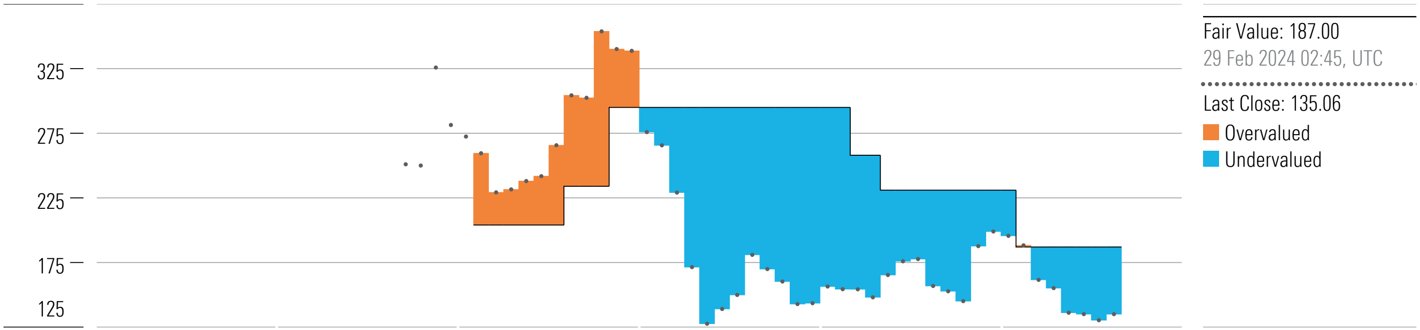
Morningstar Equity Analyst Report | Report as of 22 Aug 2024 05:06, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NEW YORK STOCK EXCHANGE, INC. Page 1 of 23

Snowflake Inc Ordinary Shares - Class A SNOW ★★★★ 21 Aug 2024 21:49, UTC

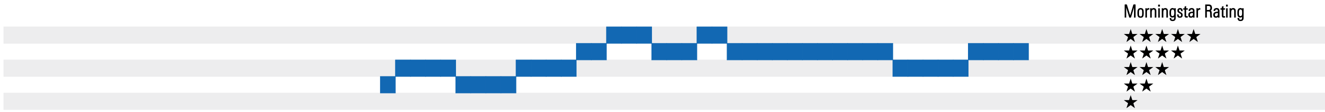
Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Equity Style Box	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
135.06 USD 21 Aug 2024	187.00 USD 29 Feb 2024 02:45, UTC	0.72	45.22 USD Bil 21 Aug 2024	None	Mid Growth	Very High	Exemplary	7 Aug 2024 05:00, UTC

Price vs. Fair Value



2019	2020	2021	2022	2023	YTD	
—	—	1.15	0.49	0.86	0.72	Price/Fair Value
—	—	20.38	-57.63	38.64	-32.13	Total Return %

Morningstar Rating



Total Return % as of 21 Aug 2024. Last Close as of 21 Aug 2024. Fair Value as of 29 Feb 2024 02:45, 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.

Snowflake Earnings: Stable Buying Patterns With Consumption Trends Up; Shares Attractive

Analyst Note Julie Bhusal Sharma, Equity Analyst, 22 Aug 2024

We are maintaining our fair value estimate of $187 per share for no-moat Snowflake after it reported second-quarter earnings slightly above our expectations. It is showing all the right signs of healthy results in the near term and beyond. We were pleased that the firm signed two nine-figure deals in the quarter, indicating massive potential when other customers' workloads go into production. In addition, we continue to believe there is ample upside from our $187 fair value estimate, given the early seedlings of a network effect that we see in Snowflake's smaller data marketplace business.

Despite the solid quarter and upped guidance, shares are down 8% upon results (from an already undervalued price)—likely influenced by overall concern that volatility in the firm's lock-in free consumption-based revenue model brought on by the weaker macroenvironment will have long-term implications. We see this concern in Berkshire Hathaway recently shedding Snowflake shares. We, however, think this makes for a ripe opportunity to buy this growthy stock. We continue to believe the market is significantly discounting Snowflake's potential by underestimating three key areas: datasphere (total data in existence) growth, how differentiated Snowflake's technology is, and the powerful potential of Snowflake's small but mighty data marketplace.

Snowflake reported second-quarter revenue of $869 million, an increase of 29% year over year. Product sales boasted revenue of $829 million, representing a 30% year-over-year increase—which was above

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Sector	Industry
Technology	Software - Application

Business Description

Founded in 2012, Snowflake is a data lake, warehousing, and sharing company that came public in 2020. To date, the company has over 3,000 customers, including nearly 30% of the Fortune 500 as its customers. Snowflake's data lake stores unstructured and semistructured data that can then be used in analytics to create insights stored in its data warehouse. Snowflake's data sharing capability allows enterprises to easily buy and ingest data almost instantaneously compared with a traditionally months-long process. Overall, the company is known for the fact that all of its data solutions that can be hosted on various public clouds.

the high end of management's guide. Fortunately, the CrowdStrike outage had little effect on Snowflake consumption in the quarter, and consumption demand trended up while overall buying patterns became more predictable.

Business Strategy & Outlook Julie Bhusal Sharma, Equity Analyst, 29 Feb 2024

In just over 10 years, Snowflake has culminated into a force that is far from melting. As enterprises continue to migrate workloads to the public cloud, significant obstacles have arisen, including hefty data transformation costs, breaking down data silos to create a single source of truth, and creating scalable performance. Snowflake seeks to address these issues with its platform, which gives its users access to its data lake, warehouse, and marketplace on various public clouds. We think Snowflake has a massive runway for future growth and should emerge as a data powerhouse in the years ahead.

Traditionally, data has been recorded in and accessed via databases. Yet, the rise of the public cloud has resulted in an increasing need to access data from different databases in one place. A data warehouse can do this, but still does not meet all public cloud data needs—particularly, in creating artificial intelligence insights. Data lakes solve this problem by storing raw data that is ingested into AI models to create insights. These insights are housed in a data warehouse to be easily queried. Snowflake offers a data lake and warehouse platform, which cuts out significant costs of ownership for enterprises. Even more valuable, in our view, is that Snowflake's platform is interoperable on numerous public clouds. This allows workloads to be performed without significant effort to convert data lake and warehouse architectures to work on different public clouds.

We think that the amount of data collected and analytical computations on such data in the cloud will continue to dramatically increase. These trends should increase usage of Snowflake's platform in the years to come, which will, in turn, strengthen Snowflake's stickiness and compound the benefits of its network effect. While today Snowflake benefits from being unique in its multicloud platform strategy, it's possible that new entrants or even public cloud service providers will encroach more on the company's offerings. Nonetheless, we think that Snowflake is well equipped with a fair head start that will keep the company in best-of-breed territory for the long run.

Bulls Say Julie Bhusal Sharma, Equity Analyst, 29 Feb 2024

- Snowflake could remain the only multicloud offering of its kind for much longer than anticipated, allowing it to increase its top line more with minimal pricing pressure.
- Snowflake could move to a subscription model from a usage-based model, boosting its monetization of its products.
- Snowflake could expand to other multicloud data needs, pushing spending per customer to greater heights.

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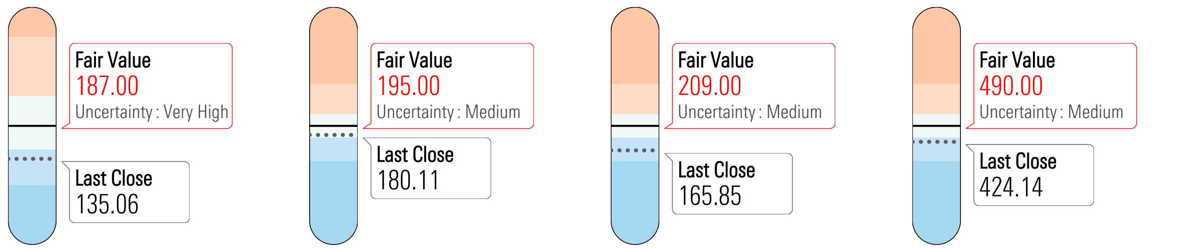
Competitors



	Snowflake Inc ...ares - Class A SNOW	Amazon.com Inc AMZN	Alphabet Inc Class A GOOGL	Microsoft Corp MSFT
Economic Moat	None	Wide	Wide	Wide
Currency	USD	USD	USD	USD
Fair Value	187.00 29 Feb 2024 02:45, UTC	195.00 2 Aug 2024 01:02, UTC	209.00 21 Aug 2024 00:06, UTC	490.00 31 Jul 2024 06:07, UTC
1-Star Price	327.25	263.25	282.15	661.50
5-Star Price	93.50	136.50	146.30	343.00
Assessment	Undervalued 21 Aug 2024	Undervalued 21 Aug 2024	Undervalued 21 Aug 2024	Undervalued 21 Aug 2024
Morningstar Rating	★★★★21 Aug 2024 21:49, UTC	★★★★21 Aug 2024 21:28, UTC	★★★★21 Aug 2024 21:28, UTC	★★★★21 Aug 2024 21:27, UTC
Analyst	Julie Bhusal Sharma, Equity Analyst	Dan Romanoff, Senior Equity Analyst	Malik Ahmed Khan, Equity Analyst	Dan Romanoff, Senior Equity Analyst
Capital Allocation	Exemplary	Exemplary	Exemplary	Exemplary
Price/Fair Value	0.72	0.92	0.79	0.87
Price/Sales	13.99	3.17	6.36	12.92
Price/Book	10.95	7.99	6.79	11.74
Price/Earning	—	42.18	23.61	35.94
Dividend Yield	0.00%	0.00%	0.12%	0.71%
Market Cap	45.22 Bil	1,890.36 Bil	2,041.61 Bil	3,152.65 Bil
52-Week Range	107.93—237.72	118.35—201.20	120.21—191.75	309.45—468.35
Investment Style	Mid Growth	Large Growth	Large Blend	Large Growth

Bears Say Julie Bhusal Sharma, Equity Analyst, 29 Feb 2024

- Other multicloud data providers may emerge to compete with Snowflake, or in-house data warehouses at Amazon Web Services or Microsoft Azure could potentially adopt a multicloud strategy.
- Snowflake could fail to expand its data sharing network extensively, leaving it vulnerable to competition with larger networks.
- Migration of existing workloads to the cloud could occur at a slower pace, extending the length of Snowflake's unprofitable years ahead.

Economic Moat Julie Bhusal Sharma, Equity Analyst, 28 Feb 2024

We assign Snowflake a no-moat rating. We think Snowflake benefits from switching costs and a network effect, protected by its unique multicloud strategies throughout its data lake, data warehousing, and data sharing offerings. However, we cannot say with the complete certainty that these moat sources will lead to excess returns on invested capital 10 years from now, given the limited public history of the recently public company as well as its significant lack of profitability today.

Snowflake is a fast-growing provider of data lake, data warehousing, and data sharing solutions. The company's value proposition lies in overturning the faults of existing data storage architectures and even more recent methods of storing data in the cloud through its combined data lake and data warehouse platform. Traditionally, data has been recorded in and accessed via databases such as the Oracle database or SAP's HANA. However, the rise of the public cloud has resulted in an increasing need to access data from different databases in one place. A data warehouse serves this need by gathering data from various databases in one place.

However, the data warehouse alone does not fulfill all public cloud data needs today—particularly, the need to create insights from artificial intelligence and big analytics. As a result, many firms now depend on having a data lake as well as a data warehouse for these needs. Data lakes are used to store not just structured data within a database or data warehouse, but also data that is not yet fully indexed (either unstructured or semistructured data). This data in the data lake is what is ingested into AI models to create novel insights. These insights are indexed and therefore are considered structured data, which is then housed in a data warehouse to easily be queried.

Data lakes and data warehouses can be created in a number of ways. Enterprises can hire robust technological teams to build out data lakes and data warehouses, or use out-of-the-box platforms, such as Amazon's data warehouse offering, Redshift, or Microsoft Azure's SQL Data Warehouse. However, the issue with out-of-the box platforms is that they tend not to be cloud agnostic; Redshift only runs on AWS, while Microsoft's product only runs on Azure.

Snowflake solves this problem because its data lake and data warehouse combo can be deployed on various public clouds. We believe Snowflake's solution provides tremendous value to its customers in two ways. First, it allows for high-performance queries for firms using multiple public cloud vendors. Second, Snowflake offers flexibility in the future if a firm wants to change public cloud providers. IT departments are often fearful of vendor lock-in, so this flexibility provides value.

For example, if an enterprise had all of its public cloud workloads on AWS, and in turn chose Amazon's Redshift for its data warehouse, it would be an extremely arduous task for the enterprise to move its data warehouse away from AWS and Redshift and into a competing cloud vendor. We think this process might take several years. However, if the enterprise's data lake and warehousing needs were met through Snowflake's platform, the shift would be far less painful as Snowflake's platform has built in cloud vendor interoperability such that even a company on multiple public clouds could use the Snowflake platform across all. We still think that switching cloud providers is a painful task that IT departments won't take lightly, but it still may occur. For example, after making an acquisition, an

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enterprise might want to consolidate the workloads from the acquired company onto its cloud vendor of choice. Or in other cases, an enterprise may want to spread its bets across multiple cloud vendors out of fear of lock-in or unfavorable pricing. In any of these instances, Snowflake's platform-agnostic data warehouse and data lake products make it easier for IT departments.

Snowflake's platform is also distinct in its ability to store diverse data sets all together as one data set, as well as the platform's methods to optimize the performance of data queries even amid large volume data sets. These characteristics differ from common issues that arise in external data lake and data warehousing architectures. One problem with existing data warehouses is that they are unable to store diverse data types in a consistent format such that the data does not require transformation before using. Data transformation is seen as undesirable as it can lead to errors and duplicates of data. This issue has come under the spotlight as diverse data types have become more and more common, while the desire to use such data sets together is becoming increasingly preferred as enterprises are increasing wanting databases designed for both transactional and analytical work simultaneously. Other issues with existing data architectures include their speed in querying large data sets, which can be problematic as the public cloud lends itself to larger and larger data sets (because storing data becomes much more effortless in the public cloud).

Altogether, we think data architecture software is extremely sticky. More than ever, enterprises rely on data significantly to be the backbone of their business—internally and through their products. Therefore, storing and accessing such data is a critical activity for an enterprise. Changing these storage and access methods of sensitive and highly mission-critical data creates numerous headaches that aren't dissimilar to switching costs we see in other enterprise software, such as a significant learning curve in using new data architecture and significant monetary and time-related costs associated with “rewiring” how a company stores and accesses data. We'd argue that data architectures might be even stickier than the enterprise software used to input and access this data, since the underlying data is even more fundamental and mission-critical to a business. As one simple example, one can imagine the disaster that would occur if Weather Channel data for Peru were accidentally replacing the data set for weather patterns in Ohio, which might lead to bad decisions and damages for companies reliant on such data, like airlines or scientific researchers.

We think Snowflake's switching costs are strong even without locking in multi year subscriptions. Roughly 93% of the firm's revenue is consumption-based, meaning that Snowflake is not a subscription-as-a-service company. Snowflake clients typically commit to set consumption rates on an annual basis. However, if they do not use their agreed-upon rate, Snowflake often allows for agreed-upon consumption to be rolled over to following periods. Although Snowflake does not lock its users into multiyear contracts like many moaty SaaS businesses (many of which we view as having narrow or wide economic moats), we don't think its revenue model makes its business any less sticky. We think that switching costs permeate throughout the enterprise software industry are most heavily tethered to the costs of implementation of a new software rather than the sheer lock-in of a multiyear contract. The firm's net revenue retention rate illuminates the loyalty of its customer core, as Snowflake boasts dollar-based net revenue retention rate of 162%.

Switching costs aren't the only moat source we see in Snowflake's business, however. We think that Snowflake benefits from a network effect in its data sharing business. Snowflake is the only platform that allows for sharing of data sets in a multicloud fashion through the Snowflake Data Marketplace—examples include FactSet, the Centers for Disease Control, and AccuWeather—and this data can be purchased by other companies. One example of a data set that might be sharable would be IMDB data for the movie industry. Before Snowflake, if the Academy of Motion Picture Arts and Sciences wanted to use IMDB data, it would have to consider where the data is housed. If the academy had its internal database and workloads on AWS, but IMDB had its data on Microsoft's Azure, it might be a tedious process, taking several months and many product managers, to funnel this IMDB data over to the Academy. Theoretically, the Academy might choose to leave the IMDB database on Azure, but workloads accessing this database would be much less performant because the data would be housed in different locations.

With Snowflake, such data sharing across different public clouds can happen seamlessly in just a matter of hours or days because the data does not need to be transformed manually. Once purchased, the data can easily be transferred to the purchasing company even if it uses a different public cloud than the provider. We think Snowflake's network effect is a product of its data marketplace because each Snowflake marketplace user benefits from each additional Snowflake data set provider on the platform and vice versa.

Public cloud providers have their own marketplace options for data sharing, but within their public clouds only. Amazon has its AWS Marketplace and Microsoft has its Azure open data sets. We think this multicloud platform will ultimately give Snowflake an edge in terms of network effects; data set buyers will likely turn to Snowflake because it has the widest multicloud selection, in turn encouraging more users and more data set providers to join the Snowflake marketplace over time.

We also note that Snowflake enables negotiable data set pricing. Amazon requires that companies that are selling data set usage on AWS publish the cost of such data sets. This allows the data sellers little flexibility in a marketplace that traditionally depends on variable pricing, dependent on the size and use cases of the data buyer.

In summary, we believe that Snowflake is a key supplier into a host of enterprises today. We ultimately foresee Snowflake achieving massive growth as it is well positioned within a large and growing Big Data market. However, the company is racking up significant operating losses as it remains in its growth phase. Such growth is a necessity in order for the company to generate excess returns on capital, and the firm is a bit too early in its lifecycle for us to have absolute certainty that it can earn these excess returns in the long run.

Fair Value and Profit Drivers Julie Bhusal Sharma, Equity Analyst, 28 Feb 2024

Our fair value estimate is $187 share. Our valuation implies forward fiscal-year enterprise value/sales of 17 times. Our fair value assumptions are based on our expectations for Snowflake achieving a compound annual growth rate over the next five years of 23% and a 10-year CAGR of 21%. Snowflake is in its infancy but has a massive market opportunity and a large runway for growth ahead. This substantial growth is driven by continued shifts of workloads to a cloud environment, prompting the use case to which Snowflake caters and resulting in Snowflake accumulating more and more share of the overall DBMS market. Our forecasts also assume substantial usage growth per customer as we expect customers to scale their data storage and compute significantly once migrating to the cloud due to reduced costs and the ease of such scaling.

We forecast that gross margins will expand from 68% in fiscal 2024 to 80% in fiscal 2033 as the company's attainment of customers due to quite fair pricing will allow leeway to push the cost of its offerings upward, especially after switching costs increase in strength—which could eventually involve moving from a consumption model to a subscription model. We expect GAAP operating margins to increase from negative 39% in fiscal 2024 to 30% in fiscal 2033, as we see operating leverage from improved scale and lower sales investment needs.

Risk and Uncertainty Julie Bhusal Sharma, Equity Analyst, 28 Feb 2024

Snowflake runs the risk that other cloud-neutral software will enter its market or that a public cloud company opens up its data warehouse and sharing offering to be interoperable outside of its respective cloud. While we think it's unlikely that either AWS or Azure will open up their ecosystems to compete with Snowflake, these two tech titans have vastly greater resources to compete in this space if they so choose.

Furthermore, Snowflake is at risk of compromising the data on its platform either through data breaches or inability for compliance tools to do their job. For example, Snowflake offers a number of features for ensuring data is compliant with regulations, such as GDPR. However, if any of such compliance tools—like the ability to delete data compliant with the right to be forgotten—were to fail, Snowflake's brand could suffer and possibly lead to diminished future business.

When considering environmental, social, and governance, or ESG, risk specifically, we think Snowflake's risk lies namely in the possibility that Snowflake's customers' data is compromised by security threats. This is a risk for virtually all software companies—but even if such attacks were to occur, we think

Snowflake's business would not be affected in the long run.

Based on these risks, along with the higher valuation uncertainty seen with any company expanding as fast as Snowflake, we assign the company a Very High Morningstar Uncertainty Rating.

Capital Allocation Julie Bhusal Sharma, Equity Analyst, 28 Feb 2024

We consider Snowflake's capital allocation to be Exemplary, based on our assessment of a sound balance sheet, exceptional investments, and appropriate shareholder distributions.

We think Snowflake's balance sheet is sound, based on its lack of debt and healthy cash cushion. We think cash generated from its 2020 IPO will provide a significant cash buffer, and the company won't require debt later down the line, unless it makes a hefty acquisition.

We think the firm's investments are exemplary. We think Snowflake is rightly withholding from shareholder distributions in the form of dividends and share repurchases, as we think investment back in the business is more important than ever right now in order to maintain its first-mover advantage and pursue growth.

Analyst Notes Archive

Snowflake Earnings: Revenue Moving in Right Direction, but Investment Needs Weigh on Margins

Eric Compton, CFA, Strategist, 23 May 2024

No-moat-rated Snowflake reported a mixed bag for fiscal first-quarter earnings. Revenue growth was ahead of expectations, but updated full-year guidance showed expected margins moving in the wrong direction yet again. It was encouraging that management is now looking for 24% year-over-year growth in product revenue, slightly higher than the previous outlook of 22%. However, non-GAAP operating margins are now expected to be 3% for full-year results, compared with the previous outlook of 6% and actual results of 8% last year. With slightly higher growth but lower margins for the year roughly offsetting, we do not plan to change our long-term forecasts, and we maintain our fair value estimate of $187 per share.

After a rough previous quarter, we sense Snowflake is starting to find some stability. Eventually, however, we will need to see some better margin realization and there is still some risk from decelerating revenue growth. This increases the downside risk if consumption and new workloads, hopefully driven by the company's new product launches, can't make up for some of the other headwinds. We estimate revenue growth will likely decelerate to a mid- to high-20% rate by the end of the year from over 30% recently. If that deceleration continues, there are risks to our fair value.

We thought shares were mildly undervalued heading into today's earnings, and being up roughly 4% in after-hours trading, they would be within 10% of our fair value estimate. We continue to think that maintaining decent growth in the mid-20s after the current year and seeing margins go in the right direction will be key for Snowflake as it builds off current results.

Snowflake Earnings: Revenue Outlook Disappoints; New CEO Taking Over Eric Compton, CFA, Strategist, 29 Feb 2024

No-moat-rated Snowflake reported decent fiscal fourth-quarter earnings. However, the company's outlook for fiscal 2025 was disappointing. This, combined with the surprise retirement of the company's CEO, Frank Slootman, created a challenging quarter for Snowflake, and investors are never thrilled with a surprise CEO succession. Slootman will be replaced by Sridhar Ramaswamy, who has only been with Snowflake since May 2023. As we factor in slower growth than we were previously expecting, driven by the disappointing outlook, we are lowering our fair value estimate to $187 from $231. We thought shares were fairly valued heading into today's earnings, and based on the drop in share price of roughly 20% afterhours, our updated fair value estimate implies shares are fairly valued once again

Quarterly results weren't terrible, as Snowflake had a slight beat on revenue, 2% higher than our estimates and FactSet consensus. At the same time, adjusted earnings per share came in at over double FactSet consensus expectations. However, the company guided for fiscal 2025 growth of only 22% while consensus was looking for growth of closer to 30%, and our expectations were even higher than that. Maintaining their current growth momentum is key for a fast-expanding company like Snowflake. As we adjust our own forecasts, this slowdown in growth is particularly damaging to our valuation, where we had hoped for growth of over 30% for years to come. The company also pulled its longer-term guidance, which had previously gone out to 2029, again signaling that confidence in the outlook has weakened. A combination of lower storage pricing, increased use of iceberg tables, which allow more data to be stored outside of Snowflake environments, and lower consumption patterns are affecting results. For the company to bounce back, we think improved product consumption and Snowflake's ability to enhance products and drive new workload volumes will be essential.

Snowflake Earnings: Long-Term Upside Is Far From Melting; Shares Remain Undervalued Julie Bhusal Sharma, Equity Analyst, 30 Nov 2023

Snowflake's third quarter was a mixed one, in our view, as revenue came in above our expectations while the bottom line came in under, as we had rosier expectations than the market. Encouragingly though, full-year fiscal 2024 guidance was raised on the revenue and profitability front. Shares have popped 7% upon results, inching the stock somewhat closer to our $231 fair value estimate, while still leaving room for ample upside as the stock remains in 4-star territory. Overall, we can't stress enough to investors that Snowflake is extremely well-positioned to benefit from a world that is rapidly collecting more data, which requires a place to live, but also a playground like Snowflake's to work with such data so as to extract more value. While these are passive tailwinds, we think Snowflake's technical expertise and execution will make it more than just a passive beneficiary in the data management software space. We still believe the name is a top pick under our technology coverage.

Snowflake reported third-quarter revenue of $734 million and product sales of $699 million, growing by 32% and 34% year over year, respectively. Solid results had execution as well as a stabilizing macroeconomic environment to thank. Management noted that they hardly hear “AI” and “budget” in the same sentence and we think this leaves Snowflake in a sweet spot, with customers eager to be at the forefront of cutting-edge technology. We think this safeguards the uncertainty that can come with a consumption-based revenue model.

Snowflake reported quarterly GAAP losses per share of $0.65 and non-GAAP earnings per share of $0.25. While we had rosier expectations for earnings than the market’s (which were beaten), we are unfazed as we keep our sights on the long term.

Snowflake Earnings: Stabilized Consumption, but Not Yet Recovery; Shares Attractive Julie Bhusal Sharma, Equity Analyst, 24 Aug 2023

Snowflake’s second quarter was a solid one, as revenue came in line with our expectations and GAAP EPS was slightly below our forecast. However, we baked in rosier expectations on the top and bottom line than consensus. As a result, shares are up 3% upon results due to the bigger beat relative to consensus. While we have moderated our expectations for the remainder of the year as we bake in continued consumption stabilization as seen in the quarter, we think Snowflake will see top-line reacceleration next year—as several new offerings will be released soon (including containerized services). We are maintaining our fair value estimate of $231 per share for no-moat Snowflake and we believe ample upside is still very much on the table, making Snowflake a top pick in the technology sector, in our view. Altogether, we believe the market is significantly discounting Snowflake's potential by underestimating three key areas: datasphere (total data in existence) growth, how differentiated Snowflake's technology is, and the powerful potential of Snowflake's small but mighty data marketplace. We think Snowflake’s consumption model spooks the market but we think switching costs inherent in the data storage space don’t need a formal subscription model to reap value.

Snowflake reported second-quarter revenue of $674 million, an increase of 36% year over year. Product sales boasted revenue of $640 million, representing a 37% year-over-year increase. GAAP losses per share were $0.69, slightly worse than our expectations. We like Snowflake’s approach of not undermining the potential of startup customers—which made up 20% of new customers landed in the quarter.

Snowflake: Shares Are a Top Pick as Market Overlooks the Data’s Massive Need for a Home (or Igloo) Julie Bhusal Sharma, Equity Analyst, 3 Aug 2023

Snowflake is one of our top picks in the technology sector, as we see an attractive long-term investment opportunity in the no-moat firm implied in our $231 fair value estimate and our 4-star rating. We believe the market is significantly discounting Snowflake's potential by underestimating three key areas: datasphere (total data in existence) growth, how differentiated Snowflake's technology is, and the powerful potential of Snowflake's small but mighty data marketplace. This leaves a meaty opportunity for investors, in our view, thanks to what we believe is a lack of understanding of this complex space.

We think Snowflake is a natural beneficiary of the booming datasphere growth we project into the future. We think the datasphere is growing powerfully at a roughly 28% compound annual growth rate over the next nine years for several reasons. First, there is the sheer addition of data points collected on individuals and things nowadays (like daily steps or office badge swipes), but there is also sizable net new metadata that comes into existence from greater use of artificial intelligence models that create such insights. All of this net new data needs a place to live—such as a data lake or warehouse, which Snowflake naturally caters to.

But we think Snowflake won't be just a passive beneficiary of datasphere growth. We think the firm is well positioned to be a leading data lake and warehouse solution thanks to its differentiated technical abilities that streamline costs and effort in a typically resource-intense business. Examples of such technical differentiation include its interoperability amid all major cloud providers, easing the gruesome replatforming required for other data lakes and warehouses. Another example of technical differentiation includes its data-transforming intellectual property, which cuts dependency on costly Apache Spark servers (often the costliest part of owning a data lake or warehouse).

Snowflake Earnings: Existing Customers Slow Spending Growth and Booking Temperature Drops

Julie Bhusal Sharma, Equity Analyst, 25 May 2023

We are lowering our fair value estimate for Snowflake to $231 per share from $258 as the firm began its first quarter with a chill that we think has implications for the long term. While revenue exceeded our expectations, EPS came in under our forecasts. Guidance for the year was moderated as existing customers are slowing spending growth, which is informing our fair value cut, as we think this will moderate longer-term growth. On the flip side, while bookings continued to see headwinds due to conservative, shorter-term commitments, we were encouraged that this was not the result of competitive dynamics. We believe that shorter-term commitments due to the macroenvironment will likely not diminish customers' total commitments significantly in the long term, as we believe Snowflake's product has very sticky beginnings reflected in an outstanding net revenue retention rate of 151%. So, all in all, while we have moderated growth expectations in the long term, we believe existing customer spending is safeguarded and sticky. Even with our fair value cut, we believe Snowflake shares are attractive. We remind investors that no-moat Snowflake boasts differentiated technical abilities in the data lake and warehouse markets with ample upside from its currently small but mighty data marketplace offering.

Snowflake beat our first-quarter revenue expectations by bringing in sales of $624 million, an increase of 48% year over year, as product revenue inched to make up 95% of revenue mix (compared with 93% in the prior-year period). Product sales was $590 million (marking 50% year-over-year growth). Snowflake reported a GAAP loss per share of $0.70, worse than our previously forecast loss of $0.54 per share.

Snowflake continued to tout a stellar net revenue retention rate, which came in at 151% in the quarter (compared with 174% in the prior-year period). We remind investors that such declines are normal for a young company and levels remain incredibly strong.

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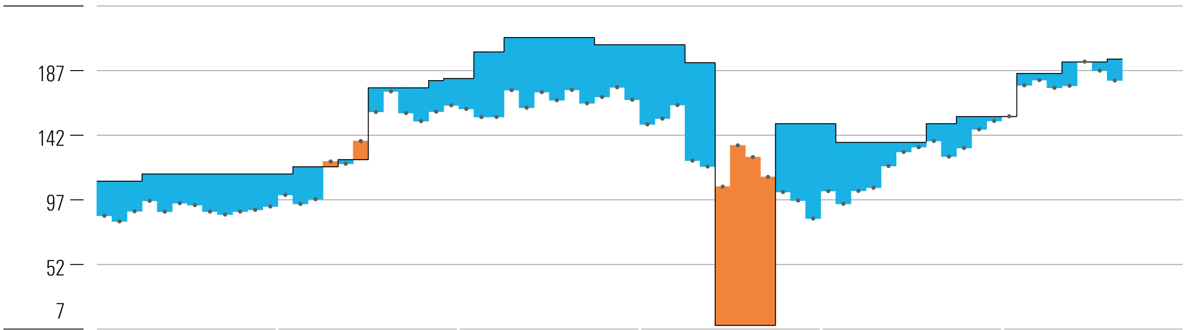
Snowflake Inc Ordinary Shares - Class A SNOW ★★★★ 21 Aug 2024 21:49, UTC

Competitors Price vs. Fair Value

Amazon.com Inc AMZN



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

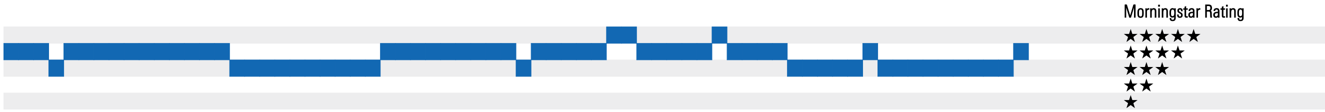
Last Close: 180.11

Overvalued

Undervalued

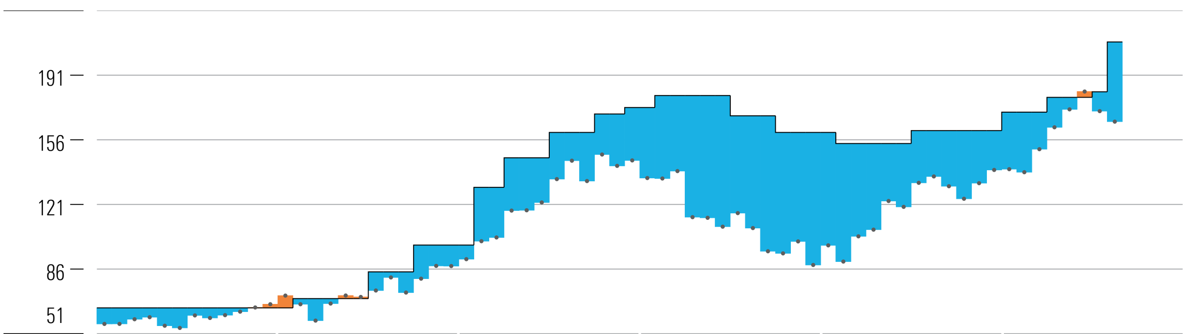
2019	2020	2021	2022	2023	YTD	
0.80	0.90	0.81	0.56	0.98	0.92	Price/Fair Value
23.03	76.26	2.38	-49.62	80.88	18.54	Total Return %

Morningstar Rating



Total Return % as of 21 Aug 2024. Last Close as of 21 Aug 2024. Fair Value as of 2 Aug 2024 01:02, UTC.

Alphabet Inc Class A GOOGL



Fair Value: 209.00
21 Aug 2024 00:06, UTC

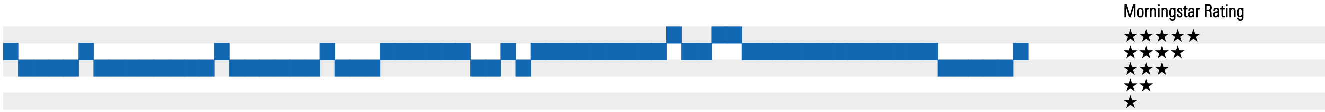
Last Close: 165.85

Overvalued

Undervalued

2019	2020	2021	2022	2023	YTD	
1.03	0.89	0.83	0.55	0.87	0.79	Price/Fair Value
28.18	30.85	65.30	-39.09	58.32	18.87	Total Return %

Morningstar Rating



Total Return % as of 21 Aug 2024. Last Close as of 21 Aug 2024. Fair Value as of 21 Aug 2024 00:06, UTC.

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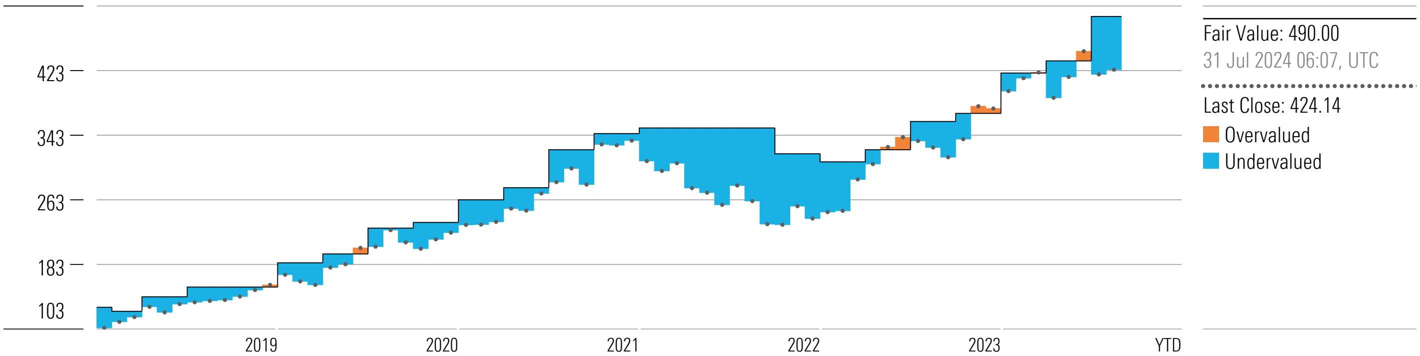
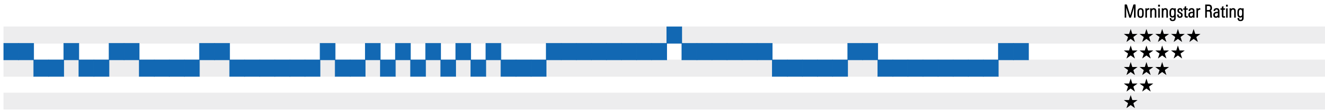
Snowflake Inc Ordinary Shares - Class A SNOW ★★★★ 21 Aug 2024 21:49, UTC

Competitors Price vs. Fair Value

Microsoft Corp MSFT



	2019	2020	2021	2022	2023	YTD	
	1.02	0.95	0.97	0.75	1.02	0.87	Price/Fair Value
	57.12	42.37	52.24	-27.94	57.96	13.39	Total Return %



Total Return % as of 21 Aug 2024. Last Close as of 21 Aug 2024. Fair Value as of 31 Jul 2024 06:07, UTC.

Snowflake Inc Ordinary Shares - Class A SNOW ★★★★ 21 Aug 2024 21:49, UTC

Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Equity Style Box	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
135.06 USD 21 Aug 2024	187.00 USD 29 Feb 2024 02:45, UTC	0.72	45.22 USD Bil 21 Aug 2024	None	Mid Growth	Very High	Exemplary	7 Aug 2024 05:00, UTC

Morningstar Historical Summary

Financials as of 30 Apr 2024

Fiscal Year, ends 31 Jan	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	YTD	TTM
Revenue (USD K)	—	—	—	—	—	96,666	264,748	592,049	1,219,327	2,065,659	828,709	3,011,599
Revenue Growth %	—	—	—	—	—	—	173	123	106	69.4	32.9	32.9
EBITDA (USD K)	—	—	—	—	—	-184,103	-354,566	-534,111	-693,538	-778,732	-308,351	-1,033,146
EBITDA Margin %	—	—	—	—	—	-190	-133	-90.2	-56.9	-37.7	-37.2	-34.3
Operating Income (USD K)	—	—	—	—	—	-185,465	-358,088	-543,937	-715,036	-842,267	-348,572	-1,170,107
Operating Margin %	—	—	—	—	—	-191	-135	-91.9	-58.6	-40.8	-42.1	-38.9
Net Income (USD K)	—	—	—	—	—	-178,028	-348,535	-539,102	-679,948	-796,705	-316,988	-927,458
Net Margin %	—	—	—	—	—	-184	-131	-91.1	-55.8	-38.6	-38.3	-30.8
Diluted Shares Outstanding (K)	—	—	—	—	—	238,370	238,370	141,613	300,273	318,730	333,584	330,358
Diluted Earnings Per Share (USD)	—	—	—	—	—	-0.75	-1.46	-3.81	-2.26	-2.50	-0.95	-2.80
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	—	—	—	—	—	—	163.9	97.1	24.3	24.8	14.8	14.3
Price/Earnings	—	—	—	—	—	—	-188.7	-166.7	-62.9	-74.1	-48.3	-46.5
Price/Cash Flow	—	—	—	—	—	—	-714.3	2,000.0	111.1	90.1	49.3	47.6
Dividend Yield %	—	—	—	—	—	—	—	—	—	—	—	—
Price/Book	—	—	—	—	—	—	16.0	20.7	8.5	13.3	9.9	9.6
EV/EBITDA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	-0.1	-0.1	0.0	0.0

Operating Performance / Profitability as of 30 Apr 2024

Fiscal Year, ends 31 Jan	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	YTD	TTM
ROA %	—	—	—	—	—	-23.3	-39.2	-15.6	-10.8	-11.1	-4.1	-12.6
ROE %	—	—	—	—	—	—	—	-24.6	-13.6	-15.2	-6.5	-18.8
ROIC %	—	—	—	—	—	—	—	-22.7	-13.2	-15.9	-7.0	-22.0
Asset Turnover	—	—	—	—	—	0.1	0.3	0.2	0.2	0.3	0.1	0.4

Financial Leverage

Fiscal Year, ends 31 Jan	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Recent Qtr	TTM
Debt/Capital %	—	—	—	—	—	—	—	3.6	3.5	4.0	5.1	—
Equity/Assets %	—	—	—	—	—	—	—	83.4	75.9	70.7	62.5	—
Total Debt/EBITDA	—	—	—	—	—	—	—	-0.4	-0.3	-0.3	-0.9	—
EBITDA/Interest Expense	Infinite	Infinite	Infinite	Infinite	Infinite	—	—	—	—	—	—	—

Morningstar Analyst Historical/Forecast Summary as of 28 Feb 2024

Financials

			Estimates		
Fiscal Year, ends 31 Jan 2024	2023	2024	2025	2026	2027
Revenue (USD Mil)	2,066	2,806	3,407	4,268	5,310
Revenue Growth %	69.4	35.9	21.4	25.3	24.4
EBITDA (USD Mil)	-721	-900	-764	-457	-193
EBITDA Margin %	-34.9	-32.1	-22.4	-10.7	-3.6
Operating Income (USD Mil)	-842	-1,095	-872	-568	-309
Operating Margin %	-40.8	-39.0	-25.6	-13.3	-5.8
Net Income (USD Mil)	79	451	13	1,818	1,067
Net Margin %	3.8	16.1	0.4	42.6	20.1
Diluted Shares Outstanding (Mil)	319	328	331	331	331
Diluted Earnings Per Share(USD)	0.25	1.38	0.04	5.49	3.22
Dividends Per Share(USD)	0.00	0.00	0.00	0.00	0.00

Forward Valuation

			Estimates		
	2023	2024	2025	2026	2027
Price/Sales	24.5	23.3	13.3	10.6	8.5
Price/Earnings	625.8	141.8	3,376.5	24.6	41.9
Price/Cash Flow	—	—	—	—	—
Dividend Yield %	—	—	—	—	—
Price/Book	9.1	12.4	9.9	10.7	10.9
EV/EBITDA	-65.0	-69.0	-54.9	—	-217.2

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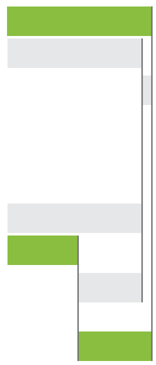
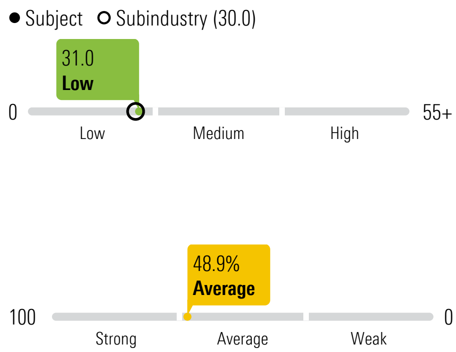
Snowflake Inc Ordinary Shares - Class A SNOW ★★★★ 21 Aug 2024 21:49, UTC

Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Equity Style Box	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
135.06 USD 21 Aug 2024	187.00 USD 29 Feb 2024 02:45, UTC	0.72	45.22 USD Bil 21 Aug 2024	None	Mid Growth	Very High	Exemplary	7 Aug 2024 05:00, UTC

ESG Risk Rating Breakdown

Exposure		
Company Exposure[1]	31.0	
– Manageable Risk	28.9	
Unmanageable Risk[2]	**2.1**	
Management		
Manageable Risk	28.9	
– Managed Risk[3]	14.1	
Management Gap[4]	**14.8**	
Overall Unmanaged Risk	**16.9**	





- 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 48.9% 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 Aug 07, 2024. Highest Controversy Level is as of Aug 08, 2024. Sustainalytics Subindustry: Enterprise and Infrastructure Software. 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 07 Aug 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		
Snowflake Inc	31.0 | Low	0	55+	48.9 | Average	100	0	16.9 | Low	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+
Amazon.com Inc	40.7 | Medium	0	55+	30.2 | Average	100	0	29.3 | Medium	0	40+
Oracle Corp	33.8 | Low	0	55+	61.0 | Strong	100	0	14.5 | Low	0	40+

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Appendix
Historical Morningstar Rating

Snowflake Inc Ordinary Shares - Class A SNOW 21 Aug 2024 21:49, 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 21 Aug 2024 21:28, 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 21 Aug 2024 21:28, 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 22 Aug 2024 05:06, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NEW YORK STOCK EXCHANGE, INC.

Microsoft Corp MSFT 21 Aug 2024 21:27, 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.

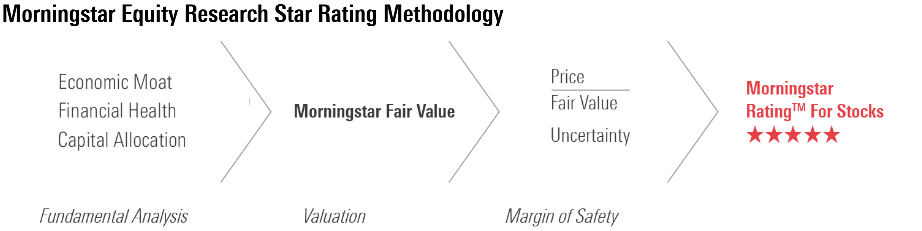
Because a dollar earned today is worth more than a dollar earned tomorrow, we discount our projections of cash flows in stages I, II, and III to arrive at a total present value of expected future cash flows. Because we are modeling free cash flow to the firm—representing cash available to provide a return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

3. Uncertainty Around That Fair Value Estimate

Morningstar's Uncertainty Rating is designed to capture the range of potential outcomes for a company's intrinsic value. This rating is used to assign the margin of safety required before investing, which in turn explicitly drives our stock star rating system. The Uncertainty Rating is aimed at identifying the confidence we should have in assigning a fair value estimate for a given stock.

Our Uncertainty Rating is meant to take into account anything that can increase the potential dispersion of future outcomes for the intrinsic value of a company, and any-

Morningstar Equity Research Star Rating Methodology



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thing that can affect our ability to accurately predict these outcomes. The rating begins with a suggested rating produced by a quantitative process based on the trailing 12-month standard deviation of daily stock returns. An analyst overlay is then applied, with analysts using the suggested rating, historical rating data, and their own knowledge of the company to inform them as they make the final Uncertainty Rating decision. Ultimately, the rating decision rests with the analyst. Analysts take into account many characteristics when making their final decision, including cyclical factors, operational and financial factors such as leverage, company-specific events, ESG risks, and anything else that might increase the potential dispersion of future outcomes and our ability to estimate those outcomes.

Our recommended margin of safety—the discount to fair value demanded before we'd recommend buying or selling the stock—widens as our uncertainty of the estimated value of the equity increases. The more uncertain we are about the potential dispersion of outcomes, the greater the discount we require relative to our estimate of the value of the firm before we would recommend the purchase of the shares. In addition, the Uncertainty Rating provides guidance in portfolio construction based on risk tolerance.

Our Uncertainty Ratings are: Low, Medium, High, Very High, and Extreme.

Qualitative Analysis Uncertainty Ratings	Margin of Safety ★★★★★Rating	★Rating
Low	20% Discount	25% Premium
Medium	30% Discount	35% Premium
High	40% Discount	55% Premium
Very High	50% Discount	75% Premium
Extreme	75% Discount	300% Premium

Our uncertainty rating is based on the interquartile range, or the middle 50% of potential outcomes, covering the 25th percentile–75th percentile. This means that when a stock hits 5 stars, we expect there is a 75% chance that the intrinsic value of that stock lies above the current market price. Similarly, when a stock hits 1 star, we expect there is a 75% chance that the intrinsic value of that stock lies below the current market price.

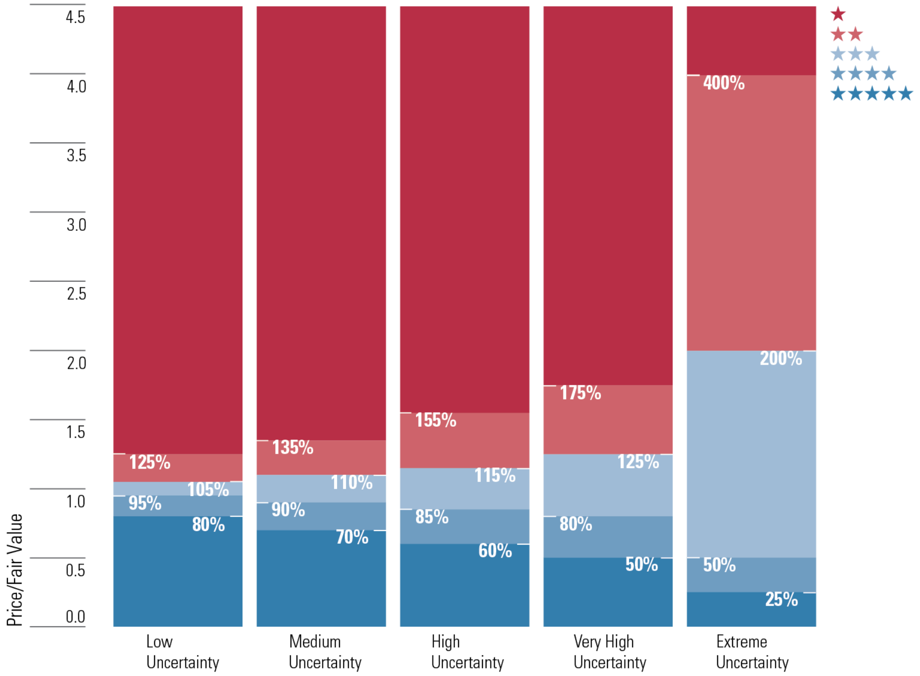
4. Market Price

The market prices used in this analysis and noted in the report come from exchange on which the stock is listed which we believe is a reliable source.

For more details about our methodology, please go to https://shareholders.morningstar.com

Morningstar 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/

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