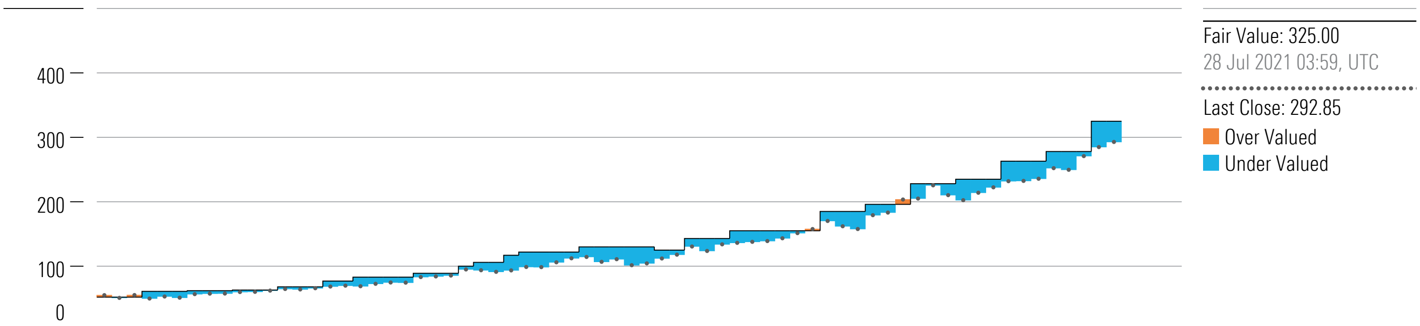
Morningstar Equity Analyst Report | Report as of 14 Aug 2021 19:59, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NASDAQ

Microsoft Corp MSFT ★★★★ 13 Aug 2021 21:24, UTC

Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Moat Trend™	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
292.85 USD 13 Aug 2021	325.00 USD 28 Jul 2021 03:59, UTC	0.90	2.20 USD Tril 13 Aug 2021	Wide	Stable	Medium	Exemplary	4 Aug 2021 05:00, UTC

Price vs. Fair Value



	2016	2017	2018	2019	2020	YTD	
	0.99	0.96	0.78	1.02	0.95	0.90	Price/Fair Value
	14.65	40.22	20.75	57.12	42.37	32.17	Total Return %

Total Return % as of 13 Aug 2021. Last Close as of 13 Aug 2021. Fair Value as of 28 Jul 2021 03:59, 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.

Microsoft Shines With Accelerating Demand and Positive Outlook; Raising FVE to $325

Analyst Note Dan Romanoff, CPA, Equity Analyst, 28 Jul 2021

Wide-moat Microsoft continues to benefit from an ongoing wave of digital transformation, which helped the company once again drive material upside compared with its revenue and EPS outlook for the quarter. Guidance for the first quarter was nicely above FactSet consensus as well. Azure and commercial related demand was robust by any measure, even as supply constraints for PCs and Surface tablets hurt on the consumer side. Importantly, commercial bookings and RPO, two forward-looking metrics, both continue to significantly outpace revenue growth. We remain impressed with Microsoft's ability to drive revenue and margins at this scale and we believe there is more to come on both fronts. Results continue to underscore our thesis, which centers on customer adoption of hybrid cloud environments with Azure. Microsoft continues to use its dominant position of on-premises architecture to allow customers to move to the cloud easily and at their own pace, which we believe will continue over the next five years. Quarterly strength along with upside to guidance and the annual roll of our DCF model drive our fair value estimate to $325 from $278 per share. We continue to see upside to this high-quality name from here.

For the June quarter, revenue growth accelerated to 21.3% year over year to $46.15 billion, compared with our model at $44.33 billion and FactSet consensus at $44.14 billion. Relative to our expectations, all segments were ahead, with most upside driven by the productivity and business processes, and intelligent cloud segments. All segments were above the high end of guidance. Enterprise software and

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Sector
Technology

Industry
Software - Infrastructure

Business Description

Microsoft develops and licenses consumer and enterprise software. It is known for its Windows operating systems and Office productivity suite. The company is organized into three equally sized broad segments: productivity and business processes (legacy Microsoft Office, cloud-based Office 365, Exchange, SharePoint, Skype, LinkedIn, Dynamics), intelligence cloud (infrastructure- and platform-as-a-service offerings Azure, Windows Server OS, SQL Server), and more personal computing (Windows Client, Xbox, Bing search, display advertising, and Surface laptops, tablets, and desktops).

services showed signs of strength, with acceleration in Azure, which was up 51% year over year; acceleration in dynamics, which was up 33%; and LinkedIn, which accelerated sharply to up 46%. Channel constraints drove Surface revenues down 20% compared to the year-ago period. We remain impressed with on-premises server products still growing despite the cloud headwind.

Business Strategy & Outlook Dan Romanoff, CPA, Equity Analyst, 28 Oct 2020

Since taking over as CEO in 2014, Satya Nadella has reinvented Microsoft into a cloud leader. In our view, Microsoft has become one of two public cloud providers that can deliver a wide variety of PaaS/IaaS solutions at scale. Additionally, Microsoft has accelerated the transition from a traditional perpetual license model to a subscription model. The company has also embraced the open-source movement. Finally, Microsoft exited the low-growth, low-margin mobile handset business and is driving Gaming to be more cloud-based. These factors have combined to drive a more focused company that offers impressive revenue growth with high and expanding margins.

We believe that Azure is the centerpiece of the new Microsoft. Even though we estimate it is already an approximately $20 billion business, it grew at a staggering 56% rate in fiscal 2019. Azure has several distinct advantages, including that it offers customers a painless way to experiment and move select workloads to the cloud. Since existing customers remain in the same Microsoft environment, applications and data are easily moved from on-premises to the cloud. Microsoft can also leverage its massive installed base of all Microsoft solutions as a touch point for an Azure move. Azure also is an excellent launching point for secular trends in AI, business intelligence and Internet of Things, as it continues to launch new services centered around these broad themes.

Microsoft is also shifting its traditional on-premises products to become cloud-based SaaS solutions. Critical applications include LinkedIn, Office 365, and Dynamics 365. Like any transition, the initial move is painful, as both revenue and margins drop. However, Microsoft is now on the back end of that where revenue have accelerated and are more predictable, and margins are increasing. Office 365 retains its virtual monopoly in office productivity software, which we do not expect to change in the foreseeable future. We believe that customers will continue to drive the transition from on-premises to cloud solutions, and revenue growth will remain robust with margins continuing to improve for the next several years.

Bulls Say Dan Romanoff, CPA, Equity Analyst, 27 Jul 2021

- Public cloud is widely considered to be the future of enterprise computing, and Azure is a leading service that benefits the evolution to first to hybrid environments, and then ultimately to public cloud environments.
- Shift to subscriptions accelerates growth after the initial growth pressure, and the company has passed the margin inflection point now such that margins are increasing again and have returned to pre-Nokia

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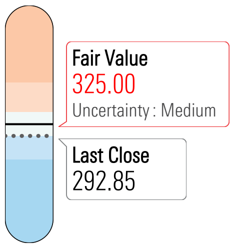
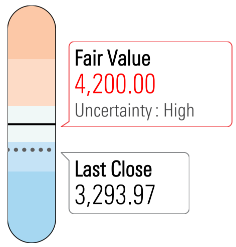
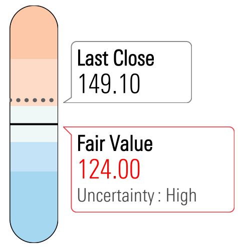
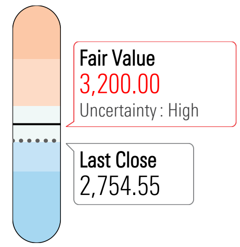
292.85 USD 13 Aug 2021	325.00 USD 28 Jul 2021 03:59, UTC	0.90	2.20 USD Tril 13 Aug 2021	Wide	Stable	Medium	Exemplary	4 Aug 2021 05:00, UTC

Competitors

	Microsoft Corp MSFT	Amazon.com Inc AMZN	Apple Inc AAPL	Alphabet Inc Class A GOOGL
				
Economic Moat	Wide	Wide	Narrow	Wide
Moat Trend	Stable	Stable	Stable	Stable
Currency	USD	USD	USD	USD
Fair Value	325.00 28 Jul 2021 03:59, UTC	4,200.00 30 Apr 2021 02:09, UTC	124.00 28 Jul 2021 02:09, UTC	3,200.00 28 Jul 2021 03:31, UTC
1-Star Price	438.75	6,510.00	192.20	4,960.00
5-Star Price	227.50	2,520.00	74.40	1,920.00
Assessment	Under Valued 14 Aug 2021	Under Valued 14 Aug 2021	Over Valued 14 Aug 2021	Under Valued 14 Aug 2021
Morningstar Rating	★★★★13 Aug 2021 21:24, UTC	★★★★13 Aug 2021 21:24, UTC	★★13 Aug 2021 21:24, UTC	★★★★13 Aug 2021 21:24, UTC
Analyst	Dan Romanoff, Equity Analyst	Dan Romanoff, Equity Analyst	Abhinav Davuluri, Sector Strategist	Ali Mogharabi, Senior Equity Analyst
Capital Allocation	Exemplary	Exemplary	Exemplary	Standard
Price/Fair Value	0.90	0.78	1.20	0.86
Price/Sales	13.25	3.81	7.31	9.23
Price/Book	15.50	14.53	38.34	7.73
Price/Earning	36.38	57.36	29.12	29.89
Dividend Yield	0.75%	—	0.57%	—
Market Cap	2,200.74 Bil	1,668.20 Bil	2,464.65 Bil	1,840.95 Bil
52-Week Range	196.25—292.90	2,871.00—3,773.08	103.10—150.00	1,402.15—2,765.94
Investment Style	Large Core	Large Growth	Large Growth	Large Core

and pre-"cloud" levels.

- Microsoft has monopoly like positions in various areas (OS, Office) that serve as cash cows to help drive Azure growth.

Bears Say Dan Romanoff, CPA, Equity Analyst, 27 Jul 2021

- Momentum is slowing in the ongoing shift to subscriptions, particularly in Office, which is generally considered a mature product.
- Microsoft lacks a meaningful mobile presence.
- Microsoft is not the top player in its key sources of growth, notably Azure and Dynamics.

Economic Moat Dan Romanoff, CPA, Equity Analyst, 27 Oct 2020

For Microsoft overall we assign a wide moat rating arising from switching costs, network effects, and cost advantages. We believe that Microsoft's different segments and products benefit from different moat sources.

Microsoft's Productivity and Business Processes segment includes Office, Dynamics, and LinkedIn. We assign the segment a wide moat rating based on high switching costs and network effects.

We believe that Microsoft Office, including both 365 and the perpetual license version, is protected by a wide moat driven by high switching costs and network effects. Office 365 is the cloud-based version of the traditional perpetual license Microsoft Office productivity suite. Office 365 is available for a monthly subscription. Together, the two products account for approximately 26% of revenue and are growing in the low double-digit area. Office 365 represents more than half of Office revenue. We expect perpetual license sales of Office to continue to decline in terms of both absolute dollars and as a percent of revenue, with growth in Office 365 more than offsetting the declines.

An office productivity suite generally consists of spreadsheet (Excel), word processing (Word), and presentation (PowerPoint) software applications. Other applications can also be bundled in. Microsoft offers a variety of versions of the Office 365 suite, and increasingly fewer perpetual license versions. Office 365 starts at approximately $6 per month and tops out at approximately $35 per user per month. Lower-cost and even free versions are available for students and the education vertical more generally. The perpetual license version is $150. Office 365 already has more than 165 million subscribers.

While Office 365 and is ubiquitous among white collar workers, there are a variety of other office productivity suites available. Many of these are available for free, notably Google Docs and Apache OpenOffice.

Microsoft eventually came to completely own this market but certainly was not there first. Lotus 1-2-3 and WordPerfect dominated office productivity throughout the 1980s and remained popular even into the 1990s. We believe Microsoft continues to enjoy a dominant market share position in Office Suites, with Google being the only other vendor of consequence. Given that so many users are willing to pay a minimum of $70 per year to use Office 365 when free versions that are generally similar in terms of features and interface are available, we are impressed with the company's pricing power and believe it supports our wide moat stance.

Microsoft Office also benefits from high switching costs. Because of the significant installed base, and the fact that critical business processes are often centered around Microsoft Excel, we believe it would be highly disruptive for a company to pivot to an office suite other than Office 365. Broadly speaking, critical reports within the financial function of countless enterprise users are pulled from an Oracle, SQL, or other popular database into an Excel file that can then be manipulated and analyzed further.

Lastly, Office 365's moat is supported by a network effect. A large installed base draws in software developers to create products specifically for Microsoft Office. For example, in the financial community, a wide variety of add-ins for Excel designed to smoothly integrate popular platforms such as Factset, Bloomberg, and CapitalIQ have been created.

Microsoft Dynamics, including both Dynamics 365 and traditional license versions, has a narrow moat, in our view, that is supported primarily by high switching costs. Dynamics is an enterprise resource planning (ERP) suite of applications designed to help mid-sized companies, or divisions of larger companies, run their businesses. We estimate Dynamics accounts for approximately 2% of total revenue and is growing in the low double-digit area. The Dynamics revenue base is shifting from a perpetual license and maintenance model into a subscription model (Dynamics 365). Microsoft has invested considerable resources in these applications, which now benefit from being re-architected and modular, creating a strong value proposition for customers. As such, Dynamics has increased its profile and is slowly gaining share market share. Dynamics 365 is a leading cloud-based CRM and ERP package that generally competes with Salesforce.com, Oracle (standalone), Netsuite (owned by Oracle), Workday, and SAP, among others.

An ERP system and its core modules represent the core systems of the company. These software suites represent a significant financial commitment, a steep learning curve, and a long lead-time for implementing and testing the system. Because of these investments, an ERP system has traditionally been considered a minimum 10-15 year investment. There is also substantial risk in changing from one ERP vendor to another--and enterprise customers are risk averse by their nature. The sales process alone is a one-year, if not two-year process, with implementation times running at 1-2 years as well. Modern architectures skew toward the shorter end of the range, while legacy systems skew longer.

We believe LinkedIn's narrow moat is supported by network effects. Hailed as a professional networking tool, LinkedIn is at its core a free-to-use networking application similar to Facebook. LinkedIn represents mid-single digits as a percent of revenue, and is growing by more than 30%. We believe LinkedIn is the premier tool for professional networking. The company boasts more than 600 million registered users, but no longer reports the more useful figure for monthly active users, or MAU, which we estimate to be approximately 145 million. When Microsoft announced the acquisition, LinkedIn had 433 million members and 105 million MAU. In the Americas and Europe, the only larger network of its kind is Facebook (2.3 billion MAU), which is geared more toward social networking. Twitter serves a different purpose, but for context has 326 million MAU.

LinkedIn ultimately provides a large database of professionals for recruiters and companies to comb for talent, the tools to make that process easy, and a platform for targeted advertising. For professional networking, we believe that no comparable platform exists. Engagement among users remains high even as new members continue to join. The large user base attracts more users, recruiters, advertisers, which in-turn, attracts more users still. We do not see a disruptive network or software tool threatening LinkedIn over the next several years.

Microsoft's Intelligent Cloud segment includes Windows Server, SQL Data Base Management System, Azure, Enterprise Services and Visual Studio. We assign the segment a wide moat rating based on high switching costs, network effects, and cost advantages.

Windows Server is protected by a wide moat driven by high switching costs and network effects. Microsoft was the clear winner in the move from mainframe computing to client-server architecture. The PC boom helped fuel the server boom beginning in the 1980s and gaining steam in the 1990s. Much cheaper Windows-based servers were severely disruptive to the mainframe server market. Mainframes and Unix based servers have been hit hard over the last 20 years and now represent just a small piece of the market. Windows remains the server operating system leader and continues to gain share, even as Linux continues to grow faster. Linux is open-source and theoretically “free.” That said, Red Hat made a business out of offering support contracts to enterprise customers for an otherwise “free” product. Despite Linux being free and being extremely stable, customers are still overwhelmingly willing to pay for Windows Server. We believe such pricing power supports our wide-moat stance.

Microsoft's presence in the PC market with both its OS and Office productivity software allowed it to easily enter the server market just as the server market was undergoing a major transformation. Great timing helped build a substantial installed base. Today the IT backbone of many of the largest companies in the world is built on Microsoft Server. We reiterate that replacing any part of the core of an enterprise's IT environment would be a significant undertaking for any company in terms of financial cost, time, and risk. In other words, switching costs are high.

Critically, we believe that Microsoft's unique ability to move clients from an on-premises Microsoft environment to a cloud Microsoft environment via Azure is a structural advantage. As the cloud theme has evolved it has become increasingly apparent that companies' IT environments will be hybrid-based for years to come.

Lastly, the early lead and substantial market share led to a wide variety of developers joining the ecosystem bringing in applications, middleware, and development tools. This has helped Microsoft Server become the path of least resistance for CIOs and IT managers as well: a larger installed base attracts developers, which in turn attracts more customers.

We believe Microsoft's SQL Database Management System (DBMS) is protected by a wide moat driven by high switching costs. Over the years the company has developed a strong technology core for DBMS and continues to add to an already strong portfolio. Beyond the portfolio breadth, Microsoft's DBMS offers a good value for customers as well. In short, the company has made it easy for customers to select Microsoft and stick with them over time. We view Microsoft DBMS as one of several leading database products along with AWS, SAP, Oracle, and IBM, with Microsoft and Oracle being a cut above the others. This is a core technology in a customer's IT environment, and changing it would involve significant costs, take a long time to implement, test, train and realign with prior day to day processes, and involve needless risk. Once again, by virtue of offering clients the ability to migrate to the cloud on their own terms through Azure, we think Microsoft has solidified its position for years to come.

We believe high switching costs and cost advantages drive a wide moat for Azure. Azure is clearly the growth engine for the Intelligent Cloud segment, and one of the critical products the "new" Microsoft will be built around. Azure is a next-generation service offering that builds upon the Dynamics 365 and Office 365 SaaS business to offer Infrastructure as a Service (IaaS) and Platform as a Service (PaaS). The lines are often blurry between IaaS and PaaS. In an IaaS model, the provider offers the necessary hardware, virtualization, networking, and storage as a computing service delivered over the Internet. Other basic software-level functionality can be layered in and still have the offering be considered IaaS. However, as software is added, IaaS quickly becomes PaaS. In PaaS model, the provider also offers and hosts operating systems, middleware, and core IT applications (notably database). Additionally, PaaS is generally thought of as an application development platform, which is again another level of complexity. Overall, the practical boundaries between different PaaS offerings is murky. We view Azure, AWS, and Google Compute as leaders in this category, with AWS and Azure being the clear leaders. We also view Salesforce and ServiceNow as competitors in this area for some use cases.

We estimate revenue from Azure itself is a mid-to-high single-digit percentage of revenue, growing by more than 75% annually. We believe the company's presence in traditional on-premises deployments of Server (and SQL database) have helped guide customers toward Azure for both fully public and hybrid deployments. It is simply the path of least resistance for many CIOs—Microsoft offers a worry-free product and a seamless transition from on-premises to Azure. Users would overwhelmingly not even notice the company shifted workloads to the cloud.

Further, we believe it is cheaper initially for companies to move workloads to the cloud, as there are less upfront costs and a lower bar to clear for maintenance and administration. Along those lines, Microsoft offers scale advantages to Azure clients in that at least some cloud offerings are cheaper relative to AWS, and it has scale by being larger than all but one competitor and possessing the largest worldwide data center footprint, with 54 locations around the world. Compliance regulations in many countries are increasingly requiring local data storage, so a global footprint is critical.

We believe that given the commodity-like nature of consulting services, as evidenced by its low(er) margin structure, Microsoft Enterprise Services (MES) is not protected by a true moat. However, we believe MES should be able to maintain its market position as a result of being part of the largest software company in the world. The move from on-premises to cloud and/or hybrid environments remains a complex task. Given the company's position as a leader in both traditional (Windows Server and SQL products) and cloud (Azure), we believe customers will continue to engage with Microsoft for professional services. This is also supported by the broader trend within technology to consolidate vendors to ease the burden on CIOs and IT management professionals.

Visual Studio's narrow moat is supported by high switching costs and network effects. Visual Studio is an integrated development environment (IDE) used to develop computer applications, mobile apps, websites, and web apps. Visual Studio supports more than 35 languages with code editing, automated code completing, and debugging. Additionally, Microsoft includes the .NET framework with its Windows OS license. Microsoft .NET is effectively a library of source code that developers can access for ensuring common functions work correctly without having to actually write the code themselves. Thus it saves time and requires no de-bugging. To further bolster Visual Studio, Microsoft acquired Xamarin. Xamarin is a software development tool that allows for cross platform application development. For example, one set of code written in C# (or various other languages) can be used for the same app on both iOS and Android. Once again, Microsoft has used its presence to attract more users, which in turn attract more developers in a virtuous circle. Additionally, developers have a lot invested in terms of man-hours sunk into learning certain languages and how to efficiently write software under a given umbrella. Our experience informs us that it would be a time-consuming, and therefore costly endeavor to learn additional languages on a different platform.

The GitHub acquisition (closed Oct. 26, 2018) bolsters Microsoft's position for developers' tools. Given that GitHub is a repository for source code and an online collaboration community for software developers, it enjoys some level of network effect as the “Facebook for programmers,” and makes Visual Studio a stickier product. Our preliminary assessment of the company suggests it reinforces our narrow moat rating. GitHub will retain its developer-first mentality, operate independently, and remain an open platform. It will be incorporated into the Intelligent Cloud segment so that Microsoft and GitHub will work together to empower developers to achieve more at every stage of the development lifecycle, accelerate enterprise use of GitHub, and expand its community of developers. The company was exploring an IPO and last saw a public valuation in 2015 at approximately $2 billion. Google, Apple, Amazon, Facebook, and Microsoft each have a material presence on GitHub and use if for documentation and code. It remains to be seen if these mega-cap tech competitors will allow their developers to continue to use GitHub.

Microsoft's "More Personal Computing" segment includes Windows, Gaming, Devices, and Search. We assign the segment a narrow moat rating based on high switching costs and network effects.

Microsoft Windows' wide moat is supported by high switching costs and a network effect. Windows accounts for approximately 18% of total revenue and is growing in the mid-single-digit area. It enjoys an 83% global market share for PC operating systems. Apple has the next largest share at 13%. The only other realistic alternatives are Linux and Chrome. We believe Windows has very slowly been bleeding market share with the rise of Apple and the introduction of some alternative PC operating systems. Despite a slow bleed of market share over a decade, Windows revenue has grown for three consecutive years. We simply do not believe there is a viable OS alternative. Additionally, other than IT managers and CIOs, PC users overwhelmingly do not contemplate their operating system.

At the core of Windows longevity is the fact that its predecessor, Microsoft DOS, enjoyed a first mover advantage, coupled with a liberal licensing strategy that allowed it to quickly become the de facto standard in desktop operating systems from the outset. The timing could not have been better, as this was right as the PC was born and the market opportunity was completely greenfield.

At the enterprise level, CIOs and IT managers require proven reliability, significant software support, and a product roadmap to insure their investment in IT infrastructure will offer an appropriate return. Windows is ubiquitous and proven. There have literally been billions of instances of Windows installed. Enterprises will often skip Windows versions and overwhelmingly not even upgrade to newer versions until the first (or second) service pack is released. We believe there is simply too much at stake in financial, operational, and informational terms to warrant companies switching to competing operating systems.

Additionally, software is overwhelmingly written for Windows. Because of the first mover advantage and concurrent de facto status as the standard in desktop OS software, software was initially written for Windows. Initially, this was a virtuous circle, as developers wrote software for the large installed base of DOS-based PCs, and users quickly coalesced around DOS because it became the most useful. Over time, Microsoft introduced a variety of other software solutions that brought it additional users and developers. The same applies today, when business software is overwhelmingly written for the Windows OS. Consumer PC software is also predominantly written for Windows.

We do not believe Microsoft's Gaming segment warrants an economic moat; while the lifecycle of a gaming console has been expanding but is realistically still a 4-6 year time horizon, we do not have enough confidence that the business can generate excess returns over the next 10 years. We believe that Gaming is supported by high switching costs and a network effect, but that such benefits are not necessarily sustainable over the next decade. Gaming includes Xbox unit sales; game software sales; Xbox Live transactions, subscriptions, and advertising, and third-party video game royalties. Gaming revenue is approximately 9% of total and is growing in the low-double-digit area.

High switching costs are explicit in the hardware platform, which for leading edge units is $500, while trailing versions of the device are $250. New games typically retail for $60. Battery packs, second controllers, and headsets will cost another $100 in aggregate. In short, with a handful of games, essential accessories, and the console itself, a user is looking at an investment of approximately $1,000. Games have typically been backward compatible but in recent new platform releases, console makers have skipped this, which has certainly angered users.

Gamers inevitably enjoy gaming with friends or within a community of gamers they are familiar with, and cross platform gaming has generally not been possible. Therefore, users tend to want to be on the same platform as their friends. More gamers on a particular console attract developers to write more games and offer exclusive content on a given platform, which in turn attracts more gamers. Microsoft currently boasts 56 million MAU on Xbox Live. Meanwhile, Microsoft has added features over the years to make the Xbox platform more sticky for its gaming community, including Xbox Live, xCloud streaming, various apps on the console itself, networking functionality, free games, and Xbox Game Pass (Netflix for video games).

We do not believe the Microsoft Surface enjoys a moat of any kind. We do not believe that there is much, if any sustainable differentiation between a Microsoft Surface and generally competitive products such as a Windows or Mac laptop, an Apple iPad, or a Google ChromeBook. This is generally reflected in low(er) product gross margins. Other devices within this category include computer peripherals (keyboards, mice, etc) and the HoloLens. On the HoloLens in particular, we remain skeptical on virtual and augmented reality within the next several years. Microsoft has not enjoyed much success in noncore devices in recent years, with the high-profile Zune and large acquisition of Nokia serving as reminders that hardware is a challenging business. Finally, we also do not believe there is a sustainable moat in Microsoft's Bing search engine.

Fair Value and Profit Drivers Dan Romanoff, CPA, Equity Analyst, 27 Jul 2021

Our fair value estimate for Microsoft is $325 per share, which implies a fiscal 2022 enterprise value/ sales (EV/S) multiple of 12 times, adjusted price/earnings, or P/E, multiple of 38 times, and a 3% free cash flow yield.

We model a 5-year compound annual growth rate, or CAGR, for revenue of approximately 13%. We foresee stronger revenue growth ahead as Microsoft's prior decade was bogged down by the downturn in 2008, the complete evaporation of mobile handset revenue from the disposal of the Nokia handset business, as well as the onset of the model transition to subscriptions (which initially results in slower revenue growth). We believe revenue growth will be driven by Azure, Office 365, Dynamics 365, and LinkedIn. Azure, in particular, is the single most critical revenue driver over the next 10 years, in our view, as hybrid environments (where Microsoft excels) drive mass cloud adoption. We believe the combination of Azure, DBMS, Dynamics 365, and Office 365 will drive above-market growth as CIOs continue to consolidate vendors. We believe More Personal Computing will grow modestly above GDP over the next 10 years.

We also model operating margins increasing modestly from 42% in fiscal 2021 (actual) to 43% in fiscal

2026, driven by improvements in gross margin as Azure continues to scale as well as some operating leverage. However, we do expect some pressure on both gross margin and operating margin in fiscal 2022 as an accounting change becomes a headwind and a pick-up in expenses from returning to business as usual after COVID-19 occurs.

Risk and Uncertainty Dan Romanoff, CPA, Equity Analyst, 27 Oct 2020

Microsoft faces risks that vary among the products and segments. High market share in the client-server architecture over the last 30 years means significant high margin revenue is at risk, particularly in OS, Office, and Server. Microsoft has thus far been successful in growing revenues in a constantly evolving technology landscape, and is enjoying success in both moving existing workloads to the cloud for current customers and attracting new clients directly to Azure. However, it must continue to drive revenue growth of cloud-based products faster than revenue declines in on-premises products.

Microsoft is acquisitive, and while many small acquisitions are completed that fly under the radar, the company has had several high-profile flops, including Nokia and aQuantive. The LinkedIn acquisition was expensive but served a purpose and seems to be working out well in our view. It is not clear how much Microsoft bought in the Permira-led Informatica LBO, and it may have been an important strategic investment, but Informatica was certainly not a growth catalyst. GitHub was expensive but strategic and seems to be shaping up as a success, while the ZeniMax deal should boost the company’s first party video game publishing efforts.

The public cloud build-out remains in its early phases. AWS has taken the market by storm, with Azure trailing, but the two are seen as clear leaders. This is a rapidly evolving market and Microsoft must continually adjust its offerings, add solutions to the stack, and compete with a company that has built a business around aggressive pricing.

While we do not see significant ESG risks, we note Microsoft faces strong competition for software engineers on the hiring front, and also faces risks arising from a potential data breach within its data centers.

Capital Allocation Dan Romanoff, CPA, Equity Analyst, 27 Apr 2021

We assign Microsoft an Exemplary Capital Allocation rating. The rating reflects our assessments of a sound balance sheet, exceptional investments, and appropriate shareholder distributions. We think investments back into the business are most likely to be the key driver of total shareholder returns and are therefore appropriately prioritized over other capital returns such as dividends and buybacks, although given the company’s prodigious free cash flow generation, we see share dividends, buybacks and acquisitions continuing.

The balance sheet is sound with a net cash position, including $138.0 billion in cash and $63.6 billion in debt. Gross leverage is under one times trailing EBITDA. We expect the balance sheet to remain sound as the company has typically maintained a conservative balance sheet and generates more than enough free cash flow to fund growth, pay dividends, buy back shares, and execute its acquisition strategy.

Microsoft's capital deployment strategy centers around re-investing in the business, paying dividends, buying back shares, and making generally small tuck-in acquisitions. We expect the share count to continue to decline over time and see dividends growing generally in line with earnings. We also think the company will continue with its acquisition strategy.

Satya Nadella took over as CEO of Microsoft in February 2014, after Steve Ballmer resigned in August 2013. Nadella joined Microsoft in 1992 and worked his way up to a variety of business unit leadership roles, mainly involving Cloud, Business, and Server & Tools groups. He was the President of the Server & Tools Division for the three years prior to becoming CEO. The company he took over is very different than the company we see today, and the transformation has been nothing short of dramatic.

We can point to several specific actions Nadella has undertaken. The first was the $2.5 billion acquisition of Mojang in 2014, which brought in the popular Minecraft title to the Gaming division. His next move in 2015 was to invest alongside Permira in its acquisition of Informatica (INFA), a data integration middleware provider. INFA is available on Azure as part of Microsoft's PaaS offering. In 2016, Microsoft wrote Nokia off and jettisoned the division. We believe the Nokia acquisition was a desperate attempt to have a relevant presence in the mobile world. Unfortunately, it was too late by then, as Apple and Alphabet had already come to dominate the market in mobile operating systems. Almost immediately after selling the remaining Nokia assets, Microsoft announced the LinkedIn (LNKD) acquisition for $26.2 billion. LinkedIn's Recruiter tool was an important SaaS offering that can be either a standalone offering or as part of Dynamics. LinkedIn also served to provide something Microsoft badly needed--a meaningful Internet presence.

While the direct actions under Nadella are easy to identify, he has also had a critical impact on strategic and cultural areas. Strategically, Nadella has increasingly shifted the company's focus to the cloud, accelerated the shift to a subscription-based model, and embraced the open-source movement in IT more broadly. Nadella's acquisitions fit with and contributed to the new strategic direction. The embrace of the open source movement is a strategically sound decision, but shifting the culture of the company to allow that to happen in such a short timeframe is an impressive feat in our view. Old Microsoft viewed open source code as a threat, while new Microsoft has sponsored the Open Source Initiative, an influential open source advocacy group. In our experience, there are few examples of such a dramatic shift in the direction of technology companies. Under his watch, Microsoft very quickly became more open and more nimble as an organization.

These direct and indirect actions, and perhaps good timing, led naturally to pushing Azure as a

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Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Moat Trend™	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
292.85 USD 13 Aug 2021	325.00 USD 28 Jul 2021 03:59, UTC	0.90	2.20 USD Tril 13 Aug 2021	Wide	Stable	Medium	Exemplary	4 Aug 2021 05:00, UTC

centerpiece of the new company. While it has certainly taken some investment and patience, Azure has taken off. While Microsoft does not disclose figures directly, the company noted that Azure grew by more than 56% in fiscal 2020, to more than $20 billion by our estimate. We believe hybrid deployments will carry the day over the course of the next several years and that Nadella’s leadership has significantly strengthened Microsoft’s competitive position. The company is also making other moves into what should be significant markets. Microsoft is increasingly talking about artificial intelligence, "Internet of Things," and virtually reality, and is introducing new offerings on Azure to capitalize on these substantial opportunities. While we are skeptical in the near term on the HoloLens and virtual reality, artificial intelligence is already being integrated into various solutions. Further, Internet of Things is an interesting market to explore how a Windows OS, Azure, and Power BI combination can help distill insights from an ocean of data.

Analyst Notes Archive

Corporate Tax Hikes Are Very Likely to Come for U.S. Equities Preston Caldwell, Equity Analyst, 11 May 2021

We expect a U.S. corporate tax hike to be passed this year. Our probability-weighted forecast is an increase in the statutory tax rate to 26% from 21% currently. Our equity analysts will be incorporating the new tax rate into their valuation models over the coming weeks, but our preliminary analysis suggests a mid-single-digit impact to the average U.S. equity valuation.

President Joe Biden has unveiled a $2 trillion infrastructure plan that he plans to pay for largely with increases in corporate taxes. While there are other plausible sources of revenue, these will likely be needed for other spending priorities, so we believe there is a high probability that Congress will pass an increase in corporate taxes this year, effective in 2022.

Biden's proposal is to increase the corporate tax rate to 28% from the current 21% (but below the 35% before the Tax Cuts and Jobs Act of 2017). Our probability-weighted estimate is a new corporate business tax rate of 26%, which incorporates an 80% probability that any tax increase is passed at all. Conditional on an increase passing, we've penciled in an 80% probability that Biden's proposed 28% is passed versus a 20% probability that the increase is limited to 25%.

We’ve simulated the impact of various tax rate changes on valuations for our covered U.S. equities. For the average U.S. equity, the impact of the statutory tax rate increase to 26% from 21% generates a 2.7% fall in valuation. If rates increase to the full 28% as proposed, that generates a 3.8% fall in valuation.

Digital Transformation Is Accelerating; Microsoft Delivers Strong Quarter; Raising FVE to $278 Dan Romanoff, CPA, Equity Analyst, 28 Apr 2021

Wide-moat Microsoft is benefiting from a second wave of digital transformation as well as strength in gaming, which helped the company once again drive material upside compared with its revenue and EPS outlook for the quarter. Guidance for the fourth quarter was nicely above FactSet consensus as well. Azure remains strong, while consumer-related revenue was ahead of our expectations as the global lockdowns continued this quarter. Importantly, commercial bookings and RPO, two forward-looking metrics, both continue to significantly outpace revenue growth. We remain impressed with Microsoft's ability to drive revenue and margins at this scale and we believe there is more to come on both fronts. Results continue to underscore our thesis, which centers on customer adoption of hybrid cloud environments with Azure. Microsoft continues to use its dominant position of on-premises architecture to allow customers to move to the cloud easily and at their own pace, which we believe will continue over the next five years. Quarterly strength along with upside to guidance drive our fair value estimate to $278 from $263 per share. We see modest upside to this high-quality name from here.

For the March quarter, revenue growth accelerated to 19.1% year over year to $41.71 billion, compared with our model at $41.09 billion and FactSet consensus at $40.97 billion. Relative to our expectations, all segments were ahead, with most upside driven by stronger gaming-related revenue within the more personal computing segment. As a result of the COVID-19-driven lockdown, general consumer-related strength in both PC-related demand and gaming persist. Intelligent cloud remains a key long-term growth driver and saw Azure growth stable sequentially at 50% year over year. We find this particularly impressive given that on-premise server products revenue still grew 3% year over year against a difficult comparison, underscoring hybrid cloud strength.

Microsoft Bolstering Healthcare Offerings With Acquisition of Nuance for $16 Billion; FVE Unchanged Dan Romanoff, CPA, Equity Analyst, 12 Apr 2021

Microsoft announced the acquisition of Nuance Communications, a leader in conversational artificial intelligence (AI), in an all-cash deal for $19.7 billion in enterprise value ($16 billion excluding debt) or $56 per share. We don't believe this deal transforms Microsoft's strategic plans, nor does it move the needle financially. Therefore, we are maintaining our fair value estimate for wide-moat Microsoft of $263 per share.

We view the acquisition as strategic in that it adds conversational AI to the portfolio and aligns Microsoft with Nuance's roster of healthcare solutions and customers. Investors, patients, politicians, care providers, insurance companies, and technology all seem to agree that healthcare is an area where change is needed, but easy solutions have been elusive. Therefore, healthcare is an important vertical for Microsoft to penetrate more deeply. However, we consider this deal as a supplement to Microsoft's larger AI efforts within Azure and do not view it as transformational. More broadly, Microsoft is clearly ramping its deal-making activities after the recently closed ZeniMax deal, the aborted attempt to acquire TikTok, and the recently rumored Discord acquisition.

Financially, even a $16 billion deal does not move the needle for Microsoft as it represents less than 1%

of its $1.9 trillion market cap. Similarly, the deal is immaterial to Microsoft's $132 billion cash hoard or Microsoft's future combined financial performance. Nuance has seen its revenue decline in each of the last several years, to $1.48 billion in fiscal 2020, with another decline expected in fiscal 2021 to $1.37 billion, according to FactSet consensus, which we understand has been partly as a result of an ongoing restructuring program. The deal is at a reasonable price at a 23% premium from Nuance's closing share price on Friday, April 9, and represents a takeout price to sales multiple of 11.7 times, as compared with our estimate of the software group median of 11.9 times.

Gaming and Azure Drive Strong Results for Microsoft Reports; Raise FVE to $263 Dan Romanoff, CPA, Equity Analyst, 27 Jan 2021

Microsoft is benefiting from a second wave of digital transformation as well as strength in gaming, which helped the company once again drive material upside compared with its revenue and EPS outlook for the quarter. Guidance for the third quarter was nicely above consensus as well. Azure remains strong, while consumer-related revenue was once again ahead of our expectations as the global lockdowns continued this quarter. Importantly, commercial bookings and RPO, two forward-looking metrics, both continue to outpace revenue growth. We remain impressed with Microsoft's ability to drive revenue and margins at this scale and we believe there is more to come on both fronts. Results continue to underscore our thesis, which centers on customer adoption of hybrid cloud environments with Azure. Microsoft continues to use its dominant position of on-premises architecture to allow customers to move to the cloud easily and at their own pace, which we believe will continue over the next five years. Quarterly strength along with upside to guidance and a variety of minor model tweaks drive our fair value estimate to $263 from $235 per share. We still see loosely 10% upside to this high-quality wide-moat name.

For the December quarter, revenue growth accelerated to 16.7% year over year to $43.08 billion, compared with our model at $40.29 billion and FactSet consensus at $40.14 billion. Relative to our expectations, all segments were ahead. However, Intelligent Cloud, which was driven by Azure, and More Personal Computing, which was driven primarily by the holiday-launch of the new Xbox consoles and the related gaming service revenue that was pulled through, were both more than $800 million ahead of our model. As a result of the COVID-19-driven lockdown, general consumer-related strength in both PC-related demand and gaming persist. Intelligent cloud remains a key long-term growth driver and saw Azure growth accelerate modestly sequentially (again) to 50% year over year.

Microsoft Reports Material Upside Thanks to Office 365, the Consumer, and Azure; Raise FVE to $235 Dan Romanoff, CPA, Equity Analyst, 28 Oct 2020

Microsoft continues to actually benefit from coronavirus-related issues, which helped the company drive material upside compared with its revenue and EPS outlook for the quarter. Azure remains strong, while consumer-related revenue was once again nicely ahead of our expectations as the global lockdowns

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Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Moat Trend™	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
292.85 USD 13 Aug 2021	325.00 USD 28 Jul 2021 03:59, UTC	0.90	2.20 USD Tril 13 Aug 2021	Wide	Stable	Medium	Exemplary	4 Aug 2021 05:00, UTC

continued this quarter. Importantly, commercial bookings and RPO, two forward-looking metrics, both continue to grow well in excess of revenue. We remain impressed with Microsoft's ability to drive revenue and margins at this scale and we believe there is more to come on both fronts. Results continue to underscore our thesis, which centers on customer adoption of hybrid cloud environments with Azure. Microsoft continues to use its dominant position of on-premises architecture to allow customers to move to the cloud easily and at their own pace, which we believe will continue over the next five years. A variety of generally minor model refinements drive our fair value estimate to $235 from $228 per share. We still see more than 10% upside to this high-quality wide-moat name.

For the September quarter, revenue grew 12.4% year over year to $37.15 billion, compared with our model at $35.90 billion and CapIQ consensus at $35.78 billion. Relative to our expectations, all segments were ahead. However, productivity & business processes, which was driven by consumer Office 365, and personal computing, which was driven by consumer Windows, Surface tablets, and Xbox, were both more than $500 million ahead of our model. As a result of the COVID-19-driven lockdown, the company continues to enjoy general consumer-related strength in both PC-related demand and gaming. Teams now has 115 million daily active users, up from 75 million a year ago. Management also noted 70% of the paid commercial Office user base is now converted to subscriptions. Intelligent cloud remains a key long-term growth driver and saw Azure growth accelerate modestly sequentially to 48% year over year.

Microsoft Bolsters Gaming Portfolio With ZeniMax Media Acquisition; FVE Unchanged Dan Romanoff, CPA, Equity Analyst, 21 Sep 2020

Microsoft announced the acquisition of ZeniMax Media, owner of Bethesda Softworks, one of the largest privately held game developers and publishers in the world. The all-cash deal for $7.5 billion is expected to close between January and June 2021. While no financial metrics were provided for ZeniMax, Microsoft expects the deal to have "minimal impact" on non-GAAP operating income in fiscal 2021 and 2022. Bringing ZeniMax's various studios into the fold ups Microsoft's internal studio count from 15 to 23. To the gaming world, we think this deal, combined with recent Xbox introductions, emphatically underscores that the gaming segment is important to Microsoft and the company expects to remain a leader for years to come. Overall, we think adding content to the gaming platform is strategically important, so we view the deal as strategically sound. Our $228 fair value estimate and wide moat rating are unchanged.

We believe Bethesda's titles, including The Elder Scrolls, Fallout, Doom, Quake, and Wolfenstein, are iconic and will be important additions to the GamePass catalog, which now boasts 15 million subscribers. Ultimately, a $7.5 billion transaction is immaterial to Microsoft. For comparison, Epic Games' June 2020 financing valued it at about $17 billion based on an estimated $5 billion in revenue, which implies a price/sales multiple of 3.4 times for that deal, while publicly traded analogs such as

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Activision, Electronic Arts, and TakeTwo, among others, trade at a median price/sales of 5.9 times. Using these multiples as guardrails suggests ZeniMax's revenue could be in a range of $1.3 billion-$2.2 billion for calendar 2020. At the midpoint, this represents about 1% of Microsoft’s revenue, which, when coupled with a cash hoard of $136.5 billion, demonstrates that the transaction is clearly not material to the financial operations of Microsoft. We do, however, think it suggests gaming is becoming more important internally.

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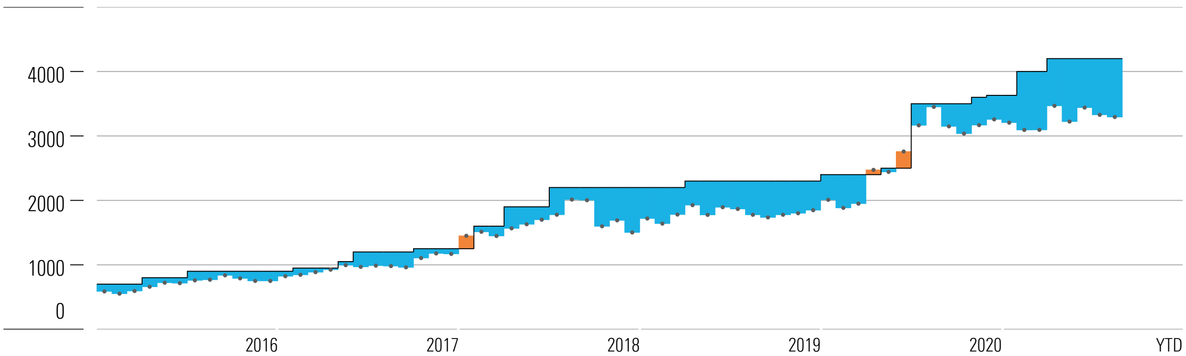
Microsoft Corp MSFT ★★★★ 13 Aug 2021 21:24, UTC

Competitors Price vs. Fair Value

Amazon.com Inc AMZN



Fair Value: 4,200.00
30 Apr 2021 02:09, UTC

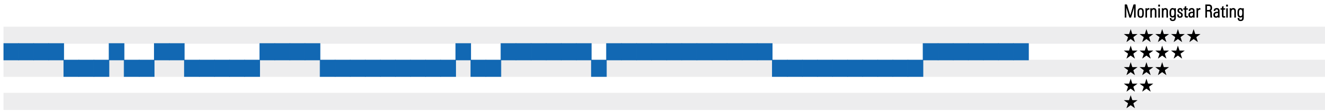
Last Close: 3,293.97

Over Valued

Under Valued

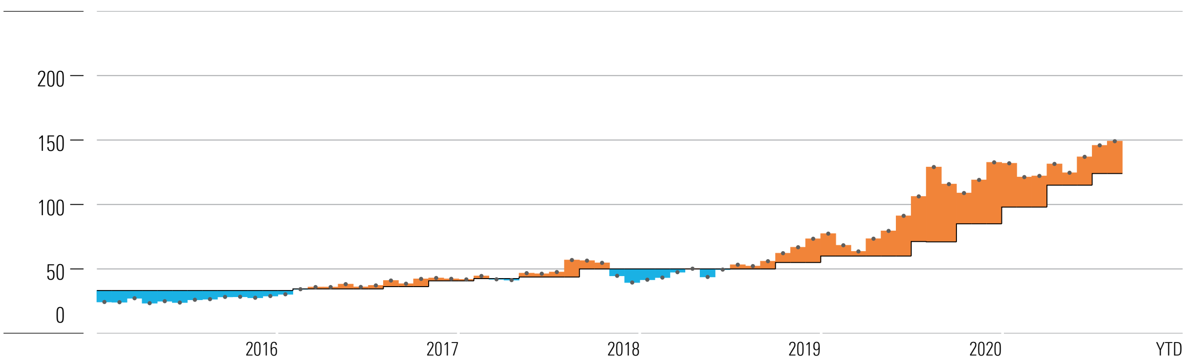
	2016	2017	2018	2019	2020	YTD
Price/Fair Value	0.83	0.94	0.68	0.80	0.90	0.78
Total Return %	10.95	55.96	28.43	23.03	76.26	1.14

Morningstar Rating



Total Return % as of 13 Aug 2021. Last Close as of 13 Aug 2021. Fair Value as of 30 Apr 2021 02:09, UTC.

Apple Inc AAPL



Last Close: 149.10

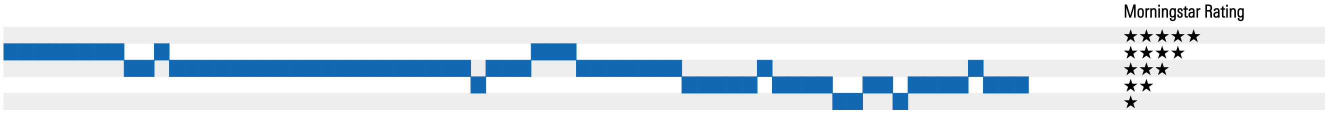
Fair Value: 124.00
28 Jul 2021 02:09, UTC

Over Valued

Under Valued

	2016	2017	2018	2019	2020	YTD
Price/Fair Value	0.87	1.04	0.79	1.33	1.56	1.20
Total Return %	12.15	48.24	-5.12	88.09	81.85	12.85

Morningstar Rating



Total Return % as of 13 Aug 2021. Last Close as of 13 Aug 2021. Fair Value as of 28 Jul 2021 02:09, UTC.

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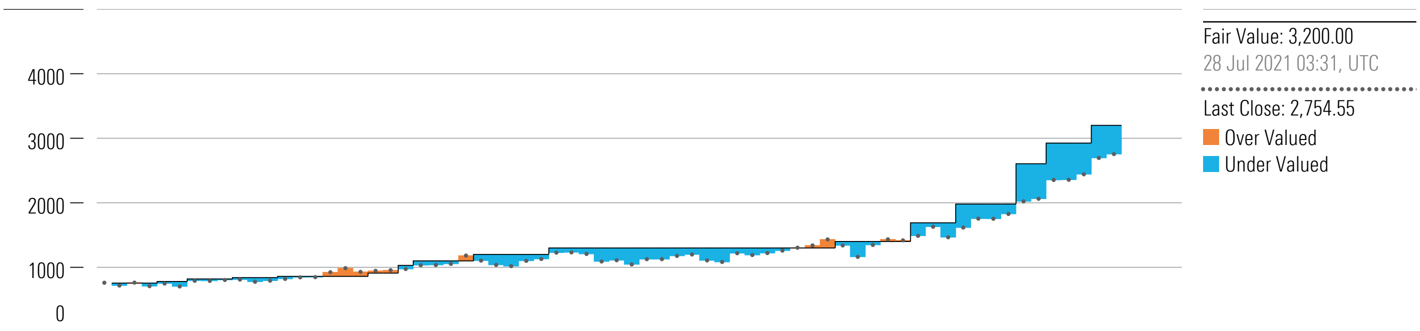
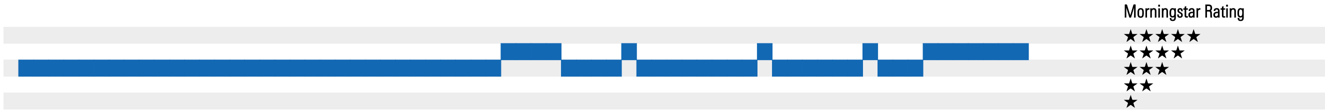
Alphabet Inc Class A GOOGL



	2016	2017	2018	2019	2020	YTD	
	0.94	0.96	0.80	1.03	0.89	0.86	Price/Fair Value
	1.86	32.93	-0.80	28.18	30.85	57.17	Total Return %



Total Return % as of 13 Aug 2021. Last Close as of 13 Aug 2021. Fair Value as of 28 Jul 2021 03:31, UTC.

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Microsoft Corp MSFT ★★★★ 13 Aug 2021 21:24, UTC

Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Moat Trend™	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
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Morningstar Historical Summary

Financials as of 30 Jun 2021

Fiscal Year, ends 30 Jun	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	YTD	TTM
Revenue (USD Bil)	70	74	78	87	94	91	97	110	126	143	168	168
Revenue Growth %	11.9	5.4	5.6	11.5	7.8	-2.6	5.9	14.3	14.0	13.7	17.5	17.5
EBITDA (USD Bil)	31	26	31	34	25	34	41	49	58	68	85	85
EBITDA Margin %	44.5	34.7	40.1	38.7	27.0	36.8	42.4	44.8	46.1	47.8	50.6	50.6
Operating Income (USD Bil)	27	28	27	28	28	27	29	35	43	53	70	70
Operating Margin %	38.8	37.9	34.4	32.1	30.1	29.8	30.4	31.8	34.1	37.0	41.6	41.6
Net Income (USD Bil)	23	17	22	22	12	21	25	17	39	44	61	61
Net Margin %	33.1	23.0	28.1	25.4	13.0	22.5	26.4	15.0	31.2	31.0	36.4	36.4
Diluted Shares Outstanding (Mil)	8,593	8,506	8,470	8,399	8,254	8,013	7,832	7,794	7,753	7,683	7,608	7,608
Diluted Earnings Per Share (USD)	2.69	2.00	2.58	2.63	1.48	2.56	3.25	2.13	5.06	5.76	8.05	8.05
Dividends Per Share (USD)	0.61	0.76	0.89	1.07	1.21	1.39	1.53	1.65	1.80	1.99	2.19	2.19

Valuation as of 30 Jul 2021

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Recent Qtr	TTM
Price/Sales	3.1	3.1	3.9	4.3	5.0	5.8	7.2	6.9	9.4	11.6	12.9	12.9
Price/Earnings	9.4	14.7	14.0	18.2	36.8	29.8	30.2	41.8	29.8	35.8	36.9	35.3
Price/Cash Flow	8.1	7.4	11.1	12.0	15.5	13.7	16.6	17.5	23.3	25.8	28.4	28.2
Dividend Yield %	2.62	3.11	2.59	2.48	2.33	2.37	1.86	1.69	1.2	0.94	0.81	0.77
Price/Book	3.7	3.1	3.8	4.2	5.7	6.8	7.4	9.1	11.3	13.6	15.2	15.1
EV/EBITDA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Operating Performance / Profitability as of 30 Jun 2021

Fiscal Year, ends 30 Jun	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	YTD	TTM
ROA %	23.8	14.8	16.6	14.0	7.0	11.2	11.5	6.5	14.4	15.1	19.3	19.3
ROE %	44.8	27.5	30.1	26.2	14.4	27.0	31.9	19.5	42.4	40.1	47.1	47.1
ROIC %	39.0	23.3	25.7	21.8	11.2	17.9	17.2	9.9	22.7	23.9	30.8	30.8
Asset Turnover	0.7	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5

Financial Leverage

Fiscal Year, ends 30 Jun	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Recent Qtr	TTM
Debt/Capital %	17.3	13.9	13.8	18.7	25.8	36.0	48.2	48.5	41.6	36.2	29.6	—
Equity/Assets %	52.5	54.7	55.4	52.1	45.9	37.2	35.0	32.0	35.7	39.3	42.5	—
Total Debt/EBITDA	0.4	0.5	0.5	0.7	1.4	1.6	2.2	1.7	1.3	1.0	0.8	—
EBITDA/Interest Expense	105.5	67.4	72.8	56.3	32.3	27.0	18.4	18.1	21.6	26.4	36.3	36.3

Morningstar Analyst Historical/Forecast Summary as of 27 Jul 2021

Financials

			Estimates		
Fiscal Year, ends 30 Jun	2020	2021	2022	2023	2024
Revenue (USD Bil)	143	168	194	218	245
Revenue Growth %	13.7	17.5	15.3	12.7	12.2
EBITDA (USD Bil)	71	88	100	113	129
EBITDA Margin %	49.7	52.2	51.6	51.7	52.5
Operating Income (USD Bil)	53	70	79	89	101
Operating Margin %	37.0	41.6	40.5	40.7	41.4
Net Income (USD Bil)	44	61	65	74	81
Net Margin %	31.0	36.1	33.8	33.8	33.2
Diluted Shares Outstanding (Mil)	7,682	7,608	7,548	7,488	7,423
Diluted Earnings Per Share(USD)	5.76	7.97	8.67	9.86	10.95
Dividends Per Share(USD)	2.04	2.24	2.44	2.64	2.84

Forward Valuation

			Estimates		
	2020	2021	2022	2023	2024
Price/Sales	10.8	12.1	11.4	10.1	9.0
Price/Earnings	35.3	34.0	33.8	29.7	26.7
Price/Cash Flow	34.1	36.3	31.2	27.3	24.3
Dividend Yield %	1.00	0.83	0.83	0.90	0.97
Price/Book	—	—	—	—	—
EV/EBITDA	20.8	22.6	21.4	18.9	16.6

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.

To assess the sustainability of excess profits, analysts perform ongoing assessments of the moat trend. A firm's moat trend is positive in cases where we think its sources of competitive advantage are growing stronger; stable where we don't anticipate changes to competitive advantages over the next several years; or negative when we see signs of deterioration.

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

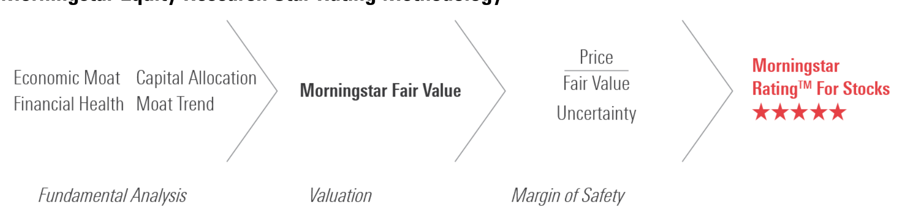
Once a company's marginal ROIC hits its cost of capital, we calculate a continuing value, using a standard perpetuity formula. At perpetuity, we assume that any growth or decline or investment in the business neither creates nor destroys value and that any new investment provides a return in line with 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 captures a range of likely potential intrinsic values for a company and uses it to assign the margin of safety required before investing, which in turn explicitly drives our stock star rating system. The Uncertainty Rating represents the analysts' ability to

Morningstar Equity Research Star Rating Methodology



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bound the estimated value of the shares in a company around the Fair Value Estimate, based on the characteristics of the business underlying the stock, including operating and financial leverage, sales sensitivity to the overall economy, product concentration, pricing power, exposure to material ESG risks, and other company-specific factors.

Analysts consider at least two scenarios in addition to their base case: a bull case and a bear case. Assumptions are chosen such that the analyst believes there is a 25% probability that the company will perform better than the bull case, and a 25% probability that the company will perform worse than the bear case. The distance between the bull and bear cases is an important indicator of the uncertainty underlying the fair value estimate. In cases where there is less than a 25% probability of an event, but where the event could result in a material decline in value, analysts may adjust the uncertainty rating to reflect the increased risk. Analysts may also make a fair value adjustment to reflect the impact of this event.

Our recommended margin of safety widens as our uncertainty of the estimated value of the equity increases. The more uncertain we are about the estimated value of the equity, 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 for our qualitative analysis 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

4. Market Price

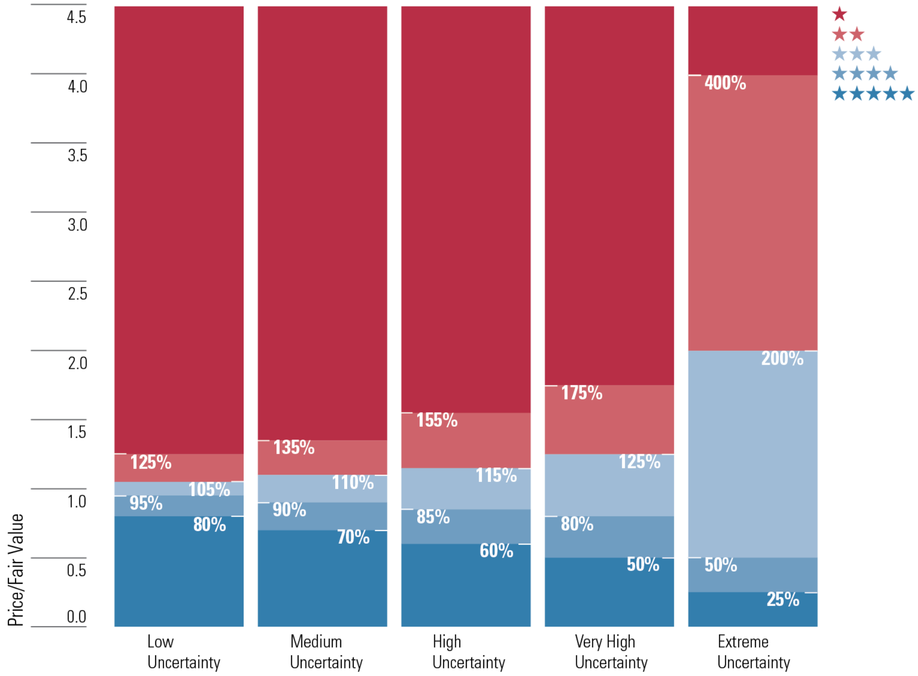
The market prices used in this analysis and noted in the report come from exchange on which the stock is listed which we believe is a reliable source.

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

Morningstar Star Rating for Stocks

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.

Morningstar Equity Research Star Rating Methodology



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 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: "Exem-

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plary", "Standard", or "Poor". Analysts judge Capital Allocation from an equity holder's perspective. Ratings are determined on a forward looking and absolute basis. The Standard rating is most common as most managers will exhibit neither exceptionally strong nor poor capital allocation.

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

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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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