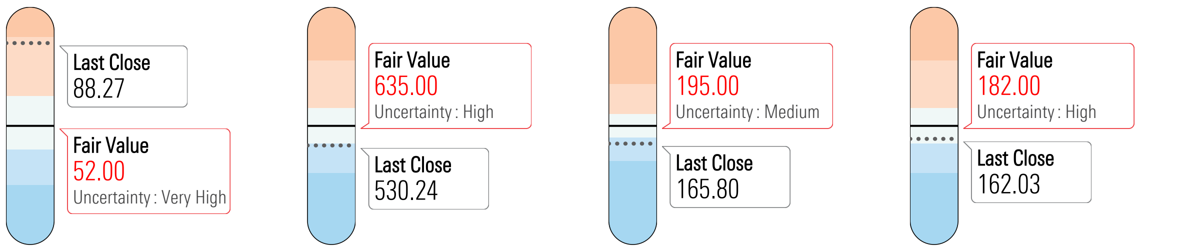
## Competitors

| | The Trade Desk Inc Class A TTD | Adobe Inc ADBE | Amazon.com Inc AMZN | Alphabet Inc Class A GOOGL |
|---|---|---|---|---|




| | The Trade Desk Inc Class A TTD | Adobe Inc ADBE | Amazon.com Inc AMZN | Alphabet Inc Class A GOOGL |
|---|---|---|---|---|
| Economic Moat | None | Wide | Wide | Wide |
| Currency | USD | USD | USD | USD |
| Fair Value | 52.00 16 Feb 2024 15:30, UTC | 635.00 14 Jun 2024 02:13, UTC | 195.00 2 Aug 2024 01:02, UTC | 182.00 24 Jul 2024 04:20, UTC |
| 1-Star Price | 91.00 | 984.25 | 263.25 | 282.10 |
| 5-Star Price | 26.00 | 381.00 | 136.50 | 109.20 |
| Assessment | Significantly Overvalued 9 Aug 2024 | Undervalued 9 Aug 2024 | Undervalued 9 Aug 2024 | Fairly Valued 9 Aug 2024 |
| Morningstar Rating | ★9 Aug 2024 21:43, UTC | ★★★★9 Aug 2024 21:26, UTC | ★★★★9 Aug 2024 21:26, UTC | ★★★9 Aug 2024 21:26, UTC |
| Analyst | Michael Hodel, Director | Dan Romanoff, Senior Equity Analyst | Dan Romanoff, Senior Equity Analyst | Michael Hodel, Director |
| Capital Allocation | Standard | Exemplary | Exemplary | Exemplary |
| Price/Fair Value | 1.91 | 0.84 | 0.86 | 0.90 |
| Price/Sales | 20.29 | 11.85 | 2.92 | 6.21 |
| Price/Book | 18.04 | 16.04 | 7.36 | 6.64 |
| Price/Earning | 172.61 | 41.41 | 38.83 | 23.06 |
| Dividend Yield | 0.00% | 0.00% | 0.00% | 0.12% |
| Market Cap | 48.57 Bil | 237.80 Bil | 1,752.13 Bil | 2,014.78 Bil |
| 52-Week Range | 60.23—102.67 | 433.97—638.25 | 118.35—201.20 | 120.21—191.75 |
| Investment Style | Mid Growth | Large Growth | Large Growth | Large Blend |

- With several media firms, like Disney and Warner Bros., adopting UID 2.0, it may become the standard identifier in the digital advertising market and significantly strengthen The Trade Desk's network effect.
- As an early mover in connected TV advertising, The Trade Desk will benefit the most from the continuing transition of linear TV advertising to CTV.

**Bears Say** Michael Hodel, CFA, Director, 12 Mar 2024

- Growth will be limited in the fragmented non-Google demand-side platform market, given Google's dominance with a 40% market share (according to Jounce Media). Amazon is also aggressively expanding in this market.
- LiveRamp's authenticated traffic solution and Google's identifier could prevent The Trade Desk's UID 2.0 from becoming the standard.
- Pricing pressure on The Trade Desk's non-CTV business from smaller competitors and Google will pressure growth and profitability.

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**Economic Moat** Michael Hodel, CFA, Director, 12 Mar 2024

We assign The Trade Desk a no-moat rating. The firm's technology is an important component of automated (programmatic) digital advertising, which eMarketer estimates represents around 90% of digital display ad spending. Advertisers and their ad agencies represent the demand side of the programmatic digital advertising market as they seek ad inventory to purchase from publishers (the supply side). Advertising technology providers like The Trade Desk help optimize advertisers' digital ad campaigns by automating various processes such as matching campaign objectives with publishers' content and the type of audience they attract, bidding on ad inventory, delivering ads to the publishers, and compiling, managing, and analyzing data to improve the ad effectiveness.

The entire process takes a few milliseconds. When a webpage loads or an app is opened, The Trade Desk is notified by the publisher (webpage or app) that ad inventory is available. The firm's platform then matches the request with an ad. This matching occurs based on the user's attributes, such as demographics and location, and its advertiser clients' preferences, such as target audience and the format of the ads they'd like to display. If these various factors are matched, the advertiser (or its ad agency) places a bid via The Trade Desk. If the publisher (or middle players on its behalf) accepts the bid, then the ad content is delivered via an ad server (in-house with the advertiser or offered by The Trade Desk) for placement on the website or app.

The Trade Desk is developing a network effect. As the firm's client base (mainly advertising agencies) and average usage grow, its reach with publishers should expand as well. We estimate that gross spending on its platform has consistently increased at a faster rate than growth in digital ad spending in recent years. However, we don't have confidence that this dynamic will create a competitive advantage. Most advertisers and agencies use multiple demand-side platforms, or DSPs, which could push providers to price their platforms more aggressively or accept lower take rates to attract volume.

On the intangible asset front, we do not believe The Trade Desk's capabilities are differentiated enough from its competitors. The firm's technology can utilize its clients' first-party data and combine it with data purchased from third parties, like other DSP providers. When optimizing ad campaigns, The Trade Desk and other DSPs work with data management and data connectivity platform providers, which gather user data from various sources and attempt to match them with the data they receive from publisher requests to identify specific users or cohorts to target.

The Trade Desk is currently one of the leaders in developing new means of identifying and tracking users. It has used its technological know-how to create UID 2.0, a user identifier that could lessen the impact of the extinction of third-party cookies. UID 2.0 is based on user emails. It is encrypted, and as it passes from publishers to advertisers or advertisers to publishers through various devices, additional security features are placed on the identifier. If widely adopted, the integration and utilization of data from multiple sources would become less costly and more efficient, increasing the effectiveness of digital ads. While The Trade Desk does not sell UID 2.0 and only considers it an industrywide initiative, the identifier could attract more advertisers to its platform. However, there are other third-party cookie replacement options provided by LiveRamp and Google.

Lastly, while there may be some indications of customer switching costs as a competitive advantage, we aren't confident they can be maintained for at least 10 years. According to management, more clients have begun to sign two- to three-year joint business partnership agreements, which is an improvement from the one-year master services agreements that most of the firm's clients have been signing. With joint business partnership agreements, it is more likely that the firm will customize its offering for various clients based on their needs, while the clients will further integrate and customize their in-house platform with The Trade Desk by using the firm's application programming interfaces. However, such exclusivity should be discounted as there could be other DSPs with preferred status with the same advertiser but based on different products or campaigns and their various objectives.

**Fair Value and Profit Drivers** Michael Hodel, CFA, Director, 12 Mar 2024

Our fair value estimate of $52 per share equals 25 and 10 times our 2024 adjusted EBITDA and sales estimates, respectively. Our adjusted EBITDA figure excludes stock-based compensation, but our fair value estimate includes these expenses in our margin forecast.

We have modeled average annual revenue growth of 20% during the next five years, driven mainly by connected TV ad spending growth and the firm’s expansion in international markets, both of which should help The Trade Desk outpace overall growth in digital advertising spending.

While we are not certain whether the firm’s UID2 will become an industry-standard identifier in digital advertising, we expect that it will gain adoption with the firm’s advertising clients and their agencies, which could help The Trade Desk become a preferred DSP among some of its clients, resulting in more impressions purchased and driving further top-line growth.

We assume an average operating margin of 27% through 2028, up from 9% over the last three years. The roll-off of expenses tied to the CEO option grant awarded in 2021 should lift margins over the next two years. Given the 10-year life of this option plan, we don't expect the firm will grant another similar award. Also, growth in revenue should create some economies of scale, increasing gross margin. We expect revenue growth will create operating leverage, even as the firm continues to invest to further enhance its platform and acquire clients.

**Risk and Uncertainty** Michael Hodel, CFA, Director, 12 Mar 2024

Our Morningstar Uncertainty Rating for The Trade Desk is Very High. The firm’s revenue is highly dependent on the well-being of the economy and overall consumption. An uncertain or weak economic

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environment will affect The Trade Desk's revenue. In addition, while The Trade Desk has made headway in becoming one of the leading demand-side platform providers, it will continue to face competition from Google, which operates as a publisher, sell-side platform, and buy-side platform. We believe Google's properties will continue to generate more traffic than many other properties, therefore attracting a larger portion of online ad spending for which Google's own platform will do the buying and selling.

Additional unexpected disruptions in the digital advertising market could come about. The market has experienced several challenges in recent years, including regulations surrounding data privacy, Apple's data policy changes, and Google's yet-to-come elimination of third-party cookies within the Chrome browser. Plus, the adoption of UID 2.0 remains uncertain as it will also be affected by offerings from Google and LiveRamp.

Similar to other advertising technology firms, The Trade Desk continues to face data privacy and security risks as the platform and its capabilities are dependent on data, of which internet user behavior is a large component. These risks could increase with wider adoption of UID 2.0, which is an identifier based on email addresses.

**Capital Allocation** Michael Hodel, CFA, Director, 12 Mar 2024

We assess The Trade Desk's capital allocation as Standard.

The Trade Desk has made only two very small acquisitions in recent years: Adbrain, whose software connected customer IDs from various sources, in 2017 and a tuck-in of a small technology firm in 2021. We expect the firm will keep increasing its investments in technology and development, but at a slower pace than revenue growth, allowing these costs to decline as a percentage of revenue.

The firm's capital expenditures the last three years have averaged 4% of revenue. During the pandemic, capital expenditures hit 9% of revenue (in 2020) due to the unexpected surge in demand for programmatic addressable digital advertising. We do not expect a significant change in capital expenditure through 2028 as the platform likely has scaled, shifting expenditures to maintenance and increasing the capacity of data centers instead of building new ones.

Historically, The Trade Desk had not allocated capital to shareholder returns. However, in 2023, the firm repurchased $647 million in shares. As of early 2024, the firm has another $700 million authorized for share buyback. We do not expect The Trade Desk to distribute dividends during the next five years.

CEO Jeff Green was granted 10-year "market-based performance" options to purchase 16 million shares in late 2021, with an initial estimated value of more than $825 million. The options are only exercisable if The Trade Desk shares reach certain price thresholds, with eight tranches ranging from $90-$340 per share. The number of options ultimately issued can move up or down by up to 20%, depending on the

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stock's performance relative to the market. The first tranche has been hit, causing 2.4 million options to become exercisable. The next tranche hits if the average share price exceeds $115 over any consecutive 30 trading days.

This unusual compensation arrangement has two negative effects, in our view. First, it has put heavy pressure on reported operating margins, as the CEO option plan has accounted for nearly half of total stock-based compensation expense over the past three years. More importantly, this arrangement could misalign interests. For example, shareholders might be best off accepting a buyout offer, but if that offer falls below several option tranches, the CEO might be reluctant to accept. Green also owns nearly all of The Trade Desk's supervoting Class B shares, giving him nearly 50% voting control. Balancing this risk, he already owns more than 45 million shares.

### Analyst Notes Archive

**The Trade Desk Earnings: New Partnerships Point to Continued Strong Revenue Growth** Michael Hodel, CFA, Director, 9 May 2024

Continued strong advertising demand fueled growth at The Trade Desk during the first quarter. Total revenue increased 28% versus a year ago, modestly faster growth than that seen among ad behemoths Alphabet and Meta while handily outperforming Google's ad network. While we expect ad spending growth will moderate in the coming quarters, we also expect TTD will continue to gain share. Our fair value estimate remains $52 per share. With the shares trading at 17 and 40 times our 2024 revenue and adjusted EBITDA estimates, respectively, we still believe the valuation is stretched.

TTD expects recently formed or expanded partnerships with Disney, NBC Universal, and Roku will continue to drive connected television growth, making more inventory and data available to its clients. Further, the firm believes that most premium video content makers will want to partner with firms like TTD to maximize ad pricing, allowing for lighter ad loads and a better customer experience. Amazon was specifically discussed. The retail giant's recently pushed Prime Video customers into an ad-supported tier. TTD believes that Amazon's video ad inventory isn't garnering premium prices in part because it is selling ad inventory exclusively through its own platform, where advertisers may question its objectivity. TTD suspects Amazon would be better off partnering with TTD and adopting the UID2 viewer identifier to help advertisers better target viewers and measure results. A partnership with Amazon, which cuts across both connected television and retail marketing, would go a long way toward establishing a network effect economic moat for TTD.

The firm continued to invest in development and marketing during the first quarter, but it still demonstrated solid operating leverage. Operating income flipped from a $23 million loss last year to a $29 million gain. The adjusted EBITDA margin, which excludes stock-based compensation, increased to 33% from 28% a year ago.

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**The Trade Desk Earnings: Strong Growth Outpacing the Digital Ad Market, but Shares Remain Overvalued** Ali Mogharabi, Senior Equity Analyst, 16 Feb 2024

The Trade Desk's fourth-quarter results mostly matched our projections, confirming our view that management's growth guidance was too conservative. Advertising spending continues to increase with economic growth, especially in the two areas on which the firm is focused—connected television and retail media—which are still in their early growth phases. Plus, as we assumed, international demand for connected TV ads remained strong, undeterred by geopolitical issues.

Despite the company's continued investment in hiring and product development, the margin impact was less than expected. As a result, we've revised our margin expectations upward and increased our fair value estimate to $52 from $48. We're optimistic about the firm's future revenue and margin growth, expecting a 20% annual revenue increase and a 23% annual rise in adjusted EBITDA over the next five years. Yet, the current stock price looks significantly too high to us, with the shares trading at multiples of 16 and 33 times 2024 revenue and adjusted EBITDA, respectively.

Total revenue came in at $605.8 million, up 23% from last year mainly due to growth in international markets, in addition to increasing adoption of connected television and retail media. We were impressed with the firm's ability to increase its full-year take rate (up 10 basis points), which with more longer-term deals could indicate some stickiness around its technology. The firm continued its investments in new offerings, including possible substitutes for third-party cookies, such as the UID2, and the artificial intelligence-powered KoKai measurement tool, which lowered the adjusted EBITDA margin to 47% from 50% last year.

The firm expects first-quarter revenue of at least $478 million (25% growth from last year) and adjusted EBITDA of $130 million or 27% margin, below the 28% margin in 2023.

**The Trade Desk Earnings: Smart TV and Retail Media Demand Still Increasing, but Guidance Disappoints** Ali Mogharabi, Senior Equity Analyst, 10 Nov 2023

The Trade Desk reported another strong quarter beating management's expectations on the top- and bottom line. Fourth-quarter revenue guidance was weaker than we anticipated and we believe the firm is either too cautious or may be facing some pressure on take rates. We did not make significant adjustments to our model and our revenue projection remains slightly above the firm's guidance. We are maintaining our $48 fair value estimate, which represents more than 9 times and 20 times our 2024 sales and adjusted EBITDA estimates, respectively. We continue to view the shares of no-moat The Trade Desk, which are trading at sales and adjusted EBITDA multiples of 15 and 38, respectively, as overvalued.

We do not think that recent geopolitical factors have hit demand for smart TVs and other digital advertising as much as the firm's forecast implies. Its peers on the supply side, which represent

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publishers, have generally provided higher-than-expected growth outlooks for the fourth quarter. Regarding the take rate, third-quarter results did not indicate a decline, even with increased competition from the likes of Google and some of the supply side platforms.

Total revenue increased 25% to $493.3 million, driven by further international expansion and continuing strength in smart TVs and retail media. Excluding last year's political advertising revenue, third-quarter growth came in at 27%. Non-GAAP operating expenses increased 29% mainly due to a higher headcount and more technology and product development investments, which reduced the adjusted EBITDA margin by around 70 basis points from last year to 40.5%.

The firm expects fourth-quarter revenue of at least $580 million (18% year-over-year growth) and $270 million in adjusted EBITDA which implies a 46.5% margin, below last year's 50%.

**Trade Desk Earnings: Executing on All Fronts as Connected TV and Retailers Drive Demand** Ali Mogharabi, Senior Equity Analyst, 10 Aug 2023

We increased our fair value estimate for The Trade Desk slightly to $48 from $46. Unlike its advertising supply-side peers, the demand-side platform provider continues to experience improving demand from advertisers and ad agencies. The firm has positioned itself well to benefit from growth in the connected TV market and expanding digital ad spending among retailers and on their online properties.

While we commend the firm for executing well, unquestionably increasing its ad-tech market share while maintaining its leadership position among demand-side platforms, we still believe the stock is significantly overvalued. The stock is trading at 17 and 43 times 2024 sales and adjusted EBITDA, respectively. This is compared with its peers' average valuation multiples of 2.5 and 7.3, respectively. While we project that the firm will comfortably outperform its peers through 2027, in our view, such a premium is still unwarranted. Our fair value estimate represents 2024 sales and adjusted EBITDA multiples of 9 and 22, assuming 22% average revenue growth and nearly two percentage points of EBITDA margin expansion through 2027.

We also think that increasing competition from the supply side cannot be ignored. Both supply- and demand-side providers are searching for less costly paths to sell and buy ads, aggressively attempting to work directly with advertisers or publishers. More competition could pressure the firm's take rate which we estimate has been sitting comfortably in the 19%-21% range. We may also see more activity in terms of mergers and acquisitions on the supply side to compete more effectively against The Trade Desk. We also wouldn't be surprised to see attempts at consolidation on the demand side among rivals, especially after the bankruptcy of MediaMath.

**Trade Desk Earnings: Digital and Programmatic Advertising Are Fine and Trade Desk Is a Beneficiary**
Ali Mogharabi, Senior Equity Analyst, 11 May 2023

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Like its peers on the supply side, first-quarter numbers for demand side platform provider Trade Desk pointed toward increasing adoption of programmatic advertising and a recovery in digital advertising, which likely will strengthen in the second half of this year. We still view Trade Desk as the leading ad-tech provider on the demand side as it leads the increasing adoption of programmatic advertising within the connected TV channel and seeks more ad inventory in non-walled-garden properties for its clients, advertisers, and their agencies.

However, we are also sensing competition from the supply side as firms on both ad-tech fronts are attempting to find less costly and more efficient paths to buy and sell ads programmatically—referred to as supply path optimization. We expect more aggressive moves on that front by Trade Desk and its OpenPath product, and by the supply-side players PubMatic and Magnite, with their Activate and ClearLine products, respectively. Offerings like OpenPath could entice some publishers to remove other participants (including supply-side platforms) from their digital advertising workflow and further increase efficiency. This could lead to less fragmentation within the ad-tech market during the next few years, whether via firms exiting the market (such as what Yahoo and EMX did on the supply side) or more activity on the M&A front to gather assets and provide a more complete ad-tech stack to compete more effectively against Google.

While the firm continues to execute well on all fronts, and we project 20% average revenue growth and slight margin expansion throughout our forecast, we view the no-moat name as overvalued. Trade Desk is trading at around 43 and 33 times 2023 and 2024 adjusted EBITDA consensus estimates, which is not warranted, in our view, given the current macro environment and increasing competition. Our fair value estimate of Trade Desk remains at $46 which implies 2023 and 2024 adjusted EBITDA multiples of 30 and 23.5.

**Digital Ad Spending Slowdown Does Not Affect The Trade Desk, but Shares Are Overvalued** Ali Mogharabi, Senior Equity Analyst, 15 Feb 2023

The Trade Desk's solid fourth-quarter results support a few of our assumptions about the firm and the digital ad market, including continued strong growth of the connected TV market, that an increasing number of clients will sign multiyear agreements, ad spending will continue to shift away from "walled garden" sites or apps like Facebook, and adoption of the firm's universal identifier offering, UID 2.0, will steadily expand.

We have slightly adjusted our projections, pushing our fair value estimate to $46 from $43. While we commend management for executing well and believe the firm remains well-positioned to gain share in the ad-tech market, we believe the stock is now overvalued as it is trading 25% higher in reaction to earnings.

Fourth-quarter revenue came in at $491 million, up 24% year over year. For the year, we were pleased with the improvement in take rate to 20.2% from 19.4%, although it remained below the prepandemic level, which we think likely reflects larger clients not having yet fully resumed programmatic ad spending. Non-GAAP operating income of $227.7 million represented a 46.4% margin, up from 45.5% last year, helped by lower variable compensation costs and the timing of various marketing campaigns.

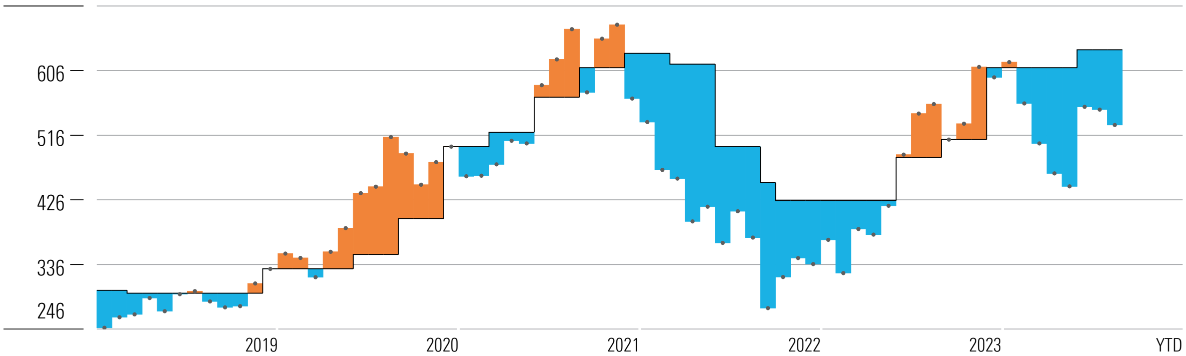
Increased demand for advertising on connected television services drove revenue growth. We expect the connected TV market will grow at a 21% annual average rate through 2027 in the U.S. Growth in the number of longer agreements with advertisers and agencies also drove top-line growth. More clients are signing two- to three-year joint business partnership, or JBP, agreements, rather than one-year agreements. We think the firm has more opportunities to customize work for its clients that with JBPs, while clients further integrate and customize their in-house platform with The Trade Desk.

Morningstar Equity Analyst Report | Report as of 9 Aug 2024 22:46, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ - ALL MARKETS

# The Trade Desk Inc Class A TTD ★ 9 Aug 2024 21:43, UTC

## Competitors Price vs. Fair Value

### Adobe Inc ADBE




Fair Value: 635.00
14 Jun 2024 02:13, UTC

Last Close: 530.24

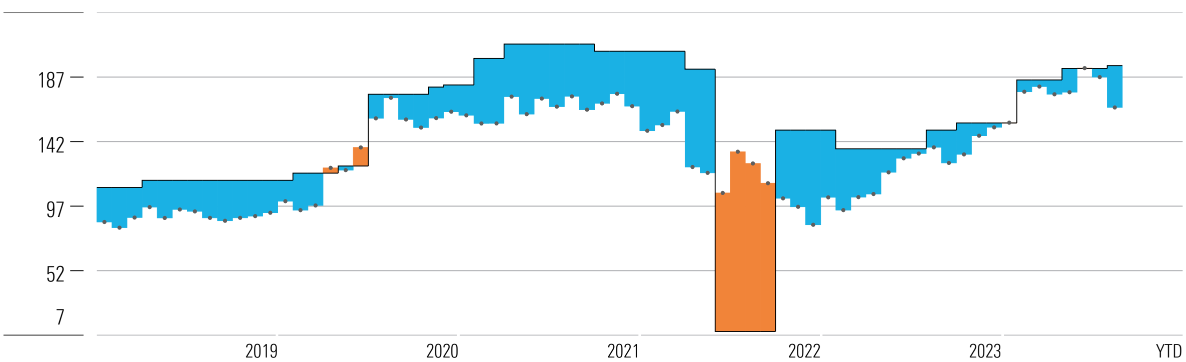
Overvalued
Undervalued

| 2019 | 2020 | 2021 | 2022 | 2023 | YTD | |
|---|---|---|---|---|---|---|
| 1.00 | 1.00 | 0.90 | 0.79 | 0.98 | 0.84 | Price/Fair Value |
| 45.78 | 51.64 | 13.38 | -40.65 | 77.28 | -11.12 | Total Return % |

Morningstar Rating
★★★★★
★★★★
★★★
★★
★

Total Return % as of 08 Aug 2024. Last Close as of 08 Aug 2024. Fair Value as of 14 Jun 2024 02:13, UTC.

### Amazon.com Inc AMZN




Fair Value: 195.00
2 Aug 2024 01:02, UTC

Last Close: 165.80

Overvalued
Undervalued

| 2019 | 2020 | 2021 | 2022 | 2023 | YTD | |
|---|---|---|---|---|---|---|
| 0.80 | 0.90 | 0.81 | 0.56 | 0.98 | 0.86 | Price/Fair Value |
| 23.03 | 76.26 | 2.38 | -49.62 | 80.88 | 9.12 | Total Return % |

Morningstar Rating
★★★★★
★★★★
★★★
★★
★

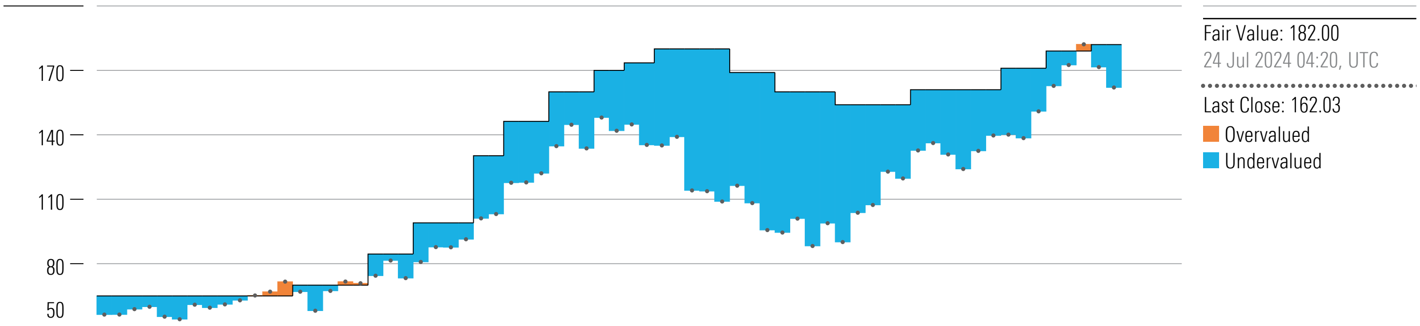
Total Return % as of 08 Aug 2024. Last Close as of 08 Aug 2024. Fair Value as of 2 Aug 2024 01:02, UTC.

Morningstar Equity Analyst Report | Report as of 9 Aug 2024 22:46, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ - ALL MARKETS Page 13 of 22

# The Trade Desk Inc Class A TTD ★ 9 Aug 2024 21:43, UTC

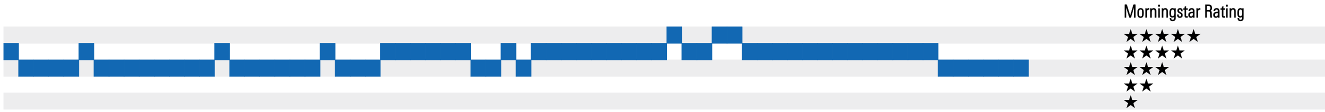
## Competitors Price vs. Fair Value

### Alphabet Inc Class A GOOGL




| | 2019 | 2020 | 2021 | 2022 | 2023 | YTD |
|---|---|---|---|---|---|---|
| Price/Fair Value | 1.03 | 0.89 | 0.83 | 0.55 | 0.87 | 0.90 |
| Total Return % | 28.18 | 30.85 | 65.30 | -39.09 | 58.32 | 16.14 |

Morningstar Rating




Total Return % as of 08 Aug 2024. Last Close as of 08 Aug 2024. Fair Value as of 24 Jul 2024 04:20, UTC.

# The Trade Desk Inc Class A TTD ★ 9 Aug 2024 21:43, UTC

| Last Price | Fair Value Estimate | Price/FVE | Market Cap | Economic Moat™ | Equity Style Box | Uncertainty | Capital Allocation | ESG Risk Rating Assessment[1] |
|---|---|---|---|---|---|---|---|---|
| 88.27 USD<br>8 Aug 2024 | 52.00 USD<br>16 Feb 2024 15:30, UTC | 1.91 | 48.57 USD Bil<br>9 Aug 2024 | None | Mid Growth | Very High | Standard | 3 Jul 2024 05:00, UTC |

## Morningstar Historical Summary

**Financials** as of 30 Jun 2024

| **Fiscal Year,** ends 31 Dec | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | YTD | TTM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Revenue (USD Mil) | 45 | 114 | 203 | 308 | 477 | 661 | 836 | 1,196 | 1,578 | 1,946 | 1,076 | 2,175 |
| Revenue Growth % | — | 155 | 78.3 | 51.9 | 54.9 | 38.5 | 26.5 | 43.1 | 31.9 | 23.3 | 27.0 | 25.5 |
| EBITDA (USD Mil) | 0.58 | 32.82 | 50.71 | 76.57 | 119.15 | 133.86 | 172.84 | 167.04 | 168.08 | 280.90 | 166.00 | 389.18 |
| EBITDA Margin % | 1.3 | 28.8 | 25.0 | 24.8 | 25.0 | 20.3 | 20.7 | 14.0 | 10.7 | 14.4 | 15.4 | 17.9 |
| Operating Income (USD Mil) | 0.76 | 37.98 | 57.52 | 69.36 | 107.32 | 112.20 | 144.21 | 124.82 | 113.65 | 200.48 | 123.38 | 305.49 |
| Operating Margin % | 1.7 | 33.4 | 28.3 | 22.5 | 22.5 | 17.0 | 17.3 | 10.4 | 7.2 | 10.3 | 11.5 | 14.1 |
| Net Income (USD K) | 5 | 15,929 | 20,482 | 50,798 | 88,140 | 108,318 | 242,317 | 137,762 | 53,385 | 178,940 | 116,689 | 253,364 |
| Net Margin % | 0.0 | 7.7 | -13.2 | 16.5 | 18.5 | 16.4 | 29.0 | 11.5 | 3.4 | 9.2 | 10.9 | 11.7 |
| Diluted Shares Outstanding (Mil) | 498 | 498 | 183 | 441 | 458 | 478 | 490 | 499 | 500 | 500 | 499 | 500 |
| Diluted Earnings Per Share (USD) | 0.00 | 0.01 | -0.15 | 0.12 | 0.19 | 0.23 | 0.49 | 0.28 | 0.11 | 0.36 | 0.23 | 0.51 |
| Dividends Per Share (USD) | — | — | — | — | — | — | — | — | — | — | — | — |

**Valuation** as of 31 Jul 2024

| | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | Recent Qtr | TTM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Price/Sales | — | — | 6.2 | 7.0 | 12.5 | 20.4 | 53.2 | 40.7 | 14.8 | 20.1 | 23.8 | 21.9 |
| Price/Earnings | — | — | -48.3 | 18.0 | 80.0 | 126.6 | 270.3 | 161.3 | -2,500.0 | 232.6 | 243.9 | 222.2 |
| Price/Cash Flow | — | — | 38.2 | 45.2 | 83.3 | 90.9 | 185.2 | 119.0 | 40.8 | 54.1 | 82.0 | 75.2 |
| Dividend Yield % | — | — | — | — | — | — | — | — | — | — | — | — |
| Price/Book | — | — | 7.4 | 8.8 | 15.1 | 22.1 | 45.5 | 34.0 | 11.5 | 16.3 | 22.2 | 20.4 |
| EV/EBITDA | 0.0 | 0.0 | 19.6 | 23.1 | 41.6 | 87.4 | 218.0 | 262.2 | 124.3 | 121.1 | 0.0 | 0.0 |

**Operating Performance / Profitability** as of 30 Jun 2024

| **Fiscal Year,** ends 31 Dec | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | YTD | TTM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ROA % | 0.0 | 5.6 | -7.1 | 7.6 | 9.2 | 7.6 | 10.8 | 4.4 | 1.3 | 3.9 | 2.3 | 5.3 |
| ROE % | — | 218 | -29.9 | 24.8 | 27.5 | 21.5 | 29.8 | 10.9 | 2.9 | 8.4 | 5.1 | 11.3 |
| ROIC % | — | 27.9 | -20.0 | 22.0 | 26.3 | 17.9 | 23.0 | 8.8 | 2.6 | 7.5 | 3.6 | 10.2 |
| Asset Turnover | 0.4 | 0.7 | 0.5 | 0.5 | 0.5 | 0.5 | 0.4 | 0.4 | 0.4 | 0.4 | 0.2 | 0.5 |

**Financial Leverage**

| **Fiscal Year,** ends 31 Dec | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | Recent Qtr | TTM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Debt/Capital % | — | 53.9 | 13.6 | 9.9 | — | 22.2 | 20.1 | 13.5 | 9.0 | 7.7 | 7.8 | — |
| Equity/Assets % | — | 6.7 | 30.6 | 30.8 | 35.3 | 35.4 | 36.8 | 42.7 | 48.3 | 44.3 | 46.6 | — |
| Total Debt/EBITDA | — | 3.7 | 0.5 | 0.4 | 0.0 | 1.4 | 1.7 | 1.7 | 1.6 | 0.8 | 1.6 | — |
| EBITDA/Interest Expense | 0.7 | 28.8 | 16.5 | — | — | — | — | — | — | — | — | — |

## Morningstar Analyst Historical/Forecast Summary as of 08 Aug 2024

**Financials**

| | | | Estimates | | |
|---|---|---|---|---|---|
| **Fiscal Year,** ends 31 Dec 2023 | 2022 | 2023 | 2024 | 2025 | 2026 |
| Revenue (USD Mil) | 1,578 | 1,946 | 2,462 | 3,016 | 3,619 |
| Revenue Growth % | 31.9 | 23.3 | 26.5 | 22.5 | 20.0 |
| EBITDA (USD Mil) | 668 | 772 | 1,011 | 1,263 | 1,553 |
| EBITDA Margin % | 42.3 | 39.6 | 41.1 | 41.9 | 42.9 |
| Operating Income (USD Mil) | 114 | 200 | 475 | 799 | 1,100 |
| Operating Margin % | 7.2 | 10.3 | 19.3 | 26.5 | 30.4 |
| Net Income (USD Mil) | 522 | 628 | 379 | 647 | 905 |
| Net Margin % | 33.1 | 32.3 | 15.4 | 21.5 | 25.0 |
| Diluted Shares Outstanding (Mil) | 500 | 500 | 500 | 500 | 500 |
| Diluted Earnings Per Share(USD) | 1.04 | 1.26 | 0.76 | 1.29 | 1.81 |
| Dividends Per Share(USD) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

**Forward Valuation**

| | | | Estimates | | |
|---|---|---|---|---|---|
| | 2022 | 2023 | 2024 | 2025 | 2026 |
| Price/Sales | 13.9 | 18.1 | 19.8 | 16.2 | 13.5 |
| Price/Earnings | 43.1 | 57.1 | 130.7 | 77.0 | 54.9 |
| Price/Cash Flow | — | — | — | — | — |
| Dividend Yield % | — | — | — | — | — |
| Price/Book | 10.6 | 16.6 | 19.5 | 15.6 | 12.1 |
| EV/EBITDA | 31.3 | 44.1 | 47.1 | 37.7 | 30.6 |

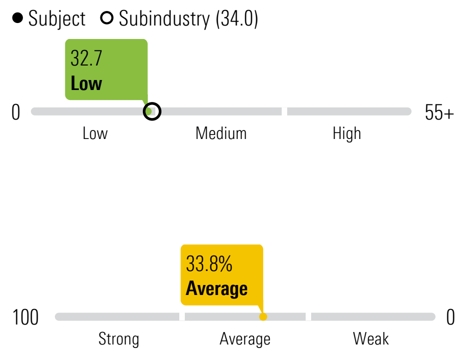
Morningstar Equity Analyst Report | Report as of 9 Aug 2024 22:46, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ - ALL MARKETS

# The Trade Desk Inc Class A TTD ★ 9 Aug 2024 21:43, UTC

| Last Price | Fair Value Estimate | Price/FVE | Market Cap | Economic Moat™ | Equity Style Box | Uncertainty | Capital Allocation | ESG Risk Rating Assessment[1] |
|---|---|---|---|---|---|---|---|---|
| 88.27 USD<br>8 Aug 2024 | 52.00 USD<br>16 Feb 2024 15:30, UTC | 1.91 | 48.57 USD Bil<br>9 Aug 2024 | None | Mid Growth | Very High | Standard | 3 Jul 2024 05:00, UTC |

## ESG Risk Rating Breakdown

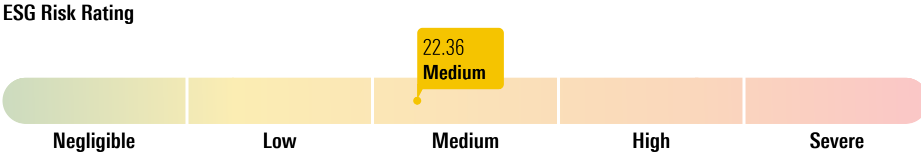
| Exposure | |
|---|---|
| Company Exposure[1] | 32.7 |
| – Manageable Risk | 30.6 |
| **Unmanageable Risk[2]** | **2.1** |
| **Management** | |
| Manageable Risk | 30.6 |
| – Managed Risk[3] | 10.3 |
| **Management Gap[4]** | **20.3** |
| **Overall Unmanaged Risk** | **22.4** |




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

- Management measures a company's ability to manage ESG risks through its commitments and actions
- Management assesses a company's efficiency on ESG programs, practices, and policies
- Management score ranges from 0-100% showing how much manageable risk a company is managing

## ESG Risk Rating




ESG Risk Ratings measure the degree to which a company's value is impacted by environmental, social, and governance risks, by evaluating the company's ability to manage the ESG risks it faces.

1. A company's Exposure to material ESG issues 2. Unmanageable Risk refers to risks that are inherent to a particular business model that cannot be managed by programs or initiatives 3. Managed Risk = Manageable Risk multiplied by a Management score of 33.8% 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 Jul 03, 2024. Highest Controversy Level is as of Aug 08, 2024. Sustainalytics Subindustry: Internet Software and Services. Sustainalytics provides Morningstar with company ESG ratings and metrics on a monthly basis and as such, the ratings in Morningstar may not necessarily reflect current Sustainalytics' scores for the company. For the most up to date rating and more information, please visit: sustainalytics.com/esg-ratings/.

## Peer Analysis 03 Jul 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 | | |
|---|---|---|---|---|---|---|---|---|---|
| **The Trade Desk Inc** | 32.7 \| Low | 0 | 55+ | 33.8 \| Average | 100 | 0 | 22.4 \| Medium | 0 | 40+ |
| Alphabet Inc | 40.8 \| Medium | 0 | 55+ | 42.1 \| Average | 100 | 0 | 24.8 \| Medium | 0 | 40+ |
| Microsoft Corp | 33.8 \| Low | 0 | 55+ | 62.4 \| Strong | 100 | 0 | 14.2 \| Low | 0 | 40+ |
| Adobe Inc | 32.0 \| Low | 0 | 55+ | 60.4 \| Strong | 100 | 0 | 14.0 \| Low | 0 | 40+ |
| Amazon.com Inc | 40.7 \| Medium | 0 | 55+ | 30.2 \| Average | 100 | 0 | 29.3 \| Medium | 0 | 40+ |

Morningstar Equity Analyst Report | Report as of 9 Aug 2024 22:46, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ - ALL MARKETS

# Appendix
## Historical Morningstar Rating

**The Trade Desk Inc Class A** TTD 9 Aug 2024 21:43, 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 |
| — | — | — | — | — | — | — | — | — | — | — | — |

**Adobe Inc** ADBE 9 Aug 2024 21:26, 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 |
| ★★★ | ★★★ | ★★★ | ★★★ | ★★★ | ★★★ | ★★★ | ★★★ | ★★★ | ★★★★ | ★★★★ | ★★★★ |

**Amazon.com Inc** AMZN 9 Aug 2024 21:26, 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 9 Aug 2024 22:46, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ - ALL MARKETS Page 17 of 22

**Alphabet Inc Class A** GOOGL 9 Aug 2024 21:26, 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 |
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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.

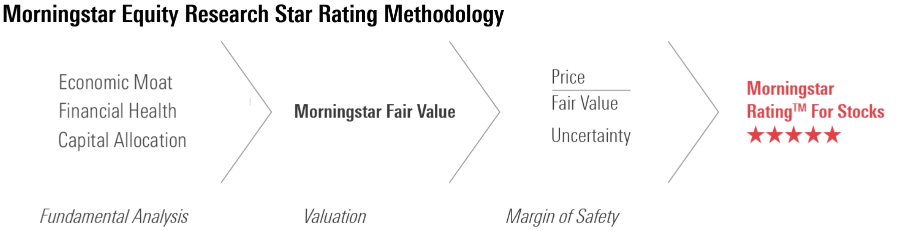
Because a dollar earned today is worth more than a dollar earned tomorrow, we discount our projections of cash flows in stages I, II, and III to arrive at a total present value of expected future cash flows. Because we are modeling free cash flow to the firm—representing cash available to provide a return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



Morningstar Equity Analyst Report | Report as of 9 Aug 2024 22:46, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ - ALL MARKETS

# 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.

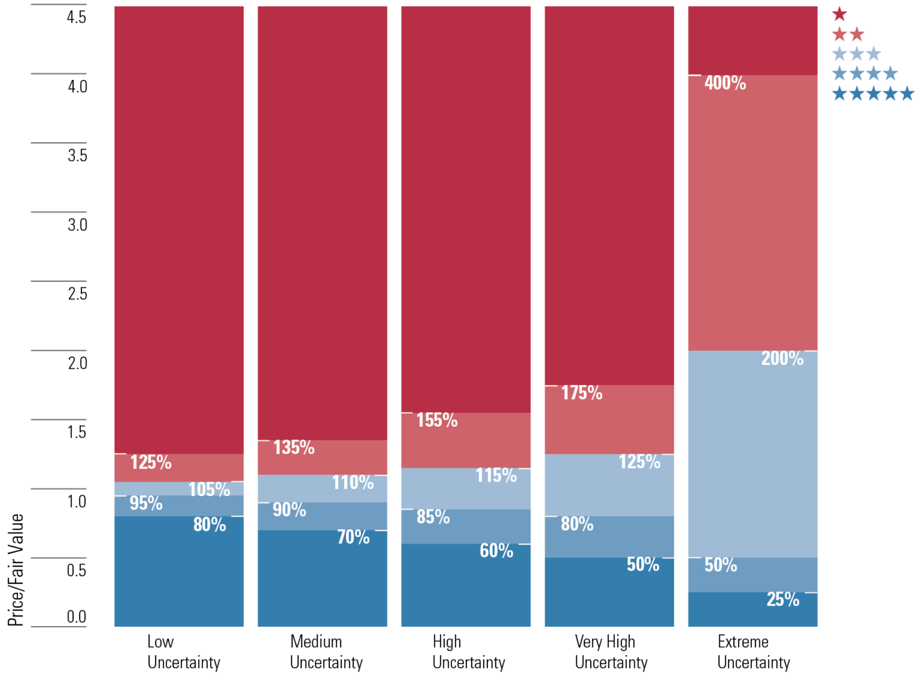
**4. Market Price**

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-

# 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.

**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.

**Risk Warning**

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