

BERKSHIRE HATHAWAY INC.

2022
ANNUAL REPORT

BERKSHIRE HATHAWAY INC.

2022 ANNUAL REPORT

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Berkshire's Performance vs. the S&P 500

Year	Annual Percentage Change	
	in Per-Share Market Value of Berkshire	in S&P 500 with Dividends Included
1965	49.5	10.0
1966	(3.4)	(11.7)
1967	13.3	30.9
1968	77.8	11.0
1969	19.4	(8.4)
1970	(4.6)	3.9
1971	80.5	14.6
1972	8.1	18.9
1973	(2.5)	(14.8)
1974	(48.7)	(26.4)
1975	2.5	37.2
1976	129.3	23.6
1977	46.8	(7.4)
1978	14.5	6.4
1979	102.5	18.2
1980	32.8	32.3
1981	31.8	(5.0)
1982	38.4	21.4
1983	69.0	22.4
1984	(2.7)	6.1
1985	93.7	31.6
1986	14.2	18.6
1987	4.6	5.1
1988	59.3	16.6
1989	84.6	31.7
1990	(23.1)	(3.1)
1991	35.6	30.5
1992	29.8	7.6
1993	38.9	10.1
1994	25.0	1.3
1995	57.4	37.6
1996	6.2	23.0
1997	34.9	33.4
1998	52.2	28.6
1999	(19.9)	21.0
2000	26.6	(9.1)
2001	6.5	(11.9)
2002	(3.8)	(22.1)
2003	15.8	28.7
2004	4.3	10.9
2005	0.8	4.9
2006	24.1	15.8
2007	28.7	5.5
2008	(31.8)	(37.0)
2009	2.7	26.5
2010	21.4	15.1
2011	(4.7)	2.1
2012	16.8	16.0
2013	32.7	32.4
2014	27.0	13.7
2015	(12.5)	1.4
2016	23.4	12.0
2017	21.9	21.8
2018	2.8	(4.4)
2019	11.0	31.5
2020	2.4	18.4
2021	29.6	28.7
2022	4.0	(18.1)
Compounded Annual Gain – 1965-2022	19.8%	9.9%
Overall Gain – 1964-2022	3,787,464%	24,708%

Note: Data are for calendar years with these exceptions: 1965 and 1966, year ended 9/30; 1967, 15 months ended 12/31.

BERKSHIRE HATHAWAY INC.

To the Shareholders of Berkshire Hathaway Inc.:

Charlie Munger, my long-time partner, and I have the job of managing the savings of a great number of *individuals*. We are grateful for their enduring trust, a relationship that often spans much of their adult lifetime. It is those dedicated savers that are forefront in my mind as I write this letter.

A common belief is that people choose to save when young, expecting thereby to maintain their living standards after retirement. Any assets that remain at death, this theory says, will usually be left to their families or, possibly, to friends and philanthropy.

Our experience has differed. We believe Berkshire's individual holders largely to be of the once-a-saver, always-a-saver variety. Though these people live well, they eventually dispense most of their funds to philanthropic organizations. These, in turn, redistribute the funds by expenditures intended to improve the lives of a great many people who are unrelated to the original benefactor. Sometimes, the results have been spectacular.

The disposition of money unmask humans. Charlie and I watch with pleasure the vast flow of Berkshire-generated funds to public needs and, alongside, the infrequency with which our shareholders opt for look-at-me assets and dynasty-building.

Who *wouldn't* enjoy working for shareholders like ours?

What We Do

Charlie and I allocate your savings at Berkshire between two related forms of ownership. First, we invest in businesses that we control, usually buying 100% of each. Berkshire directs capital allocation at these subsidiaries and selects the CEOs who make day-by-day operating decisions. When large enterprises are being managed, both trust and rules are essential. Berkshire emphasizes the former to an unusual – some would say extreme – degree. Disappointments are inevitable. We are understanding about *business* mistakes; our tolerance for personal misconduct is zero.

In our second category of ownership, we buy publicly-traded stocks through which we passively own *pieces* of businesses. Holding *these* investments, we have no say in management.

Our goal in both forms of ownership is to make meaningful investments in *businesses* with both long-lasting favorable economic characteristics and trustworthy managers. Please note particularly that we own publicly-traded stocks based on our expectations about their long-term *business* performance, not because we view them as vehicles for adroit purchases and sales. That point is crucial: Charlie and I are *not* stock-pickers; we are business-pickers.

Over the years, I have made many mistakes. Consequently, our extensive collection of businesses currently consists of a few enterprises that have truly extraordinary economics, many that enjoy very good economic characteristics, and a large group that are marginal. Along the way, other businesses in which I have invested have died, their products unwanted by the public. Capitalism has two sides: The system creates an ever-growing pile of losers while concurrently delivering a gusher of improved goods and services. Schumpeter called this phenomenon “creative destruction.”

One advantage of our publicly-traded segment is that – episodically – it becomes easy to buy *pieces* of wonderful businesses at wonderful prices. It’s crucial to understand that stocks often trade at truly foolish prices, both high and low. “Efficient” markets exist only in textbooks. In truth, marketable stocks and bonds are baffling, their behavior usually understandable only in retrospect.

Controlled businesses are a different breed. They sometimes command ridiculously *higher* prices than justified but are almost never available at bargain valuations. Unless under duress, the owner of a controlled business gives no thought to selling at a panic-type valuation.

* * * * *

At this point, a report card from me is appropriate: In 58 years of Berkshire management, most of my capital-allocation decisions have been no better than so-so. In some cases, also, bad moves by me have been rescued by very large doses of luck. (Remember our escapes from near-disasters at USAir and Salomon? I certainly do.)

Our satisfactory results have been the product of about a dozen truly good decisions – that would be about one every five years – *and* a sometimes-forgotten advantage that favors long-term investors such as Berkshire. Let’s take a peek behind the curtain.

The Secret Sauce

In August 1994 – yes, 1994 – Berkshire *completed* its seven-year purchase of the 400 million shares of Coca-Cola we now own. The total cost was \$1.3 billion – then a very meaningful sum at Berkshire.

The cash dividend we received from Coke in 1994 was \$75 million. By 2022, the dividend had increased to \$704 million. Growth occurred every year, just as certain as birthdays. All Charlie and I were required to do was cash Coke’s quarterly dividend checks. We expect that those checks are highly likely to grow.

American Express is much the same story. Berkshire’s purchases of Amex were essentially completed in 1995 and, coincidentally, also cost \$1.3 billion. Annual dividends received from this investment have grown from \$41 million to \$302 million. Those checks, too, seem highly likely to increase.

These dividend gains, though pleasing, are *far* from spectacular. But they bring with them important gains in stock prices. At yearend, our Coke investment was valued at \$25 billion while Amex was recorded at \$22 billion. Each holding now accounts for roughly 5% of Berkshire’s net worth, akin to its weighting long ago.

Assume, for a moment, I had made a similarly-sized investment mistake in the 1990s, one that flat-lined and simply retained its \$1.3 billion value in 2022. (An example would be a high-grade 30-year bond.) That disappointing investment would now represent an insignificant 0.3% of Berkshire’s net worth and would be delivering to us an unchanged \$80 million or so of annual income.

The lesson for investors: The weeds wither away in significance as the flowers bloom. Over time, it takes just a few winners to work wonders. And, yes, it helps to start early and live into your 90s as well.

The Past Year in Brief

Berkshire had a good year in 2022. The company’s *operating earnings* – our term for income calculated using Generally Accepted Accounting Principles (“GAAP”), *exclusive* of capital gains or losses from equity holdings – set a record at \$30.8 billion. Charlie and I focus on this operational figure and urge you to do so as well. The GAAP figure, *absent our adjustment*, fluctuates wildly and capriciously at every reporting date. Note its acrobatic behavior in 2022, which is in no way unusual:

<u>2022 Quarter</u>	<u>Earnings in \$ billions</u>	
	<u>“Operating Earnings”</u>	<u>GAAP Earnings We are Required to Report</u>
1	7.0	5.5
2	9.3	(43.8)
3	7.8	(2.7)
4	6.7	18.2

The GAAP earnings are 100% misleading when viewed quarterly or even annually. Capital gains, to be sure, have been hugely important to Berkshire over past decades, and we expect them to be meaningfully positive in future decades. But their quarter-by-quarter gyrations, regularly and mindlessly headlined by media, totally misinform investors.

A second positive development for Berkshire last year was our purchase of Alleghany Corporation, a property-casualty insurer captained by Joe Brandon. I've worked with Joe in the past, and he understands both Berkshire and insurance. Alleghany delivers special value to us because Berkshire's unmatched financial strength allows its insurance subsidiaries to follow valuable and enduring investment strategies unavailable to virtually all competitors.

Aided by Alleghany, our insurance float increased during 2022 from \$147 billion to \$164 billion. With disciplined underwriting, these funds have a decent chance of being *cost-free* over time. Since purchasing our first property-casualty insurer in 1967, Berkshire's float has increased 8,000-fold through acquisitions, operations and innovations. Though *not* recognized in our financial statements, this float has been an extraordinary asset for Berkshire. New shareholders can get an understanding of its value by reading our annually updated explanation of float on page A-2.

* * * * *

A *very* minor gain in per-share intrinsic value took place in 2022 through Berkshire share repurchases as well as similar moves at Apple and American Express, both significant investees of ours. At Berkshire, we directly increased your interest in our unique collection of businesses by repurchasing 1.2% of the company's outstanding shares. At Apple and Amex, repurchases increased Berkshire's ownership a bit without any cost to us.

The math isn't complicated: When the share count goes down, *your* interest in our many businesses goes *up*. Every small bit helps *if repurchases are made at value-accretive prices*. Just as surely, when a company overpays for repurchases, the continuing shareholders *lose*. At such times, gains flow only to the *selling* shareholders and to the friendly, but expensive, investment banker who recommended the foolish purchases.

Gains from value-accretive repurchases, it should be emphasized, benefit *all* owners – in *every* respect. Imagine, if you will, three fully-informed shareholders of a local auto dealership, one of whom manages the business. Imagine, further, that one of the passive owners wishes to sell his interest back to the company at a price attractive to the two continuing shareholders. When completed, has this transaction harmed anyone? Is the manager somehow favored over the continuing passive owners? Has the public been hurt?

When you are told that *all* repurchases are harmful to shareholders *or* to the country, *or* particularly beneficial to CEOs, you are listening to either an economic illiterate or a silver-tongued demagogue (characters that are *not* mutually exclusive).

Almost endless details of Berkshire’s 2022 operations are laid out on pages K-33 – K-66. Charlie and I, along with many Berkshire shareholders, enjoy poring over the many facts and figures laid out in that section. These pages are *not*, however, required reading. There are many Berkshire centimillionaires and, yes, billionaires who have never studied our financial figures. They simply know that Charlie and I – along with our families and close friends – continue to have very significant investments in Berkshire, and they trust us to treat their money as we do our own.

And *that* is a promise we can make.

* * * * *

Finally, an important warning: Even the *operating* earnings figure that we favor can easily be manipulated by managers who wish to do so. Such tampering is often thought of as sophisticated by CEOs, directors and their advisors. Reporters and analysts embrace its existence as well. Beating “expectations” is heralded as a managerial triumph.

That activity is disgusting. It requires no talent to manipulate numbers: Only a deep desire to deceive is required. “Bold imaginative accounting,” as a CEO once described his deception to me, has become one of the shames of capitalism.

58 Years – and a Few Figures

In 1965, Berkshire was a one-trick pony, the owner of a venerable – but doomed – New England textile operation. With that business on a death march, Berkshire needed an immediate fresh start. Looking back, I was slow to recognize the severity of its problems.

And then came a stroke of good luck: National Indemnity became available in 1967, and we shifted our resources toward insurance and other non-textile operations.

Thus began our journey to 2023, a bumpy road involving a combination of *continuous* savings by our owners (that is, by their retaining earnings), the power of compounding, our avoidance of *major* mistakes and – most important of all – the American Tailwind. America would have done fine without Berkshire. The reverse is *not* true.

Berkshire now enjoys major ownership in an unmatched collection of huge and diversified businesses. Let’s first look at the 5,000 or so publicly-held companies that trade daily on NASDAQ, the NYSE and related venues. Within this group is housed the members of the S&P 500 Index, an elite collection of large and well-known American companies.

In aggregate, the 500 earned \$1.8 trillion in 2021. I don’t yet have the final results for 2022. Using, therefore, the 2021 figures, only 128 of the 500 (including Berkshire itself) earned \$3 billion or more. Indeed, 23 lost money.

At yearend 2022, Berkshire was the largest owner of *eight* of these giants: American Express, Bank of America, Chevron, Coca-Cola, HP Inc., Moody's, Occidental Petroleum and Paramount Global.

In addition to those eight investees, Berkshire owns 100% of BNSF and 92% of BH Energy, each with earnings that exceed the \$3 billion mark noted above (\$5.9 billion at BNSF and \$4.3 billion at BHE). Were these companies publicly-owned, they would replace two present members of the 500. All told, our ten controlled and non-controlled behemoths leave Berkshire more broadly aligned with the country's economic future than is the case at any other U.S. company. (This calculation leaves aside "fiduciary" operations such as pension funds and investment companies.) In addition, Berkshire's insurance operation, though conducted through many individually-managed subsidiaries, has a value comparable to BNSF or BHE.

As for the future, Berkshire will always hold a boatload of cash and U.S. Treasury bills along with a wide array of businesses. We will also avoid behavior that could result in *any* uncomfortable cash needs at inconvenient times, including financial panics and unprecedented insurance losses. Our CEO will always be the Chief Risk Officer – a task it is irresponsible to delegate. Additionally, our future CEOs will have a significant part of their net worth in Berkshire shares, bought with their own money. *And* yes, our shareholders will continue to save and prosper by retaining earnings.

At Berkshire, there will be no finish line.

Some Surprising Facts About Federal Taxes

During the decade ending in 2021, the United States Treasury received about \$32.3 trillion in taxes while it spent \$43.9 trillion.

Though economists, politicians and many of the public have opinions about the consequences of that huge imbalance, Charlie and I plead ignorance and firmly believe that near-term economic and market forecasts are worse than useless. Our job is to manage Berkshire's operations and finances in a manner that will achieve an acceptable result over time and that will preserve the company's unmatched staying power when financial panics or severe worldwide recessions occur. Berkshire also offers some modest protection from runaway inflation, but this attribute is *far* from perfect. Huge and entrenched fiscal deficits have consequences.

The \$32 trillion of revenue was garnered by the Treasury through individual income taxes (48%), social security and related receipts (34½%), corporate income tax payments (8½%) and a wide variety of lesser levies. Berkshire's contribution via the corporate income tax was \$32 billion during the decade, almost exactly a tenth of 1% of *all* money that the Treasury collected.

And that means – brace yourself – had there been roughly 1,000 taxpayers in the U.S. matching Berkshire’s payments, no other businesses nor any of the country’s 131 million households would have needed to pay *any* taxes to the federal government. Not a dime.

* * * * *

Millions, billions, trillions – we all know the words, but the sums involved are almost impossible to comprehend. Let’s put physical dimensions to the numbers:

- If you convert \$1 million into newly-printed \$100 bills, you will have a stack that reaches your chest.
- Perform the same exercise with \$1 *billion* – this is getting exciting! – and the stack reaches about $\frac{3}{4}$ of a mile into the sky.
- Finally, imagine piling up \$32 billion, the total of Berkshire’s 2012-21 federal income tax payments. Now the stack grows to more than 21 miles in height, about three times the level at which commercial airplanes usually cruise.

When it comes to federal taxes, individuals who own Berkshire can unequivocally state “I gave at the office.”

* * * * *

At Berkshire we hope *and expect* to pay much more in taxes during the next decade. We owe the country no less: America’s dynamism has made a huge contribution to whatever success Berkshire has achieved – a contribution Berkshire will always need. We *count* on the American Tailwind and, though it has been becalmed from time to time, its propelling force has always returned.

I have been investing for 80 years – more than one-third of our country’s lifetime. Despite our citizens’ penchant – almost enthusiasm – for self-criticism and self-doubt, I have yet to see a time when it made sense to make a long-term bet against America. And I doubt very much that any reader of this letter will have a different experience in the future.

Nothing Beats Having a Great Partner

Charlie and I think pretty much alike. But what it takes me a page to explain, he sums up in a sentence. His version, moreover, is always more clearly reasoned and also more artfully – some might add bluntly – stated.

Here are a few of his thoughts, many lifted from a very recent podcast:

- The world is full of foolish gamblers, and they will not do as well as the patient investor.
- If you don’t see the world the way it is, it’s like judging something through a distorted lens.
- All I want to know is where I’m going to die, so I’ll never go there. And a related thought: Early on, write your desired obituary – and then behave accordingly.
- If you don’t care whether you are rational or not, you won’t work on it. Then you will stay irrational and get lousy results.

- Patience can be learned. Having a long attention span and the ability to concentrate on one thing for a long time is a huge advantage.
- You can learn a lot from dead people. Read of the deceased you admire and detest.
- Don't bail away in a sinking boat if you can swim to one that is seaworthy.
- A great company keeps working after you are not; a mediocre company won't do that.
- Warren and I don't focus on the froth of the market. We seek out good long-term investments and stubbornly hold them for a long time.
- Ben Graham said, "Day to day, the stock market is a voting machine; in the long term it's a weighing machine." If you keep making something more valuable, then some wise person is going to notice it and start buying.
- There is no such thing as a 100% sure thing when investing. Thus, the use of leverage is dangerous. A string of wonderful numbers times zero will always equal zero. Don't count on getting rich twice.
- You don't, however, need to own a lot of things in order to get rich.
- You have to keep learning if you want to become a great investor. When the world changes, *you* must change.
- Warren and I hated railroad stocks for decades, but the world changed and finally the country had four huge railroads of vital importance to the American economy. We were slow to recognize the change, but better late than never.
- Finally, *I* will add two short sentences by Charlie that have been his decision-clinchers for decades: "Warren, think more about it. You're smart and I'm right."

And so it goes. I never have a phone call with Charlie without learning something. And, while he makes me think, he also makes me laugh.

* * * * *

I will add to Charlie's list a rule of my own: Find a very smart high-grade partner – preferably slightly older than you – and then listen *very* carefully to what he says.

A Family Gathering in Omaha

Charlie and I are shameless. Last year, at our first shareholder get-together in three years, we greeted you with our usual commercial hustle.

From the opening bell, we went straight for your wallet. In short order, our See's kiosk sold you *eleven tons* of nourishing peanut brittle and chocolates. In our P.T. Barnum pitch, we promised you longevity. After all, what else but candy from See's could account for Charlie and me making it to 99 and 92?

I know you can't wait to hear the specifics of last year's hustle.

On Friday, the doors were open from noon until 5 p.m., and our candy counters rang up 2,690 individual sales. On Saturday, See's registered an additional 3,931 transactions between 7 a.m. and 4:30 p.m., despite the fact that 6½ of the 9½ operating hours occurred while our movie and the question-and-answer session were limiting commercial traffic.

Do the math: See's rang up about 10 sales per minute during its prime operating time (racking up \$400,309 of volume during the two days), with all the goods purchased at a single location selling products that haven't been materially altered in 101 years. What worked for See's in the days of Henry Ford's model T works now.

* * * * *

Charlie, I, and the entire Berkshire bunch look forward to seeing you in Omaha on May 5-6. We will have a good time and so will you.

February 25, 2023

Warren E. Buffett
Chairman of the Board

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549
FORM 10-K**

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended December 31, 2022

OR

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the transition period from _____ to _____

Commission file number 001-14905

BERKSHIRE HATHAWAY INC.

(Exact name of Registrant as specified in its charter)

Delaware
State or other jurisdiction of
incorporation or organization
3555 Farnam Street, Omaha, Nebraska
(Address of principal executive office)

47-0813844
(I.R.S. Employer
Identification No.)
68131
(Zip Code)

Registrant's telephone number, including area code (402) 346-1400

Securities registered pursuant to Section 12(b) of the Act:

<u>Title of each class</u>	<u>Trading Symbols</u>	<u>Name of each exchange on which registered</u>
Class A Common Stock	BRK.A	New York Stock Exchange
Class B Common Stock	BRK.B	New York Stock Exchange
0.750% Senior Notes due 2023	BRK23	New York Stock Exchange
1.300% Senior Notes due 2024	BRK24	New York Stock Exchange
0.000% Senior Notes due 2025	BRK25	New York Stock Exchange
1.125% Senior Notes due 2027	BRK27	New York Stock Exchange
2.150% Senior Notes due 2028	BRK28	New York Stock Exchange
1.500% Senior Notes due 2030	BRK30	New York Stock Exchange
2.000% Senior Notes due 2034	BRK34	New York Stock Exchange
1.625% Senior Notes due 2035	BRK35	New York Stock Exchange
2.375% Senior Notes due 2039	BRK39	New York Stock Exchange
0.500% Senior Notes due 2041	BRK41	New York Stock Exchange
2.625% Senior Notes due 2059	BRK59	New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act: NONE

Indicate by check mark if the Registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes No

Indicate by check mark if the Registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes No

Indicate by check mark whether the Registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes No

Indicate by check mark whether the Registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes No

Indicate by check mark whether the Registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act. Large accelerated filer Accelerated filer Non-accelerated filer Smaller reporting company Emerging growth company

If an emerging growth company, indicate by check mark if the Registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report.

If securities are registered pursuant to Section 12(b) of the Act, indicate by check mark whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements.

Indicate by check mark whether any of those error corrections are restatements that required a recovery analysis of incentive-based compensation received by any of the registrant's executive officers during the relevant recovery period pursuant to §240.10D-1(b).

Indicate by check mark whether the Registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes No

State the aggregate market value of the voting stock held by non-affiliates of the Registrant as of June 30, 2022: \$500,000,000,000

Indicate the number of shares outstanding of each of the Registrant's classes of common stock:

February 13, 2023—Class A common stock, \$5 par value 590,835 shares
February 13, 2023—Class B common stock, \$0.0033 par value 1,301,100,243 shares

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Proxy Statement for the Registrant's Annual Meeting to be held May 6, 2023 are incorporated in Part III.

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Part I

Item 1. Business Description

Berkshire Hathaway Inc. (“Berkshire,” “Company” or “Registrant”) is a holding company owning subsidiaries engaged in numerous diverse business activities. The most important of these are insurance businesses conducted on both a primary basis and a reinsurance basis, a freight rail transportation business and a group of utility and energy generation and distribution businesses. Berkshire also owns and operates numerous other businesses engaged in a variety of manufacturing, services, retailing and other activities. Berkshire is domiciled in the state of Delaware, and its corporate headquarters is in Omaha, Nebraska.

Berkshire’s operating businesses are managed on an unusually decentralized basis. There are few centralized or integrated business functions. Berkshire’s corporate senior management team participates in and is ultimately responsible for significant capital allocation decisions, investment activities and the selection of the Chief Executive to head each of the operating businesses.

Berkshire’s senior management is also responsible for establishing and monitoring Berkshire’s corporate governance practices, including monitoring governance efforts, including those at the operating businesses, and participating in the resolution of governance-related issues as needed. Berkshire’s Board of Directors is responsible for assuring an appropriate successor to the Chief Executive Officer. The Berkshire Code of Business Conduct and Ethics emphasizes, among other things, the commitment to ethics and compliance with government laws and regulations and provides basic standards for ethical and legal behavior of its employees.

Human capital and resources are an integral and essential component of Berkshire’s businesses. Berkshire and its consolidated subsidiaries employed approximately 383,000 people worldwide at the end of 2022, of which approximately 78% were in the United States (“U.S.”) and 20% were represented by unions. Employees engage in a wide variety of occupations. Consistent with Berkshire’s decentralized management philosophy, Berkshire’s operating businesses individually establish specific policies and practices concerning the attraction and retention of personnel within their organizations. Given the wide variations in the nature and size of business activities, specific policies and practices may vary widely among Berkshire’s operating subsidiaries. Policies and practices commonly address, among other things: maintaining a safe work environment and minimizing or eliminating workplace injuries; offering competitive compensation, which includes various health insurance and retirement benefits, as well as incentives to recognize and reward performance; wellness programs; training, learning and career advancement opportunities; and hiring practices intended to identify qualified candidates and promote diversity and inclusion in the workforce. Berkshire’s consolidated U.S. workforce demographics, based on U.S. Equal Employment Opportunity Commission guidelines, are available on its website (<https://www.berkshirehathaway.com>), under sustainability.

Insurance and Reinsurance Businesses

Berkshire’s insurance and reinsurance business activities are conducted through numerous domestic and foreign-based insurance subsidiaries. Berkshire’s insurance subsidiaries provide insurance and reinsurance of property and casualty risks and reinsurance of life and health risks worldwide. Berkshire’s insurance subsidiaries employed approximately 50,000 people at the end of 2022. For purposes of this discussion, entities that provide insurance or reinsurance are referred to as insurers.

In direct or primary insurance activities, the insurer assumes the risk of loss from persons or organizations that are directly subject to the risks. Such risks may relate to property, casualty (or liability), life, accident, health, financial or other perils that may arise from an insurable event. In reinsurance activities, the insurer assumes defined portions of risks that other direct insurers or reinsurers assumed in their own insuring activities.

Reinsurance contracts are normally classified as treaty or facultative contracts. Treaty reinsurance refers to reinsurance coverage for all or a portion of a specified group or class of risks ceded by a direct insurer or reinsurer, while facultative reinsurance involves coverage of specific individual underlying risks. Reinsurance contracts are further classified as quota-share or excess. Under quota-share (proportional or pro-rata) reinsurance, the reinsurer shares proportionally in the original premiums and losses of the direct insurer or reinsurer. Excess (or non-proportional) reinsurance provides for the indemnification of the direct insurer or reinsurer for all or a portion of the loss in excess of an agreed upon amount or “retention.” Both quota-share and excess reinsurance contracts may provide for aggregate limits of indemnification.

Insurance and reinsurance are generally subject to regulatory oversight throughout the world. Except for regulatory considerations, there are virtually no barriers to entry into the insurance and reinsurance industry. Competitors may be domestic or foreign, as well as licensed or unlicensed. The number of competitors within the industry is not known. Insurers compete on the basis of reliability, financial strength and stability, financial ratings, underwriting consistency, service, business ethics, price, performance, capacity, policy terms and coverage conditions.

Insurers based in the U.S. are subject to regulation by their states of domicile and by those states in which they are licensed to write policies on an admitted basis. The primary focus of regulation is to assure that insurers are financially solvent and that policyholder interests are otherwise protected. States establish minimum capital levels for insurance companies and establish guidelines for permissible business and investment activities. States have the authority to suspend or revoke a company's authority to do business as conditions warrant. States regulate the payment of dividends by insurance companies to their shareholders and other transactions with affiliates. Dividends, capital distributions and other transactions of extraordinary amounts are subject to prior regulatory approval.

Insurers may market, sell and service insurance policies in the states where they are licensed. These insurers are referred to as admitted insurers. Admitted insurers are generally required to obtain regulatory approval of their policy forms and premium rates. Non-admitted insurance markets have developed to provide insurance that is otherwise unavailable through admitted insurers. Non-admitted insurance, often referred to as "excess and surplus" lines, is procured by either state-licensed surplus lines brokers who place risks with insurers not licensed in that state or by the insured party's direct procurement from non-admitted insurers. Non-admitted insurance is subject to considerably less regulation with respect to policy rates and forms. Reinsurers are normally not required to obtain regulatory approval of premium rates or reinsurance contracts.

The insurance regulators of every state participate in the National Association of Insurance Commissioners ("NAIC"). The NAIC adopts forms, instructions and accounting procedures for use by U.S. insurers in preparing and filing annual statutory financial statements. However, an insurer's state of domicile has ultimate authority over these matters. In addition to its activities relating to the annual statement, the NAIC develops or adopts statutory accounting principles, model laws, regulations and programs for use by its members. Such matters deal with regulatory oversight of solvency, risk management, compliance with financial regulation standards and risk-based capital reporting requirements.

U.S. states, through the NAIC, and international insurance regulators through the International Association of Insurance Supervisors ("IAIS") have been developing standards and best practices focused on establishing a common set of principles ("Insurance Core Principles") and framework ("ComFrame") for the regulation of large multi-national insurance groups. The IAIS is developing capital standards for internationally active insurance groups (the "Insurance Capital Standard") based on a consolidated group approach and is also evaluating a potentially comparable group capital standard based on the aggregation of regulated entities and their underlying local capital requirements (the "Aggregation Method"). The IAIS standards address a variety of topics regarding supervision, coordination of regulators, insurance capital standards, risk management and governance. While the IAIS standards do not have legal effect, U.S. state insurance departments and the NAIC are implementing various group supervision regulatory tools and mandates that are responsive to certain IAIS standards. U.S. state regulators have formed supervisory colleges intended to promote communication and cooperation amongst the various domestic and international insurance regulators. The Nebraska Department of Insurance acts as the lead supervisor for our group of insurance companies and chairs the Berkshire supervisory college. U.S. state regulators require insurance groups to file an annual report and an Own Risk Solvency Assessment or ORSA, with the group's lead supervisor. The NAIC recently adopted a group capital calculation based on methodology similar to the Aggregation Method, which leverages the NAIC's existing Risk Based Capital standards. The NAIC's group capital calculation is a tool designed to help the lead supervisor understand the capital adequacy across an insurance group. The NAIC is also developing further tools, including various liquidity assessments, that will likely be imposed on insurance groups in the future.

Berkshire's insurance companies maintain capital strength at exceptionally high levels, which differentiates them from their competitors. The combined statutory surplus of Berkshire's U.S.-based insurers was approximately \$272 billion at December 31, 2022. Berkshire's major insurance subsidiaries are rated AA+ by Standard & Poor's and A++ (superior) by A.M. Best with respect to their financial condition and claims paying ability.

The Terrorism Risk Insurance Act of 2002 established within the Department of the Treasury a Terrorism Insurance Program ("Program") for commercial property and casualty insurers by providing federal reinsurance of insured terrorism losses. The Program currently extends to December 31, 2027 through other Acts, most recently the Terrorism Risk Insurance Program Reauthorization Act of 2019. Hereinafter these Acts are collectively referred to as TRIA. Under TRIA, the Department of the Treasury is charged with certifying "acts of terrorism." Coverage under TRIA occurs if the industry insured loss for certified events occurring during the calendar year exceeds \$200 million in any calendar year.

To be eligible for federal reinsurance, insurers must make available insurance coverage for acts of terrorism, by providing policyholders with clear and conspicuous notice of the amount of premium that will be charged for this coverage and of the federal share of any insured losses resulting from any act of terrorism. Assumed reinsurance is specifically excluded from TRIA participation. TRIA currently also excludes certain forms of direct insurance (such as personal and commercial auto, burglary, theft, surety and certain professional liability lines). Reinsurers are not required to offer terrorism coverage and are not eligible for federal reinsurance of terrorism losses.

In the event of a certified act of terrorism, the federal government will reimburse insurers (conditioned on their satisfaction of policyholder notification requirements) for 80% of their insured losses in excess of an insurance group's deductible. Under the Program, the deductible is 20% of the aggregate direct subject earned premium for relevant commercial lines of business in the immediately preceding calendar year. The aggregate deductible in 2023 for Berkshire's insurance group is expected to approximate \$2.25 billion. There is also an aggregate program limit of \$100 billion on the amount of the federal government coverage for each TRIA year.

The extent of insurance regulation varies significantly among the countries in which our non-U.S. operations conduct business. While each country imposes licensing, solvency, auditing and financial reporting requirements, the type and extent of the requirements differ substantially. For example:

- in some countries, insurers are required to prepare and file monthly and/or quarterly financial reports, and in others, only annual reports;
- some regulators require intermediaries to be involved in the sale of insurance products, whereas other regulators permit direct sales contact between the insurer and the customer;
- the extent of restrictions imposed upon an insurer's use of local and offshore reinsurance vary;
- policy form filing and rate regulation vary by country;
- the frequency of contact and periodic on-site examinations by insurance authorities differ by country;
- the scope and prescriptive requirements of an insurer's risk management and governance framework vary significantly by country; and
- regulatory requirements relating to insurer dividend policies vary by country.

Significant variations can also be found in the size, structure and resources of the local regulatory departments that oversee insurance activities. Certain regulators prefer close relationships with all subject insurers and others operate a risk-based approach.

Berkshire's insurance group operates in some countries through subsidiaries and in some countries through branches of subsidiaries. Berkshire insurance subsidiaries are located in several countries, including Germany, the United Kingdom ("U.K."), Ireland, Australia and South Africa, and also maintain branches in several other countries. Most of these foreign jurisdictions impose local capital requirements. Other legal requirements include discretionary licensing procedures, local retention of funds and records, and data privacy and protection program requirements. Berkshire's international insurance companies are also subject to multinational application of certain U.S. laws.

There are various regulatory bodies and initiatives that impact Berkshire in multiple international jurisdictions and the potential for significant effect on the Berkshire insurance group could be heightened as a result of recent industry and economic developments. In 2016, the U.K. voted in a national referendum to withdraw from the European Union ("EU") ("Brexit"), which resulted in the U.K.'s withdrawal from the EU on January 31, 2020. In anticipation of the U.K. leaving the EU, Berkshire Hathaway European Insurance DAC in Ireland was established to permit property and casualty insurance and reinsurance businesses to continue to operate in the EU. Berkshire also continues to maintain a substantial presence in London following Brexit.

Alleghany Corporation ("Alleghany"), based in New York, New York, was acquired by Berkshire on October 19, 2022. Alleghany's operating subsidiaries include property and casualty reinsurance and insurance, as well as a portfolio of non-financial businesses. Information regarding Alleghany's primary insurance and reinsurance activities is provided in the Berkshire Hathaway Primary Group and Berkshire Hathaway Reinsurance Group sections and its non-insurance businesses are included in the manufacturing and services sections.

Berkshire's insurance underwriting operations include the following groups: (1) GEICO, (2) Berkshire Hathaway Primary Group and (3) Berkshire Hathaway Reinsurance Group. Except for retroactive reinsurance and periodic payment annuity products, which generate significant amounts of up-front premiums along with estimated claims expected to be paid over long time periods (creating "float," see Investments section), Berkshire expects to achieve an underwriting profit over time and that its managers will reject inadequately priced risks. Underwriting profit is defined as earned premiums less associated incurred losses, loss adjustment expenses and underwriting and policy acquisition expenses. Underwriting profit does not include income earned from investments. Additional information related to each of Berkshire's underwriting groups follows.

GEICO—GEICO is headquartered in Chevy Chase, Maryland. GEICO’s insurance subsidiaries consist of Government Employees Insurance Company, GEICO General Insurance Company, GEICO Indemnity Company, GEICO Casualty Company, GEICO Advantage Insurance Company, GEICO Choice Insurance Company, GEICO Secure Insurance Company, GEICO County Mutual Insurance Company, GEICO Texas County Mutual Insurance Company and GEICO Marine Insurance Company. The GEICO companies primarily offer private passenger automobile insurance to individuals in all 50 states and the District of Columbia. GEICO also provides insurance for motorcycles, all-terrain vehicles, recreational vehicles, boats and small commercial fleets and acts as an agent for other insurers who offer homeowners, renters, life and identity management insurance to individuals desiring insurance coverages other than those offered by GEICO.

GEICO’s marketing is primarily through direct response methods in which applications for insurance are submitted directly to the companies via the Internet or by telephone, and to a lesser extent, through captive agents. GEICO conducts business through regional service centers and claims adjustment and other facilities in 39 states.

The automobile insurance business is highly competitive in the areas of price and service. GEICO competes for private passenger automobile insurance customers in the preferred, standard and non-standard risk markets with other companies that sell directly to the customer and with companies that use agency sales forces, including State Farm, Allstate, Progressive and USAA. GEICO’s advertising campaigns and competitive rates contributed to a cumulative increase in voluntary policies-in-force of approximately 4.0% over the past five years. During 2022, GEICO experienced a reduction of 1.7 million voluntary policies-in-force after flat year-over-year growth from 2020 to 2021. According to the most recently published A.M. Best data for 2021, the five largest automobile insurers had a combined market share in 2021 of approximately 60.5% based on written premiums, with GEICO’s market share being the second largest at approximately 14.4%. GEICO’s management estimates its current market share is approximately 13.9%. The COVID-19 pandemic and subsequent supply chain disruptions affecting automobile manufacturers have impacted GEICO’s business and underwriting results in 2020 and thereafter. Seasonal variations in GEICO’s insurance business are not significant. However, extraordinary weather conditions or other factors may have a significant effect upon the frequency or severity of automobile claims.

State insurance departments stringently regulate private passenger auto insurance. As a result, it is difficult for insurance companies to differentiate their products. Competition for private passenger automobile insurance tends to focus on price and level of customer service provided. GEICO’s cost-efficient direct response marketing methods and emphasis on customer satisfaction enable it to offer competitive rates and value to its customers. GEICO primarily uses its own claims staff to manage and settle claims. The name and reputation of GEICO are material assets and management protects those and other service marks through appropriate registrations.

Berkshire Hathaway Primary Group—The Berkshire Hathaway Primary Group (“BH Primary”) is a collection of independently managed insurers that provide a wide variety of insurance coverages to policyholders located principally in the U.S. These various operations are discussed below.

National Indemnity Company (“NICO”), domiciled in Nebraska, and certain affiliates (“NICO Primary”) underwrite commercial motor vehicle and general liability insurance on an admitted basis and on an excess and surplus basis. Insurance coverages are offered nationwide primarily through insurance agents and brokers.

The Berkshire Hathaway Homestate Companies (“BHHC”) is a group of insurers offering workers’ compensation, commercial automobile and commercial property coverages to a diverse client base. BHHC has a national reach, with the ability to provide first-dollar and small to large deductible workers’ compensation coverage to employers in all states, except those where coverage is available only through state-operated workers’ compensation funds. NICO Primary and BHHC are each based in Omaha, Nebraska.

Berkshire Hathaway Specialty Insurance (“BH Specialty”) offers commercial property, casualty, healthcare professional liability, executive and professional, surety, travel, medical stop loss and homeowner’s insurance through Berkshire Hathaway Specialty Insurance Company and other Berkshire insurance affiliates. BH Specialty writes primary and excess and surplus policies on an admitted and non-admitted basis in the U.S., and on a local or foreign non-admitted basis outside the U.S. BH Specialty is based in Boston, Massachusetts, with regional offices in several U.S. cities. BH Specialty also maintains international offices and branches located in Australia, New Zealand, Canada and several countries in Asia, Europe and the Middle East. BH Specialty writes business through wholesale and retail insurance brokers, as well as managing general agents.

Alleghany’s property and casualty insurance business is conducted in the U.S. on both an admitted and non-admitted basis through RSUI Group, Inc. and its subsidiaries (“RSUI”) and CapSpecialty, Inc. and its subsidiaries (“CapSpecialty”). RSUI and CapSpecialty primarily write specialty insurance in the property, umbrella/excess liability, professional liability, directors’ and officers’ liability, and general liability lines of business. Insurance is written through independent wholesale insurance brokers, retail agents and managing general agents.

MedPro Group (“MedPro”) is a leading provider of healthcare liability (“HCL”) insurance based on premiums written. MedPro provides customized HCL insurance, claims, patient safety and risk solutions to physicians, surgeons, dentists and other healthcare professionals, as well as hospitals, senior care and other healthcare facilities. Additionally, MedPro provides HCL insurance solutions to international markets through other Berkshire insurance affiliates, delivers liability insurance to other professionals, and offers specialized accident and health insurance solutions to colleges and other customers through its subsidiaries and other Berkshire insurance affiliates. MedPro is based in Fort Wayne, Indiana.

U.S. Liability Insurance Company (“USLI”) includes a group of five specialty insurers that underwrite commercial, professional and personal lines of insurance on an admitted basis, as well as on an excess and surplus basis. USLI markets policies in all 50 states, the District of Columbia and Canada through wholesale and retail insurance agents. USLI companies also underwrite and market a wide variety of specialty insurance products. USLI is based in Wayne, Pennsylvania. Berkshire Hathaway GUARD Insurance Companies (“GUARD”) is a group of five insurance companies that provide a full suite of commercial insurance products, as well as homeowners policies to over 350,000 small to mid-sized businesses and homeowners. These offerings are made through independent agents and retail and wholesale brokers. GUARD is based in Wilkes-Barre, Pennsylvania.

Berkshire Hathaway Direct Insurance Company and its affiliates (“BH Direct”) offer commercial insurance products (including workers’ compensation, property, auto, general and professional liability) to small business customers. BH Direct’s products are primarily sold through two internet-based distribution platforms, biBERK.com and Threeinsurance.com. BH Direct writes policies on an admitted basis and is based in Stamford, Connecticut. MLMIC Insurance Company (“MLMIC”) is a leading writer of medical professional liability insurance in New York State. MLMIC distributes the majority of its policies on a direct basis to medical and dental professionals, health care providers and hospitals.

Berkshire Hathaway Reinsurance Group—Berkshire’s combined global reinsurance business, referred to as the Berkshire Hathaway Reinsurance Group (“BHRG”), offers a wide range of coverages on property, casualty, life and health risks to insurers and reinsurers worldwide. BHRG conducts business activities in 27 countries. Reinsurance business is written through NICO and several other Berkshire insurance subsidiaries (“NICO Group”), General Re Corporation, and its subsidiaries (“General Re Group”) and Alleghany’s Transatlantic Reinsurance Company and affiliates (“TransRe Group”). The NICO Group and Gen Re Group underwriting operations in the U.S. are based in Stamford, Connecticut and the TransRe Group is based in New York, New York.

The type and volume of business written is dependent on market conditions, including prevailing premium rates and coverage terms. The level of underwriting activities often fluctuates significantly from year to year depending on the perceived level of price adequacy in specific insurance and reinsurance markets as well as from the timing of particularly large reinsurance transactions.

Property/casualty

The NICO Group offers traditional property/casualty reinsurance on both an excess-of-loss and a quota-share basis, catastrophe excess-of-loss treaty and facultative reinsurance, and primary insurance on an excess-of-loss basis for large or unusual risks. The type and volume of business written by the NICO Group may vary significantly from period to period resulting from changes in perceived premium rate adequacy and from unique or large transactions. A significant portion of NICO Group’s annual reinsurance premium volume currently derives from a 20% quota-share agreement with Insurance Australia Group Limited (“IAG”) that inceptioned in 2015. The agreement was renewed, and extended, effective January 1, 2023, with an expiration of December 31, 2029. IAG is a multi-line insurer in Australia, New Zealand and other Asia-Pacific countries.

The General Re Group conducts a global property and casualty reinsurance business. Reinsurance contracts are written on both a quota-share and excess basis for multiple lines of business. Contracts are primarily in the form of treaties, and to a lesser degree, on a facultative basis. General Re Group conducts business in North America, primarily marketed on a direct basis through General Reinsurance Corporation (“GRC”), which is licensed in the District of Columbia and all states, except Hawaii, where it is an accredited reinsurer. GRC also conducts operations in North America through 11 branch offices in the U.S. and Canada.

In North America, the General Re Group includes General Star National Insurance Company, General Star Indemnity Company and Genesis Insurance Company, which offer a broad array of specialty and surplus lines and property, casualty and professional liability coverages. Such business is marketed through a select group of wholesale brokers, managing general underwriters and program administrators, and offers solutions for the unique needs of public entity, commercial and captive customers.

General Re Group’s international reinsurance business is conducted on a direct basis through General Reinsurance AG, based in Cologne, Germany, and through subsidiaries and branches in numerous other countries. International business is also written through brokers, including Faraday Underwriting Limited (“Faraday”), a subsidiary. Faraday owns the managing agent of Syndicate 435 at Lloyd’s of London and provides capacity and participates in 100% of the results of Syndicate 435.

The TransRe Group provides pro-rata and excess-of-loss reinsurance across various property and casualty lines of business. Contracts are written on both a treaty and facultative basis to insurance and other reinsurance companies in the U.S. and in foreign markets through subsidiaries and branches in numerous countries. Business is written primarily through brokers, and to a lesser extent on a direct basis.

Life/health

The General Re Group conducts a global life and health reinsurance business. In the U.S. and internationally, the General Re Group writes life, disability, supplemental health, critical illness and long-term care coverages. The life/health business is marketed on a direct basis. Life/health net premiums written by the General Re Group in 2022 were primarily in the Asia Pacific, U.S. and Western Europe.

Berkshire Hathaway Life Insurance Company of Nebraska (“BHLN”) and its affiliates write reinsurance covering various forms of traditional life insurance exposures. BHLN and affiliates are parties to contracts that reinsure certain guaranteed minimum death, income and similar benefit risks on closed-blocks of variable annuity risks under reinsurance contracts, with the most recent contract inception in 2014.

Retroactive reinsurance

NICO also occasionally writes retroactive reinsurance contracts. Retroactive reinsurance contracts indemnify ceding companies against the adverse development of claims arising from loss events that have already occurred under property and casualty policies issued in prior years. Premiums from such contracts may be exceptionally large in amount. Coverages under such contracts are provided on an excess basis (above a stated retention) or for losses payable after the inception of the contract with no additional ceding company retention. Contracts are normally subject to aggregate limits of indemnification, which can be exceptionally large in amount. Significant amounts of asbestos, environmental and latent injury claims may arise under these contracts.

The concept of time-value-of-money is an important element in establishing retroactive reinsurance contract prices and terms since loss payments may occur over decades. Normally, expected ultimate losses payable under these policies are expected to exceed premiums, thus producing underwriting losses. Nevertheless, this business is written, in part, because of the large amounts of policyholder funds generated for investment, the economic benefit of which will be reflected through investment results in future periods.

Periodic payment annuity

BHLN writes periodic payment annuity insurance policies and reinsures annuity-like obligations. Under these policies, BHLN receives upfront consideration and agrees in the future to make periodic payments that often extend for decades. These policies generally relate to the settlement of underlying personal injury or workers’ compensation claims of other insurers, known as structured settlements. Consistent with retroactive reinsurance contracts, time-value-of-money is an important factor in establishing annuity premiums, and underwriting losses are expected from the periodic accretion of time-value discounted liabilities.

Investments of insurance businesses—Berkshire’s insurance subsidiaries hold significant levels of invested assets. Investment portfolios are managed by Berkshire’s Chief Executive Officer and Berkshire’s other investment managers. Investments include a very large portfolio of publicly traded equity securities, which is unusually concentrated in relatively few issuers, as well as fixed maturity securities and cash and short-term investments. Generally, there are no targeted allocations by investment type or attempts to match investment asset and insurance liability durations. However, investment portfolios have historically included a much greater proportion of equity securities than is customary in the insurance industry.

Invested assets derive from shareholder capital as well as funds provided from policyholders through insurance and reinsurance business (“float”). Float is an approximation of the net policyholder funds generated through underwriting activities that is held for investment. The major components of float are unpaid losses and loss adjustment expenses, life, annuity and health benefit liabilities, unearned premiums and other policyholder liabilities less premium and reinsurance receivables, deferred policy acquisition costs and deferred charges on assumed retroactive reinsurance contracts. On a consolidated basis, float has grown from approximately \$114 billion at the end of 2017 to approximately \$164 billion at the end of 2022. The cost of float can be measured as the net pre-tax underwriting loss as a percentage of average float. The cost of float was nominal in 2022, reflecting a small underwriting loss. In 2021 and 2020, the cost of float was negative, reflecting underwriting earnings in each of those years.

Railroad Business—Burlington Northern Santa Fe

Burlington Northern Santa Fe, LLC (“BNSF”) is based in Fort Worth, Texas, and through BNSF Railway Company (“BNSF Railway”) operates one of the largest railroad systems in North America. BNSF Railway had approximately 36,000 employees at the end of 2022, of whom approximately 31,000 were members of a labor union. BNSF also operates a relatively smaller third-party logistics services business.

In serving the Midwest, Pacific Northwest, Western, Southwestern and Southeastern regions and ports of the U.S., BNSF transports a range of products and commodities derived from manufacturing, agricultural and natural resource industries. Freight revenues are covered by contractual agreements of varying durations or common carrier published prices or company quotations. BNSF's financial performance is influenced by, among other things, general and industry economic conditions at the international, national and regional levels.

BNSF's primary routes, including trackage rights, allow it to access major cities and ports in the western and southern U.S. as well as parts of Canada and Mexico. In addition to major cities and ports, BNSF Railway efficiently serves many smaller markets by working closely with approximately 200 shortline railroads. BNSF Railway has also entered into marketing agreements with other rail carriers, expanding the marketing reach for each railroad and their customers. For the year ending December 31, 2022, 38% of freight revenues were derived from consumer products, 23% from industrial products, 23% from agricultural products and 16% from coal.

Regulatory Matters

BNSF is subject to federal, state and local laws and regulations generally applicable to its businesses. Rail operations are subject to the regulatory jurisdiction of the Surface Transportation Board ("STB"), the Federal Railroad Administration of the United States Department of Transportation ("DOT"), the Occupational Safety and Health Administration ("OSHA"), the Environmental Protection Agency ("EPA"), as well as other federal and state regulatory agencies and Canadian regulatory agencies for operations in Canada. The STB has jurisdiction over disputes and complaints involving certain rates, routes and services, the sale or abandonment of rail lines, applications for line extensions and construction, and the merger with or acquisition of control of rail common carriers. The outcome of STB proceedings can affect the profitability of BNSF Railway's business.

The DOT, OSHA, and EPA have jurisdiction under several federal statutes over a number of safety, health, and environmental aspects of rail operations, including the transportation of hazardous materials. BNSF Railway is required to transport these materials to the extent of its common carrier obligation. State agencies regulate some health, safety, and environmental aspects of rail operations in areas not otherwise preempted by federal law.

Environmental Matters

BNSF's rail operations, as well as those of its competitors, are also subject to extensive federal, state and local environmental regulations covering discharges to the ground or waters, air emissions, toxic substances and the generation, handling, storage, transportation and disposal of waste and hazardous materials. Such regulations effectively increase the costs and liabilities associated with rail operations. Environmental risks are also inherent in rail operations, which frequently involve transporting chemicals and other hazardous materials.

Many of BNSF's land holdings are or have been used for industrial or transportation-related purposes or leased to commercial or industrial companies whose activities may have resulted in discharges onto the property. Under federal (in particular, the Comprehensive Environmental Response, Compensation and Liability Act) and state statutes, BNSF may be held jointly and severally liable for cleanup and enforcement costs associated with a particular site without regard to fault or the legality of the original conduct. BNSF may also be subject to claims by third parties for investigation, cleanup, restoration or other environmental costs under environmental statutes or common law with respect to properties they own that have been impacted by BNSF operations.

Consumption of diesel fuel by locomotives accounted for approximately 80% of BNSF's greenhouse gas ("GHG") emissions in its baseline year of 2018. BNSF management has committed to a broad sustainability model, applying science based approaches, that will provide a 30% reduction in BNSF's GHG-emissions by 2030 from its baseline year of 2018. BNSF intends to continue improvements in fuel efficiency and increased utilization of renewable diesel fuel. Long-term solutions, such as battery-electric and hydrogen locomotives, are also being evaluated and field-tested.

Competition

The business environment in which BNSF operates is highly competitive. Depending on the specific market, deregulated motor carriers and other railroads, as well as river barges, ships and pipelines, may exert pressure on price and service levels. The presence of advanced, high service truck lines with expedited delivery, subsidized infrastructure and minimal empty mileage continues to affect the market for non-bulk, time-sensitive freight. The potential expansion of longer combination vehicles could further encroach upon markets traditionally served by railroads. In order to remain competitive, BNSF Railway and other railroads seek to develop and implement operating efficiencies to improve productivity.

As railroads streamline, rationalize and otherwise enhance their franchises, competition among rail carriers intensifies. BNSF Railway's primary rail competitor in the Western region of the U.S. is the Union Pacific Railroad Company. Other Class I railroads and numerous regional railroads and motor carriers also operate in parts of the same territories served by BNSF Railway.

Utilities and Energy Businesses—Berkshire Hathaway Energy

Berkshire currently holds a 92% ownership interest in Berkshire Hathaway Energy Company (“BHE”), based in Des Moines, Iowa. BHE is a global energy company with subsidiaries and affiliates that generate, transmit, store, distribute and supply energy. BHE’s domestic regulated energy interests are comprised of four regulated U.S. utility companies (collectively, “U.S. utilities”) serving approximately 5.2 million retail customers and five U.S. interstate natural gas pipeline companies with approximately 21,200 miles of operated pipeline having a design capacity of approximately 21 billion cubic feet of natural gas per day. Other energy businesses include electric transmission and distribution operations in Great Britain and Canada, a diversified portfolio of mostly renewable independent power projects and investments, and a liquefied natural gas export, import and storage facility. BHE also owns a residential real estate brokerage firm in the U.S. and a large network of residential real estate brokerage franchises in the U.S. BHE employs approximately 24,000 people in connection with its various operations.

General Matters

BHE’s U.S. utilities include PacifiCorp, MidAmerican Energy Company (“MEC”) and NV Energy, Inc.’s (“NV Energy”) two regulated utility subsidiaries, Nevada Power Company (“Nevada Power”) and Sierra Pacific Power Company (“Sierra Pacific”). PacifiCorp is a regulated electric utility company headquartered in Oregon, serving electric customers in portions of Utah, Oregon, Wyoming, Washington, Idaho and California. The combined service territory’s diverse regional economy ranges from rural, agricultural and mining areas to urban, manufacturing and government service centers. No single segment of the economy dominates the combined service territory, which helps mitigate PacifiCorp’s exposure to economic fluctuations. In addition to retail sales, PacifiCorp sells electricity on a wholesale basis.

MEC is a regulated electric and natural gas utility company headquartered in Iowa, serving electric and natural gas customers primarily in Iowa and also in portions of Illinois, South Dakota and Nebraska. MEC has a diverse retail customer base consisting of urban and rural residential customers and a variety of commercial and industrial customers. In addition to retail sales and natural gas transportation, MEC sells electricity and natural gas on a wholesale basis.

Nevada Power serves retail electric customers in southern Nevada and Sierra Pacific serves retail electric and natural gas customers in northern Nevada. The combined Nevada Power/Sierra Pacific service territory economy includes gaming, mining, recreation, warehousing, manufacturing and governmental services. In addition to retail sales and natural gas transportation, these utilities sell electricity and natural gas on a wholesale basis.

As vertically integrated utilities, BHE’s U.S. utilities collectively own approximately 29,500 net megawatts of generation capacity in operation and under construction. The U.S. utilities’ business is subject to seasonal variations principally related to the use of electricity for air conditioning and natural gas for heating. Typically, regulated electric revenues are higher in the summer months, while regulated natural gas revenues are higher in the winter months.

The natural gas pipelines consist of BHE GT&S, LLC (“BHE GT&S”), Northern Natural Gas Company (“Northern Natural”) and Kern River Gas Transmission Company (“Kern River”). BHE GT&S was acquired on November 1, 2020.

BHE GT&S, based in Virginia, operates three interstate natural gas pipeline systems that consist of approximately 5,400 miles of natural gas transmission, gathering and storage pipelines and operates seventeen underground natural gas storage fields in the eastern region of the U.S. BHE GT&S’s large underground natural gas storage assets and pipeline systems are part of an interconnected gas transmission network that provides transportation services to utilities and numerous other customers. BHE GT&S is also an industry leader in liquefied natural gas solutions through its investments in and ownership of several liquefied natural gas facilities located throughout the eastern region of the U.S.

Northern Natural, based in Nebraska, operates the largest interstate natural gas pipeline system in the U.S., as measured by pipeline miles, reaching from west Texas to Michigan’s Upper Peninsula. Northern Natural’s pipeline system consists of approximately 14,400 miles of natural gas pipelines. Northern Natural’s extensive pipeline system, which is interconnected with many interstate and intrastate pipelines in the national grid system, has access to supplies from multiple major supply basins and provides transportation services to utilities and numerous other customers. Northern Natural also operates three underground natural gas storage facilities and two liquefied natural gas storage peaking units. Northern Natural’s pipeline system experiences significant seasonal swings in demand and revenue, with the highest demand typically occurring during the months of November through March.

Kern River, based in Utah, operates an interstate natural gas pipeline system that consists of approximately 1,400 miles and extends from supply areas in the Rocky Mountains to consuming markets in Utah, Nevada and California. Kern River transports natural gas for electric and natural gas distribution utilities, major oil and natural gas companies or affiliates of such companies, electric generating companies, energy marketing and trading companies, and financial institutions.

Other energy businesses include Northern Powergrid (Northeast) plc and Northern Powergrid (Yorkshire) plc, which own a substantial electricity distribution network that delivers electricity to end-users in northeast England in an area covering approximately 10,000 square miles. These distribution companies primarily charge supply companies regulated tariffs for the use of their distribution systems and serve about 4.0 million electricity end-users. AltaLink L.P. (“AltaLink”) is a regulated electric transmission-only utility company headquartered in Calgary, Alberta. AltaLink’s high voltage transmission lines and related facilities transmit electricity from generating facilities to major load centers, cities and large industrial plants throughout its 87,000 square mile service territory. AltaLink serves approximately 85% of Alberta’s population. BHE and its subsidiaries, also own interests in independent power projects having approximately 6,000 net megawatts of generation capacity that are in service in California, Texas, Illinois, Nebraska, Montana, Australia, New York, Arizona, Canada, Minnesota, Kansas, Iowa and Hawaii. These independent power projects sell power generated primarily from wind, solar, geothermal and hydro sources under long-term contracts. Additionally, \$7.3 billion has been invested in wind projects sponsored by third parties, commonly referred to as tax equity investments.

Regulatory Matters

The U.S. utilities are subject to comprehensive regulation by various federal, state and local agencies. The Federal Energy Regulatory Commission (“FERC”) is an independent agency with broad authority to implement provisions of the Federal Power Act, the Energy Policy Act of 2005 and other federal statutes. The FERC regulates rates for wholesale sales of electricity; transmission of electricity, including pricing and regional planning for the expansion of transmission systems; electric system reliability; utility holding companies; accounting and records retention; securities issuances; construction and operation of hydroelectric facilities; and other matters. The FERC also has the enforcement authority to assess civil penalties of up to \$1.5 million per day per violation of rules, regulations and orders issued under the Federal Power Act. MEC is also subject to regulation by the Nuclear Regulatory Commission pursuant to the Atomic Energy Act of 1954, as amended, with respect to its 25% ownership of the Quad Cities Nuclear Station.

With certain limited exceptions, the U.S. utilities have an exclusive right to serve retail customers within their service territories and, in turn, have an obligation to provide service to those customers. In some jurisdictions, certain classes of customers may choose to purchase all or a portion of their energy from alternative energy suppliers, and in some jurisdictions retail customers can generate all or a portion of their own energy. Historically, state regulatory commissions have established retail electric and natural gas rates on a cost-of-service basis, which are designed to allow a utility the opportunity to recover what each state regulatory commission deems to be the utility’s reasonable costs of providing services, including a fair opportunity to earn a reasonable return on its investments based on its cost of debt and equity. The retail electric rates of U.S. utilities are generally based on the cost of providing traditional bundled services, including generation, transmission and distribution services; however, rates are available for transmission-only and distribution-only services.

Northern Powergrid (Northeast) plc and Northern Powergrid (Yorkshire) plc each charge fees for the use of their distribution systems that are controlled by a formula prescribed by the British electricity regulatory body, the Gas and Electricity Markets Authority. The current eight-year price control period runs from April 1, 2015 through March 31, 2023 and the next price control period is set for the five-year period ending March 31, 2028.

AltaLink is regulated by the Alberta Utilities Commission (“AUC”), pursuant to the Electric Utilities Act (Alberta), the Public Utilities Act (Alberta), the Alberta Utilities Commission Act (Alberta) and the Hydro and Electric Energy Act (Alberta). The AUC is an independent quasi-judicial agency, which regulates and oversees Alberta’s electricity transmission sector with broad authority that may impact many of AltaLink’s activities, including its tariffs, rates, construction, operations and financing. Under the Electric Utilities Act, AltaLink prepares and files applications with the AUC for approval of tariffs to be paid by the Alberta Electric System Operator (“AESO”) for the use of its transmission facilities, and the terms and conditions governing the use of those facilities. The AESO is an independent system operator in Alberta, Canada that oversees Alberta’s integrated electrical system (“AIES”) and wholesale electricity market. The AESO is responsible for directing the safe, reliable and economic operation of the AIES, including long-term transmission system planning.

The natural gas pipelines are subject to regulation by various federal and state agencies. The natural gas pipeline and storage operations of BHE GT&S, Northern Natural and Kern River are regulated by the FERC pursuant to the Natural Gas Act and the Natural Gas Policy Act of 1978. Under this authority, the FERC regulates, among other items, (a) rates, charges, terms and conditions of service; (b) the construction and operation of interstate pipelines, storage and related facilities, including the extension, expansion or abandonment of such facilities; and (c) the construction and operation of liquefied natural gas export/import facilities. Interstate natural gas pipeline companies are also subject to regulations administered by the Office of Pipeline Safety within the Pipeline and Hazardous Materials Safety Administration, an agency of the DOT. Federal pipeline safety regulations are issued pursuant to the Natural Gas Pipeline Safety Act of 1968, as amended, which establishes safety requirements in the design, construction, operation and maintenance of interstate natural gas pipeline facilities.

Environmental Matters

BHE and its energy businesses are subject to federal, state, local and foreign laws and regulations regarding air quality, climate change, emissions performance standards, water quality, coal ash disposal and other environmental matters that have the potential to impact current and future operations. In addition to imposing continuing compliance obligations, these laws and regulations, such as the Federal Clean Air Act, provide regulators with the authority to levy substantial penalties for noncompliance, including fines, injunctive relief and other sanctions.

The Federal Clean Air Act, as well as state laws and regulations impacting air emissions, provides a framework for protecting and improving the nation's air quality and controlling sources of air emissions. These laws and regulations continue to be promulgated and implemented and will impact the operation of BHE's generating facilities and require them to reduce emissions at those facilities to comply with the requirements. In addition, the potential adoption of state or federal clean energy standards, which include low-carbon, non-carbon and renewable electricity generating resources, may also impact electricity generators and natural gas providers.

In December 2015, an international agreement was negotiated by 195 nations to create a universal framework for coordinated action on climate change in what is referred to as the Paris Agreement. The Paris Agreement reaffirms the goal of limiting global temperature increase well below 2 degrees Celsius, while urging efforts to limit the increase to 1.5 degrees Celsius and reaching a global peak of GHG emissions as soon as possible to achieve climate neutrality by mid-century; establishes commitments by all parties to make nationally determined contributions and pursue domestic measures aimed at achieving the commitments; commits all countries to submit emissions inventories and report regularly on their emissions and progress made in implementing and achieving their nationally determined commitments; and commits all countries to submit new commitments every five years, with the expectation that the commitments will be more aggressive in reducing GHG emissions. In the context of the Paris Agreement, the U.S. agreed to reduce GHG emissions by 26% to 28% from 2005 levels by 2025. The Paris Agreement formally became effective on November 4, 2016; however, the U.S. completed its withdrawal from the Paris Agreement on November 4, 2020. President Biden accepted the terms of the climate agreement on January 20, 2021, and the U.S. completed its reentry on February 19, 2021. New commitments to the Paris Agreement were announced in April 2021, with the U.S. pledging to cut its overall GHG emissions by 50% to 52% from 2005 levels by 2030 and to reach 100% carbon pollution-free electricity by 2035. Increasingly, states are adopting legislation and regulations to reduce GHG emissions, and local governments and consumers are seeking increasing amounts of clean and renewable energy.

On June 19, 2019, the EPA repealed the Clean Power Plan and issued the Affordable Clean Energy rule. In the Affordable Clean Energy rule, the EPA determined that the best system of emissions reduction for existing coal fueled power plants is heat rate improvements and identified a set of candidate technologies and measures that could improve heat rates. Measures taken to meet the standards of performance must be achieved at the source itself. On January 19, 2021, the D.C. Circuit Court of Appeals vacated the Affordable Clean Energy rule in its entirety. In October 2021, the U.S. Supreme Court agreed to hear an appeal of that decision. Arguments in the case were held in February 2022 and on June 30, 2022, the U.S. Supreme Court issued its decision regarding the scope of the EPA's authority to regulate GHG emissions under the Clean Air Act. The U.S. Supreme Court held that the "generation shifting" approach in the Clean Power Plan exceeded the powers granted to the EPA by Congress, although the court did not address whether the EPA may only adopt measures applied at the individual source as it did in the Affordable Clean Energy rule. The Biden administration plans to propose a replacement to the Clean Power Plan and Affordable Clean Energy rule by April 2023.

In November 2021, the EPA proposed rules that would reduce methane emissions from both new and existing sources in the oil and natural gas industry. The proposals would expand and strengthen emission reduction requirements for new, modified and reconstructed oil and natural gas sources and would require states to reduce methane emissions from existing sources nationwide. The EPA issued a supplemental proposal in November 2022 to further strengthen emission requirements and intends to finalize the rules by fall 2023.

BHE and its energy subsidiaries continue to focus on delivering reliable, affordable, safe and clean energy to its customers and on actions to mitigate its GHG emissions. BHE's primary source of GHG emissions is the generation of electricity from its power plants that are fueled by coal or natural gas. In managing its electricity generation, BHE works with its regulators to protect the energy and economic needs of customers by considering costs, reliability and sources of electric generation. Over the years, BHE has invested heavily in owned wind, solar and geothermal generation, with cumulative investments of \$31.6 billion through 2022 and has retired 16 coal generation units. As a result, as of December 31, 2022, BHE reduced its annual GHG emissions by more than 27% as compared to 2005 levels. BHE plans to continue investing in wind, solar and other low-carbon generation in the future and to retire an additional 16 coal generation units between 2023 and 2030 in a reliable and cost-effective manner, thereby achieving a 50% reduction in GHG emissions from 2005 levels in 2030.

Non-Energy Businesses

HomeServices of America, Inc. (“HomeServices”) is a residential real estate brokerage firm in the U.S. In addition to providing traditional residential real estate brokerage services, HomeServices offers other integrated real estate services, including mortgage originations and mortgage banking, title and closing services, insurance, home warranties, relocation services and other home-related services. It operates under 55 brand names with approximately 45,000 real estate agents in nearly 930 brokerage offices in 33 states and the District of Columbia.

HomeServices’ franchise network currently includes approximately 300 franchisees and over 1,500 brokerage offices with nearly 51,000 real estate agents under two brand names, primarily in the U.S. In exchange for certain fees, HomeServices provides the right to use the Berkshire Hathaway HomeServices or Real Living brand names and other related service marks, as well as providing orientation programs, training and consultation services, advertising programs and other services.

HomeServices’ principal sources of revenue are dependent on residential real estate sales, which are generally higher in the second and third quarters of each year. This business is highly competitive and subject to general real estate market conditions.

Manufacturing Businesses

Berkshire’s numerous and diverse manufacturing subsidiaries are grouped into three categories: (1) industrial products, (2) building products and (3) consumer products. Berkshire’s industrial products businesses manufacture components for aerospace and power generation applications, specialty chemicals, metal cutting tools, and a variety of other products primarily for industrial use. The building products group produces prefabricated and site-built residential homes, flooring products, insulation, roofing and engineered products, building and engineered components, paint and coatings and bricks and masonry products. The consumer products group manufactures and distributes recreational vehicles, batteries, and various apparel, footwear and other products. Information concerning the major activities of these three groups follows. Berkshire’s manufacturing businesses employed approximately 191,000 people at the end of 2022.

Industrial products

Precision Castparts

Precision Castparts Corp. (“PCC”), based in Lake Oswego, Oregon, manufactures complex metal components and products, provides high-quality investment castings, forgings, fasteners/fastener systems and aerostructures for critical aerospace and power and energy applications. PCC also manufactures investment castings and forgings for general industrial, armament, medical and other applications; nickel and titanium alloys in all standard mill forms from large ingots and billets to plate, foil, sheet, strip, tubing, bar, rod, extruded shapes, rod-in-coil, wire and welding consumables, as well as cobalt alloys, for the aerospace, chemical processing, oil and gas, pollution control and other industries; fasteners for automotive and general industrial markets; specialty alloys for the investment casting and forging industries; heat treating and destructive testing services for the investment cast products and forging industries; grinder pumps and affiliated components for low-pressure sewer systems; critical auxiliary equipment and gas monitoring systems for the power generation industry; and metalworking tools for the fastener market and other applications.

Investment casting technology involves a multi-step process that uses ceramic molds in the manufacture of metal components with more complex shapes, closer tolerances and finer surface finishes than parts manufactured using other methods. PCC uses this process to manufacture products for aircraft engines, industrial gas turbine and other aeroderivative engines, airframes, medical implants, armament, unmanned aerial vehicles and other industrial applications. PCC also manufactures high temperature carbon and ceramic composite components, including ceramic matrix composites, for use in next-generation aerospace engines.

PCC uses forging processes to manufacture components for the aerospace and power generation markets. PCC manufactures high-performance, nickel-based alloys, as well as titanium alloys and products. PCC’s nickel-based alloys are used to produce forged components and investment castings for aerospace and non-aerospace applications in such markets as oil and gas, chemical processing and pollution control. PCC’s titanium products are used to manufacture components for the commercial and military aerospace, power generation, energy, medical, and industrial end markets.

PCC is also a leading developer and manufacturer of highly engineered fasteners, fastener systems, aerostructures and precision components, primarily for critical aerospace applications. These products are produced for the aerospace and power and energy markets, as well as for construction, automotive, heavy truck, farm machinery, mining and construction equipment, shipbuilding, machine tools, medical equipment, appliances and recreation markets.

PCC has several significant customers, including aerospace original equipment manufacturers (“OEMs”) (Boeing and Airbus) and aircraft engine manufacturer suppliers (General Electric, Rolls Royce and Pratt & Whitney). The majority of PCC’s sales are from customer orders or demand schedules pursuant to long-term agreements. Contractual terms may provide for termination by the customer, subject to payment for work performed. PCC typically does not experience significant order cancellations, although periodically it receives requests for delays in delivery schedules.

The effects of the COVID-19 pandemic produced significant adverse effects on the PCC aerospace business in 2020 and 2021. The sudden and material reductions in air travel led to aircraft build rate reductions and customer destocking at extraordinary rates. Further, production delays in Boeing’s 737 MAX and 787 programs during this time also adversely impacted PCC over the past three years.

While commercial air travel increased in both the U.S. and international markets during 2022, traffic remains below pre-COVID-19 pandemic levels, especially for international routes. Further recovery could be uneven, in the event of new COVID-19 variant developments and related travel restrictions, as well as from the changes in supply chain conditions, including the availability of workers. Commercial aircraft delivery rates by OEMs of narrow-body aircraft have rebounded since the onset of the pandemic. However, deliveries of wide-body aircraft remain relatively low, in part attributable to the pause in the Boeing 787 program, which resumed deliveries in the third quarter of 2022. Long-term industry forecasts continue to show growth and strong demand for air travel and aerospace products.

PCC is subject to substantial competition in all of its markets. Components and similar products may be produced by competitors, who use either the same types of manufacturing processes as PCC or other processes. Although PCC believes its manufacturing processes, technology and experience provide its customers advantages, such as high quality, competitive prices and physical properties that often meet more stringent demands, alternative forms of manufacturing can be used to produce many of the same components and products. Nevertheless, PCC is a leading supplier in most of its principal markets. Several factors, including long-standing customer relationships, technical expertise, state-of-the-art facilities and dedicated employees, aid PCC in maintaining competitive advantages.

Several raw materials used in PCC products, including certain metals such as nickel, titanium, cobalt, tantalum and molybdenum, are found in only a few parts of the world. These metals are required for the alloys used in manufactured products. The availability and costs of these metals may be influenced by private or governmental cartels, changes in world politics, labor relations between the metal producers and their workforces and inflation.

PCC is currently subject to various federal, state and foreign environmental laws concerning, among other things, water discharges, air emissions, waste management, toxic materials use reduction and environmental cleanup. Laws and regulations continue to evolve, and it is reasonably possible that environmental standards will become more stringent in the future, particularly under air quality and water quality laws and standards related to climate change, including reporting of GHG emissions. As a result, it is also reasonably likely that PCC will be regularly required to make additional expenditures, including capital expenditures, which could be significant, relating to environmental matters.

Lubrizol

The Lubrizol Corporation (“Lubrizol”), headquartered in Wickliffe, Ohio, is a specialty chemical and performance materials company that manufactures products and supplies technologies for the global transportation, industrial and consumer markets. Lubrizol currently operates two business segments: Lubrizol Additives, which produces engine lubricant additives, driveline lubricant additives and industrial specialties products; and Lubrizol Advanced Materials, which includes engineered materials (engineered polymers and performance coatings) and life sciences (beauty and personal care, and health and home care solutions).

Lubrizol Additives’ products are used in a broad range of applications including engine oils, transmission fluids, gear oils, specialty driveline lubricants, fuels, metalworking fluids and compressor lubricants for transportation and industrial applications. Lubrizol Advanced Materials’ products are used in many different types of applications including beauty, personal care, home care, over-the-counter pharmaceuticals, medical devices, performance coatings, sporting goods, plumbing and fire sprinkler systems. Lubrizol is an industry leader in many of the markets in which it competes, and its principal lubricant additives competitors are Infineum International Ltd., Chevron Oronite Company and Afton Chemical Corporation. Lubrizol Advanced Materials’ businesses compete in many markets with a variety of competitors in each product line.

With its considerable patent portfolio, Lubrizol uses its technological leadership position and applies its science capabilities, formulation know-how and market expertise in product development to improve the demand, quality and value of its solutions. Lubrizol also leverages its scientific and applications knowledge to meet and exceed customer performance and sustainability requirements. While Lubrizol typically has patents that expire each year, it invests resources to protect its intellectual property and to develop or acquire innovative products for the markets it serves. Lubrizol uses many specialty and commodity chemical raw materials in its manufacturing processes. Raw materials are primarily feedstocks derived from petroleum and petrochemicals and, generally, are obtainable from several sources. The materials that Lubrizol chooses to purchase from a single source typically are subject to long-term supply contracts to ensure supply reliability.

Lubrizol operates its business on a global basis through more than 100 offices, laboratories, production facilities and warehouses on six continents, the most significant of which are North America, Europe, Asia and South America. Lubrizol markets its products worldwide through direct sales, sales agents and distributors. Lubrizol's customers principally consist of major global and regional oil companies and industrial and consumer products companies. Some of Lubrizol's largest customers also may be suppliers. During 2022, no single customer accounted for more than 10% of Lubrizol's consolidated revenues. In recent years, the COVID-19 pandemic, supply chain disruptions, severe weather and fires at certain Lubrizol facilities affected the availability of raw materials and fulfillment of customer orders and otherwise disrupted Lubrizol's operations.

Lubrizol expends significant capital to ensure the safety of its employees and the communities where it operates, as well as delivering on its commitments to operational excellence and cybersecurity. Lubrizol also makes significant capital investments to ensure reliable supply and compliance with regulations governing its operations, while reducing their environmental footprint.

Lubrizol is subject to foreign, federal, state and local laws to protect the environment, limit manufacturing waste and emissions, ensure product and employee safety and regulate trade. While the company believes that its policies, practices and procedures are designed to limit the associated risks and consequent financial liability, the operation of chemical manufacturing plants entails inherent environmental, safety and other risks, and significant capital expenditures, costs or liabilities could be incurred in the future.

IMC International Metalworking Companies

IMC International Metalworking Companies ("IMC") is one of the three largest multinational manufacturers of consumable precision carbide metal cutting tools for applications in a broad range of industrial end markets. IMC's principal brand names include ISCAR®, TaeguTec®, Ingersoll®, Tungaloy®, Unitac®, UOP®, It.te.di®, Qutiltec®, Tool—Flo®, PCT®, IMCO® and BSW. IMC's primary manufacturing facilities are located in Israel, the U.S., South Korea, Japan, Germany, Italy, Switzerland, India and China.

IMC has five primary product lines: milling tools, gripping tools, turning/thread tools, drilling tools and tooling. The main products are split within each product line between consumable cemented tungsten carbide inserts and steel tool holders. Inserts comprise a major portion of IMC's sales and earnings. Metal cutting inserts are used by industrial manufacturers to cut metals and are consumed during their use in cutting applications. IMC manufactures hundreds of types of highly engineered inserts within each product line that are tailored to maximize productivity and meet the technical requirements of customers. IMC's staff of scientists and engineers continuously develop and innovate products that address end user needs and requirements.

IMC's global sales and marketing network operates in nearly every major manufacturing center around the world, staffed with highly skilled engineers and technical personnel. IMC's customer base is very diverse, with its primary customers being large, multinational businesses in the automotive, aerospace, engineering and machinery industries. IMC operates a regional central warehouse system with locations in Israel, the U.S., Belgium, Korea, Japan and China. Additional small quantities of products are maintained at local IMC sales offices to provide on-time customer support and inventory management.

IMC competes in the metal cutting tools segment of the global metalworking tools market. The segment includes hundreds of participants who range from small, private manufacturers of specialized products for niche applications and markets to larger, global multinational businesses (such as Sandvik and Kennametal, Inc.) with a wide assortment of products and extensive distribution networks. Other manufacturing companies such as Kyocera, Mitsubishi, Sumitomo, Ceratizit and Korloy also play a significant role in the cutting tool market.

Cemented tungsten carbide powder is the main raw material used in manufacturing cutting tools. Most of IMC's insert products are made from tungsten. While supplies are currently adequate, a significant disruption or constraints in production processing facilities could cause reduced availability and increased prices.

IMC is committed to following and complying with all government and environmental rules, regulations and requirements and applicable laws. IMC considers environmental preservation and pollution prevention as important factors in all operations and activities. IMC production facilities are built with the highest standards and follow all applicable regulations.

Marmon

Marmon Holdings, Inc. (“Marmon”), headquartered in Chicago, Illinois, is a global industrial organization comprising eleven diverse business groups and more than 100 autonomous manufacturing and service businesses. Marmon’s manufacturing and service operations are conducted at approximately 400 manufacturing, distribution and service facilities located primarily in the U.S., as well as 18 other countries worldwide. Marmon’s business groups are as follows.

Foodservice Technologies manufactures beverage dispensing and cooling equipment, hot and cold food preparation and holding equipment and related products for restaurants, global brand owners and other foodservice providers. Operations are based in the U.S. with manufacturing facilities in the U.S., Mexico, China, Czech Republic and Italy. Products are sold primarily throughout the U.S., Europe and Asia.

Water Technologies manufactures water treatment equipment for residential, commercial and industrial applications worldwide. Operations are based primarily in the U.S., Canada, China, Singapore, India and Poland with business centers located in Belgium, France, Germany, the U.K. and Italy.

Transportation Products serves the automotive, heavy-duty highway transportation and aerospace industries with precision-molded plastic components; fastener thread solutions; metal tubing; auto aftermarket transmission and chassis products; platform and lowbed trailers; and truck and trailer components. Operations and business are conducted primarily in the U.S., Mexico, Canada, Europe and Asia.

Retail Solutions provides retail environment design services; in-store digital merchandising, dispensing and display fixtures; shopping, material handling and security carts. Operations and business are conducted in the U.S., the U.K. and Czech Republic.

Metal Services provides specialty metal pipe, tubing and related value-added services to customers across a broad range of industries. Operations are based in the U.S., Canada and Mexico and business is conducted primarily in those countries.

Electrical produces electrical wire for use in residential and commercial buildings, and specialty wire and cable for use in energy, transit, aerospace, defense, communication and other industrial applications. Operations are based in the U.S., Canada, India and England. Business is conducted globally and primarily in the U.S., Canada, India, the U.K., U.A.E. and China.

Plumbing & Refrigeration supplies copper tubing and copper, brass, aluminum and stainless-steel fittings and components for the plumbing, heating, ventilation and air conditioning (HVAC) and refrigeration markets; custom coils, ducting, air handling units and heat pipe for the HVAC market; HVAC systems and structures for military, nuclear and medical markets and aluminum and brass forgings for many commercial and industrial applications. Business and operations are conducted primarily in the U.S., Canada and the U.K.

Industrial Products supplies construction fasteners; masonry and stone anchoring systems used in commercial construction; two component polymer products for anchoring, bonding and repair applications, gloves and other protective wear; gear drives, gearboxes, fan and pump drives for various markets; wind machines for agricultural use; wheels, axles and gears for rail, mining and other applications; lighting products for industrial and mining; and equipment for the manufacture and assembly of lead acid batteries. Operations are primarily based in the U.S., the U.K., Canada and China and business is conducted in those countries.

Rail & Leasing manufactures, leases and maintains railcars; leases intermodal tank containers; manufactures mobile railcar movers; provides in-plant rail switching and loading services; performs track construction and maintenance; and manufactures steel tank heads and cylinders.

Union Tank Car Company (“UTLX”) is the largest component of the Rail & Leasing group and is a leading designer, builder and full-service lessor of railroad tank cars and other specialized railcars. Together with its Canadian affiliate Procor, UTLX owns a fleet of approximately 120,000 railcars for lease to customers in chemical, petrochemical, energy and agricultural/food industries. UTLX manufactures tank cars in the U.S. and performs railcar maintenance services at more than 100 locations across North America.

UTLX has a diversified customer base, both geographically and across industries. UTLX, while subject to cyclicality and significant competition in most of its markets, competes by offering a broad range of high-quality products and services targeted at its niche markets. Railcars are typically leased for multiple-year terms and most of the leases are renewed upon expiration. Due to selective ongoing capital investment, utilization rates (the number of railcars on lease as a percentage of the total fleet) of the railcar fleet are generally high.

Intermodal tank containers are leased through EXSIF Worldwide. EXSIF is a leading international lessor of intermodal tank containers with a fleet of approximately 74,000 units, primarily serving chemical producers and logistics operators. In May 2022, EXSIF exited its Russia business, which resulted in the sale of approximately 7,300 intermodal tank containers.

Crane Services is a provider of mobile cranes and operators in North America and Australia with a combined fleet of approximately 1,100 cranes, primarily serving the energy, mining, petrochemical and infrastructure markets. Cranes are leased on either a fully operated and maintained service basis or on an equipment-only basis. The Crane Services group is subject to customer seasonality, with typical concentration of volume in the warmer months.

Medical develops, manufactures and distributes a wide range of innovative medical devices in the extremities fixation, craniomaxillofacial surgery, neurosurgery, biologics, aesthetics and powered instruments markets. The group's leading-edge medical technology and products are used globally to help improve patient care and outcomes. Operations are based in the U.S., Europe and China and business is conducted primarily in North and South America, Europe, Asia and Australia.

Certain Marmon businesses, including the Rail and Medical groups, are subject to government regulation and oversight. Marmon has numerous known environmental matters which are subject to on-going monitoring and/or remediation efforts. Marmon follows all federal, state and local environmental regulations.

Other industrial products

CTB International Corp. ("CTB"), headquartered in Milford, Indiana, is a leading global designer, manufacturer and marketer of a wide range of agricultural systems and solutions for preserving grain, producing poultry, pigs and eggs, and for processing poultry, fish, vegetables and other foods. CTB operates from facilities located around the globe and supports customers through a worldwide network of independent distributors and dealers.

CTB competes with a variety of manufacturers and suppliers, including many that offer only a limited number of the products offered by CTB, as well as a few that offer products across several of CTB's product lines. Competition is based on the price, value, reputation, quality and design of the products offered and the customer service provided by distributors, dealers and manufacturers of the products. CTB's leading brand names, distribution network, diversified product line, product support and high-quality products enable it to compete effectively. CTB manufactures its products primarily from galvanized steel, steel wire, stainless steel and polymer materials. The availability of these materials in recent years has been adequate.

LiquidPower Specialty Products Inc. ("LSPI"), headquartered in Houston, Texas, is a global leader in the science of drag reduction application ("DRA") technology by maximizing the flow potential of pipelines, increasing operational flexibility and throughput capacity, and efficiencies for customers. LSPI develops innovative flow improver solutions with customers in over 20 countries on five continents, treating over 50 million barrels of hydrocarbon liquids per day. LSPI's DRA offering is part of a comprehensive, full-service solution that encompasses industry-leading technology, quality manufacturing, technical support and consulting, a reliable supply chain, injection equipment and field service. LSPI is subject to foreign, federal, state and local laws to protect the environment and limit manufacturing waste and emissions.

The Scott Fetzer companies are a group of businesses that manufacture, distribute, service and finance a wide variety of products for residential, industrial and institutional use. The industrial products group also includes certain manufacturing subsidiaries of Alleghany acquired in October 2022. The Alleghany businesses include the structural steel fabrication products business conducted through W&W|AFCO Steel. Additionally, the Alleghany businesses included certain other smaller manufacturers that primarily became part of Marmon.

Building Products

Clayton

Clayton Homes, Inc. ("Clayton"), headquartered near Knoxville, Tennessee, is a vertically integrated housing company offering traditional site-built homes and off-site (factory) built housing, including modular, manufactured, CrossMod™ and tiny homes. In 2022, Clayton delivered approximately 53,000 off-site built and 11,750 site-built homes. Clayton also offers home financing and insurance products and competes on price, service, location and delivery capabilities.

All Clayton Built® off-site built homes are designed, engineered and assembled in the U.S. As of December 2022, off-site backlog was \$256 million, down 82% from the prior year end. Clayton sells off-site built homes through independent and company-owned home centers, realtors and subdivision channels. Clayton considers its ability to offer financing to retail purchasers a factor affecting the marketplace acceptance of its off-site built homes. Clayton's financing programs utilize proprietary loan underwriting guidelines to evaluate loan applicants.

Since 2015, Clayton's site-built division, Clayton Properties Group, has expanded through the acquisition of nine builders across 18 states with over 310 subdivisions, supplementing the portfolio of housing products offered to customers. Clayton's site-builders currently own and control approximately 70,000 homesites, with a home order backlog of approximately \$1.4 billion as of December 2022.

Historically, access to key housing inputs such as lumber, steel and resin products has been adequate. During 2021 and the first half of 2022, the availability and pricing of these and other inputs was volatile. Input shortages coupled with reduced labor and subcontractor availability increased the time needed to construct a home, increasing the levels of work-in-process inventory. These constraints began to lessen in the latter half of 2022 due to improved availability and pricing of key inputs, increased order cancellations and lower overall demand for new home construction.

Clayton's building products business has benefited in recent years from the low interest rate environment. However, interest rates in the U.S. increased significantly during 2022, which contributed to slowing demand for new home construction.

Clayton's home building business regularly makes capital and non-capital expenditures with respect to compliance with federal, state and local environmental regulations, primarily related to erosion control, permitting and stormwater protection for site-built home subdivisions. The financing business originates and services loans which are federally regulated by the Consumer Financial Protection Bureau, various state regulatory agencies and reviewed by the U.S. Department of Housing and Urban Development, the Government National Mortgage Association and government-sponsored enterprises.

Shaw

Shaw Industries Group, Inc. ("Shaw"), headquartered in Dalton, Georgia, is a leading manufacturer and distributor of carpet, carpet tile, and hard surface flooring products. Shaw designs and manufactures over 4,000 styles of tufted carpet, wood and resilient flooring for residential and commercial use under about 30 brand and trade names and under certain private labels. Soft and hard surface products are available in a broad range of patterns, colors and textures. Shaw's carpet manufacturing operations are fully integrated from the processing of raw materials used to make fiber through to the finishing. Shaw's flooring businesses are primarily in the U.S. and it also manufactures in China and the U.K. and distributes carpet tile throughout Europe and Southeast Asia. Shaw manufactures or distributes a variety of hardwood, wood plastic composite (WPC), stone plastic composite (SPC), vinyl and laminate floor products ("hard surfaces"). Shaw's Integrated Solutions business also provides project management and installation services.

Shaw operates Shaw Sports Turf, Sawgrass and Southwest Greens International, LLC, which provide synthetic sports turf, golf greens and landscape turf products. Since 2021, Shaw's businesses include Watershed Geosynthetics, LLC, which sells innovative and patented environmental solutions for utility, waste management, erosion control and mining industries.

Shaw products are sold wholesale to over 46,000 retailers, distributors and commercial users throughout the U.S., Canada, Mexico and the U.K. Products are also exported to various overseas markets. Shaw's wholesale products are marketed domestically by over 2,000 salaried and commissioned sales personnel directly to retailers and distributors and to large national accounts. Shaw's seven carpet and nine hard surface facilities, one sample full-service distribution facility, three sample satellite locations and 30 redistribution centers, along with centralized management information systems, enable it to provide prompt and efficient delivery of its products to both its retail customers and wholesale distributors.

Substantially all carpet manufactured by Shaw is tufted carpet made from nylon, polypropylene and polyester, as well as recycled materials. During 2022, Shaw processed approximately 89% of its requirements for carpet yarn in its own yarn processing facilities. The availability of raw materials is adequate, but costs are impacted by petro-chemical and natural gas price changes. A significant portion of Shaw's soft-flooring raw materials derive from recycled sources. Raw material cost changes are periodically factored into selling prices to customers.

The soft floor covering industry is highly competitive with only a handful of major competitors domestically. There are numerous manufacturers, domestically and internationally, that are engaged in the hard surfaces flooring sector. According to industry estimates, carpet accounts for approximately 41% of the total U.S. consumption of all flooring types. The principal competitive measures within the floor covering industry are quality, style, price and service.

Johns Manville

Johns Manville Corporation ("JM"), headquartered in Denver, Colorado, is a leading manufacturer and marketer of premium-quality products for building insulation, mechanical and industrial insulation, commercial roofing and roof insulation, as well as reinforcement fiberglass and technical nonwovens. JM serves markets that include aerospace, automotive and transportation, air handling, appliance, HVAC, pipe and equipment, air and liquid filtration, waterproofing, building, flooring, interiors and wind energy. Fiberglass is the basic material in many of JM's products, although JM also manufactures a significant portion of its products with other materials to satisfy the broader needs of its customers.

JM regards its patents and licenses as valuable; however it does not consider any of its businesses to be materially dependent on any single patent or license. JM operates over 40 manufacturing facilities in North America and Europe and conducts research and development at its technical center in Littleton, Colorado and at other facilities in the U.S. and Europe.

Fiberglass is made from earthen raw materials and recycled glass. JM's products also contain materials other than fiberglass, including chemical agents to bind many of its glass fibers and various chemical-based and petrochemical-based materials used in roofing and other specialized products. JM uses recycled material when available and suitable to satisfy the broader needs of its customers. The raw materials used in these various products are generally readily available in sufficient quantities from various sources to maintain and expand its current production levels.

JM's operations are subject to a variety of federal, state and local environmental laws and regulations, which regulate or impose liability for the discharge of materials into the air, land and water and govern the use and disposal of hazardous substances and use of chemical substances. The most relevant of the federal laws are the Federal Clean Air Act, the Clean Water Act, the Toxic Substances Control Act, the Resource Conservation and Recovery Act and the Comprehensive Environmental Response, Compensation and Liability Act, which are administered by the EPA. Canadian and European regulatory authorities have also adopted their own environmental laws and regulations. JM continually monitors new and pending regulations and assesses their potential impact on the business. JM's capital projects regularly address environmental compliance and are generally incidental to other capital projects.

JM sells its products through a wide variety of channels including contractors, distributors, retailers, manufacturers and fabricators. JM operates in highly competitive markets, with competitors comprising primarily large global and national manufacturers and smaller regional manufacturers. JM holds leadership positions in the key markets that it serves. JM's products compete primarily on value, differentiation and customization, breadth of product line, quality and service. Sales of JM's products are moderately seasonal due to increases in construction activity that typically occur in the second and third quarters of the calendar year.

MiTek

MiTek Industries, Inc. ("MiTek"), based in Chesterfield, Missouri, operates in two separate building markets: residential and commercial. MiTek operates worldwide with sales in over 100 countries and with manufacturing facilities and/or sales/engineering offices located in 20 countries.

In the residential building market, MiTek is a leading supplier of engineered connector products, construction hardware, engineering software and services, and computer-driven manufacturing machinery to the truss component market of the building components industry. MiTek's primary customers are component manufacturers who manufacture prefabricated roof and floor trusses and wall panels for the residential building market. MiTek also sells construction hardware to commercial distributors and do-it-yourself retail stores.

A significant raw material used by MiTek is hot dipped galvanized sheet steel. While supplies are presently adequate, variations in supply have historically occurred, producing significant variations in cost and availability.

Benjamin Moore

Benjamin Moore & Co. ("Benjamin Moore"), headquartered in Montvale, New Jersey, is one of North America's leading manufacturers of premium quality residential, commercial and industrial maintenance coatings. Benjamin Moore is committed to innovation and sustainable manufacturing practices. The Benjamin Moore premium portfolio includes Aura®, Regal® Select, Ultra Spec®, ben®, ADVANCE®, ARBORCOAT® and others. The Benjamin Moore diversified brands include specialty and architectural paints from Coronado® and Insl-x®.

Benjamin Moore coatings are available through more than 8,000 independently owned and operated paint, decorating and hardware retailers, including approximately 3,800 Ace Hardware ("Ace") stores, throughout the U.S. and Canada as well as 75 countries globally. Benjamin Moore became the preferred paint supplier for the aforementioned Ace Stores in 2019 through an agreement which affords these stores the opportunity to carry a full line of Benjamin Moore products or a streamlined offering of certain branded products. As part of the agreement, Benjamin Moore assumed responsibility for manufacturing Clark+Kensington® and Royal®, as well as the balance of Ace's private label paint brands.

Benjamin Moore also allows customers to directly order coatings or color samples online or, for national accounts and government agencies, via its customer information center, for delivery to the customer or a retailer near the customer.

Benjamin Moore competes with numerous manufacturers, distributors and paint, coatings and related products retailers. Product quality, product innovation, breadth of product line, technical expertise, service and price determine the competitive advantage. Competitors include other premium paint and decorating stores, mass merchandisers, home centers, independent hardware stores, hardware chains and manufacturer-operated direct outlets, such as Sherwin-Williams Company, PPG Industries, Inc., The Home Depot, Inc. and Lowe's Companies, Inc.

The most significant raw materials in Benjamin Moore products are titanium dioxide, monomers, polymers and pigments. Historically, these materials have been generally available, with pricing and availability subject to fluctuation. However, Benjamin Moore experienced raw material constraints concurrent with the COVID-19 pandemic. These constraints began to ease in the second half of 2022, allowing for the return to normal production scheduling, replenishment of overall finished goods inventory levels and the reduction of customer order cancellations. Some limited constraints remain with alkyd raw materials resulting in elevated cancellation quantities for orders with those products. Benjamin Moore continually evaluates processes, including evaluating raw material substitutions and sourcing from alternative vendors, to optimize production capacity to meet future demand.

Benjamin Moore undertakes to comply with applicable regulations relating to protection of the environment and workers' safety and Benjamin Moore products meet or exceed environmental standards. Benjamin Moore has certain known past environmental matters, which are subject to on-going monitoring and/or remediation efforts.

Acme

Acme Brick Company ("Acme"), headquartered in Fort Worth, Texas, manufactures and distributes clay bricks (Acme Brick®) and concrete block (Featherlite). In addition, Acme distributes numerous other building products of other manufacturers, including floor and wall tile, wood flooring and other masonry products. Products are sold primarily in the South Central and Southeastern U.S. through company-operated sales offices. Acme distributes products primarily to homebuilders and masonry and general contractors.

Acme currently operates 12 clay brick manufacturing sites located in four states and three concrete block facilities in Texas. The demand for Acme's products is seasonal, with higher sales in the warmer weather months, and is subject to the level of construction activity, which is cyclical. Acme also owns and leases properties and mineral rights that supply raw materials used in many of its manufactured products. Acme's raw materials supply is believed to be adequate.

The brick industry is subject to the EPA Maximum Achievable Control Technology Standards ("MACT"). As required under the 1990 Clean Air Act, the EPA developed a list of source categories that require the development of National Emission Standards for Hazardous Air Pollutants, which are also referred to as MACT Standards ("Rule"). Key elements of the MACT Rule include emission limits established for certain hazardous air pollutants and acidic gases. Acme's brick plants are in compliance with the current Rule.

Consumer Products

Recreational vehicles

Forest River, Inc. ("Forest River"), headquartered in Elkhart, Indiana, is a manufacturer of recreational vehicles ("RV"), utility cargo trailers, buses and pontoon boats with products sold in the U.S. and Canada through an independent dealer network. Forest River has numerous manufacturing facilities located in six states and is a leading manufacturer of RVs with numerous brand names, including Forest River, Coachmen RV and Prime Time. Utility cargo trailers are sold under a variety of brand names. Buses are sold under several brand names, including Starcraft Bus. Pontoon boats are sold under the Berkshire, South Bay and Trifecta brand names.

The RV industry is highly competitive. Competition is based primarily on price, design, quality and service. The industry has consolidated over the past several years and is currently concentrated in a few companies, the largest of which had a market share of approximately 42% based on industry data as of September 2022. Forest River held a market share of approximately 33% at that time. Forest River is subject to regulations of the National Traffic and Motor Vehicle Safety Act, the safety standards for recreational vehicles established by the U.S. Department of Transportation and similar laws and regulations issued by the Canadian government. Forest River is a member of the Recreational Vehicle Industry Association, a voluntary association of RV manufacturers which promotes safety standards for RVs. Forest River believes its products comply in all material respects with the standards that govern its products.

Apparel and footwear

Fruit of the Loom Inc. (“FOL”), headquartered in Bowling Green, Kentucky, is primarily a manufacturer and distributor of basic apparel, underwear, casualwear, athletic apparel and sports equipment. Products under the Fruit of the Loom® and JERZEES® labels are primarily sold in the mass merchandise, mid-tier chains and wholesale markets. In the Vanity Fair Brands product line, Vassarette®, Curvation® and Radiant® by Vanity Fair are sold in the mass merchandise market, while Vanity Fair® and Lily of France® products are sold to mid-tier chains and department stores. FOL also markets and sells athletic apparel and sports equipment to team dealers and to sporting goods retailers under the Russell Athletic® and Spalding® brands. Additionally, Spalding® markets and sells sports equipment in the mass merchandise market and dollar store channels.

FOL generally performs its own knitting, cloth finishing, cutting, sewing and packaging for apparel. For the North American market, which is FOL’s predominant sales region, cloth manufacturing is primarily performed in Honduras. Labor-intensive cutting, sewing and packaging operations are in Central America, the Caribbean and Vietnam. For the European market, products are either sourced from third-party contractors in Europe or Asia or sewn in Morocco from textiles internally produced in Morocco. Bras, athletic equipment, sporting goods and other athletic apparel lines are generally sourced from third-party contractors located primarily in Asia.

U.S.-grown cotton fiber and U.S.-manufactured polyester fiber are the main raw materials used in manufacturing FOL’s products. Historically, fibers have been purchased from a limited number of third parties, including one key supplier that provided the majority of FOL’s yarn spinning/raw material conversion services. Supply chain disruptions in 2021 and 2022 caused FOL to utilize alternative sources for these raw materials/services. FOL has since engaged an additional supplier for a portion of FOL’s yarn spinning/raw material conversion services. FOL’s markets are highly competitive, consisting of many domestic and foreign manufacturers and distributors. Competition is generally based upon product features, quality, customer service and price.

Garan Incorporated (“Garan”), headquartered in New York, New York designs, manufactures, imports and sells apparel primarily for children, including boys, girls, toddlers and infants. Products are sold under its own trademarks Garanimals® and 365 Kids from Garanimals® and easy-peasy®, as well as customer private label brands. Garan conducts its business through operating subsidiaries located in the U.S., Central America and Asia. Garan’s products are sold through its distribution centers in the U.S. Fechheimer Brothers Company (“Fechheimers”) manufactures and distributes uniforms, principally for the public service and safety markets, including police, fire, postal and military markets. Fechheimers is based in Cincinnati, Ohio.

The BH Shoe Holdings Group, headquartered in Greenwich, Connecticut, manufactures and distributes work, rugged outdoor and casual shoes and western-style footwear under a number of brand names, including Justin, Tony Lama®, Chippewa®, BØRN®, B•Ø•C®, Carolina®, EuroSofft, Söfft, Double-H Boots®, Nursemates® and Comfortiva®. Brooks Sports, Inc., headquartered in Seattle, Washington, markets and sells performance running footwear and apparel to specialty and national retailers and directly to consumers under the Brooks® brand. A significant volume of the shoes sold by Berkshire’s shoe businesses are manufactured or purchased from sources located outside the U.S. Products are sold worldwide through a variety of channels including department stores, footwear chains, specialty stores, catalogs and the Internet, as well as through company-owned retail stores.

Other consumer products

The Duracell Company (“Duracell”), headquartered in Chicago, Illinois, is a leading manufacturer of high-performance alkaline and lithium coin batteries. Duracell manufactures batteries in the U.S., Europe and China and provides a network of worldwide sales and distribution centers. Duracell sells its products to a diverse group of retailers and distributors across the globe. There are several competitors in the battery manufacturing market with Duracell holding an approximately 29% market share of the global alkaline battery market. Management believes there are currently sufficient sources of raw materials available, which are primarily steel, zinc, manganese and nickel-based chemistries.

Albecca Inc. (“Albecca”), headquartered in Suwanee, Georgia, operates in the U.S., Canada and 11 other countries, with products primarily under the Larson-Juhl® name. Albecca designs, manufactures and distributes a complete line of high quality, branded custom framing products, including wood and metal moulding, matboard, foamboard, glass and framing supplies. Complementary to its framing products, Albecca offers art printing and fulfillment services.

Richline Group, Inc., headquartered in New York, New York, operates five strategic business units: Richline Jewelry, Richline Digital, LeachGarner, Rio Grande and Inverness. Each business unit is a manufacturer and/or distributor of precious metal, non-precious metal, diamond and gem products to specific target markets including large jewelry chains, department stores, shopping networks, mass merchandisers, e-commerce retailers and artisans as well as certain global manufacturers and wholesalers in the medical, electronics and aerospace industries.

The consumer products group also includes Jazwares, LLC and its subsidiaries and affiliates, (“Jazwares”), acquired in October 2022 in connection with Alleghany. Jazwares is a global toy company headquartered in Sunrise, Florida.

Service and Retailing Businesses

Service Businesses

Berkshire’s service businesses provide grocery and foodservice distribution, professional aviation training programs, shared aircraft ownership programs and distribution of electronic components. Other service businesses include franchising and servicing of quick service restaurants, media businesses (television and information distribution), as well as logistics businesses. Berkshire’s service businesses employed approximately 55,000 people at the end of 2022. Information concerning these activities follows.

McLane

McLane Company, Inc. (“McLane”) provides wholesale distribution services in all 50 states to customers that include convenience stores, discount retailers, wholesale clubs, drug stores, military bases, quick service restaurants and casual dining restaurants. McLane’s major customers during 2022 included Walmart (approximately 15.5% of revenues); 7-Eleven (approximately 14.2% of revenues); and Yum! Brands, (approximately 12.0% of revenues). McLane’s business model is based on a high volume of sales, rapid inventory turnover and stringent expense controls. Operations are currently divided into three business units: grocery distribution, foodservice distribution and beverage distribution.

McLane’s grocery distribution unit, based in Temple, Texas, maintains a dominant market share within the convenience store industry and serves most of the national convenience store chains and major oil company retail outlets. Grocery operations provide products to approximately 48,500 retail locations nationwide. McLane’s grocery distribution unit operates 25 distribution facilities in 20 states.

McLane’s foodservice distribution unit, based in Carrollton, Texas, focuses on serving the quick service and casual dining restaurant industry with high quality, timely-delivered products. Operations are conducted through 47 facilities in 22 states. The foodservice distribution unit services approximately 33,600 restaurants nationwide.

Through its subsidiaries, McLane also operates wholesale distributors of distilled spirits, wine and beer. The beverage unit operates as Empire Distributors and operations are conducted through 14 distribution centers in Georgia, North Carolina, Tennessee and Colorado. Empire Distributors services approximately 27,600 retail locations in the southeastern U.S. and Colorado.

FlightSafety

FlightSafety International Inc. (“FlightSafety”) is an industry leading provider of professional aviation training services and flight simulation products. FlightSafety and FlightSafety Textron Aviation Training, a joint venture with Textron, provide high technology training to pilots, aircraft maintenance technicians, flight attendants and dispatchers who operate and support a wide variety of business, commercial and military aircraft. The training is provided using a large fleet of advanced full flight simulators at learning centers and training locations in the U.S., Australia, Brazil, Canada, France, Japan, Singapore, Norway, South Africa and the U.K. Compliance with applicable environmental regulations is an inherent requirement to operate the facilities. The vast majority of the instructors, training programs and flight simulators are qualified by the United States Federal Aviation Administration (“FAA”) and other aviation regulatory agencies around the world.

FlightSafety is also a leader in the design and manufacture of full flight simulators, visual systems, displays and other advanced technology training devices. This equipment is used to support FlightSafety training programs and is offered for sale to airlines and government and military organizations around the world. Manufacturing facilities are located in Oklahoma, Missouri and Illinois. FlightSafety strives to maintain and manufacture simulators and develop courseware using state-of-the-art technology and invests in research and development as it builds new equipment and training programs.

NetJets

NetJets Inc. (“NetJets”) is the leader in private aviation services and operates a large, diverse private aircraft fleet and offers a full range of personalized private aviation solutions to meet and exceed the high standards of its customers. NetJets’ global headquarters is located in Columbus, Ohio. NetJets’ European operations are based in Lisbon, Portugal. The shared ownership concept is designed to meet the travel needs of customers who require the scale, flexibility and access of a large fleet of aircraft as opposed to reliance on whole aircraft ownership. In addition, shared ownership programs are available for corporate flight departments seeking to outsource their general aviation needs or add capacity for peak periods and for others that previously chartered aircraft.

NetJets’ programs are focused on safety and service and are designed to offer customers guaranteed availability of aircraft, predictable operating costs and increased liquidity. NetJets’ shared aircraft ownership programs permit customers to acquire a specific percentage of a certain aircraft type and allows customers to utilize the aircraft for a specified number of flight hours annually. In addition, NetJets offers prepaid flight cards and other aviation solutions and services for aircraft management, customized aircraft sales and acquisition, ground support and flight operation services under several programs including NetJets Shares™, NetJets Leases™ and the NetJets Card Program™.

NetJets is subject to the rules and regulations of the FAA, the Portuguese Civil Aviation Authority and the European Union Aviation Safety Agency. Regulations address aircraft registration, maintenance requirements, pilot qualifications and airport operations, including flight planning and scheduling as well as security issues and other matters. NetJets maintains comprehensive training and development programs in compliance with regulatory requirements for pilots, flight attendants, maintenance mechanics, and other flight operations specialists, many of whom are represented by unions.

TTI

TTI, Inc. (“TTI”), headquartered in Fort Worth, Texas, is a global specialty distributor of passive, interconnect, electromechanical, discrete, and semiconductor components used by customers in the manufacturing and assembling of electronic products. TTI’s customer base includes OEMs, electronic manufacturing services, original design manufacturers and military and commercial customers, as well as design and system engineers. TTI’s distribution agreements with the industry’s leading suppliers allow it to uniquely leverage its product cost and to expand its business by providing new lines and products to its customers. TTI operates sales offices and distribution centers from more than 100 locations throughout North America, South America, Europe and Asia.

TTI services a variety of industries including telecommunications, medical devices, computers and office equipment, military/aerospace, automotive and industrial electronics. TTI’s core customers include businesses in the design through production stages in the electronic component supply chain, which supports its high-volume business, and its Mouser subsidiary, which supports a broader base of customers with lower volume purchases through internet-based marketing.

Other services

XTRA Corporation (“XTRA”), headquartered in St. Louis, Missouri, is a leading transportation equipment lessor operating under the XTRA Lease® brand name. XTRA manages a diverse fleet of approximately 89,000 units located at 47 facilities throughout the U.S. The fleet includes over-the-road and storage trailers, chassis, temperature-controlled vans and flatbed trailers. XTRA is one of the largest lessors (in terms of units available) of over-the-road trailers in North America. Transportation equipment customers lease equipment to cover cyclical, seasonal and geographic needs and as a substitute for purchasing equipment. Therefore, as a provider of marginal capacity to its customers, XTRA’s utilization rates and operating results tend to be cyclical. In addition, transportation providers often use leasing to maximize their asset utilization and reduce capital expenditures. By maintaining a large fleet, XTRA is able to provide customers with a broad selection of equipment and quick response times.

International Dairy Queen Inc. develops and services a worldwide system of over 7,000 franchised restaurants operating primarily under the names DQ Grill and Chill®, Dairy Queen® and Orange Julius® that offer various dairy desserts, beverages, prepared foods and blended fruit drinks. Business Wire Inc. (“Business Wire”) transmits full-text news releases, regulatory filings, photos and other multimedia content to journalists, financial professionals, investor services, regulatory authorities and the general public. Releases are distributed globally via Business Wire’s patented NX network. CORT Business Services Corporation (“CORT”) is a leading national provider of rental furniture and related services in the “rent-to-rent” segment of the furniture rental industry. CORT’s primary revenue streams include furniture rental to individuals, businesses, government agencies, the trade show and events industry and retail sales of new and used furniture. WPLG, Inc. is an ABC affiliate television broadcast station in Miami, Florida and Charter Brokerage Holdings Corp. is a leading non-asset based third party logistics provider to the petroleum and chemical industries. In connection with the Alleghany acquisition, the services group includes IPS-Integrated Project Services, LLC, a provider of a variety of services, including design and engineering, project management, procurement, validation and consulting that are used in facilities construction projects.

Retailing Businesses

Berkshire's retailing businesses include automotive, home furnishings and several other operations that sell various consumer products. Berkshire's retailing businesses employed approximately 26,000 people at the end of 2022. Information regarding each of these operations follows.

Berkshire Hathaway Automotive

Berkshire Hathaway Automotive, Inc. ("BHA") is one of the largest automotive retailers in the U.S., currently operating 106 new vehicle franchises through 83 dealerships located primarily in major metropolitan markets in the U.S. The dealerships sell new and used vehicles, vehicle maintenance and repair services, extended service contracts, vehicle protection products and other aftermarket products. BHA also arranges financing for its customers through third-party lenders. BHA operates 28 collision centers directly connected to the dealerships' operations and owns and operates two auto auctions and an automotive fluid maintenance products distributor.

Dealership operations are highly concentrated in the Arizona and Texas markets, with approximately 75% of dealership-related revenues derived from sales in these markets. BHA currently maintains franchise agreements with 27 different vehicle manufacturers, although it derives a significant portion of its revenue from the Toyota/Lexus, General Motors, Ford/Lincoln, Nissan/Infiniti and Honda/Acura brands. Approximately 90% of BHA's annual revenues are from dealerships representing these manufacturers.

The retail automotive industry is highly competitive. BHA faces competition from other large public and private dealership groups, as well as individual franchised dealerships and competition via the Internet. Given the pricing transparency available via the Internet, and the fact that franchised dealers acquire vehicles from the manufacturers on the same terms irrespective of volume, the location and quality of the dealership facility, customer service and transaction speed are key differentiators in attracting customers.

BHA's overall relationships with the automobile manufacturers are governed by framework agreements. The framework agreements contain provisions relating to the management, operation, acquisition and ownership structure of BHA's dealerships. Failure to meet the terms of these agreements could adversely impact BHA's ability to acquire additional dealerships representing those manufacturers. Additionally, these agreements contain limitations on the number of dealerships from a specific manufacturer that may be owned by BHA.

Individual dealerships operate under franchise agreements with the manufacturer, which grants the dealership entity a non-exclusive right to sell the manufacturer's brand of vehicles and offer related parts and service within a specified market area, as well as the right to use the manufacturer's trademarks. The agreements contain various requirements and restrictions related to the management and operation of the franchised dealership and provide for termination of the agreement by the manufacturer or non-renewal for a variety of causes. States generally have automotive dealership franchise laws that provide substantial protection to the franchisee, and it is difficult for a manufacturer to terminate or not renew a franchise agreement outside of bankruptcy or with "good cause" under the applicable state franchise law.

BHA also develops, underwrites and administers various vehicle protection plans as well as life and accident and health insurance plans sold to consumers through BHA's dealerships and third-party dealerships. BHA also develops proprietary training programs and materials and provides ongoing monitoring and training of the dealership's finance and insurance personnel.

Home furnishings retailing

The home furnishings businesses consist of Nebraska Furniture Mart Inc. ("NFM"), R.C. Willey Home Furnishings ("R.C. Willey"), Star Furniture Company ("Star") and Jordan's Furniture, Inc. ("Jordan's"). These businesses offer a wide selection of furniture, bedding and accessories. In addition, NFM and R.C. Willey sell a full line of major household appliances, electronics, computers and other home furnishings and offer customer financing to complement their retail operations. An important feature of each of these businesses is their ability to control costs and to produce high business volume by offering significant value to their customers.

NFM operates its business from four retail complexes with almost 4.5 million square feet of retail, warehouse and administrative facilities located in Omaha, Nebraska, Clive, Iowa, Kansas City, Kansas and The Colony, Texas. NFM also owns Homemakers Furniture located in Urbandale, Iowa, which has approximately 600,000 square feet of retail, warehouse and administrative space. NFM is the largest furniture retailer in each of these markets. R.C. Willey, based in Salt Lake City, Utah, currently operates ten full-line retail home furnishings stores and three distribution centers. These facilities include approximately 1.3 million square feet of retail space with four stores located in Utah, one store in Meridian, Idaho, three stores in Nevada (Las Vegas and Reno) and two stores in the Sacramento, California area.

Jordan's operates a retail furniture business from seven locations with approximately 890,000 square feet of retail space in stores located in Massachusetts, New Hampshire, Rhode Island, Maine and Connecticut. The retail stores are supported by an 800,000 square foot distribution center in Taunton, Massachusetts. Jordan's is the largest furniture retailer, as measured by sales, in Massachusetts, Maine and New Hampshire. Jordan's is well known in its markets for its unique store arrangements and advertising campaigns. Star has operated home furnishings retail stores in Texas for many years. Star's retail facilities currently include about 700,000 square feet of retail space in 10 locations in Texas, including seven in Houston.

Other retailing

Borsheim Jewelry Company, Inc. ("Borsheims") operates from a single store in Omaha, Nebraska. Borsheims is a high-volume retailer of fine jewelry, watches, crystal, china, stemware, flatware, gifts and collectibles. Helzberg's Diamond Shops, LLC. ("Helzberg") is based in North Kansas City, Missouri, and operates a chain of 170 retail jewelry stores in 34 states, which includes approximately 400,000 square feet of retail space. Helzberg's stores are located in malls, lifestyle centers, power strip centers and outlet malls, and all stores operate under the name Helzberg Diamonds® or Helzberg Diamonds Outlet®. The Ben Bridge Corporation ("Ben Bridge Jeweler"), based in Seattle, Washington, operates 37 retail jewelry stores under two different brand names, located primarily in major shopping malls in nine western states. Thirty-six of its retail locations are upscale jewelry stores selling loose diamonds, finished jewelry and high-end timepieces. One store is a Breitling concept store, selling only Breitling timepieces.

See's Candy Shops, Incorporated ("See's") produces boxed chocolates and other confectionery products with an emphasis on quality and distinctiveness in two large kitchens in Los Angeles and South San Francisco and a facility in Burlingame, California. See's operates approximately 250 retail and volume saving stores located mainly in California and other Western states, as well as over 125 seasonal locations. See's revenues are highly seasonal with approximately half of its annual revenues earned in the fourth quarter.

The Pampered Chef, Ltd. ("Pampered Chef") is a premier direct seller of distinctive high-quality kitchenware products with sales and operations in the U.S., Canada, Germany, Austria and France and operations in China. Pampered Chef's product portfolio consists of over 400 Pampered Chef® branded kitchenware items in categories ranging from stoneware and cutlery to grilling and entertaining. Pampered Chef's products are available through its sales force of independent cooking consultants and online.

Oriental Trading Company ("OTC") is a leading multi-channel and online retailer for fun-value-priced party supplies, seasonal products, arts and crafts, toys and novelties, school supplies and educational games. OTC, headquartered in Omaha, Nebraska, serves a broad base of nearly four million customers annually, including consumers, schools, churches, non-profit organizations, medical and dental offices and other businesses. OTC offers a unique assortment of over 80,000 fun products emphasizing proprietary designs. OTC operates both direct-to-consumer and business-to-business brands including Oriental Trading®, Fun Express®, MindWare®, SmileMakers®, Morris Costumes® and HalloweenExpress.com® and utilizes digital and print marketing along with dedicated sales teams to promote online sales.

Detlev Louis Motorrad ("Louis"), headquartered in Hamburg, Germany, is a leading retailer of motorcycle clothing and equipment in Europe. Louis carries over 50,000 different store and private label products, mainly covering the areas of clothing, technical equipment and leisure. Louis has over 80 stores in Germany, Austria, Switzerland and the Netherlands as well as an online business with online shops in various languages in Europe.

Pilot Travel Centers

Since October 2017, we have owned a 38.6% interest in Pilot Travel Centers, LLC (“Pilot”), headquartered in Knoxville, Tennessee. Through December 31, 2022, we accounted for our investment in Pilot under the equity method. On January 31, 2023, we acquired an additional 41.4% interest in Pilot and we attained control of Pilot for financial reporting purposes as of that date. Consequently, we will discontinue the use of the equity method and include Pilot’s financial statements in our Consolidated Financial Statements at that date.

Pilot is the largest operator of travel centers in North America (primarily under the names Pilot or Flying J) with more than 650 travel center locations across 44 U.S. states and six Canadian provinces. Pilot also has over 150 retail locations in the U.S. and Canada where it sells diesel fuel through various arrangements with third party travel centers. Pilot sold over 13 billion gallons of fuel in 2022 (primarily diesel and gasoline). Pilot has approximately 25,500 employees.

Pilot’s travel centers are generally located close to an interstate highway and offer petroleum products, merchandise, fast food, and a variety of services and amenities to consumers and professional truck drivers. While Pilot’s primary business is operating fuel and inside store travel centers, it also enters into dealer agreements with existing travel centers where Pilot procures and sells diesel fuel at these locations for a fee. Additionally, Pilot operates large wholesale fuel and fuel marketing platforms in the U.S. and operates a water hauling and disposal business in the oil fields sector.

The travel center industry is concentrated among a few large operators (including Love’s Travel Stops and TravelCenters of America), although there are numerous independent operators that operate one to ten travel centers. Pilot’s top 10 customers for diesel sales account for less than 15% of total diesel gallons sold by Pilot, while Pilot’s top 10 fuel suppliers account for less than 50% of gallons purchased by Pilot.

Pilot currently supplies approximately 1.5 billion gallons per year of low-carbon fuels (renewable diesel, biodiesel and ethanol) and approximately 320 million gallons per year of diesel exhaust fluid. During 2022, Pilot entered a partnership with General Motors Company to develop a nationwide electric vehicle fast charger network of 2,000 charging stations in 500 U.S. locations by 2026. Pilot also signed a letter of intent with Volvo during 2022 in a partnership to develop a nationwide public charging network to support the expansion of battery-powered electric trucks.

Pilot is subject to federal, state, and local laws and regulations relating to the environment. These laws generally provide for control of pollutants released into the environment and require responsible parties to undertake remediation of hazardous waste disposal sites. Penalties may be imposed for non-compliance. Certain assets (such as petroleum tanks, dispensers, and disposal wells) impose retirement obligations.

Additional information with respect to Berkshire’s businesses

Revenue, earnings before taxes and identifiable assets attributable to Berkshire’s reportable business segments are included in Note 25 to Berkshire’s Consolidated Financial Statements contained in Item 8, Financial Statements and Supplementary Data. Additional information regarding Berkshire’s investments in fixed maturity and equity securities is included in Notes 3 and 4, respectively, to Berkshire’s Consolidated Financial Statements.

Berkshire or a subsidiary owns 26.6% of the outstanding common stock of The Kraft Heinz Company (“Kraft Heinz”) and 21.4% of the outstanding Occidental Petroleum Corporation (“Occidental”) common stock. Kraft Heinz manufactures and markets food and beverage products, including condiments and sauces, cheese and dairy, meals, meats, refreshment beverages, coffee and other grocery products. Occidental is an international energy company, including oil and natural gas exploration, development and production, and chemicals manufacturing businesses. Occidental’s midstream businesses purchase, market, gather, process, transport and store various oil, natural gas, carbon dioxide and other products. Berkshire subsidiaries also own a 50% joint venture interest in Berkadia Commercial Mortgage LLC. Information concerning these investments is included in Note 5 to Berkshire’s Consolidated Financial Statements.

Berkshire maintains a website (<http://www.berkshirehathaway.com>) where its annual reports, certain corporate governance documents, press releases, interim shareholder reports and links to its subsidiaries’ websites can be found. Berkshire’s periodic reports filed with the SEC, which include Form 10-K, Form 10-Q, Form 8-K and amendments thereto, may be accessed by the public free of charge from the SEC and through Berkshire. Electronic copies of these reports can be accessed at the SEC’s website (<http://www.sec.gov>) and indirectly through Berkshire’s website (<http://www.berkshirehathaway.com>). Copies of these reports may also be obtained, free of charge, upon written request to: Berkshire Hathaway Inc., 3555 Farnam Street, Omaha, NE 68131, Attn: Corporate Secretary.

Item 1A. Risk Factors

Berkshire and its subsidiaries (referred to herein as “we,” “us,” “our” or similar expressions) are subject to certain risks and uncertainties in its business operations which are described below. The risks and uncertainties described below are not the only risks we face. Additional risks and uncertainties that are presently unknown or are currently deemed immaterial may also impair our business operations.

General Business Risks

Terrorist acts could hurt our operating businesses.

A cyber, biological, nuclear or chemical terrorist attack could produce significant losses to our worldwide operations. Our business operations could be adversely affected from such acts through the loss of human resources or destruction of production facilities and information systems. We share the risk with all businesses.

Cyber security risks

We rely on technology in virtually all aspects of our business. Like those of many large businesses, certain of our information systems have been subject to computer viruses, malicious codes, unauthorized access, phishing efforts, denial-of-service attacks and other cyber-attacks. We expect to be subject to similar attacks in the future as such attacks become more sophisticated and frequent. A significant disruption or failure of our technology systems could result in service interruptions, safety failures, security events, regulatory compliance failures, an inability to protect information and assets against unauthorized users and other operational difficulties. Attacks perpetrated against our systems could result in loss of assets and critical information and expose us to remediation costs and reputational damage.

Although we have taken steps intended to mitigate these risks, including business continuity planning, disaster recovery planning and business impact analysis, a significant disruption or cyber intrusion at one or more of our significant operations could adversely affect our results of operations, financial condition and liquidity. Additionally, if we are unable to acquire, develop, implement, adopt or protect rights around new technology, we may suffer a competitive disadvantage, which could also have an adverse effect on our results of operations, financial condition and/or liquidity.

Cyber-attacks could further adversely affect our ability to operate facilities, information technology and business systems or compromise confidential customer and employee information. Political, economic, social or financial market instability or damage to or interference with our operating assets, customers or suppliers from cyber-attacks may result in business interruptions, lost revenues, higher commodity prices, disruption in fuel supplies, lower energy consumption, unstable markets, increased security, repair or other costs, or may materially adversely affect us in ways that cannot be predicted at this time. Any of these risks could materially affect our consolidated financial results. Furthermore, instability in the financial markets resulting from terrorism, sustained or significant cyber-attacks or war could also have a material adverse effect on our ability to raise capital. We share these risks with all businesses.

We are dependent on a few key people for our major investment and capital allocation decisions.

Major investment decisions and all major capital allocation decisions are made by Warren E. Buffett, Chairman of the Board of Directors and Chief Executive Officer, age 92, in consultation with Charles T. Munger, Vice Chairman of the Board of Directors, age 99. In 2018, Berkshire’s Board of Directors appointed Mr. Gregory Abel as Vice Chairman of Berkshire’s non-insurance operations and Mr. Ajit Jain as Vice Chairman of Berkshire’s insurance operations. Mr. Abel and Mr. Jain each report directly to Mr. Buffett. Mr. Buffett continues to be responsible for major capital allocation and investment decisions.

If for any reason the services of our key personnel, particularly Mr. Buffett, were to become unavailable, there could be a material adverse effect on our operations. Should a replacement for Mr. Buffett be needed currently, Berkshire’s Board of Directors has agreed that Mr. Abel should replace Mr. Buffett. The Board continually monitors this risk and could alter its current view regarding a replacement for Mr. Buffett in the future. We believe that the Board’s succession plan, together with the outstanding managers running our numerous and highly diversified operating units helps to mitigate this risk.

We need qualified personnel to manage and operate our various businesses.

In our decentralized business model, we need qualified and competent management to direct day-to-day business activities of our operating subsidiaries and to manage changes in future business operations due to changing business or regulatory environments. Our operating subsidiaries also need qualified and competent personnel to execute business plans and serve their customers, suppliers and other stakeholders. Our inability to recruit, train and retain qualified and competent managers and personnel could negatively affect the operating results, financial condition and liquidity of our subsidiaries and Berkshire as a whole.

Investments are unusually concentrated in equity securities and fair values are subject to loss in value.

We concentrate a high percentage of the equity security investments of our insurance subsidiaries in a relatively small number of issuers. A significant decline in the fair values of our larger investments in equity securities may produce a material decline in our consolidated shareholders' equity and our consolidated earnings.

Since a large percentage of our equity securities are held by our insurance subsidiaries, significant decreases in the fair values of these investments will produce significant declines in the statutory surplus of our insurance subsidiaries. Our large statutory surplus is a competitive advantage, and a long-term material decline could have an adverse effect on our claims-paying ability ratings and our ability to write new insurance business thus potentially reducing our future underwriting profits.

Competition and technology may erode our business franchises and result in lower earnings.

Each of our operating businesses face intense competition within markets in which they operate. While we manage our businesses with the objective of achieving long-term sustainable growth by developing and strengthening competitive advantages, many factors, including technological changes, may erode or prevent the strengthening of competitive advantages. Accordingly, our future operating results will depend to some degree on our operating units successfully protecting and enhancing their competitive advantages. If our operating businesses are unsuccessful in these efforts, our periodic operating results in the future may decline.

Unfavorable general economic conditions may significantly reduce our operating earnings and impair our ability to access capital markets at a reasonable cost.

Our operating businesses are subject to normal economic cycles affecting the general economy or the specific industries in which they operate. Significant deteriorations of economic conditions, including significant inflation over a prolonged period could produce a material adverse effect on one or more of our significant operations. In addition, our utilities and energy businesses and our railroad business regularly utilize debt as a component of their capital structures and depend on having access to borrowed funds through the capital markets at reasonable rates. To the extent that access to the capital markets is restricted or the cost of funding increases, these operations could be adversely affected.

Epidemics, pandemics or other similar outbreaks could hurt our operating businesses.

The outbreak of epidemics, pandemics or other similar outbreaks in the future may adversely affect our operations, including the value of our equity securities portfolio. This may be due to closures or restrictions requested or mandated by governmental authorities, disruption to supply chains and workforce, reduction of demand for our products and services, credit losses when customers and other counterparties fail to satisfy their obligations to us, and volatility in global equity securities markets, among other factors. We share most of these risks with all businesses.

Regulatory changes may adversely impact our future operating results.

Over time, in response to financial markets crises, global economic recessions, and social and environmental issues, regulatory initiatives were adopted in the United States and elsewhere. Such initiatives addressed, for example, the regulation of banks and other major financial institutions, the regulation of products and environmental and global-warming matters. These initiatives impact all of our businesses, albeit in varying ways. Increased regulatory compliance costs could have a significant negative impact on our operating businesses, as well as on the businesses in which we have a significant, but not controlling economic interests. We cannot predict whether such initiatives will have a material adverse impact on our consolidated financial position, results of operations and/or cash flows.

Data privacy regulations have recently been enacted in various jurisdictions in the U.S. and throughout the world. These regulations address numerous aspects related to the security of personal information that is stored in our information systems, networks and facilities. Failure to comply with these regulations could result in reputational damage and significant penalties.

Climate change and the regulation of greenhouse gas (“GHG”) emissions may impact our businesses.

The impacts of climate change and the regulation of GHG emissions could impact our businesses to varying degrees. Climate change could cause or intensify hurricanes, floods, wildfires, and other extreme weather events that may increase physical risks to and impacts on our operations. An increase in the frequency or intensity of extreme weather events and storms could impact the physical assets of our non-insurance operations and could produce losses affecting our businesses. Similarly, extreme weather events may produce losses affecting our insurance operations as their primary business is to monitor, assess and price risk, including climate-related risk, at an expected economic profit to address the risk-transfer needs of their insurance customers.

Additional GHG policies, including legislation, may emerge that accelerate the transition to a lower GHG emitting economy and could, in turn, increase costs for our businesses to comply with those policies, including BNSF and BHE, which combined represent more than 90% of Berkshire's direct emissions. The failure to comply with new or existing regulations or reinterpretation of existing regulations relating to climate change could have a significant adverse effect on our financial results.

Risks unique to our regulated businesses

Our tolerance for risk in our insurance businesses may result in significant underwriting losses.

When properly paid for the risk assumed, we have been and will continue to be willing to assume more risk from a single event than any other insurer has knowingly assumed. Accordingly, we could incur a significant loss from a single catastrophe event resulting from a natural disaster or man-made catastrophes such as terrorism or cyber-attacks. We employ various disciplined underwriting practices intended to mitigate potential losses and attempt to take into account all possible correlations and avoid writing groups of policies from which pre-tax losses from a single catastrophe event might aggregate in excess of \$15 billion. However, despite our efforts, it is possible that losses could manifest in ways that we do not anticipate and that our risk mitigation strategies are not designed to address. Various provisions of our policies, negotiated to limit our risk, such as limitations or exclusions from coverage, may not be enforceable in the manner we intend, as it is possible that a court or regulatory authority could nullify or void an exclusion or limitation, or legislation could be enacted modifying or barring the use of these exclusions and limitations. Our tolerance for significant insurance losses may result in lower reported earnings in a future period.

The principal cost associated with the property and casualty insurance business is claims. In writing property and casualty insurance policies, we receive premiums today and promise to pay covered losses in the future. However, it will take decades before all claims that have occurred as of any given balance sheet date will be reported and settled. Although we believe that liabilities for unpaid losses are adequate, we will not know whether these liabilities or the premiums charged for the coverages provided were sufficient until well after the balance sheet date. Estimating insurance claim costs is inherently imprecise. It is possible that significant claims may emerge or develop in the future from the policies we have written in the past. As industry practices and legal, social and other environmental conditions change, unexpected and unintended issues related to claims and coverage may emerge, including new or expanded theories of liability. These or other changes could impose new financial obligations on us by extending coverage beyond our underwriting intent. In some instances, these changes may not become apparent until sometime after we have issued insurance or reinsurance contracts that are affected by the changes. As a result, the full extent of liability under our insurance or reinsurance contracts may not be known for many years after a contract is issued. Our estimated unpaid losses arising under contracts covering property and casualty insurance risks are large (\$143 billion at December 31, 2022), and a small percentage increase to those liabilities can result in materially lower reported earnings.

Changes in regulations and regulatory actions can adversely affect our operating results and our ability to allocate capital.

Our insurance businesses are subject to regulation in the jurisdictions in which we operate. Such regulations may relate to among other things, the types of business that can be written, the rates that can be charged for coverage, the level of capital that must be maintained, and restrictions on the types and size of investments that can be made. Regulations may also restrict the timing and amount of dividend payments to Berkshire by these businesses. U.S. state insurance regulators and international insurance regulators are also actively developing various regulatory mechanisms to address the regulation of large internationally active insurance groups, including regulations concerning group capital, liquidity, governance and risk management. Accordingly, changes in regulations related to these or other matters or regulatory actions imposing restrictions on our insurance businesses may adversely impact our results of operations and restrict our ability to allocate capital.

Our railroad business conducted through BNSF is also subject to a significant number of laws and regulations with respect to rates and practices, taxes, railroad operations and a variety of health, safety, labor, environmental and other matters. Failure to comply with applicable laws and regulations could have a material adverse effect on BNSF's business. Governments may change the legislative and/or regulatory framework within which BNSF operates, without providing any recourse for any adverse effects that the change may have on the business. Complying with legislative and regulatory changes may pose significant operating and implementation risks and require significant capital expenditures.

BNSF derives significant amounts of revenue from the transportation of energy-related commodities, particularly coal. To the extent that changes in government policies limit or restrict the usage of coal as a source of fuel in generating electricity or alternate fuels, such as natural gas, or displace coal on a competitive basis, revenues and earnings could be adversely affected. As a common carrier, BNSF is also required to transport toxic inhalation hazard chemicals and other hazardous materials. A release of hazardous materials could expose BNSF to significant claims, losses, penalties and environmental remediation obligations. Changes in the regulation of the rail industry could negatively impact BNSF's ability to determine prices for rail services and to make capital improvements to its rail network, resulting in an adverse effect on our results of operations, financial condition and/or liquidity.

Our utilities and energy businesses operated under BHE are highly regulated by numerous federal, state, local and foreign governmental authorities in the jurisdictions in which they operate. These laws and regulations are complex, dynamic and subject to new interpretations or change. Regulations affect almost every aspect of our utilities and energy businesses. Regulations broadly apply and may limit management's ability to independently make and implement decisions regarding numerous matters including: acquiring businesses; constructing, acquiring, disposing or retiring of operating assets; operating and maintaining generating facilities and transmission and distribution system assets; complying with pipeline safety and integrity and environmental requirements; setting rates charged to customers; establishing capital structures and issuing debt; managing and reporting transactions between our domestic utilities and our other subsidiaries and affiliates; and paying dividends or similar distributions. Failure to comply with or reinterpretations of existing regulations and new legislation or regulations, such as those relating to air quality, climate change, emissions performance standards, water quality, coal ash disposal and other environmental matters, or changes in the nature of the regulatory process may have a significant adverse impact on our financial results.

Our railroad business requires significant ongoing capital investment to improve and maintain its railroad network so that transportation services can be safely and reliably provided to customers on a timely basis. Our utilities and energy businesses also require significant amounts of capital to construct, operate and maintain generation, transmission and distribution systems to meet their customers' needs and reliability criteria. System assets may need to be operational for long periods of time in order to justify the financial investment. The operational or financial failure of capital projects may not be recoverable through rates that are charged to customers. Further, a significant portion of costs of capital improvements may be funded through debt issued by BNSF and BHE and their subsidiaries. Disruptions in debt capital markets that restrict access to funding when needed could adversely affect the results of operations, liquidity and/or capital resources of these businesses.

Item 1B. Unresolved Staff Comments

None.

Item 2. Description of Properties

The properties used by Berkshire's business segments are summarized in this section. Berkshire's railroad and utilities and energy businesses, in particular, utilize considerable physical assets in their businesses.

Railroad Business—Burlington Northern Santa Fe

Through BNSF Railway, BNSF operates over 32,500 route miles of track (excluding multiple main tracks, yard tracks and sidings) in 28 states, and also operates in three Canadian provinces. BNSF owns over 23,000 route miles, including easements, and operates over 9,000 route miles of trackage rights that permit BNSF to operate its trains with its crews over other railroads' tracks. As of December 31, 2022, the total BNSF Railway system, including single and multiple main tracks, yard tracks and sidings, consisted of over 50,000 operated miles of track.

BNSF operates various facilities and equipment to support its transportation system, including its infrastructure, locomotives and freight cars. It also owns or leases other equipment to support rail operations, such as vehicles. Support facilities for rail operations include yards and terminals throughout its rail network, system locomotive shops to perform locomotive servicing and maintenance, a centralized network operations center for train dispatching and network operations monitoring and management, computers, telecommunications equipment, signal systems and other support systems. Transfer facilities are maintained for rail-to-rail as well as intermodal transfer of containers, trailers and other freight traffic and include approximately 25 intermodal hubs located across the system. BNSF owns or holds under non-cancelable leases exceeding one year approximately 7,500 locomotives and 68,000 freight cars, in addition to maintenance of way and other equipment.

In the ordinary course of business, BNSF incurs significant costs in repairing and maintaining its properties. In 2022, BNSF recorded approximately \$2 billion in repairs and maintenance expense.

Utilities and Energy Businesses—Berkshire Hathaway Energy

BHE's energy properties consist of the physical assets necessary to support its electricity and natural gas businesses. Properties of BHE's electricity businesses include electric generation, transmission and distribution facilities, as well as coal mining assets that support certain of BHE's electric generating facilities. Properties of BHE's natural gas businesses include natural gas distribution facilities, interstate pipelines, storage facilities, liquefied natural gas facilities, compressor stations and meter stations. The transmission and distribution assets are primarily within each of BHE's utility service territories. In addition to these physical assets, BHE has rights-of-way, mineral rights and water rights that enable BHE to utilize its facilities. Pursuant to separate financing agreements, the majority of these properties are pledged or encumbered to support or otherwise provide the security for the related subsidiary debt. BHE or its affiliates own or have interests in the following types of operating electric generating facilities at December 31, 2022:

Energy Source	Entity	Location by Significance	Facility Net Capacity (MW) ⁽¹⁾	Net Owned Capacity (MW) ⁽¹⁾
Wind	PacifiCorp, MEC, BHE Canada, BHE Montana and BHE Renewables	Iowa, Wyoming, Texas, Montana, Nebraska, Washington, California, Illinois, Canada, Oregon and Kansas	12,282	12,282
Natural gas	PacifiCorp, MEC, NV Energy, BHE Canada and BHE Renewables	Nevada, Utah, Iowa, Illinois, Washington, Wyoming, Oregon, Texas, New York, Arizona and Canada	11,284	11,005
Coal	PacifiCorp, MEC and NV Energy	Wyoming, Iowa, Utah, Nevada, Colorado and Montana	13,210	8,178
Solar	MEC, NV Energy, Northern Powergrid and BHE Renewables	California, Australia, Texas, Arizona, Iowa, Minnesota and Nevada	2,120	1,972
Hydroelectric	PacifiCorp, MEC and BHE Renewables	Washington, Oregon, Idaho, Utah, Hawaii, Montana, Illinois, California and Wyoming	985	985
Nuclear	MEC	Illinois	1,822	455
Geothermal	PacifiCorp and BHE Renewables	California and Utah	377	377
		Total	<u>42,080</u>	<u>35,254</u>

⁽¹⁾ Facility Net Capacity in megawatts (MW) represents the lesser of nominal ratings or any limitations under applicable interconnection, power purchase, or other agreements for intermittent resources and the total net dependable capability available during summer conditions for all other units. An intermittent resource's nominal rating is the manufacturer's contractually specified capability (in MW) under specified conditions. Net Owned Capacity indicates BHE's ownership of Facility Net Capacity.

As of December 31, 2022, BHE's subsidiaries also have electric generating facilities that are under construction in Nevada and Wyoming having total Facility Net Capacity and Net Owned Capacity of 243 MW.

PacifiCorp, MEC and NV Energy own electric transmission and distribution systems, including approximately 27,800 miles of transmission lines and approximately 1,670 substations, and gas distribution facilities, including approximately 28,200 miles of gas mains and service lines.

Northern Powergrid (Northeast) and Northern Powergrid (Yorkshire) operate an electricity distribution network that includes approximately 17,040 miles of overhead lines, approximately 43,400 miles of underground cables and approximately 810 major substations. AltaLink's electricity transmission system includes approximately 8,300 miles of transmission lines and approximately 310 substations.

The BHE GT&S pipeline system consists of approximately 5,400 miles of natural gas transmission, gathering and storage pipelines located in portions of Maryland, New York, Ohio, Pennsylvania, Virginia, West Virginia, South Carolina and Georgia. Storage services are provided through the operation of 17 underground natural gas storage fields located in Pennsylvania, West Virginia and New York. BHE GT&S also operates, as the general partner, and owns a 25% limited partnership interest in one liquefied natural gas export, import and storage facility in Maryland and operates and has ownership interests in three smaller liquefied natural gas facilities in Alabama, Florida and Pennsylvania.

Northern Natural's pipeline system consists of approximately 14,400 miles of natural gas pipelines, including approximately 5,900 miles of mainline transmission pipelines and approximately 8,500 miles of branch and lateral pipelines. Northern Natural's end-use and distribution market area includes points in Iowa, Nebraska, Minnesota, Wisconsin, South Dakota, Michigan and Illinois and its natural gas supply and delivery service area includes points in Kansas, Texas, Oklahoma and New Mexico. Storage services are provided through the operation of one underground natural gas storage field in Iowa, two underground natural gas storage facilities in Kansas and two liquefied natural gas storage peaking units, one in Iowa and one in Minnesota.

Kern River's system consists of approximately 1,400 miles of natural gas pipelines, which extends from the system's point of origination in Wyoming through the Central Rocky Mountains into California.

Other Segments

Significant physical properties used by Berkshire's other business segments are summarized below:

Business	Country	Locations	Property/Facility type	Number of Properties	
				Owned	Leased
Insurance:					
GEICO	U.S.		Offices and claims centers	10	107
BHRG	U.S.		Offices	1	34
	Non-U.S.	Locations in 26 countries	Offices	1	51
BH Primary	U.S.		Offices	5	52
	Non-U.S.	Locations in 7 countries	Offices	—	15
Manufacturing					
	U.S.		Manufacturing facility	513	114
			Offices/Warehouses	225	472
			Retail/Showroom	230	205
			Housing subdivisions	322	—
	Non-U.S.	Locations in 63 countries	Manufacturing facility	176	107
			Offices/Warehouses	109	465
Service					
	U.S.		Training facilities/Hangars	11	88
			Offices/Distribution	16	136
			Production facilities	4	4
			Leasing/Showroom/Retail	34	40
	Non-U.S.	Locations in 18 countries	Training facilities/Hangars	1	16
			Offices/Distribution	—	39
McLane					
	U.S.		Distribution centers/Offices	63	28
Retailing					
	U.S.		Offices/Warehouses	23	27
			Retail/Showroom	141	466
	Non-U.S.	Locations in 6 countries	Retail/Offices/Warehouses	1	95

Item 3. Legal Proceedings

Berkshire and its subsidiaries are parties in a variety of legal actions that routinely arise out of the normal course of business, including legal actions seeking to establish liability directly through insurance contracts or indirectly through reinsurance contracts issued by Berkshire subsidiaries. Plaintiffs occasionally seek punitive or exemplary damages. We do not believe that such normal and routine litigation will have a material effect on our financial condition or results of operations. Berkshire and certain of its subsidiaries are also involved in other kinds of legal actions, some of which assert or may assert claims or seek to impose fines and penalties. We currently believe that any liability that may arise as a result of other pending legal actions will not have a material effect on our consolidated financial condition or results of operations.

Item 4. Mine Safety Disclosures

Information regarding the Company's mine safety violations and other legal matters disclosed in accordance with Section 1503 (a) of the Dodd-Frank Reform Act is included in Exhibit 95 to this Form 10-K.

Executive Officers of the Registrant

Following is a list of the Registrant's named executive officers:

Name	Age	Position with Registrant	Since
Warren E. Buffett	92	Chairman and Chief Executive Officer	1970
Charles T. Munger	99	Vice Chairman	1978
Gregory E. Abel	60	Vice Chairman – Non-Insurance Operations	2018
Ajit Jain	71	Vice Chairman – Insurance Operations	2018
Marc D. Hamburg	73	Senior Vice-President – Chief Financial Officer	1992

Each executive officer serves, in accordance with the by-laws of the Registrant, until the first meeting of the Board of Directors following the next annual meeting of shareholders and until a successor is chosen and qualified or until such executive officer sooner dies, resigns, is removed or becomes disqualified.

FORWARD-LOOKING STATEMENTS

Investors are cautioned that certain statements contained in this document as well as some statements in periodic press releases and some oral statements of Berkshire officials during presentations about Berkshire or its subsidiaries are “forward-looking” statements within the meaning of the Private Securities Litigation Reform Act of 1995 (the “Act”). Forward-looking statements include statements which are predictive in nature, which depend upon or refer to future events or conditions, or which include words such as “expects,” “anticipates,” “intends,” “plans,” “believes,” “estimates” or similar expressions. In addition, any statements concerning future financial performance (including future revenues, earnings or growth rates), ongoing business strategies or prospects and possible future Berkshire actions, which may be provided by management, are also forward-looking statements as defined by the Act. Forward-looking statements are based on current expectations and projections about future events and are subject to risks, uncertainties and assumptions about Berkshire and its subsidiaries, economic and market factors and the industries in which we do business, among other things. These statements are not guarantees of future performance and we have no specific intention to update these statements.

Actual events and results may differ materially from those expressed or forecasted in forward-looking statements due to a number of factors. The principal risk factors that could cause our actual performance and future events and actions to differ materially from such forward-looking statements include, but are not limited to, changes in market prices of our investments in fixed maturity and equity securities; losses realized from derivative contracts; the occurrence of one or more catastrophic events, such as an earthquake, hurricane, act of terrorism or cyber-attack that causes losses insured by our insurance subsidiaries and/or losses to our business operations; the frequency and severity of epidemics, pandemics or other outbreaks, that negatively affect our operating results and restrict our access to borrowed funds through the capital markets at reasonable rates; changes in laws or regulations affecting our insurance, railroad, utilities and energy and finance subsidiaries; changes in federal income tax laws; and changes in general economic and market factors that affect the prices of securities or the industries in which we do business.

Part II

Item 5. Market for Registrant's Common Equity, Related Security Holder Matters and Issuer Purchases of Equity Securities

Market Information

Berkshire's Class A and Class B common stock are listed for trading on the New York Stock Exchange, trading symbols: BRK.A and BRK.B, respectively.

Shareholders

Berkshire had approximately 1,300 record holders of its Class A common stock and 18,700 record holders of its Class B common stock at February 13, 2023. Record owners included nominees holding at least 334,000 shares of Class A common stock and 1,297,000,000 shares of Class B common stock on behalf of beneficial-but-not-of-record owners.

Dividends

Berkshire has not declared a cash dividend since 1967.

Common Stock Repurchase Program

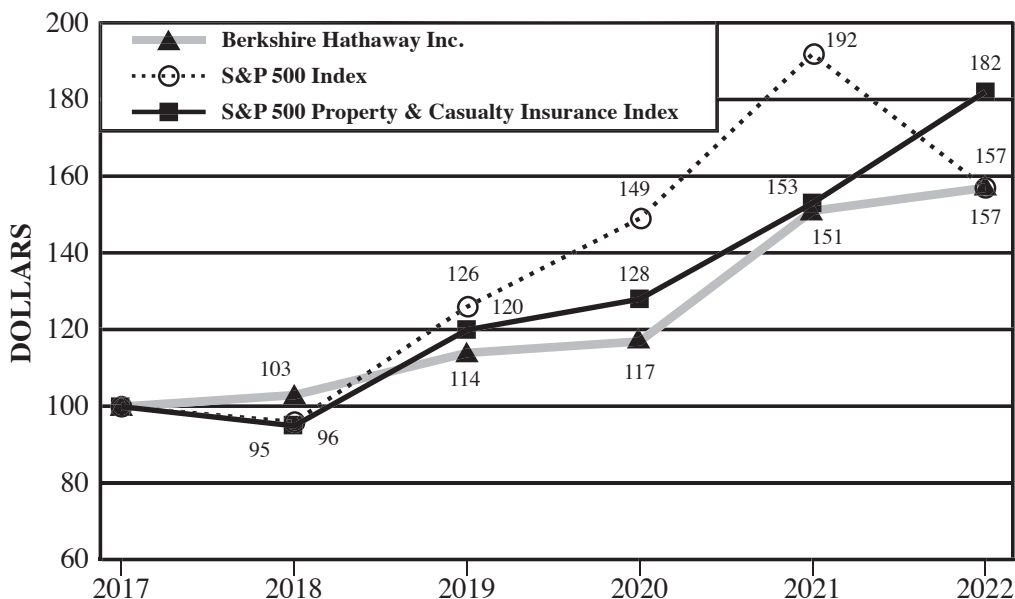
Berkshire's common stock repurchase program permits Berkshire to repurchase its Class A and Class B shares at any time that Warren Buffett, Berkshire's Chairman of the Board and Chief Executive Officer, and Charles Munger, Vice Chairman of the Board, believe that the repurchase price is below Berkshire's intrinsic value, conservatively determined. Repurchases may be in the open market or through privately negotiated transactions. Information with respect to Berkshire's Class A and Class B common stock repurchased during the fourth quarter of 2022 follows.

Period	Total number of shares purchased	Average price paid per share	Total number of shares purchased as part of publicly announced program	Maximum number or value of shares that yet may be repurchased under the program
October				
Class A common stock	1,550	\$ 426,592.77	1,550	*
Class B common stock	—	\$ —	—	*
November				
Class A common stock	2,146	\$ 463,584.86	2,146	*
Class B common stock	—	\$ —	—	*
December				
Class A common stock	584	\$ 468,113.93	584	*
Class B common stock	3,046,794	\$ 303.83	3,046,794	*

* The program does not specify a maximum number of shares to be repurchased or obligate Berkshire to repurchase any specific dollar amount or number of Class A or Class B shares and there is no expiration date to the repurchase program. Berkshire will not repurchase its common stock if the repurchases reduce the total value of Berkshire's consolidated cash, cash equivalents and U.S. Treasury Bills holdings to less than \$30 billion.

Stock Performance Graph

The following chart compares the subsequent value of \$100 invested in Berkshire common stock on December 31, 2017 with a similar investment in the Standard & Poor's 500 Stock Index and in the Standard & Poor's Property – Casualty Insurance Index**.



* Cumulative return for the Standard & Poor's indices based on reinvestment of dividends.

** It would be difficult to develop a peer group of companies similar to Berkshire. The Corporation owns subsidiaries engaged in a number of diverse business activities of which an important component is the property and casualty insurance business. Accordingly, management has used the Standard & Poor's Property—Casualty Insurance Index for comparative purposes.

Item 6. [Reserved]

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

Results of Operations

Net earnings (loss) attributable to Berkshire Hathaway shareholders for each of the past three years are disaggregated in the table that follows. Amounts are after deducting income taxes and exclude earnings attributable to noncontrolling interests (in millions).

	2022	2021	2020
Insurance – underwriting	\$ (90)	\$ 728	\$ 657
Insurance – investment income	6,484	4,807	5,039
Railroad	5,946	5,990	5,161
Utilities and energy	3,904	3,572	3,141
Manufacturing, service and retailing	12,512	11,120	8,300
Investment and derivative contract gains (losses)	(53,612)	62,340	31,591
Other*	2,037	1,238	(11,368)
Net earnings (loss) attributable to Berkshire Hathaway shareholders	<u>\$ (22,819)</u>	<u>\$ 89,795</u>	<u>\$ 42,521</u>

* Includes goodwill and indefinite-lived intangible asset impairment charges of \$157 million in 2022, \$259 million in 2021 and \$11.0 billion in 2020, which includes our share of charges recorded by Kraft Heinz.

Through our subsidiaries, we engage in numerous diverse business activities. We manage our operating businesses on an unusually decentralized basis. There are few centralized or integrated business functions. Our senior corporate management team participates in and is ultimately responsible for significant capital allocation decisions, investment activities and the selection of the Chief Executive to head each of the operating businesses. The business segment data (Note 25 to the accompanying Consolidated Financial Statements) should be read in conjunction with this discussion.

The COVID-19 pandemic affected our operating businesses in varying ways and degrees, particularly in 2020 and 2021. Significant disruptions of supply chains and higher costs emerged in 2021 and persisted in 2022. Further, geopolitical conflicts, including the Russia-Ukraine conflict, developed in 2022 and are continuing in 2023. We cannot reliably predict future economic effects of these events on our businesses. Nor can we reliably predict how these events will alter the future consumption patterns of consumers and businesses we serve.

Insurance underwriting generated an after-tax loss of \$90 million in 2022 and after-tax earnings of \$728 million in 2021 and \$657 million in 2020. Insurance underwriting results included after-tax losses from significant catastrophe events of approximately \$2.4 billion in 2022, \$2.3 billion in 2021 and \$750 million in 2020. Underwriting results in 2022 were also negatively impacted by increases in private passenger automobile claims frequencies and severities at GEICO, and favorably impacted by higher earnings from reinsurance underwriting and foreign currency exchange rate gains arising from the remeasurement of non-U.S. Dollar denominated liabilities of our U.S. insurance subsidiaries.

Underwriting results in 2021 were favorably impacted by reductions in incurred losses for prior accident years under property and casualty insurance and reinsurance contracts. Underwriting results in 2021 were negatively impacted by higher private passenger auto claims frequencies and severities and by the reduction in earned premium from the GEICO Giveback program, as well as from high claims costs in the life reinsurance business. Underwriting results in 2020 included the effects of the pandemic, arising from premium reductions from the GEICO Giveback program, significantly reduced claims frequencies for private passenger automobile insurance and increased loss estimates for certain commercial insurance coverages.

After-tax earnings from insurance investment income increased \$1.7 billion in 2022 compared to 2021, attributable to increased dividend income and higher interest rates. After-tax earnings from insurance investment income in 2021 and 2020 were negatively affected by low interest rates on our substantial holdings of cash and U.S. Treasury Bills.

Management’s Discussion and Analysis (Continued)

Results of Operations (Continued)

After-tax earnings of our railroad, BNSF were relatively unchanged in 2022 compared to 2021 and increased 16.1% in 2021 versus 2020. Results in 2022 reflected higher revenue per car/unit, substantially offset by lower overall freight volumes and higher fuel and other operating costs. The earnings increase in 2021 reflected overall higher freight volumes, higher average revenue per car/unit and improved productivity, partly offset by higher average fuel prices and volume related costs. Earnings in 2020 reflected relatively low railroad operating revenues from reduced shipping volumes, attributable to the COVID-19 pandemic, partly offset by lower operating costs and the effects of productivity improvements.

After-tax earnings of our utilities and energy business increased 9.3% in 2022 compared to 2021 and 13.7% in 2021 versus 2020. The increase in 2022 reflected higher earnings from other energy businesses, including tax equity investments and the Northern Powergrid businesses, as well as from the natural gas pipeline businesses, partly offset by lower earnings from the real estate brokerage business. The increase in 2021 reflected higher earnings from the U.S. utilities and natural gas pipelines businesses.

Earnings from our manufacturing, service and retailing businesses increased 12.5% in 2022 compared to 2021 and 34.0% in 2021 versus 2020. Operating results in 2022 were mixed among our various businesses. While customer demand for products and services was relatively good in 2022, demand began to weaken in the second half of the year at certain of our businesses. We experienced the negative effects of higher materials, freight, labor and other input costs through much of 2022. Many of our businesses generated significantly higher earnings in 2021 compared to 2020, attributable to relatively strong customer demand for products and higher selling prices, partially offset by higher materials, freight and other input costs attributable to ongoing disruptions in global supply chains.

Investment and derivative contract gains (losses) in each of the three years presented predominantly derived from our investments in equity securities and included significant net unrealized gains and losses from market price changes. We believe that investment gains and losses on investments in equity securities, whether realized from dispositions or unrealized from changes in market prices, are generally meaningless in understanding our reported quarterly or annual results or evaluating the economic performance of our operating businesses. These gains and losses have caused and will continue to cause significant volatility in our periodic earnings.

Other earnings included after-tax foreign exchange rate gains of approximately \$1.3 billion in 2022 and \$1.0 billion in 2021 and after-tax losses of \$764 million in 2020 related to the non-U.S. Dollar denominated debt issued by Berkshire and its U.S.-based finance subsidiary, Berkshire Hathaway Finance Corporation (“BHFC”). Other earnings also included after-tax goodwill and indefinite-lived intangible asset impairment charges of \$157 million in 2022, \$259 million in 2021 and \$11.0 billion in 2020. Such amounts included our share of impairment charges recorded by Kraft Heinz. Approximately \$9.8 billion of the charges in 2020 were attributable to impairments of goodwill and indefinite-lived intangible assets recorded in connection with Berkshire’s acquisition of Precision Castparts in 2016.

Insurance—Underwriting

Our management views our insurance businesses as possessing two distinct activities – underwriting and investing. Underwriting decisions are the responsibility of the unit managers, while investing decisions are the responsibility of Berkshire’s Chairman and CEO, Warren E. Buffett and Berkshire’s corporate investment managers. Accordingly, we evaluate performance of underwriting operations without any allocation of investment income or investment gains and losses. We consider investment income as an integral component of our aggregate insurance operating results. However, we consider investment gains and losses, whether realized or unrealized, as non-operating. We believe that such gains and losses are not meaningful in understanding the periodic operating results of our insurance businesses.

The timing and magnitude of catastrophe losses can produce significant volatility in our periodic underwriting results, particularly with respect to our reinsurance businesses. We currently consider pre-tax incurred losses exceeding \$150 million from a current year catastrophic event to be significant. Significant catastrophe events in 2022 included Hurricane Ian and floods in Australia, while significant events in 2021 included Hurricane Ida, floods in Europe and Winter Storm Uri.

Changes in estimates for unpaid losses and loss adjustment expenses, including amounts established for occurrences in prior years, can also significantly affect our periodic underwriting results. Unpaid loss estimates, including estimates under retroactive reinsurance contracts, were approximately \$143 billion as of December 31, 2022 and \$125 billion as of December 31, 2021. Our periodic underwriting results may also include significant foreign currency transaction gains and losses arising from the changes in the valuation of non-U.S. Dollar denominated liabilities of our U.S. based insurance subsidiaries due to foreign currency exchange rate fluctuations.

Management’s Discussion and Analysis (Continued)

Insurance—Underwriting (Continued)

We provide primary insurance and reinsurance products covering property and casualty risks, as well as life and health risks. Our insurance and reinsurance businesses are GEICO, Berkshire Hathaway Primary Group (“BH Primary”) and Berkshire Hathaway Reinsurance Group (“BHRG”). On October 19, 2022, Berkshire acquired Alleghany Corporation (“Alleghany”), which operates property and casualty insurance and reinsurance businesses. These businesses were included in the BH Primary and BHRG underwriting results beginning as of that date.

We strive to produce pre-tax underwriting earnings (premiums earned less losses incurred and underwriting expenses) over the long term in all business categories, except for BHRG’s retroactive reinsurance and periodic payment annuity contracts. Time-value-of-money is an important element in establishing prices for these contracts. We normally receive all premiums at the contract inception date, which are immediately available for investment. Ultimate claim payments can extend for decades and are expected to exceed premiums, producing underwriting losses over the claim settlement periods, primarily through deferred charge amortization and discount accretion charges.

Underwriting results of our insurance businesses are summarized below (dollars in millions).

	2022	2021	2020
Pre-tax underwriting earnings (loss):			
GEICO	\$ (1,880)	\$ 1,259	\$ 3,428
Berkshire Hathaway Primary Group	393	607	110
Berkshire Hathaway Reinsurance Group	1,389	(930)	(2,700)
Pre-tax underwriting earnings	(98)	936	838
Income taxes and noncontrolling interests	(8)	208	181
Net underwriting earnings (loss)	<u>\$ (90)</u>	<u>\$ 728</u>	<u>\$ 657</u>
Effective income tax rate	<u>8.5%</u>	<u>22.2%</u>	<u>21.5%</u>

GEICO

GEICO writes private passenger automobile insurance, offering coverages to insureds in all 50 states and the District of Columbia. GEICO markets its policies mainly by direct response methods where most customers apply for coverage directly to the company via the Internet or over the telephone. A summary of GEICO’s underwriting results follows (dollars in millions).

	2022		2021		2020	
	Amount	%	Amount	%	Amount	%
Premiums written	<u>\$ 39,107</u>		<u>\$ 38,395</u>		<u>\$ 34,928</u>	
Premiums earned	<u>\$ 38,984</u>	100.0	<u>\$ 37,706</u>	100.0	<u>\$ 35,093</u>	100.0
Losses and loss adjustment expenses	36,297	93.1	30,999	82.2	26,018	74.1
Underwriting expenses	4,567	11.7	5,448	14.5	5,647	16.1
Total losses and expenses	<u>40,864</u>	<u>104.8</u>	<u>36,447</u>	<u>96.7</u>	<u>31,665</u>	<u>90.2</u>
Pre-tax underwriting earnings (loss)	<u>\$ (1,880)</u>		<u>\$ 1,259</u>		<u>\$ 3,428</u>	

GEICO’s pre-tax underwriting results in each of the past three years were significantly affected by changes in average claims frequencies and severities. Beginning in the first quarter of 2020 and continuing through the first quarter of 2021, average claims frequencies were significantly below historical levels from the effects of less driving by policyholders during the COVID-19 pandemic. These effects were partially offset by higher average claims severities and lower premiums earned from the GEICO Giveback program, which provided a 15% premium reduction to all new or renewing voluntary auto and motorcycle policies between April 8, 2020 and October 7, 2020. Starting in the second quarter of 2021, average claims frequencies began to increase as driving by policyholders increased. GEICO’s pre-tax underwriting losses in 2022 reflected significant increases in average claims severities, primarily due to significant cost inflation in property and physical damage claims, which began to accelerate in the second half of 2021 and have continued through 2022. Increases in used car prices are producing increased claims severities on total losses and shortages of car parts are contributing to elevated claims severities on partial losses. In addition, injury claims severities continued to trend higher in 2022.

Management's Discussion and Analysis (Continued)

Insurance—Underwriting (Continued)

GEICO (Continued)

2022 versus 2021

Premiums written increased \$712 million (1.9%) in 2022 compared to 2021, reflecting increases in average premiums per auto policy due to rate increases, which were substantially offset by a decrease in policies-in-force. Voluntary auto policies-in-force declined 8.9% in 2022 compared to 2021 while average premiums per voluntary auto policy increased 11.3%. Premiums earned increased \$1.3 billion (3.4%) in 2022 compared to 2021, partially attributable to a reduction in 2021 of approximately \$475 million from the remaining impact of the GEICO Giveback program.

Losses and loss adjustment expenses increased \$5.3 billion (17.1%) in 2022 compared to 2021. GEICO's ratio of losses and loss adjustment expenses to premiums earned (the "loss ratio") was 93.1% in 2022, an increase of 10.9 percentage points over 2021. The increase was primarily attributable to higher claims frequencies and severities, as well as lower reductions of ultimate loss estimates for prior years' events.

Claims frequencies in 2022 were higher for all coverages, including property damage (one to two percent range), bodily injury and collision (four to five percent range) and personal injury (three to four percent range). Average claims severities in 2022 were higher for all coverages, including property damage (twenty-one to twenty-two percent range), collision (fourteen to sixteen percent range) and bodily injury (nine to eleven percent range). Losses and loss adjustment expenses reflected reductions in the ultimate loss estimates for prior years' loss events of \$653 million in 2022 compared to \$1.8 billion in 2021. The reductions in 2022 reflected decreases in all major coverages except collision and property damage coverages, while the reductions in 2021 were across all major coverages. Losses and loss adjustment expenses were approximately \$400 million from Hurricane Ian in 2022 and \$375 million from Hurricane Ida in 2021.

Underwriting expenses decreased \$881 million (16.2%) in 2022 compared to 2021, primarily due to significant reductions in advertising costs and lower employee-related costs. GEICO's expense ratio (underwriting expense to premiums earned) was 11.7% in 2022, a decrease of 2.8 percentage points compared to 2021, attributable to both the decrease in expenses as well as the increase in earned premiums.

GEICO has successfully obtained premium rate increase approvals from certain states in response to the significant claims costs increases it has experienced in recent years. As a result, we currently expect GEICO to generate an underwriting profit in 2023.

2021 versus 2020

Premiums written in 2021 increased \$3.5 billion (9.9%) compared to 2020, which included a reduction of approximately \$2.9 billion attributable to the GEICO Giveback program. Premiums earned in 2021 increased \$2.6 billion (7.4%) compared to 2020. The GEICO Giveback Program reduced earned premiums by approximately \$2.5 billion in 2020 with the remainder of the impact included in 2021. Voluntary auto policies-in-force in 2021 were slightly higher compared to 2020.

Losses and loss adjustment expenses increased \$5.0 billion (19.1%) compared to 2020. GEICO's loss ratio increased 8.1 percentage points compared to 2020. The increase in the loss ratio reflected an increase in average claims frequencies and severities and higher losses from significant catastrophe events, partially offset by increased reductions of ultimate estimated losses for claims occurring in prior years.

Claims frequencies in 2021 were higher for all coverages, including property damage and bodily injury (thirteen to fourteen percent range), personal injury (sixteen to seventeen percent range) and collision (twenty-one to twenty-two percent range). Average claims severities in 2021 were also higher for property damage coverage (two to three percent range), collision coverage (fifteen to sixteen percent range) and bodily injury coverage (eight to ten percent range). Ultimate claim loss estimates for claims occurring in prior years were reduced approximately \$1.8 billion in 2021 and \$253 million in 2020. Losses incurred attributable to Hurricane Ida in 2021 were \$375 million, while losses in 2020 were \$81 million from significant catastrophe events.

Underwriting expenses decreased \$199 million (3.5%) compared to 2020, reflecting lower advertising expenses. GEICO's expense ratio decreased 1.6 percentage points in 2021, reflecting lower expenses and higher premiums earned.

Management's Discussion and Analysis (Continued)

Insurance—Underwriting (Continued)

Berkshire Hathaway Primary Group

The Berkshire Hathaway Primary Group consists of several independently managed businesses that provide a variety of primarily commercial insurance solutions, including healthcare professional liability, workers' compensation, automobile, general liability, property and specialty coverages for small, medium and large clients. BH Primary's larger insurers include Berkshire Hathaway Specialty Insurance ("BH Specialty"), Berkshire Hathaway Homestate Companies ("BHHC"), MedPro Group, Berkshire Hathaway GUARD Insurance Companies ("GUARD"), National Indemnity Company ("NICO Primary") and U.S. Liability Insurance Company ("USLI"). This group also includes Alleghany's RSUI Group Inc. and CapSpecialty, Inc. ("Alleghany Insurance") beginning October 19, 2022. A summary of BH Primary underwriting results follows (dollars in millions).

	2022		2021		2020	
	Amount	%	Amount	%	Amount	%
Premiums written	\$ 14,619		\$ 12,595		\$ 10,212	
Premiums earned	\$ 13,746	100.0	\$ 11,575	100.0	\$ 9,615	100.0
Losses and loss adjustment expenses	9,889	71.9	8,107	70.0	7,129	74.1
Underwriting expenses	3,464	25.2	2,861	24.8	2,376	24.7
Total losses and expenses	13,353	97.1	10,968	94.8	9,505	98.8
Pre-tax underwriting earnings	\$ 393		\$ 607		\$ 110	

Premiums written increased \$2.0 billion (16.1%) in 2022 compared to 2021, reflecting increases at BH Specialty (16%), USLI (16%), BHHC (15%) and MedPro Group (10%), and from the inclusion of Alleghany Insurance (\$435 million). Premiums written increased \$2.4 billion (23.3%) in 2021 compared to 2020, primarily due to increases from BH Specialty (36%), MedPro Group (16%), NICO Primary (25%), GUARD (7%) and USLI (20%). The increases in each year were across a variety of coverages and in several markets.

BH Primary's loss ratio increased 1.9 percentage points compared to 2021, which decreased 4.1 percentage points versus 2020. Incurred losses from significant catastrophe events were \$641 million in 2022 (\$554 from Hurricane Ian), \$433 million in 2021 (\$239 million from Hurricane Ida) and \$207 million in 2020 (\$160 million from Hurricanes Laura and Sally). Incurred losses in 2020 also included increased liabilities attributable to the pandemic of \$167 million. Incurred losses and loss adjustment expenses reflected net reductions in estimated ultimate liabilities for prior years' loss events of \$428 million in 2022, \$631 million in 2021 and \$265 million in 2020. BH Primary insurers continue to write significant levels of workers' compensation, commercial and professional liability insurance and the related claim costs may be subject to high severity and long claim-tails. Claims liabilities could be greater than anticipated due to a variety of factors.

Underwriting expenses increased \$603 million (21.1%) in 2022 compared to 2021, while underwriting expenses increased \$485 million (20.4%) in 2021 compared to 2020. These increases reflected the increases in premiums earned and changes in business mix.

Berkshire Hathaway Reinsurance Group

The Berkshire Hathaway Reinsurance Group ("BHRG") offers excess-of-loss and quota-share reinsurance coverages on property and casualty risks to insurers and reinsurers worldwide through several subsidiaries, led by National Indemnity Company ("NICO"), General Reinsurance Corporation, General Reinsurance AG and, beginning October 19, 2022, Alleghany's Transatlantic Reinsurance Company and affiliates ("TransRe Group"). We also write life and health reinsurance coverages through General Re Life Corporation, General Reinsurance AG and Berkshire Hathaway Life Insurance Company of Nebraska ("BHLN"). We assume property and casualty risks under retroactive reinsurance contracts written through NICO and we write periodic payment annuity contracts through BHLN.

Management's Discussion and Analysis (Continued)

Insurance—Underwriting (Continued)

Berkshire Hathaway Reinsurance Group (Continued)

A summary of BHRG's premiums and pre-tax underwriting earnings follows (dollars in millions).

	Premiums earned			Pre-tax underwriting earnings (loss)		
	2022	2021	2020	2022	2021	2020
Property/casualty	\$ 16,040	\$ 13,740	\$ 12,214	\$ 2,180	\$ 667	\$ (799)
Life/health	5,279	5,648	5,861	292	(421)	(18)
Retroactive reinsurance	—	136	38	(668)	(782)	(1,248)
Periodic payment annuity	582	658	566	(532)	(508)	(617)
Variable annuity	14	15	14	117	114	(18)
	<u>\$ 21,915</u>	<u>\$ 20,197</u>	<u>\$ 18,693</u>	<u>\$ 1,389</u>	<u>\$ (930)</u>	<u>\$ (2,700)</u>

Property/casualty

A summary of property/casualty reinsurance underwriting results follows (dollars in millions).

	2022		2021		2020	
	Amount	%	Amount	%	Amount	%
Premiums written	<u>\$ 16,962</u>		<u>\$ 14,149</u>		<u>\$ 13,295</u>	
Premiums earned	<u>\$ 16,040</u>	100.0	<u>\$ 13,740</u>	100.0	<u>\$ 12,214</u>	100.0
Losses and loss adjustment expenses	10,605	66.1	9,878	71.9	9,898	81.0
Underwriting expenses	3,255	20.3	3,195	23.2	3,115	25.5
Total losses and expenses	<u>13,860</u>	<u>86.4</u>	<u>13,073</u>	<u>95.1</u>	<u>13,013</u>	<u>106.5</u>
Pre-tax underwriting earnings (loss)	<u>\$ 2,180</u>		<u>\$ 667</u>		<u>\$ (799)</u>	

Premiums written increased \$2.8 billion (19.9%) in 2022 compared to 2021, primarily due to net increases in new property business and higher rates, and the inclusion of the TransRe Group (\$986 million), partially offset by unfavorable foreign currency translation effects. Premiums written increased \$854 million (6.4%) in 2021 compared to 2020, primarily attributable to net new business, increased participations and improved prices on renewals and favorable currency translation effects. The increase was primarily attributable to property coverages.

Losses and loss adjustment expenses increased \$727 million (7.4%) in 2022 compared to 2021 and were relatively unchanged in 2021 compared to 2020. Losses incurred from significant catastrophe events were \$2.0 billion in 2022 (\$1.6 billion from Hurricane Ian), \$2.1 billion (\$933 million from Hurricane Ida) in 2021 and \$667 million in 2020 (\$357 million in the aggregate from Hurricanes Laura and Sally). Losses incurred in 2020 also included \$964 million attributable to the COVID-19 pandemic. Losses and loss adjustment expenses included reductions in estimated ultimate liabilities for prior years' events of \$1.6 billion in 2022 and \$718 million in 2021 and increases of \$162 million in 2020.

Underwriting expenses as percentages of premiums earned decreased 2.9 percentage points in 2022 compared to 2021, primarily attributable to foreign currency exchange rate effects and changes in business mix. Underwriting expenses included foreign currency exchange gains of \$371 million in 2022 compared to \$173 million in 2021, related to the remeasurement of certain non-U.S. Dollar denominated liabilities of our U.S. insurance subsidiaries. The expense ratio in 2021 decreased 2.3 percentage points compared to 2020, primarily attributable to changes in business mix and foreign currency effects.

Management's Discussion and Analysis (Continued)

Insurance—Underwriting (Continued)

Berkshire Hathaway Reinsurance Group (Continued)

Life/health

A summary of our life/health reinsurance underwriting results follows (dollars in millions).

	2022		2021		2020	
	Amount	%	Amount	%	Amount	%
Premiums written	\$ 5,185		\$ 5,621		\$ 5,848	
Premiums earned	\$ 5,279	100.0	\$ 5,648	100.0	\$ 5,861	100.0
Life and health insurance benefits	4,004	75.8	4,933	87.3	4,883	83.3
Underwriting expenses	983	18.7	1,136	20.2	996	17.0
Total benefits and expenses	4,987	94.5	6,069	107.5	5,879	100.3
Pre-tax underwriting earnings (loss)	\$ 292		\$ (421)		\$ (18)	

Life/health premiums written decreased \$436 million (7.8%) in 2022 compared to 2021 which decreased 3.9% from 2020. The decrease in 2022 was primarily due to unfavorable foreign currency translation effects (\$289 million) and decreased volume in the Asia Pacific region. Premiums written in 2020 included \$710 million from a contract that covered U.S. health risks that did not renew in 2021. Otherwise, premiums written in 2021 increased 9.4% versus 2020, primarily due to volume growth in the Asia Pacific region and favorable foreign currency translation effects. Life and health benefits declined \$929 million (18.8%) in 2022 compared to 2021, primarily due to relatively high pandemic-related mortality claims in the U.S., South Africa, India and Latin America in 2021. Underwriting earnings in 2020 were negatively affected by increased life benefits from COVID-19-related claims and from increased liabilities from changes in assumptions used in estimating disability benefit liabilities in Australia, which were mostly offset by lower other life claims and reduced losses from U.S. long-term care business in run-off.

Retroactive reinsurance

Retroactive reinsurance underwriting results primarily derive from the runoff of contracts written several years ago. Pre-tax underwriting losses in each year derived from the amortization of deferred charges and changes in the estimated timing and amounts of future claim payments. Underwriting results also include foreign currency exchange gains and losses from the effects of changes in foreign currency exchange rates on non-U.S. Dollar denominated liabilities of our U.S. subsidiaries. Pre-tax foreign currency gains were \$168 million in 2022 and \$58 million in 2021 versus pre-tax losses of \$171 million in 2020.

Pre-tax underwriting losses before foreign currency gains/losses were \$836 million in 2022, \$840 million in 2021 and \$1.1 billion in 2020, primarily from deferred charge amortization. Underwriting results also reflected the effects of changes in the estimates of the timing of future payments and amounts of ultimate claim liabilities. Estimated ultimate claim liabilities for prior years' contracts were increased \$86 million in 2022 and reduced \$974 million in 2021, which net of related changes in unamortized deferred charges, produced relatively insignificant effects on underwriting earnings.

Gross unpaid losses assumed under retroactive reinsurance contracts were \$35.4 billion at December 31, 2022, a decline of \$2.4 billion since December 31, 2021, primarily attributable to paid claims. Unamortized deferred charges related to retroactive reinsurance contracts were \$9.9 billion at December 31, 2022, a decline of \$769 million since December 31, 2021. Deferred charge amortization will be included in underwriting earnings over the expected remaining claims settlement periods.

Periodic payment annuity

Periodic payment annuity premiums earned decreased \$76 million (11.6%) in 2022 compared to 2021, which increased \$92 million (16.3%) compared to 2020. Periodic payment annuity business is both price and demand sensitive and the supply of available business is affected by the timing of underlying legal claim settlements. Our volumes written may change rapidly due to changes in prices, which are affected by prevailing interest rates, the perceived risks and durations associated with the expected annuity payments, as well as the level of competition.

Management's Discussion and Analysis (Continued)

Insurance—Underwriting (Continued)

Berkshire Hathaway Reinsurance Group (Continued)

Our periodic payment annuity contracts normally produce pre-tax underwriting losses from the recurring accretion of time-value discounted annuity liabilities, which includes discount accruals on liabilities of contracts without life contingencies. Underwriting results also include gains or losses from foreign currency exchange rate changes on non-U.S. Dollar denominated liabilities of our U.S. subsidiaries. Pre-tax underwriting results included foreign currency gains of \$164 million in 2022 and \$18 million in 2021, and pre-tax losses of \$67 million in 2020.

Pre-tax underwriting losses before foreign currency exchange effects were \$696 million in 2022, \$526 million in 2021 and \$550 million in 2020. Pre-tax losses in 2022 included approximately \$130 million attributable to the termination of a reinsurance contract, in which the settlement paid exceeded the carrying value of the liabilities. Pre-tax losses in 2021 were partially offset by the effects of higher mortality and by higher interest rates applicable to settlements under certain contracts. Discounted liabilities were \$15.4 billion at December 31, 2022, which included \$3.9 billion for contracts without life contingencies, and had a weighted average discount rate of approximately 3.9%. Upon the adoption of ASU 2018-12 in 2023, the discount rates on contracts with life-contingent liabilities will be adjusted quarterly based upon prevailing interest rates which could have a significant effect on our recorded liabilities. The periodic effect from discount rate changes will be reflected in other comprehensive income.

Variable annuity

Variable annuity guarantee reinsurance contracts produced pre-tax gains of \$117 million in 2022 and \$114 million in 2021, and pre-tax losses of \$18 million in 2020. The results from these contracts are affected by changes in securities markets, interest rates and foreign currency exchange rates, which can be volatile, and from the periodic amortization of expected profit margins. Underwriting earnings in 2022 and 2021 were primarily attributable to the net effects of interest rate increases and changes in securities markets.

Insurance—Investment Income

A summary of net investment income attributable to our insurance operations follows (dollars in millions).

	2022	2021	2020	Percentage change	
				2022 vs 2021	2021 vs 2020
Dividend income	\$ 6,039	\$ 5,060	\$ 4,890	19.3%	3.5%
Interest and other investment income	1,685	589	1,059	186.1	(44.4)
Pre-tax net investment income	7,724	5,649	5,949	36.7	(5.0)
Income taxes and noncontrolling interests	1,240	842	910		
Net investment income	\$ 6,484	\$ 4,807	\$ 5,039		
Effective income tax rate	16.0%	14.9%	15.3%		

Dividend income increased \$979 million (19.3%) in 2022 compared to 2021 and increased \$170 million (3.5%) in 2021 versus 2020. The increase in 2022 reflected an overall increase in equity security investments during 2022. Dividend income also varies from period to period due to changes in the investment portfolio and the frequency and timing of dividends from certain investees. Dividend income included \$46 million in 2022, \$121 million in 2021 and \$26 million in 2020 from investments in preferred stock of Berkshire Hathaway Energy. Such amounts are deducted from earnings of the utilities and energy segment.

Interest and other investment income increased \$1.1 billion (186.1%) in 2022 compared to 2021, primarily due to significant increases in interest income due to interest rate increases during the year, as well as the inclusion of interest income on assets of Alleghany's insurance subsidiaries. Interest and other investment income in 2021 declined 44.4% compared to 2020, primarily due to lower income from short-term investments and fixed maturity securities. We continue to hold substantial balances of cash, cash equivalents and short-term U.S. Treasury Bills. We continue to believe that maintaining ample liquidity is paramount and we insist on safety over yield with respect to short-term investments.

Management's Discussion and Analysis (Continued)

Insurance—Investment Income (Continued)

Invested assets of our insurance businesses derive from shareholder capital and from net liabilities under insurance and reinsurance contracts or “float.” The major components of float are unpaid losses and loss adjustment expenses, including liabilities under retroactive reinsurance contracts, life, annuity and health insurance benefit liabilities, unearned premiums and other liabilities due to policyholders, reduced by insurance premiums and reinsurance receivables, deferred charges assumed under retroactive reinsurance contracts and deferred policy acquisition costs. Float approximated \$164 billion at December 31, 2022, \$147 billion at December 31, 2021 and \$138 billion at December 31, 2020. Float at December 31, 2022 included approximately \$14 billion attributable to Allegheny’s insurance and reinsurance businesses. Our combined insurance operations generated pre-tax underwriting losses of \$98 million in 2022, and the cost of float was nominal. In 2021 and 2020, our combined insurance operations generated pre-tax underwriting gains, and consequently, the cost of float in each year was negative.

A summary of cash and investments held in our insurance businesses as of December 31, 2022 and 2021 follows (in millions).

	December 31,	
	2022	2021
Cash, cash equivalents and U.S. Treasury Bills	\$ 86,816	\$ 90,688
Equity securities	298,934	334,907
Fixed maturity securities	24,998	16,386
Other	3,417	4,296
	<u>\$ 414,165</u>	<u>\$ 446,277</u>

Fixed maturity investments as of December 31, 2022 were as follows (in millions).

	Amortized cost	Unrealized gains/losses	Carrying value
U.S. Treasury, U.S. government corporations and agencies	\$ 10,029	\$ (237)	\$ 9,792
Foreign governments	10,375	(127)	10,248
Corporate bonds	1,938	251	2,189
Other	2,701	68	2,769
	<u>\$ 25,043</u>	<u>\$ (45)</u>	<u>\$ 24,998</u>

U.S. government obligations are rated AA+ or Aaa by the major rating agencies. Approximately 93% of all foreign government obligations were rated AA or higher by at least one of the major rating agencies. Foreign government securities include obligations issued or unconditionally guaranteed by national or provincial government entities.

Management's Discussion and Analysis (Continued)

Railroad

Burlington Northern Santa Fe, LLC ("BNSF") operates one of the largest railroad systems in North America, with over 32,500 route miles of track in 28 states. BNSF also operates in three Canadian provinces. BNSF classifies its major business groups by type of product shipped including consumer products, industrial products, agricultural products and coal. A summary of BNSF's earnings follows (dollars in millions).

	2022	2021	2020	Percentage change	
				2022 vs 2021	2021 vs 2020
Railroad operating revenues	\$ 25,203	\$ 22,513	\$ 20,181	11.9%	11.6%
Railroad operating expenses:					
Compensation and benefits	5,253	4,696	4,542	11.9	3.4
Fuel	4,581	2,766	1,789	65.6	54.6
Purchased services	2,102	2,033	1,954	3.4	4.0
Depreciation and amortization	2,517	2,444	2,460	3.0	(0.7)
Equipment rents, materials and other	2,147	1,763	1,684	21.8	4.7
Total	16,600	13,702	12,429	21.2	10.2
Railroad operating earnings	8,603	8,811	7,752	(2.4)	13.7
Other revenues (expenses):					
Other revenues	685	769	688	(10.9)	11.8
Other expenses, net	(555)	(687)	(611)	(19.2)	12.4
Interest expense	(1,025)	(1,032)	(1,037)	(0.7)	(0.5)
Pre-tax earnings	7,708	7,861	6,792	(1.9)	15.7
Income taxes	1,762	1,871	1,631	(5.8)	14.7
Net earnings	\$ 5,946	\$ 5,990	\$ 5,161	(0.7)	16.1
Effective income tax rate	22.9%	23.8%	24.0%		

The following table summarizes BNSF's railroad freight volumes by business group (cars/units in thousands).

	Cars/Units			Percentage change	
	2022	2021	2020	2022 vs 2021	2021 vs 2020
Consumer products	5,202	5,673	5,266	(8.3)%	7.7%
Industrial products	1,618	1,709	1,622	(5.3)	5.4
Agricultural products	1,200	1,224	1,189	(2.0)	2.9
Coal	1,529	1,529	1,404	—	8.9
	9,549	10,135	9,481	(5.8)	6.9

2022 versus 2021

Railroad operating revenues increased 11.9% in 2022 compared to 2021, reflecting an 18.9% increase in average revenue per car/unit, including the impact from higher fuel surcharge revenue driven by higher fuel prices, partially offset by lower volumes of 5.8%. BNSF's pre-tax earnings decreased 1.9% in 2022 from 2021. Pre-tax earnings in 2022 were impacted by lower volumes and higher fuel and other operating costs, offset by higher yield and fuel surcharge revenue.

Operating revenues from consumer products increased 11.8% in 2022 to \$9.2 billion compared to 2021, reflecting higher average revenue per car/unit, partially offset by a volume decrease of 8.3%. The volume decrease was primarily due to lower intermodal shipments, resulting from supply chain disruptions and lower west coast imports during the second half of the year.

Operating revenues from industrial products were \$5.6 billion in 2022, an increase of 5.6% from 2021, reflecting higher average revenue per car/unit, partially offset by a volume decrease of 5.3%. The volume decrease was primarily due to a decrease in petroleum products related to lower demand for shipments of crude by rail and lower building products, steel and taconite shipments, partially offset by increased mineral shipments.

Operating revenues from agricultural products increased 12.6% to \$5.7 billion in 2022 compared to 2021. The revenue increase reflected higher revenue per car/unit partially offset by lower volumes of 2.0%. The decrease in volumes was primarily due to lower grain exports and fertilizer shipments, partially offset by higher volumes of domestic grains, renewable diesel and feedstocks.

Operating revenues from coal increased 21.7% to \$3.9 billion in 2022 compared to 2021, attributable to higher average revenue per car/unit. Coal volumes were unchanged compared to 2021.

Management's Discussion and Analysis (Continued)

Railroad (Continued)

Railroad operating expenses were \$16.6 billion in 2022, an increase of \$2.9 billion (21.2%) compared to 2021. Our ratio of railroad operating expenses to railroad operating revenues increased 5.0 percentage points to 65.9% in 2022 versus 2021. The operating expense increase was primarily attributable to significant increases in the cost of fuel, as well as higher compensation and benefits expense. Compensation and benefits expenses increased \$557 million (11.9%) in 2022 compared to 2021, primarily due to wage inflation, including the impact from the ratified union labor agreements, higher health and welfare costs and lower productivity. Fuel expenses increased \$1.8 billion (65.6%) in 2022 compared to 2021, primarily due to higher average fuel prices, partially offset by lower volumes. Equipment rents, materials and other expenses increased \$384 million (21.8%) in 2022 compared to 2021, due to general inflation, lower gains from land and easement sales and higher casualty and litigation costs.

Approximately 31,000 of BNSF's employees are members of a labor union. The U.S. Class I railroads and rail labor unions were engaged in multi-party national negotiations from January 2020 through June 2022. Federal mediation was included in that timeframe, followed by a release from the National Mediation Board and subsequent appointment of a Presidential Emergency Board (PEB), in accordance with the Railway Labor Act. The PEB issued its report and recommendations to settle the bargaining disputes on August 16, 2022. Tentative agreements based on these recommendations were reached with all labor unions in September 2022. Thereafter, a majority of the unions ratified those agreements with the remainder being imposed by Congress in December 2022. This concluded the national round which is not subject to re-opening until late 2024.

2021 versus 2020

Railroad operating revenues increased 11.6% in 2021 compared to 2020, reflecting higher volumes of 6.9%, as well as a 3.5% increase in average revenue per car/unit resulting from business mix changes and higher fuel surcharge revenue attributable to higher fuel prices. Pre-tax earnings were \$7.9 billion in 2021, an increase of 15.7% from 2020. The COVID-19 pandemic caused a significant economic slowdown that adversely affected our volumes in 2020. Revenue changes in 2021 were driven by continued improvements from the 2020 effects of the COVID-19 pandemic, partially offset by disruptions in the global supply chain.

Operating revenues from consumer products increased 13.7% in 2021 to \$8.3 billion compared to 2020, reflecting increased volumes of 7.7% and higher average revenue per car/unit. The volume increase was primarily due to growth in intermodal in both international and domestic shipments driven by increased retail sales, inventory replenishments by retailers and increased e-commerce activity. Operating revenues from industrial products were \$5.3 billion in 2021, an increase of 5.0% from 2020. Volumes increased 5.4% while average revenue per car/unit was nearly unchanged from 2020. The volume increase was primarily due to improvement in the U.S. industrial economy, driving higher volumes in the construction and building sectors, partially offset by lower petroleum volumes due to unfavorable market conditions in the energy sector.

Operating revenues from agricultural products increased 5.8% to \$5.1 billion in 2021 compared to 2020. The revenue change reflected a volume increase of 2.9% due to higher domestic grain shipments and higher volumes of ethanol and related commodities, as well as higher revenue per car/unit. Operating revenues from coal increased 21.5% to \$3.2 billion in 2021 compared to 2020 attributable to higher volumes of 8.9% in 2021, as well as higher average revenue per car/unit. The volume increase in 2021 was attributable to increased electricity generation, higher natural gas prices and improved export demand.

Railroad operating expenses were \$13.7 billion in 2021, an increase of \$1.3 billion (10.2%) compared to 2020. The ratio of railroad operating expenses to railroad operating revenues decreased 0.7 percentage points to 60.9% in 2021 versus 2020. The increase in railroad operating expenses reflected higher volumes and higher average fuel prices, partially offset by the favorable impact of productivity improvements. Compensation and benefits expenses increased \$154 million (3.4%) in 2021 compared to 2020, primarily due to increased volumes, wage inflation and health and welfare costs, partially offset by productivity improvements. Fuel expenses increased \$977 million (54.6%) compared to 2020, primarily due to higher average fuel prices. Purchased service expenses increased \$79 million (4.0%) compared to 2020, primarily due to higher volumes and the effects of insurance recoveries in 2020 related to 2019 flooding, partially offset by improved productivity. Equipment rents, materials and other expenses increased \$79 million (4.7%) compared to 2020, due to higher volume-related costs.

Management's Discussion and Analysis (Continued)

Utilities and Energy

We currently own 92% of Berkshire Hathaway Energy Company ("BHE"), which operates a global energy business. BHE's domestic regulated utility interests include PacifiCorp, MidAmerican Energy Company ("MEC") and NV Energy. BHE's natural gas pipelines consist of five domestic regulated interstate natural gas pipeline systems and a 25% interest in a liquefied natural gas export, import and storage facility ("LNG interest"), which BHE operates and consolidates for financial reporting purposes. Three of the natural gas pipeline systems and the LNG interest were acquired on November 1, 2020 from Dominion Energy, Inc. ("BHE GT&S"). Other energy businesses include two regulated electricity distribution businesses operated by BHE subsidiaries (referred to as Northern Powergrid) in Great Britain, a regulated electricity transmission-only business in Alberta, Canada ("AltaLink, L.P.") and a diversified portfolio of mostly renewable independent power projects and investments. BHE also operates a residential real estate brokerage business and a large network of real estate brokerage franchises in the United States.

The rates our regulated businesses charge customers for energy and services are based in large part on the costs of business operations, including income taxes and a return on capital, and are subject to regulatory approval. To the extent such costs are not allowed in the approved rates, operating results will be adversely affected. A summary of BHE's net earnings follows (dollars in millions).

	2022	2021	2020
Revenues:			
Energy operating revenue	\$ 21,069	\$ 18,935	\$ 15,556
Real estate operating revenue	5,268	6,215	5,396
Other income (loss)	56	(54)	148
Total revenue	<u>26,393</u>	<u>25,096</u>	<u>21,100</u>
Costs and expense:			
Energy cost of sales	6,757	5,504	4,187
Energy operating expense	9,233	8,535	7,539
Real estate operating costs and expense	5,117	5,710	4,885
Interest expense	2,140	2,054	1,941
Total costs and expense	<u>23,247</u>	<u>21,803</u>	<u>18,552</u>
Pre-tax earnings	3,146	3,293	2,548
Income tax expense (benefit)*	(1,629)	(1,153)	(996)
Net earnings after income taxes	4,775	4,446	3,544
Noncontrolling interests of BHE subsidiaries	423	399	71
Net earnings attributable to BHE	4,352	4,047	3,473
Noncontrolling interests and preferred stock dividends	448	475	332
Net earnings attributable to Berkshire Hathaway shareholders	<u>\$ 3,904</u>	<u>\$ 3,572</u>	<u>\$ 3,141</u>
Effective income tax rate	<u>(51.8)%</u>	<u>(35.0)%</u>	<u>(39.1)%</u>

* Includes significant production tax credits from wind-powered electricity generation.

Management's Discussion and Analysis (Continued)

Utilities and Energy (Continued)

The discussion of BHE's operating results that follows is based on after-tax earnings, reflecting how the energy businesses are managed and evaluated. A summary of net earnings attributable to BHE follows (dollars in millions).

	2022	2021	2020	Percentage change	
				2022 vs 2021	2021 vs 2020
U.S. utilities	\$ 2,295	\$ 2,211	\$ 1,969	3.8%	12.3%
Natural gas pipelines	1,040	807	528	28.9	52.8
Other energy businesses	1,338	979	953	36.7	2.7
Real estate brokerage	100	387	375	(74.2)	3.2
Corporate interest and other	(421)	(337)	(352)	24.9	(4.3)
	<u>\$ 4,352</u>	<u>\$ 4,047</u>	<u>\$ 3,473</u>	7.5	16.5

2022 versus 2021

Our U.S. utilities operate in several states, including Utah, Oregon and Wyoming (PacifiCorp), Iowa and Illinois (MEC) and Nevada (NV Energy). After-tax earnings increased \$84 million in 2022 compared to 2021. The earnings increase reflected higher electric utility margin (operating revenue less cost of sales) and a \$157 million increase in production tax credits recognized on new wind-powered generating facilities placed in-service at PacifiCorp and MEC, partially offset by higher operating expenses and state income taxes. Operating expenses increased due to higher costs associated with certain regulatory mechanisms at MEC and NV Energy, increases in general and plant maintenance costs, incremental depreciation expense from additional assets placed in-service and higher accruals at PacifiCorp associated with the 2020 wildfires.

The U.S. utilities' electric utility margin was \$7.7 billion in 2022, an increase of \$586 million (8.3%) compared to 2021. The increase reflected higher operating revenue from favorable retail and wholesale pricing and increases in retail customer volumes, partially offset by increases in thermal generation and purchased power costs. Retail customer volumes increased 2.4% (1.6% at PacifiCorp, 4.3% at MEC and 2.2% at NV Energy) in 2022 compared to 2021, primarily due to higher customer usage, an increase in the average number of customers and the favorable impact of weather.

Natural gas pipelines' after-tax earnings increased \$233 million in 2022 compared to 2021. Substantially all of the increase was derived from BHE GT&S, primarily attributable to higher regulated storage and service revenues from a general rate case settlement and higher revenues and margins from non-regulated activities, as well as income tax adjustments.

Other energy businesses' after-tax earnings increased \$359 million in 2022 compared to 2021. The increase was primarily due to increased wind tax equity investment earnings of \$200 million and the impact in 2021 on income tax expense of \$109 million at Northern Powergrid related to the enactment in June 2021 of an increase in the United Kingdom corporate income tax rate from 19% to 25%, effective April 1, 2023. The earnings increase also reflected higher operating revenue from owned renewable energy projects and earnings from new gas exploration and solar projects, partially offset by lower earnings from natural gas generating facilities and unfavorable foreign currency translation effects in 2022. The increase in wind tax equity investment earnings reflected the impact of losses in 2021 on pre-existing tax equity investments due to the February 2021 winter storms as well as increased income tax benefits from projects reaching commercial operation over the past twelve months.

Real estate brokerage after-tax earnings decreased \$287 million in 2022 compared to 2021. The decrease reflected lower brokerage services revenues and margins, primarily due to an 11% reduction in closed brokerage transaction volumes, as well as lower mortgage services revenues and margins from a 40% decrease in closed transaction volumes, attributable to lower homeowner refinancing activity resulting from rising interest rates.

Corporate interest and other after-tax earnings decreased \$84 million in 2022 compared to 2021. The decrease was primarily due to lower state income tax benefits and higher interest expense from corporate debt issued in 2022.

Management's Discussion and Analysis (Continued)

Utilities and Energy (Continued)

2021 versus 2020

The U.S. utilities' after-tax earnings increased \$242 million in 2021 compared to 2020. The increase reflected higher electric utility margin and an increase of \$139 million in production tax credits recognized at PacifiCorp and MEC, partially offset by higher operating expenses. Operating expenses increased due to higher costs associated with certain regulatory mechanisms at MEC, increased depreciation expense from additional assets placed in-service and by the impacts of a depreciation study effective January 1, 2021 at PacifiCorp. The operating expense increase was partially offset by the impact of accruals at PacifiCorp in 2020 associated with wildfires and changes to a settlement agreement in 2021 related to a hydroelectric facility, as well as lower costs associated with certain regulatory mechanisms at NV Energy.

The U.S. utilities' electric utility margin was \$7.1 billion in 2021, an increase of \$126 million (1.8%) compared to 2020. The increase reflected higher operating revenue from increases in retail and wholesale customer volumes and favorable wholesale pricing, partially offset by increases in thermal generation and purchased power costs as well as lower base tariff general rates in 2021 and a favorable regulatory decision in 2020 at NV Energy. Retail customer volumes increased 3.8% in 2021 compared to 2020, primarily due to higher customer usage, an increase in the average number of customers and the favorable impact of weather.

Natural gas pipelines' after-tax earnings increased \$279 million in 2021 compared to 2020. The earnings increase in 2021 was primarily due to incremental earnings of \$211 million from the BHE GT&S acquisition completed in November 2020. In addition, earnings in 2021 reflected the effects of higher margins on natural gas sales and higher transportation revenue at Northern Natural Gas due to increased demand from the February 2021 winter storms, partially offset by lower transportation revenue primarily due to lower volumes for the remainder of the year.

Other energy businesses' after-tax earnings increased \$26 million in 2021 compared to 2020. The increase was primarily due to higher earnings at Northern Powergrid (\$46 million), partially offset by lower earnings from renewable energy. The increase at Northern Powergrid was attributable to higher tariff rates and units distributed, lower write-offs of gas exploration costs and favorable foreign currency exchange rate movements, partially offset by an increase in income tax expense of \$74 million from increases in the United Kingdom corporate income tax rates in both 2021 and 2020. The decline in earnings from renewable energy reflected a reduction in wind tax equity investment earnings of \$56 million, which included increased losses from pre-existing tax equity investments of \$165 million, largely attributable to the February 2021 winter storms, partially offset by increased income tax benefits from projects reaching commercial operation over the past twelve months.

Real estate brokerage after-tax earnings increased \$12 million in 2021 compared to 2020. The increase was due to an increase in closed brokerage transaction volumes in 2021, partially offset by lower mortgage volume due to a decrease in refinance activity.

Corporate interest and other after-tax earnings increased \$15 million in 2021 compared to 2020. The increase was primarily due to an increase in state income tax benefits and higher earnings from non-regulated energy services, offset by higher operating expenses and higher interest expense from corporate debt issued in 2020.

Management's Discussion and Analysis (Continued)

Manufacturing, Service and Retailing

A summary of revenues and earnings of our manufacturing, service and retailing businesses follows (dollars in millions). Beginning January 31, 2023, this group will include Pilot Travel Centers.

	2022	2021	2020	Percentage change	
				2022 vs 2021	2021 vs 2020
Revenues					
Manufacturing	\$ 75,781	\$ 68,730	\$ 59,079	10.3%	16.3%
Service and retailing	91,512	84,282	75,018	8.6	12.3
	<u>\$ 167,293</u>	<u>\$ 153,012</u>	<u>\$ 134,097</u>	9.3	14.1
Pre-tax earnings					
Manufacturing	\$ 11,177	\$ 9,841	\$ 8,010	13.6%	22.9%
Service and retailing	5,042	4,711	2,879	7.0	63.6
	16,219	14,552	10,889	11.5	33.6
Income taxes and noncontrolling interests	3,707	3,432	2,589		
Net earnings*	<u>\$ 12,512</u>	<u>\$ 11,120</u>	<u>\$ 8,300</u>		
Effective income tax rate	<u>22.2%</u>	<u>23.0%</u>	<u>23.3%</u>		
Pre-tax earnings as a percentage of revenues	<u>9.7%</u>	<u>9.5%</u>	<u>8.1%</u>		

* Excludes certain acquisition accounting expenses, which primarily related to the amortization of identified intangible assets recorded in connection with our business acquisitions. The after-tax acquisition accounting expenses excluded from earnings above were \$681 million in 2022, \$690 million in 2021 and \$783 million in 2020. In 2020, net earnings also excluded after-tax goodwill and indefinite-lived intangible asset impairment charges of \$10.4 billion. These expenses are included in "Other" in the summary of earnings on page K-33 and in the "Other" earnings table on page K-56.

Manufacturing

Our manufacturing group includes a variety of industrial, building and consumer products businesses. A summary of revenues and pre-tax earnings of our manufacturing operations follows (dollars in millions).

	2022	2021	2020	Percentage change	
				2022 vs 2021	2021 vs 2020
Revenues					
Industrial products	\$ 30,824	\$ 28,176	\$ 25,667	9.4%	9.8%
Building products	28,896	24,974	21,244	15.7	17.6
Consumer products	16,061	15,580	12,168	3.1	28.0
	<u>\$ 75,781</u>	<u>\$ 68,730</u>	<u>\$ 59,079</u>		
Pre-tax earnings					
Industrial products	\$ 4,862	\$ 4,469	\$ 3,755	8.8%	19.0%
Building products	4,789	3,390	2,858	41.3	18.6
Consumer products	1,526	1,982	1,397	(23.0)	41.9
	<u>\$ 11,177</u>	<u>\$ 9,841</u>	<u>\$ 8,010</u>		
Pre-tax earnings as a percentage of revenues					
Industrial products	15.8%	15.9%	14.6%		
Building products	16.6%	13.6%	13.5%		
Consumer products	9.5%	12.7%	11.5%		

Management's Discussion and Analysis (Continued)

Manufacturing, Service and Retailing (Continued)

Industrial products

The industrial products group includes metal products for aerospace, power and general industrial markets (Precision Castparts Corp. ("PCC")), specialty chemicals (The Lubrizol Corporation ("Lubrizol")), metal cutting tools/systems (IMC International Metalworking Companies ("IMC")), and Marmon, which consists of more than 100 autonomous manufacturing and service businesses, internally aggregated into eleven groups, and includes equipment leasing for the rail, intermodal tank container and mobile crane industries. The industrial products group also includes equipment and systems for the livestock and agricultural industries (CTB International) and a variety of industrial products for diverse markets (Scott Fetzer and LiquidPower Specialty Products). Beginning October 19, 2022, this group includes the structural steel fabrication products business conducted through W&W|AFCO Steel, acquired in connection with the Alleghany acquisition. Additionally, the Alleghany businesses included certain other smaller manufacturers that primarily became part of Marmon.

2022 versus 2021

Revenues of the industrial products group in 2022 increased \$2.6 billion (9.4%) and pre-tax earnings increased \$393 million (8.8%) compared to 2021. Pre-tax earnings as a percentage of revenues in 2022 was 15.8%, a decrease of 0.1 percentage points compared 2021.

PCC's revenues were \$7.5 billion in 2022, an increase of \$1.1 billion (16.5%) compared to 2021. PCC derives significant revenues and earnings from aerospace products. The revenue increase in 2022 was primarily attributable to higher demand for aerospace products. Commercial aircraft delivery rates by original equipment manufacturers ("OEMs") of narrow-body aircraft have rebounded since the onset of the pandemic. Deliveries of wide-body aircraft remain relatively low, in part, attributable to the pause in the Boeing 787 program. However, Boeing resumed deliveries in the third quarter of 2022. Long-term industry forecasts continue to show growth and strong demand for air travel and aerospace products.

PCC's pre-tax earnings in 2022 were \$1.2 billion, an increase of 1.6% compared to 2021. PCC's results in 2022 were negatively affected by increased costs for labor and training, materials and utilities and supply chain disruptions, as well as a \$59 million reduction in pension plan income. PCC management has taken and will continue to take actions to improve operations, maintain safety and prepare for increased demand for its products. Growth in PCC's revenues and earnings will be predicated on the ability to successfully increase production levels to match the expected growth in aerospace demand, including managing through the current supply chain and employment environments.

Lubrizol's revenues were \$6.7 billion in 2022, an increase of 3.2% compared to 2021. The revenue increase reflected higher average selling prices, partially offset by lower volumes and adverse foreign currency translation effects from the stronger U.S. Dollar. Sales volumes throughout 2022 were restricted by effects of supply constraints for certain raw materials and the effects of unplanned plant maintenance activities, both of which limited Lubrizol's production capabilities. The increase in average selling prices was driven by escalating prices for raw materials, including oil feedstocks, as well as for utilities, packaging, shipping and freight costs. We believe supply chain and required maintenance constraints are easing and that we can increase production rates and sales volumes in 2023.

Lubrizol's pre-tax earnings in 2022 increased 48.6% compared to 2021. Pre-tax earnings in 2022 included insurance recoveries of \$242 million related to a fire in 2019 at the Rouen, France facility and a fire in 2021 at the Rockton, Illinois, facility compared to insurance recoveries of \$55 million in 2021. Earnings in 2022 also included aggregate losses related to the Rockton, Illinois fire of \$36 million compared to aggregate losses and asset impairment charges in 2021 of \$257 million related to the Rockton facility fire and an underperforming business in the Advanced Materials product lines. Earnings in 2022 were also negatively impacted by rising raw material costs, lower sales volumes, higher unplanned maintenance expenses, and by unfavorable foreign currency translation effects, partially offset by higher selling prices. Earnings in 2021 were negatively impacted by severe winter storms, which caused industry-wide temporary facilities closures, including at our Additives facilities, which experienced lost sales and incremental manufacturing and other operating costs.

Marmon's revenues were \$10.7 billion in 2022, an increase of \$934 million (9.6%) compared to 2021. Nearly all of Marmon's business groups generated higher revenues in 2022, led by significant increases in the Transportation, Retail Solutions, Metal Services and Crane groups, which contributed 82% of the increase. These increases generally reflected higher volumes and prices in our heavy-duty truck & trailer, shopping cart and store shelving businesses, stronger demand in Canada for metal services and higher demand in the mining and infrastructure markets. Revenues of most of Marmon's other groups, particularly those serving the transit, oil & gas, utility and restaurant markets, also increased in 2022, reflecting higher volumes. These increases were partially offset by lower lease revenues in the Rail & Leasing group, reflecting lower renewal rates and fewer third-party tank car sales.

Management's Discussion and Analysis (Continued)

Manufacturing, Service and Retailing (Continued)

Industrial products (Continued)

Marmon's pre-tax earnings in 2022 increased 11.3% compared to 2021. Earnings in 2022 reflected increases in the Transportation, Metal Services, Retail, Crane and several other business groups due to higher volumes and pricing, which were partially offset by lower earnings from the Rail & Leasing group, reflecting lower renewal rates, higher repair costs and losses of approximately \$90 million related to the shutdown in the second quarter of its business in Russia.

IMC's revenues increased 4.5% to \$3.7 billion in 2022 compared to 2021, reflecting increased sales in most regions, partially offset by the foreign currency translation effects of a stronger U.S. Dollar, lower sales in China (attributable to the pandemic) and the effects the Russia-Ukraine conflict in Europe. IMC's pre-tax earnings decreased 2.5% in 2022 compared to 2021, primarily due to lower average gross sales margins, primarily attributable to changes in product sales mix and higher raw material costs. Earnings were also negatively affected by unfavorable foreign currency translation effects and the Russian-Ukraine conflict.

2021 versus 2020

Revenues of the industrial products group in 2021 increased \$2.5 billion (9.8%) from 2020. Pre-tax earnings increased \$714 million (19.0%) compared to 2020 and pre-tax earnings as a percentage of revenues in 2021 was 15.9%, an increase of 1.3 percentage points compared to 2020.

PCC's revenues were \$6.5 billion in 2021, a decrease of \$853 million (11.6%) compared to 2020. The COVID-19 pandemic contributed to material declines in commercial air travel and OEM aircraft production in 2021 and 2020. PCC's revenues were negatively impacted in both years by reduced aircraft production levels, which reflected order delays and cancellations by airlines and inventory reduction initiatives within the industry.

PCC's pre-tax earnings in 2021 were \$1.2 billion, an increase of 78.8% compared to 2020, which reflected significant restructuring costs and inefficiencies associated with reduction in production. Asset impairment and restructuring costs in 2020 were \$295 million. The 2021 earnings increase also reflected the actions taken by management in 2020 and 2021 to resize, restructure and improve operations and to prepare for more normalized demand, as well as from a decline in restructuring costs.

Lubrizol's revenues were \$6.5 billion in 2021, an increase of 8.6% compared to 2020. The increase reflects higher average selling prices, driven by significant increases in materials and other manufacturing costs, as well as slightly higher volumes. Sales volumes in the Additives product lines in 2021 were negatively affected by the impacts of the severe winter weather events in the first quarter, raw materials supply constraints and unplanned maintenance in the second half of the year.

Lubrizol's pre-tax earnings in 2021 decreased 50.8% compared to 2020. The earnings decline in 2021 included previously mentioned losses of \$257 million related to the Rockton, Illinois facility fire and asset impairment charges, as well as the adverse effects of rising raw material costs and the winter storms in 2021.

Marmon's revenues were \$9.8 billion in 2021, an increase of \$2.1 billion (27.9%) compared to 2020, which was negatively impacted by the initial effects of the pandemic. Revenues in 2021 from the Electrical, Metal Services and Plumbing & Refrigeration groups increased 54% over 2020, accounting for over half of the aggregate increase in Marmon's revenues. These increases were attributable to higher volumes and prices, including the impact of significantly higher average copper and metal prices. Revenues of most of Marmon's other groups, particularly those serving the construction, automotive, heavy-duty truck and restaurant markets, also increased in 2021, reflecting higher volumes. These increases were partially offset by the impact of divestitures and business closures in the Water Technologies and Retail Solutions groups and lower lease revenues in the Rail & Leasing group, reflecting fewer railcars on lease and changes in lease mix.

Management's Discussion and Analysis (Continued)

Manufacturing, Service and Retailing (Continued)

Industrial products (Continued)

Marmon's pre-tax earnings increased 40.3% in 2021 compared to 2020. The increase was primarily due to earnings increases in the Electrical, Metal Services and Plumbing & Refrigeration groups due to higher volumes and average margins and relatively low earnings in 2020 attributable to the pandemic. Earnings of several other business groups also increased attributable to higher sales volumes, sales mix changes and lower restructuring charges, which were partially offset by lower earnings from the Rail & Leasing and Water Technologies groups.

IMC's revenues increased 19.5% in 2021 compared to 2020, reflecting improving business conditions in most geographic regions and favorable foreign currency translation effects. IMC's pre-tax earnings increased 47.7% in 2021 versus 2020, primarily attributable to higher customer demand, improved manufacturing efficiencies, operating cost management saving initiatives and favorable foreign currency translation effects.

Building products

The building products group includes manufactured and site-built home construction and related lending and financial services (Clayton Homes), flooring (Shaw), insulation, roofing and engineered products (Johns Manville), bricks and masonry products (Acme Building Brands), paint and coatings (Benjamin Moore) and residential and commercial construction and engineering products and systems (MiTek).

2022 versus 2021

Revenues of the building products group increased \$3.9 billion (15.7%) in 2022 and pre-tax earnings increased \$1.4 billion (41.3%) compared to 2021. Pre-tax earnings as percentages of revenues were 16.6% in 2022 and 13.6% in 2021. During 2021 and much of 2022, our businesses experienced relatively strong customer demand and higher sales volumes. Our building products businesses benefited in recent years from the low interest rate environment. However, interest rates in the U.S. increased significantly during 2022, which contributed to slowing demand for new home construction in the fourth quarter. As such, comparative revenues and earnings in the near term will likely decline from current levels.

Clayton Homes' revenues were approximately \$12.7 billion in 2022, an increase of \$2.2 billion (21.1%) over 2021. Revenues from home sales for the year increased \$2.1 billion (25.1%) in 2022 to approximately \$10.4 billion, primarily due to higher average selling prices. New home unit sales increased 6.2% in 2022, reflecting a 6.0% increase in factory-built manufactured home unit sales and a 7.1% increase in site-built home unit sales. However, unit sales in the fourth quarter of 2022 declined 3.9% from 2021, and our net order backlog declined significantly during 2022. We expect the comparative decline in unit sales to accelerate in the near term. Financial services revenues, which include mortgage, insurance and interest income from lending activities, increased 4.7% in 2022 compared to 2021. Loan balances, net of allowances for credit losses, were approximately \$21.3 billion as of December 31, 2022, an increase of approximately \$2.5 billion from December 31, 2021. Actual and anticipated loan foreclosures rose during the fourth quarter of 2022.

Pre-tax earnings of Clayton Homes were approximately \$2.4 billion in 2022, an increase of \$685 million (40.7%) compared to 2021. Earnings in 2022 reflected higher home sales, gross margin rates and net interest income. As previously mentioned, we expect unit home sales to decline in the near term and we anticipate earnings will also decline in 2023 compared to 2022.

Aggregate revenues of our other building products businesses were approximately \$16.2 billion in 2022, an increase of 11.8% versus 2021. The increase was primarily due to higher average selling prices, and to a lesser extent, from higher unit volumes in certain product lines and product mix changes. Significant cost inflation in 2021, that continued through 2022, largely drove the higher selling prices.

Pre-tax earnings of the other building products businesses were approximately \$2.4 billion in 2022, an increase of 41.9% over 2021. Pre-tax earnings as a percentage of revenues was 15.0% in 2022, a 3.2 percentage point increase compared to 2021. Earnings in 2022 benefitted from higher selling prices and strong demand in certain product categories, as well as an increase in gains from certain business divestitures and asset sales and reduced impairment and restructuring charges. The increase in earnings in 2022 also reflected the negative impact of severe winter storms in the first quarter of 2021, which reduced sales and increased production and other operating costs in 2021.

Management's Discussion and Analysis (Continued)

Manufacturing, Service and Retailing (Continued)

Building products (Continued)

2021 versus 2020

Revenues of the building products group increased \$3.7 billion (17.6%) in 2021 and pre-tax earnings increased \$532 million (18.6%) compared to 2020. Pre-tax earnings as percentages of revenues were 13.6% in 2021 and 13.5% in 2020. During 2021, our businesses experienced strong customer demand and higher sales volumes. We also experienced various forms of supply chain disruptions that contributed to considerable raw material and logistics cost inflation and supply constraints.

Clayton Homes' revenues were approximately \$10.5 billion in 2021, an increase of \$1.9 billion (22.2%) over 2020. Revenues from home sales increased \$1.8 billion (26.5%) in 2021 to approximately \$8.3 billion, reflecting increased revenue per home sold, changes in sales mix and a net increase in new units sold. Unit sales of site-built homes increased 15.8% in 2021, while factory-built manufactured home unit sales increased 1.5%. Site-built home unit sales were constrained by longer construction periods arising from supply chain constraints and labor shortages. Financial services revenues increased 7.8% in 2021 compared to 2020. Loan balances, net of allowances for credit losses, were approximately \$18.8 billion as of December 31, 2021, an increase of approximately \$1.7 billion compared to December 31, 2020.

Pre-tax earnings of Clayton Homes were approximately \$1.7 billion in 2021, an increase of \$440 million (35.3%) compared to 2020. Earnings in 2021 reflected higher earnings from home sales, mortgage originations, net interest income and lower provisions for expected credit losses, partially offset by the impact of rising manufacturing and supply chain costs. The provision for expected credit losses in 2020 was unusually high and included provisions for the expected impact of the COVID-19 pandemic.

Aggregate revenues of our other building products businesses were approximately \$14.5 billion in 2021, an increase of 14.4% versus 2020. The increase was primarily due to higher average selling prices driven by significantly higher input and supply chain costs, as well as higher unit volumes for paint and coatings, flooring, insulation, roofing and other engineered products.

Pre-tax earnings of the other building products businesses were approximately \$1.7 billion in 2021, an increase of 5.7% over 2020. Pre-tax earnings as a percentage of revenues were 11.8% in 2021, a 1.0 percentage point decrease compared to 2020. While customer demand in 2021 was generally strong, reduced availability of materials and other product inputs from supply chain disruptions negatively affected operating results. In addition, higher restructuring and impairment charges contributed to the reduction in our pre-tax margin rates.

Consumer products

The consumer products group includes leisure vehicles (Forest River), several apparel and footwear operations (including Fruit of the Loom, Garan, H.H. Brown Shoe Group and Brooks Sports) and a manufacturer of high-performance alkaline batteries (Duracell). This group also includes custom picture framing products (Larson-Juhl), jewelry products (Richline) and beginning October 19, 2022, Jazwares, LLC ("Jazwares"), a global toy company acquired in connection with the Alleghany acquisition.

2022 versus 2021

Consumer products group revenues increased \$481 million (3.1%) in 2022 versus 2021, reflecting an 8.0% increase from Forest River and the impact of the Jazwares acquisition, substantially offset by lower apparel and footwear and Duracell revenues (4.7% in the aggregate). In the fourth quarter of 2022, consumer products revenues before the impact of the Jazwares acquisition declined 15.7%, driven by significant declines in recreational vehicle unit sales. Revenues of Forest River increased 8.0% in 2022 compared to 2021, while apparel and footwear and Duracell revenues decreased 4.5% and 5.2%, respectively. The declines in apparel and footwear revenues were driven by lower volumes, as major retailers reduced orders in response to rising inventories. Duracell's revenue decline was primarily due to lower volumes and unfavorable foreign currency translation effects of the stronger U.S. Dollar.

Management's Discussion and Analysis (Continued)

Manufacturing, Service and Retailing (Continued)

Consumer products (Continued)

Consumer products group pre-tax earnings declined \$456 million (23.0%) in 2022 compared to 2021 and as a percentage of revenues in 2022 decreased 3.2 percentage points to 9.5%. The earnings decline reflected lower aggregate earnings from the apparel and footwear businesses (68.0%) and Duracell (30.6%), partially offset by higher earnings from Forest River (7.6%).

Our apparel businesses were negatively affected in 2022 by low sales volumes, reduced manufacturing efficiencies and higher input costs, including raw materials, freight, labor and other operating costs. The reductions in sales volumes and supply chain issues in 2021 and 2022 have also elevated our current inventories. We currently believe retailers will continue to constrain purchases in the near term and that our sales volumes and earnings will continue to be negatively affected. We are taking measures to right-size our operations for the long-term and reduce product inventories to more appropriate levels. Duracell's earnings in 2022 declined, primarily due to lower sales, cost inflation and foreign currency translation effects.

Earnings from Forest River increased in 2022, primarily due to the increase in unit sales in the first half of the year and higher average selling prices, partly offset by higher materials costs. However, sales volumes, revenues and earnings declined over the second half of the year compared to the elevated levels in the first half of 2022 and in 2021. We currently expect demand for recreational vehicles will continue to slow and Forest River's comparative revenues and earnings to decline in 2023, particularly over the first half of the year.

2021 versus 2020

Consumer products group revenues increased \$3.4 billion (28.0%) in 2021 versus 2020. Revenues from Forest River increased 40.2% in 2021 compared to 2020, driven by a 27.6% increase in recreational vehicle unit sales and higher average selling prices, primarily due to significant increases in manufacturing costs.

Revenues of several of our other consumer products businesses were significantly higher in 2021 as compared to 2020. The initial impacts of the pandemic in the first half of 2020 from temporary retail store closures and reduced demand had a severe impact on most of these businesses. Apparel and footwear revenues increased 25.3% in 2021 compared to 2020, reflecting significant increases in unit sales, partly attributable to inventory restocking by certain customers, and from increased consumer demand. Revenues from Richline increased 39.9%, while revenues from Duracell increased 2.4%.

Consumer products group pre-tax earnings increased \$585 million (41.9%) in 2021 compared to 2020 and as a percentage of revenues in 2021 increased 1.2 percentage points to 12.7%. The increase reflected significant earnings increases at many of our businesses. However, our consumer products businesses, particularly the apparel and footwear businesses, also experienced significant cost increases and supply chain disruptions, causing pre-tax margins in the second half of 2021 to be 1.1 percentage points lower than in the first half of the year.

Service and retailing

A summary of revenues and pre-tax earnings of our service and retailing businesses follows (dollars in millions).

	2022	2021	2020	Percentage change	
				2022 vs 2021	2021 vs 2020
Revenues					
Service	\$ 19,006	\$ 15,872	\$ 12,346	19.7%	28.6%
Retailing	19,297	18,960	15,832	1.8	19.8
McLane	53,209	49,450	46,840	7.6	5.6
	<u>\$ 91,512</u>	<u>\$ 84,282</u>	<u>\$ 75,018</u>		
Pre-tax earnings					
Service	\$ 3,047	\$ 2,672	\$ 1,600	14.0%	67.0%
Retailing	1,724	1,809	1,028	(4.7)	76.0
McLane	271	230	251	17.8	(8.4)
	<u>\$ 5,042</u>	<u>\$ 4,711</u>	<u>\$ 2,879</u>		
Pre-tax earnings as a percentage of revenues					
Service	16.0%	16.8%	13.0%		
Retailing	8.9%	9.5%	6.5%		
McLane	0.5%	0.5%	0.5%		

Management's Discussion and Analysis (Continued)

Manufacturing, Service and Retailing (Continued)

Service

Our service group consists of several businesses. The largest of these businesses are NetJets and FlightSafety (aviation services), which offer shared ownership programs for general aviation aircraft and high technology training products and services to operators of aircraft, and TTI, a distributor of electronics components. Our other service businesses franchise and service a network of quick service restaurants (Dairy Queen), lease transportation equipment (XTRA) and furniture (CORT), provide third party logistics services that primarily serve the petroleum and chemical industries (Charter Brokerage), distribute electronic news, multimedia and regulatory filings (Business Wire) and operate a television station in Miami, Florida (WPLG). Beginning, October 19, 2022, this group includes IPS Integrated Project Services, LLC (IPS), a provider of various services in facilities construction management.

2022 versus 2021

Service group revenues increased \$3.1 billion (19.7%) in 2022 compared to 2021, primarily attributable to revenue increases from TTI and the aviation services businesses, as well as the impact of the IPS acquisition. Revenues from TTI increased 17.4% in 2022 versus 2021. However, in the third quarter, new orders began to slow in certain regions and markets and the slowing of new orders was observed across nearly all regions in the fourth quarter. The slowing of electronic components demand is in part attributable to elevated inventory levels within the supply chain. Revenues from aviation services increased 18.2% in 2022 compared to 2021. The revenue increase reflected year-to-date increases in training hours (11%), customer flight hours (9%), most of which occurred in the first half of the year, and fuel surcharges to customers due to the increase in customer flight hours and significant increases in fuel prices. These increases were partially offset by changes in sales mix.

Pre-tax earnings of our service business group increased \$375 million (14.0%) in 2022 to \$3.0 billion. Pre-tax earnings of the group as a percentage of revenues were 16.0% in 2022, a decrease of 0.8 percentage points compared to 2021. The earnings increase in 2022 was attributable to TTI (19.4%) and aviation services (3.4%), as well as increased earnings from several of our smaller services businesses. The increase from TTI was primarily attributable to the increase in sales and higher average gross margin rates, partially offset by unfavorable foreign currency effects in 2022 and a favorable legal settlement in 2021. The earnings increase from aviation services in 2022 compared to 2021 was primarily attributable to improved product sales margins, increased training hours and lower restructuring costs at FlightSafety. Earnings at our smaller services companies increased \$106 million (19.3%) over 2021, reflecting a combination of higher revenues and operating cost leverage.

2021 versus 2020

Service group revenues increased \$3.5 billion (28.6%) in 2021 compared to 2020, primarily attributable to higher revenues from TTI and the aviation services businesses. Revenues from TTI increased 37.4% in 2021 versus 2020, primarily attributable to significantly higher volumes across all significant markets and product categories, and to a lesser extent, higher average prices and changes in sales mix. Customer demand accelerated throughout 2021, as customers attempted to maintain adequate inventories in response to high demand for components in end products and effects of supply chain disruptions. Revenues from aviation services increased 27.5% in 2021 over low 2020 levels, primarily due to higher training hours (24%) and customer flight hours (70%).

Pre-tax earnings of our service business group increased \$1.1 billion (67.0%) to \$2.7 billion. Pre-tax earnings of the group as a percentage of revenues was 16.8% in 2021, an increase of 3.8 percentage points compared to 2020. Earnings at nearly all service businesses increased in 2021 compared to 2020, with the largest increases from TTI, the aviation services businesses and the XTRA leasing business. TTI's earnings increase was primarily attributable to increases in sales volumes, as well as from improved operating cost leverage, changes in sales mix and a gain from a legal settlement. The increase in earnings from aviation services was attributable to the favorable effects of higher volume, changes in business mix, increased operating efficiencies, lower impairment charges and the effects of past restructuring efforts, partly offset by higher subcontractor costs attributable to the significant increase in flight demand.

Retailing

Our largest retailing business is Berkshire Hathaway Automotive, Inc. ("BHA"), which represented 65% of our combined retailing revenue in 2022. BHA consists of over 80 auto dealerships that sell new and pre-owned automobiles and offer repair services and related products. BHA also operates two insurance businesses, two auto auctions and an automotive fluid maintenance products distributor. Our retailing businesses also include four home furnishings businesses (Nebraska Furniture Mart, R.C. Willey, Star Furniture and Jordan's), which sell furniture, appliances, flooring and electronics. The home furnishings group represented 20% of the combined retailing revenues in 2022.

Management's Discussion and Analysis (Continued)

Manufacturing, Service and Retailing (Continued)

Retailing (Continued)

Other retailing businesses include three jewelry businesses (Borsheims, Helzberg and Ben Bridge), See's Candies (confectionary products), Pampered Chef (high quality kitchen tools), Oriental Trading Company (party supplies, school supplies and toys and novelties) and Detlev Louis Motorrad ("Louis"), a retailer of motorcycle accessories based in Germany.

2022 versus 2021

Retailing group revenues in 2022 increased \$337 million (1.8%) compared to 2021, reflecting an increase at BHA, partially offset by combined lower revenues from our other retailers. BHA's revenues in 2022 increased 6.1% compared to 2021. Revenues from new and used retail vehicle sales increased 5.9% compared to 2021, attributable to higher average vehicle transaction prices, partly offset by a 4.5% decline in total retail units sold. New vehicle unit sales continue to be constrained by relatively low new vehicle production, although production gradually trended higher during 2022. Revenues from BHA's service and repair business increased 11.1% versus 2021. Revenues of the home furnishings group declined 2.6%, while revenues of all other retailers declined 8.9%, primarily due to lower sales at Pampered Chef.

Pre-tax earnings in 2022 of the retailing group decreased \$85 million (4.7%) from 2021 and the pre-tax margin rate decreased 0.6 percentage points to 8.9%. BHA's pre-tax earnings increased 18.4%, primarily due to increases in vehicle gross profit margins. BHA's comparative vehicle gross profit margin rates began to accelerate during the second half of 2021, attributable to low available inventory. BHA's vehicle gross margin rates peaked in the first half of 2022 and have since declined. Aggregate pre-tax earnings for the remainder of our retailing group decreased \$233 million (23.2%) in 2022 compared to 2021, primarily due to reduced earnings from the home furnishings group, See's Candies and Pampered Chef.

2021 versus 2020

Retailing group revenues in 2021 increased \$3.1 billion (19.8%) compared to 2020. BHA's revenues increased 19.0%, with vehicle sales, service and repair, and finance and service contract revenues each increasing versus 2020. Revenues from vehicle sales increased \$1.7 billion (20.7%), primarily due to higher average selling prices, as well as a 2.7% increase in units sold. However, new vehicle unit sales in the second half of 2021 declined 18% compared to the second half of 2020, reflecting significant new vehicle supply shortages at manufacturers attributable to the global computer chip shortages and other supply chain disruptions. Home furnishings group revenues increased 22.0%, attributable to higher consumer demand and higher average selling prices, driven by higher inventory and freight costs.

Pre-tax earnings of the retailing group increased \$781 million (76.0%) in 2021 from 2020 and the pre-tax margin rate increased 3.0 percentage points to 9.5%. BHA's pre-tax earnings increased 47.5%, primarily due to increased vehicle sales margins and higher earnings from finance and service contract activities. In addition, earnings in 2021 benefitted from lower floorplan interest expense, attributable to significant declines in inventory levels, and from ongoing operating cost control efforts.

Home furnishings group pre-tax earnings increased 67.6% in 2021 versus 2020, reflecting generally higher average gross margin rates and sales mix changes and cost control efforts, partly offset by higher personnel costs. Aggregate pre-tax earnings for the remainder of our retailing group increased \$321 million in 2021 compared to 2020. The initial effects of the pandemic in 2020 were severe for most of our other retailers due to the restricted operations at many of those businesses. Results in 2021 also benefitted from relatively strong consumer demand and the effects of restructuring efforts in 2020.

Management's Discussion and Analysis (Continued)

Manufacturing, Service and Retailing (Continued)

Retailing (Continued)

McLane

McLane Company, Inc. ("McLane") operates a wholesale distribution business that provides grocery and non-food consumer products to retailers and convenience stores ("grocery") and to restaurants ("foodservice"). McLane also operates businesses that are wholesale distributors of distilled spirits, wine and beer ("beverage"). The grocery and foodservice businesses generate high sales and very low profit margins. These businesses have several significant customers, including Walmart, 7-Eleven, Yum! Brands and others. Grocery sales comprised about 62% of McLane's consolidated sales in 2022 with food service comprising most of the remainder. A curtailment of purchasing by any of its significant customers could have an adverse impact on periodic revenues and earnings.

2022 versus 2021

Revenues of \$53.2 billion in 2022 increased \$3.8 billion (7.6%) compared to 2021. Revenues from the grocery business increased 4.4%, while revenues from the foodservice and beverage businesses increased 14.1% and 6.0%, respectively.

Pre-tax earnings increased \$41 million (17.8%) in 2022 as compared to 2021. The increase reflected slightly higher gross margin rates in the grocery and foodservice businesses, partly offset by higher personnel costs, fuel expense and insurance costs. McLane's grocery and food service operating results continue to be adversely affected by supply chain constraints, including the effects of labor and truck driver shortages, high fuel costs and high inventory costs.

2021 versus 2020

Revenues increased \$2.6 billion (5.6%) in 2021 compared to 2020. Revenues from the grocery business increased 1.5%, while revenues from the foodservice and beverage businesses increased 13.1% and 17.8%, respectively. The foodservice business was significantly impacted by pandemic-related restaurant closures in 2020.

Pre-tax earnings decreased \$21 million (8.4%) in 2021 as compared to 2020. The decrease reflected significant increases in personnel, contract transportation and fuel costs, which more than offset the favorable impact of higher sales and slightly higher gross sales margins. McLane's grocery and food service operations were significantly affected in 2021 by upstream supply chain constraints, including the effects of labor and truck driver shortages, which contributed to higher inventory costs, and disruptions in inventory availability. These upstream supply chain effects, together with the truck driver and warehouse personnel shortages that we experienced, adversely affected our customer service levels and reduced our operating efficiencies. In response, hiring and wage and benefits costs increased significantly in 2021. The increase in fuel costs was primarily attributable to significant increases in petroleum prices.

Investment and Derivative Contract Gains (Losses)

A summary of investment and derivative contract gains (losses) follows (dollars in millions).

	2022	2021	2020
Investment gains (losses)	\$ (67,623)	\$ 77,576	\$ 40,905
Derivative contract gains (losses)	(276)	966	(159)
Gains (losses) before income taxes and noncontrolling interests	(67,899)	78,542	40,746
Income taxes and noncontrolling interests	(14,287)	16,202	9,155
Net earnings (loss)	<u>\$ (53,612)</u>	<u>\$ 62,340</u>	<u>\$ 31,591</u>
Effective income tax rate	<u>20.9%</u>	<u>20.4%</u>	<u>21.7%</u>

Management's Discussion and Analysis (Continued)

Investment and Derivative Contract Gains (Losses) (Continued)

Investment gains (losses)

Unrealized gains and losses arising from changes in market prices of our investments in equity securities are included in our reported earnings, which significantly increases the volatility of our periodic net earnings due to the magnitude of our equity securities portfolio and the inherent volatility of equity securities prices. Unrealized gains and losses also include the effects of changes in foreign currency exchange rates on investments in non-U.S. issuers that are held by our U.S.-based subsidiaries. Pre-tax investment gains and losses included net unrealized losses of approximately \$63.1 billion in 2022 and gains of approximately \$76.4 billion in 2021 and \$55.0 billion in 2020 attributable to changes in market prices of equity securities we held at the end of each year. In each year, we also recorded pre-tax gains and losses from market value changes during each year on equity securities sold during such year, including losses of \$3.9 billion in 2022, gains of \$1.0 billion in 2021 and losses of \$14.0 billion in 2020. Taxable investment gains on equity securities sold, which is generally the difference between sales proceeds and the original cost basis of the securities sold, were \$769 million in 2022, \$3.6 billion in 2021 and \$6.2 billion in 2020.

We believe that investment gains and losses, whether realized from sales or unrealized from changes in market prices, are often meaningless in terms of understanding our reported consolidated earnings or evaluating our periodic economic performance. We continue to believe the investment gains and losses recorded in earnings in any given period has little analytical or predictive value.

Derivative contract gains (losses)

Derivative contract gains and losses include the changes in fair value of our few remaining equity index put option contract liabilities. The periodic changes in the fair values of these liabilities are recorded in earnings. Substantially all of our contracts have expired and our exposure to loss in the future is insignificant.

Other

A summary of after-tax other earnings follows (in millions).

	2022	2021	2020
Equity method earnings	\$ 1,528	\$ 804	\$ 615
Acquisition accounting expenses	(681)	(690)	(783)
Goodwill and intangible asset impairments	—	—	(10,381)
Corporate interest expense, before foreign currency effects	(269)	(305)	(334)
Foreign currency exchange rate gains (losses) on Berkshire and BHFC non-U.S. Dollar senior notes	1,263	955	(764)
Other earnings	196	474	279
	<u>\$ 2,037</u>	<u>\$ 1,238</u>	<u>\$ (11,368)</u>

After-tax equity method earnings include our proportionate share of earnings attributable to our investments in Kraft Heinz, Pilot, Occidental Petroleum and Berkadia. Equity method earnings increased \$724 million in 2022 versus 2021, primarily due to higher earnings from Kraft Heinz and Pilot and from the inclusion of Occidental Petroleum, beginning in the fourth quarter of 2022. See Note 5 to the Consolidated Financial Statements.

Our after-tax earnings from Kraft Heinz were \$550 million in 2022, \$317 million in 2021 and \$170 million in 2020, which included our after-tax share of goodwill and other intangible asset impairment charges recorded by Kraft Heinz of \$157 million in 2022, \$259 million in 2021 and \$611 million in 2020. Our after-tax earnings from Occidental in 2022 were \$258 million and our after-tax earnings from Pilot increased \$267 million in 2022 compared to 2021. As a result of the increase in our ownership in Pilot to 80% on January 31, 2023, we discontinued the use of the equity method on that date. See Note 26 to the Consolidated financial Statements.

After-tax acquisition accounting expenses include charges arising from the application of the acquisition method in connection with certain of Berkshire's past business acquisitions. Such charges arise primarily from the amortization or impairment of intangible assets recorded in connection with those business acquisitions. Goodwill and intangible asset impairments in 2020 included after-tax charges of \$9.8 billion attributable to impairments of goodwill and certain identifiable intangible assets that were recorded in connection with our acquisition of PCC in 2016. See Other Critical Accounting Policies on page K-62 for additional details.

Management's Discussion and Analysis (Continued)

Other (Continued)

Foreign currency exchange rate gains and losses pertain to the Berkshire and BHFC Euro, Great Britain Pound and Japanese Yen denominated debt. Changes in foreign currency exchange rates produce unrealized gains and losses from the periodic revaluation of these liabilities into U.S. Dollars. In 2022, we recorded foreign currency exchange rate gains on these debt issues, due to strengthening of the U.S. Dollar, which reduced the U.S. Dollar carrying value of the debt. The gains and losses recorded in any given period can be significant due to the magnitude of the borrowings and the inherent volatility in foreign currency exchange rates. Other earnings consist primarily of Berkshire parent company investment income and corporate expenses, other intercompany interest income where the interest expense is included in earnings of the operating businesses and other unallocated income and income taxes.

Financial Condition

Our consolidated balance sheet continues to reflect significant liquidity and a very strong capital base. Consolidated shareholders' equity at December 31, 2022 was \$472.4 billion, a decrease of \$33.8 billion since December 31, 2021. Net loss attributable to Berkshire shareholders was \$22.8 billion and included after-tax losses on our investments of approximately \$53.4 billion. Over each of the last three years, investment gains and losses from changes in the market prices of our investments in equity securities produced significant volatility in our earnings.

Berkshire's common stock repurchase program, as amended, permits Berkshire to repurchase its Class A and Class B shares at prices below Berkshire's intrinsic value, as conservatively determined by Warren Buffett, Berkshire's Chairman of the Board and Chief Executive Officer, and Charlie Munger, Vice Chairman of the Board. The program does not specify a maximum number of shares to be repurchased and does not require any specified repurchase amount. The program is expected to continue indefinitely. We will not repurchase our stock if it reduces the total amount of Berkshire's consolidated cash, cash equivalents and U.S. Treasury Bill holdings below \$30 billion. Financial strength and redundant liquidity will always be of paramount importance at Berkshire. Berkshire paid \$7.9 billion during 2022 to repurchase shares of its Class A and Class B common stock.

At December 31, 2022, our insurance and other businesses held cash, cash equivalents and U.S. Treasury Bills of \$125.0 billion, which included \$94.7 billion in U.S. Treasury Bills. Investments in equity and fixed maturity securities (excluding our investments in Kraft Heinz and Occidental common stock) were \$333.9 billion. During 2022, we paid cash of \$67.9 billion to acquire equity securities and we received proceeds of \$33.7 billion from sales of equity securities. On October 19, 2022, we acquired Alleghany Corporation for \$11.5 billion, which held cash and investments of \$19.7 billion as of the acquisition date. On January 31, 2023, we acquired an additional 41.4% interest in Pilot for approximately \$8.2 billion, which was based on Pilot's unaudited earnings in 2022 and its net debt as of December 31, 2022 and is subject to post-closing adjustments following the completion of the audit of Pilot's 2022 consolidated financial statements.

Our consolidated borrowings at December 31, 2022 were \$122.7 billion, of which approximately 94% were by the Berkshire parent company, BHFC, BNSF and BHE and its subsidiaries. During 2022, Berkshire and certain of its subsidiaries issued term debt of approximately \$12.7 billion in the aggregate and paid approximately \$3.9 billion of maturing senior debt. Expected principal and interest payments related to our consolidated borrowings in each of the next five years are (in billions): \$17.4 in 2023; \$10.4 in 2024; \$11.0 in 2025; \$8.7 in 2026; and \$8.1 in 2027.

Berkshire parent company debt outstanding at December 31, 2022 was \$21.4 billion, substantially unchanged from December 31, 2021. In 2022, Berkshire issued an aggregate ¥243.5 billion (approximately \$1.94 billion) of senior notes with maturity dates ranging from 2025 to 2052 and a weighted average interest rate of 0.8%. Berkshire's borrowings decreased \$1.4 billion during 2022 from changes in foreign currency exchange rates on its non-U.S. Dollar denominated debt.

Berkshire's insurance and other subsidiary outstanding borrowings were approximately \$25.1 billion at December 31, 2022, an increase of \$7.3 billion since December 31, 2021. Senior note borrowings of BHFC, a wholly-owned financing subsidiary, were approximately \$17.9 billion at December 31, 2022, an increase of \$4.8 billion since December 31, 2021, reflecting the issuance of debt, repayments of maturing debt (\$775 million) and reductions in the carrying value of non-U.S. denominated debt due to foreign currency exchange rate changes (\$300 million). In 2022, BHFC issued \$4.5 billion of senior notes maturing in 2027, 2032 and 2052 with a weighted average interest rate of 3.4% and €1.25 billion (approximately \$1.4 billion) of senior notes maturing in 2030 and 2034 with a weighted average interest rate of 1.8%. BHFC's borrowings are used to fund a portion of loans originated and acquired by Clayton Homes and equipment held for lease by our railcar leasing business. Berkshire guarantees BHFC's senior notes for the full and timely payment of principal and interest. Subsidiary borrowings as of December 31, 2022 included approximately \$2.3 billion attributable to Alleghany and its subsidiaries.

Management’s Discussion and Analysis (Continued)

Financial Condition (Continued)

BNSF’s outstanding debt was \$23.5 billion as of December 31, 2022, an increase of \$233 million from December 31, 2021. In 2022, BNSF issued \$1.0 billion of 4.45% debentures due in 2053 and repaid approximately \$900 million of term debt. Outstanding borrowings of BHE and its subsidiaries were \$52.8 billion at December 31, 2022, an increase of \$1.0 billion since December 31, 2021. In 2022, BHE issued \$1.0 billion of 4.6% senior notes due in 2053. During 2022, BHE subsidiaries issued approximately \$3.0 billion of term debt with a weighted average interest rate of 5.2% at December 31, 2022 and maturity dates ranging from 2024 to 2053. Berkshire does not guarantee the repayment of debt issued by BNSF, BHE or any of their subsidiaries.

In each of the past three years, our diverse group of businesses generated net operating cash flows between \$37 billion and \$40 billion. Our consolidated capital expenditures for property, plant and equipment and equipment held for lease were \$15.5 billion in 2022, which included capital expenditures by our railroad, utilities and energy businesses (BNSF and BHE) of \$11.0 billion. BNSF and BHE maintain very large investments in capital assets (property, plant and equipment) and will regularly make significant capital expenditures in the normal course of business. We forecast capital expenditures of these two operations will approximate \$13.7 billion in 2023.

On August 16, 2022, the Inflation Reduction Act of 2022 (“the 2022 act”) was signed into law. The 2022 act contains numerous provisions, including a 15% corporate alternative minimum income tax on “adjusted financial statement income”, expanded tax credits for clean energy incentives and a 1% excise tax on corporate stock repurchases. The provisions of the 2022 act become effective for tax years beginning after December 31, 2022. On December 27, 2022, the IRS and Department of Treasury issued initial guidance for taxpayers subject to the corporate alternative minimum tax. The guidance addresses several, but not all, issues that needed clarification. The IRS and Department of Treasury intend to release additional guidance in the future. We will continue to evaluate the impact of the Act as more guidance becomes available. We currently do not expect a material impact on our consolidated financial statements.

Contractual Obligations

We are party to other contracts associated with ongoing business activities, which will result in cash payments to counterparties in future periods. Certain obligations are included in our Consolidated Balance Sheets, such as operating lease liabilities and shared aircraft repurchase liabilities of NetJets. Estimated payments of these liabilities in each of the next five years are (in billions): \$1.8 in 2023; \$1.6 in 2024; \$1.4 in 2025; \$1.3 in 2026; and \$1.5 in 2027.

We are also obligated to pay claims arising from our property and casualty insurance companies. Such liabilities, including amounts from retroactive reinsurance, were approximately \$143 billion at December 31, 2022. We currently forecast claim payments in 2023 of approximately \$35 billion with respect to claims occurring prior to 2023. Additionally, we estimate net payments of approximately \$2 billion in 2023 for life, health and annuity benefits under contracts. However, the timing and amount of the payments under insurance and reinsurance contracts are contingent upon the outcome of future events. Actual payments will likely vary, perhaps materially, from the forecasted payments, as well as from the liabilities currently recorded in our Consolidated Balance Sheet. We anticipate that these payments will be funded by operating cash flows.

Other obligations pertaining to the acquisition of goods or services in the future, such as certain purchase obligations, are not currently reflected in the Consolidated Financial Statements and will be recognized in future periods as the goods are delivered or services are provided. As of December 31, 2022, the largest categories of our long-term contractual obligations primarily related to fuel, capacity, transmission and maintenance contracts and capital expenditure commitments of BHE and BNSF, aircraft purchase commitments of NetJets and certain raw materials purchase commitments. We estimate future payments associated with these contracts over the next five years of approximately \$24 billion, including \$12 billion in 2023.

Critical Accounting Policies

Certain accounting policies require us to make estimates and judgments in determining the amounts reflected in our Consolidated Financial Statements. Such estimates and judgments necessarily involve varying and possibly significant degrees of uncertainty. Accordingly, certain amounts currently recorded in our Consolidated Financial Statements will likely be adjusted in the future based on new available information and changes in other facts and circumstances. A discussion of our principal accounting policies that required the application of significant judgments as of December 31, 2022 follows.

Management's Discussion and Analysis (Continued)

Property and casualty insurance unpaid losses

We record liabilities for unpaid losses and loss adjustment expenses (also referred to as “gross unpaid losses” or “claim liabilities”) based upon estimates of the ultimate amounts payable for loss events occurring on or before the balance sheet date. The timing and amount of ultimate loss payments are contingent upon, among other things, the timing of claim reporting from insureds and ceding companies and the final determination of the loss amount through the loss adjustment and settlement process. We use a variety of techniques in establishing claim liabilities, which may require significant judgments and assumptions.

As of the balance sheet date, recorded claim liabilities include estimates for reported claims and for incurred-but-not-reported (“IBNR”) claims. The period between the loss occurrence date and loss settlement date is the “claim-tail.” Property claims usually have relatively short claim-tails, absent litigation. Casualty claims usually have longer claim-tails, occasionally extending for decades. Casualty claims may be more susceptible to litigation and the impact of changing contract interpretations. The legal environment and judicial process further contribute to extending claim-tails.

Our consolidated claim liabilities, including liabilities from retroactive reinsurance contracts, as of December 31, 2022 were approximately \$143 billion, of which 78% related to GEICO and the Berkshire Hathaway Reinsurance Group. Additional information regarding significant uncertainties inherent in the processes and techniques for estimating unpaid losses of these businesses follows.

GEICO

GEICO predominantly writes private passenger automobile insurance. As of December 31, 2022, GEICO’s gross unpaid losses were \$24.8 billion and claim liabilities, net of reinsurance recoverable, were \$23.8 billion. GEICO’s claim reserving methodologies produce liability estimates based upon the individual claims. The key assumptions affecting our liability estimates include projections of ultimate claim counts (“frequency”) and average loss per claim (“severity”). We utilize a combination of several actuarial estimation methods, including Bornhuetter-Ferguson and chain-ladder methodologies.

Claim liability estimates for automobile liability coverages (such as bodily injury (“BI”), uninsured motorists, and personal injury protection) are more uncertain due to the longer claim-tails, so we establish additional case development estimates. As of December 31, 2022, case development liabilities averaged approximately 38% of the case reserves. We select case development factors through analysis of the overall adequacy of historical case liabilities.

IBNR claim liabilities are based on projections of the ultimate number of claims expected (reported and unreported) for each significant coverage. We use historical claim count data to develop age-to-age projections of the ultimate counts by quarterly accident period, from which we deduct reported claims to produce the number of unreported claims. We estimate the average costs per unreported claim and apply such estimates to the unreported claim counts, producing an IBNR liability estimate. We may record additional IBNR estimates when actuarial techniques are difficult to apply.

We test the adequacy of the aggregate claim liabilities using one or more actuarial projections based on claim closure models and paid and incurred loss triangles. Each type of projection analyzes loss occurrence data for claims occurring in a given period and projects the ultimate cost.

Our claim liability estimates recorded at the end of 2021 were reduced by \$653 million during 2022, which produced a corresponding increase to pre-tax earnings. The assumptions used to estimate liabilities at December 31, 2022 reflect the most recent frequency and severity estimates. Future development of recorded liabilities will depend on whether actual frequency and severity of claims are more or less than anticipated.

With respect to liabilities for BI claims, we believe it is reasonably possible that average claims severities will change by at least one percentage point from the projected severities used in establishing the recorded liabilities at December 31, 2022. We estimate that a one percentage point increase or decrease in BI severities would produce a \$245 million increase or decrease in recorded liabilities, with a corresponding decrease or increase in pre-tax earnings. Many of the economic forces that would likely cause BI severity to differ from expectations would likely also cause severities for other injury coverages to differ in the same direction.

Management's Discussion and Analysis (Continued)

Property and casualty insurance unpaid losses (Continued)

Berkshire Hathaway Reinsurance Group

BHRG's liabilities for unpaid losses and loss adjustment expenses derive primarily from reinsurance contracts issued through the NICO, General Re and TransRe Groups. A summary of BHRG's property and casualty unpaid losses and loss adjustment expenses, other than retroactive reinsurance losses and loss adjustment expenses, as of December 31, 2022 follows (in millions).

	Property	Casualty	Total
Reported case liabilities	\$ 8,314	\$ 12,136	\$ 20,450
IBNR liabilities	9,084	21,041	30,125
Gross unpaid losses and loss adjustment expenses	17,398	33,177	50,575
Reinsurance recoverable	787	1,439	2,226
Net unpaid losses and loss adjustment expenses	\$ 16,611	\$ 31,738	\$ 48,349

Gross unpaid losses and loss adjustment expenses consist primarily of traditional property and casualty coverages written primarily under excess-of-loss and quota-share treaties. Under certain contracts, coverage can apply to multiple lines of business written and the ceding company may not report loss data by such lines consistently, if at all. In those instances, we judgmentally allocate losses to property and casualty coverages based on internal estimates.

In connection with reinsurance contracts, the nature, extent, timing and perceived reliability of loss information received from ceding companies varies widely depending on the type of coverage and the contractual reporting terms. Reinsurance contract terms, conditions and coverages also tend to lack standardization and may evolve more rapidly than primary insurance policies.

The nature and extent of loss information provided under many facultative (individual risk) or per occurrence excess contracts may be comparable to the information received under a primary insurance contract. However, loss information with respect to aggregate excess-of-loss and quota-share contracts is often in a summary format rather than on an individual claim basis. Loss data includes currently recoverable paid losses, as well as case loss estimates. Ceding companies infrequently provide reliable IBNR loss estimates.

Loss reporting to reinsurers is typically slower than primary insurers. In the U.S., client reporting is generally required at quarterly intervals ranging from 30 to 90 days after the end of the quarterly period, while outside of the U.S., reinsurance reporting practices may vary further. In certain countries, clients report annually from 90 to 180 days after the end of the annual period. To the extent that reinsurers assume and cede underlying risks from other reinsurers, further delays in claims reporting may occur. The relative impact of reporting delays on the reinsurer may vary depending on the type of coverage, contractual reporting terms, the magnitude of the claim relative to the attachment point of the reinsurance coverage and other reasons.

As reinsurers, the premium and loss data we receive is at least one level removed from the underlying claimant, so there is a risk that the loss data reported is incomplete, inaccurate or the claim is outside the coverage terms. We maintain certain internal procedures to determine that the information is complete and in compliance with the contract terms. Generally, our reinsurance contracts permit us to access the ceding company's records with respect to the subject business, thus providing the ability to audit the reported information. In the normal course of business, disputes occasionally arise concerning whether claims are covered by our reinsurance policies. We resolve most coverage disputes through negotiation with the client. If disputes cannot be resolved, our contracts generally provide arbitration or alternative dispute resolution processes. We believe there are no coverage disputes at this time for which an adverse resolution would likely have a material impact on our consolidated results of operations or financial condition.

Establishing claim liability estimates for reinsurance assumed requires evaluation of loss information received from our clients. We generally rely on the ceding companies' reported case loss estimates. We independently evaluate certain reported case losses and if appropriate, we use our own case liability estimate. For instance, as of December 31, 2022, our case loss estimates exceeded ceding company estimates by approximately \$650 million for certain legacy workers' compensation claims occurring over 10 years ago. We also periodically conduct detailed reviews of individual client claims, which may cause us to adjust our case estimates.

Management's Discussion and Analysis (Continued)

Property and casualty insurance unpaid losses (Continued)

Berkshire Hathaway Reinsurance Group (Continued)

Although liabilities for losses are initially determined based on pricing and underwriting analysis, we use a variety of actuarial methodologies that place reliance on the extrapolation of historical data, loss development patterns, industry data and other benchmarks. The estimate of the IBNR liabilities also requires judgment by actuaries and management to reflect the impact of additional factors like change in business mix, volume, claim reporting and handling practices, inflation, social and legal environment and the terms and conditions of the contracts. The methodologies generally fall into or are hybrids of one or more of the following categories:

Paid and incurred loss development methods – These methods consider expected case loss emergence and development patterns, together with expected loss ratios by year. Factors affecting our loss development analysis include, but are not limited to, changes in the following: client claims reporting and settlement practices, the frequency of client company claim reviews, policy terms and coverage (such as loss retention levels and occurrence and aggregate policy limits), loss trends and legal trends that result in unanticipated losses. Collectively, these factors influence our selections of expected case loss emergence patterns.

Incurred and paid loss Bornhuetter-Ferguson methods – These methods consider actual paid and incurred losses and expected patterns of paid and incurred losses, taking the initial expected ultimate losses into account to determine an estimate of the expected unpaid or unreported losses.

Frequency and severity methods – These methods commonly focus on a review of the number of anticipated claims and the anticipated claims severity and may also rely on development patterns to derive such estimates. However, our processes and techniques for estimating liabilities in such analyses generally rely more on a per-policy assessment of the ultimate cost associated with the individual loss rather than with an analysis of historical development patterns of past losses.

Additional analysis – In some cases we have established reinsurance claim liabilities on a contract-by-contract basis, determined from case loss estimates reported by the ceding company and IBNR liabilities that are primarily a function of an anticipated loss ratio for the contract and the reported case loss estimate. Liabilities are adjusted upward or downward over time to reflect case losses reported versus expected case losses, which we use to form revised judgment on the adequacy of the expected loss ratio and the level of IBNR liabilities required for unreported claims. Anticipated loss ratios are also revised to include estimates of known major catastrophe events.

Our claim liability estimation process for short-tail lines, primarily property exposures, utilizes a combination of the paid and incurred loss development methods and the incurred and paid loss Bornhuetter-Ferguson methods. Certain catastrophe, individual risk and aviation excess-of-loss contracts tend to generate low frequency/high severity losses. Our processes and techniques for estimating liabilities under such contracts generally rely more on a per contract assessment of the ultimate cost associated with the individual loss event rather than with an analysis of the historical development patterns of past losses.

For our long-tail lines, primarily casualty exposures, we may rely on different methods depending on the maturity of the business, with estimates for the most recent years being based on priced loss expectations and more mature years reflecting the paid or incurred development pattern indications.

In 2022, certain workers' compensation claims reported losses were less than expected. As a result, we reduced estimated ultimate losses for prior years' loss events by \$114 million. We estimate that increases of ten percent in the tail of the expected loss emergence pattern and in the expected loss ratios would produce a net increase of approximately \$1.1 billion in IBNR liabilities, producing a corresponding decrease in pre-tax earnings. We believe it is reasonably possible for these assumptions to increase at these rates.

For other casualty losses, other than asbestos, environmental and other latent injury claims, we reduced estimated ultimate liabilities for prior years' events by approximately \$650 million in 2022. For certain significant casualty and general liability portfolios, we estimate that increases of five percent in the claim-tails of the expected loss emergence patterns and in the expected loss ratios would produce a net increase in our nominal IBNR liabilities and a corresponding reduction in pre-tax earnings of approximately \$980 million, although outcomes of greater than or less than \$980 million are possible given the diversification in worldwide business.

The change in estimated ultimate liabilities for asbestos, environmental and other latent injury claims, excluding amounts assumed under retroactive reinsurance contracts was not significant in 2022. Net liabilities for such claims were approximately \$2.1 billion at December 31, 2022. Loss estimations for these exposures are difficult to determine due to the changing legal environment and increases may be required in the future if new exposures or claimants are identified, new claims are reported or new theories of liability emerge.

Management's Discussion and Analysis (Continued)

Property and casualty insurance unpaid losses (Continued)

Retroactive reinsurance

Our retroactive reinsurance contracts cover loss events occurring before the contract inception dates. Claim liabilities associated with our retroactive reinsurance contracts predominately pertain to casualty or liability exposures. We expect the claim-tails to be very long. At December 31, 2022, gross unpaid losses were \$35.4 billion and deferred charges were \$9.9 billion.

Our contracts are generally subject to maximum limits of indemnifications and, as such, we currently expect that maximum remaining gross losses payable under our retroactive policies will not exceed \$52 billion. Absent significant judicial or legislative changes affecting asbestos, environmental or latent injury exposures, we also currently believe it unlikely that losses will develop upward to the maximum losses payable or downward by more than 15% of our estimated gross liability.

We establish liability estimates by individual contract, considering exposure and development trends. In establishing our liability estimates, we often analyze historical aggregate loss payment patterns and project expected ultimate losses under various scenarios. We assign judgmental probability factors to these scenarios and an expected outcome is determined. We then monitor subsequent loss payment activity and review ceding company reports and other available information concerning the underlying losses. We re-estimate the expected ultimate losses when significant events or significant deviations from expectations are revealed.

Certain of our retroactive reinsurance contracts include asbestos, environmental and other latent injury claims. Our estimated liabilities for such claims were approximately \$12.1 billion at December 31, 2022. We do not consistently receive reliable detailed data regarding asbestos, environmental and latent injury claims from all ceding companies, particularly with respect to multi-line or aggregate excess-of-loss policies. When possible, we conduct a detailed analysis of the underlying loss data to make an estimate of ultimate reinsured losses. When detailed loss information is unavailable, we develop estimates by applying recent industry trends and projections to aggregate client data. Judgments in these areas necessarily consider the stability of the legal and regulatory environment under which we expect claims will be adjudicated. Legal reform and legislation could also have a significant impact on our ultimate liabilities.

We increased estimated ultimate liabilities for prior years' retroactive reinsurance contracts by \$86 million in 2022. In 2022, we paid losses and loss adjustment expenses of \$2.4 billion with respect to our retroactive reinsurance contracts.

In connection with our retroactive reinsurance contracts, we also record deferred charges, which at contract inception represents the excess, if any, of the estimated ultimate liability for unpaid losses over premiums received. We amortize deferred charges, which produces charges to pre-tax earnings in future periods based on the expected timing and amount of loss payments. We adjust deferred charge balances due to changes in the expected timing and ultimate amount of claim payments and the effects of the adjustments are included in pre-tax earnings. Significant changes in such estimates may have a significant effect on unamortized deferred charge balances. Based on the contracts in effect as of December 31, 2022, we estimate that amortization expense in 2023 will approximate \$860 million.

Other Critical Accounting Policies

Our Consolidated Balance Sheet at December 31, 2022 includes goodwill of acquired businesses of \$78.1 billion and other indefinite-lived intangible assets of \$18.3 billion. We evaluate these assets for impairment annually in the fourth quarter and on an interim basis if the facts and circumstances lead us to believe that more likely than not there has been an impairment.

Goodwill and indefinite-lived intangible asset impairment reviews include determining the estimated fair values of our reporting units and indefinite-lived intangible assets. The key assumptions and inputs used in such determinations may include forecasting revenues and expenses, cash flows and capital expenditures, as well as an appropriate discount rate and other inputs. Significant judgment by management is required in estimating the fair value of a reporting unit and in performing impairment reviews. Due to the inherent subjectivity and uncertainty in forecasting future cash flows and earnings over long periods of time, actual results may differ materially from the forecasts. If the carrying value of the indefinite-lived intangible asset exceeds fair value, the excess is charged to earnings as an impairment loss. If the carrying value of a reporting unit exceeds the estimated fair value of the reporting unit, then the excess, limited to the carrying amount of goodwill, will be charged to earnings as an impairment loss.

Management's Discussion and Analysis (Continued)

Other Critical Accounting Policies (Continued)

As of December 31, 2022, we concluded it was more likely than not that goodwill recorded in our Consolidated Balance Sheet was not impaired. The fair value estimates of reporting units are and will likely be significantly affected by assumptions on the long-term effects of the COVID-19 pandemic on the reporting units businesses, as well as other assumptions concerning the long-term economic performance of the reporting units, which we cannot reliably predict. Consequently, any fair value estimates can be subject to wide variations.

We primarily use discounted projected future earnings or cash flow methods in determining fair values. The key assumptions and inputs used in such methods may include forecasting revenues and expenses, cash flows and capital expenditures, as well as an appropriate discount rate and other inputs. A significant amount of judgment is required in estimating the fair value of a reporting unit and in performing goodwill impairment tests.

In connection with the annual goodwill impairment review conducted in the fourth quarter of 2022, the estimated fair values of six reporting units did not exceed our carrying values by at least 20%. The most significant of these reporting units was Precision Castparts Corp. ("PCC"). Our estimated fair value of PCC was approximately \$31.5 billion, exceeding our carrying value of approximately \$30.3 billion by 4.0%. Our carrying value of PCC included goodwill of approximately \$7.5 billion. For the five other reporting units, our aggregate estimated fair value was approximately \$4.5 billion, which exceeded our aggregate carrying value of approximately \$4.1 billion by 9.9%. Our carrying value of these units included goodwill of approximately \$1.4 billion.

In the second quarter of 2020, we quantitatively reevaluated goodwill for impairment for certain reporting units, and most significantly for PCC. As a result of our reviews, we recorded pre-tax goodwill impairment charges of \$10 billion and indefinite-lived intangible asset impairment charges of \$638 million, of which approximately \$10 billion related to PCC. Prior to the reevaluation, the carrying value of PCC-related goodwill was approximately \$17 billion. Additionally, the carrying value of PCC-related indefinite-lived intangible assets was approximately \$14 billion. Substantially all of these amounts were recorded in connection with Berkshire's acquisition of PCC in 2016. The initial effects of the COVID-19 pandemic on commercial airlines and aircraft manufacturers were particularly severe. At that time, we considered several factors in our reevaluation, including but not limited to the announcements by airlines concerning potential future demand, employment levels and aircraft orders, announcements by manufacturers of reduced aircraft production and the actions we were taking to restructure operations. Consequently, we deemed it prudent under the prevailing circumstances to increase discount rates and reduce prior long-term forecasts of future cash flows for purposes of reviewing for impairments.

Market Risk Disclosures

Our Consolidated Balance Sheets include substantial amounts of assets and liabilities whose fair values are subject to market risks. Our significant market risks are primarily associated with equity prices, interest rates, foreign currency exchange rates and commodity prices. The fair values of our investment portfolios remain subject to considerable volatility. The following sections address the significant market risks associated with our business activities.

Equity Price Risk

Equity securities represent the most significant portion of our consolidated investment portfolio. Strategically, we strive to invest in businesses that possess excellent economics and able and honest management, and we prefer to invest a meaningful amount in each company. Historically, equity investments have been concentrated in relatively few issuers. At December 31, 2022, approximately 75% of the total fair value of equity securities was concentrated in five companies.

We often hold our equity securities for long periods and short-term price volatility has occurred in the past and will occur in the future. We also strive to maintain significant levels of shareholder capital and ample liquidity to provide a margin of safety against short-term price volatility.

Management's Discussion and Analysis (Continued)

Equity Price Risk (Continued)

For the past several years, we were also subject to equity price risk with respect to our equity index put option contracts. However, substantially all of the contracts written to date have expired.

The following table summarizes our significant assets and liabilities as of December 31, 2022 and 2021 and the estimated effects of a hypothetical 30% increase and a 30% decrease in market prices as of those dates. The selected 30% hypothetical increase and decrease does not reflect the best or worst case scenario. Indeed, results from declines could be far worse due both to the nature of equity markets and the aforementioned concentrations existing in our equity investment portfolio. Dollar amounts are in millions.

	<u>Fair Value</u>	<u>Hypothetical Price Change</u>	<u>Estimated Fair Value After Hypothetical Change in Prices</u>	<u>Estimated Increase (Decrease) in Net Earnings ⁽¹⁾</u>
<i>December 31, 2022</i>				
Investments in equity securities	\$ 308,793	30% increase	\$ 399,087	\$ 71,344
		30% decrease	218,688	(71,195)
<i>December 31, 2021</i>				
Investments in equity securities	\$ 350,719	30% increase	\$ 452,936	\$ 81,136
		30% decrease	248,606	(81,053)
Equity index put option contract liabilities	99	30% increase	5	74
		30% decrease	1,088	(781)

⁽¹⁾ The estimated increase (decrease) is after income taxes.

Interest Rate Risk

We may also invest in bonds, loans or other interest rate sensitive instruments. Our strategy is to acquire or originate such instruments at prices considered appropriate relative to the perceived credit risk. We also issue debt in the ordinary course of business to fund business operations, business acquisitions and for other general purposes. We attempt to maintain high credit ratings in order to minimize the cost of our debt. We infrequently utilize derivative products, such as interest rate swaps, to manage interest rate risks and we do not attempt to match maturities of assets and liabilities.

The fair values of our fixed maturity investments, loans and finance receivables and notes payable and other borrowings will fluctuate in response to changes in market interest rates. Increases and decreases in interest rates generally translate into decreases and increases in fair values of these instruments. Additionally, fair values of interest rate sensitive instruments may be affected by the creditworthiness of the issuer, prepayment options, relative values of alternative investments, the liquidity of the instrument and other general market conditions.

Management's Discussion and Analysis (Continued)

Interest Rate Risk (Continued)

The following table summarizes the estimated effects of hypothetical changes in interest rates on our significant assets and liabilities that are subject to significant interest rate risk at December 31, 2022 and 2021. We assumed that the interest rate changes occur immediately and uniformly to each category of instrument and that there were no significant changes to other factors used to determine the value of the instrument. The hypothetical changes in interest rates do not reflect the best or worst case scenarios. Actual results may differ from those reflected in the table. Dollars are in millions.

	Fair Value	Estimated Fair Value After Hypothetical Change in Interest Rates (bp=basis points)			
		100 bp decrease	100 bp increase	200 bp increase	300 bp increase
<i>December 31, 2022</i>					
Assets:					
Investments in fixed maturity securities	\$ 25,128	\$ 25,619	\$ 24,659	\$ 24,215	\$ 23,794
Investments in equity securities*	9,964	10,434	9,523	9,109	8,719
Loans and finance receivables	23,428	24,249	22,633	21,907	21,228
Liabilities:					
Notes payable and other borrowings:					
Insurance and other	41,961	45,535	38,941	36,367	34,157
Railroad, utilities and energy	67,651	74,698	61,725	56,710	52,430
<i>December 31, 2021</i>					
Assets:					
Investments in fixed maturity securities	\$ 16,434	\$ 16,624	\$ 16,231	\$ 16,036	\$ 15,847
Investments in equity securities*	10,864	11,457	10,313	9,798	9,319
Loans and finance receivables	22,174	22,982	21,417	20,714	20,054
Liabilities:					
Notes payable and other borrowings:					
Insurance and other	42,339	46,559	38,724	35,683	33,104
Railroad, utilities and energy	87,065	97,474	78,472	71,289	65,246

* Includes Cumulative Perpetual Preferred Stocks

Foreign Currency Risk

Certain of our subsidiaries operate in foreign jurisdictions and we transact business in foreign currencies. In addition, we hold investments in common stocks of major multinational companies, who have significant foreign business and foreign currency risk of their own. We generally do not attempt to match assets and liabilities by currency and do not use derivative contracts to manage foreign currency risks in a meaningful way.

Management's Discussion and Analysis (Continued)

Foreign Currency Risk (Continued)

Our net assets subject to financial statement translation into U.S. Dollars are primarily in our insurance, utilities and energy and certain manufacturing and service subsidiaries. A portion of our financial statement translation-related impact from changes in foreign currency rates is recorded in other comprehensive income. In addition, we include gains or losses from changes in foreign currency exchange rates in net earnings related to non-U.S. Dollar denominated assets and liabilities of Berkshire and its U.S.-based subsidiaries. A summary of these gains (losses), after-tax, for each of the years ending December 31, 2022 and 2021 follows (in millions).

	2022	2021
Non-U.S. denominated debt included in net earnings	\$ 1,263	\$ 955
Net liabilities under certain reinsurance contracts included in net earnings	263	58
Foreign currency translation included in other comprehensive income	(2,045)	(1,021)

Commodity Price Risk

Our subsidiaries use commodities in various ways in manufacturing and providing services. As such, we are subject to price risks related to various commodities. In most instances, we attempt to manage these risks through the pricing of our products and services to customers. To the extent that we are unable to sustain price increases in response to commodity price increases, our operating results will likely be adversely affected. We generally do not utilize derivative contracts to manage commodity price risks to any significant degree.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

See "Market Risk Disclosures" contained in Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations."

Management's Report on Internal Control Over Financial Reporting

Management of Berkshire Hathaway Inc. is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in the Securities Exchange Act of 1934 Rule 13a-15(f). Under the supervision and with the participation of our management, including our principal executive officer and principal financial officer, we conducted an evaluation of the effectiveness of the Company's internal control over financial reporting as of December 31, 2022, as required by the Securities Exchange Act of 1934 Rule 13a-15(c). In making this assessment, we used the criteria set forth in the framework in *Internal Control—Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on our evaluation under the framework in *Internal Control—Integrated Framework* (2013), our management concluded that our internal control over financial reporting was effective as of December 31, 2022.

The effectiveness of our internal control over financial reporting as of December 31, 2022 has been audited by Deloitte & Touche LLP, an independent registered public accounting firm, as stated in their report which appears on page K-67.

Berkshire Hathaway Inc.
February 25, 2023

Item 8. Financial Statements and Supplementary Data

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Shareholders and the Board of Directors of
Berkshire Hathaway Inc.
Omaha, Nebraska

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Berkshire Hathaway Inc. and subsidiaries (the “Company”) as of December 31, 2022 and 2021, the related consolidated statements of earnings, comprehensive income, changes in shareholders’ equity, and cash flows, for each of the three years in the period ended December 31, 2022, and the related notes (collectively referred to as the “financial statements”). We also have audited the Company’s internal control over financial reporting as of December 31, 2022, based on criteria established in Internal Control — Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2022 and 2021, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2022, in conformity with accounting principles generally accepted in the United States of America. Also, in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2022, based on criteria established in Internal Control — Integrated Framework (2013) issued by COSO.

Basis for Opinions

The Company’s management is responsible for these financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management’s Report on Internal Control Over Financial Reporting. Our responsibility is to express an opinion on these financial statements and an opinion on the Company’s internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the US federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the financial statements included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures to respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

A company’s internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company’s internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company’s assets that could have a material effect on the financial statements.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM (Continued)

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current-period audit of the financial statements that were communicated or required to be communicated to the audit committee and that (1) relate to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Unpaid Losses and Loss Adjustment Expenses— Refer to Notes 1 and 16 to the financial statements

Critical Audit Matter Description

The Company's unpaid losses and loss adjustment expenses ("claim liabilities") under short duration property and casualty insurance and reinsurance contracts are \$107,472 million as of December 31, 2022. The key assumptions affecting certain claim liabilities include expected loss and expense ("loss") ratios, expected claim count emergence patterns, expected loss payment emergence patterns, and expected loss reporting emergence patterns.

Given the subjectivity of estimating these key assumptions, performing audit procedures to evaluate whether claim liabilities were appropriately recorded as of December 31, 2022, required a high degree of auditor judgment and an increased extent of effort, including the need to involve our actuarial specialists.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to the key assumptions affecting certain claim liabilities included the following, among others:

- We tested the operating effectiveness of controls over claim liabilities, including those over the key assumptions.
- We evaluated the methods and assumptions used by management to estimate the claim liabilities by:
 - Testing the underlying data that served as the basis for the actuarial analysis, such as historical claims and earned premium, to test that the inputs to the actuarial estimate were reasonable.
 - Comparing management's prior-year claim liabilities to actual development during the current year to identify potential bias in the determination of the claim liabilities.
- With the assistance of our actuarial specialists:
 - We developed independent estimates of the claim liabilities, including loss data and industry claim development factors as needed, and compared our estimates to management's estimates.
 - We compared management's change in ultimate loss and loss adjustment expense to prior year estimates to test the reasonableness of the prior year estimates and assessed unexpected development.

Unpaid Losses and Loss Adjustment Expenses Under Retroactive Reinsurance Contracts — Refer to Notes 1 and 17 to the financial statements

Critical Audit Matter Description

The Company's unpaid losses and loss adjustment expenses ("claim liabilities") for property and casualty retroactive reinsurance contracts are \$35,415 million as of December 31, 2022. The key assumptions affecting certain claim liabilities and related deferred charge reinsurance assumed assets ("related assets") include expected loss and expense ("loss") ratios, expected loss payment emergence patterns, and expected loss reporting emergence.

Given the subjectivity of estimating these key assumptions, performing audit procedures to evaluate whether claim liabilities were appropriately recorded as of December 31, 2022, required a high degree of auditor judgment and an increased extent of effort, including the need to involve our actuarial specialists.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to the key assumptions affecting claim liabilities and related assets included the following, among others:

- We tested the operating effectiveness of controls over claim liabilities and related assets, including those over the key assumptions.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM (Continued)

- We evaluated the methods and assumptions used by management to estimate the claim liabilities and related assets by:
 - Testing the underlying data that served as the basis for the actuarial analysis, including historical claims, to test that the inputs to the actuarial estimate were reasonable.
 - Comparing management’s prior-year claim liabilities to actual development during the current year to identify potential bias in the determination of the claim liabilities and related assets.
- With the assistance of our actuarial specialists:
 - We developed independent claim liability estimates for certain retroactive reinsurance contracts and compared our estimates to management’s estimates. For other retroactive reinsurance contracts and related assets, we evaluated the process used by management to develop the estimated claim liabilities and related assets.
 - We compared management’s change in ultimate loss and loss adjustment expense to prior year estimates, assessed unexpected development and assessed internal rates of return.

Goodwill and Indefinite-Lived Intangible Assets — Refer to Notes 1 and 13 to the financial statements

Critical Audit Matter Description

The Company’s evaluation of goodwill and indefinite-lived intangible assets for impairment involves the comparison of the fair value of each reporting unit or asset to its carrying value. The Company evaluates goodwill and indefinite-lived intangible assets for impairment at least annually. When evaluating goodwill and indefinite-lived intangible assets for impairment, the fair value of each reporting unit or asset is estimated. Significant judgment is required in estimating fair values and performing impairment tests. The Company primarily uses discounted projected future net earnings or net cash flows and multiples of earnings to estimate fair value, which requires management to make significant estimates and assumptions related to forecasts of future revenue, earnings before interest and taxes (“EBIT”), and discount rates. Changes in these assumptions could have a significant impact on the fair value of reporting units and indefinite-lived intangible assets.

The Precision Castparts Corp. (“PCC”) reporting unit reported approximately \$8 billion of goodwill and approximately \$13 billion of indefinite-lived intangible assets as of December 31, 2022. Given the significant judgments made by management to estimate the fair value of the PCC reporting unit and certain customer relationships with indefinite lives along with the difference between their fair values and carrying values, performing audit procedures to evaluate the reasonableness of management’s estimates and assumptions related to forecasts of future revenue and EBIT and the selection of the discount rate required a high degree of auditor judgment and an increased extent of effort, including the need to involve our fair value specialists.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to forecasts of future revenue and EBIT and the selection of the discount rate for the PCC reporting unit and certain customer relationships included the following, among others:

- We tested the effectiveness of controls over goodwill and indefinite-lived intangible assets, including those over the forecasts of future revenue and EBIT and the selection of the discount rate.
- We evaluated management’s ability to accurately forecast future revenue and EBIT by comparing prior year forecasts to actual results in the respective years.
- We evaluated the reasonableness of management’s current revenue and EBIT forecasts by comparing the forecasts to historical results, newly executed long-term contracts, customer demand and build schedules, forecasted information included in analyst and industry reports and certain peer companies’ disclosures.
- With the assistance of our fair value specialists, we evaluated the valuation methodologies, the terminal growth rates and discount rate, including testing the underlying source information and the mathematical accuracy of the calculations, and developed a range of independent estimates and compared those to the terminal growth rates and discount rate selected by management.

/s/ Deloitte & Touche LLP

Omaha, Nebraska

February 25, 2023

We have served as the Company’s auditor since 1985.

BERKSHIRE HATHAWAY INC.
and Subsidiaries
CONSOLIDATED BALANCE SHEETS
(dollars in millions)

	December 31,	
	2022	2021
ASSETS		
<i>Insurance and Other:</i>		
Cash and cash equivalents*	\$ 32,260	\$ 85,319
Short-term investments in U.S. Treasury Bills	92,774	58,535
Investments in fixed maturity securities	25,128	16,434
Investments in equity securities	308,793	350,719
Equity method investments	28,050	16,045
Loans and finance receivables	23,208	20,751
Other receivables	43,506	35,388
Inventories	25,366	20,954
Property, plant and equipment	21,113	20,834
Equipment held for lease	15,584	14,918
Goodwill	51,522	47,117
Other intangible assets	29,187	28,486
Deferred charges - retroactive reinsurance	9,870	10,639
Other	19,628	15,854
	725,989	741,993
<i>Railroad, Utilities and Energy:</i>		
Cash and cash equivalents*	3,551	2,865
Receivables	4,795	4,177
Property, plant and equipment	160,268	155,530
Goodwill	26,597	26,758
Regulatory assets	5,062	3,963
Other	22,190	23,498
	222,463	216,791
	\$ 948,452	\$ 958,784

* Includes U.S. Treasury Bills with maturities of three months or less when purchased of \$2.6 billion at December 31, 2022 and \$61.7 billion at December 31, 2021.

See accompanying Notes to Consolidated Financial Statements

BERKSHIRE HATHAWAY INC.
and Subsidiaries
CONSOLIDATED BALANCE SHEETS
(dollars in millions)

	December 31,	
	2022	2021
LIABILITIES AND SHAREHOLDERS' EQUITY		
<i>Insurance and Other:</i>		
Unpaid losses and loss adjustment expenses	\$ 107,472	\$ 86,664
Unpaid losses and loss adjustment expenses under retroactive reinsurance contracts	35,415	37,855
Unearned premiums	28,657	23,512
Life, annuity and health insurance benefits	22,421	22,282
Other policyholder liabilities	10,101	9,901
Accounts payable, accruals and other liabilities	33,201	30,376
Aircraft repurchase liabilities and unearned lease revenues	6,820	5,849
Notes payable and other borrowings	46,538	39,272
	<u>290,625</u>	<u>255,711</u>
<i>Railroad, Utilities and Energy:</i>		
Accounts payable, accruals and other liabilities	16,615	15,696
Regulatory liabilities	7,369	7,214
Notes payable and other borrowings	76,206	74,990
	<u>100,190</u>	<u>97,900</u>
Income taxes, principally deferred	77,020	90,243
Total liabilities	<u>467,835</u>	<u>443,854</u>
Shareholders' equity:		
Common stock	8	8
Capital in excess of par value	35,167	35,592
Accumulated other comprehensive income	(6,591)	(4,027)
Retained earnings	511,602	534,421
Treasury stock, at cost	(67,826)	(59,795)
Berkshire Hathaway shareholders' equity	<u>472,360</u>	<u>506,199</u>
Noncontrolling interests	8,257	8,731
Total shareholders' equity	<u>480,617</u>	<u>514,930</u>
	<u>\$ 948,452</u>	<u>\$ 958,784</u>

See accompanying Notes to Consolidated Financial Statements

BERKSHIRE HATHAWAY INC.
and Subsidiaries
CONSOLIDATED STATEMENTS OF EARNINGS
(dollars in millions except per share amounts)

	Year Ended December 31,		
	2022	2021	2020
Revenues:			
<i>Insurance and Other:</i>			
Insurance premiums earned	\$ 74,645	\$ 69,478	\$ 63,401
Sales and service revenues	157,518	145,043	127,044
Leasing revenues	7,514	5,988	5,209
Interest, dividend and other investment income	10,263	7,465	8,092
	<u>249,940</u>	<u>227,974</u>	<u>203,746</u>
<i>Railroad, Utilities and Energy:</i>			
Freight rail transportation revenues	25,802	23,177	20,750
Energy operating revenues	21,023	18,891	15,540
Service revenues and other income	5,324	6,161	5,543
	<u>52,149</u>	<u>48,229</u>	<u>41,833</u>
Total revenues	<u>302,089</u>	<u>276,203</u>	<u>245,579</u>
Investment and derivative contract gains (losses)	<u>(67,899)</u>	<u>78,542</u>	<u>40,746</u>
Costs and expenses:			
<i>Insurance and Other:</i>			
Insurance losses and loss adjustment expenses	57,646	49,964	43,951
Life, annuity and health insurance benefits	5,152	6,007	5,812
Insurance underwriting expenses	11,942	12,569	12,798
Cost of sales and services	124,319	114,138	101,091
Cost of leasing	5,550	4,201	3,520
Selling, general and administrative expenses	19,506	18,843	19,809
Goodwill and intangible asset impairments	—	—	10,671
Interest expense	1,187	1,086	1,105
	<u>225,302</u>	<u>206,808</u>	<u>198,757</u>
<i>Railroad, Utilities and Energy:</i>			
Freight rail transportation expenses	17,282	14,477	13,120
Utilities and energy cost of sales and other expenses	15,896	13,959	11,638
Other expenses	4,984	5,615	4,796
Interest expense	3,165	3,086	2,978
	<u>41,327</u>	<u>37,137</u>	<u>32,532</u>
Total costs and expenses	<u>266,629</u>	<u>243,945</u>	<u>231,289</u>
Earnings (loss) before income taxes and equity method earnings	<u>(32,439)</u>	<u>110,800</u>	<u>55,036</u>
Equity method earnings	1,863	886	657
Earnings (loss) before income taxes	<u>(30,576)</u>	<u>111,686</u>	<u>55,693</u>
Income tax expense (benefit)	(8,518)	20,879	12,440
Net earnings (loss)	<u>(22,058)</u>	<u>90,807</u>	<u>43,253</u>
Earnings (loss) attributable to noncontrolling interests	761	1,012	732
Net earnings (loss) attributable to Berkshire Hathaway shareholders	<u>\$ (22,819)</u>	<u>\$ 89,795</u>	<u>\$ 42,521</u>
Net earnings (loss) per average equivalent Class A share	<u>\$ (15,535)</u>	<u>\$ 59,460</u>	<u>\$ 26,668</u>
Net earnings (loss) per average equivalent Class B share*	<u>\$ (10.36)</u>	<u>\$ 39.64</u>	<u>\$ 17.78</u>
Average equivalent Class A shares outstanding	1,468,876	1,510,180	1,594,469
Average equivalent Class B shares outstanding	2,203,313,642	2,265,269,867	2,391,703,454

* Class B shares are economically equivalent to one-fifteen-hundredth of a Class A share. Accordingly, net earnings per average equivalent Class B share outstanding is equal to one-fifteen-hundredth of the equivalent Class A amount. See Note 21.

See accompanying Notes to Consolidated Financial Statements

BERKSHIRE HATHAWAY INC.
and Subsidiaries
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
(dollars in millions)

	Year Ended December 31,		
	2022	2021	2020
Net earnings (loss)	\$ (22,058)	\$ 90,807	\$ 43,253
Other comprehensive income:			
Unrealized gains (losses) on investments	(713)	(217)	74
Applicable income taxes	158	50	(19)
Foreign currency translation	(2,136)	(1,011)	1,284
Applicable income taxes	22	(6)	3
Defined benefit pension plans	(253)	1,775	(355)
Applicable income taxes	47	(457)	74
Other, net	250	100	(42)
Other comprehensive income, net	(2,625)	234	1,019
Comprehensive income	(24,683)	91,041	44,272
Comprehensive income attributable to noncontrolling interests	700	1,030	751
Comprehensive income attributable to Berkshire Hathaway shareholders	\$ (25,383)	\$ 90,011	\$ 43,521

BERKSHIRE HATHAWAY INC.
and Subsidiaries
CONSOLIDATED STATEMENTS OF CHANGES IN SHAREHOLDERS' EQUITY
(dollars in millions)

	Berkshire Hathaway shareholders' equity					
	Common stock and capital in excess of par value	Accumulated other comprehensive income	Retained earnings	Treasury stock	Non- controlling interests	Total
Balance December 31, 2019	\$ 35,666	\$ (5,243)	\$ 402,493	\$ (8,125)	\$ 3,772	\$ 428,563
Net earnings	—	—	42,521	—	732	43,253
Adoption of new accounting pronouncement	—	—	(388)	—	—	(388)
Other comprehensive income, net	—	1,000	—	—	19	1,019
Acquisition of common stock	—	—	—	(24,728)	—	(24,728)
Transactions with noncontrolling interests	(32)	—	—	—	3,649	3,617
Balance December 31, 2020	35,634	(4,243)	444,626	(32,853)	8,172	451,336
Net earnings	—	—	89,795	—	1,012	90,807
Other comprehensive income, net	—	216	—	—	18	234
Acquisition of common stock	—	—	—	(26,942)	—	(26,942)
Transactions with noncontrolling interests	(34)	—	—	—	(471)	(505)
Balance December 31, 2021	35,600	(4,027)	534,421	(59,795)	8,731	514,930
Net earnings (loss)	—	—	(22,819)	—	761	(22,058)
Other comprehensive income, net	—	(2,564)	—	—	(61)	(2,625)
Acquisition of common stock	—	—	—	(8,031)	—	(8,031)
Transactions with noncontrolling interests	(425)	—	—	—	(1,174)	(1,599)
Balance December 31, 2022	\$ 35,175	\$ (6,591)	\$ 511,602	\$ (67,826)	\$ 8,257	\$ 480,617

See accompanying Notes to Consolidated Financial Statements

BERKSHIRE HATHAWAY INC.
and Subsidiaries
CONSOLIDATED STATEMENTS OF CASH FLOWS
(dollars in millions)

	Year Ended December 31,		
	2022	2021	2020
Cash flows from operating activities:			
Net earnings (loss)	\$ (22,058)	\$ 90,807	\$ 43,253
Adjustments to reconcile net earnings (loss) to operating cash flows:			
Investment (gains) losses	67,623	(77,576)	(40,905)
Depreciation and amortization	10,899	10,718	10,596
Other	(4,324)	(3,397)	11,263
Changes in operating assets and liabilities:			
Unpaid losses and loss adjustment expenses	4,057	4,194	4,476
Deferred charges - retroactive reinsurance	769	1,802	1,307
Unearned premiums	1,861	2,306	1,587
Receivables and originated loans	(5,592)	(5,834)	(1,609)
Inventories	(4,779)	(1,862)	681
Other assets	(373)	176	(1,790)
Other liabilities	2,033	2,790	3,719
Income taxes	(12,892)	15,297	7,195
Net cash flows from operating activities	<u>37,224</u>	<u>39,421</u>	<u>39,773</u>
Cash flows from investing activities:			
Purchases of equity securities	(67,930)	(8,448)	(30,161)
Sales of equity securities	33,664	15,849	38,756
Purchases of U.S. Treasury Bills and fixed maturity securities	(183,922)	(152,637)	(208,429)
Sales of U.S. Treasury Bills and fixed maturity securities	90,088	27,188	31,873
Redemptions and maturities of U.S. Treasury Bills and fixed maturity securities	66,318	160,402	149,709
Acquisitions of businesses, net of cash acquired	(10,594)	(456)	(2,532)
Purchases of property, plant and equipment and equipment held for lease	(15,464)	(13,276)	(13,012)
Other	239	770	(3,961)
Net cash flows from investing activities	<u>(87,601)</u>	<u>29,392</u>	<u>(37,757)</u>
Cash flows from financing activities:			
Proceeds from borrowings of insurance and other businesses	7,822	2,961	5,925
Repayments of borrowings of insurance and other businesses	(1,502)	(3,032)	(2,700)
Proceeds from borrowings of railroad, utilities and energy businesses	4,873	3,959	8,445
Repayments of borrowings of railroad, utilities and energy businesses	(2,426)	(4,016)	(3,761)
Changes in short term borrowings, net	(596)	(624)	(1,118)
Acquisition of treasury stock	(7,854)	(27,061)	(24,706)
Other, principally transactions with noncontrolling interests	(1,979)	(695)	(429)
Net cash flows from financing activities	<u>(1,662)</u>	<u>(28,508)</u>	<u>(18,344)</u>
Effects of foreign currency exchange rate changes	(268)	5	92
Increase (decrease) in cash and cash equivalents and restricted cash	(52,307)	40,310	(16,236)
Cash and cash equivalents and restricted cash at beginning of year	88,706	48,396	64,632
Cash and cash equivalents and restricted cash at end of year*	<u>\$ 36,399</u>	<u>\$ 88,706</u>	<u>\$ 48,396</u>
* Cash and cash equivalents and restricted cash at end of year are comprised of:			
Insurance and Other	\$ 32,260	\$ 85,319	\$ 44,714
Railroad, Utilities and Energy	3,551	2,865	3,276
Restricted cash included in other assets	588	522	406
	<u>\$ 36,399</u>	<u>\$ 88,706</u>	<u>\$ 48,396</u>

See accompanying Notes to Consolidated Financial Statements

BERKSHIRE HATHAWAY INC.
and Subsidiaries
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
December 31, 2022

(1) Significant accounting policies and practices

(a) Nature of operations and basis of consolidation

Berkshire Hathaway Inc. (“Berkshire”) is a holding company owning subsidiaries engaged in numerous diverse business activities, including insurance and reinsurance, freight rail transportation, utilities and energy, manufacturing, service and retailing. In these notes the terms “us,” “we,” or “our” refer to Berkshire and its consolidated subsidiaries. Further information regarding our reportable business segments is contained in Note 25. Information concerning significant business acquisitions completed over the past three years appears in Note 2. We believe that reporting the Railroad, Utilities and Energy subsidiaries separately is appropriate given the relative significance of their long-lived assets, capital expenditures and debt, which is not guaranteed by Berkshire.

The accompanying Consolidated Financial Statements include the accounts of Berkshire consolidated with the accounts of all subsidiaries and affiliates in which we hold a controlling financial interest as of the financial statement date. Normally a controlling financial interest reflects ownership of a majority of the voting interests. We consolidate variable interest entities (“VIE”) when we possess both the power to direct the activities of the VIE that most significantly affect its economic performance, and we (a) are obligated to absorb the losses that could be significant to the VIE or (b) hold the right to receive benefits from the VIE that could be significant to the VIE. Intercompany accounts and transactions have been eliminated. Certain immaterial balances in the Consolidated Financial Statements have been reclassified in prior years to conform to current year presentations.

(b) Use of estimates in preparation of financial statements

We prepare our Consolidated Financial Statements in conformity with accounting principles generally accepted in the United States (“GAAP”) which requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities at the balance sheet date and the reported amounts of revenues and expenses during the period. Our estimates of unpaid losses and loss adjustment expenses are subject to considerable estimation error due to the inherent uncertainty in projecting ultimate claim costs. In addition, estimates and assumptions associated with the amortization of deferred charges on retroactive reinsurance contracts, determinations of fair values of certain financial instruments and evaluations of goodwill and indefinite-lived intangible assets for impairment require considerable judgment. Actual results may differ from the estimates used in preparing our Consolidated Financial Statements.

To varying degrees the COVID-19 pandemic and its consequences continues to affect our operating businesses. Significant government and private sector actions have been taken since 2020 to control the spread and mitigate the economic effects of the virus and its variants. Such actions in 2022 included temporary business closures or restrictions of business activities in various parts of the world. In addition, significant disruptions of supply chains and higher costs emerged in 2021 and persisted in 2022. The development of geopolitical conflicts in 2022 contributed to disruptions of supply chains, resulting in cost increases for commodities, goods and services in many parts of the world. In the U.S. and elsewhere, governments are implementing actions intended to slow price inflation. The economic effects from these events over longer terms cannot be reasonably estimated at this time. Accordingly, significant estimates used in the preparation of our financial statements, including those associated with evaluations of certain long-lived assets, goodwill and other intangible assets for impairment, expected credit losses on amounts owed to us and the estimations of certain losses assumed under insurance and reinsurance contracts, may be subject to significant adjustments in future periods.

(c) Cash and cash equivalents and short-term investments in U.S. Treasury Bills

Cash equivalents consist of demand deposit and money market accounts and investments with maturities of three months or less when purchased. Short-term investments in U.S. Treasury Bills have maturities exceeding three months and less than one year at the time of purchase.

(d) Investments in fixed maturity securities

We classify investments in fixed maturity securities on the acquisition date and at each balance sheet date. Securities classified as held-to-maturity are carried at amortized cost, reflecting the ability and intent to hold the securities to maturity. Securities classified as trading are acquired with the intent to sell in the near term and are carried at fair value with changes in fair value reported in earnings. All other securities are classified as available-for-sale and are carried at fair value. Substantially all of our investments in fixed maturity securities are classified as available-for-sale. We amortize the difference between the original cost and maturity value of a fixed maturity security to earnings using the interest method.

Notes to Consolidated Financial Statements (Continued)

(1) Significant accounting policies and practices (Continued)

(d) Investments in fixed maturity securities (Continued)

We record investment gains and losses on available-for-sale fixed maturity securities when the securities are sold, determined on a specific identification basis. For securities in an unrealized loss position, we recognize a loss in earnings for the excess of amortized cost over fair value if we intend to sell before the price recovers. As of the balance sheet date, we evaluate whether the other unrealized losses are attributable to credit losses or other factors. We consider the severity of the decline in value, creditworthiness of the issuer and other relevant factors. We record an allowance for credit losses, limited to the excess of amortized cost over fair value, with a corresponding charge to earnings if the present value of estimated cash flows is less than the present value of contractual cash flows. The allowance may be subsequently increased or decreased based on the prevailing facts and circumstances. The portion of the unrealized loss that we believe is not related to a credit loss is recognized in other comprehensive income.

(e) Investments in equity securities

We carry substantially all investments in equity securities at fair value and record the subsequent changes in fair values in the Consolidated Statements of Earnings as a component of investment gains or losses.

(f) Investments under the equity method

We utilize the equity method to account for investments when we possess the ability to exercise significant influence, but not control, over the operating and financial policies of the investee. The ability to exercise significant influence is presumed when the investor possesses more than 20% of the voting interests of the investee. This presumption may be overcome based on specific facts and circumstances that demonstrate that the ability to exercise significant influence is restricted. We apply the equity method to investments in common stock and other investments when such investments possess substantially identical subordinated interests to common stock, and do not apply the equity method to investments that are not in-substance common stock as defined by GAAP.

In applying the equity method, we record the investment at cost and subsequently increase or decrease the carrying amount of the investment by our proportionate share of the net earnings or losses and other comprehensive income of the investee. We record dividends or other equity distributions as reductions in the carrying value of the investment. If net losses reduce our carrying amount to zero, additional net losses may be recorded if other investments in the investee are at-risk, even if we have not committed to provide financial support to the investee. Such additional equity method losses, if any, are based upon the change in our claim on the investee's book value.

(g) Loans and finance receivables

Loans and finance receivables are primarily manufactured home loans, and to a lesser extent, commercial loans and site-built home loans. We carry substantially all loans and finance receivables at amortized cost, net of allowances for expected credit losses, based on our ability and intent to hold such loans to maturity. Acquisition costs and loan origination and commitment costs paid and fees received, as well as acquisition premiums or discounts, are amortized as yield adjustments over the lives of the loans.

Measurements of expected credit losses include provisions for non-collection, whether the risk is probable or remote. Expected credit losses on manufactured home loans are based on the net present value of future principal payments less estimated expenses related to the charge-off and foreclosure of expected uncollectible loans and include provisions for loans that are not in foreclosure. Our principal credit quality indicator is whether the loans are performing. Expected credit loss estimates consider historical default rates, collateral recovery rates, historical runoff rates, interest rates, reductions of future cash flows for modified loans and the historical time elapsed from last payment until foreclosure, among other factors. In addition, our estimates consider current conditions and reasonable and supportable forecasts.

Notes to Consolidated Financial Statements (Continued)

(1) Significant accounting policies and practices (Continued)

(g) Loans and finance receivables (Continued)

Loans are considered delinquent when payments are more than 30 days past due. We place loans over 90 days past due on nonaccrual status and accrued but uncollected interest is reversed. Subsequent collections on the loans are first applied to the principal and interest owed for the most delinquent amount. We resume interest income accrual once a loan is less than 90 days delinquent.

Loans are considered non-performing when the foreclosure process has started. Once a loan is in the process of foreclosure, interest income is not recognized until the foreclosure is cured or the loan is modified. Once a modification is complete, interest income is recognized based on the terms of the new loan. Foreclosed loans are charged off when the collateral is sold. Loans not in foreclosure are evaluated for charge-off based on individual circumstances concerning the future collectability of the loan and the condition of the collateral securing the loan.

(h) Other receivables

Other receivables include balances due from customers, insurance premiums receivable and reinsurance losses recoverable, as well as other receivables. Trade receivables, insurance premium receivables and other receivables are primarily short-term in nature with stated collection terms of less than one year from the date of origination. Reinsurance recoverables are comprised of amounts ceded under reinsurance contracts or pursuant to mandatory government-sponsored insurance programs. Reinsurance recoverables relate to unpaid losses and loss adjustment expenses arising from property and casualty contracts and benefits under life and health contracts. Receivables are stated net of estimated allowances for uncollectible balances.

We measure expected credit losses primarily utilizing credit loss history, with adjustments to reflect current or expected future economic conditions when reasonable and supportable forecasts of losses deviate from historical experience. In evaluating expected credit losses of reinsurance recoverables on unpaid losses, we review the credit quality of the counterparty and consider right-of-offset provisions within reinsurance contracts and other forms of credit enhancement including collateral, guarantees and other available information. We charge-off receivables against the allowances after all reasonable collection efforts are exhausted.

(i) Derivatives

We carry assets and liabilities arising from derivative contracts at fair value in other assets and accounts payable, accruals and other liabilities in our Consolidated Balance Sheets. Balances are net of reductions permitted under master netting agreements with counterparties. We record the changes in fair value of derivative contracts that do not qualify as hedging instruments for financial reporting purposes in earnings or, if such contracts involve our regulated utilities subsidiaries, as regulatory assets or liabilities when inclusion in regulated rates is probable.

(j) Fair value measurements

As defined under GAAP, fair value is the price that would be received to sell an asset or paid to transfer a liability between market participants in the principal market or in the most advantageous market when no principal market exists. Adjustments to transaction prices or quoted market prices may be required in illiquid or disorderly markets in estimating fair value. Alternative valuation techniques may be appropriate under the circumstances to determine the value that would be received to sell an asset or paid to transfer a liability in an orderly transaction. Market participants are assumed to be independent, knowledgeable, and able and willing to transact an exchange and not acting under duress. Our nonperformance or credit risk is considered in determining the fair value of liabilities. Considerable judgment may be required in interpreting market data used to develop the estimates of fair value. Accordingly, estimates of fair value presented herein are not necessarily indicative of the amounts that could be realized in a current or future market exchange.

(k) Inventories

Inventories consist of manufactured goods, goods or products acquired for resale and homes constructed for sale. Manufactured inventory costs include materials, direct and indirect labor and factory overhead. At December 31, 2022, we used the last-in-first-out (“LIFO”) method to value approximately 30% of consolidated inventories with the remainder primarily determined under first-in-first-out and average cost methods. Non-LIFO inventories are stated at the lower of cost or net realizable value. The excess of current or replacement costs over costs determined under LIFO was approximately \$2.5 billion as of December 31, 2022 and \$1.9 billion as of December 31, 2021.

Notes to Consolidated Financial Statements (Continued)

(1) Significant accounting policies and practices (Continued)

(l) Property, plant and equipment and equipment held for lease

We use property, plant and equipment in our operations. We also own equipment that we lease to others under lease contracts. We record additions to property, plant and equipment and equipment held for lease at cost, which includes asset additions, improvements and betterments. With respect to constructed assets, all materials, direct labor and contract services as well as certain indirect costs are capitalized. Indirect costs include interest over the construction period. With respect to constructed assets of our utility and energy subsidiaries that are subject to authoritative guidance for regulated operations, capitalized costs also include an allowance for funds used during construction, which represents the cost of equity funds used to finance the construction of the regulated facilities. Normal repairs and maintenance and other costs that do not improve the property, extend its useful life or otherwise do not meet capitalization criteria are charged to expense as incurred.

Depreciation of assets of our regulated utilities and railroad is generally determined using group depreciation methods where rates are based on periodic depreciation studies approved by the applicable regulator. Under group depreciation, a composite rate is applied to the gross investment in a particular class of property, despite differences in the service life or salvage value of individual property units within the same class. When such assets are retired or sold, no gain or loss is recognized. Gains or losses on disposals of all other assets are recorded through earnings.

We depreciate property, plant and equipment used by our other businesses to the estimated salvage value primarily using the straight-line method over estimated service lives. Ranges of estimated service lives of depreciable assets used in our other businesses are as follows: buildings and improvements – 5 to 50 years, machinery and equipment – 3 to 25 years and furniture, fixtures and other – 3 to 15 years. Ranges of estimated useful lives of depreciable assets unique to our railroad business are as follows: track structure and other roadway – 10 to 100 years and locomotives, freight cars and other equipment – 6 to 43 years. Ranges of estimated useful lives of assets unique to our regulated utilities and energy businesses are as follows: utility generation, transmission and distribution systems – 5 to 80 years, interstate natural gas pipeline assets – 3 to 80 years and independent power plants and other assets – 2 to 50 years. We depreciate the equipment held for lease to estimated salvage value primarily using the straight-line method over estimated useful lives ranging from 3 to 35 years. We use declining balance depreciation methods for assets when the revenue-earning power of the asset is greater during the earlier years of its life.

We evaluate property, plant and equipment and equipment held for lease for impairment when events or changes in circumstances indicate that the carrying value of such assets may not be recoverable or when the assets are held for sale. Upon the occurrence of a triggering event, we assess whether the estimated undiscounted cash flows expected from the use of the asset and the residual value from the ultimate disposal of the asset exceeds the carrying value. If the carrying value exceeds the estimated recoverable amounts, we reduce the carrying value to fair value and record an impairment loss in earnings, except with respect to impairment of assets of our regulated utility and energy subsidiaries where the impacts of regulation are considered in evaluating the carrying value.

(m) Leases

We are party to contracts where we lease property from others. When we lease assets from others, we record right-of-use assets and lease liabilities. Right-of-use assets represent our right to use an underlying asset for the lease term and lease liabilities represent our obligation to make lease payments arising from the lease. In this regard, lease payments include fixed payments and variable payments that depend on an index or rate. The lease term is generally considered the non-cancellable lease period. Certain lease contracts contain renewal options or other terms that provide for variable payments based on performance or usage. Options are not included in determining right-of-use assets or lease liabilities unless it is reasonably certain that options will be exercised. Generally, incremental borrowing rates are used in measuring lease liabilities. Right-of-use assets are subject to review for impairment. As permitted under GAAP, for some leases we do not separate lease components from non-lease components by class of asset and we do not record assets or liabilities for leases with terms of one year or less.

(n) Goodwill and other intangible assets

Goodwill represents the excess of the acquisition price of a business over the fair value of identified net assets of that business. We evaluate goodwill for impairment at least annually. When evaluating goodwill for impairment, we estimate the fair value of the reporting unit. Several methods may be used to estimate a reporting unit's fair value, including market quotations, asset and liability fair values and other valuation techniques, including, but not limited to, discounted projected future net earnings or net cash flows and multiples of earnings. When the carrying amount of a reporting unit, including goodwill, exceeds the estimated fair value, the excess up to the balance of goodwill is charged to earnings as an impairment loss.

Notes to Consolidated Financial Statements (Continued)

(1) Significant accounting policies and practices (Continued)

(n) Goodwill and other intangible assets (Continued)

Intangible assets with indefinite lives are also tested for impairment at least annually and when events or changes in circumstances indicate that, more-likely-than-not, the asset is impaired. Significant judgment is required in estimating fair values and performing goodwill and indefinite-lived intangible asset impairment tests. We amortize intangible assets with finite lives in a pattern that reflects the expected consumption of related economic benefits or on a straight-line basis over the estimated economic useful lives. Intangible assets with finite lives are reviewed for impairment when events or changes in circumstances indicate that the carrying amount may not be recoverable.

(o) Revenue recognition

We earn insurance premiums on prospective property/casualty insurance and reinsurance contracts over the loss exposure or coverage period in proportion to the level of protection provided. Premiums are generally earned in proportion to the coverage provided, which in most cases is ratably over the term of the contract with unearned premiums computed on a monthly or daily pro-rata basis. Premiums on retroactive property/casualty reinsurance contracts are generally received in full and are earned at the inception of the contracts, as all underlying loss events covered by the policies occurred prior to contract inception. Premiums for life reinsurance and periodic payment annuity contracts are earned when due. Premiums for periodic payment annuity contracts are received in full at the inception of the contracts. Premiums earned are stated net of amounts ceded to reinsurers. Premiums earned on contracts with experience-rating provisions reflect estimated loss experience under such contracts.

Sales and service revenues are recognized when goods or services are transferred to a customer. A good or service is transferred when (or as) the customer obtains control of that good or service. Revenues are based on the consideration we expect to receive in connection with our promises to deliver goods and services to our customers.

We manufacture and/or distribute a wide variety of industrial, building and consumer products. Our sales contracts provide customers with these products directly or through wholesale and retail channels in exchange for consideration specified under the contracts. Contracts generally represent customer orders for individual products at stated prices. Sales contracts may contain either single or multiple performance obligations. In instances where contracts contain multiple performance obligations, we allocate the revenue to each obligation based on the relative stand-alone selling prices of each product or service.

Sales revenue reflects reductions for returns, allowances, late delivery penalties, volume discounts and other incentives, some of which may be contingent on future events. In certain customer contracts, sales revenue includes certain state and local excise taxes billed to customers on specified products when those taxes are levied directly upon us by the taxing authorities. Sales revenue excludes sales taxes and value-added taxes collected on behalf of taxing authorities. Sales revenue includes consideration for shipping and other fulfillment activities performed prior to the customer obtaining control of the goods. We also elect to treat consideration for such services performed after control has passed to the customer as sales revenue.

Our product sales revenues are generally recognized at a point in time when control of the product transfers to the customer, which coincides with customer pickup or product delivery or acceptance, depending on terms of the arrangement. We recognize sales revenues and related costs with respect to certain contracts over time, primarily from certain castings, forgings and aerostructures contracts. Control of the product units under these contracts transfers continuously to the customer as the product is manufactured. These products generally have no alternative use and the contract requires the customer to provide reasonable compensation if terminated for reasons other than breach of contract.

The primary performance obligation under our freight rail transportation service contracts is to move freight from a point of origin to a point of destination. The performance obligations are represented by bills of lading which create a series of distinct services that have a similar pattern of transfer to the customer. The revenues for each performance obligation are based on various factors including the product being shipped, the origin and destination pair and contract incentives, which are outlined in various private rate agreements, common carrier public tariffs, interline foreign road agreements and pricing quotes. The transaction price is generally a per car/unit amount to transport railcars from a specified origin to a specified destination. Freight revenues are recognized over time as the service is performed because the customer simultaneously receives and consumes the benefits of the service. Revenues recognized represent the portion of the service completed as of the balance sheet date. Invoices for freight transportation services are generally issued to customers and paid within 30 days or less. Customer incentives, which are primarily provided for shipping a specified cumulative volume or shipping to/from specific locations, are recorded as a reduction to revenue on a pro-rata basis based on actual or projected future customer shipments.

Notes to Consolidated Financial Statements (Continued)

(1) Significant accounting policies and practices (Continued)

(o) Revenue recognition (Continued)

Our energy revenue derives primarily from tariff-based sales arrangements approved by various regulatory commissions. These tariff-based revenues are mainly comprised of energy, transmission, distribution and natural gas and have performance obligations to deliver energy products and services to customers which are satisfied over time as energy is delivered or services are provided. Our nonregulated energy revenue primarily relates to our renewable energy business. Energy revenues are equivalent to the amounts we have the right to invoice and correspond directly with the value to the customer of the performance to date and include billed and unbilled amounts. Payments from customers are generally due within 30 days of billing. Rates charged for energy products and services are established by regulators or contractual arrangements that establish the transaction price, as well as the allocation of price among the separate performance obligations. When preliminary regulated rates are permitted to be billed prior to final approval by the applicable regulator, certain revenue collected may be subject to refund and a liability for estimated refunds is accrued. Other service revenues derive from contracts with customers in which performance obligations are satisfied over time, where customers receive and consume benefits as we perform the services or at a point in time when the services are provided. Other service revenues primarily derive from real estate brokerage, automotive repair, aircraft management, aviation training, franchising and news distribution.

Leasing revenue is generally recognized ratably over the term of the lease or based on usage, if applicable under the terms of the contract. A substantial portion of our lessor contracts are classified as operating leases.

(p) Losses and loss adjustment expenses

We record liabilities for unpaid losses and loss adjustment expenses under property/casualty insurance and reinsurance contracts for loss events that have occurred on or before the balance sheet date. Such liabilities represent the estimated ultimate payment amounts without discounting for time value.

We base liability estimates on (1) loss reports from policyholders and cedents, (2) individual case estimates and (3) estimates of incurred but not reported losses. Losses and loss adjustment expenses in the Consolidated Statements of Earnings include paid claims, claim settlement costs and changes in estimated claim liabilities. Losses and loss adjustment expenses charged to earnings are net of amounts recovered and estimates of amounts recoverable under ceded reinsurance contracts. Reinsurance contracts do not relieve the ceding company of its obligations to indemnify policyholders with respect to the underlying insurance and reinsurance contracts.

(q) Retroactive reinsurance contracts

We record liabilities for unpaid losses and loss adjustment expenses under short duration retroactive reinsurance contracts consistent with property/casualty insurance and reinsurance contracts described in Note 1(p). With respect to retroactive reinsurance contracts, we also record deferred charge assets at the inception of the contracts, representing the excess, if any, of the estimated ultimate claim liabilities over the premiums earned. We subsequently amortize the deferred charge assets over the expected claim settlement periods using the interest method. Changes to the estimated timing or amount of future loss payments also produce changes in deferred charge balances. We apply changes in such estimates retrospectively and the resulting changes in deferred charge balances, together with periodic amortization, are included in insurance losses and loss adjustment expenses in the Consolidated Statements of Earnings.

(r) Insurance policy acquisition costs

We capitalize the direct incremental costs that relate to the successful sale of insurance contracts, subject to ultimate recoverability. Direct incremental acquisition costs include commissions, premium taxes and certain other costs associated with successful efforts. We expense all other underwriting costs as incurred. For short duration contracts, we subsequently amortize deferred policy acquisition costs to underwriting expenses as the related premiums are earned. Acquisition costs related to long duration life insurance contracts are amortized over the expected premium-paying period in proportion to the anticipated premiums over the life of the policy. Such anticipated premiums are estimated using the same assumptions used for computing liabilities for future policy benefits. The recoverability of deferred policy acquisition costs generally considers anticipated investment income. The unamortized balances are included in other assets and were approximately \$3.8 billion and \$3.4 billion at December 31, 2022 and 2021, respectively, which included \$3.2 billion and \$2.9 billion, respectively, related to property and casualty insurance contracts.

Notes to Consolidated Financial Statements (Continued)

(1) Significant accounting policies and practices (Continued)

(s) Life, annuity and health insurance benefits

Liabilities for future life, annuity and health insurance benefits represent the present value of expected future benefits and non-acquisition variable expenses, less the present value of expected future net premiums (the portion of gross premium required to provide for all expected future benefits and variable expenses). In estimating future cash flows, we consider the timing and amounts of future claims, premiums and expenses, which require estimates concerning future investment yields, expected mortality, morbidity and lapse or withdrawal rates. These assumptions, as applicable, also include a margin for adverse deviation and may vary with the characteristics of the contract's date of issuance, policy duration and country of risk. The interest rate assumptions used for discounting may vary by contract or underlying currency denomination of our reinsurance contracts. Generally, assumptions regarding cash flow and discount rate are fixed at the inception of the contract and changed only under certain adverse circumstances. The effects of changes in estimated cash flows and discount rate assumptions on benefit liabilities are recorded in earnings in the period of the change. Periodic payment and annuity reinsurance contracts are regarded as limited payment contracts under GAAP. We discount annuity liabilities based on the implicit rate as of the inception of the contracts such that the present value of the liabilities equals the premiums received less brokerage expense at the inception date. Discount rates for most contracts range between 3% to 7%.

(t) Regulated utilities and energy businesses

Certain energy subsidiaries prepare their financial statements in accordance with authoritative guidance for regulated operations, reflecting the economic effects of regulation from the ability to recover certain costs from customers and the requirement to return revenues to customers in the future through the regulated rate-setting process. Accordingly, certain costs are deferred as regulatory assets and certain income is accrued as regulatory liabilities. Regulatory assets and liabilities will be amortized into operating expenses and revenues over various future periods.

Regulatory assets and liabilities are continually assessed for probable future inclusion in regulatory rates by considering factors such as applicable regulatory or legislative changes and recent rate orders received by other regulated entities. If future inclusion in regulatory rates ceases to be probable, the amount no longer probable of inclusion in regulatory rates is charged or credited to earnings (or other comprehensive income, if applicable) or returned to customers.

(u) Foreign currency

The accounts of our non-U.S.-based subsidiaries are measured, in most instances, using functional currencies other than the U.S. Dollar. Revenues and expenses in the financial statements of these subsidiaries are translated into U.S. Dollars at the average exchange rate for the period and assets and liabilities are translated at the exchange rate as of the end of the reporting period. The net effects of translating the financial statements of these subsidiaries are included in shareholders' equity as a component of accumulated other comprehensive income. Gains and losses arising from transactions denominated in a currency other than the functional currency of the subsidiary, including gains and losses from the remeasurement of assets and liabilities due to changes in currency exchange rates, are included in earnings.

(v) Income taxes

Berkshire files a consolidated federal income tax return in the U.S., which includes eligible subsidiaries. In addition, we file income tax returns in state, local and foreign jurisdictions. Provisions for current income tax liabilities are calculated and accrued on income and expense amounts expected to be included in the income tax returns for the current year. Income taxes reported in earnings also include deferred income tax provisions.

Deferred income tax assets and liabilities are computed on differences between the financial statement bases and tax bases of assets and liabilities at the enacted tax rates. Changes in deferred income tax assets and liabilities associated with components of other comprehensive income are charged or credited directly to other comprehensive income. Otherwise, changes in deferred income tax assets and liabilities are included as a component of income tax expense. The effect on deferred income tax assets and liabilities attributable to changes in enacted tax rates are charged or credited to income tax expense in the period of enactment. Valuation allowances are established for certain deferred income tax assets when realization is not likely.

Liabilities are established for uncertain tax positions taken or positions expected to be taken in income tax returns when such positions, in our judgment, do not meet a more-likely-than-not threshold based on the technical merits of the positions. Estimated interest and penalties related to uncertain tax positions are included as a component of income tax expense.

Notes to Consolidated Financial Statements (Continued)

(1) Significant accounting policies and practices (Continued)

(w) New accounting pronouncements adopted in 2020

We adopted Accounting Standards Codification (“ASC”) 326 “Financial Instruments-Credit Losses” on January 1, 2020, which provides for the measurement of expected credit losses on financial assets that are carried at amortized cost based on the net amounts expected to be collected. Measurements of expected credit losses therefore include provisions for non-collection, whether the risk is probable or remote. Upon adoption of ASC 326, we recorded a charge to retained earnings of \$388 million representing the cumulative after-tax increase in our allowances for credit losses.

(x) New accounting pronouncements to be adopted subsequent to December 31, 2022

In August 2018, the Financial Accounting Standards Board issued Accounting Standards Update 2018-12 “Targeted Improvements to the Accounting for Long-Duration Contracts” (“ASU 2018-12”). ASU 2018-12 requires reassessment of cash flow assumptions at least annually and revision of discount rate assumptions each reporting period in valuing policyholder liabilities of long-duration insurance and reinsurance contracts. Discount rate assumptions are established based upon upper-medium grade corporate bond yields that reflect the duration characteristics of the liabilities. ASU 2018-12 also provides for new disclosures. Under ASU 2018-12, the effects from changes in cash flow assumptions are reflected in earnings and the effects from changes in discount rate assumptions are reflected in other comprehensive income. Prior to ASU 2018-12, the cash flow and discount rate assumptions were set at the contract inception date and not subsequently changed, except under certain adverse circumstances. ASU 2018-12 is to be applied retrospectively to the earliest period presented in the financial statements.

We adopted ASU 2018-12 as of January 1, 2023 using the modified retrospective method. Revised cash flow and discount rate assumptions were applied to contracts in-force between January 1, 2021 (the transition date) and December 31, 2022 with liabilities remeasured, with the cumulative effect from discount rate changes (based on prevailing interest rates) recorded in accumulated other comprehensive income and the cumulative effect from cash flow assumption changes in retained earnings.

The adoption of ASU 2018-12 produced a cumulative after-tax reduction in our originally reported consolidated shareholders’ equity at the end of 2020 of approximately \$6.4 billion (or 1.4%), consisting of reductions to accumulated other comprehensive income of \$5.7 billion and retained earnings of \$700 million. The cumulative decline in shareholders’ equity decreased to approximately \$4.6 billion (or 0.9% of the shareholders’ equity originally reported) at December 31, 2021. The cumulative effect of adopting ASU 2018-12 will increase our shareholders’ equity at December 31, 2022 by approximately \$1.0 billion. These effects reflect the after-tax increases or decreases to our life, health and annuity benefits liabilities and reinsurance recoverables, primarily derived from changes in discount rate assumptions. The effects of adopting ASU 2018-12 will be reflected primarily in other comprehensive income and the impact on our consolidated net earnings for each of the years ending December 31, 2022 and 2021 is not material.

(2) Significant business acquisitions

Our long-held acquisition strategy is to acquire businesses that have consistent earning power, good returns on equity and able and honest management. Financial results attributable to business acquisitions are included in our Consolidated Financial Statements beginning on their respective acquisition dates. Information concerning significant business acquisitions completed in each of the three years ending December 31, 2022 follows.

On October 19, 2022, Berkshire acquired all of the outstanding common stock of Alleghany Corporation (“Alleghany”) for approximately \$11.5 billion, which includes the value of certain Alleghany equity awards, pursuant to a definitive agreement and plan of merger dated as of March 20, 2022. Alleghany operates a group of property and casualty reinsurance and insurance businesses. It also owns a portfolio of non-financial businesses.

Notes to Consolidated Financial Statements (Continued)

(2) Significant business acquisitions (Continued)

The preliminary values of the Alleghany identified assets acquired and liabilities assumed are summarized as follows (in millions). Valuations of certain assets, such as intangible assets and goodwill, and certain liabilities as of the acquisition date have not been finalized at this time and are provisional.

Cash, cash equivalents and U.S. Treasury Bills	\$	3,762
Investments in fixed maturity and equity securities		15,982
Loans and other receivables		5,650
Goodwill and other intangible assets		6,362
Other		3,834
Assets acquired	\$	<u>35,590</u>
Unpaid losses and loss adjustment expenses	\$	15,080
Unearned premiums		3,536
Notes payable		2,169
Other		3,300
Liabilities assumed		<u>24,085</u>
Net assets	\$	<u>11,505</u>

Alleghany's consolidated revenues and net earnings included in Berkshire's Consolidated Financial Statements in 2022 were approximately \$2.4 billion and \$216 million, respectively. The following table sets forth certain unaudited pro forma consolidated earnings data for the years ending December 31, 2022 and 2021, as if the Alleghany acquisition was consummated on the same terms at the beginning of 2021 (in millions, except per share amounts).

	2022	2021
Revenues	\$ 311,184	\$ 287,450
Net earnings (loss) attributable to Berkshire Hathaway shareholders	(24,107)	90,728
Net earnings (loss) per equivalent Class A common share	(16,412)	60,077

Berkshire Hathaway Energy ("BHE") acquired certain businesses of Dominion Energy, Inc. ("Dominion") on November 1, 2020 for cash of approximately \$2.5 billion. The acquired businesses included natural gas transmission, gathering and storage pipelines, natural gas storage capacity and partial ownership of a liquefied natural gas export, import and storage facility ("Cove Point"). As part of the Dominion acquisition, BHE acquired an indirect 25% economic interest in Cove Point, consisting of 100% of the general partnership interest and 25% of the limited partnership interests. We concluded that Cove Point is a VIE and that we have the power to direct the activities that most significantly impact its economic performance as well as the obligation to absorb losses and receive benefits which could be significant to Cove Point. Therefore, we treat Cove Point as a consolidated subsidiary.

(3) Investments in fixed maturity securities

Investments in fixed maturity securities as of December 31, 2022 and 2021 are summarized by type below (in millions).

	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
<u>December 31, 2022</u>				
U.S. Treasury, U.S. government corporations and agencies	\$ 10,039	\$ 12	\$ (249)	\$ 9,802
Foreign governments	10,454	50	(177)	10,327
Corporate bonds	1,945	256	(6)	2,195
Other	2,735	77	(8)	2,804
	<u>\$ 25,173</u>	<u>\$ 395</u>	<u>\$ (440)</u>	<u>\$ 25,128</u>
<u>December 31, 2021</u>				
U.S. Treasury, U.S. government corporations and agencies	\$ 3,286	\$ 22	\$ (5)	\$ 3,303
Foreign governments	10,998	29	(33)	10,994
Corporate bonds	1,363	412	(1)	1,774
Other	317	47	(1)	363
	<u>\$ 15,964</u>	<u>\$ 510</u>	<u>\$ (40)</u>	<u>\$ 16,434</u>

Notes to Consolidated Financial Statements (Continued)

(3) Investments in fixed maturity securities (Continued)

The fair value of investments in U.S. Treasury securities as of December 31, 2022 included approximately \$9.1 billion of securities that mature in 2023 and 2024. Investments in foreign governments include securities issued by national and provincial government entities as well as instruments that are unconditionally guaranteed by such entities. As of December 31, 2022, approximately 93% of our foreign government holdings were rated AA or higher by at least one of the major rating agencies. The amortized cost and estimated fair value of fixed maturity securities at December 31, 2022 are summarized below by contractual maturity dates. Amounts are in millions. Actual maturities may differ from contractual maturities due to prepayment rights held by issuers.

	Due in one year or less	Due after one year through five years	Due after five years through ten years	Due after ten years	Mortgage- backed securities	Total
Amortized cost	\$ 7,720	\$ 13,413	\$ 1,393	\$ 842	\$ 1,805	\$ 25,173
Fair value	7,660	13,122	1,627	864	1,855	25,128

(4) Investments in equity securities

Investments in equity securities as of December 31, 2022 and 2021 are summarized based on the primary industry of the investee in the table below (in millions).

	Cost Basis	Net Unrealized Gains	Fair Value
December 31, 2022 *			
Banks, insurance and finance	\$ 25,893	\$ 43,663	\$ 69,556
Consumer products	40,508	112,384	152,892
Commercial, industrial and other	65,209	21,136	86,345
	<u>\$ 131,610</u>	<u>\$ 177,183</u>	<u>\$ 308,793</u>

* Approximately 75% of the aggregate fair value was concentrated in five companies (American Express Company – \$22.4 billion; Apple Inc. – \$119.0 billion; Bank of America Corporation – \$34.2 billion; The Coca-Cola Company – \$25.4 billion and Chevron Corporation – \$30.0 billion).

	Cost Basis	Net Unrealized Gains	Fair Value
December 31, 2021 *			
Banks, insurance and finance	\$ 26,822	\$ 62,236	\$ 89,058
Consumer products	36,076	154,945	191,021
Commercial, industrial and other	41,707	28,933	70,640
	<u>\$ 104,605</u>	<u>\$ 246,114</u>	<u>\$ 350,719</u>

* Approximately 73% of the aggregate fair value was concentrated in four companies (American Express Company – \$24.8 billion; Apple Inc. – \$161.2 billion; Bank of America Corporation – \$46.0 billion and The Coca-Cola Company – \$23.7 billion).

During 2022, we began acquiring common stock of Occidental Petroleum Corporation (“Occidental”) and our aggregate voting interest exceeded 20% on August 4, 2022. We adopted the equity method with respect to our investment in Occidental common stock as of that date and included this investment in equity method investments at December 31, 2022. See Note 5. We continue to report our investments in Occidental Cumulative Perpetual Preferred Stock and Occidental common stock warrants at fair value as equity securities, as such interests are not in-substance common stock under GAAP and are not eligible for the equity method.

Notes to Consolidated Financial Statements (Continued)

(4) Investments in equity securities (Continued)

Our investment in Occidental preferred stock has an aggregate liquidation value of \$10 billion and our investment in Occidental warrants allows us to purchase up to 83.86 million shares of Occidental common stock at an exercise price of \$59.62 per share. The preferred stock accrues dividends at 8% per annum and is redeemable at the option of Occidental commencing in 2029 at a redemption price equal to 105% of the liquidation preference plus any accumulated and unpaid dividends and is mandatorily redeemable at 110% of the liquidation preference plus accrued dividends under specified events. The warrants are exercisable in whole or in part until one year after the redemption of the preferred stock.

As of December 31, 2022, we owned 20.4% of the outstanding common stock of the American Express Company (“American Express”). Since 1995, we have been party to an agreement with American Express whereby we agreed to vote a significant portion of our shares in accordance with the recommendations of the American Express Board of Directors. We have also agreed to passivity commitments as requested by the Board of Governors of the Federal Reserve System, which collectively, in our judgment, restrict our ability to exercise significant influence over the operating and financial policies of American Express. Accordingly, we do not use the equity method with respect to our investment in American Express common stock and we continue to record our investment at fair value.

(5) Equity method investments

Berkshire and its subsidiaries hold investments in certain businesses that are accounted for pursuant to the equity method. Currently, the most significant of these are our investments in the common stock of The Kraft Heinz Company (“Kraft Heinz”) and, as of August 4, 2022, Occidental. We own 26.6% of Kraft Heinz common stock and 21.4% of Occidental common stock, which excludes the potential effect of the exercise of Occidental common stock warrants. See Note 4.

Kraft Heinz manufactures and markets food and beverage products, including condiments and sauces, cheese and dairy, meals, meats, refreshment beverages, coffee and other grocery products. Occidental is an international energy company, whose activities include oil and natural gas exploration, development and production, and chemical manufacturing businesses. Occidental’s midstream businesses purchase, market, gather, process, transport and store various oil, natural gas, carbon dioxide and other products. Occidental’s financial information is not available in time for concurrent reporting in our consolidated financial statements. Therefore, we report the equity method effects for Occidental on a one-quarter lag. Our earnings in the fourth quarter of 2022 included our equity method share of Occidental’s third quarter earnings.

The common stock of Kraft Heinz and Occidental are publicly traded. The fair values and carrying values of these two investments in addition to the carrying values of our other significant equity method investments are summarized as follows (in millions).

	Carrying Value		Fair Value	
	December 31,		December 31,	
	2022	2021	2022	2021
Kraft Heinz	\$ 12,937	\$ 13,112	\$ 13,249	\$ 11,683
Occidental	11,484	—	12,242	—
Other	3,629	2,933		
	<u>\$ 28,050</u>	<u>\$ 16,045</u>		

Our earnings and distributions received from significant equity method investments are summarized in the table below (in millions). As previously indicated, we are reporting the equity method effects for Occidental on a one-quarter lag, thus the earnings we recorded in 2022 below do not reflect Occidental’s results for its fourth quarter.

	Equity in Earnings			Distributions Received		
	Year ended December 31,			Year ended December 31,		
	2022	2021	2020	2022	2021	2020
Kraft Heinz	\$ 628	\$ 269	\$ 95	\$ 521	\$ 521	\$ 521
Occidental	323	—	—	24	—	—
Other	912	617	562	284	1,057	383
	<u>\$ 1,863</u>	<u>\$ 886</u>	<u>\$ 657</u>	<u>\$ 829</u>	<u>\$ 1,578</u>	<u>\$ 904</u>

Notes to Consolidated Financial Statements (Continued)

(5) Equity method investments (Continued)

Summarized consolidated financial information of Kraft Heinz follows (in millions).

	December 31, 2022	December 25, 2021
Assets	\$ 90,513	\$ 93,394
Liabilities	41,643	43,942

	Year ending		
	December 31, 2022	December 25, 2021	December 26, 2020
Sales	\$ 26,485	\$ 26,042	\$ 26,185
Net earnings attributable to Kraft Heinz common shareholders	2,363	1,012	356

Summarized consolidated financial information of Occidental, reported on a one quarter lag follows (in millions).

	September 30, 2022
Assets	\$ 72,144
Liabilities	43,424

	Third Quarter 2022	First Nine Months 2022
Total revenues and other income	\$ 9,501	\$ 28,769
Net earnings attributable to Occidental common shareholders	2,546	10,777

Other significant investments accounted for pursuant to the equity method as of December 31, 2022 included our investments in Pilot Travel Centers, LLC (“Pilot”) and Berkadia Commercial Mortgage LLC (“Berkadia”). Since 2017, we have owned a 38.6% interest in Pilot. We acquired an additional 41.4% interest on January 31, 2023 and became the majority owner of Pilot at that date. As a result, we discontinued the use of the equity method during the first quarter of 2023. See Note 26. We own a 50% interest in Berkadia, with Jefferies Financial Group Inc. (“Jefferies”) owning the other 50% interest. Berkadia provides capital solutions, investment sales advisory and mortgage servicing for multifamily and commercial real estate. Berkadia’s commercial paper borrowing capacity (currently limited to \$1.5 billion) is supported by a surety policy issued by a Berkshire insurance subsidiary. Jefferies is obligated to indemnify us for one-half of any losses incurred under the policy.

(6) Investment and derivative contract gains (losses)

Investment and derivative contract gains (losses) for each of the three years ending December 31, 2022 are summarized as follows (in millions).

	2022	2021	2020
Investment gains (losses):			
Equity securities:			
Change in unrealized investment gains (losses) during the year on securities held at the end of the year	\$ (63,120)	\$ 76,375	\$ 54,951
Investment gains (losses) during the year on securities sold	(3,927)	997	(14,036)
	<u>(67,047)</u>	<u>77,372</u>	<u>40,915</u>
Fixed maturity securities:			
Gross realized gains	134	85	56
Gross realized losses	(684)	(29)	(27)
Other	(26)	148	(39)
Investment gains (losses)	(67,623)	77,576	40,905
Derivative contract gains (losses)	(276)	966	(159)
	<u>\$ (67,899)</u>	<u>\$ 78,542</u>	<u>\$ 40,746</u>

Notes to Consolidated Financial Statements (Continued)

(6) Investment and derivative contract gains (losses) (Continued)

Equity securities gains and losses include unrealized gains and losses from changes in fair values during the year on equity securities we still own, as well as gains and losses on securities we sold during the year. As reflected in the Consolidated Statements of Cash Flows, we received proceeds of approximately \$33.7 billion in 2022, \$15.8 billion in 2021 and \$38.8 billion in 2020 from sales of equity securities. In the preceding table, investment gains and losses on equity securities sold during the year represent the difference between the sales proceeds and the fair value of the equity securities sold at the beginning of the applicable year or, if later, the purchase date. Our taxable gains and losses on equity securities sold are generally the difference between the proceeds from sales and original cost. Equity securities sold produced taxable gains of \$769 million in 2022, \$3.6 billion in 2021 and \$6.2 billion in 2020.

Our derivative contract gains and losses derived from equity index put option contracts. As of December 31, 2022, we had three open contracts, one of which has since expired. Our exposure to losses in the future is insignificant.

(7) Loans and finance receivables

Loans and finance receivables are summarized as follows (in millions).

	December 31,	
	2022	2021
Loans and finance receivables before allowances and discounts	\$ 24,664	\$ 22,065
Allowances for credit losses	(856)	(765)
Unamortized acquisition discounts and points	(600)	(549)
	<u>\$ 23,208</u>	<u>\$ 20,751</u>

Loans and finance receivables are principally manufactured home loans, and to a lesser extent, commercial loans and site-built home loans. Reconciliations of the allowance for credit losses on loans and finance receivables for the three years ending December 31, 2022 follow (in millions).

	2022	2021	2020
Balance at beginning of year	\$ 765	\$ 712	\$ 167
Adoption of ASC 326	—	—	486
Provision for credit losses	124	88	177
Charge-offs, net of recoveries	(33)	(35)	(118)
Balance at December 31	<u>\$ 856</u>	<u>\$ 765</u>	<u>\$ 712</u>

At December 31, 2022, substantially all manufactured and site-built home loan balances were evaluated collectively for impairment. At December 31, 2022, we considered approximately 96% of the loan balances to be current as to payment status. A summary of performing and non-performing home loans before discounts and allowances by year of loan origination as of December 31, 2022 follows (in millions).

	Origination Year						Total
	2022	2021	2020	2019	2018	Prior	
Performing	\$ 5,743	\$ 3,630	\$ 2,830	\$ 1,992	\$ 1,509	\$ 6,959	\$ 22,663
Non-performing	4	9	9	8	6	46	82
	<u>\$ 5,747</u>	<u>\$ 3,639</u>	<u>\$ 2,839</u>	<u>\$ 2,000</u>	<u>\$ 1,515</u>	<u>\$ 7,005</u>	<u>\$ 22,745</u>

We are the lender under several commercial loan agreements which had a principal value of approximately \$1.9 billion at December 31, 2022 and December 31, 2021. The balance at December 31, 2022 included \$450 million acquired in connection with the Alleghany acquisition. Our largest commercial loan is with Seritage Growth Properties (“Seritage”) with an unpaid principal balance of \$1.0 billion as of December 31, 2022 and \$1.4 billion as of December 31, 2021. Our commercial loans are generally secured by mortgages on real estate properties or by other assets and substantially all of these loans are current as to payment status.

Notes to Consolidated Financial Statements (Continued)

(8) Other receivables

Other receivables are comprised of the following (in millions).

	December 31,	
	2022	2021
Insurance and other:		
Insurance premiums receivable	\$ 18,398	\$ 15,050
Reinsurance recoverables	7,119	4,900
Trade receivables	14,510	12,971
Other	4,154	3,146
Allowances for credit losses	(675)	(679)
	<u>\$ 43,506</u>	<u>\$ 35,388</u>
Railroad, utilities and energy:		
Trade receivables	\$ 4,182	\$ 3,678
Other	754	650
Allowances for credit losses	(141)	(151)
	<u>\$ 4,795</u>	<u>\$ 4,177</u>

Provisions for credit losses with respect to receivables summarized above were \$409 million in 2022, \$441 million in 2021 and \$564 million in 2020. Charge-offs, net of recoveries, were \$432 million in 2022, \$420 million in 2021 and \$401 million in 2020.

(9) Inventories

Inventories are comprised of the following (in millions).

	December 31,	
	2022	2021
Raw materials	\$ 6,381	\$ 5,743
Work in process and other	3,464	3,192
Finished manufactured goods	5,739	4,530
Goods acquired for resale	9,782	7,489
	<u>\$ 25,366</u>	<u>\$ 20,954</u>

(10) Property, plant and equipment

A summary of property, plant and equipment of our insurance and other businesses follows (in millions).

	December 31,	
	2022	2021
Land, buildings and improvements	\$ 14,761	\$ 14,070
Machinery and equipment	26,690	26,063
Furniture, fixtures and other	4,847	4,640
	46,298	44,773
Accumulated depreciation	(25,185)	(23,939)
	<u>\$ 21,113</u>	<u>\$ 20,834</u>

Notes to Consolidated Financial Statements (Continued)

(10) Property, plant and equipment (Continued)

A summary of property, plant and equipment of railroad and utilities and energy businesses follows (in millions). The utility generation, transmission and distribution systems and interstate natural gas pipeline assets are owned by regulated public utility and natural gas pipeline subsidiaries.

	December 31,	
	2022	2021
Railroad:		
Land, track structure and other roadway	\$ 67,350	\$ 65,843
Locomotives, freight cars and other equipment	16,031	13,822
Construction in progress	1,743	1,027
	<u>85,124</u>	<u>80,692</u>
Accumulated depreciation	(17,899)	(14,978)
	<u>67,225</u>	<u>65,714</u>
Utilities and energy:		
Utility generation, transmission and distribution systems	92,759	90,223
Interstate natural gas pipeline assets	18,328	17,423
Independent power plants and other assets	14,650	13,695
Construction in progress	5,357	4,196
	<u>131,094</u>	<u>125,537</u>
Accumulated depreciation	(38,051)	(35,721)
	<u>93,043</u>	<u>89,816</u>
	<u>\$ 160,268</u>	<u>\$ 155,530</u>

Depreciation expense for each of the three years ending December 31, 2022 is summarized below (in millions).

	2022	2021	2020
Insurance and other	\$ 2,276	\$ 2,318	\$ 2,320
Railroad, utilities and energy	6,181	5,990	5,799
	<u>\$ 8,457</u>	<u>\$ 8,308</u>	<u>\$ 8,119</u>

(11) Equipment held for lease

Equipment held for lease includes railcars, aircraft, and other equipment, including over-the-road trailers, intermodal tank containers, cranes, storage units and furniture. Equipment held for lease is summarized below (in millions).

	December 31,	
	2022	2021
Railcars	\$ 9,612	\$ 9,448
Aircraft	10,667	9,234
Other	5,212	5,053
	<u>25,491</u>	<u>23,735</u>
Accumulated depreciation	(9,907)	(8,817)
	<u>\$ 15,584</u>	<u>\$ 14,918</u>

Notes to Consolidated Financial Statements (Continued)

(11) Equipment held for lease (Continued)

Depreciation expense for equipment held for lease was \$1,209 million in 2022, \$1,158 million in 2021 and \$1,200 million in 2020. Fixed and variable operating lease revenues for each of the three years ending December 31, 2022 are summarized below (in millions).

	2022	2021	2020
Fixed lease revenue	\$ 5,184	\$ 4,482	\$ 4,262
Variable lease revenue	2,330	1,506	947
	<u>\$ 7,514</u>	<u>\$ 5,988</u>	<u>\$ 5,209</u>

A summary of future operating lease receipts as of December 31, 2022 follows (in millions).

2023	2024	2025	2026	2027	Thereafter	Total
\$ 3,365	\$ 2,687	\$ 1,992	\$ 1,373	\$ 673	\$ 299	\$ 10,389

(12) Leases

We are party to contracts where we lease property from others under contracts classified as operating leases. We primarily lease buildings, offices and operating facilities. Operating lease right-of-use assets are included in other assets and operating lease liabilities are included in accounts payable, accruals and other liabilities. Information related to our operating leases follows (dollars in millions).

	Right-of-use assets	Lease liabilities	Weighted average remaining term in years	Weighted average discount rate used to measure liabilities
December 31, 2022	\$ 4,975	\$ 4,939	7.0	3.7%
December 31, 2021	5,091	4,991	7.2	3.5%

A summary of our remaining future operating lease payments reconciled to lease liabilities as of December 31, 2022 and December 31, 2021 follows (in millions).

	Year 1	Year 2	Year 3	Year 4	Year 5	Thereafter	Total lease payments	Amount representing interest	Lease liabilities
December 31:									
2022	\$ 1,283	\$ 1,073	\$ 822	\$ 560	\$ 449	\$ 1,464	\$ 5,651	\$ (712)	\$ 4,939
2021	1,238	1,038	835	631	418	1,571	5,731	(740)	4,991

Components of operating lease costs for the three years ending December 31, 2022, by type, are summarized in the following table (in millions).

	2022	2021	2020
Operating lease cost	\$ 1,361	\$ 1,426	\$ 1,413
Short-term lease cost	233	154	145
Variable lease cost	217	223	228
Sublease income	(12)	(10)	(10)
Total lease cost	<u>\$ 1,799</u>	<u>\$ 1,793</u>	<u>\$ 1,776</u>

Notes to Consolidated Financial Statements (Continued)

(13) Goodwill and other intangible assets

Reconciliations of the changes in the carrying value of goodwill during 2022 and 2021 follow (in millions).

	December 31,	
	2022	2021
Balance at beginning of year	\$ 73,875	\$ 73,734
Business acquisitions	4,657	353
Other, including foreign currency translation	(413)	(212)
Balance at end of year*	<u>\$ 78,119</u>	<u>\$ 73,875</u>

* Net of accumulated goodwill impairments of \$11.0 billion as of December 31, 2022 and 2021

The gross carrying amounts and related accumulated amortization of other intangible assets are summarized as follows (in millions).

	December 31, 2022			December 31, 2021		
	Gross carrying amount	Accumulated amortization	Net carrying value	Gross carrying amount	Accumulated amortization	Net carrying value
Insurance and other:						
Customer relationships	\$ 27,765	\$ 7,174	\$ 20,591	\$ 27,335	\$ 6,450	\$ 20,885
Trademarks and trade names	5,603	822	4,781	5,176	802	4,374
Patents and technology	4,943	3,748	1,195	4,763	3,484	1,279
Other	4,150	1,530	2,620	3,390	1,442	1,948
	<u>\$ 42,461</u>	<u>\$ 13,274</u>	<u>\$ 29,187</u>	<u>\$ 40,664</u>	<u>\$ 12,178</u>	<u>\$ 28,486</u>
Railroad, utilities and energy:						
Customer relationships and contracts and other	<u>\$ 1,914</u>	<u>\$ 622</u>	<u>\$ 1,292</u>	<u>\$ 1,693</u>	<u>\$ 542</u>	<u>\$ 1,151</u>

Intangible asset amortization expense was \$1,233 million in 2022, \$1,252 million in 2021 and \$1,277 million in 2020. Estimated amortization expense over the next five years is as follows (in millions): 2023 – \$1,253; 2024 – \$1,128; 2025 – \$1,081; 2026 – \$1,000 and 2027 – \$877. Intangible assets with indefinite lives were \$18.3 billion as of December 31, 2022 and \$18.5 billion as of December 31, 2021 and primarily related to certain customer relationships and trademarks and trade names.

(14) Supplemental cash flow information

A summary of supplemental cash flow information for each of the three years ending December 31, 2022 is presented in the following table (in millions).

	2022	2021	2020
Cash paid during the year for:			
Income taxes	\$ 4,236	\$ 5,412	\$ 5,001
Interest:			
Insurance and other	1,150	1,227	1,001
Railroad, utilities and energy	3,195	3,162	3,006
Other adjustments to reconcile net earnings to operating cash flows:			
Foreign currency exchange (gains) losses	(2,148)	(1,433)	1,074
Goodwill and intangible asset impairment charges	—	—	10,671
Other	(2,176)	(1,964)	(482)
Non-cash investing and financing activities:			
Liabilities assumed in connection with business acquisitions	24,186	102	6,981
Operating lease liabilities arising from obtaining right-of-use assets	1,118	687	729

Notes to Consolidated Financial Statements (Continued)

(15) Dividend restrictions – Insurance subsidiaries

Payments of dividends by our insurance subsidiaries are restricted by insurance statutes and regulations. Without prior regulatory approval, our principal insurance subsidiaries may declare up to approximately \$35 billion as ordinary dividends during 2023. Investments in fixed maturity and equity securities and short-term investments on deposit with U.S. state insurance authorities in accordance with state insurance regulations were approximately \$4.9 billion at December 31, 2022 and \$6.4 billion at December 31, 2021.

Combined shareholders' equity of U.S.-based insurance subsidiaries determined pursuant to statutory accounting rules (Surplus as Regards Policyholders) was approximately \$272 billion at December 31, 2022 and \$301 billion at December 31, 2021. Statutory surplus differs from the corresponding amount based on GAAP due to differences in accounting for certain assets and liabilities. For instance, deferred charges reinsurance assumed, deferred policy acquisition costs, unrealized gains on certain investments and related deferred income taxes are recognized for GAAP but not for statutory reporting purposes. In addition, the carrying values of certain assets, such as goodwill and non-insurance entities owned by our insurance subsidiaries, are not fully recognized for statutory reporting purposes.

(16) Unpaid losses and loss adjustment expenses

Our liabilities for unpaid losses and loss adjustment expenses (also referred to as “claim liabilities”) under property and casualty insurance and reinsurance contracts are based upon estimates of the ultimate claim costs associated with claim occurrences as of the balance sheet date and include estimates for incurred-but-not-reported (“IBNR”) claims. A reconciliation of the changes in claim liabilities, excluding liabilities under retroactive reinsurance contracts (see Note 17), for each of the three years ending December 31, 2022 follows (in millions). The changes in claim liabilities in 2022 within this table include Alleghany’s property and casualty claim liabilities beginning as of the October 19, 2022 acquisition date.

	2022	2021	2020
Balances at beginning of year:			
Gross liabilities	\$ 86,664	\$ 79,854	\$ 73,019
Reinsurance recoverable on unpaid losses	(2,960)	(2,912)	(2,855)
Net liabilities	83,704	76,942	70,164
Incurred losses and loss adjustment expenses:			
Current accident year	59,463	52,099	43,400
Prior accident years	(2,672)	(3,116)	(356)
Total	56,791	48,983	43,044
Paid losses and loss adjustment expenses:			
Current accident year	(27,236)	(22,897)	(17,884)
Prior accident years	(23,083)	(18,904)	(18,862)
Total	(50,319)	(41,801)	(36,746)
Foreign currency effect	(508)	(420)	480
Net liabilities of acquired businesses (see Note 2)	12,779	—	—
Balances at December 31:			
Net liabilities	102,447	83,704	76,942
Reinsurance recoverable on unpaid losses	5,025	2,960	2,912
Gross liabilities	<u>\$ 107,472</u>	<u>\$ 86,664</u>	<u>\$ 79,854</u>

Incurred losses and loss adjustment expenses shown in the preceding table were recorded in earnings and related to insured events occurring in the current year (“current accident year”) and events occurring in all prior years (“prior accident years”). Incurred and paid losses and loss adjustment expenses are net of reinsurance recoveries. Current accident year incurred losses from significant catastrophe events (losses in excess of \$150 million per event) were approximately \$3.1 billion in 2022 (\$2.5 billion from Hurricane Ian), \$2.9 billion in 2021 and \$950 million in 2020. Significant catastrophe events in 2021 included Hurricane Ida (\$1.5 billion), Winter Storm Uri and floods in Europe, while significant catastrophe events in 2020 included losses from Hurricanes Laura and Sally (about \$600 million in the aggregate) and U.S. wildfires. Current accident year incurred losses for private passenger auto insurance increased significantly in 2022 and 2021, attributable to increases in claims frequencies and severities.

Notes to Consolidated Financial Statements (Continued)

(16) Unpaid losses and loss adjustment expenses (Continued)

We recorded net reductions of estimated ultimate liabilities for prior accident years of \$2.7 billion in 2022, \$3.1 billion in 2021 and \$356 million in 2020, which produced corresponding reductions in incurred losses and loss adjustment expenses in those periods. These reductions, as percentages of the net liabilities at the beginning of each year, were 3.2% in 2022, 4.0% in 2021 and 0.5% in 2020.

We reduced estimated ultimate liabilities for prior accident years of primary insurance businesses by \$1.1 billion in 2022, \$2.4 billion in 2021 and \$518 million in 2020. The reductions in each year derived primarily from private passenger auto, medical professional liability and workers' compensation claims, partly offset by increases with respect to other casualty claims. Estimated ultimate liabilities for prior accident years of property and casualty reinsurance businesses were reduced \$1.6 billion in 2022 and \$718 million in 2021 and increased \$162 million in 2020. The reductions in 2022 and 2021 reflected reduced estimates for both property and casualty claims. In 2020, increases in casualty claims estimates were partly offset by reductions in property estimates.

Estimated net claim liabilities for environmental, asbestos and other latent injury exposures were approximately \$2.1 billion at December 31, 2022 and 2021. These liabilities are subject to change due to changes in the legal and regulatory environment. We are unable to reliably estimate additional losses or a range of losses that are reasonably possible for these claims.

Disaggregated information concerning our claims liabilities is provided below and in the pages that follow. The accident year data for Alleghany's primary insurance business is included in Berkshire Hathaway Primary Group ("BH Primary") and for its reinsurance business is included in Berkshire Hathaway Reinsurance Group ("BHRG") on a retrospective basis. A reconciliation of the disaggregated net unpaid losses and allocated loss adjustment expenses (the latter referred to as "ALAE") of GEICO, BH Primary and BHRG to our consolidated unpaid losses and loss adjustment expenses as of December 31, 2022 follows (in millions).

	GEICO		BH Primary		BHRG		Total
	Physical Damage	Auto Liability	Medical Professional Liability	Workers' Compensation/Other Casualty	Property	Casualty	
Unpaid losses and ALAE, net	\$ 884	\$ 20,930	\$ 8,980	\$ 18,491	\$ 16,552	\$ 31,366	\$ 97,203
Reinsurance recoverable	5	867	28	1,543	787	1,439	4,669
Unallocated loss adjustment expenses							2,232
Other losses and loss adjustment expenses							3,368
Unpaid losses and loss adjustment expenses							<u>\$ 107,472</u>

GEICO

GEICO's claim liabilities predominantly relate to various types of private passenger auto liability and physical damage claims. For such claims, we establish and evaluate unpaid claim liabilities using standard actuarial loss development methods and techniques. The actuarial methods utilize historical claims data, adjusted when deemed appropriate to reflect perceived changes in loss patterns. Claim liabilities include average, case, case development and IBNR estimates.

We establish average liabilities based on expected severities for newly reported physical damage and liability claims prior to establishing individual case reserves when insufficient time or information is available for specific claim estimates and for large volumes of minor physical damage claims that once reported are quickly settled. We establish case loss estimates for liability claims, including estimates for loss adjustment expenses, as the facts and merits of the claim are evaluated.

Claim estimates for liability coverages normally reflect greater uncertainty than physical damage coverages, primarily due to the longer claim-tails, the greater chance of litigation and the time needed to evaluate facts at the time the case estimate is first established. The "claim-tail" is the period between the claim occurrence date and claim settlement or payment date. Consequently, we establish additional case development liabilities, which are usually percentages of the case liabilities. For unreported claims, IBNR liabilities are estimated by projecting the ultimate number of claims expected (reported and unreported) for each significant coverage and deducting reported claims to produce estimated unreported claims. The product of the average cost per unreported claim and the number of unreported claims produces the IBNR liability estimate. We may record supplemental IBNR liabilities in certain situations when actuarial techniques are difficult to apply.

Notes to Consolidated Financial Statements (Continued)

(16) Unpaid losses and loss adjustment expenses (Continued)

GEICO's net incurred and paid auto physical damage and liability losses and ALAE are summarized by accident year below. IBNR and case development liabilities are as of December 31, 2022. Claim counts are established when accidents that may result in a liability are reported and are based on policy coverage. Each claim event may generate claims under multiple coverages, and thus may result in multiple counts. The "Cumulative Number of Reported Claims" includes the combined number of reported claims for all auto policy coverages. Dollars are in millions.

Physical Damage

Accident Year	Incurred Losses and ALAE through December 31,			IBNR and Case Development Liabilities	Cumulative Number of Reported Claims (in thousands)
	2021*	2022			
2021	\$ 12,135	\$ 11,968		\$ 70	9,141
2022		14,138		610	8,986
		<u>\$ 26,106</u>			

Accident Year	Cumulative Paid Losses and ALAE through December 31,	
	2021*	2022
2021	\$ 11,427	\$ 11,978
2022		13,251
		<u>25,229</u>
	Net unpaid losses and ALAE for 2021 – 2022 accident years	877
	Net unpaid losses and ALAE for accident years before 2021	7
	Net unpaid losses and ALAE	<u>\$ 884</u>

Auto Liability

Accident Year	Incurred Losses and ALAE through December 31,					IBNR and Case Development Liabilities	Cumulative Number of Reported Claims (in thousands)
	2018*	2019*	2020*	2021*	2022		
2018	\$ 15,383	\$ 15,226	\$ 14,985	\$ 14,838	\$ 14,854	\$ 259	2,720
2019		16,901	16,678	16,191	16,151	566	2,790
2020			14,637	14,024	13,697	1,182	2,111
2021				17,481	17,457	2,994	2,413
2022					19,645	6,275	2,166
					<u>\$ 81,804</u>		

Accident Year	Cumulative Paid Losses and ALAE through December 31,					
	2018*	2019*	2020*	2021*	2022	
2018	\$ 6,218	\$ 10,772	\$ 12,658	\$ 13,757	\$ 14,337	
2019		6,742	11,671	13,851	15,084	
2020			5,395	9,839	11,794	
2021				6,450	12,681	
2022					7,614	
					<u>61,510</u>	
					Net unpaid losses and ALAE for 2018 – 2022 accident years	20,294
					Net unpaid losses and ALAE for accident years before 2018	636
					Net unpaid losses and ALAE	<u>\$ 20,930</u>

* Unaudited required supplemental information

Notes to Consolidated Financial Statements (Continued)

(16) Unpaid losses and loss adjustment expenses (Continued)

BH Primary

BH Primary's liabilities for unpaid losses and loss adjustment expenses primarily derive from medical professional liability and workers' compensation and other casualty insurance, which includes commercial auto and general liability insurance. Net incurred and paid losses and ALAE are summarized by accident year in the following tables, disaggregated by medical professional liability coverages and workers' compensation and other casualty coverages. IBNR and case development liabilities are as of December 31, 2022. The cumulative number of reported claims reflects the number of individual claimants and includes claims that ultimately resulted in no liability or payment. Dollars are in millions.

Medical Professional Liability

We estimate the ultimate expected incurred losses and loss adjustment expenses for medical professional claim liabilities using a variety of commonly accepted actuarial methodologies, such as the paid and incurred development method and Bornhuetter-Ferguson based methods, as well as other techniques that consider insured loss exposures and historical and expected loss trends, among other factors. These methodologies produce loss estimates from which we determine our best estimate. In addition, we study developments in older accident years and adjust initial loss estimates to reflect recent developments based upon claim age, coverage and litigation experience.

Accident Year	2013*	2014*	2015*	2016*	2017*	2018*	2019*	2020*	2021*	2022	IBNR and Case Development Liabilities	Cumulative Number of Reported Claims (in thousands)
2013	\$ 1,328	\$ 1,296	\$ 1,261	\$ 1,195	\$ 1,127	\$ 1,086	\$ 1,019	\$ 985	\$ 978	\$ 979	\$ 37	11
2014		1,370	1,375	1,305	1,246	1,218	1,127	1,061	1,033	1,029	74	11
2015			1,374	1,342	1,269	1,290	1,218	1,157	1,093	1,033	84	12
2016				1,392	1,416	1,414	1,394	1,341	1,288	1,216	141	15
2017					1,466	1,499	1,495	1,474	1,382	1,349	228	21
2018						1,602	1,650	1,659	1,580	1,616	289	24
2019							1,670	1,691	1,663	1,614	584	21
2020								1,704	1,751	1,698	959	30
2021									1,852	1,855	1,444	20
2022										1,927	1,749	12
										Incurring losses and ALAE	\$14,316	

Accident Year	2013*	2014*	2015*	2016*	2017*	2018*	2019*	2020*	2021*	2022	
2013	\$ 15	\$ 90	\$ 219	\$ 368	\$ 518	\$ 635	\$ 743	\$ 793	\$ 821	\$ 853	
2014		21	106	238	396	540	671	752	788	840	
2015			23	108	218	382	543	663	719	799	
2016				22	115	274	461	620	712	822	
2017					27	128	300	457	582	739	
2018						35	166	367	543	728	
2019							39	160	314	536	
2020								34	148	321	
2021									36	136	
2022										38	
										Paid losses and ALAE	5,812
										Net unpaid losses and ALAE for 2013 – 2022 accident years	8,504
										Net unpaid losses and ALAE for accident years before 2013	476
										Net unpaid losses and ALAE	\$ 8,980

* Unaudited required supplemental information

Notes to Consolidated Financial Statements (Continued)

(16) Unpaid losses and loss adjustment expenses (Continued)

Workers' Compensation and Other Casualty

We periodically evaluate ultimate loss and loss adjustment expense estimates for the workers' compensation and other casualty claims using a combination of commonly accepted actuarial methodologies such as the Bornhuetter-Ferguson and chain-ladder approaches using paid and incurred loss data. Paid and incurred loss data is segregated and analyzed by state due to the different state regulatory frameworks that may impact certain factors, including the duration and amount of loss payments. We also separately study the various components of liabilities, such as employee lost wages, medical expenses and the costs of claims investigations and administration. We establish case liabilities for reported claims based upon the facts and circumstances of the claim. The excess of the ultimate projected losses, including the expected development of case estimates, and the case-basis liabilities is included in IBNR liabilities. As previously noted, Alleghany was acquired on October 19, 2022. Alleghany's incurred and paid losses and ALAE are included for all years presented retrospectively.

Incurred Losses and ALAE through December 31,

Accident Year	2013*	2014*	2015*	2016*	2017*	2018*	2019*	2020*	2021*	2022	IBNR and Case Development Liabilities	Cumulative Number of Reported Claims (in thousands)
2013	\$ 1,602	\$ 1,574	\$ 1,541	\$ 1,491	\$ 1,462	\$ 1,435	\$ 1,407	\$ 1,376	\$ 1,360	\$ 1,340	\$ 101	78
2014		2,138	2,064	2,036	1,970	1,901	1,906	1,875	1,861	1,829	153	103
2015			2,580	2,539	2,455	2,426	2,428	2,402	2,408	2,393	249	121
2016				2,931	2,848	2,793	2,772	2,815	2,825	2,864	409	125
2017					3,473	3,337	3,299	3,310	3,322	3,320	477	144
2018						3,998	3,886	3,967	4,030	4,091	841	164
2019							4,584	4,623	4,692	4,763	1,057	185
2020								5,030	4,881	4,775	1,858	155
2021									5,899	5,856	3,105	311
2022										6,796	4,889	285
										<u>\$38,027</u>		

Cumulative Paid Losses and ALAE through December 31,

Accident Year	2013*	2014*	2015*	2016*	2017*	2018*	2019*	2020*	2021*	2022		
2013	\$ 210	\$ 520	\$ 774	\$ 941	\$ 1,049	\$ 1,111	\$ 1,147	\$ 1,173	\$ 1,194	\$ 1,209		
2014		286	683	1,002	1,269	1,407	1,504	1,557	1,600	1,617		
2015			329	804	1,187	1,507	1,766	1,873	1,966	2,041		
2016				373	908	1,359	1,765	1,998	2,140	2,303		
2017					480	1,133	1,645	2,050	2,279	2,492		
2018						583	1,340	1,902	2,324	2,746		
2019							725	1,598	2,214	2,898		
2020								736	1,498	2,066		
2021									869	1,751		
2022										962		
										<u>20,085</u>		
											Net unpaid losses and ALAE for 2013 – 2022 accident years	17,942
											Net unpaid losses and ALAE for accident years before 2013	549
											Net unpaid losses and ALAE	<u>\$18,491</u>

* Unaudited required supplemental information

BHRG

We use a variety of methodologies to establish BHRG's estimates for property and casualty claims liabilities. These methodologies include paid and incurred loss development techniques, incurred and paid loss Bornhuetter-Ferguson techniques and frequency and severity techniques, as well as ground-up techniques when appropriate.

Our claims liabilities are principally a function of reported losses from ceding companies, case development and IBNR liability estimates. Case loss estimates are reported under our contracts either individually or in bulk as provided under the terms of the contracts. We may independently evaluate case losses reported by the ceding company, and if deemed appropriate, we may establish case liabilities based on our estimates.

Notes to Consolidated Financial Statements (Continued)

(16) Unpaid losses and loss adjustment expenses (Continued)

Estimated IBNR liabilities are affected by expected case loss emergence patterns and expected loss ratios, which are evaluated as groups of contracts with similar exposures or on a contract-by-contract basis. Estimated case and IBNR liabilities for major catastrophe events are generally based on a per-contract assessment of the ultimate cost associated with the individual loss event. Claim count data is not provided consistently by ceding companies under our contracts or is otherwise considered unreliable.

Net incurred and paid losses and ALAE of BHRG are disaggregated based on losses that are expected to have shorter claim-tails (property) and losses expected to have longer claim-tails (casualty). Under certain contracts, the coverage can apply to multiple lines of business written by the ceding company, whether property, casualty or combined, and the ceding company may not report loss data by such lines consistently, if at all. In those instances, we allocated losses to property and casualty coverages based on internal estimates. BHRG's disaggregated incurred and paid losses and ALAE are summarized by accident year. IBNR and case development liabilities are as of December 31, 2022. As previously noted, Alleghany was acquired on October 19, 2022. Alleghany's incurred and paid losses and ALAE are included for all years presented retrospectively in the tables that follow. Dollars are in millions.

Property

Incurred Losses and ALAE through December 31,

Accident Year	2013*	2014*	2015*	2016*	2017*	2018*	2019*	2020*	2021*	2022	IBNR and Case Development Liabilities
2013	\$ 3,654	\$ 3,460	\$ 3,092	\$ 2,980	\$ 2,946	\$ 2,885	\$ 2,828	\$ 2,811	\$ 2,808	\$ 2,796	\$ 31
2014		3,088	2,847	2,724	2,566	2,509	2,433	2,399	2,393	2,373	31
2015			3,595	3,405	2,838	3,229	3,225	3,244	3,246	3,240	116
2016				3,917	4,508	4,186	4,149	4,144	4,133	4,111	47
2017					6,390	6,093	5,916	5,790	5,711	5,630	100
2018						5,478	5,574	5,433	5,289	5,296	372
2019							4,991	5,116	4,907	4,592	245
2020								6,937	7,217	6,857	1,025
2021									8,080	7,951	1,757
2022										8,870	4,663
										Incurring losses and ALAE	\$ 51,716

Cumulative Paid Losses and ALAE through December 31,

Accident Year	2013*	2014*	2015*	2016*	2017*	2018*	2019*	2020*	2021*	2022	
2013	\$ 621	\$ 1,674	\$ 2,190	\$ 2,414	\$ 2,540	\$ 2,623	\$ 2,663	\$ 2,694	\$ 2,718	\$ 2,710	
2014		571	1,518	1,899	2,059	2,135	2,187	2,218	2,242	2,272	
2015			669	1,799	2,204	2,422	2,531	2,713	2,799	2,852	
2016				914	2,211	2,673	3,162	3,431	3,626	3,736	
2017					1,347	3,508	4,583	4,936	5,171	5,364	
2018						1,208	3,089	3,733	4,019	4,265	
2019							1,010	2,852	3,578	3,905	
2020								1,253	3,583	4,632	
2021									1,622	4,083	
2022										1,815	
										Paid losses and ALAE	35,634
										Net unpaid losses and ALAE for 2013 – 2022 accident years	16,082
										Net unpaid losses and ALAE for accident years before 2013	470
										Net unpaid losses and ALAE	\$ 16,552

* Unaudited required supplemental information

Notes to Consolidated Financial Statements (Continued)

(16) Unpaid losses and loss adjustment expenses (Continued)

Casualty

Incurred Losses and ALAE through December 31,

Accident Year	2013*	2014*	2015*	2016*	2017*	2018*	2019*	2020*	2021*	2022	IBNR and Case Development
											Liabilities
2013	\$ 3,752	\$ 3,897	\$ 3,894	\$ 3,703	\$ 3,634	\$ 3,571	\$ 3,453	\$ 3,345	\$ 3,301	\$ 3,235	\$ 337
2014		3,492	3,653	3,596	3,535	3,436	3,451	3,427	3,315	3,280	480
2015			3,408	3,607	3,647	3,561	3,420	3,383	3,346	3,291	426
2016				3,775	3,980	3,884	3,854	3,803	3,760	3,731	491
2017					4,026	4,453	4,332	4,226	4,158	4,147	639
2018						4,871	5,515	5,457	5,328	5,257	942
2019							5,555	6,019	5,890	5,727	1,548
2020								6,216	6,228	6,045	2,294
2021									6,287	6,256	3,139
2022										6,063	4,726
Incurred losses and ALAE										\$ 47,032	

Cumulative Paid Losses and ALAE through December 31,

Accident Year	2013*	2014*	2015*	2016*	2017*	2018*	2019*	2020*	2021*	2022
2013	\$ 576	\$ 1,120	\$ 1,585	\$ 1,881	\$ 2,088	\$ 2,284	\$ 2,396	\$ 2,492	\$ 2,563	\$ 2,598
2014		428	997	1,385	1,657	1,911	2,096	2,303	2,396	2,484
2015			445	991	1,426	1,725	1,997	2,190	2,338	2,473
2016				653	1,356	1,796	2,144	2,414	2,607	2,782
2017					606	1,307	1,824	2,472	2,720	2,937
2018						693	1,736	2,785	3,251	3,629
2019							840	1,865	2,415	3,182
2020								867	1,901	2,710
2021									765	1,780
2022										621
Paid losses and ALAE										25,196
Net unpaid losses and ALAE for 2013 – 2022 accident years										21,836
Net unpaid losses and ALAE for accident years before 2013										9,530
Net unpaid losses and ALAE										\$ 31,366

* Unaudited required supplemental information

Required supplemental unaudited average historical claims duration information based on the net losses and ALAE incurred and paid accident year data in the preceding tables follows. The percentages show the average portions of net losses and ALAE paid by each succeeding year, with year 1 representing the current accident year.

Average Annual Percentage Payout of Incurred Losses by Age, Net of Reinsurance

In Year	1	2	3	4	5	6	7	8	9	10
GEICO Physical Damage	97%	3%								
GEICO Auto Liability	41%	31%	13%	8%	4%					
BH Primary Medical Professional Liability	2%	7%	12%	14%	13%	11%	8%	6%	4%	3%
BH Primary Workers' Compensation and Other Casualty	15%	19%	15%	13%	9%	5%	4%	3%	1%	1%
BHRG Property	22%	36%	15%	8%	4%	4%	2%	1%	1%	0%
BHRG Casualty	14%	18%	13%	11%	7%	6%	5%	3%	2%	1%

Notes to Consolidated Financial Statements (Continued)

(17) Retroactive reinsurance contracts

Retroactive reinsurance policies provide indemnification of losses and loss adjustment expenses of short-duration insurance contracts with respect to underlying loss events that occurred prior to the contract inception date. Claims payments may commence immediately after the contract date or, when applicable, after a contractual retention amount has been reached. Reconciliations of the changes in estimated liabilities for retroactive reinsurance unpaid losses and loss adjustment expenses (“claim liabilities”) and reconciliations of incurred losses and loss adjustment expenses to the amounts recorded in the Consolidated Statements of Earnings for each of the three years ended December 31, 2022 follow (in millions).

	2022	2021	2020
Balances at beginning of year	\$ 37,855	\$ 40,623	\$ 41,927
Incurred losses and loss adjustment expenses:			
Current year contracts	—	153	—
Prior years’ contracts	86	(974)	(399)
Total	86	(821)	(399)
Paid losses and loss adjustment expenses	(2,358)	(1,889)	(1,076)
Foreign currency effect	(168)	(58)	171
Balances at December 31	\$ 35,415	\$ 37,855	\$ 40,623
Incurred losses and loss adjustment expenses above	\$ 86	\$ (821)	\$ (399)
Deferred charge amortization and adjustments	769	1,802	1,306
Incurred losses and loss adjustment expenses included in the Consolidated Statements of Earnings	\$ 855	\$ 981	\$ 907

In the preceding table, classifications of incurred losses and loss adjustment expenses are based on the inception dates of the contracts, which reflect when our exposures to losses began. We believe that analysis of losses incurred and paid by accident year of the underlying event is irrelevant given that our exposure to losses incepts when the contract incepts and that the classification of reported claims and case development liabilities has little or no practical analytical value. Incurred losses and loss adjustment expenses in the Consolidated Statements of Earnings include changes in estimated liabilities and related deferred charge asset amortization and adjustments arising from the changes in estimated timing and amount of future loss payments. Unamortized deferred charges related to retroactive reinsurance contracts were \$9.9 billion at December 31, 2022 and \$10.6 billion at December 31, 2021.

Paid losses and loss adjustment expenses include claim payments attributable to a contract between our subsidiary, National Indemnity Company, and certain subsidiaries of American International Group, Inc. (collectively, “AIG”). Claim payments under the AIG contract commenced in 2021 and were \$1.5 billion in 2022 and \$1.2 billion in 2021. Our estimated unpaid claim liabilities with regard to the AIG contract were approximately \$13.9 billion at December 31, 2022 and \$15.8 billion at December 31, 2021.

In establishing retroactive reinsurance claim liabilities, we analyze historical aggregate loss payment patterns and project losses into the future under various probability-weighted scenarios. We expect the claim-tail to be very long for many contracts, with some lasting several decades. We monitor claim payment activity and review ceding company reports and other information concerning the underlying losses. We reassess and revise the expected timing and amounts of ultimate losses periodically or when significant events are revealed through our monitoring and review processes.

Estimated claim liabilities for retroactive reinsurance included estimates for environmental, asbestos and other latent injury exposures of approximately \$12.1 billion at December 31, 2022 and \$12.3 billion at December 31, 2021. Retroactive reinsurance contracts are generally subject to aggregate policy limits and thus, our exposure to such claims under these contracts is likewise limited. We monitor evolving case law and its effect on environmental and other latent injury claims. Changing laws or government regulations, newly identified toxins, newly reported claims, new theories of liability, new contract interpretations and other factors could result in increases in these liabilities, which could be material to our results of operations. We are unable to reliably estimate the amount of additional net loss or the range of net loss that is reasonably possible.

Notes to Consolidated Financial Statements (Continued)

(18) Notes payable and other borrowings

The carrying value of notes payable and other borrowings is summarized below (in millions). The weighted average interest rates and maturity date ranges shown in the following tables are based on borrowings as of December 31, 2022.

	Weighted Average Interest Rate	December 31,	
		2022	2021
Insurance and other:			
Berkshire Hathaway Inc. (“Berkshire”):			
U.S. Dollar denominated due 2023-2047	3.2%	\$ 6,231	\$ 6,820
Euro denominated due 2023-2041	1.0%	7,344	7,792
Japanese Yen denominated due 2023-2060	0.7%	7,818	6,797
Berkshire Hathaway Finance Corporation (“BHFC”):			
U.S. Dollar denominated due 2027-2052	3.6%	14,458	10,758
Great Britain Pound denominated due 2039-2059	2.5%	2,078	2,325
Euro denominated due 2030-2034	1.8%	1,332	—
Other subsidiary borrowings due 2023-2051	4.3%	5,967	4,438
Short-term subsidiary borrowings	5.8%	1,310	342
		<u>\$ 46,538</u>	<u>\$ 39,272</u>

In January 2022, Berkshire issued ¥128.5 billion (approximately \$1.1 billion) of senior notes with maturity dates ranging from 2027 to 2052 and a weighted average interest rate of 0.5%. In December 2022, Berkshire issued ¥115.0 billion (approximately \$840 million) of senior notes with maturity dates ranging from 2025 to 2052 and a weighted average interest rate of 1.1%. In the first two months of 2023, Berkshire repaid \$1.1 billion of maturing senior notes. An additional \$3.2 billion of Berkshire senior notes mature in March and April of 2023.

Borrowings of BHFC, a wholly owned finance subsidiary of Berkshire, consist of senior unsecured notes used to fund manufactured housing loans originated or acquired and equipment held for lease of certain subsidiaries. BHFC borrowings are fully and unconditionally guaranteed by Berkshire. In March 2022, BHFC issued \$4.5 billion of senior notes with maturity dates ranging from 2027 to 2052 with a weighted average interest rate of 3.4% and €1.25 billion (approximately \$1.4 billion) of senior notes maturing in 2030 and 2034 with a weighted average interest rate of 1.8%. Berkshire also guarantees certain debt of other subsidiaries, aggregating approximately \$3.7 billion at December 31, 2022, of which \$1.0 billion matured in January 2023. Generally, Berkshire’s guarantee of a subsidiary’s debt obligation is an absolute, unconditional and irrevocable guarantee for the full and prompt payment when due of all payment obligations. Other subsidiary and short-term subsidiary borrowings as of December 31, 2022 includes approximately \$2.3 billion attributable to Alleghany Corporation and its subsidiaries.

The carrying values of Berkshire and BHFC non-U.S. Dollar denominated senior notes (€8.15 billion, £1.75 billion and ¥1,029 billion par at December 31, 2022) reflect the applicable exchange rates as of each balance sheet date. The effects of changes in foreign currency exchange rates during the period are recorded in earnings as a component of selling, general and administrative expenses. Changes in the exchange rates resulted in pre-tax gains of \$1.7 billion in 2022, \$1.3 billion in 2021 and pre-tax losses of \$1.0 billion in 2020.

	Weighted Average Interest Rate	December 31,	
		2022	2021
Railroad, utilities and energy:			
Berkshire Hathaway Energy Company (“BHE”) and subsidiaries:			
BHE senior unsecured debt due 2023-2053	4.3%	\$ 13,996	\$ 13,003
Subsidiary and other debt due 2023-2064	4.3%	37,639	36,759
Short-term borrowings	5.2%	1,119	2,009
Burlington Northern Santa Fe (“BNSF”) and subsidiaries due 2023-2097	4.5%	23,452	23,219
		<u>\$ 76,206</u>	<u>\$ 74,990</u>

Notes to Consolidated Financial Statements (Continued)

(18) Notes payable and other borrowings (Continued)

BHE subsidiary debt represents amounts issued pursuant to separate financing agreements. Substantially all of the assets of certain BHE subsidiaries are, or may be, pledged or encumbered to support or otherwise secure debt. These borrowing arrangements generally contain various covenants, including covenants which pertain to leverage ratios, interest coverage ratios and/or debt service coverage ratios. In 2022, BHE issued \$1.0 billion of 4.6% senior notes due in 2053. During 2022, BHE subsidiaries issued approximately \$3.0 billion of term debt with a weighted average interest rate of 5.2% as of December 31 and maturity dates ranging from 2024 to 2053.

BNSF's borrowings are primarily senior unsecured debentures. In June 2022, BNSF issued \$1.0 billion of 4.45% debentures due in 2053. As of December 31, 2022, BNSF, BHE and their subsidiaries were in compliance with all applicable debt covenants. Berkshire does not guarantee any debt, borrowings or lines of credit of BNSF, BHE or their subsidiaries.

Our subsidiaries had unused lines of credit and commercial paper capacity to support short-term borrowing programs and provide additional liquidity. Unused lines of credit were approximately \$11.1 billion at December 31, 2022, which included approximately \$9.1 billion related to BHE and its subsidiaries.

Debt principal repayments expected during each of the next five years are as follows (in millions). Amounts in 2023 include short-term borrowings.

	2023	2024	2025	2026	2027
Insurance and other	\$ 7,080	\$ 1,975	\$ 3,122	\$ 3,454	\$ 2,870
Railroad, utilities and energy	5,882	4,281	3,919	1,498	1,686
	<u>\$ 12,962</u>	<u>\$ 6,256</u>	<u>\$ 7,041</u>	<u>\$ 4,952</u>	<u>\$ 4,556</u>

(19) Income taxes

Liabilities for income taxes reflected in our Consolidated Balance Sheets are as follows (in millions).

	December 31,	
	2022	2021
Currently payable (receivable)	\$ 511	\$ (482)
Deferred	76,069	89,679
Other	440	1,046
	<u>\$ 77,020</u>	<u>\$ 90,243</u>

The tax effects of temporary differences that give rise to significant portions of deferred income tax assets and liabilities are shown below (in millions).

	December 31,	
	2022	2021
Deferred income tax liabilities:		
Investments – unrealized appreciation	\$ 41,150	\$ 55,437
Deferred charges reinsurance assumed	2,073	2,234
Property, plant and equipment and equipment held for lease	32,080	31,323
Goodwill and other intangible assets	7,010	6,748
Other	4,695	4,094
	<u>87,008</u>	<u>99,836</u>
Deferred income tax assets:		
Unpaid losses and loss adjustment expenses	(1,290)	(1,091)
Unearned premiums	(1,196)	(990)
Accrued liabilities	(1,790)	(1,868)
Regulatory liabilities	(1,323)	(1,349)
Other	(5,340)	(4,859)
	<u>(10,939)</u>	<u>(10,157)</u>
Net deferred income tax liability	<u>\$ 76,069</u>	<u>\$ 89,679</u>

Notes to Consolidated Financial Statements (Continued)

(19) Income taxes (Continued)

We have not established deferred income taxes on accumulated undistributed earnings of certain foreign subsidiaries, which are expected to be reinvested indefinitely. Repatriation of all accumulated earnings of foreign subsidiaries would be impracticable to the extent that such earnings represent capital to support ongoing business operations. Generally, no U.S. federal income taxes will be imposed on future distributions of foreign earnings under current law. However, distributions to the U.S. or other foreign jurisdictions could be subject to withholding and other local taxes.

Income tax expense (benefit) reflected in our Consolidated Statements of Earnings for each of the three years ending December 31, 2022 was as follows (in millions).

	2022	2021	2020
Federal	\$ (10,360)	\$ 20,345	\$ 10,596
State	762	(527)	1,086
Foreign	1,080	1,061	758
	<u>\$ (8,518)</u>	<u>\$ 20,879</u>	<u>\$ 12,440</u>
Current	\$ 4,815	\$ 5,326	\$ 5,052
Deferred	(13,333)	15,553	7,388
	<u>\$ (8,518)</u>	<u>\$ 20,879</u>	<u>\$ 12,440</u>

Income tax expense (benefit) is reconciled to hypothetical amounts computed at the U.S. federal statutory rate for each of the three years ending December 31, 2022 in the table below (in millions).

	2022	2021	2020
Earnings (loss) before income taxes	<u>\$ (30,576)</u>	<u>\$ 111,686</u>	<u>\$ 55,693</u>
Hypothetical income tax expense (benefit) at the U.S. federal statutory rate	\$ (6,421)	\$ 23,454	\$ 11,696
Dividends received deduction and tax-exempt interest	(512)	(457)	(448)
State income taxes, less U.S. federal income tax effect	602	(417)	858
U.S. income tax credits*	(2,187)	(1,860)	(1,519)
Goodwill impairments	—	—	1,977
Other differences, net	—	159	(124)
	<u>\$ (8,518)</u>	<u>\$ 20,879</u>	<u>\$ 12,440</u>
Effective income tax rate	<u>27.9%</u>	<u>18.7%</u>	<u>22.3%</u>

* U.S. income tax credits derive primarily from production tax credits associated with wind-energy generation of BHE and tax credits arising from affordable housing investments.

We file income tax returns in the United States and in state, local and foreign jurisdictions. We have settled income tax liabilities with the U.S. federal taxing authority (“IRS”) for tax years through 2011. The 2012 and 2013 tax years are under review by the IRS’s Independent Office of Appeals, and the IRS is currently auditing tax years 2014 through 2019. We are also under audit or subject to audit with respect to income taxes in state and foreign jurisdictions. It is reasonably possible that certain of these income tax examinations will be settled in 2023. We currently do not believe that the outcome of unresolved issues or claims will be material to our Consolidated Financial Statements.

At December 31, 2022 and 2021, net unrecognized tax benefits were \$440 million and \$1,046 million, respectively. Included in the balance at December 31, 2022, were \$383 million of tax positions that, if recognized, would impact the effective tax rate. The remaining balance in net unrecognized tax benefits principally relates to tax positions where the ultimate recognition is highly certain but there is uncertainty about the timing of recognition. Because of the impact of deferred income tax accounting, these positions, when recognized, would not affect the annual effective income tax rate. We do not expect material increases to the estimated amount of unrecognized tax benefits during 2023.

Notes to Consolidated Financial Statements (Continued)

(20) Fair value measurements

Our financial assets and liabilities are summarized below as of December 31, 2022 and December 31, 2021, with fair values shown according to the fair value hierarchy (in millions). The carrying values of cash and cash equivalents, U.S. Treasury Bills, other receivables and accounts payable, accruals and other liabilities are considered to be reasonable estimates of or otherwise approximate the fair values.

	Carrying Value	Fair Value	Quoted Prices (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
December 31, 2022					
Investments in fixed maturity securities:					
U.S. Treasury, U.S. government corporations and agencies	\$ 9,802	\$ 9,802	\$ 9,733	\$ 69	\$ —
Foreign governments	10,327	10,327	9,854	473	—
Corporate bonds	2,195	2,195	—	1,546	649
Other	2,804	2,804	—	2,804	—
Investments in equity securities	308,793	308,793	296,610	9	12,174
Investments in Kraft Heinz & Occidental common stock	24,421	25,491	25,491	—	—
Loans and finance receivables	23,208	23,428	—	1,513	21,915
Derivative contract assets ⁽¹⁾	589	589	56	474	59
Derivative contract liabilities ⁽¹⁾	242	242	8	122	112
Notes payable and other borrowings:					
Insurance and other	46,538	41,961	—	41,061	900
Railroad, utilities and energy	76,206	67,651	—	67,651	—
December 31, 2021					
Investments in fixed maturity securities:					
U.S. Treasury, U.S. government corporations and agencies	\$ 3,303	\$ 3,303	\$ 3,261	\$ 42	\$ —
Foreign governments	10,994	10,994	10,286	708	—
Corporate bonds	1,774	1,774	—	1,774	—
Other	363	363	—	363	—
Investments in equity securities	350,719	350,719	339,225	8	11,486
Investment in Kraft Heinz common stock	13,112	11,683	11,683	—	—
Loans and finance receivables	20,751	22,174	—	2,178	19,996
Derivative contract assets ⁽¹⁾	329	329	6	230	93
Derivative contract liabilities ⁽¹⁾	376	376	2	150	224
Notes payable and other borrowings:					
Insurance and other	39,272	42,339	—	42,292	47
Railroad, utilities and energy	74,990	87,065	—	87,065	—

⁽¹⁾ Assets are included in other assets, and liabilities are included in accounts payable, accruals and other liabilities.

Notes to Consolidated Financial Statements (Continued)

(20) Fair value measurements (Continued)

The fair values of substantially all of our financial instruments were measured using market or income approaches. The hierarchy for measuring fair value consists of Levels 1 through 3, which are described below.

Level 1 – Inputs represent unadjusted quoted prices for identical assets or liabilities exchanged in active markets.

Level 2 – Inputs include directly or indirectly observable inputs (other than Level 1 inputs) such as quoted prices for similar assets or liabilities exchanged in active or inactive markets; quoted prices for identical assets or liabilities exchanged in inactive markets; other inputs that may be considered in fair value determinations of the assets or liabilities, such as interest rates and yield curves, volatilities, prepayment speeds, loss severities, credit risks and default rates; and inputs that are derived principally from or corroborated by observable market data by correlation or other means. Pricing evaluations generally reflect discounted expected future cash flows, which incorporate yield curves for instruments with similar characteristics, such as credit ratings, estimated durations and yields for other instruments of the issuer or entities in the same industry sector.

Level 3 – Inputs include unobservable inputs used in the measurement of assets and liabilities. Management is required to use its own assumptions regarding unobservable inputs because there is little, if any, market activity in the assets or liabilities and it may be unable to corroborate the related observable inputs. Unobservable inputs require management to make certain projections and assumptions about the information that would be used by market participants in valuing assets or liabilities.

Reconciliations of significant assets and liabilities measured and carried at fair value on a recurring basis with the use of significant unobservable inputs (Level 3) for each of the three years ending December 31, 2022 follow (in millions).

	Balance at beginning of year	Gains (losses) included in earnings	Acquisitions, dispositions and settlements	Transfers out of Level 3	Balance at December 31,
Investments in equity securities:					
2022	\$ 11,480	\$ 689	\$ —	\$ —	\$ 12,169
2021	8,978	1,902	1,100	(500)	11,480
2020	10,405	(1,426)	—	(1)	8,978
Equity index put option contract liabilities:					
2021	(1,065)	966	—	99	—
2020	(968)	(159)	62	—	(1,065)

Quantitative information as of December 31, 2022 for the significant assets measured and carried at fair value on a recurring basis with the use of significant unobservable inputs (Level 3) follows (in millions).

	Fair Value	Principal Valuation Techniques	Unobservable Inputs	Weighted Average
Investments in equity securities:				
Preferred stock	\$ 9,964	Discounted cash flow	Expected duration	6 years
			Discount for transferability restrictions and subordination	372 bps
Common stock warrants	2,205	Warrant pricing model	Expected duration	6 years
			Volatility	39%

Notes to Consolidated Financial Statements (Continued)

(20) Fair value measurements (Continued)

Investments in equity securities in the preceding table include our investments in certain preferred and common stock warrants that do not have readily determinable market values as defined under GAAP. These investments are subject to contractual restrictions on transferability and contain provisions that currently prevent us from economically hedging our investments. We applied discounted cash flow techniques in valuing the preferred stock and we made assumptions regarding the expected duration of the investment and the effects of subordination in liquidation. In valuing the common stock warrants, we used a warrant valuation model. While most of the inputs to the model are observable, we made assumptions regarding the expected duration and volatility of the warrants.

(21) Common stock

Changes in Berkshire's issued, treasury and outstanding common stock during the three years ending December 31, 2022 are shown in the table below. In addition to our common stock, 1,000,000 shares of preferred stock are authorized, but none are issued.

	Class A, \$5 Par Value (1,650,000 shares authorized)			Class B, \$0.0033 Par Value (3,225,000,000 shares authorized)		
	Issued	Treasury	Outstanding	Issued	Treasury	Outstanding
Balance December 31, 2019	719,307	(17,337)	701,970	1,408,183,852	(23,702,319)	1,384,481,533
Conversions of Class A to Class B common stock	(40,784)	—	(40,784)	61,176,000	—	61,176,000
Treasury stock acquired	—	(17,255)	(17,255)	—	(95,614,062)	(95,614,062)
Balance December 31, 2020	678,523	(34,592)	643,931	1,469,359,852	(119,316,381)	1,350,043,471
Conversions of Class A to Class B common stock	(12,622)	—	(12,622)	18,933,000	—	18,933,000
Treasury stock acquired	—	(14,196)	(14,196)	—	(78,501,968)	(78,501,968)
Balance December 31, 2021	665,901	(48,788)	617,113	1,488,292,852	(197,818,349)	1,290,474,503
Conversions of Class A to Class B common stock	(14,451)	—	(14,451)	21,676,500	—	21,676,500
Treasury stock acquired	—	(11,098)	(11,098)	—	(9,896,927)	(9,896,927)
Balance December 31, 2022	<u>651,450</u>	<u>(59,886)</u>	<u>591,564</u>	<u>1,509,969,352</u>	<u>(207,715,276)</u>	<u>1,302,254,076</u>

Each Class A common share is entitled to one vote per share. Class B common stock possesses dividend and distribution rights equal to one-fifteen-hundredth (1/1,500) of such rights of Class A common stock. Each Class B common share possesses voting rights equal to one-ten-thousandth (1/10,000) of the voting rights of a Class A share. Unless otherwise required under Delaware General Corporation Law, Class A and Class B common shares vote as a single class. Each share of Class A common stock is convertible, at the option of the holder, into 1,500 shares of Class B common stock. Class B common stock is not convertible into Class A common stock. On an equivalent Class A common stock basis, there were 1,459,733 shares outstanding as of December 31, 2022 and 1,477,429 shares outstanding as of December 31, 2021.

Since we have two classes of common stock, we provide earnings per share data on the Consolidated Statements of Earnings for average equivalent Class A shares outstanding and average equivalent Class B shares outstanding. Class B shares are economically equivalent to one-fifteen-hundredth (1/1,500) of a Class A share. Average equivalent Class A shares outstanding represents average Class A shares outstanding plus one-fifteen-hundredth (1/1,500) of the average Class B shares outstanding. Average equivalent Class B shares outstanding represents average Class B shares outstanding plus 1,500 times average Class A shares outstanding.

Berkshire's common stock repurchase program, as amended, permits Berkshire to repurchase shares any time that Warren Buffett, Berkshire's Chairman of the Board and Chief Executive Officer, and Charlie Munger, Vice Chairman of the Board, believe that the repurchase price is below Berkshire's intrinsic value, conservatively determined. The program continues to allow share repurchases in the open market or through privately negotiated transactions and does not specify a maximum number of shares to be repurchased. However, repurchases will not be made if they would reduce the total value of Berkshire's consolidated cash, cash equivalents and U.S. Treasury Bill holdings below \$30 billion. The repurchase program does not obligate Berkshire to repurchase any specific dollar amount or number of Class A or Class B shares and there is no expiration date to the program.

Notes to Consolidated Financial Statements (Continued)

(22) Revenues from contracts with customers

We recognize revenue when a good or service is transferred to a customer. A good or service is transferred when or as the customer obtains control of that good or service. Revenues are based on the consideration we expect to receive in connection with our promises to deliver goods and services to our customers. The following tables summarize customer contract revenues disaggregated by reportable segment and the source of the revenue for each of the three years ended December 31, 2022 (in millions). Other revenues, which are not considered to be revenues from contracts with customers under GAAP, are primarily insurance premiums earned, interest, dividend and other investment income and leasing revenues.

2022	Manufacturing	McLane	Service and Retailing	BNSF	Berkshire Hathaway Energy	Insurance, Corporate and other	Total
Manufactured products:							
Industrial and commercial products	\$ 24,566	\$ —	\$ 199	\$ —	\$ —	\$ —	\$ 24,765
Building products	22,762	—	—	—	—	—	22,762
Consumer products	19,912	—	—	—	—	—	19,912
Grocery and convenience store distribution	—	32,599	—	—	—	—	32,599
Food and beverage distribution	—	19,388	—	—	—	—	19,388
Auto sales	—	—	10,486	—	—	—	10,486
Other retail and wholesale distribution	3,195	—	16,931	—	—	—	20,126
Service	1,199	1,103	4,439	25,742	4,933	—	37,416
Electricity and natural gas	—	—	—	—	20,317	—	20,317
Total	71,634	53,090	32,055	25,742	25,250	—	207,771
Other revenues	4,016	119	6,154	60	1,097	82,872	94,318
	<u>\$ 75,650</u>	<u>\$ 53,209</u>	<u>\$ 38,209</u>	<u>\$ 25,802</u>	<u>\$ 26,347</u>	<u>\$ 82,872</u>	<u>\$302,089</u>
2021							
Manufactured products:							
Industrial and commercial products	\$ 22,184	\$ —	\$ 159	\$ —	\$ —	\$ —	\$ 22,343
Building products	19,604	—	—	—	—	—	19,604
Consumer products	18,540	—	—	—	—	—	18,540
Grocery and convenience store distribution	—	31,245	—	—	—	—	31,245
Food and beverage distribution	—	17,332	—	—	—	—	17,332
Auto sales	—	—	9,966	—	—	—	9,966
Other retail and wholesale distribution	2,997	—	15,898	—	—	—	18,895
Service	1,486	751	4,123	23,120	5,583	—	35,063
Electricity and natural gas	—	—	—	—	18,264	—	18,264
Total	64,811	49,328	30,146	23,120	23,847	—	191,252
Other revenues	3,766	122	4,601	57	1,205	75,200	84,951
	<u>\$ 68,577</u>	<u>\$ 49,450</u>	<u>\$ 34,747</u>	<u>\$ 23,177</u>	<u>\$ 25,052</u>	<u>\$ 75,200</u>	<u>\$276,203</u>
2020							
Manufactured products:							
Industrial and commercial products	\$ 20,772	\$ —	\$ 192	\$ —	\$ —	\$ —	\$ 20,964
Building products	15,943	—	—	—	—	—	15,943
Consumer products	14,757	—	—	—	—	—	14,757
Grocery and convenience store distribution	—	30,795	—	—	—	—	30,795
Food and beverage distribution	—	15,368	—	—	—	—	15,368
Auto sales	—	—	8,258	—	—	—	8,258
Other retail and wholesale distribution	2,452	—	12,470	—	—	—	14,922
Service	1,456	584	3,332	20,693	4,595	—	30,660
Electricity and natural gas	—	—	—	—	15,066	—	15,066
Total	55,380	46,747	24,252	20,693	19,661	—	166,733
Other revenues	3,598	93	3,859	57	1,422	69,817	78,846
	<u>\$ 58,978</u>	<u>\$ 46,840</u>	<u>\$ 28,111</u>	<u>\$ 20,750</u>	<u>\$ 21,083</u>	<u>\$ 69,817</u>	<u>\$245,579</u>

Notes to Consolidated Financial Statements (Continued)

(22) Revenues from contracts with customers (Continued)

A summary of the transaction price allocated to the significant unsatisfied remaining performance obligations relating to contracts with expected durations in excess of one year as of December 31, 2022 and the timing of when the performance obligations are expected to be satisfied follows (in millions).

	Less than 12 months	Greater than 12 months	Total
Electricity and natural gas	\$ 3,514	\$ 20,619	\$ 24,133
Other sales and service contracts	1,856	3,176	5,032

(23) Pension plans

Certain of our subsidiaries sponsor defined benefit pension plans. Benefits under the plans are generally based on years of service and compensation or fixed benefit rates. Plan sponsors may make contributions to the plans to meet regulatory requirements and may also make discretionary contributions. The components of our net periodic pension expense for each of the three years ending December 31, 2022 follow (in millions).

	2022	2021	2020
Service cost	\$ 181	\$ 257	\$ 235
Interest cost	482	410	510
Expected return on plan assets	(975)	(1,008)	(955)
Amortization of actuarial losses and other	156	203	171
Net periodic pension expense	<u>\$ (156)</u>	<u>\$ (138)</u>	<u>\$ (39)</u>

The projected benefit obligation (“PBO”) is the actuarial present value of benefits earned based upon service and compensation prior to the valuation date and, if applicable, includes assumptions regarding future compensation levels. Benefit obligations under qualified U.S. defined benefit pension plans are funded through assets held in trusts. Pension obligations under certain non-U.S. plans and non-qualified U.S. plans are unfunded and the aggregate PBOs of such plans were \$1.1 billion and \$1.4 billion as of December 31, 2022 and 2021, respectively. The cost of certain BHE pension plans are expected to be recoverable through the regulated rate making process.

The funded status reflected in the Consolidated Balance Sheet at year end 2022 and 2021 and reconciliations of the changes in PBOs and plan assets related to BHE’s pension plans and all other pension plans for each of the two years ending December 31, 2022 follow (in millions).

	2022			2021		
	BHE	Other	Total	BHE	Other	Total
Benefit obligations						
PBO beginning of year	\$ 4,780	\$ 14,012	\$ 18,792	\$ 5,282	\$ 15,147	\$ 20,429
Service cost	36	145	181	46	211	257
Interest cost	118	364	482	109	301	410
Benefits paid	(250)	(585)	(835)	(214)	(795)	(1,009)
Settlements paid	(164)	(678)	(842)	(185)	(22)	(207)
Business acquisition	—	58	58	—	—	—
Actuarial gains and other	(1,305)	(3,793)	(5,098)	(258)	(830)	(1,088)
PBO end of year	<u>\$ 3,215</u>	<u>\$ 9,523</u>	<u>\$ 12,738</u>	<u>\$ 4,780</u>	<u>\$ 14,012</u>	<u>\$ 18,792</u>
Plan assets						
Plan assets beginning of year	\$ 5,158	\$ 13,462	\$ 18,620	\$ 5,158	\$ 12,780	\$ 17,938
Employer contributions	29	133	162	41	124	165
Benefits paid	(250)	(585)	(835)	(214)	(795)	(1,009)
Settlements paid	(164)	(678)	(842)	(185)	(22)	(207)
Business acquisition	—	51	51	—	—	—
Actual return on plan assets	(1,162)	(2,971)	(4,133)	382	1,401	1,783
Foreign currency translation and other	(235)	(196)	(431)	(24)	(26)	(50)
Plan assets end of year	<u>\$ 3,376</u>	<u>\$ 9,216</u>	<u>\$ 12,592</u>	<u>\$ 5,158</u>	<u>\$ 13,462</u>	<u>\$ 18,620</u>
Funded status – net (asset) liability	<u>\$ (161)</u>	<u>\$ 307</u>	<u>\$ 146</u>	<u>\$ (378)</u>	<u>\$ 550</u>	<u>\$ 172</u>

Notes to Consolidated Financial Statements (Continued)

(23) Pension plans (Continued)

The funded status reflected in assets was \$1,510 million and in liabilities was \$1,656 million at December 31, 2022. The funded status included in assets was \$1,954 million and in liabilities was \$2,126 million at December 31, 2021.

The accumulated benefit obligation (“ABO”) is the actuarial present value of benefits earned based on service and compensation prior to the valuation date. The ABO was \$12.2 billion at December 31, 2022 and \$17.9 billion at December 31, 2021. Information for plans with PBOs and ABOs in excess of plan assets as of December 31, 2022 and 2021 follows (in millions).

	2022	2021
PBOs	\$ 6,422	\$ 9,643
Plan assets	4,766	7,518
ABOs	5,594	9,111
Plan assets	4,234	7,429

Weighted average assumptions used in determining PBOs and net periodic pension expense follow.

	2022	2021	2020
Discount rate applicable to PBOs	5.2%	2.7%	2.3%
Expected long-term rate of return on plan assets	5.9	6.1	6.2
Rate of compensation increase	2.5	2.6	2.6
Discount rate applicable to net periodic pension expense	2.9	2.4	3.1

Pension benefit payments expected over the next ten years are as follows (in millions): in 2023 – \$1,259; in 2024 – \$902; in 2025 – \$896; in 2026 – \$894; in 2027 – \$900; and in 2028 to 2032 – \$4,438. Sponsoring subsidiaries expect to contribute \$176 million to the plans in 2023.

Fair value measurements of plan assets as of December 31, 2022 and 2021 follow (in millions).

	Fair Value				Investments carried at net asset value
	Total	Level 1	Level 2	Level 3	
December 31, 2022					
Cash and cash equivalents	\$ 602	\$ 523	\$ 79	\$ —	\$ —
Equity securities	7,673	7,112	321	240	—
Fixed maturity securities	2,152	1,328	824	—	—
Investment funds and other	2,165	198	394	42	1,531
	<u>\$ 12,592</u>	<u>\$ 9,161</u>	<u>\$ 1,618</u>	<u>\$ 282</u>	<u>\$ 1,531</u>
December 31, 2021					
Cash and cash equivalents	\$ 992	\$ 901	\$ 91	\$ —	\$ —
Equity securities	11,343	10,358	660	325	—
Fixed maturity securities	3,422	2,226	1,168	28	—
Investment funds and other	2,863	180	361	57	2,265
	<u>\$ 18,620</u>	<u>\$ 13,665</u>	<u>\$ 2,280</u>	<u>\$ 410</u>	<u>\$ 2,265</u>

See Note 20 for a discussion of the three levels of fair value measurements. Plan assets are generally invested with the long-term objective of producing earnings to adequately cover expected benefit obligations, while assuming a prudent level of risk. Allocations may change due to changing market conditions and investment opportunities. The expected rates of return on plan assets reflect subjective assessments of expected long-term investment returns. Generally, past investment returns are not given significant consideration when establishing assumptions for expected long-term rates of return on plan assets. Actual experience will differ from the assumed rates of return.

Notes to Consolidated Financial Statements (Continued)

(23) Pension plans (Continued)

A reconciliation of the pre-tax accumulated other comprehensive income (loss) related to defined benefit pension plans for each of the two years ending December 31, 2022 follows (in millions).

	2022	2021
Balance beginning of year	\$ (485)	\$ (2,251)
Amount included in net periodic pension expense	123	170
Actuarial gains (losses) and other	(376)	1,596
Balance end of year	<u>\$ (738)</u>	<u>\$ (485)</u>

Several of our subsidiaries also sponsor defined contribution retirement plans, such as 401(k) or profit-sharing plans. Employee contributions are subject to regulatory limitations and the specific plan provisions. Several plans provide for employer matching contributions up to levels specified in the plans and provide for additional discretionary contributions as determined by management. Our defined contribution plan expense was approximately \$0.8 billion in 2022, \$1.0 billion in 2021 and \$1.4 billion in 2020.

(24) Accumulated other comprehensive income

A summary of the net changes in after-tax accumulated other comprehensive income attributable to Berkshire Hathaway shareholders for each of the three years ending December 31, 2022 follows (in millions).

	Unrealized gains (losses) on investments	Foreign currency translation	Defined benefit pension plans	Other	Total
Balance December 31, 2019	\$ 481	\$ (4,346)	\$ (1,369)	\$ (9)	\$ (5,243)
Other comprehensive income	78	1,264	(385)	(52)	905
Reclassifications into net earnings	(23)	—	109	9	95
Balance December 31, 2020	536	(3,082)	(1,645)	(52)	(4,243)
Other comprehensive income	(123)	(1,021)	1,163	80	99
Reclassifications into net earnings	(44)	11	135	15	117
Balance December 31, 2021	369	(4,092)	(347)	43	(4,027)
Other comprehensive income	(991)	(2,045)	(298)	283	(3,051)
Reclassifications into net earnings	435	(3)	93	(38)	487
Balance December 31, 2022	<u>\$ (187)</u>	<u>\$ (6,140)</u>	<u>\$ (552)</u>	<u>\$ 288</u>	<u>\$ (6,591)</u>

Notes to Consolidated Financial Statements (Continued)

(25) Business segment data

Our operating businesses include a large and diverse group of insurance, manufacturing, service and retailing businesses. We organize our reportable business segments in a manner that reflects how management views those business activities. Certain businesses are grouped together for segment reporting based upon similar products or product lines, marketing, selling and distribution characteristics, even though those business units are operated under separate local management.

The tabular information that follows shows data of reportable segments reconciled to amounts reflected in our Consolidated Financial Statements. Intersegment transactions are not eliminated from segment results when management considers those transactions in assessing the results of the respective segments. Furthermore, our management does not consider investment and derivative gains/losses, impairments or amortization of certain business acquisition accounting adjustments related to Berkshire's business acquisitions or certain other corporate income and expense items in assessing the financial performance of operating units. Collectively, these items are included in reconciliations of segment amounts to consolidated amounts.

Berkshire's operating segments are as follows.

Business Identity	Business Activity
Insurance:	
GEICO	Underwriting private passenger automobile insurance mainly by direct response methods
Berkshire Hathaway Primary Group	Underwriting multiple lines of property and casualty insurance policies for primarily commercial accounts
Berkshire Hathaway Reinsurance Group	Underwriting excess-of-loss, quota-share and facultative reinsurance worldwide
Railroad ("BNSF")	Operation of one of the largest railroad systems in North America through Burlington Northern Santa Fe LLC
Utilities and energy ("BHE")	Regulated electric and gas utility, including power generation and distribution activities and real estate brokerage activities through Berkshire Hathaway Energy Company and affiliates
Manufacturing	Manufacturers of numerous products including industrial, consumer and building products, including home building and related financial services
McLane Company ("McLane")	Wholesale distribution of groceries and non-food items
Service and retailing	Providers of numerous services including shared aircraft ownership programs, aviation pilot training, electronic components distribution, various retailing businesses, including automobile dealerships and trailer and furniture leasing

Notes to Consolidated Financial Statements (Continued)

(25) Business segment data (Continued)

A disaggregation of our consolidated data for each of the three most recent years is presented as follows (in millions).

	Revenues			Earnings (loss) before income taxes		
	2022	2021	2020	2022	2021	2020
Operating Businesses						
Insurance:						
Underwriting:						
GEICO	\$ 38,984	\$ 37,706	\$ 35,093	\$ (1,880)	\$ 1,259	\$ 3,428
Berkshire Hathaway Primary Group	13,746	11,575	9,615	393	607	110
Berkshire Hathaway Reinsurance Group	21,915	20,197	18,693	1,389	(930)	(2,700)
Insurance underwriting	74,645	69,478	63,401	(98)	936	838
Investment income	7,734	5,662	5,960	7,724	5,649	5,949
Total insurance	82,379	75,140	69,361	7,626	6,585	6,787
BNSF	25,888	23,282	20,869	7,708	7,861	6,792
BHE	26,393	25,096	21,100	3,146	3,293	2,548
Manufacturing	75,781	68,730	59,079	11,177	9,841	8,010
McLane	53,209	49,450	46,840	271	230	251
Service and retailing	38,303	34,832	28,178	4,771	4,481	2,628
	301,953	276,530	245,427	34,699	32,291	27,016
Reconciliation to consolidated amount						
Investment and derivative gains (losses)	—	—	—	(67,899)	78,542	40,746
Interest expense, not allocated to segments	—	—	—	(420)	(455)	(483)
Equity method investments	—	—	—	1,863	886	657
Goodwill and intangible asset impairments	—	—	—	—	—	(10,671)
Corporate, eliminations and other	136	(327)	152	1,181	422	(1,572)
	<u>\$ 302,089</u>	<u>\$ 276,203</u>	<u>\$ 245,579</u>	<u>\$ (30,576)</u>	<u>\$ 111,686</u>	<u>\$ 55,693</u>
	Interest expense			Income tax expense (benefit)		
	2022	2021	2020	2022	2021	2020
Operating Businesses						
Insurance	\$ —	\$ —	\$ —	\$ 1,231	\$ 1,050	\$ 1,089
BNSF	1,025	1,032	1,037	1,763	1,871	1,631
BHE	2,140	2,054	1,941	(1,629)	(1,153)	(996)
Manufacturing	739	704	737	2,403	2,193	1,795
McLane	—	—	—	66	61	71
Service and retailing	42	38	61	1,131	1,086	669
	3,946	3,828	3,776	4,965	5,108	4,259
Reconciliation to consolidated amount						
Investment and derivative gains (losses)	—	—	—	(14,166)	16,025	8,855
Interest expense, not allocated to segments	420	455	483	(88)	(96)	(102)
Equity method investments	—	—	—	334	82	43
Corporate, eliminations and other	(14)	(111)	(176)	437	(240)	(615)
	<u>\$ 4,352</u>	<u>\$ 4,172</u>	<u>\$ 4,083</u>	<u>\$ (8,518)</u>	<u>\$ 20,879</u>	<u>\$ 12,440</u>

Notes to Consolidated Financial Statements (Continued)

(25) Business segment data (Continued)

	Capital expenditures			Depreciation of tangible assets		
	2022	2021	2020	2022	2021	2020
Operating Businesses						
Insurance	\$ 82	\$ 62	\$ 50	\$ 69	\$ 72	\$ 74
BNSF	3,532	2,910	3,063	2,479	2,406	2,423
BHE	7,505	6,611	6,765	3,702	3,584	3,376
Manufacturing	2,477	2,100	2,133	2,021	2,037	2,026
McLane	93	106	98	176	189	204
Service and retailing	1,775	1,487	903	1,219	1,177	1,216
	<u>\$ 15,464</u>	<u>\$ 13,276</u>	<u>\$ 13,012</u>	<u>\$ 9,666</u>	<u>\$ 9,465</u>	<u>\$ 9,319</u>
	Goodwill at year-end			Identifiable assets at year-end		
	2022	2021	2020	2022	2021	2020
Operating Businesses						
Insurance	\$ 16,548	\$ 15,181	\$ 15,224	\$ 459,904	\$ 482,813	\$ 399,169
BNSF	14,852	14,852	14,851	77,752	76,586	73,809
BHE	11,745	11,906	11,763	118,114	113,447	109,880
Manufacturing	28,460	25,463	25,512	113,578	107,231	104,318
McLane	232	232	232	7,049	6,841	6,771
Service and retailing	6,282	6,241	6,152	31,291	28,221	26,173
	<u>\$ 78,119</u>	<u>\$ 73,875</u>	<u>\$ 73,734</u>	<u>807,688</u>	<u>815,139</u>	<u>720,120</u>
Reconciliation to consolidated amount						
Corporate and other				62,645	69,770	79,875
Goodwill				78,119	73,875	73,734
				<u>\$ 948,452</u>	<u>\$ 958,784</u>	<u>\$ 873,729</u>

Property/casualty and life/health insurance premiums written and earned are summarized below (in millions).

	Property/Casualty			Life/Health		
	2022	2021	2020	2022	2021	2020
Premiums Written:						
Direct	\$ 56,700	\$ 53,829	\$ 47,838	\$ 582	\$ 649	\$ 510
Assumed	15,143	12,461	11,533	5,235	5,685	5,960
Ceded	(1,155)	(1,015)	(898)	(37)	(40)	(42)
	<u>\$ 70,688</u>	<u>\$ 65,275</u>	<u>\$ 58,473</u>	<u>\$ 5,780</u>	<u>\$ 6,294</u>	<u>\$ 6,428</u>
Premiums Earned:						
Direct	\$ 55,879	\$ 52,139	\$ 46,418	\$ 582	\$ 649	\$ 510
Assumed	14,184	12,072	11,449	5,332	5,713	5,973
Ceded	(1,293)	(1,054)	(907)	(39)	(41)	(42)
	<u>\$ 68,770</u>	<u>\$ 63,157</u>	<u>\$ 56,960</u>	<u>\$ 5,875</u>	<u>\$ 6,321</u>	<u>\$ 6,441</u>

Insurance premiums written by geographic region (based upon the domicile of the insured or reinsured) are summarized below (in millions).

	Property/Casualty			Life/Health		
	2022	2021	2020	2022	2021	2020
United States	\$ 59,648	\$ 55,451	\$ 50,250	\$ 2,120	\$ 2,161	\$ 2,820
Western Europe	4,901	4,613	3,751	1,235	1,298	1,120
Asia Pacific	4,699	3,822	3,410	1,704	2,030	1,652
All other	1,440	1,389	1,062	721	805	836
	<u>\$ 70,688</u>	<u>\$ 65,275</u>	<u>\$ 58,473</u>	<u>\$ 5,780</u>	<u>\$ 6,294</u>	<u>\$ 6,428</u>

Notes to Consolidated Financial Statements (Continued)

(25) Business segment data (Continued)

Consolidated sales, service and leasing revenues were \$165.0 billion in 2022, \$151.0 billion in 2021 and \$132.3 billion in 2020. Sales, service and leasing revenues attributable to the United States were 86% in 2022, 85% in 2021 and 86% in 2020 of such amounts. The remainder of sales, service and leasing revenues were primarily in Europe, Canada and the Asia Pacific region. Railroad, utilities and energy revenues were \$52.1 billion in 2022, \$48.2 billion in 2021 and \$41.8 billion in 2020. In each of the three years, approximately 96% of such revenues were attributable to the United States. At December 31, 2022, approximately 90% of our consolidated net property, plant and equipment and equipment held for lease was located in the United States with the remainder primarily in Canada and the United Kingdom.

(26) Contingencies and Commitments

We are parties in a variety of legal actions that routinely arise out of the normal course of business, including legal actions seeking to establish liability directly through insurance contracts or indirectly through reinsurance contracts issued by Berkshire subsidiaries. Plaintiffs occasionally seek punitive or exemplary damages. We do not believe that such normal and routine litigation will have a material effect on our financial condition or results of operations. Berkshire and certain of its subsidiaries are also involved in other kinds of legal actions, some of which assert or may assert claims or seek to impose fines and penalties. We currently believe that any liability that may arise as a result of other pending legal actions will not have a material effect on our consolidated financial condition or results of operations.

Our subsidiaries regularly make commitments in the ordinary course of business for the future purchase of goods and services used in their businesses, which are not yet reflected in our Consolidated Financial Statements. The most significant of our long-term commitments relate to our railroad, utilities and energy businesses, our shared aircraft ownership and leasing business and certain raw materials purchase commitments. As of December 31, 2022, estimated future payments under those arrangements were as follows: \$12 billion in 2023, \$5 billion in 2024, \$3 billion in 2025, \$2 billion in 2026, \$2 billion in 2027 and \$18 billion after 2027.

Since October 2017, we have owned a 38.6% interest in Pilot, headquartered in Knoxville, Tennessee. Pilot is the largest operator of travel centers in North America (primarily under the names Pilot or Flying J) with more than 650 travel center locations across 44 U.S. states and six Canadian provinces. Pilot also has over 150 retail locations in the U.S. and Canada where it sells diesel fuel through various arrangements with third party travel centers. Through December 31, 2022, we accounted for our investment in Pilot under the equity method and the carrying value of our investment was \$3.2 billion as of December 31, 2022. On January 31, 2023, we acquired an additional 41.4% interest for approximately \$8.2 billion. This amount is based on a contractual agreement that is dependent on Pilot's earnings for 2022 and its net debt at the end of 2022, and is subject to post-closing adjustments following the completion of Pilot's independent public accountant's audit of its 2022 financial statements. We obtained control of Pilot for financial reporting purposes on January 31, 2023 and, consequently, we will discontinue the use of the equity method and include Pilot's financial statements in our Consolidated Financial Statements at that date.

In applying the acquisition method of accounting, we are required to remeasure our previously held 38.6% interest in Pilot to fair value as of January 31, 2023. The excess of the fair value of that interest over the carrying value under the equity method will be recorded as a remeasurement gain.

Given the proximity of the acquisition date of the additional Pilot interest to the date these Consolidated Financial Statements are issued, it was impracticable to provide an initial estimate of the fair values of identifiable assets acquired, liabilities assumed and residual goodwill or proforma information. We expect to provide such disclosures in our Consolidated Financial Statements beginning with our interim report for the quarterly period ending March 31, 2023.

We may be obligated to acquire certain noncontrolling interests in less-than-wholly-owned subsidiaries in the future, pursuant to the terms of agreements with the noncontrolling shareholders for cash or other assets. The timing and the amount of any future payments that might be required to such noncontrolling shareholders are contingent on future actions of the noncontrolling owners and the value of the interest being acquired.

In June 2022, BHE acquired the BHE common stock held by Gregory Abel, Berkshire's Vice Chairman - non-insurance operations, for \$870 million. The purchase was pursuant to the terms of a shareholder agreement between Berkshire, BHE and BHE's noncontrolling shareholders. Berkshire recorded a charge of \$362 million to capital in excess of par value for the excess of the consideration paid over the carrying value of the acquired noncontrolling interest.

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

None

Item 9A. Controls and Procedures

At the end of the period covered by this Annual Report on Form 10-K, the Corporation carried out an evaluation, under the supervision and with the participation of the Corporation's management, including the Chairman (Chief Executive Officer) and the Senior Vice President (Chief Financial Officer), of the effectiveness of the design and operation of the Corporation's disclosure controls and procedures pursuant to Exchange Act Rule 13a-15. Based upon that evaluation, the Chairman (Chief Executive Officer) and the Senior Vice President (Chief Financial Officer) concluded that the Corporation's disclosure controls and procedures are effective in timely alerting them to material information relating to the Corporation (including its consolidated subsidiaries) required to be included in the Corporation's periodic SEC filings. The report called for by Item 308(a) of Regulation S-K is incorporated herein by reference to Management's Report on Internal Control Over Financial Reporting, included on page K-66 of this report. The attestation report called for by Item 308(b) of Regulation S-K is incorporated herein by reference to the Report of Independent Registered Public Accounting Firm, included on page K-67 of this report. There has been no change in the Corporation's internal control over financial reporting during the quarter ended December 31, 2022 that has materially affected, or is reasonably likely to materially affect, the Corporation's internal control over financial reporting.

Item 9B. Other Information

None

Part III

Except for the information set forth under the caption "Executive Officers of the Registrant" in Part I hereof, information required by this Part (Items 10, 11, 12, 13 and 14) is incorporated by reference from the Registrant's definitive proxy statement, filed pursuant to Regulation 14A, for the Annual Meeting of Shareholders of the Registrant to be held on May 6, 2023, which will involve the election of directors.

Part IV

Item 15. Exhibits and Financial Statement Schedules

(a)1. Financial Statements

The following Consolidated Financial Statements, as well as the Report of Independent Registered Public Accounting Firm, are included in Part II Item 8 of this report:

	<u>PAGE</u>
Report of Independent Registered Public Accounting Firm (PCAOB ID No. 34)	K-67
Consolidated Balance Sheets—	
December 31, 2022 and December 31, 2021	K-70
Consolidated Statements of Earnings—	
Years Ended December 31, 2022, December 31, 2021, and December 31, 2020	K-72
Consolidated Statements of Comprehensive Income—	
Years Ended December 31, 2022, December 31, 2021, and December 31, 2020	K-73
Consolidated Statements of Changes in Shareholders' Equity—	
Years Ended December 31, 2022, December 31, 2021, and December 31, 2020	K-73
Consolidated Statements of Cash Flows—	
Years Ended December 31, 2022, December 31, 2021, and December 31, 2020	K-74
Notes to Consolidated Financial Statements	K-75
2. Financial Statement Schedule	
Report of Independent Registered Public Accounting Firm	K-115
Schedule I—Parent Company Condensed Financial Information	
Balance Sheets as of December 31, 2022 and 2021, Statements of Earnings and Comprehensive Income and Cash Flows for the years ended December 31, 2022, December 31, 2021, and December 31, 2020 and Note to Condensed Financial Information	K-116

Other schedules are omitted because they are not required, information therein is not applicable, or is reflected in the Consolidated Financial Statements or notes thereto.

(b) Exhibits

See the "Exhibit Index" at page K-118.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Shareholders and the Board of Directors of
Berkshire Hathaway Inc.
Omaha, Nebraska

Opinion on the Financial Statement Schedule

We have audited the consolidated financial statements of Berkshire Hathaway Inc. and subsidiaries (the “Company”) as of December 31, 2022 and 2021, and for each of the three years in the period ended December 31, 2022, and the Company’s internal control over financial reporting as of December 31, 2022, and have issued our report thereon dated February 25, 2023; such consolidated financial statements and reports are included elsewhere in this Form 10-K. Our audits also included the financial statement schedule of the Company listed in the Index at Item 15. This financial statement schedule is the responsibility of the Company’s management. Our responsibility is to express an opinion on the Company’s financial statement schedule based on our audits. In our opinion, such financial statement schedules, when considered in relation to the financial statements taken as a whole, presents fairly, in all material respects, the information set forth therein.

/s/ Deloitte & Touche LLP
Omaha, Nebraska
February 25, 2023

BERKSHIRE HATHAWAY INC. (Parent Company)
Condensed Financial Information
(Dollars in millions)
Schedule I
Balance Sheets

	December 31,	
	2022	2021
Assets:		
Cash and cash equivalents	\$ 2,777	\$ 18,797
Short-term investments in U.S. Treasury Bills	17,628	9,681
Investments in and advances to consolidated subsidiaries	462,030	486,862
Investment in The Kraft Heinz Company	12,937	13,112
Other assets	12	140
	<u>\$ 495,384</u>	<u>\$ 528,592</u>
Liabilities and Shareholders' Equity:		
Accounts payable, accrued interest and other liabilities	\$ 355	\$ 237
Income taxes, principally deferred	1,276	747
Notes payable and other borrowings	21,393	21,409
	23,024	22,393
Berkshire Hathaway shareholders' equity	472,360	506,199
	<u>\$ 495,384</u>	<u>\$ 528,592</u>

Statements of Earnings and Comprehensive Income

	Year ended December 31,		
	2022	2021	2020
Income items:			
From consolidated subsidiaries:			
Dividends and distributions	\$ 15,724	\$ 13,462	\$ 26,110
Undistributed earnings (losses)	(39,639)	74,819	17,402
	<u>(23,915)</u>	<u>88,281</u>	<u>43,512</u>
Investment gains (losses)	(34)	35	(24)
Equity in earnings of The Kraft Heinz Company	628	269	95
Other income	413	73	328
	<u>(22,908)</u>	<u>88,658</u>	<u>43,911</u>
Cost and expense items:			
General and administrative	131	136	194
Interest expense	513	444	489
Foreign exchange (gains) losses on non-U.S. Dollar denominated debt	(1,401)	(1,281)	970
Income tax expense (benefit)	668	(436)	(263)
	<u>(89)</u>	<u>(1,137)</u>	<u>1,390</u>
Net earnings (loss) attributable to Berkshire Hathaway shareholders	(22,819)	89,795	42,521
Other comprehensive income attributable to Berkshire Hathaway shareholders	(2,564)	216	1,000
Comprehensive income attributable to Berkshire Hathaway shareholders	<u>\$ (25,383)</u>	<u>\$ 90,011</u>	<u>\$ 43,521</u>

See Note to Condensed Financial Information

BERKSHIRE HATHAWAY INC. (Parent Company)
Condensed Financial Information
(Dollars in millions)
Schedule I (continued)
Statements of Cash Flows

	Year ended December 31,		
	2022	2021	2020
Cash flows from operating activities:			
Net earnings (loss) attributable to Berkshire Hathaway shareholders	\$ (22,819)	\$ 89,795	\$ 42,521
Adjustments to reconcile net earnings (loss) to operating cash flows:			
Investment (gains) losses	34	(35)	24
Undistributed (earnings) losses of consolidated subsidiaries	39,639	(74,819)	(17,402)
Non-cash dividends from subsidiaries	(7,220)	(2,126)	(8,296)
Income taxes payable	661	(389)	(72)
Other	(1,833)	(1,038)	1,100
Net cash flows from operating activities	<u>8,462</u>	<u>11,388</u>	<u>17,875</u>
Cash flows from investing activities:			
Investments in and advances to consolidated subsidiaries, net	(11,852)	(174)	(1,947)
Purchases of U.S. Treasury Bills	(44,187)	(34,988)	(54,715)
Sales and maturities of U.S. Treasury Bills	37,915	57,296	59,035
Other	128	—	11
Net cash flows from investing activities	<u>(17,996)</u>	<u>22,134</u>	<u>2,384</u>
Cash flows from financing activities:			
Proceeds from borrowings	1,970	2,174	2,923
Repayments of borrowings	(602)	(2,167)	(1,151)
Acquisition of treasury stock	(7,854)	(27,061)	(24,706)
Net cash flows from financing activities	<u>(6,486)</u>	<u>(27,054)</u>	<u>(22,934)</u>
Increase (decrease) in cash and cash equivalents	(16,020)	6,468	(2,675)
Cash and cash equivalents at beginning of year	18,797	12,329	15,004
Cash and cash equivalents at end of year	<u>\$ 2,777</u>	<u>\$ 18,797</u>	<u>\$ 12,329</u>
Other cash flow information:			
Income taxes paid	\$ 2,259	\$ 3,403	\$ 3,391
Interest paid	332	377	359

Note to Condensed Financial Information

Berkshire currently owns 26.6% of the outstanding shares of The Kraft Heinz Company (“Kraft Heinz”) common stock, which is accounted for pursuant to the equity method. See Note 5 to the Consolidated Financial Statements. On October 19, 2022, Berkshire acquired all of the outstanding common stock of Alleghany Corporation for \$11.5 billion. See Note 2 to the Consolidated Financial Statements.

In January 2022, the Parent Company issued ¥128.5 billion (approximately \$1.1 billion) of senior notes with maturity dates ranging from 2027 to 2052 and a weighted average interest rate of 0.5%. In December 2022, the Parent Company also issued ¥115.0 billion (approximately \$840 million) of senior notes with maturity dates ranging from 2025 to 2052 and a weighted average interest rate of 1.1%. As of December 31, 2022, the Parent Company’s non-U.S. Dollar denominated borrowings included €6.9 billion and ¥1,029 billion par value senior notes. The gains and losses from the periodic remeasurement of these non-U.S. Dollar denominated notes due to changes in foreign currency exchange rates are included in earnings. In the first two months of 2023, Berkshire repaid \$1.1 billion of maturing senior notes. An additional \$3.2 billion of Berkshire senior notes mature in March and April of 2023.

Parent Company debt maturities over the next five years are as follows: 2023—\$4.3 billion; 2024—\$1.9 billion; 2025—\$2.0 billion; 2026—\$3.2 billion and 2027—\$2.1 billion. The Parent Company guarantees certain debt of subsidiaries, which aggregated approximately \$21.7 billion at December 31, 2022 and was primarily debt issued by Berkshire Hathaway Finance Corporation. Such guarantees are an absolute, unconditional and irrevocable guarantee for the full and prompt payment when due of all present and future payment obligations. The Parent Company has also provided guarantees in connection with certain retroactive reinsurance contracts issued by subsidiaries. The amounts of subsidiary payments under these contracts, if any, is contingent upon the outcome of future events.

EXHIBIT INDEX

<u>Exhibit No.</u>	
2(i)	Agreement and Plan of Merger dated as of June 19, 1998 between Berkshire and General Re Corporation. Incorporated by reference to Annex I to Registration Statement No. 333-61129 filed on Form S-4.
2(ii)	Agreement and Plan of Merger dated as of November 2, 2009 by and among Berkshire, R Acquisition Company, LLC and BNSF. Incorporated by reference to Annex A to Registration Statement No. 333-163343 on Form S-4.
2(iii)	Agreement and Plan of Merger dated August 8, 2015, by and among Berkshire, NW Merger Sub Inc. and Precision Castparts Corporation (“PCC”) Incorporated by reference to Exhibit 2.1 to PCC’s Current Report on Form 8-K filed on August 10, 2015 (SEC File No. 001-10348)
3(i)	Restated Certificate of Incorporation Incorporated by reference to Exhibit 3(i) to Form 10-K filed on March 2, 2015.
3(ii)	By-Laws Incorporated by reference to Exhibit 3(ii) to Form 8-K filed on May 4, 2022.
4.1	Indenture, dated as of December 22, 2003, between Berkshire Hathaway Finance Corporation, Berkshire Hathaway Inc. and The Bank of New York Mellon Trust Company, N.A. (as successor to J.P. Morgan Trust Company, National Association), as trustee. Incorporated by reference to Exhibit 4.1 on Form S-4 of Berkshire Hathaway Finance Corporation and Berkshire Hathaway Inc. filed on February 4, 2004. SEC File No. 333-112486
4.2	Indenture, dated as of February 1, 2010, among Berkshire Hathaway Inc., Berkshire Hathaway Finance Corporation and The Bank of New York Mellon Trust Company, N.A., as trustee. Incorporated by reference to Exhibit 4.1 to Berkshire’s Registration Statement on Form S-3 filed on February 1, 2010. SEC File No. 333-164611
4.3	Indenture, dated as of January 26, 2016, by and among Berkshire Hathaway Inc., Berkshire Hathaway Finance Corporation and The Bank of New York Mellon Trust Company, N.A., as trustee. Incorporated by reference to Exhibit 4.1 to Berkshire’s Registration Statement on Form S-3 filed on January 26, 2016. SEC File No. 333-209122
4.4	Indenture, dated as of December 1, 1995, between BNSF and The First National Bank of Chicago, as trustee. Incorporated by reference to Exhibit 4 on Form S-3 of BNSF filed on February 8, 1999.
4.5	Indenture, dated as of October 4, 2002, by and between MidAmerican Energy Holdings Company and The Bank of New York, Trustee. Incorporated by reference to Exhibit 4.1 to the Berkshire Hathaway Energy Company Registration Statement No. 333-101699 dated December 6, 2002.
4.6	Indenture, dated as of January 28, 2022, by and among Berkshire Hathaway Inc., as an issuer and a guarantor of the debt securities issued by Berkshire Hathaway Finance Corporation, Berkshire Hathaway Finance Corporation, as an issuer, and The Bank of New York Mellon Trust Company, N.A., as trustee. Incorporated by reference to Exhibit 4.1 to Berkshire’s Registration Statement on Form S-3 filed on January 28, 2022. SEC File No 333-262384.
	Other instruments defining the rights of holders of long-term debt of Registrant and its subsidiaries are not being filed since the total amount of securities authorized by all other such instruments does not exceed 10% of the total assets of the Registrant and its subsidiaries on a consolidated basis as of December 31, 2022. The Registrant hereby agrees to furnish to the Commission upon request a copy of any such debt instrument to which it is a party.
10.1	Equity Commitment Letter of Berkshire Hathaway Inc. with Hawk Acquisition Holding Corporation dated February 13, 2013. Incorporated by reference to Exhibit 10.1 on Form 8-K of Berkshire Hathaway Inc. filed on February 14, 2013.
14	Code of Ethics Berkshire’s Code of Business Conduct and Ethics is posted on its Internet website at www.berkshirehathaway.com
21	Subsidiaries of Registrant
23	Consent of Independent Registered Public Accounting Firm

Exhibit No.

- 31.1 Rule 13a—14(a)/15d-14(a) Certification
- 31.2 Rule 13a—14(a)/15d-14(a) Certification
- 32.1 Section 1350 Certification
- 32.2 Section 1350 Certification
- 95 Mine Safety Disclosures
- 101 The following financial information from Berkshire Hathaway Inc.'s Annual Report on Form 10-K for the year ended December 31, 2022, formatted in iXBRL (Inline Extensible Business Reporting Language) includes: (i) the Cover Page (ii) the Consolidated Balance Sheets, (iii) the Consolidated Statements of Earnings, (iv) the Consolidated Statements of Comprehensive Income, (v) the Consolidated Statements of Changes in Shareholders' Equity, (vi) the Consolidated Statements of Cash Flows, and (vii) the Notes to Consolidated Financial Statements and Schedule I, tagged in summary and detail.
- 104 Cover Page Interactive Data File (formatted as iXBRL and contained in Exhibit 101)

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

BERKSHIRE HATHAWAY INC.

Date: February 25, 2023

/S/ MARC D. HAMBURG

Marc D. Hamburg
Senior Vice President and
Principal Financial Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant and in the capacities and on the dates indicated.

/S/ WARREN E. BUFFETT Warren E. Buffett	Chairman of the Board of Directors—Chief Executive Officer	February 25, 2023 Date
/S/ GREGORY E. ABEL Gregory E. Abel	Director—Vice Chairman—Non-Insurance Operations	February 25, 2023 Date
/S/ HOWARD G. BUFFETT Howard G. Buffett	Director	February 25, 2023 Date
/S/ SUSAN A. BUFFETT Susan A. Buffett	Director	February 25, 2023 Date
/S/ STEPHEN B. BURKE Stephen B. Burke	Director	February 25, 2023 Date
/S/ KENNETH I. CHENAULT Kenneth I. Chenault	Director	February 25, 2023 Date
/S/ CHRISTOPHER C. DAVIS Christopher C. Davis	Director	February 25, 2023 Date
/S/ SUSAN L. DECKER Susan L. Decker	Director	February 25, 2023 Date
/S/ CHARLOTTE GUYMAN Charlotte Guyman	Director	February 25, 2023 Date
/S/ AJIT JAIN Ajit Jain	Director—Vice Chairman—Insurance Operations	February 25, 2023 Date
/S/ CHARLES T. MUNGER Charles T. Munger	Director—Vice Chairman	February 25, 2023 Date
/S/ THOMAS S. MURPHY, JR. Thomas S. Murphy, Jr.	Director	February 25, 2023 Date
/S/ RONALD L. OLSON Ronald L. Olson	Director	February 25, 2023 Date
/S/ WALLACE R. WEITZ Wallace R. Weitz	Director	February 25, 2023 Date
/S/ MERYL B. WITMER Meryl B. Witmer	Director	February 25, 2023 Date
/S/ MARC D. HAMBURG Marc D. Hamburg	Senior Vice President—Principal Financial Officer	February 25, 2023 Date
/S/ DANIEL J. JAKSICH Daniel J. Jaksich	Vice President—Principal Accounting Officer	February 25, 2023 Date

**BERKSHIRE HATHAWAY INC.
SHAREHOLDER EVENT INFORMATION**

SHAREHOLDER MEETING SCHEDULE – SATURDAY, MAY 6
CHI Health Center

7:00am	Doors Open
8:30am	Movie
9:15am	Q & A Session
Noon	Lunch Break
1:00pm	Shareholder Q & A Session
3:30pm	Recess
4:30pm	Annual Shareholders Meeting

Details: Becky Quick, of CNBC will review questions that shareholders have submitted by e-mail and select those she believes will have the widest interest. Questions can be submitted to Becky at berkshirequestions@cnbc.com. We will have a drawing at 8:15 am at each of the 11 microphone locations for those shareholders wishing to ask questions themselves. At the meeting, Warren will alternate the questions asked by Becky and the shareholders in attendance.

At the morning session, Warren as well as Charlie, Greg and Ajit will be available to answer questions. At the afternoon session, Warren and Charlie will be available to answer questions.

The Berkshire Q & A Session will be broadcast on CNBC and webcast in English and Mandarin on CNBC.com beginning at 8:45 am central time. Visit www.cnbc.com/brklive.

OTHER SHAREHOLDER EVENTS INFORMATION

Friday, May 5

Berkshire Bazaar of Bargains (Shareholder Shopping Day)-CHI Health Center Noon – 5pm

Details: An extended afternoon of shopping for our shareholders.

Borsheims Shareholder-Only Shopping Night 6:00pm – 8:00pm

Saturday, May 6

NFM’s Berkshire Picnic 5:30pm – 8:00pm

Details: NFM will be hosting a Berkshire Picnic at the Omaha store with food and live entertainment.

Sunday, May 7

Berkshire Hathaway “Invest in Yourself” 5K presented by Brooks 8:00am – 11:00am

Details: Brooks and Berkshire Hathaway are bringing the Run Happy spirit to the Annual Shareholders Meeting by again hosting the “Invest in Yourself” 5K fun run and walk. The event will be held in downtown Omaha. Run, jog, or walk to the starting line by registering at www.investinyourself5k.com.

Borsheims Shareholder-Only Shopping Day 11:00am – 4:00pm

NFM Shareholder Discount Period

Wednesday, April 26 through Tuesday, May 9

(Discounts also available in Dallas/Fort Worth, Kansas City and Des Moines Stores.)

Store Hours:

Sunday – Friday: 11am – 8pm | Saturday: 10am – 8pm

Borsheims Shareholder Discount Period

Saturday, April 29 through Sunday, May 14

Store Hours:

Monday – Friday*: 10am – 6pm

Saturday**: 10am – 5:00pm | Sunday***Closed

* *Shareholder-Only Shopping Night, Friday, May 5 / 6 – 8pm*

** *Shareholder Shopping Day, Saturday, May 6 / 10am – 5:00pm*

*** *Shareholder-Only Shopping Day Sunday, May 7 / 11am – 4pm*

Books for Shareholders

The Bookworm will be back with a selection of books. Shareholders receive a 20% discount. The books selected for sale at the Berkshire annual meeting are available year round at www.bookwormomaha.com. Shareholders with credentials also receive the 20% shareholder discount Friday, May 5 through Monday, May 8, at The Bookworm, 90th and Center Street.

BERKSHIRE HATHAWAY INC.
PROPERTY/CASUALTY INSURANCE*

Our property/casualty (“P/C”) insurance business has been the engine propelling Berkshire’s growth since 1967, the year we acquired National Indemnity and its sister company, National Fire & Marine, for \$8.6 million. Today, National Indemnity is the largest P/C company in the world as measured by net worth. Insurance is a business of promises, and Berkshire’s ability to honor its commitments is unmatched.

One reason we were attracted to the P/C business was the industry’s business model: P/C insurers receive premiums upfront and pay claims later. In extreme cases, such as claims arising from exposure to asbestos, or severe workplace accidents, payments can stretch over many decades.

This collect-now, pay-later model leaves P/C companies holding large sums – money we call “float” – that will eventually go to others. Meanwhile, insurers get to invest this float for their own benefit. Though individual policies and claims come and go, the amount of float an insurer holds usually remains fairly stable in relation to premium volume. Consequently, as our business grows, so does our float. And *how* it has grown, as the following table shows:

<u>Year</u>	<u>Float (in millions)</u>
1970	\$ 39
1980	237
1990	1,632
2000	27,871
2010	65,832
2020	138,503
2021	146,701
2022	164,109

We may in time experience a decline in float. If so, the decline will be *very* gradual – at the outside no more than 3% in any year. The nature of our insurance contracts is such that we can *never* be subject to immediate or near-term demands for sums that are of significance to our cash resources. That structure is by design and is a key component in the unequaled financial strength of our insurance companies. That strength will *never* be compromised.

If our premiums exceed the total of our expenses and eventual losses, our insurance operation registers an underwriting profit that adds to the investment income the float produces. When such a profit is earned, we enjoy the use of free money – and, better yet, *get paid* for holding it.

For the P/C industry as a whole, the financial value of float is now far less than it was for many years. That’s because the standard investment strategy for almost all P/C companies is heavily – and *properly* – skewed toward high-grade bonds. Changes in interest rates therefore matter enormously to these companies, and during the last decade the bond market has offered pathetically low rates.

Consequently, insurers suffered, as year by year they were forced – by maturities or issuer-call provisions – to recycle their “old” investment portfolios into new holdings providing much lower yields. Where once these insurers could safely earn 5 cents or 6 cents on each dollar of float, they now take in only 2 cents or 3 cents.

Some insurers may try to mitigate their loss of revenue by buying lower-quality bonds or non-liquid “alternative” investments promising higher yields. But those are dangerous games and activities that most institutions are ill-equipped to play.

Berkshire’s situation is more favorable than that of insurers in general. Most important, our unrivaled mountain of capital, abundance of cash and a huge and diverse stream of non-insurance earnings allow us far more investment flexibility than is generally available to other companies in the industry. The many choices open to us are always advantageous – and sometimes have presented us with major opportunities.

Our P/C companies have meanwhile had an excellent underwriting record. Berkshire has now operated at an underwriting profit for 18 of the last 20 years, the exceptions being 2017 and 2022. In 2017 our pre-tax loss was a whopping \$3.2 billion. In 2022 the loss was minimal. For the entire 20-year span, our pre-tax gain totaled \$29.2 billion.

That record is no accident: Disciplined risk evaluation is the daily focus of our insurance managers, who know that the rewards of float can be drowned by poor underwriting results. All insurers give that message lip service. At Berkshire it is a religion, Old Testament style.

As I have repeatedly done in the past, I will emphasize now that happy outcomes in insurance are far from a sure thing: Danger always lurks.

Mistakes in assessing insurance risks can be huge and can take many years – even decades – to surface and ripen. (Think asbestos.) A major catastrophe that will dwarf hurricanes Katrina and Ian *will* occur – perhaps tomorrow, perhaps many decades from now. “The Big One” may come from a traditional source, such as wind or earthquake, or it may be a total surprise involving, say, a cyber attack having disastrous consequences beyond anything insurers now contemplate. When such a mega-catastrophe strikes, Berkshire will get its share of the losses and they will be big – *very* big. Unlike many other insurers, however, handling the loss will not come close to straining our resources, and we will be eager to *add* to our business the next day.

* Reproduced from Berkshire Hathaway Inc. 2019 Annual Report and updated through 2022

**BERKSHIRE HATHAWAY INC.
OPERATING COMPANIES**

<u>INSURANCE:</u>	<u>Employees</u>	<u>RAILROAD, UTILITIES AND ENERGY:</u>	<u>Employees</u>
GEICO	38,285	BNSF:	
Berkshire Hathaway Reinsurance Group	658	BNSF Railway	36,250
General Re	2,101	BNSF Logistics	575
Berkshire Hathaway Homestate Companies	1,157	Berkshire Hathaway Energy Company:	
Berkshire Hathaway Specialty	1,427	Corporate Office	32
Berkshire Hathaway GUARD Insurance Companies	1,082	PacifiCorp	4,815
MedPro Group Inc.	1,201	MidAmerican Energy	3,411
MLMIC Insurance Companies	247	NV Energy	2,427
National Indemnity Primary Group	1,263	Northern Powergrid	2,604
United States Liability Insurance Companies	1,089	BHE Pipeline Group	2,723
Alleghany ⁽¹⁾	1,399	BHE Transmission	748
Central States Indemnity	21	BHE Renewables	379
	<u>49,930</u>	MidAmerican Energy Services	61
		HomeServices of America	6,757
			<u>60,782</u>
 <u>MANUFACTURING:</u>		 <u>SERVICE AND RETAILING:</u>	
Acme	1,890	Affordable Housing Partners, Inc.	28
Alleghany ⁽¹⁾	6,417	Alleghany ⁽¹⁾	3,052
Benjamin Moore	2,026	Ben Bridge Jeweler	425
Brooks Sports	1,253	Berkshire Hathaway Automotive	9,802
Clayton Homes	20,229	Borsheims	142
CTB	2,637	Business Wire	417
Duracell	3,082	Charter Brokerage	165
Fechheimer	395	CORT	2,198
Forest River	12,994	Dairy Queen	507
Fruit of the Loom	27,095	Detlev Louis	1,438
Garan	2,654	FlightSafety	4,442
H. H. Brown Shoe Group	1,189	Helzberg Diamonds	1,575
IMC International Metalworking Companies	13,286	Jordan's Furniture	1,047
Johns Manville	8,044	McLane Company	27,554
Larson-Juhl	837	Nebraska Furniture Mart	4,446
LiquidPower Specialty Products, Inc.	447	NetJets	7,402
Lubrizon	8,292	Oriental Trading	1,296
Marmon ⁽²⁾	24,175	Pampered Chef	320
MiTek Inc.	5,974	R.C. Willey Home Furnishings	2,308
Precision Castparts	23,164	See's Candies	2,660
Richline Group	2,247	Star Furniture	337
Scott Fetzer Companies	1,765	TTL, Inc.	8,896
Shaw Industries	20,784	WPLG, Inc.	212
	<u>190,876</u>	XTRA	368
			<u>81,037</u>
		Berkshire Hathaway Corporate Office	26
			<u>382,651</u>

⁽¹⁾ Alleghany Corporation (“Alleghany”) is a holding company with insurance, manufacturing and service businesses.

⁽²⁾ Marmon Holding, Inc. (“Marmon”) is a holding company that conducts operations through more than 100 manufacturing and service businesses organized into 11 business groups.

**BERKSHIRE HATHAWAY INC.
STOCK TRANSFER AGENT**

EQ Shareowner Services (“EQ”), a division of Equiniti Trust Company., P. O. Box 64854, St. Paul, MN 55164-0854 serves as Transfer Agent and Registrar for the Company’s common stock. Correspondence may be directed to EQ at the address indicated or at www.shareowneronline.com. Telephone inquiries should be directed to the Shareowner Relations Department at 1-877-602-7411 between 7:00 A.M. and 7:00 P.M. Central Time. Certificates for re-issue or transfer should be directed to the Transfer Department at the address indicated.

Berkshire has two classes of common stock designated Class A common stock and Class B common stock. Each share of Class A common stock is convertible, at the option of the holder, into 1,500 shares of Class B common stock. Shares of Class B common stock are not convertible into shares of Class A common stock.

Registered owner’s holding Berkshire stock in certificate form or through EQ’s direct registration system, may contact EQ directly for instructions regarding changes in registration, including shareowner’s mailing address or conversion of Class A shares to Class B shares. Correspondence may be directed to EQ at the address indicated above or at www.shareowneronline.com. Telephone inquiries should be directed to the Shareowner Relations Department at 1-877-602-7411 between 7:00 A.M. and 7:00 P.M. Central Time. Certificates for re-issue or transfer should be directed to the Transfer Department at the address indicated above. Shareowners can also view account information at the EQ website www.shareowneronline.com.

If a shareowner has lost or misplaced stock certificates, he or she should contact EQ to arrange for replacements. Transfer agent’s, including EQ, will require the shareowner to provide an indemnification bond based on the value of the share certificate being replaced. Shareholders are encouraged to contact EQ periodically to verify the mailing address of record to assure that Company communications are delivered. We encourage you to vote on shareholder proposals contained in our annual proxy solicitation. Contact with EQ is established automatically through the voting process.

Shareholders of record wishing to convert Class A common stock into Class B common stock may contact EQ in writing. Along with the underlying stock certificate, shareholders should provide EQ with specific written instructions regarding the number of shares to be converted and the manner in which the Class B shares are to be registered. We recommend that you use certified or registered mail addressed to EQ Shareowner Services, 1110 Centre Pointe Curve, Suite 101, Mendota Heights, MN 55120 when delivering the stock certificates and written instructions.

Owners holding Berkshire common stock in street name (in a bank, broker or other nominee account) should contact the bank, broker or nominee for changes in registration. If Class A shares are held in “street name,” shareholders wishing to convert all or a portion of their holding to Class B should contact their broker or bank nominee. It will be necessary for the nominee to make the request for conversion.

BERKSHIRE HATHAWAY INC.

DIRECTORS

WARREN E. BUFFETT,
Chairman and CEO of Berkshire

CHARLES T. MUNGER,
Vice Chairman of Berkshire

GREGORY E. ABEL,
Vice Chairman of Berkshire - Non-Insurance Operations

AJIT JAIN,
Vice Chairman of Berkshire - Insurance Operations

HOWARD G. BUFFETT,
Chairman and Chief Executive Officer of the Howard G. Buffett Foundation, a charitable foundation that directs funding for humanitarian and conservation related issues.

SUSAN A. BUFFETT,
Chairman of The Susan Thompson Buffett Foundation and of The Sherwood Foundation, each of which is a grant-making foundation.

STEPHEN B. BURKE,
Former Chairman and CEO of NBCUniversal, a media and entertainment company.

KENNETH I. CHENAULT,
Chairman and Managing Director of General Catalyst, a venture capital firm and Former Chairman and CEO of American Express Company.

CHRISTOPHER C. DAVIS,
Chairman of Davis Advisors, an investment management firm.

SUSAN L. DECKER,
Founder and CEO of RaftR, a community-building and insights platform.

CHARLOTTE GUYMAN,
Independent Director of two start-up entities, Landings Holdings and Evercase.

THOMAS S. MURPHY, JR.,
Partner, Crestview Partners, a private equity firm.

RONALD L. OLSON,
Partner of the law firm of Munger, Tolles & Olson LLP.

WALLACE R. WEITZ,
Co-Chair of Board of Weitz Investment Management, an investment management firm.

MERYL B. WITMER,
Managing member of the General Partner of Eagle Capital Partners L.P., an investment partnership.

OFFICERS

WARREN E. BUFFETT, *Chairman and CEO*

CHARLES T. MUNGER, *Vice Chairman*

GREGORY E. ABEL, *Vice Chairman - Non-Insurance Operations*

AJIT JAIN, *Vice Chairman - Insurance Operations*

MARC D. HAMBURG, *Senior Vice President and CFO*

DANIEL J. JAKSICH, *Vice President, Controller*

MARK D. MILLARD, *Vice President*

JO ELLEN RIECK, *Vice President*

KERBY S. HAM, *Treasurer*

REBECCA K. AMICK, *Director of Internal Auditing*

Letters from Annual Reports (1977 through 2022), quarterly reports, press releases and other information about Berkshire may be obtained on the Internet at www.berkshirehathaway.com.

BERKSHIRE HATHAWAY INC.

Executive Offices — 3555 Farnam Street, Omaha, Nebraska 68131