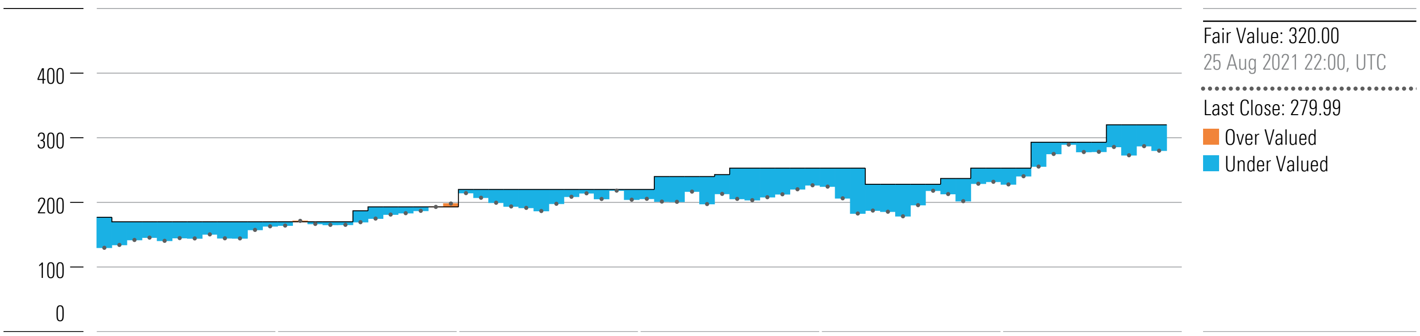
Morningstar Equity Analyst Report | Report as of 21 Nov 2021 19:20, UTC | Reporting Currency: USD | Trading Currency: USD | Exchange: NEW YORK STOCK EXCHANGE, INC. Page 1 of 24

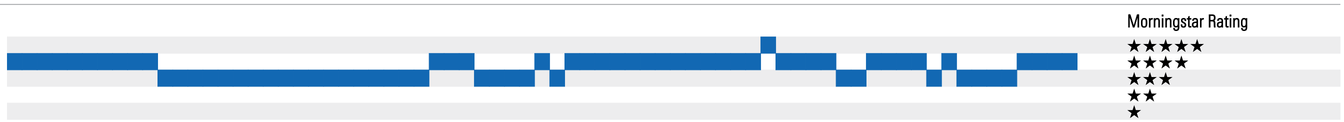
Berkshire Hathaway Inc Class B BRK.B ★★★★ 19 Nov 2021 23:25, UTC

Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Moat Trend™	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
279.99 USD 19 Nov 2021	320.00 USD 25 Aug 2021 22:00, UTC	0.87	627.43 USD Bil 19 Nov 2021	Wide	Stable	Medium	Standard	3 Nov 2021 05:00, UTC

Price vs. Fair Value



	2016	2017	2018	2019	2020	YTD	
	0.96	1.03	0.93	0.90	0.92	0.87	Price/Fair Value
	23.43	21.62	3.01	10.93	2.37	20.75	Total Return %



Total Return % as of 19 Nov 2021. Last Close as of 19 Nov 2021. Fair Value as of 25 Aug 2021 22:00, UTC.

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The primary analyst covering this company does not own its stock.

[1] The ESG Risk Rating Assessment is a representation of Sustainalytics' ESG Risk Rating.

Berkshire Once Again a Net Seller of Equities in Q3; Commits More to Repurchasing Own Shares

Analyst Note Greggory Warren, CFA, Sector Strategist, 16 Nov 2021

Wide-moat-rated Berkshire Hathaway had already reported a fairly mundane quarter from a trading perspective for its equity investment portfolio when the firm released third-quarter earnings, noting that the company had sold some $3.4 billion worth of stock while also acquiring a little over $1.4 billion of equities during the September quarter. Contrast that with the fact that the company bought back $7.6 billion worth of its own shares during the quarter.

Following the release of the insurer's 13-F filing, we see that the stock sales involved a few eliminations and a mixture of position trimmings in its healthcare, financial services, and communication services holdings. Within healthcare, Berkshire reduced its stake in Abbvie another 30% (selling 6.1 million shares) and also trimmed its stake in Bristol-Myers Squibb by 16% (selling 4.2 million shares), raising some $950 million from the trades. On top of that, the insurer eliminated its stake in Merck, as well as its holdings of Organon, which was spun-off by Merck during the June quarter, raising some $750 million from the transactions.

Within financial services, Berkshire reduced its stake in Marsh & McLennan another 35% (selling 1.5 million shares), and also trimmed its stakes in Visa, MasterCard, and U.S. Bancorp, raising some $550 million in proceeds from the trades.

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Sector
Financial Services

Industry
Insurance - Diversified

Business Description

Berkshire Hathaway is a holding company with a wide array of subsidiaries engaged in diverse activities. The firm's core business segment is insurance, run primarily through Geico, Berkshire Hathaway Reinsurance Group, and Berkshire Hathaway Primary Group. Berkshire has used the excess cash thrown off from these and its other operations over the years to acquire Burlington Northern Santa Fe (railroad), Berkshire Hathaway Energy (utilities and energy distributors), and the firms that make up its manufacturing, service, and retailing operations (which include five of Berkshire's largest noninsurance pretax earnings generators: Precision Castparts, Lubrizol, Clayton Homes, Marmon, and IMC/ISCAR). The conglomerate is unique in that it is run on a completely decentralized basis.

As for the communication services sector, the insurer eliminated its stake in Liberty Global, and reduced its stake in Charter Communications by nearly 20%, raising close to $800 million in the process.

As for the purchases, there were only three transactions during the quarter, with the insurer initiating new positions in Royalty Pharma and Floor & Décor--albeit smaller ones at around $500 million and $100 million, respectively, compared with $293.4 billion of total reportable holdings at the end of September. Berkshire also increased its stake in Chevron by 24%, making it a nearly $3 billion holding at the end of the third quarter.

Business Strategy & Outlook Greggory Warren, CFA, Sector Strategist, 25 Aug 2021

While 2020 was an extremely difficult year for Berkshire Hathaway, with a nearly 10% decline in operating earnings and a more than 40% decline in reported net earnings, the firm's overall positioning improved as the back half of the year progressed. Since the start of 2021, Berkshire has seen an even more marked improvement in its insurance investment portfolio as well as the operating results of its various subsidiaries. That said, we expect 2021 and 2022 to be relatively abnormal years, with strong results in the current year offset by weaker results next year as the company laps the exceptional levels of performance put up in 2021.

We continue to view Berkshire's decentralized business model, broad business diversification, high cash-generation capabilities, and unmatched balance sheet strength as true differentiators. While these advantages have been overshadowed by an ever-expanding cash balance--which is earning next to nothing in a near-zero interest-rate environment--we believe the company has finally hit a nexus where it is far more focused on reducing its cash hoard through stock and bond investments and share repurchases. During the past eight calendar quarters, the company has repurchased $40 billion worth of its common stock, eliminating around 7.5% of its total Class A equivalent shares outstanding, and it seems committed to matching our expectations for $5.5 billion in quarterly share repurchases on average during 2021-25.

The firm is starting the third quarter with an estimated $109 billion in dry powder, but valuations are still running a bit too high for many of the types of quality assets Berkshire would prefer to acquire. Therefore, we expect the bulk of its capital allocation (aside from ongoing capital expenditures) to be focused on stock and bond investments and share repurchases in the near term, with the former aimed at boosting the yield on Berkshire's investment portfolio and the latter focused on a continued return of capital to shareholders.

Bulls Say Greggory Warren, CFA, Sector Strategist, 25 Aug 2021

- Book value per share, which is a good proxy for measuring changes in Berkshire's intrinsic value, increased at an estimated 18.7% CAGR during 1965-2020, compared with a 10.2% return for the S&P

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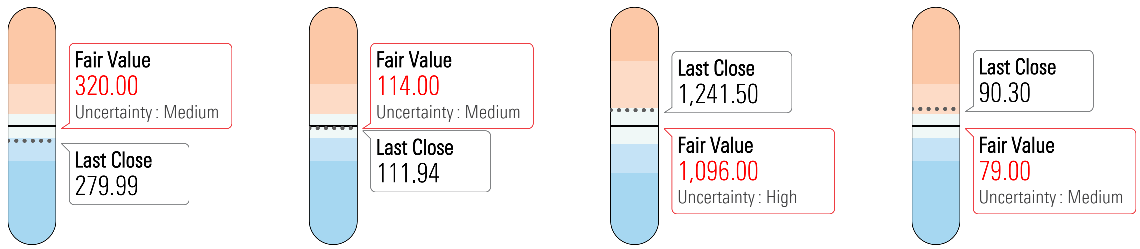
Competitors



	Berkshire Hathaway Inc Class B BRK.B	Allstate Corp ALL	Markel Corp MKL	Progressive Corp PGR
Economic Moat	Wide	None	None	Narrow
Moat Trend	Stable	Stable	Stable	Stable
Currency	USD	USD	USD	USD
Fair Value	320.00 25 Aug 2021 22:00, UTC	114.00 28 Jun 2021 21:50, UTC	1,096.00 25 Jun 2021 20:12, UTC	79.00 28 Jun 2021 21:42, UTC
1-Star Price	432.00	153.90	1,698.80	106.65
5-Star Price	224.00	79.80	657.60	55.30
Assessment	Under Valued 21 Nov 2021	Fairly Valued 21 Nov 2021	Over Valued 21 Nov 2021	Over Valued 21 Nov 2021
Morningstar Rating	★★★★19 Nov 2021 23:25, UTC	★★★19 Nov 2021 23:25, UTC	★★19 Nov 2021 23:25, UTC	★★19 Nov 2021 23:25, UTC
Analyst	Greggory Warren, Sector Strategist	Brett Horn, Senior Equity Analyst	Brett Horn, Senior Equity Analyst	Brett Horn, Senior Equity Analyst
Capital Allocation	Standard	Standard	Standard	Exemplary
Price/Fair Value	0.87	0.98	1.13	1.14
Price/Sales	1.85	0.66	1.38	1.14
Price/Book	1.32	1.30	1.26	2.92
Price/Earning	7.56	5.39	7.15	13.13
Dividend Yield	—	2.65%	—	5.43%
Market Cap	627.43 Bil	32.09 Bil	16.97 Bil	52.78 Bil
52-Week Range	221.26—295.65	99.92—140.00	942.44—1,343.56	84.89—107.59
Investment Style	Large Growth	Mid Value	Mid Growth	Large Value

500 TR Index.

- Berkshire's stock performance has generally been solid, increasing at a 13.0% (11.6%) CAGR during 2016-20 (2011-20), compared with a 15.2% (13.9%) average annual return for the S&P 500 TR Index.
- At the end of June, Berkshire had approximately $142 billion in insurance float. The cost of its float has been negative for much of the past decade.

Bears Say Greggory Warren, CFA, Sector Strategist, 25 Aug 2021

- Given its size, Berkshire's biggest long-term hurdle will be its ability to consistently find deals that not only add value but are large enough to be meaningful.
- Another big issue facing the firm is the longevity of chair and CEO Warren Buffett (who will turn 91 at the end of August) and managing partner Charlie Munger (who will be 98 in January 2022).
- Berkshire's insurance business faces competitive and highly cyclical markets that occasionally produce large losses, and several of its noninsurance operations are economically sensitive and focused on U.S. markets.

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Economic Moat Greggory Warren, CFA, Sector Strategist, 25 Aug 2021

Berkshire's wide economic moat is more than just a sum of its parts, although the parts that make up the whole are fairly moaty in their own regard. The insurance operations--Geico, Berkshire Hathaway Reinsurance Group, and Berkshire Hathaway Primary Group--remain important contributors to the overall business. Not only do they account for around one fourth of Berkshire's pretax earnings (and close to 45% of our current valuation of the firm because the insurance operations are overcapitalized and maintain a larger-than-normal equity investment portfolio for a property and casualty insurer), but they also generate low-cost float. These temporary cash holdings, which arise from premiums being collected in advance of future claims, have allowed Berkshire to generate additional returns as the company has invested these funds in assets that are commensurate with the duration of the business that is being underwritten. They have tended to come at little to no cost to Berkshire, given the company's proclivity for generating underwriting gains the past several decades.

That said, we don't believe the insurance industry is particularly conducive to the development of sustainable competitive advantages. While there are some high-quality companies in the industry (with Berkshire having some of the best operators in the segments where it competes), the product that insurers sell is basically a commodity, with excess returns difficult to achieve on a consistent basis. Buyers of insurance are not inclined to pay a premium for brands, and the products themselves are easily replicable. Competition among insurance firms is fierce, and participants have been known to slash prices or undercut competitors to gain market share. Insurance is also one of the few industries where the cost of goods sold (signified by claims) may not be known for years, providing an incentive for companies to sacrifice long-term profitability in favor of near-term growth. In reinsurance, this dynamic can be even more pronounced, as losses in this business tend to be large in nature and may not be realized for years after a policy is written. However, insurers can develop sustainable cost advantages by either focusing on less commodified areas of the market or developing efficient and/or scalable distribution platforms. What they can't do is gain a sustainable competitive advantage through investing, even when gains are the result of the investing prowess of someone like Warren Buffett. We believe insurers that consistently achieve positive underwriting profitability are better bets in the long run, as insurance profitability tends to be more sustainable than investment income.

Given the continued growth of its auto insurance operations, Geico has become one of the largest generators of earned premiums for Berkshire. The auto insurer has made strides with its direct-selling operations, moving from its position as the seventh-largest U.S. private passenger auto insurance underwriter two decades ago (with less than 5% market share) to the second-largest at the end of 2020, responsible for 13.5% of written premiums last year, compared with the industry leader State Farm at 16.2%. Much like its closest competitor, Progressive (which generated 13.3% of written premiums during 2020), Geico has set itself apart by its scale in the direct-response channel. While scaling is typically difficult for insurance companies, personal line insurers like Geico and Progressive have done a better job of spreading fixed costs over a wider base, as their business models do not require as much human capital and specialized underwriters as other insurance lines. Given the similarity in their auto insurance operations, with both firms at the forefront of the shift into non-agent-derived business, as well as the level of each insurer's underwriting profitability the past decade (with Geico producing an average annual combined ratio, including the impact of hurricanes and other natural disasters, of 95.6% during 2011-20 compared with Progressive at 95.6% with its direct operations and 95.0% for all of its personal auto lines), we believe that Geico, much like Progressive, has a narrow economic moat.

With regard to Berkshire's reinsurance arm, we believe that BHRG has a narrow economic moat at best. For a premium, reinsurers assume all or part of an insurance or reinsurance policy written by another insurer. While any insurance company can provide reinsurance, a handful of larger companies--Munich Re, Swiss Re, Berkshire Hathaway, Hannover Re, and Scor--hold sway over the lion's share of global premiums written. The policies underwritten by these reinsurers often times contain large long-tail risks that when priced appropriately can generate favorable long-term returns. That said, reinsurers compete almost exclusively on price and capital strength, making it almost impossible to build structural cost advantages. Losses in the reinsurance market are also lumpy and may not be realized for years after a policy is written, magnifying the importance of disciplined and accurate underwriting. While Berkshire believes its catastrophe and supercatastrophe underwriting can generate solid long-term results, the volatility of these business lines, which have the potential to subject the firm to especially large losses, tends to be high.

Although we don't normally view reinsurers as benefiting from favorable competitive positions, there are some specialty lines where a long history of underwriting incidence and/or unique relationships have allowed a firm to build a sustainable competitive advantage. We believe Berkshire's reinsurance operations are unique. The company's overall balance sheet strength makes it capable of taking on large amounts of supercatastrophe underwriting (covering events like terrorism and natural catastrophes) that few companies have the capacity to endure. It has also historically had the luxury of walking away from business when appropriate premiums cannot be obtained, something its publicly traded peers cannot always do. While underwriting profitability has been less consistent because of the nature of the risks BHRG is underwriting, the company sticks with reinsurance, even if it proves to be unprofitable from time to time, because it generates float that can be invested for longer periods of time than short-tail business lines like auto insurance.

BHPG has been Berkshire's most profitable insurance business in the past two decades, and we believe the segment has developed a narrow economic moat. What is all the more remarkable about this is that BHPG is a conglomeration of several insurance operations, including National Indemnity's primary group, Berkshire Hathaway Homestate Companies, Berkshire Hathaway Specialty Insurance, Medical

Protective Co., U.S. Investment Corp., and Berkshire Hathaway Guard Insurance. These entities offer commercial insurance coverage as varied as healthcare malpractice, workers' compensation, automobile, general liability, property, and various specialty coverages for small, medium, and large clients. By focusing more on specialty lines that require extensive experience or unique relationships to underwrite effectively, BHPG has been able to put together a continuous record of solid earned premium growth and underwriting profitability, which is a rarity in the insurance business; most P&C insurers are willing to take underwriting losses from time to time in order to generate earned premium growth, believing that they can make up the difference with investment gains.

Like most P&C insurers, Berkshire faces the risk that claims from any one of its insurance businesses exceed the amount reserved, or that material asset impairments or market declines affect the contribution provided by its investment portfolio. From an environmental, social, and governance perspective, commercial insurers that underwrite industries with a high level of ESG risk could draw criticism and lead to lost revenue if the situation becomes unsustainable. Insurers can also draw criticism over the extent to which they incorporate ESG into their investment decisions. Exposure to cybersecurity and data privacy risks is also high for insurers, given the amount of sensitive data they store. Reinsurers face greater exposure to human capital-related risks than other segments of the industry, reflecting the need for more specialized skill sets, including calculating natural disaster risks. But we view all of these issues as being relatively minor, with operational and investment practices being relatively easy for most of the larger insurance companies to tackle. In our view, the biggest ESG issue for P&C insurers is climate change. Insurers typically cover weather-related losses, and climate change is likely to increase the frequency and severity of extreme weather events. Profitability could be significantly impaired if P&C insurers do not recognize these risks and adjust their underwriting practices accordingly. The same holds for pandemic-related legal issues that we've seen crop up over the past year or so, which could materially decrease the level of certainty we have around the underwriting profitability of affected firms.

Of the more than 70 noninsurance businesses that make up Berkshire's remaining subsidiaries, Burlington Northern Santa Fe and Berkshire Hathaway Energy are usually lumped together under the railroad, utilities, and energy segment in Berkshire's financial statements. While their contribution to pretax earnings and our own fair value estimate for the firm is now overshadowed by the manufacturing, service, and retailing segment, they are far more transparent than the company's other operating segments. On a combined basis, BNSF and BHE generate more than a third of Berkshire's pretax earnings on average and contribute more than 25% to our estimate of the company's overall fair value. The most interesting thing about these two businesses is that neither one was a major contributor to Berkshire's pretax earnings just over a decade ago. Buffett's shift into such debt-heavy capital-intensive businesses as railroads and utilities represented a marked departure from many of

Berkshire's other acquisitions over the years, which tended to require less ongoing capital investment, had little to no debt, and produced higher returns on average. That said, had Buffett focused more on buying asset-light companies with fewer capital investment needs, this would have left his successors with even greater amounts of cash to have to reinvest annually in the long run. During 2016-20, the firm generated an average of $22.7 billion annually in free cash flow. The amount of excess cash Buffett would have needed to find a home for would have been meaningfully higher had Berkshire purchased similar-size companies to BNSF and BHE with similar cash flow profiles that were not investing close to $10 billion annually in their combined property and equipment.

With BNSF, which was acquired in full in February 2010, Berkshire picked up a Class I railroad operator--an industry designation for a large operator with an extensive system of interconnected rails, yards, terminals, and expansive fleets of motive power and rolling stock. We believe that all of the major North American Class I railroads benefit from colossal barriers to entry due to their established, practically impossible-to-replicate networks of rights of way and continuously welded steel rail. While barges, ships, aircraft, and trucks also haul freight, railroads are by far the lowest-cost option when no waterway connects the origin and destination, especially for freight with low value per unit weight. Customers have few choices and thus wield limited buyer power, with most Class I railroads operating as duopolies (and some being a monopoly supplier) to end clients in many markets. This provides the major North American Class I railroads with efficient scale. Believing that operators like BNSF will continue to leverage their competitive advantages of low cost and efficient scale to generate returns on invested capital in excess of their cost of capital, we have awarded them wide moat ratings.

In terms of ESG-related risks, the rail industry faces concerns about greenhouse gas emissions, safety, and corporate sustainability. The transportation sector is generally viewed as being a significant contributor to greenhouse gas emissions, with the rail industry itself (despite nearly all of the North American fleet running on diesel-powered locomotives) tending to present itself as a lower-emission alternative to other forms of transportation. BNSF is also one of the larger carriers of coal for coal-fired furnaces and electrical generation units, opening up another avenue for criticism on the carbon emission front. Rail safety is one of the more significant and obvious social risks that has been prioritized by governments and railroads, with most firms now looking to technology to improve how operators identify and manage transportation hazards (like derailments and hazardous material spills), the risks at railway crossings (thereby reducing incidents of injuries and fatalities), and potential intrusions (allowing train operators to know of issues long before they arrive at a point in the rail line). The North American railroads have embraced public reporting on safety standards and sustainability issues. While reporting is an important attribute with regard to sustainability, it is only one aspect when it comes to mitigating ESG risks, which may require broader and more cohesive regulation, combined with more robust reporting and accountability on the part of the railroads. Additionally, most of the workforce at BNSF is unionized, with the firm being party to collective bargaining agreements. Although the railroad has managed this process well, it nonetheless creates risk in terms of future contract negotiations and related potential for higher labor costs.

We think Berkshire Hathaway Energy overall is endowed with a narrow economic moat. Buffett built up this business through investments in MidAmerican Energy (supplanting a 76% equity stake taken in 2000 with additional purchases that have raised Berkshire's interest to 91.1%), PacifiCorp (acquired in full in 2005), NV Energy (acquired in full in 2013), and AltaLink (acquired in full in 2014). While BHE has picked up pipeline assets, which have wide-moat characteristics, the majority of its revenue, profitability, and ongoing capital investment continues to be driven by its three main regulated utilities: MidAmerican Energy, PacifiCorp, and NV Energy. We think that regulated utilities cannot establish more than a narrow moat around their businesses, even with their difficult-to-replicate networks of power generation, transmission, and distribution, because their rates and returns are set by state and federal regulators. That said, we believe that BHE has benefited greatly from being part of Berkshire's larger consolidated tax return, as well as from not having to pay a dividend to the parent company (most of its publicly traded peers pay out as much as 60% of earnings as dividends annually). This has allowed the firm to invest far more capital (upward of $35 billion over the past two decades) in renewables than it would have been able to on a stand-alone basis, allowing it to shut down a lot of its coal-fired plants, which accounted for 33% of per generation during 2020 compared with 74% during 2006 when BHE closed its purchase of PacifiCorp.

From an ESG perspective, given its relatively large coal and natural gas generation capacity (accounting for 33% and 30% of 2020 owned power generation, respectively), BHE has a high carbon risk rating and has risk exposure to controversies over water use and community relations. That said, it does generate 37% (48%) of its power from owned (owned and contracted) renewable and noncarbon sources. The company has tended to be ahead of state regulators, many of whom have embraced tighter policies on carbon emissions and greater restrictions on coal generation, addressing the risk through its base capital investment program, coal plant retirements, and the addition of renewable generation assets. Through fuel switching and retirements, BHE expects to eliminate approximately 7,800 megawatts of coal generation by the end of 2042, with 100% of NV Energy's and PacifiCorp's coal generation facilities retired by the end of 2025 and 2042, respectively. While BHE has not declared a net-zero emissions target, it has already seen a nearly 40% decline in carbon emissions over the past 15 years, with management recently noting that it will have reduced emissions 50% below 2005 levels by 2030. Around a third of BHE's workforce is unionized, with the firm being party to collective bargaining agreements. Although the utility has managed this process well, it nonetheless creates risk in terms of future contract negotiations and related potential for higher labor costs.

Berkshire's manufacturing, service, and retailing operations are now one of the largest contributors to

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pretax earnings, following the folding of the old finance and financial products segment into the MSR unit. Given these operations' lack of full transparency, getting a handle on the profitability and economic moats of the wide array of businesses operating in several industries is difficult at best. Unlike BNSF and BHE, both of which file quarterly and annual reports with the Securities and Exchange Commission, there is little financial information available on the firms operating in this segment. That said, given Buffett's penchant for acquiring companies that have consistent earnings power, generate above-average returns on capital, hold little debt, and are run by solid management teams, we believe that the vast majority of the businesses in the segment are collectively endowed with a narrow economic moat. During 2020, the five largest companies (on a pretax earnings basis) in the MSR segment--Precision Castparts, Lubrizol, Clayton Homes, Marmon, and IMC/ISCAR--accounted for around half of the pretax earnings produced by the division. Each of these subsidiaries, by our estimates, has a fairly solid narrow moat around its operations. When combined with the next five largest subsidiaries--Shaw Industries, Forest River, Johns Manville, TTI, and MiTek--the 10 subsidiaries accounted for around 70% of the MSR segment's pretax earnings during 2020, with a moat rating overall that skews to the narrow end of the spectrum.

In terms of ESG-related risks, we focus on the five largest subsidiaries in the MSR segment. Precision Castparts, which manufactures metal components and products for the aerospace and defense industries, is generally considered high risk from an ESG perspective, given its concentration in highly regulated markets and the resulting regulatory scrutiny. The company is exposed to the issue of product governance, as products are typically required to meet strict quality, safety, and reliability standards, as well as concerns about the carbon impact of air travel. The company's disclosure has generally been poor, lacking policies and programs to manage risks related to its material ESG issues, even though it has been involved in a moderate level of ESG-related controversies. The same could be said for Lubrizol, which develops and produces specialty chemical additives for automotive and industrial lubricants, an industry that is generally considered medium/high risk from an ESG perspective due to ongoing events related to emissions, effluents, and waste. The chemical industry has the second-highest exposure to environmental and social impact of products and services risks. Clayton Homes, which is in the manufactured housing subset of the homebuilders industry, tends to have slightly higher ESG risk exposure than most in the industry (where the ESG risk rating tends to be in a low to negligible range) because it also offers home financing and has been accused in the past of predatory sales practices, exorbitant fees, and interest rates well above the industry norm.

With Marmon being a broadly diversified industrial organization comprising 11 diverse business sectors with more than 100 independent manufacturing and service businesses, its ESG exposure generally falls in the risks associated with diversified industrials. Although high exposure across multiple issues is one reason for the high level of unmanaged risk among industrial conglomerates like Marmon, weak management of these risks also tends to be a contributor, given that conglomerates face challenges in terms of applying suitable management systems across the entire company due to the diverse nature of the products and services they offer. As for IMC/ISCAR, which manufactures consumable precision carbide metal cutting tools, the company is exposed to the issue of product governance, as products are typically required to meet strict quality, safety, and reliability standards, as well as workplace safety concerns. A combination of medium to high exposure scores and the assumption of weak management of these risks (given the opaqueness of most of the firms in Berkshire's MSR segment) leaves these operations more exposed to ESG-related issues.

With Buffett preferring to run Berkshire on a decentralized basis, the managers of the company's operating subsidiaries are empowered to make their own business decisions. In most cases, the managers running Berkshire's subsidiaries are the same individuals who sold their firms to Buffett, leaving them with a vested interest in the businesses they run. Barring a truly disruptive event in their industries, we expect these firms to continue to have the same advantages that attracted Buffett to them in the first place. That does not mean that there won't be subsidiaries whose competitive advantages diminish over time (exemplified by the demise of the textile manufacturer that Berkshire Hathaway derives its own name from). It's just that the large collection of moaty firms that reside in Berkshire's MSR operations is more likely to maintain a narrow economic moat in aggregate, even as a few firms along the way succumb to changing competitive dynamics in their industries. That said, the decentralization in Berkshire's operations (on top of a less-than-adequate level of transparency about many of its operating companies) does leave the firm exposed to more ESG-related risks. Overall management is generally weak at diversified conglomerates like Berkshire, because firms that have been constructed this way tend to face challenges in terms of applying suitable systems for managing their ESG risks across the entire company, especially given (in Berkshire's case more than any other conglomerate) the diverse nature of the products and services they offer.

Fair Value and Profit Drivers Greggory Warren, CFA, Sector Strategist, 25 Aug 2021

We've increased our fair value estimate to $320 per Class B share from $293 after updating our near- to medium-term forecasts for Berkshire's various operations. Our fair value estimate is equivalent to 1.42, 1.31, and 1.35 times our estimates for Berkshire's book value per share at the end of 2021, 2022, and 2023, respectively. For some perspective, during the past 5 (10) years, the shares have traded at an average of 1.43 (1.41) times trailing calendar year-end book value per share. We use a 9.0% cost of equity and a 26% U.S. federal statutory tax rate in our valuation.

Our valuation for Berkshire is derived using a sum-of-the-parts methodology, valuing each of the major parts of the company's operations separately and then adding them together for the total estimate. As part of this process, we've increased our valuation of Berkshire's insurance operations to $141 per Class B share (from $125) due to the performance of the equity portfolio since our last update as well as improved expectations for earned premium growth (9.0% on average annually during 2021-25) and underwriting profitability (a combined ratio of 98.1% on average annually). During 2016-20 (2011-20), earned premiums grew at an average annual rate of 9.0% (7.5%), with the operations maintaining a combined ratio of 99.0% (97.0%) on average.

Our valuation of the company's railroad operations increased to $54 per Class B share (from $51) as we now expect unit volume to increase at a 4.2% CAGR during 2021-25, with freight revenue expanding 5.6% on average annually and the operating ratio falling below 60% by the end of 2025. Our valuation of Berkshire's utilities and energy division increased to $29 per Class B share (from $26) on continued constructive rate case outcomes and the addition of Dominion GT&S to BHE's pipeline operations.

We estimate Berkshire's manufacturing, service, and retail operations are worth $96 per Class B share (up from $91). Our forecast assumes average annual revenue growth of 4.3% during 2021-25 (with much of that front-end-loaded) and pretax operating margins of 9.2% on average annually, a step up from what we've seen historically as the unit benefits from restructuring and cost-cutting initiatives.

Risk and Uncertainty Greggory Warren, CFA, Sector Strategist, 25 Aug 2021

Our uncertainty rating for Berkshire is medium. We don't consider any environmental, social, or governance issues at the firm to be material enough to affect our uncertainty rating, mainly because of the firm's lower exposure to some of the main ESG risks inherent to the industries where it competes. However, Berkshire has generally scored lower on governance issues because of the makeup of its board and board committees, the unequal voting structure of its shares, and the lack of engagement and opaqueness historically on governance issues.

Berkshire faces the risk that insurance claims exceed loss reserves or that material impairments affect its investment portfolio. Several of the firm's key businesses--insurance, energy generation and distribution, and rail transport--operate in industries that are subject to higher degrees of regulatory oversight, which could affect future business combinations, as well as the setting of rates charged to customers. Many of the company's noninsurance operations are exposed to the cyclicality of the economy, with results suffering during economic slowdowns.

Berkshire is exposed to foreign currency, equity price, and credit default risk through its various investments and operating companies. Its derivative contracts could affect the firm's earnings and capital position, especially during more volatile markets, as they are recorded at fair value and updated periodically to reflect any changes in value. These contracts started expiring in 2019 and will continue to do so until 2025.

Berkshire depends on two key employees, Warren Buffett and Charlie Munger, for almost all of its investment and capital-allocation decisions. With Buffett turning 91 in August 2021 and Munger turning

98 in January 2022, it is increasingly likely that our valuation horizon will exceed their life spans, with the quality of investment returns and capital allocation being affected.

Capital Allocation Greggory Warren, CFA, Sector Strategist, 25 Aug 2021

Warren Buffett has been chair and CEO of Berkshire Hathaway since 1970. Charlie Munger has served as vice chairman since 1978. Berkshire has two classes of common stock, with Class B shares holding 1/1,500th of the economic rights of Class A shares and 1/10,000th of the voting rights. Buffett is Berkshire's largest shareholder, with a 31.5% voting stake and a 15.8% economic interest at the end of June.

Our capital allocation rating for Berkshire is Standard. This rating focuses on the three key areas where we strive to assess management efficacy: balance sheet strength and capital adequacy, investment efficacy, and shareholder distributions. In our opinion, Berkshire’s balance sheet is sound (with the insurer's liquid investments generally exceeding regulatory benchmarks by more than 2 times), capital investment decisions are fair (with credit for investing in more competitively advantaged businesses and staying disciplined with its underwriting and investment options, offset by a stubbornness about adopting technology to enhance risk assessment and improve operations), and the current capital return strategy is appropriate, although this would be lowered if the firm pared back share repurchases from the pace we've seen the past year or so, given that it does not pay a dividend.

Buffett has consistently aligned his own interests with those of shareholders, with Berkshire's wide economic moat derived in part from the success he has had melding the firm's financial strength and underwriting ability with his own investment acumen. However, we think the firm has stagnated some the past 5-10 years as annual returns on book value, while exceeding the company's cost of capital, have drifted below the returns of the S&P 500 TR Index (which had been Buffett's preferred benchmark for performance). For much of the past decade, Berkshire has struggled to find enough suitable investments to keep its cash balances--which hit a near record $144 billion at the end of June 2021--from expanding, with the returns on those cash balances being meagre in a historically low-interest-rate environment. Meanwhile, several of its larger investments--such as the Kraft Foods merger with Heinz (2014-15), the Precision Castparts acquisition (2015-16), taking 10% equity stakes in each of the four major U.S.-based airlines (2016-20), and supplying Occidental Petroleum with $10 billion to help fund that firm's unsolicited bid for Anadarko Petroleum (2019-20)--have not fully lived up to management's expectations.

Even though Buffett has more recently discouraged investors from focusing on book value per share growth, we still view it as a valuable gauge for assessing changes in intrinsic value--that is, until such time that Berkshire is buying back a ton of its own common stock. Absent share repurchases, we would expect the firm to increase book value per share at a high-single- to low-double-digit rate--comfortably above its cost of capital--in most years. With all of the company's operating businesses managed on a decentralized basis, eliminating the need for layers of management control and pushing responsibility for each business down to the subsidiary level, Buffett has historically been focused on managing the firm's investments and capital-allocation decisions (basically being a capital allocator in chief). If the firm's next CEO is expected to do nothing more than act as a caretaker for the business, tending to the needs of the managers of the different subsidiaries, overseeing the actions of the investment managers handling the company's investment portfolio, and dealing with the capital-allocation and risk assessments that need to be made along the way, then we could not think of a better candidate than Greg Abel, who was announced as the heir apparent following this year's annual meeting.

Once there is a shift in top management, we would expect Berkshire to be more open to initiating a dividend, as well as potentially accelerating the return of capital to shareholders via share repurchases. Over the past eight calendar quarters, the company has repurchased $40 billion worth of its common stock, equivalent to just over $5 billion per quarter on average. We expect a similar pace of repurchase activity during 2021-25. With the firm closing the second quarter of 2021 with what we estimate is around $109 billion in dry powder, and valuations still running a bit too high for many of the types of quality assets Buffett would prefer to acquire, we expect the bulk of the company's excess capital allocation to be focused on stock and bond investments and share repurchases in the near to medium term.

Analyst Notes Archive

Catastrophe Losses and Fewer Investment Gains Impact Berkshire's 3Q Results; No Change to FVE

Greggory Warren, CFA, Sector Strategist, 6 Nov 2021

With wide-moat-rated Berkshire Hathaway reporting third-quarter (year-to-date) results that were in line with our expectations, we are leaving our $480,000 ($320) per Class A (B) share fair value estimate in place. Third-quarter (year-to-date) revenue, which includes both realized and unrealized gains/losses from Berkshire's investments and derivatives portfolios, declined 20.2% (increased 32.8%) to $75.5 ($242.3) billion from $94.6 ($182.5) billion in the prior year's period(s), on a marked decrease (increase) in investment gains year over year. Excluding the impact of investment and derivative gains/losses and other adjustments, third-quarter (year-to-date) operating revenue increased 12.0% (12.8%) to $70.6 ($204.3) billion.

Operating earnings, exclusive of the impact of investment and derivative gains/losses, increased 18.0% (19.3%) year over year to $6.5 ($20.2) billion during the September quarter (first nine months) of 2021, even with the insurance operations posting a net underwriting loss for the third quarter (due to losses incurred from Hurricane Ida and flooding in Europe). When including the impact of the investment and derivative gains/losses, operating earnings decreased 65.7% (increased 650.1%) to $10.3 ($50.1) billion

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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]
279.99 USD 19 Nov 2021	320.00 USD 25 Aug 2021 22:00, UTC	0.87	627.43 USD Bil 19 Nov 2021	Wide	Stable	Medium	Standard	3 Nov 2021 05:00, UTC

$30.1 ($6.7) billion in the prior year's period(s).

Book value per share (by our estimates) increased 1.7% sequentially to $316,443 (from $311,145 at the end of June), below our forecast of $322,354 (which did not include as much in catastrophe losses as Berkshire incurred during the September quarter). The company closed out the third quarter with $149.2 billion in cash and cash equivalents, up from $138.3 billion at the end of last year, despite buying back $20.2 billion worth of Berkshire's stock during the first nine months of the 2021. By our calculations, Berkshire came into the fourth quarter with around $113 billion in dry powder (excess cash) on hand that could be committed to investments, acquisitions, and share repurchases.

Strong Investment Performance and Operating Results Leave Berkshire Hathaway Well Positioned
Greggory Warren, CFA, Sector Strategist, 25 Aug 2021

We've increased our fair value estimate for wide-moat-rated Berkshire Hathaway to $480,000 per Class A share from $440,000 and $320 per Class B share from $293 after updating our near- to medium-term forecasts for the firm's various operations. We use a 9.0% cost of equity in our valuation, which assumes an increase in the company's U.S. federal statutory tax rate to 26%, from 21% currently. Our fair value estimate is equivalent to 1.42, 1.31, and 1.35 times our estimated book value per share for Berkshire at the end of 2021, 2022, and 2023, respectively. For some perspective, during the past 5 and 10 years, the shares have traded at an average of 1.43 and 1.41 times trailing calendar year-end book value per share. We expect book value to grow at a 15%-20% rate this year (it expanded 26.6% year over year during the first half) and increase at a mid- to high-single-digit rate in 2022. Having forecast a year with an equity market correction, which will affect the contribution from Berkshire's insurance investment portfolio, as well as larger-than-normal catastrophe losses, which will require an increase in loss reserves, we see book value per share declining by the midsingle digits in 2023. The firm is starting the third quarter with an estimated $109 billion in dry powder, but valuations are still running a bit too high for many of the types of quality assets Berkshire would prefer to acquire. Therefore, we expect the bulk of the firm's capital allocation, aside from ongoing capital expenditures, to be focused on stock and bond investments and share repurchases in the near term--with Berkshire's common stock continuing to be the company's best investment option in the near term, in our view.

Berkshire Once Again a Net Seller of Equities in Q2; Apple Remains Top Stock Holding Greggory Warren, CFA, Sector Strategist, 17 Aug 2021

Wide-moat-rated Berkshire Hathaway had a fairly quiet second quarter in its equity investment portfolio, selling some $2.1 billion worth of stock while also acquiring a little over $1 billion of equities. Based on the insurer's recent 13-F filing, Berkshire trimmed positions in US Bancorp and Chevron, and sold off more than 10% of the investment portfolio's stakes in Abbvie (selling 2.3 million shares or 10.2% of its holdings), General Motors (7.0 million shares or 10.4% of its holdings), Bristol-Myers Squibb (4.7 million shares or 15.3% of its holdings), and Marsh & McLennan (1.1 million shares or 20.6% of its

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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]
279.99 USD 19 Nov 2021	320.00 USD 25 Aug 2021 22:00, UTC	0.87	627.43 USD Bil 19 Nov 2021	Wide	Stable	Medium	Standard	3 Nov 2021 05:00, UTC

holdings). Berkshire also disposed of meaningful amounts of Merck (8.7 million shares, or 48.8% of its holdings) and Liberty Global Cl C shares (5.5 million shares, or 74.5% of its holdings), while completely eliminating the firm's holdings in Liberty Global Cl A, Biogen, and Axalta Coating Systems.

As for the purchases, almost all of them involved existing holdings as Berkshire added to stakes in Kroger (picking up 10.7 million shares and increasing its position by 21.0%), Aon (around 300,000 shares and increasing its position by 7.3%), and Restoration Hardware (35,500 shares for a 2.0% increase in the company's holdings). Berkshire also disclosed a new investment during the quarter in Organon (some 1.65 million shares), which was spun-off by Merck during the second quarter. Berkshire had originated stakes in the pharmaceuticals--AbbVie, Biogen, Bristol Myers Squibb and Merck--as well as the insurance brokers-- Marsh & McLennan and Aon--in just the past year and a half, but many of these stocks have seen marked gains in just the past few quarters, allowing the insurer's main managers of many of these smaller holdings (relative to the portfolio overall)--CEO Warren Buffett's two lieutenants Todd Combs and Ted Weschler--to take some profit off the table. Even so, the firm ended the second quarter with $293.0 billion of reportable equity holdings.

Berkshire Hathaway Bounces Back in First Half on Solid Operating and Investment Results Greggory Warren, CFA, Sector Strategist, 7 Aug 2021

With wide-moat-rated Berkshire Hathaway reporting stronger second-quarter (first-half) results than we had forecast, we are likely to reassess our $440,000 ($293) per Class A (B) share fair value estimate in the near term. That said, the outcome will be driven by our ability to discern the lasting impacts that the coronavirus pandemic could have on Berkshire's operating subsidiaries, especially with regards to the insurance and manufacturing, service, and retail operations.

Second-quarter (first-half) revenue, which includes unrealized and realized gains/losses from Berkshire's investments and derivatives portfolios, declined slightly (increased significantly) to $96.5 ($166.8) billion from negative $96.9 ($87.9) billion in the prior year's period. Excluding the impact of investment and derivative gains/losses and other adjustments, second-quarter (first-half) operating revenue increased 21.6% (13.2%) to $69.1 ($133.7) billion. Operating earnings, exclusive of the impact of investment and derivative gains/losses, increased 21.3% (20.0%) year over year to $6.7 ($13.7) billion during the June quarter (first half). When including the impact of the investment and derivative gains/losses, operating earnings increased 6.8% (and quite significantly) to $28.1 ($39.8) billion (from negative $23.4 billion in the prior year's period).

Book value per share (by our estimates) increased 6.5% sequentially to $311,145 (from $292,175 at the end of March), above our forecast of $298,019 on the backs of both strong investment and operating performance. The company closed out the June quarter with $144.1 billion in cash and cash equivalents, up from $138.3 billion at the end of last year, despite buying back $12.6 billion worth of Berkshire's stock during the first six months of the 2021. By our calculations, Berkshire came into the third quarter with $109.0 billion in dry powder (excess cash) on hand that could be committed to investments, acquisitions, and share repurchases.

Berkshire Once Again a Net Seller of Equities in Q1; Apple Remains Top Stock Holding Greggory Warren, CFA, Sector Strategist, 18 May 2021

Wide-moat rated Berkshire Hathaway has been fairly quiet about its gradual exiting of its long-held stake in Wells Fargo, having sold off another 51.7 million shares (for an estimated $1.8 billion) during the March quarter. This marked the fourth straight quarter of meaningful sales of shares of the bank, which at one time had been a prized holding--a stake CEO Warren Buffett even tried several times over the years to increase above the 10% bank ownership limit for non-bank entities. At this point, it looks like Bank of America, which has not been mired in the scandals that have plagued Wells Fargo, will be at the forefront of Berkshire's bank holdings, accounting for 14.5% of the insurer's $270.4 billion 13-F portfolio at the end of March. In just the past year, Berkshire has either winnowed down or eliminated stakes in Wells Fargo, JPMorgan Chase, PNC Financial, M&T Bank, US Bancorp, and Bank of New York Mellon, all while adding to its stake in Bank of America. Even so, Apple remains Berkshire's top holding, accounting for 40.1% of the portfolio at the end of the first quarter.

The insurer was a net seller of equities during the March quarter, raising an estimated $7.7 billion from its sales of shares of Chevron, Wells Fargo, Merck, Synchrony Financial, Liberty Global, AbbVie, Axalta, General Motors, Suncor Energy, StoneCo, Bristol-Myers Squibb, US Bancorp, and Sirius XM Radio. Most of these sales were enacted on stocks that have appreciated strongly the past several quarters. In the case of Synchrony Financial and Suncor, Berkshire completely exited its stakes. As for Wells Fargo, the insurer still held close to 0.7 million shares at the end of March, but we expect that to be eliminated in the near term. Berkshire used an estimated $2.3 billion of its sales proceeds during the first quarter to put new money to work in Aon, add meaningfully to stakes in Kroger and Marsh & McLennan, and increase its stakes in Verizon Communications and Restoration Hardware.

Berkshire Naming Buffett's Successor Is a Net Positive for the Company and Its Shares Greggory Warren, CFA, Sector Strategist, 3 May 2021

We were a little surprised to see wide-moat rated Berkshire Hathaway actually announce today that Greg Abel would be CEO Warren Buffett's successor once he departs the scene. The surprise, though, was in the timing of the announcement (which apparently was forced by a slip-up on Charlie Munger's part during the annual meeting this past weekend) as opposed to the announcement itself, both of which have had a positive impact on the stock, as it removes one of the major uncertainties hanging over the company.

We have long believed that Abel was the most likely successor to Buffett, given his age (59)--which satisfies Buffett's criterion that the company's next "CEO should be relatively young, so that he or she can have a long run in the job"--and his combination of both operational and capital allocation experience during his years at Berkshire Hathaway Energy. With the company's next CEO expected to fill the role of capital-allocator-in-chief, there were two strong candidates in line to take the top job (at least from the time they've spent with the company and their understanding of what Buffett wants the next capital-allocator-in-chief to do): Ajit Jain, who oversees all of Berkshire's insurance operations, and Abel, who has stewardship of the noninsurance businesses.

While we've always thought that Buffett and the board had some deference toward Jain; he's closer to 70 and has not shown much interest in following in Buffett's footsteps (given the pressures of being in that spot once Buffet departs). We've always thought that Berkshire would likely be better served longer term by having Jain to continue to oversee the insurance business (which is really where his passion lies) and have Abel--who will work closely with Jain, as well as Ted Weschler and Todd Combs--focus on properly allocating Berkshire's capital. Buffett did note that while Abel would succeed him if he departed tomorrow that Jain would succeed Abel if anything were to happen to him.

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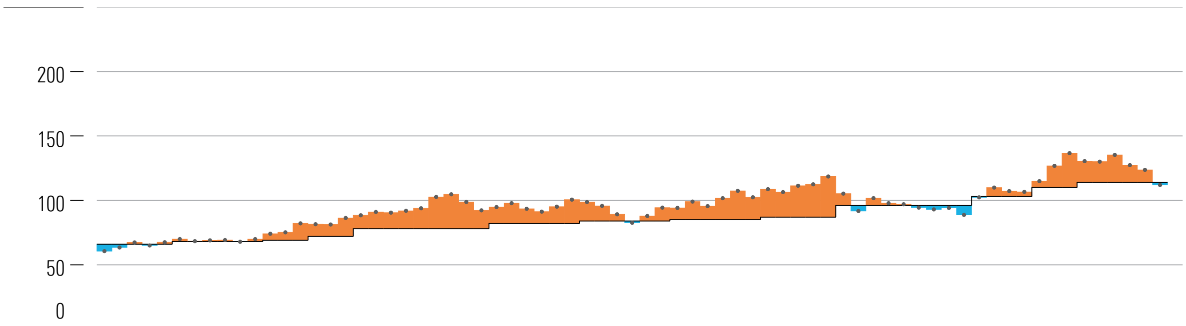
Berkshire Hathaway Inc Class B BRK.B ★★★★ 19 Nov 2021 23:25, UTC

Competitors Price vs. Fair Value

Allstate Corp ALL



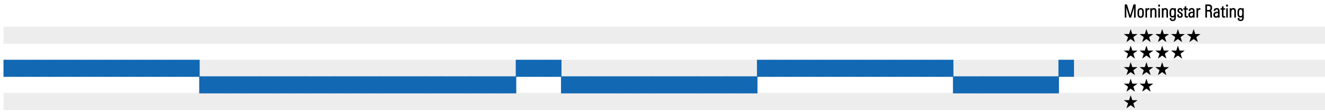
Fair Value: 114.00
28 Jun 2021 21:50, UTC

Last Close: 111.94

Over Valued
Under Valued

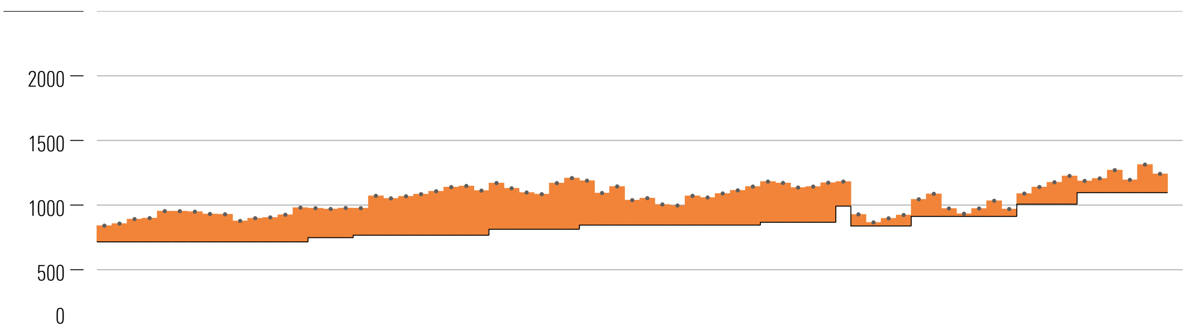
	2016	2017	2018	2019	2020	YTD
Price/Fair Value	1.07	1.34	0.98	1.29	1.07	0.98
Total Return %	21.50	43.27	-19.33	38.51	-0.32	4.04

Morningstar Rating



Total Return % as of 19 Nov 2021. Last Close as of 19 Nov 2021. Fair Value as of 28 Jun 2021 21:50, UTC.

Markel Corp MKL



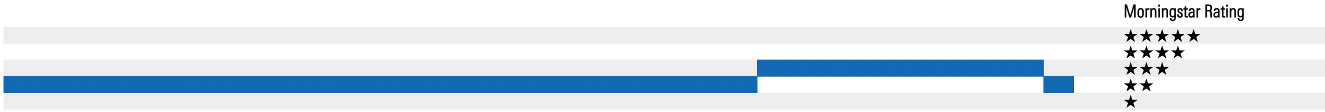
Last Close: 1,241.50

Fair Value: 1,096.00
25 Jun 2021 20:12, UTC

Over Valued
Under Valued

	2016	2017	2018	2019	2020	YTD
Price/Fair Value	1.27	1.49	1.23	1.32	1.13	1.13
Total Return %	2.39	25.94	-8.87	10.13	-9.61	20.15

Morningstar Rating



Total Return % as of 19 Nov 2021. Last Close as of 19 Nov 2021. Fair Value as of 25 Jun 2021 20:12, UTC.

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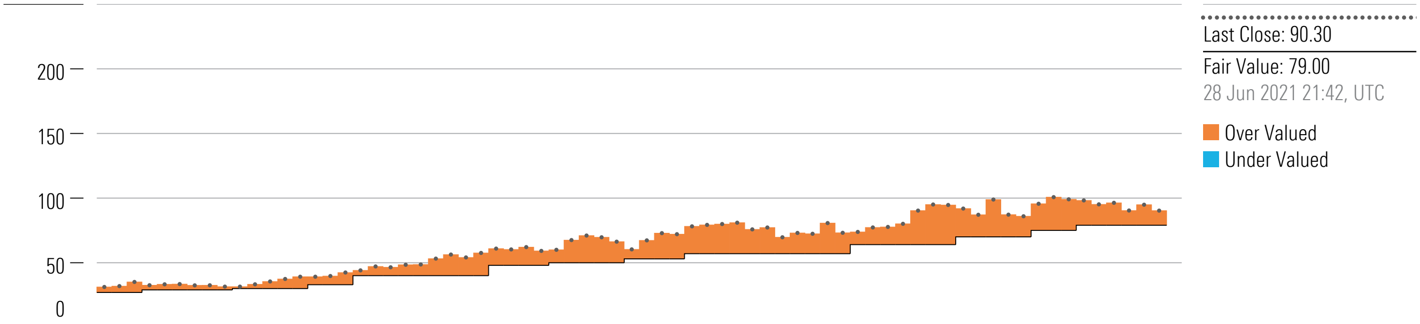
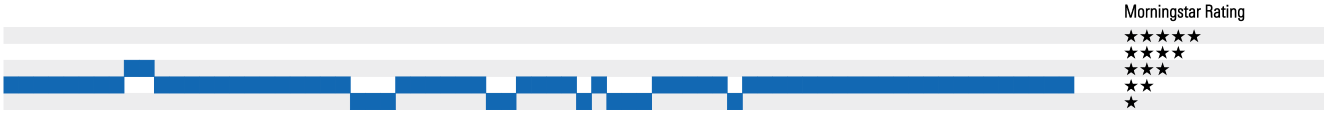
Berkshire Hathaway Inc Class B BRK.B ★★★★ 19 Nov 2021 23:25, UTC

Progressive Corp PGR



	2016	2017	2018	2019	2020	YTD
Price/Fair Value	1.18	1.41	1.14	1.27	1.41	1.14
Total Return %	14.43	60.57	9.12	24.65	37.15	-3.72

Morningstar Rating



Total Return % as of 19 Nov 2021. Last Close as of 19 Nov 2021. Fair Value as of 28 Jun 2021 21:42, UTC.

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Berkshire Hathaway Inc Class B BRK.B ★★★★ 19 Nov 2021 23:25, UTC

Last Price	Fair Value Estimate	Price/FVE	Market Cap	Economic Moat™	Moat Trend™	Uncertainty	Capital Allocation	ESG Risk Rating Assessment[1]
279.99 USD 19 Nov 2021	320.00 USD 25 Aug 2021 22:00, UTC	0.87	627.43 USD Bil 19 Nov 2021	Wide	Stable	Medium	Standard	3 Nov 2021 05:00, UTC

Morningstar Historical Summary

Financials as of 30 Sep 2021

Fiscal Year, ends 31 Dec	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	YTD	TTM
Net Earned Premium												
Net Earned Premium Growth %												
Revenue (USD Bil)	144	162	182	195	211	223	242	225	327	286	242	346
Revenue Growth %	5.5	13.1	12.1	6.9	8.3	5.9	8.3	-6.9	45.2	-12.5	32.8	23.9
Operating Income (USD Tril)	—	—	—	—	—	—	—	—	—	—	—	—
Operating Margin %	—	—	—	—	—	—	—	—	—	—	—	—
Net Income (USD Bil)	10.25	14.82	19.48	19.87	24.08	24.07	44.94	4.02	81.42	42.52	50.15	85.98
Net Margin %	7.1	9.1	10.7	10.2	11.4	10.8	18.6	1.8	24.9	14.9	20.7	24.9
Diluted Shares Outstanding (Mil)	2,475	2,477	2,465	2,465	2,465	2,466	2,467	2,466	2,451	2,392	2,278	2,292
Diluted Earnings Per Share (USD)	4.14	5.98	7.90	8.06	9.77	9.76	18.22	1.63	33.22	17.78	22.02	37.02
Dividends Per Share (USD)	—	—	—	—	—	—	—	—	—	—	—	—

Valuation as of 29 Oct 2021

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Recent Qtr	TTM
Price/Earnings	16.3	15.0	15.4	17.9	14.3	17.3	26.2	8.1	20.6	15.8	6.1	6.4
Dividend Yield %	—	—	—	—	—	—	—	—	—	—	—	—
Price/Book	1.2	1.2	1.4	1.6	1.3	1.5	1.6	1.3	1.4	1.3	1.3	1.4
Price/Tangible Book	1.8	1.7	2.0	2.2	1.9	2.6	2.5	1.9	1.9	1.7	—	—

Operating Performance / Profitability as of 30 Sep 2021

Fiscal Year, ends 31 Dec	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	YTD	TTM
ROA %	2.7	3.6	4.3	3.9	4.5	4.1	6.8	0.6	10.7	5.0	—	9.8
ROE %	6.4	8.4	9.5	8.6	9.7	9.0	14.3	1.2	21.1	9.8	—	19.4

Financial Leverage

Fiscal Year, ends 31 Dec	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Recent Qtr	TTM
Debt/Capital %	26.3	24.6	24.3	24.8	24.4	25.7	21.7	21.1	18.9	20.4	19.3	—
Equity/Assets %	42.0	43.9	45.8	45.7	46.3	45.4	49.6	49.3	51.9	50.7	51.3	—

Morningstar Analyst Historical/Forecast Summary as of 25 Aug 2021

Financials

			Estimates		
Fiscal Year, ends 31 Dec	2019	2020	2021	2022	2023
Net Earned Premium (USD Mil)	61,078	63,401	68,871	75,563	82,472
Net Earned Premium Growth %	6.4	3.8	8.6	9.7	9.1
Investment Income (USD Mil)	6,615	5,960	6,750	7,500	8,000
Investment Yield %	2.4	2.0	1.9	2.0	2.5
Revenue (USD Mil)	138,816	110,266	88,622	92,200	103,401
Revenue Growth %	240.4	-20.6	-19.6	4.0	12.2
Operating Income (USD Mil)	78,174	47,705	20,422	18,730	20,791
Operating Margin %	56.3	43.3	23.0	20.3	20.1
Net Income (USD Mil)	61,153	39,287	16,287	13,650	15,020
Net Margin %	44.1	35.6	18.4	14.8	14.5
Diluted Shares Outstanding (Mil)	2	2	2	1	1
Diluted Earnings Per Share(USD)	49,828.30	26,667.81	37,338.04	22,449.43	21,167.31
Dividends Per Share(USD)	0.00	0.00	0.00	0.00	0.00

Forward Valuation

			Estimates		
	2019	2020	2021	2022	2023
Price/Earnings	6.5	12.4	10.7	17.8	18.9
Dividend Yield %	—	—	—	—	—
Price/Book	2.3	2.0	2.2	2.1	2.5
Price/Tangible Book	2.8	2.5	2.7	2.5	3.2

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

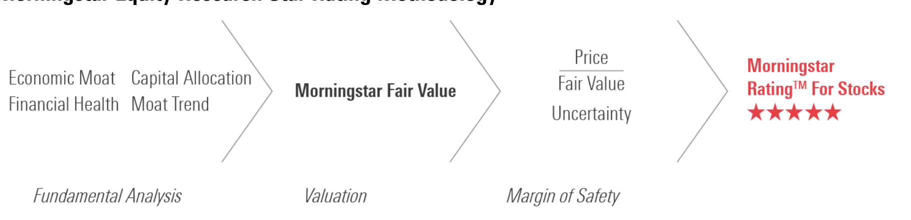
Once a company's marginal ROIC hits its cost of capital, we calculate a continuing value, using a standard perpetuity formula. At perpetuity, we assume that any growth or decline or investment in the business neither creates nor destroys value and that any new investment provides a return in line with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

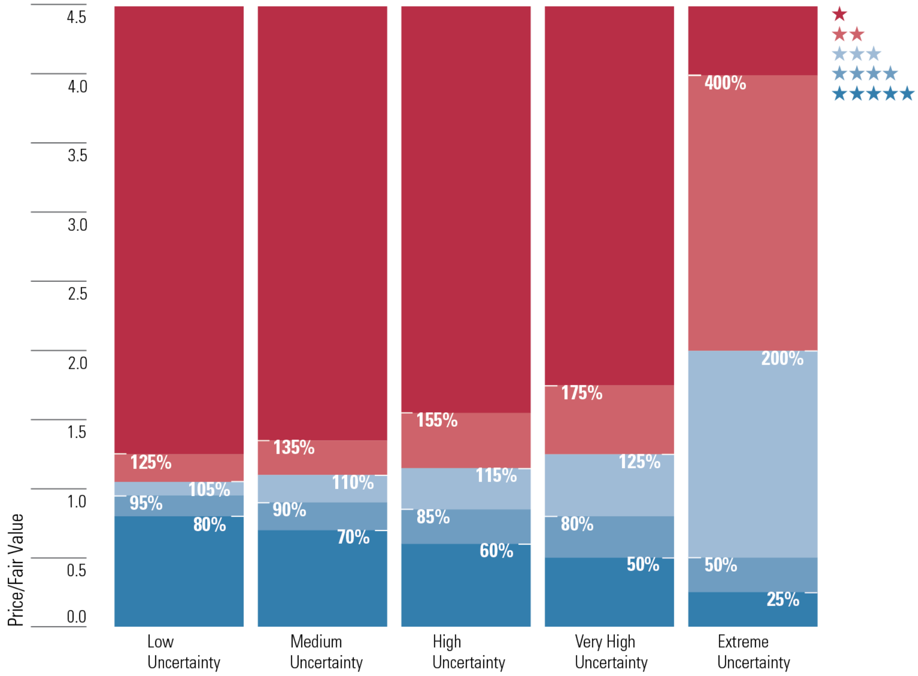
The market prices used in this analysis and noted in the report come from exchange on which the stock is listed which we believe is a reliable source.

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-

Research Methodology for Valuing Companies

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.

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

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Sustainalytics ESG Risk Rating Assessment: The ESG Risk Rating Assessment is provided by Sustainalytics; a Morningstar company.

Sustainalytics' ESG Risk Ratings measure the degree to which company's economic value at risk is driven by environment, social and governance (ESG) factors.

Sustainalytics analyzes over 1,300 data points to assess a company's exposure to and management of ESG risks. In other words, ESG Risk Ratings measures a company's unmanaged ESG Risks represented as a quantitative score. Unmanaged Risk is measured on an open-ended scale starting at zero (no risk) with lower scores representing less unmanaged risk and, for 95% of cases, the unmanaged ESG Risk score is below 50.

Based on their quantitative scores, companies are grouped into one of five Risk Categories (negligible, low, medium, high, severe). These risk categories are absolute, meaning that a 'high risk' assessment reflects a comparable degree of unmanaged ESG risk across all subindustries covered.

The ESG Risk Rating Assessment is a visual representation of Sustainalytics ESG Risk Categories on a 1 to 5 scale. Companies with Negligible Risk = 5 Globes, Low Risk = 4, Medium Risk = 3 Globes, High Risk = 2 Globes, Severe Risk = 1 Globe. For more information, please visit sustainalytics.com/esg-ratings/

Ratings should not be used as the sole basis in evaluating a company or security. Ratings involve unknown risks and uncertainties which may cause our expectations not to occur or to differ significantly from what was expected and should not be considered an offer or solicitation to buy or sell a security.

Risk Warning

Please note that investments in securities are subject to market and other risks and there is no assurance or guarantee that the intended investment objectives will be achieved. Past performance of a security may or may not be sustained in future and is no indication of future performance. A security investment return and an investor's principal value will fluctuate so that, when redeemed, an investor's shares may be worth more or less than their original cost. A security's current investment performance may be lower or higher than the investment performance noted within the report. Morningstar's Uncertainty Rating serves as a useful data point with respect to sensitivity analysis of the assumptions used in our determining a fair value price.

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