2022

Markel Corporation

Annual Report & Form 10-K

THE CORPORATE PROFILE

Markel Corporation is a diverse financial holding company serving a variety of niche markets. Our principal business markets and underwrites specialty insurance products.

In each of our businesses, we seek to provide quality products and excellent customer service so that we can be a market leader.

Our financial goals are to earn consistent underwriting and operating profits and superior investment returns to build shareholder value.

THE MARKEL STYLE

Markel has a Commitment to Success. We believe in hard work and a zealous pursuit of excellence while keeping a sense of humor. Our creed is honesty and fairness in all our dealings.

The Markel way is to seek to be a market leader in each of our pursuits. We seek to know our customers' needs and to provide our customers with quality products and service.

Our pledge to our shareholders is that we will build the financial value of our Company. We respect our relationship with our suppliers and have a commitment to our communities.

We are encouraged to look for a better way to do things…to challenge management. We have the ability to make decisions or alter a course quickly. The Markel approach is one of spontaneity and flexibility. This requires a respect for authority but a disdain of bureaucracy.

At Markel, we hold the individual's right to self-determination in the highest light, providing an atmosphere in which people can reach their personal potential. Being results-oriented, we are willing to put aside individual concerns in the spirit of teamwork to achieve success.

Above all, we enjoy what we are doing. There is excitement at Markel, one that comes from innovating, creating, striving for a better way, sharing success with others…winning.

Highlights

Financial Highlights

(dollars in millions, except per share data)		**2022**		2021		2020
Gross premium volume	**$**	**13,202**	$	11,439	$	9,267
Earned premiums	**$**	**7,588**	$	6,503	$	5,612
Net investment income	**$**	**447**	$	367	$	376
U.S. GAAP combined ratio		**92 %**		90 %		98 %
Markel Ventures operating revenues	**$**	**4,758**	$	3,644	$	2,795
Total operating revenues	**$**	**11,675**	$	12,846	$	9,735
Net income (loss) to common shareholders	**$**	**(250)**	$	2,389	$	798
Comprehensive income (loss) to shareholders	**$**	**(1,309)**	$	2,078	$	1,192
Total investments, cash and cash equivalents and restricted cash and cash equivalents (invested assets)	**$**	**27,420**	$	28,292	$	24,927
Total assets	**$**	**49,791**	$	48,477	$	41,738
Senior long-term debt and other debt	**$**	**4,104**	$	4,361	$	3,484
Shareholders' equity	**$**	**13,066**	$	14,717	$	12,822
Debt to capital		**24 %**		23 %		21 %
Per Share Data						
Common shares outstanding (at year end, in thousands)		**13,423**		13,632		13,783
Diluted net income (loss) per common share	**$**	**(23.57)**	$	176.51	$	55.63
Book value per common share	**$**	**929.27**	$	1,036.20	$	887.34
5-Year CAGR in book value per common share [1]		**6 %**		11 %		10 %
Closing stock price per common share	**$**	**1,317.49**	$	1,234.00	$	1,033.30
5-Year CAGR in closing stock price [1]		**3 %**		6 %		3 %

[1] CAGR—compound annual growth rate

Operating Highlights

- Insurance engine produced over $8 billion in revenues
- Combined ratio of 92%, including one point from the combined impact of Hurricane Ian and the Russia-Ukraine conflict
- Net investment income, representing recurring interest and dividend income on our investment portfolio, up 22%
- Revenues from Markel Ventures increased by 31%
- Gains totaling $226 million from the sale of our two Nephila managing general agent businesses
- Operating cash flows exceeded $2.7 billion
- Comprehensive loss to shareholders of $1.3 billion, driven by a decline in the fair value of our investment portfolio

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2022

To Our Business Partners,

Thank you for being part of Markel. Whether you're reading this as a shareholder, an associate, or as a customer (and we hope you are at least two out of three), we thank you for being a part of our dream to build one of the world's great companies.

We cannot do it without you, and we thank you for your consistent commitment.

In return for your commitment to us, here is our commitment to you – we pledge to expend every effort, every day, to build one of the world's great companies.

If we continue to do so, and you continue to stay with us, we should both be thrilled with the long-term outcome.

Markel started in 1930. After two generations of family ownership, we went public in 1986 at roughly $8 per share.

By year-end 2022, each share fetched $1,317. That is a compound annual return of roughly 15% for 36 years.

That is the *financial* result so far from chasing this dream. Financial metrics are easy to calculate. But financial metrics are just measurements of the work and commitment expended by people.

People come first at Markel.

The financial results flow from the relationships and efforts of our people.

In 1986, approximately 300 people worked at Markel. Today, more than 20,000 find careers and support their customers, families, and communities, as part of your company.

In 1986, we delivered goods and services to our customers (who are people too) for which they paid us total revenues of approximately $33 million. In 2022, we delivered goods and services for which they paid us total revenues of $11.7 billion. (More on what "total revenues" means for Markel later).

I hope you will concur with our sense of our progress towards the goal of building one of the world's great companies as…

So far, so good.

Financial Highlights

(in millions, except per share data)	**2022**	2021	2020	2019	2018	2017	2016	2015	2014
Total operating revenues	**$ 11,675**	12,846	9,735	9,526	6,841	6,062	5,612	5,370	5,134
Gross written premiums	**$ 13,202**	11,439	9,267	8,780	7,864	5,507	4,797	4,633	4,806
Combined ratio	**92 %**	90 %	98 %	94 %	98 %	105 %	92 %	89 %	95 %
Invested assets	**$ 27,420**	28,292	24,927	22,258	19,238	20,570	19,059	18,181	18,638
Invested assets per common share	**$2,042.73**	2,075.42	1,808.50	1,613.62	1,385.24	1,479.45	1,365.72	1,302.48	1,334.89
Net income (loss) to common shareholders	**$ (250)**	2,389	798	1,790	(128)	395	456	583	321
Comprehensive income (loss) to shareholders	**$ (1,309)**	2,078	1,192	2,094	(376)	1,175	667	233	936
Shareholders' equity	**$ 13,066**	14,717	12,822	11,071	9,081	9,504	8,461	7,834	7,595
Book value per common share	**$ 929.27**	1,036.20	887.34	802.59	653.85	683.55	606.30	561.23	543.96
5-Year CAGR in book value per common share [1]	**6 %**	11 %	10 %	8 %	7 %	11 %	11 %	11 %	14 %
Closing stock price per share	**$1,317.49**	1,234.00	1,033.30	1,143.17	1,038.05	1,139.13	904.50	883.35	682.84
5-Year CAGR in closing stock price per share [1]	**3 %**	6 %	3 %	11 %	12 %	21 %	17 %	18 %	15 %

(1) CAGR - compound annual growth rate

Win-Win-Win

We attribute much of our success to our efforts to sustain a win-win-win culture. From that culture grows the *system* that is Markel. Our culture is based on the idea that our customers, associates, and shareholders all win because of what we do and how we do it.

Our customers win as we provide what they need or want at fair prices. People need insurance to backstop the uncertainty of life. People need food to eat, medical care, help with changing technology, affordable housing, plants to brighten their day, protection against fires, construction for shelter, industrial gases, truck trailers to carry needs for daily life, and so on and so on.

This is only a partial list of how we serve our customers, who win when we solve their problems and provide what they need to live their lives.

Associates win by being a part of Markel. Their jobs help them support their families and their communities. They create and learn. They find joy that comes from serving customers, and colleagues. They solve problems, find better ways to do things, and make the world a better place through their daily work. That's winning.

Our shareholders win when we earn good returns on the capital we need to operate the company. You can see this win on the scoreboard of our share price growing from $8 to over $1,300 since we went public.

What we do matters.

Each win for our customers, our associates, and our shareholders gives us the fuel and credibility to do it again the next day, the day after that, and so on, ad infinitum.

If the Markel Corporation was an athlete, I would hope the image of someone like a Cal Ripken Jr. or Bill Russell would come to mind.

Thank you again for your role as a customer, an associate, and/or shareholder of Markel. Now, on to some details from last year as well as some thoughts on our goals and aspirations for 2023 and beyond.

2022 (and a little about accounting)

First, this is an annual report letter. As such, we talk about the financial results from the year 2022 and compare them to those of 2021.

However, we'll also talk about longer time frames.

2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	**20-Year CAGR** [(1)]
4,323	3,000	2,630	2,225	2,069	1,977	2,551	2,576	2,200	2,262	2,092	1,770	**10 %**
3,920	2,514	2,291	1,982	1,906	2,213	2,359	2,536	2,401	2,518	2,572	2,218	**9 %**
97 %	97 %	102 %	97 %	95 %	99 %	88 %	87 %	101 %	96 %	99 %	103 %	
17,612	9,333	8,728	8,224	7,849	6,893	7,775	7,524	6,588	6,317	5,350	4,314	**10 %**
1,259.26	969.23	907.20	846.24	799.34	702.34	780.84	752.80	672.34	641.49	543.31	438.79	**8 %**
281	253	142	267	202	(59)	406	393	148	165	123	75	
459	504	252	431	591	(403)	337	551	64	273	222	73	
6,674	3,889	3,388	3,172	2,774	2,181	2,641	2,296	1,705	1,657	1,382	1,159	**13 %**
477.16	403.85	352.10	326.36	282.55	222.20	265.26	229.78	174.04	168.22	140.38	117.89	**11 %**
17 %	9 %	9 %	13 %	11 %	10 %	18 %	16 %	11 %	20 %	13 %	13 %	
580.35	433.42	414.67	378.13	340.00	299.00	491.10	480.10	317.05	364.00	253.51	205.50	**10 %**
14 %	(2)%	(3)%	4 %	(1)%	3 %	19 %	22 %	12 %	19 %	7 %	6 %	

We believe that longer time frames provide a better perspective and data than any one year.

Any given year contains volatility that makes it hard to distinguish skill from luck (both good and bad).

By measuring things five years at a time, as we do for things like our incentive compensation plans for senior executives, the role of luck begins to fade. Five-year periods show more reliable data to make sound judgments.

Then we go one step further. We show you summary data from the last 21 years at the bottom of the first two pages of this letter.

We do this every year to provide you (and ourselves as managers) with a fulsome sense of the progress we are making over decades.

We think providing and emphasizing a multi-decade review is uncommon (and important). We believe that a long-term time horizon matches up with our long-term goal of building one of the world's great companies. A 21-year scorecard gives a far more comprehensive understanding than any one year's results. We never forget, though, that the 21-year scorecard gets constructed one year (and one day) at a time by our daily actions.

As to the single year 2022, we believe as Frank Sinatra sang, "It was a very good year."

When you take a first look at the numbers, it may not jump off the page that way. So here is some more detail as to why we describe ourselves as happy with the results, and with what we accomplished, in 2022.

To start, on the top line we reported "total revenues" of $11.7 billion in 2022 compared to $12.8 billion in 2021. A decline of 9%.

Wait…what?

We're "happy" with this result?

How can that be?

Well, let's talk about what "total revenues" means. As Inigo Montoya said in the movie *The Princess Bride*, "You might want to pick a different word because I don't think that one means what you think it does." GAAP accounting defines the term "total revenues" in such a way that we have to use that word, but "I don't think it means what you think it does."

"Total revenues" include two distinct types of "revenues." One type is the normal recurring revenues from each of our three engines of Insurance, Markel Ventures, and Investments. Our insurance premiums and fee income streams are revenues, sales of the products and services in Markel Ventures are revenues, and interest and dividend income from our investment portfolio are all revenues. That all makes sense to me. We also have some non-recurring revenues in our three engines, like the gains from the sale of our managing general agent businesses this year. For the purposes of this discussion, let's call all of those "orange revenues."

The other component of "revenues", according to GAAP, is the unrealized changes in the value of our equity portfolio. When stock markets decline, as they did in 2022, we report negative revenues from our equity holdings even if we didn't sell anything. Changes in the market price of equities, positive or negative, flow through the line of "total revenues." Let's call those "blue revenues."

I completely agree that we should report on our investment returns, but this strikes me as a curious way to describe them in our financial statements.

To me, it's like talking about chocolate milk and motor oil. Both are fine substances. They both play critical roles in my life. They can both be measured in terms of fluid ounces. That said, I've never combined the two into one composite measurement.

"Total revenues" at a company with financial and non-financial businesses like Markel must combine these two disparate streams into one container labeled "total revenues" as mandated by GAAP accounting.

I would neither drink the contents of that container nor put it in my car's engine. Therefore, I think it's important to break things down into their separate components to help provide greater understanding.

Our "orange revenues" increased 21% to $13.2 billion in 2022 from $10.9 billion in 2021. That is an excellent result. It reflects the superb accomplishments of our associates from all around the world. That number describes how we served our customers with products and services that they needed and wanted. That's why we're happy and proud of what took place in 2022.

Our "blue revenues" swung to a negative $1.6 billion in 2022 compared to positive $1.9 billion in 2021. This is not surprising. Equity markets experienced their worst decline since the 2008 financial crisis,

causing our portfolio of publicly-traded stocks to decline in 2022.

In any given year, investment markets tend to be volatile. And, as is the custom, when we use the word volatile in the context of investment markets, we mean down. Sometimes investment markets go up a lot and nobody (including us) describes up years as "volatile" even though it seems like the same word should apply.

That mathematical fact of lower public market prices at year-end 2022 compared to year-end 2021 causes the sum of "orange revenues" and "blue revenues" to show a decline in our GAAP "total revenues." That doesn't strike me as informative. Progress, in this case, doesn't look like progress when you look at it through the GAAP accounting lens.

I hope that by breaking apart the components, you can share my sense of optimism and pride as to what took place at Markel last year. "Orange revenues" rose 21% and are generally more recurring in nature. The annual volatility around that number should be less than "blue revenues."

"Blue revenues" will likely continue to be volatile, especially on an annual basis. Market prices tend to swing much more violently than the value of the underlying businesses they represent. As such, I think it is important to understand both the accounting presentation and what it means. "Blue revenues" start to make sense, and get the direction of things right, arguably only over multi-year time horizons. It takes multiple years to make reasonable judgments about our investments. Over the last five years, we earned an annual return on our equity portfolio of 9.5% and over the last ten years, we earned an annual return of 13.2%.

Insurance Engine

Our Insurance engine, which generates nothing but orange revenues, reported earned premiums of $7.6 billion in 2022, up 17% from $6.5 billion in 2021. We also reported underwriting profits of $627 million, compared to $628 million in 2021. Cumulatively over both years, we earned $1.3 billion in underwriting profit. That amount stands at approximately 4x the $315 million we generated in the *four years* from 2017-2020.

2022 marked another excellent result and positive momentum in our Insurance engine and we are proud of these results.

The 2022 results of both dramatic topline growth, and excellent profitability, should be celebrated. Fortunately, top line growth and bottom line profitability describe our long-term accomplishments. You can see evidence of this in the five-year and 21-year data included in this report.

Our insurance-linked securities (Nephila) and fronting (State National's Program Services) revenues grew to $485 million in 2022 compared to $328 million in 2021 and our operating income from these operations grew to $193 million from $62 million in 2021.

We've written extensively about our ILS and Program Services operations in previous years and we're glad to be able to report progress this year. State National continues to go from strength to strength and reached new peaks of revenues and operating income in 2022. Our Nephila ILS operation also made meaningful progress in 2022.

Nephila continued to adjust (i.e. raise) prices for property catastrophe reinsurance products. The ongoing level of higher natural catastrophes experienced over the last several years suggest a new normal level of annual catastrophe losses should be expected. Both the capital providers to Nephila, and those seeking to cover the risks, continue to adapt to this new reality.

Changes in climate, along with more affluence over time, have combined to create a situation where more economic activity takes place next to a nice view of the water. As a society, we are all engaged in figuring out how to balance out the various forces involved in such a circumstance.

The team at Nephila continues to do an excellent job of providing the world with real time data through pricing that helps everyone to know the true costs involved in decisions regarding where to live, conduct economic activities, and set governmental policies around these topics.

We are also excited about how the team at Nephila continues to be at the leading edge of creating and providing tools to manage a wider array of risks. In many cases, the work of Nephila helps to address the issues of climate change and the resulting, ongoing, tectonic shifts in energy markets.

For instance, the development of new forms of renewable energy requires providers to commit capital amidst uncertain output and price factors. At the same time, energy users seek certainty in supplies and pricing as they adapt to changes in the sources and uses of energy.

Just as grain processors and farmers have long relied on financial markets to match up uncertainty and volatility to protect and proceed with their operations, the team at Nephila continues to create financial tools to manage uncertainty in ways that can provide protection to people who need it.

We wish we had better and more immediate profits to tell you about from our ILS activities. The learning curve of ILS involved some big and painful bumps along the way. That said, we remain confident that tackling these problems will prove fruitful.

The long-term rewards from these activities could be substantial. These efforts stand as one of the many ways in which we continue to work to "future proof" Markel.

Stay tuned…we'll keep you posted.

In the meantime, we did realize a gain of $226 million from the sale of two managing general agency operations within Nephila in 2022. The proceeds from these sales effectively lower our invested capital in ILS, and provide some validation of our efforts. These two businesses were incubated within Nephila in a modest amount of time and we sold them for attractive gains when we concluded that they were no longer best suited as part of Markel.

We also reduced the carrying value of our investment in Nephila by writing off goodwill of $80 million as part of our normal review of goodwill balances on the balance sheet.

The combination of recapturing some of the capital via the sales and reducing the carrying value via the goodwill write-off should improve our reported returns in 2023 and beyond.

Markel Ventures Engine

Markel Ventures earned record operating revenues of $4.8 billion in 2022, all of which were orange revenues, compared to $3.6 billion in 2021, an increase of 31%. We reported record EBITDA of $506 million in 2022 compared to $403 million in 2021, an increase of 26%.

2022 stands out as a spectacular year for Markel Ventures. First, the record numbers speak for themselves. More importantly, those records took place against a backdrop of continuing and unrelenting labor and material supply chain challenges, and a myriad of ongoing inflation pressures.

It is not easy to raise prices. Our culture compels us to approach our customers with an attitude of service. Our mindset of service makes us reluctant to charge new, higher prices, rather than send a bill with the same price as last time.

That said, even after we work to become more efficient, the costs of doing business continue to increase. Taxes and regulations continue to increase. What we pay our associates continues to increase. The costs of shipping and transportation continue to increase. Everything costs more.

As such, we focus on providing our products and services as efficiently as possible. We also selectively raise prices, where appropriate, to cover our higher costs, and to serve our customers with what they need and want. The managers of the Markel Ventures businesses did a superb job balancing the need to raise prices and strengthening long-term relationships with our customers at the same time. In the aggregate, the management teams of the diversified portfolio of Markel Ventures companies delivered outstanding results.

Despite the record aggregate results in 2022, which included strong overall organic growth, some of our companies experienced a difficult year. Ever since we started the Markel Ventures operations in 2005, we've experienced cyclical ups and downs and specific challenges at different businesses in any given year. This is nothing new.

We continue to respond to every challenge in the same way. We do our best to take realistic looks at each circumstance, and then make rational decisions about what to do next. We also do so while remaining focused on the long-term. We take no short cuts, and we pursue no quick fixes.

We constantly ask ourselves the question, "If this were the only business we or our family was ever going to own, what would we do?"

We try to answer that question to the best of our ability and then we proceed to do just that.

The net result of our Markel Ventures leaders asking this question in some form every day is what you see – record results again in 2022.

We remain optimistic about the long-term contributions from our Markel Ventures operations. These businesses reinforce our culture and provide resiliency, diversification, and cash flow to Markel. We're all better off with each of them as part of the system.

Investment Engine

In our investment operations, we earned record recurring interest and dividend "orange revenues" of $447 million in 2022 compared to $367 million a year ago.

The total return of our equity portfolio was (16.0)% compared to the S&P 500 return of (18.1)%[1] and the NASDAQ Composite return of (32.5)%[2]. Our fixed income portfolio produced a total return of (5.8)% compared to the Bloomberg Aggregate of (13.0)%[3] and the total portfolio produced a total return of (9.5)% for the year.

Negative investment returns are never fun to report.

Despite the negative absolute returns of 2022, I take comfort in several facts about our Investment engine. First, these results took place while following the same time-tested discipline that we've followed for decades. In our fixed income operations, we own a portfolio of the highest credit quality bonds to match against the future claims we expect to pay to our insurance policyholders. We also match the duration and currencies of our fixed income portfolio to our expectation of when we will pay claims.

The job of the fixed income operations is to make sure that when claims come due, we've got the cash and liquidity of maturing bonds to pay them. We continue to execute that strategy without a hitch. Also, as interest rates continue to rise, our recurring interest income continues to grow.

In our equity operations, we continued to follow our four-part, time-tested, discipline. As you will find in this annual letter for decades, those four parts are to invest in profitable businesses with: one, good returns on capital and not too much debt; two, that are run by managers with equal measures of talent and integrity; three, with reinvestment opportunities and/or capital discipline, and; four, at reasonable valuations.

That catechism continues to guide every equity investment decision we make. We have outperformed the S&P 500 results for over three decades, as well as in 2022. Those results speak for themselves.

Another nuanced, but extremely powerful and important, aspect of why we are pleased with the Investment engine results in 2022 is that given the profitability of our Insurance underwriting operations, our Markel Ventures operations, our growing interest and dividend income, and our strong capital position, we were able to continue to invest regularly throughout 2022. As overall equity prices fell during 2022, we put money to work throughout the year at more and more attractive prices (and future expected returns).

A declining market may not be fun while you're in the middle of it, but as the great investor Shelby Cullom Davis once said, "You make most of your money in a bear market, you just don't realize it at the time."

Every time we bought shares in companies that met that four-part test, and every time we paid a lower price for the next batch, we increased the future earning power and value of Markel. It may not be obvious in this year's financial reports, but we believe it should become obvious over time.

Five-year view

When you lengthen time horizons, accounting nuances tend to fade away. The five-year buckets of information give you a more robust, and directionally correct, way of analyzing how things are going for your company:

(dollars in millions, except per share data)	2018 - 2022	2013 - 2017	2008 - 2012
Total revenues	$ 50,623	$ 26,501	$ 11,901
Earned premiums	$ 29,465	$ 19,011	$ 9,695
Underwriting profits	$ 1,777	$ 821	$ 184
ILS and Program Services revenues	$ 1,661	$ 44	N/A
ILS and Program Services operating income (loss)	$ 104	$ (28)	N/A
Markel Ventures revenues	$ 15,168	$ 5,124	$ 1,136
Markel Ventures EBITDA	$ 1,710	$ 623	$ 133
Net investment income	$ 2,067	$ 1,753	$ 1,353
Comprehensive income to shareholders	$ 3,679	$ 3,470	$ 1,375
Closing stock price per share, at end of period	$1,317.49	$1,139.13	$ 433.42

In the single year of 2022, we earned $627 million of underwriting profits. That is 35% of what we earned in underwriting profits in the last five years. As we've discussed in previous years, between the heightened levels of natural catastrophes, the COVID shock losses, and some less than perfect execution

[1] *S&P Dow Jones Indices S&P 500 Equity Factsheet* - S&P Global (*January 31, 2023*)
[2] *US Markets 2022 Review and Outlook* - Nasdaq Market Intelligence Team (*January 3, 2023*)
[3] *Bloomberg U.S. Aggregate bond index total return* - WSJ (*January 2, 2023*)

navigating soft insurance markets, we did not always earn what we would consider appropriate underwriting profits relative to the risk insured and capital deployed.

We worked hard to correct that. Where the causes were internal, and in our control, we addressed them. We changed our mix of business by reducing exposures to natural catastrophe risks. We improved our expense ratio, and we grew our business with discipline.

As an example, the turnaround in profitability of our Reinsurance operations provides vivid and tangible evidence of improvement. In Reinsurance, we improved the segment combined ratio year-over-year to 92% in 2022 from 105% in 2021. We are extremely pleased to be able to report these developments to you.

Insurance accounting inherently contains appropriate and necessary time lags between the time we write a policy and when the earnings show up. Our confidence has grown over time that our Insurance engine results were improving dramatically. Now those improvements are coming through in our results. Yay!

We also remain optimistic that the ongoing trends of growth and profitability you see in this five-year table will continue to move up and to the right over time.

You can fundamentally track our progress over these five-year intervals by simply following the cash.

When we make profits, we allocate that cash across a 360-degree range of options. First, we invest in our current, known and profitable businesses. Second, we invest in publicly-traded equities. Third, we use the cash to buy additional Insurance or Markel Ventures businesses. Fourth, we repurchase our own shares. In some years, like this one, we do all four.

So, how is this all working out?

One part of the assessment is extremely straightforward. If you assume that we will continue to be profitable in our insurance operations, and we do not shrink, the *total* value of the investment portfolio accrues to the shareholders.

The earnings from our investment portfolio are like fruit from a fruit tree.

If you were valuing a fruit tree, the value is the present value of the fruit the tree will produce over time. Same thing with our investment portfolio.

As such, we simply take the total value of our investment portfolio and subtract out all debt, to get an indication of the value of the balance sheet part of Markel.

Another important part of estimating an indication of the value of Markel stems from the *earnings* power of our Insurance and Markel Ventures operations. We take the normal, annualized earnings from those operations and multiply that by a consistent and reasonable multiple year-by-year. That process provides an indication of the total value of Markel's income statement.

Then we add those two parts together to determine our own sense of what each share of Markel is worth.

We track that number every year. Since our initial public offering in 1986, that number correlates to the actual price of Markel stock over time. Sometimes the gap between the two lines is wider, sometimes it is narrower. Over time, both lines head in the same direction.

This is the technique and guidepost we use internally to judge our financial progress.

Others may use different techniques and come to different answers, but this is what we do.

Richie Whitt

As I close this portion of the Annual Report, I want to thank Richie Whitt. Richie retired at the end of 2022 after more than 30 years at Markel.

Richie first came to us as an auditor in the late 1980s. Using the eighties as a starting point through 2022, that means he's been connected to Markel for FIVE DECADES! He's been a critical component of the fantastic growth that we've experienced over that time.

Richie always put the interest of Markel first. He always made decisions while thinking about others. He always tackled every challenge and every circumstance with the thought of, "What would be best for Markel over the long term?" He has dedicated almost his entire adult life to making your Company better, and he has fully embodied the Markel Style each step of the way.

I could ask no more of any human being and I hope you will join me in thanking Richie for his accomplishments and contributions. We couldn't have done it without him.

Additionally, Richie did what all great leaders do. He helped to build and develop a team that will carry on the work of Markel.

Jeremy Noble now runs our Insurance engine as President, Insurance. Jeremy came to Markel more than 20 years ago and he has been an integral part of creating our Insurance engine results for many years.

During 2022 Mike Heaton also moved into the role of Executive Vice President of Markel Corporation. In that role he oversees the day-to-day operations of the Markel Corporation holding company. Mike worked side-by-side with me for the last 15 years building up our Markel Ventures engine and continues to be a trusted and valuable partner to me.

Andrew Crowley now serves as President of Markel Ventures. Andrew, along with Mike, has been part of the Markel Ventures team since our early days. Andrew and his team continue to produce record results. They put people first and continue to build up Markel Ventures.

Thank you, Richie. We will all work to make you proud.

2023 and Beyond

I hope you share our sense of optimism as you review our past performance.

But as is always the case, the past is past. Now it's onto the future.

We don't forecast future economic conditions or geopolitical circumstances. We continue to struggle with the effects of inflation, challenging economic circumstances, currency fluctuations, wars, and generational shifts in workplace dynamics. We do not have any idea what will transpire in those important dimensions.

We never try to forecast these things; and yet, the Markel culture of win-win-win, and our integrated three-engine system, continues to produce good results.

We focus on what we can control and do. We do our best to prepare ourselves to survive and persist no matter what comes our way.

Over decades, we've lived and grown despite bouts of inflation, deflation, dollar strength, dollar weakness, wars, energy shocks, political shocks, labor shortages, natural catastrophes and more.

External shocks and challenges like these will never stop coming.

I believe our results over time should give you some comfort that we created a well-designed system that can handle and thrive despite ongoing unpredictable factors.

How we remain resilient, durable, and growing, stems from our integrated architectural design of the three-engine system. Our combination of Insurance, Markel Ventures, and Investments work together to support and reinforce each other continuously.

For example, all three engines benefit from the excess cash that each generates. The cash flows to the holding company where we allocate it across our 360-degree view of options, using our four-part catechism. We can lean into and pursue any rational opportunity we find. Our system and broad range of operations, in and of itself, exposes us to a never-ending array of opportunities. The system should continue to do so.

When business operators think about a forever-home for their cherished business, Markel Ventures should spring to mind. Markel Ventures benefits from the financial strength and marketplace presence of the overall Markel Corporation.

Also, the recurring, reliable nature of our cash flow streams – and their lack of dependence on capital markets' fundraising cycles – allow us to continually deploy capital. This should prove to be a major advantage over the course of a normal economic/ market cycle.

Finally, with our system, we benefit from our daily exposure to business conditions and opportunities everywhere in the world of Markel. We don't need to rely on any one business to keep us moving forward. We can absorb volatility and uncertainty more than most organizations. We've got the opportunity to turn challenging short-term conditions into opportunities. And so on and so on.

This entire system, of the engines working together, creates a virtual feedback loop that continuously refreshes and strengthens the whole in ways that any one of the engines could not do alone.

A rope with three interwoven strands is stronger than a single strand rope of the same size. That's what we've got at Markel.

And with each passing year, the beat goes on.

Conclusion

If Markel was an athlete, I hope you would think of us as something like Cal Ripken Jr. or Bill Russell.

Ripken set the record of 2,632 consecutive games played in major league baseball. That surpassed the record of 2,130 games, a record held by Lou Gehrig for 56 years. Only five other players have streaks of over 1,000 games. Every other streak is in the *hundreds*. This consecutive game streak earned Ripken his nickname of "The Iron Man."

Imagine how many people have played baseball over the last century. The scale and context of this record is stunning and will probably endure.

Ripken also was a two-time gold glove fielder, had 3,184 hits, 1,647 runs, 1,695 RBI's, 431 home runs, 1,129 walks, 8,212 assists, and 1,682 double plays. His name is on the list of every one of those baseball records. He clearly earned his first ballot selection into the Hall of Fame.

All those accomplishments get blended into the consecutive game streak though. That is what Ripken is most known for, and it might appropriately stand atop all of his accomplishments.

By showing up every day, Ripken multiplied the force of each of those other accomplishments. He would never have achieved 3,184 hits and all the other feats without being in the lineup every day.

His unrelenting presence, day after day, year after year, created the ability of his teammates to depend on him. His team knew that they could count on him. The sense of dependability he provided to his team can't be measured. The greatness of his baseball career can be described by his numbers, but the numbers tell only part of the story. I don't know how to quantify the team dynamics he created but they seem evident just the same.

Like Ripken, Bill Russell also owns quantifiable accomplishments that speak loudly to his ability.

The Celtics won the World Championship in 11 of his 13 years with the team. He was the NBA's Most Valuable Player five times. The numbers tell only part of the story. Russell, along with his coach and general manager Red Auerbach, knew that there was an unquantifiable piece involved in Russell's value to the Celtics.

Simply put, Russell was not the most prolific scorer, nor dominant in offensive statistics that are easily measured.

Russell's primary contribution was on the defensive side of the ball where it's harder to capture his value in numbers. What is clear is that when Russell was on the floor, the Celtics won. His contributions of things like energy, drive, and the will to win defy quantification. I hope you would agree that they are nonetheless real.

Russell's fierce determination and will to win powered his team far beyond what numbers could capture.

We see the power of the Markel Style in similar terms.

I hope that as you continue to think of Markel, and our dream of building one of the world's great companies, you might think about the careers and contributions of people like Ripken and Russell.

We are a group of more than 20,000 Ripkens and Russells who work every day to do our best to serve our customers, our colleagues, and our shareholders. The streak keeps going, and the numbers keep adding up. They're quantifiable and fun to report, but they don't tell the whole story. "The map is not the territory."

Can the magic and difference-making ability of the "Iron Man," or the feats of Bill Russell be captured entirely in a stat line? What is clear is this - people come first at Markel. Fantastic things happen when people come together, persist towards a common goal guided by a set of shared, timeless values. I thank you for the honor and privilege of serving as your Chief Executive Officer and leading this amazing team of Ripkens and Russells.

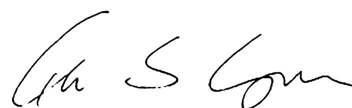
We hope to see you in person at our annual meeting in Richmond this year on May 17, 2023. We'll be at the Robins Center at the University of Richmond. Our annual meeting is a great opportunity to connect with the management team at Markel and one another.

We find that the spontaneous conversations and thoughtful questions you ask help us to be better managers at Markel. We would love to see you there. You can register and find more information about the event at www.markelshareholdersmeeting.com.

We're on an exhilarating and fun journey.

We can't do it without you and…We're all suited up and ready to go.

Your teammate,



Thomas S. Gayner, *Chief Executive Officer*

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

Commission File Number 001-15811

MARKEL CORPORATION

(Exact name of registrant as specified in its charter)

A Virginia Corporation
IRS Employer Identification No. 54-1959284

4521 Highwoods Parkway, Glen Allen, Virginia 23060-6148
(Address of principal executive offices) (Zip code)

Registrant's telephone number, including area code: (804) 747-0136

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

Title of each class	Trading Symbol(s)	Name of exchange on which registered
Common Stock, no par value	MKL	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. ☒

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

The aggregate market value of the shares of the registrant's Common Stock held by non-affiliates as of June 30, 2022 was approximately $17,203,000,000.

The number of shares of the registrant's Common Stock outstanding at February 1, 2023: 13,408,610.

Documents Incorporated By Reference: The portions of the registrant's Proxy Statement for the Annual Meeting of Shareholders scheduled to be held on May 17, 2023, referred to in Part III.

Markel Corporation
Form 10-K
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PART I

Item 1. BUSINESS

Markel Corporation is a diverse financial holding company serving a variety of niche markets. We aspire to build one of the world's great companies and deploy three financial engines in pursuit of this goal.

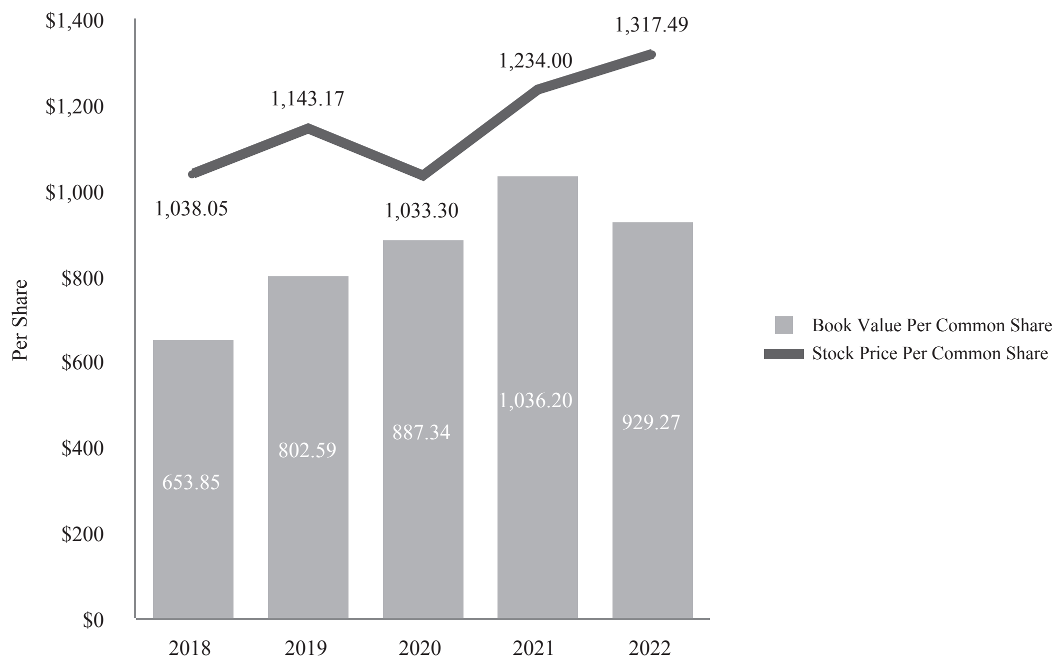
Insurance - Our principal business markets and underwrites specialty insurance products using multiple platforms that enable us to best match risk and capital.

Investments - Our investing activities are primarily related to our underwriting operations. The majority of our investable assets come from premiums paid by policyholders and the remainder is comprised of shareholder funds.

Markel Ventures - Through our Markel Ventures operations, we own controlling interests in a diverse portfolio of businesses that operate in a variety of industries.

Our financial goals are to earn consistent underwriting and operating profits and superior investment returns to build shareholder value. We measure financial success by our ability to grow book value per common share and the market price per common share of our stock, or total shareholder return, at high rates of return over a long period of time. To mitigate effects of short-term volatility and align with the longer-term perspective we apply to operating our businesses, we generally use five-year time periods to measure our performance. Growth in book value per common share is an important measure of our success because it includes all underwriting, operating and investing results. Over the past five years, the compound annual growth in book value per common share was 6%. Growth in total shareholder value is also an important measure of our success, as a significant portion of our operations are not recorded at fair value or otherwise captured in book value. Over the past five years, our common share price increased at a compound annual rate of 3%. While these measures, considered independently of other factors, fall below our internal targets, we remain confident in the strong operating performance of our businesses.

The following graph presents book value per common share and stock price per common share for the past five years as of December 31.



The following table presents summary financial data over the last five years, including book value per common share, market price per common share and other important financial measures and metrics.

(dollars in millions, except per share data)	**2022**	2021	2020	2019	2018	**5-Year CAGR [1]**
Results of Operations						
Earned premiums	**$ 7,588**	$ 6,503	$ 5,612	$ 5,050	$ 4,712	**12 %**
Net investment income	**447**	367	376	442	435	**3 %**
Net investment gains (losses)	**(1,596)**	1,979	618	1,602	(438)	
Markel Ventures operating revenues	**4,758**	3,644	2,795	2,055	1,915	**29 %**
Total operating revenues	**11,675**	12,846	9,735	9,526	6,841	**14 %**
Net income (loss) to common shareholders	**(250)**	2,389	798	1,790	(128)	
Comprehensive income (loss) to shareholders	**(1,309)**	2,078	1,192	2,094	(376)	
Diluted net income (loss) per common share	**$ (23.57)**	$ 176.51	$ 55.63	$ 129.07	$ (9.55)	
Financial Position						
Total investments, cash and cash equivalents and restricted cash and cash equivalents (invested assets)	**$ 27,420**	$ 28,292	$ 24,927	$ 22,258	$ 19,238	**6 %**
Total assets	**49,791**	48,477	41,738	37,474	33,306	**9 %**
Unpaid losses and loss adjustment expenses	**20,948**	18,179	16,222	14,729	14,276	**9 %**
Shareholders' equity	**$ 13,066**	$ 14,717	$ 12,822	$ 11,071	$ 9,081	**7 %**
Common shares outstanding (at year end, in thousands)	**13,423**	13,632	13,783	13,794	13,888	
Consolidated Performance Measures						
Book value per common share	**$ 929.27**	$1,036.20	$ 887.34	$ 802.59	$ 653.85	**6 %**
5-Year CAGR in book value per common share [1]	**6 %**	11 %	10 %	8 %	7 %	
Closing stock price	**$1,317.49**	$1,234.00	$1,033.30	$1,143.17	$1,038.05	**3 %**
5-Year CAGR in closing stock price [1]	**3 %**	6 %	3 %	11 %	12 %	

(1) CAGR—compound annual growth rate.

Insurance

Our insurance engine is comprised of the following types of operations:

- Underwriting - Our underwriting operations are comprised of our risk-bearing insurance and reinsurance operations.
- Insurance-linked securities - Our insurance-linked securities (ILS) operations provide investment management services for a variety of investment products, including insurance-linked securities, catastrophe bonds, insurance swaps and weather derivatives.
- Program services - Our program services business serves as a fronting platform that provides other insurance entities access to the United States (U.S.) property and casualty insurance market.

Through our underwriting, ILS and program services operations, we have a suite of capabilities through which we can access capital to support our customers' risks, which includes our own capital through our underwriting operations, as well as third-party capital through our ILS and program services operations. Within each of these insurance platforms, we believe that our specialty product focus and niche market strategy enable us to develop expertise and specialized market knowledge. We seek to differentiate ourselves from competitors by our expertise, service, continuity and other value-based considerations, including the multiple platforms through which we can manage risk and deploy capital. For example, through our program services platform, we have programs through which we write insurance policies on behalf of our ILS operations that are supported by third-party capital. Additionally, we cede certain risks written through our underwriting operations to our ILS operations to the extent those risks are more aligned with the risk profile of our ILS investors than our own corporate tolerance. Our ability to access multiple insurance platforms allows us to achieve income streams from our insurance operations beyond the traditional underwriting model. We believe this multi-platform approach provides us with a unique

advantage through which we have the ability to unlock additional value for our customers and business partners, which we refer to as "the power of the platform."

Underwriting

Specialty Insurance and Reinsurance

Within our underwriting operations, we underwrite specialty insurance products on a risk-bearing basis. The specialty insurance market differs significantly from the standard market. In the standard market, insurance rates and forms are highly regulated, products and coverages are largely uniform with relatively predictable exposures and companies tend to compete for customers on the basis of price. In contrast, the specialty market provides coverage for hard-to-place risks that generally do not fit the underwriting criteria of standard carriers.

Competition in the specialty insurance market tends to focus less on price than in the standard insurance market and more on other value-based considerations, such as availability, service and expertise. While specialty market exposures may have higher perceived insurance risks than their standard market counterparts, we seek to manage these risks and achieve higher financial returns. To reach our financial and operational goals, we must have extensive knowledge and expertise in our chosen markets. Many of our larger accounts are considered on an individual basis where customized forms and tailored solutions are employed.

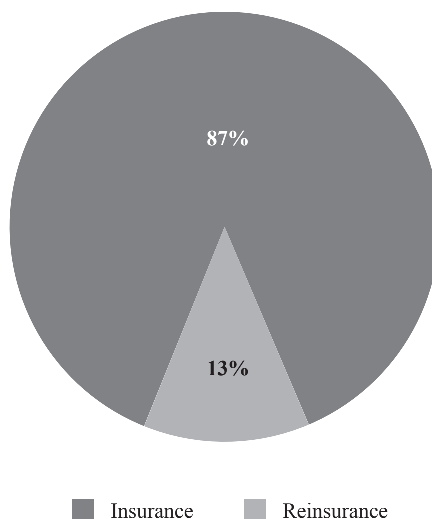
By focusing on the distinctive risk characteristics of our insureds, we have been able to identify a variety of niche markets where we can add value with our specialty product offerings and alternative platforms through which we can access capital to support our customers' risks. Examples of niche insurance markets that we have targeted include liability coverage for highly specialized professionals, wind and earthquake-exposed commercial properties, equine-related risks, transaction-related risks, classic cars, credit and surety-related risks, collateral protection risks and marine, energy and environmental-related activities. Our market strategy in each of these areas of specialization is tailored to the unique nature of the loss exposure, coverage and services required by insureds. In each of our niche markets, we assign teams of experienced underwriters and claims specialists who provide a full range of insurance services.

We also participate in the reinsurance market in certain classes of reinsurance product offerings, primarily casualty lines and certain other specialty lines. In the reinsurance market, our clients are other insurance companies, or cedents. We typically write our reinsurance products in the form of treaty reinsurance contracts, which are contractual arrangements that provide for automatic reinsuring of a type or category of risk underwritten by cedents. Generally, we participate in reinsurance treaties with a number of other reinsurers, each with an allocated portion of the treaty, with the terms and conditions of the treaty being substantially the same for each participating reinsurer. With treaty reinsurance contracts, we do not separately evaluate each of the individual risks assumed under the contracts and are largely dependent on the individual underwriting decisions made by the cedent. Accordingly, we review and analyze the cedent's risk management and underwriting practices in deciding whether to provide treaty reinsurance and in pricing of treaty reinsurance contracts.

Our reinsurance products are written globally on both a quota share and excess of loss basis. Quota share contracts require us to share the losses and expenses in an agreed proportion with the cedent. Excess of loss contracts require us to indemnify the cedent against all or a specified portion of losses and expenses in excess of a specified dollar or percentage amount. Our reinsurance products may include features such as contractual provisions that require our cedent to share in a portion of losses resulting from ceded risks, may require payment of additional premium amounts or provide experience refunds if the losses we incur differ from those projected at the time of the execution of the contract or may require a reinstatement premium to restore coverage after there has been a loss occurrence.

We distinguish ourselves in the reinsurance market by the expertise of our underwriting teams, our access to global reinsurance markets, our ability to offer large capacity lines and our ability to customize reinsurance solutions to fit our cedents' needs. Additionally, as with our insurance underwriting operations, our ability to access third-party capital through our ILS and program services platforms provides additional capital alternatives to support certain risks, to the extent those risks do not align with our underwriting risk tolerance. For example, we do not write property reinsurance business, including catastrophe-exposed property business, on a risk-bearing basis. Such business is only written on behalf of our ILS operations, to the extent it matches the risk profile of our third-party ILS investors, who provide the capital to support the risk. See "Program Services and Other Fronting" for further discussion of business written on behalf of our ILS operations.

The following chart presents the composition of our underwriting operations between insurance and reinsurance based on 2022 gross premium volume of $9.8 billion, which also aligns with our two reportable underwriting segments.



The Insurance segment includes all of our direct business and facultative placements and is written through our Markel Specialty, Markel International and State National divisions, with the exception of our State National division's program services business, which is not included in a reportable segment. The Reinsurance segment includes all treaty reinsurance and is primarily written through our Global Reinsurance division. Additional detail regarding our underwriting divisions and products is included in "Underwriting Segments."

The following table summarizes our U.S. insurance and reinsurance underwriting subsidiaries.

U.S. Legal Entity	Abbreviation	State of Domicile
Essentia Insurance Company	Essentia	Missouri
Evanston Insurance Company	EIC	Illinois
FirstComp Insurance Company	FCIC	Nebraska
Markel American Insurance Company	MAIC	Virginia
Markel Global Reinsurance Company	MGRC	Delaware
Markel Insurance Company	MIC	Illinois
National Specialty Insurance Company	NSIC	Texas
State National Insurance Company, Inc.	SNIC	Texas
SureTec Insurance Company	SIC	Texas

Through these U.S. insurance and reinsurance subsidiaries, we are licensed, authorized, or accredited to write business in all 50 states and the District of Columbia.

The following table summarizes our international insurance and reinsurance underwriting subsidiaries.

International Legal Entity	Abbreviation	Country
Markel Bermuda Limited	MBL	Bermuda
Markel Insurance SE	MISE	Germany
Markel International Insurance Company Limited	MIICL	United Kingdom
Markel Syndicate 3000	Syndicate 3000	United Kingdom

Markets and Distribution

Our underwriting operations write business on a global basis and utilize multiple distribution channels to access our targeted risks.

In the U.S., we write business in the excess and surplus lines (E&S) and admitted insurance markets, as well as the reinsurance market. The primary distribution channels through which our U.S. business is placed are wholesale insurance and reinsurance brokers, retail insurance agents and alternative channels that include third-party managing general agents.

The E&S, or non-admitted, market focuses on hard-to-place risks and loss exposures that generally are not written in the standard market. U.S. insurance regulations generally require an E&S account to be declined by admitted carriers before an E&S company may write the business. E&S eligibility allows our insurance subsidiaries to underwrite unique loss exposures with more flexible policy forms and unregulated premium rates. This typically results in coverages that are more restrictive and more expensive than coverages in the standard market. The E&S market is accessed primarily through wholesale insurance and reinsurance brokers, which have limited quoting and binding authority. In 2021, the E&S market represented $83 billion, or 10%, of the $798 billion U.S. property and casualty industry.[1] In 2021, we were the third largest E&S writer in the U.S. as measured by direct premium writings.[1] Our E&S insurance operations are conducted through EIC.

Our U.S. business written in the admitted market focuses on unique and hard-to-place risks in the standard market, some of which must remain with an admitted insurance company for marketing and regulatory reasons. Hard-to-place risks written in the admitted market cover insureds engaged in similar, but highly specialized, activities that require a total insurance program not otherwise available from standard insurers or insurance products that are overlooked by large admitted carriers. The admitted market is subject to more state regulation than the E&S market, particularly with regard to rate and form filing requirements, restrictions on the ability to exit lines of business, premium tax payments and membership in various state associations, such as state guaranty funds and assigned risk plans. Business written in the admitted market is placed primarily by retail insurance agents. We are looking for opportunities to expand our business placed through retail insurance agents in order to capture additional business in the admitted market that fits our risk profile. Our admitted business is also placed through managing general agents, which have broader underwriting authority than retail agents. These agents are carefully selected based on a track record of proficiency with their selected products, and the business written is controlled through regular audits and pre-approvals. In addition, certain products and programs written on an admitted basis are marketed directly to consumers. The majority of our admitted insurance operations are conducted through MIC, MAIC, FCIC and Essentia. Our admitted operations also include SIC, SNIC and NSIC.

Our U.S. reinsurance operations are conducted through MGRC. Reinsurance business is placed primarily through wholesale reinsurance brokers. We were the 41st largest reinsurer in 2021 as measured by worldwide gross reinsurance premium writings.[2]

We also participate in the London insurance and reinsurance market, which is known for its ability to provide innovative, tailored coverage and capacity for unique and hard-to-place risks. Hard-to-place risks in the London market are generally distinguishable from standard risks due to the complexity or significant size of the risk. It is primarily a broker market, which means that insurance brokers bring most of the business to the market. Risks written in this market are written on either a direct basis or a subscription basis, the latter of which means that loss exposures brought into the market are typically insured by more than one insurance company or Lloyd's of London (Lloyd's) syndicate, often due to the high limits of insurance coverage required. When we write business in the subscription market, we prefer to participate as lead underwriter in order to control underwriting terms, policy conditions and claims handling. We participate in the London insurance and reinsurance market primarily through Markel Capital Limited (Markel Capital) and MIICL. Markel Capital is the corporate capital provider for Syndicate 3000, through which our Lloyd's operations are conducted. Syndicate 3000 is managed by Markel Syndicate Management Limited. In addition to their headquarters in London, Markel Capital and MIICL have offices across the United Kingdom (U.K.), Europe, Canada, Asia and the Middle East through which we are able to offer insurance and reinsurance. The London insurance market produced approximately $94 billion of gross written premium in 2021, of which $53 billion was produced by Lloyd's syndicates.[3,4] In 2021, our share of the London market was approximately 2% as measured by gross written premiums.

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[1] *Market Segment Report - U.S. Surplus Lines*, A.M. Best *(September 6, 2022)*

[2] *Market Segment Report - Global Reinsurance*, A.M. Best *(August 31, 2022)*

[3] *London Company Market Statistics Report*, International Underwriting Association *(September 2022)*

[4] *Lloyd's Annual Report 2021*

In Bermuda, which is known for its significant concentration of insurance and reinsurance businesses, we participate in the worldwide insurance and reinsurance markets. The Bermuda property and casualty market is a significant source of capital for the U.S. market and the leading location for cessions by U.S. insurers.[5] Business written in the Bermuda market is typically placed by a Bermuda-based wholesale broker. The Bermuda market produced $83 billion of gross written premium in 2020.[6] In 2020, our share of the Bermuda market was approximately 1% as measured by gross written premiums in our underwriting operations. We conduct our Bermuda underwriting operations through MBL, which is registered as a Class 4 insurer and Class C long-term insurer under the insurance laws of Bermuda.

In Europe, we also write business through Syndicate 3000 and MISE, a regulated insurance carrier located in Munich, Germany. From its offices in Germany, MISE transacts business in European Union (E.U.) member states and throughout the European Economic Area (EEA). MISE has established branches in Ireland, the Netherlands, Spain, Switzerland, France and the U.K. Syndicate 3000 supplements, or serves as an alternative to, MISE for access to the E.U. markets.

While we operate in various other markets, substantially all of our gross written premiums in 2022 were written from our platforms in the United States, United Kingdom, Bermuda and Germany. In 2022, 80% of gross premium writings from our global underwriting operations were attributed to risks or cedents located in the United States. In each of the markets in which we operate, we seek to develop and capitalize on relationships with insurance and reinsurance brokers, insurance and reinsurance companies, large global corporations and financial intermediaries to develop and underwrite business. A significant volume of premium for the property and casualty insurance and reinsurance industry is produced through a small number of large insurance and reinsurance brokers. In 2022, the top three independent brokers accounted for 28% of gross premiums written in our underwriting segments. Additionally, a significant portion of the reinsurance contracts securitized through our ILS operations, for the benefit of third-party investors, are placed through these three independent brokers.

Ceded Reinsurance

In a reinsurance transaction, an insurance company transfers, or cedes, all or part of its exposure in return for a premium. In a retrocessional reinsurance transaction, a reinsured exposure is further ceded to another reinsurer. Within our underwriting operations, we seek to retain as much of our profitable business as possible while managing volatility within our underwriting results. We purchase reinsurance and retrocessional reinsurance to manage our net retention on individual risks and overall exposure to losses, while providing us with the ability to offer policies with sufficient limits to meet policyholder needs. This includes purchasing sufficient coverage for our catastrophe-exposed policies to ensure that our net retained catastrophe risk is within our corporate tolerances. Our exposure to catastrophe risk has been significantly reduced over the past two years with the discontinuation of our retrocessional reinsurance business and the transition of our property reinsurance business from our underwriting operations to our Nephila ILS operations, where it is placed with third-party capital. See "Program Services and Other Fronting" for further discussion of this business. We continue to have exposure to property risks within our insurance operations.

For our professional liability and general liability lines of business within our insurance operations, we typically purchase excess of loss coverage. On product lines with property exposures, we purchase both excess of loss and proportionate coverages to reduce our exposure to large losses, including catastrophes. The structure of our reinsurance purchases may vary from year to year depending on the availability and cost of reinsurance, as determined by current market conditions. In such instances, we may in turn modify our gross premium writings in order to to manage our overall net loss exposures. Net retention of gross premium volume in our underwriting segments was 83% in 2022.

Reinsurance and retrocessional treaties are generally purchased on an annual basis and are subject to renegotiation at renewal. In most circumstances, the reinsurer remains responsible for all business produced before termination. Treaties typically contain provisions concerning ceding commissions, required reports to reinsurers, responsibility for taxes, arbitration in the event of a dispute and provisions that allow us to demand that a reinsurer post letters of credit or assets as security if a reinsurer becomes an unauthorized reinsurer under applicable regulations or if its rating falls below an acceptable level.

Our ceded reinsurance and retrocessional contracts do not legally discharge us from our primary liability for the full amount of the policies, and we will be required to pay the loss and bear collection risk if the reinsurer fails to meet its obligations under the reinsurance agreement. We attempt to minimize credit exposure to reinsurers through adherence to internal ceded reinsurance guidelines. We manage our exposures so that no unsecured exposure to any one reinsurer is material to our ongoing business.

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[5] *Offshore Reinsurance in the U.S. Market*, Reinsurance Association of America *(2020)*

[6] *Bermuda Monetary Authority 2021 Annual Report*

When appropriate, we pursue reinsurance commutations that involve the termination of ceded reinsurance and retrocessional reinsurance contracts. Our commutation strategy related to ceded reinsurance and retrocessional contracts is to reduce credit exposure and eliminate administrative expenses associated with the run-off of ceded reinsurance placed with certain reinsurers.

See note 12 of the notes to consolidated financial statements included under Item 8 and Item 7A Quantitative and Qualitative Disclosures About Market Risk for additional information about our ceded reinsurance programs and exposures.

Competition and Underwriting Philosophy

We compete with numerous domestic and international insurance companies and reinsurers, Lloyd's syndicates, risk retention groups, insurance buying groups, risk securitization programs, alternative capital sources, such as that provided through ILS, and alternative self-insurance mechanisms. We also compete with new companies that continue to be formed to enter the insurance and reinsurance markets, particularly companies with new or "disruptive" technologies or business models. Competition may take the form of lower prices, broader coverages, greater product flexibility, enhanced digital capabilities for distribution of insurance products, higher coverage limits, higher quality services or higher ratings by independent rating agencies. In all of our markets, we compete on the basis of overall financial strength, ratings assigned by independent rating agencies, development of specialty products to satisfy well-defined market needs and by maintaining relationships with agents, brokers and insureds who rely on our expertise. This expertise is our principal means of competing. We offer a diverse portfolio of products, each with its own distinct competitive environment, which requires us to be responsive to changes in market conditions for individual product lines. With each of our products, we seek to write business that produces consistent underwriting profits by competing with innovative ideas, appropriate pricing, expense control and quality service to policyholders, agents and brokers. We also leverage our underwriting capacity and expertise through relationships with start-ups and digital distribution partners through which we can develop ideas that leverage emerging technologies and modern customer acquisition strategies to create the service and experience that consumers have grown to expect and demand.

Few barriers exist to prevent insurers and reinsurers from entering our markets within the property and casualty industry. Market conditions, risk tolerance and capital capacity influence the degree of competition at any point in time. During periods of excess underwriting capacity, as defined by availability of capital, competition can result in lower pricing and less favorable policy terms and conditions for insurers. During periods of reduced underwriting capacity, pricing and policy terms and conditions are generally more favorable for insurers. Historically, the performance of the property and casualty insurance and reinsurance industries has tended to fluctuate in cyclical periods of price competition and excess underwriting capacity, followed by periods of high premium rates and shortages of underwriting capacity. At any given time, our portfolio of insurance products could be experiencing varying combinations of these characteristics. This cyclical market pattern can be more pronounced in the specialty insurance and reinsurance markets in which we compete than the standard insurance market.

Following several years of price decreases and the high level of natural catastrophes that occurred in 2017, we began seeing more favorable rates in 2018, particularly on our catastrophe-exposed and loss-affected business. Since 2018, we have continued to see rate strengthening across most product lines following the continued high level of natural catastrophes and significant losses attributed to the COVID-19 pandemic, as well as general market conditions. However, we began to see rate increases moderate on many of our product lines in 2022. In some product lines, such as directors and officers, we even began to see single digit rate decreases in the latter part of 2022. The overall strengthening of rates in recent years has been most prominent within our professional liability and general liability product lines, reflecting the impacts of both economic and social inflation on loss costs. Recent increases in economic and social inflation have created more uncertainty around the ultimate losses that will be incurred to settle claims on these longer-tail product lines. These factors, as well as the impacts of the low interest rate environment on interest income in recent years, have contributed to the strong rate environment. The primary exception to the favorable rate environment is workers' compensation, where we continue to see low single digit rate decreases given generally favorable loss experience in recent years.

By focusing on market niches where we have underwriting expertise, and leveraging capabilities offered through our multiple insurance platforms, we seek to earn consistent underwriting profits, which are a key component of our strategy. The property and casualty insurance industry commonly defines underwriting profit or loss as earned premiums net of losses and loss adjustment expenses and underwriting, acquisition and insurance expenses. We believe that the ability to achieve consistent underwriting profits demonstrates knowledge and expertise, commitment to superior customer service and the ability to manage insurance risk. We use underwriting profit or loss as a basis for evaluating our underwriting performance. The combined ratio is a measure of underwriting performance and represents the relationship of incurred losses, loss adjustment expenses and underwriting, acquisition and insurance expenses to earned premiums. A combined ratio less than 100% indicates an underwriting profit, while a combined ratio greater than 100% reflects an underwriting loss. In 2022, our

combined ratio was 92%. See Item 7 Management's Discussion & Analysis of Financial Condition and Results of Operations for a discussion of our underwriting results.

We routinely review the pricing of our major product lines. When we believe the prevailing market price will not support our underwriting profit targets, the business is not written. As a result of our underwriting discipline, gross premium volume may vary when we alter our product offerings to maintain or improve underwriting profitability.

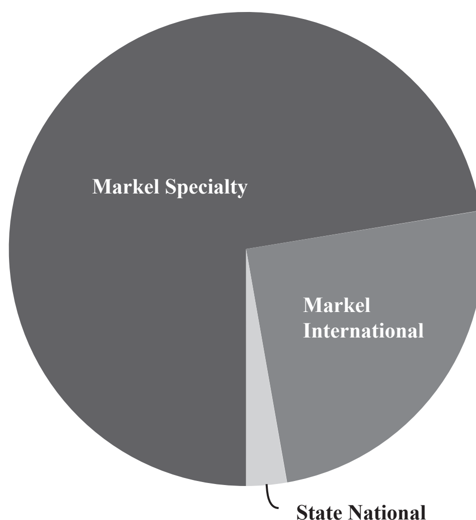
Over the past few years, we have increased our focus on growing our most profitable lines of business and have discontinued certain lines or programs that have not performed consistent with our expectations. This is particularly true within our Reinsurance segment, where in 2021, we discontinued writing property reinsurance business, including catastrophe-exposed property business, on a risk-bearing basis, and in 2022, we discontinued writing property retrocessional reinsurance business. In more limited instances, we have taken similar actions within our Insurance segment. We saw the benefit of these changes in our underwriting results in 2022, which reflected a lower impact from Hurricane Ian than we would have expected absent these changes.

Underwriting Segments

We monitor and assess the performance of our ongoing underwriting operations on a global basis in the following two segments: Insurance and Reinsurance. See note 2 of the notes to consolidated financial statements included under Item 8 for additional segment reporting disclosures.

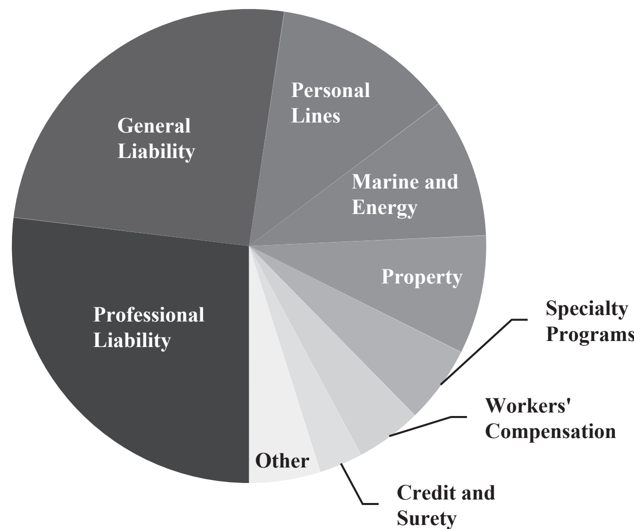
Insurance Segment

Our Insurance segment reported gross premium volume of $8.6 billion, earned premiums of $6.5 billion and an underwriting profit of $549.9 million in 2022. The following chart presents the composition of our Insurance segment by division based on 2022 gross premium volume.



The Markel Specialty division writes business for insureds from individuals and small businesses to Fortune 1000 companies in the U.S., Bermuda, the U.K. and the E.U. The Markel Specialty division is a unified platform that provides easy access to our diverse portfolio of products and capabilities. The Markel International division writes business worldwide from our London and Munich-based platforms, which include branch offices around the world. The State National division writes collateral protection insurance in the U.S., which insures personal automobiles and other vehicles held as collateral for loans made by credit unions, banks and specialty finance companies through its lender services product line on both an admitted and non-admitted basis.

The following chart displays the types of products written in our Insurance segment based on 2022 gross premium volume.



Our professional liability product lines provide insurance solutions for small, middle market and risk management accounts with coverage that is tailored to their exposures and needs. Professional liability coverages include errors and omissions, directors and officers, cyber, employment practices liability, professional indemnity, transaction liability, intellectual property and union liability. Errors and omissions coverage provides solutions for specialized professions including lawyers, accountants, agents and brokers, service technicians and consultants, as well as other less-specialized professionals. Directors and officers coverage is provided for publicly-traded, private and non-profit companies, including financial institutions and Fortune 1000 companies. Cyber products provide coverage for, among other things, data breach and privacy liability, data breach loss to insureds and electronic media coverage. We also offer claims-made professional liability coverage for individual healthcare providers, such as therapists, pharmacists, physician assistants and nurse anesthetists, and coverages for medical facilities and other allied healthcare risks, such as clinics, laboratories, pharmacies and senior living facilities.

General liability product offerings include a variety of primary and excess liability coverages. We focus on businesses in the construction, life sciences, energy, medical, healthcare, pharmaceutical, professional services, social welfare, recreational, transportation, heavy industrial and hospitality industries. Specific products include primary general liability, excess and umbrella products, products liability products, environmental liability products and casualty facultative reinsurance written for individual casualty risks.

Personal lines products provide first and third-party coverages in the U.S. for classic cars, motorcycles and a variety of personal watercraft, including vintage boats, high-performance boats and yachts and recreational vehicles, such as motorcycles, snowmobiles and ATVs. Based on the seasonal nature of much of our personal lines business, we generally will experience higher claims activity during the second and third quarters of the year. Additionally, property coverages are offered for mobile homes, dwellings and homeowners that do not qualify for standard homeowner's coverage, as well as personal umbrella coverage.

Marine and energy products include a portfolio of coverages for cargo, energy, hull, liability, war and terrorism risks worldwide. The cargo product line is an international transit-based book providing coverage for many types of cargo. Energy coverage includes all aspects of oil, gas and renewable energy activities. Hull coverages consist of coverage for physical damage to ocean-going tonnage, yachts and mortgagees' interests. Liability coverage provides for a broad range of energy liabilities, as well as traditional marine exposures including charterers, terminal operators and ship repairers. War coverage includes protections for the hulls of ships, and other related interests, against war and associated perils. Terrorism coverage provides for property damage and business interruption related to political and civil violence including war and civil war.

Property coverages consist principally of fire, allied lines (including windstorm, hail and water damage) and other specialized property coverages, including catastrophe-exposed property risks such as earthquake and wind on both a primary and excess basis. Catastrophe-exposed property risks are typically lower frequency and higher severity in nature than more standard property risks. Our property coverages are exposed to windstorm losses that, based on the seasonal nature of those events, are more likely to occur in the third and fourth quarters of the year. Our property risks range from small, single-location accounts

to large, multi-state, multi-location, multi-national accounts on a worldwide basis. Other types of property products include inland marine products, railroad-related products and specie coverage for fine art on exhibition and in private collections.

Specialty programs business is offered in the U.S. on a standalone or package basis and generally targets specialized commercial markets and various customer groups, such as amateur sports and fitness clubs. Certain specialty programs written in this segment use managing general agents to offer single source admitted and non-admitted programs for a specific industry, class or line of business, including first and third-party coverages such as packaged policies for providers of leisure and recreational activities.

Workers' compensation products are offered in the U.S. and provide wage replacement and medical benefits to employees injured in the course of employment and target main-street, service and artisan contractor businesses, retail stores and restaurants.

Credit and surety products consist primarily of trade credit and prepayment coverage and a range of bonds and guarantees that support contractual obligations, as well as other coverages for specific credit risks, markets and contingencies. Key risks covered include those of counterparty insolvency and defaults by government-owned entities. The key coverages under surety products include contractual performance and payment risks, commercial license and permit obligations and obligations related to judicial proceedings such as court and fiduciary bonds.

Other product lines within the Insurance segment include auto and collateral protection insurance.

Reinsurance Segment

Our Reinsurance segment product offerings are underwritten primarily by our Global Reinsurance division, which operates from platforms in the U.S., Bermuda and the U.K. We write quota share and excess of loss reinsurance on a local, national and global basis. Our Reinsurance segment reported gross premium volume of $1.2 billion, earned premiums of $1.1 billion and an underwriting profit of $83.9 million in 2022. The following chart displays the types of products written in our Reinsurance segment based on 2022 gross premium volume.

Professional liability reinsurance primarily consists of the following:

- Transaction liability, which provides representation, warranty and indemnity coverage for mergers and acquisitions, including coverage for tax and contingent liability;
- Directors and officers liability for publicly-traded, private and non-profit companies;
- Cyber and technology errors and omissions covering both first and third-party exposures;
- Errors and omissions for lawyers, accountants, agents and brokers, services technicians and consultants; and
- Healthcare liability for physicians, hospitals, long-term care and other medical facilities.

General liability reinsurance primarily consists of umbrella and excess casualty products, as well as environmental liability products covering pollution legal liability and contractors' pollution exposures.

Our specialty treaty reinsurance products are also written on a quota share and excess of loss basis across a wide range of specialty product lines, primarily consisting of the following:

- Credit and surety products, including structured and whole turnover credit, political risk and contract and commercial surety reinsurance programs covering worldwide exposures;
- Workers' compensation and accident and health covering both standard and catastrophe-exposed business in the U.S. and worldwide;
- Marine and energy products, both offshore and onshore marine, energy and renewable energy risks on a worldwide basis, including hull, cargo and liability;
- Public entity reinsurance products offering casualty coverage for municipalities, schools, special districts, public housing authorities and public entity affiliated non-profits;
- Mortgage default insurance offering coverage for private mortgage insurers predominantly located in the U.S. and Australia;
- Aviation and space coverage, including major risk, general aviation, satellite launch and orbit;
- Agriculture reinsurance covering multi-peril crop insurance, hail and related exposures for risks located in the U.S. and Canada; and
- Discrete political violence and national terror pools in select jurisdictions globally.

Previously, we also wrote property reinsurance and retrocessional reinsurance business. We discontinued writing these lines effective January 1, 2021 and 2022, respectively, and effective January 1, 2022, we were off-risk for substantially all property loss exposures, including catastrophe exposures, previously written within our Reinsurance segment. Any such business is now written on behalf of our Nephila ILS operations to the extent it matches the risk-profile of our third-party ILS investors, who will ultimately assume the risk.

Insurance-Linked Securities

Our insurance-linked securities operations are primarily comprised of our Nephila operations and are not included in a reportable segment. Nephila Holdings Ltd. (together with its subsidiaries, Nephila) provides investment and insurance management services through which we offer alternative capital to the reinsurance market while providing investors with investment strategies that typically are uncorrelated with traditional asset classes. We receive management fees for investment and insurance management services provided through these operations primarily based on the net asset value of the accounts managed, and for certain funds, incentive fees based on their annual performance. Through 2022, we also provided risk origination services for our fund management operations, as well as for third parties, through our Velocity and Volante managing general agent companies and received commissions based on the direct written premiums of the insurance contracts placed. Total revenues from our insurance-linked securities operations for the year ended December 31, 2022 were $338.3 million, which included $225.8 million of gains from the sales of our managing general agent operations.

Our fund management operations provide insurance and investment management services for a broad range of investment products for insurance and reinsurance companies, government entities, banks, hedge funds, pension funds and institutional investors, including insurance-linked securities, catastrophe bonds, insurance swaps and weather derivatives. Nephila serves as the investment manager to several Bermuda based private funds (the Nephila Funds). To provide access for the Nephila Funds to a variety of insurance-linked securities in the property catastrophe, climate and specialty markets, Nephila acts as an insurance manager to certain Bermuda Class 3 and 3A reinsurance companies, Lloyd's Syndicate 2357 and Lloyd's Syndicate 2358 (collectively, the Nephila Reinsurers). The results of the Nephila Reinsurers are attributed to the Nephila Funds primarily through derivative transactions between these entities. Neither the Nephila Funds nor the Nephila Reinsurers are subsidiaries of Markel Corporation, and as such, these entities are not included in our consolidated financial statements.

The Nephila Reinsurers subscribe to various reinsurance contracts based on their investors' risk profiles, including property and specialty reinsurance business fronted through our underwriting and program services platforms. We write this business on behalf of our Nephila ILS operations to the extent it fits Nephila investors' risk profile and cede substantially all of the risk to Nephila Reinsurers. See note 18 of the notes to consolidated financial statements included under Item 8 for further details regarding transactions with entities managed through our Nephila operations.

Since our acquisition of Nephila in 2018, we experienced significant growth in the Velocity and Volante managing general agent operations. We realized the value created since 2018 through the sale of Velocity in February 2022 and Volante in October 2022. See Note 3 of the notes to consolidated financial statements included under Item 8 for additional details regarding these transactions.

Following the sales of our Velocity and Volante managing general agent operations, our Nephila ILS operations are solely comprised of our fund management operations. Since acquiring Nephila in 2018, investment performance in the broader ILS market has been adversely impacted by consecutive years of elevated catastrophe losses, most recently with Hurricane Ian in 2022. These events, as well as recent volatility in the capital markets, have impacted investor decisions around allocation of capital to ILS, which in turn has impacted our capital raises and redemptions within the funds we manage. As of December 31, 2022, Nephila's net assets under management were $7.2 billion.

Our insurance-linked securities operations also include our run-off Markel CATCo operations, the results of which are reported separately from our ongoing insurance-linked securities operations. Our Markel CATCo operations are conducted through Markel CATCo Investment Management Ltd. (MCIM), an ILS investment fund manager headquartered in Bermuda. MCIM serves as the insurance manager for Markel CATCo Re Ltd. (Markel CATCo Re), a Bermuda Class 3 reinsurance company, and as the investment manager for Markel CATCo Reinsurance Fund Ltd., a Bermuda exempted mutual fund company comprised of multiple segregated accounts (Markel CATCo Funds). In July 2019, these operations were placed into run-off. In March 2022, we completed a buy-out transaction that provided for an accelerated return of all remaining capital to investors in the Markel CATCo Funds. Following the completion of the buy-out transaction, we consolidate Markel CATCo Re as its primary beneficiary. Results attributable to the run-off of Markel CATCo Re are included with our other Markel CATCo operations within services and other expenses, and for the year ended December 31, 2022, these results were entirely attributable to noncontrolling interest holders in Markel CATCo Re. In connection with the buy-out transaction, we entered into a tail risk cover with Markel CATCo Re through which we have uncollateralized exposure to adverse development on loss reserves held by Markel CATCo Re for loss exposures in excess of limits that we believe are unlikely to be exceeded. For further details regarding our Markel CATCo operations and the consolidation of Markel CATCo Re, see note 17 of the notes to consolidated financial statements included under Item 8 and for further details regarding the buy-out transaction, see note 21 of the notes to consolidated financial statements included under Item 8.

Program Services and Other Fronting

Our program services business generates fee income in the form of ceding fees in exchange for fronting insurance business to other insurance carriers (capacity providers). In general, fronting refers to business in which we write insurance on behalf of a general agent or capacity provider and then cede all, or substantially all, of the risk under these policies to the capacity provider in exchange for ceding fees. The results of our program services operations are not included in a reportable segment.

Our program services business, which is provided through our State National division, offers issuing carrier capacity to both specialty managing general agents and other producers who sell, control and administer books of insurance business that are supported by third parties that assume reinsurance risk, including the Nephila Reinsurers. These reinsurers are domestic and foreign insurers and institutional risk investors that want to access specific lines of U.S. property and casualty insurance business but may not have the required licenses and filings to do so.

Through our program services business, we write a wide variety of insurance products, principally including general liability, commercial liability, commercial multi-peril, property and workers' compensation. Program services business written through our State National division is separately managed from our underwriting divisions, which write similar products, in order to protect our program services customers.

The following table summarizes the subsidiaries through which our program services business is written.

Legal Entity	Abbreviation	State of Domicile
City National Insurance Company	CNIC	Texas
Independent Specialty Insurance Company	ISIC	Delaware
National Specialty Insurance Company	NSIC	Texas
Pinnacle National Insurance Company	PNIC	Texas
State National Insurance Company, Inc.	SNIC	Texas
Superior Specialty Insurance Company	SSIC	Delaware
United Specialty Insurance Company	USIC	Delaware

These subsidiaries are authorized or licensed to write property and casualty insurance in all 50 states and the District of Columbia. Many of our programs are arranged with the assistance of brokers that are seeking to provide customized insurance solutions for specialty insurance business that requires a carrier rated "A" by A.M. Best Company (Best). Our specialized

business model relies on third-party producers or capacity providers to provide the infrastructure associated with providing policy administration, claims handling, cash handling, underwriting, or other traditional insurance company services. We compete primarily on the basis of price, customer service, geographic coverage, financial strength ratings, licenses, reputation, business model and experience.

Total revenues attributed to our program services business for the year ended December 31, 2022 were $133.3 million. Our program services business generated $2.8 billion of gross written premium volume for the year ended December 31, 2022.

In our program services business, we generally enter into quota share reinsurance agreements whereby we cede to the capacity providers substantially all of our gross liability under all policies issued by and on behalf of us by the producer. The capacity providers are generally entitled to 100% of the net premiums received on policies reinsured, less the ceding fee to us, the commission paid to the producer and premium taxes on the policies. In connection with writing this business, we also enter into agency agreements with both the producer and the capacity providers whereby the producer and capacity providers are generally required to deal directly with each other to develop business structures and terms to implement and maintain the ongoing contractual relationship. In a number of cases, the producer and capacity providers for a program are part of the same organization or are otherwise affiliated. As a result of our contract design, substantially all of the underwriting risk and operational risk inherent in the arrangement is borne by the capacity providers. The capacity providers assume and are liable for substantially all losses incurred in connection with the risks under the reinsurance agreement, including judgments and settlements. Our contracts with capacity providers do not legally discharge us from our primary liability for the full amount of the policies, and we will be required to pay the loss and bear collection risk if a capacity provider fails to meet its obligations under the reinsurance agreement. As a result, we remain exposed to the credit risk of capacity providers, or the risk that one of our capacity providers becomes insolvent or otherwise unable or unwilling to pay policyholder claims. We mitigate this credit risk generally by either selecting well capitalized, highly rated authorized capacity providers or requiring that the capacity provider post substantial collateral to secure the reinsured risks, which, in some instances, exceeds the related reinsurance recoverable.

In certain instances, we also leverage the strength of our underwriting platform to write business on behalf of our ILS operations, in exchange for ceding fees, to support their business plans and assist in meeting their desired return objectives. This fronting business is conducted separately from our program services business and consists of catastrophe-exposed property insurance and reinsurance business and specialty reinsurance business.

Although we reinsure substantially all of the risks inherent in our program services business and ILS fronting arrangements, we have certain programs that contain limits on our reinsurers' obligations to us that expose us to underwriting risk, including loss ratio caps, aggregate reinsurance limits or exclusion of the credit risk of producers. Under certain programs, including programs and contracts with Nephila Reinsurers, we also bear underwriting risk for annual aggregate agreement year losses in excess of a limit that we believe is unlikely to be exceeded. See note 18 of the notes to consolidated financial statements included under Item 8 for further details regarding our programs with Nephila Reinsurers.

Ratings

Financial stability and strength are important purchase considerations of policyholders, cedents and insurance agents and brokers. Because an insurance premium paid today purchases coverage for losses that might not be paid for many years, the financial viability of the insurer is of critical concern. Various independent rating agencies provide information and assign ratings to assist buyers in their search for financially sound insurers. Rating agencies periodically re-evaluate assigned ratings based upon changes in the insurer's operating results, financial condition or other significant factors influencing the insurer's business. Changes in assigned ratings could have an adverse impact on an insurer's ability to write new business.

Rating agencies assign financial strength ratings (FSRs) to property and casualty insurance companies based on quantitative criteria such as profitability, leverage and liquidity, as well as qualitative assessments such as the spread of risk, the adequacy and soundness of ceded reinsurance, the quality and estimated market value of assets, the adequacy of loss reserves and surplus and the competence, experience and integrity of management.

Seventeen of our eighteen insurance subsidiaries are rated by Best. All seventeen of our insurance subsidiaries rated by Best have been assigned an FSR of "A" (excellent). Our Lloyd's syndicate is part of a group rating for the Lloyd's overall market, which has been assigned an FSR of "A" (excellent) by Best.

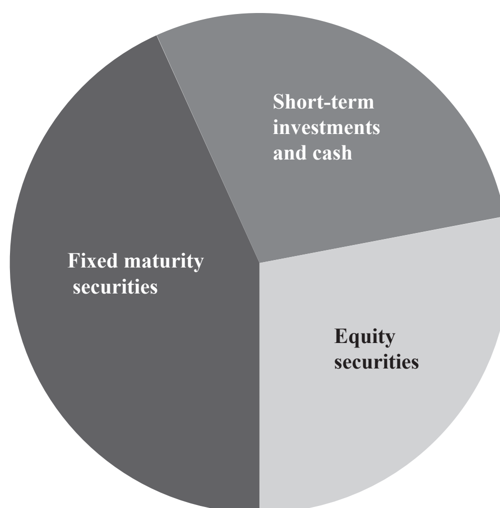
Nine of our eighteen insurance subsidiaries are rated by Standard & Poor's (S&P). All nine of our insurance subsidiaries rated by S&P have been assigned an FSR of "A" (strong). Our Lloyd's syndicate is part of a group rating for the Lloyd's overall market, which has been assigned an FSR of "A+" (strong) by S&P.

Five of our eighteen insurance subsidiaries are rated by Moody's Corporation (Moody's). All five insurance subsidiaries rated by Moody's have been assigned an FSR of "A2" (good).

Investments

Our business strategy recognizes the importance of both consistent underwriting and operating profits and superior investment returns to build shareholder value. The majority of our investable assets come from premiums paid by policyholders. We rely on sound underwriting practices to produce investable funds. Policyholder funds are invested predominantly in high-quality government and municipal bonds and mortgage-backed securities that generally match the duration and currency of our loss reserves. We typically hold these fixed maturity investments until maturity. As a result, unrealized holding gains and losses on these securities are generally expected to reverse as the securities mature. Premiums collected through our underwriting operations may also be held as short-term investments or cash and cash equivalents to provide short-term liquidity for projected claims payments, reinsurance costs and operating expenses. The balance of our investable assets, comprised of shareholder funds, is available to be invested in equity securities, which over the long run, have produced higher returns relative to fixed maturity and short-term investments. When purchasing equity securities, we seek to invest in profitable companies, with honest and talented management, that exhibit reinvestment opportunities and capital discipline, at reasonable prices. We intend to hold these equity investments over the long-term. Substantially all of our investment portfolio is managed by company employees.

Invested assets, comprised of fixed maturity securities, equity securities, short-term investments, cash and cash equivalents and restricted cash and cash equivalents, were $27.4 billion at December 31, 2022. The following chart displays the composition of our invested assets as of December 31, 2022.



We measure our investment performance by analyzing net investment income earned on our investment portfolio, as well as through net investment gains, which includes unrealized gains on our equity portfolio, and the change in net unrealized investment gains on available-for-sale investments. Our performance measures also include investment yield and taxable equivalent total investment return, which is a non-GAAP financial measure. We focus on long-term investment performance, understanding that the level of investment gains or losses and unrealized gains or losses may vary from one period to the next.

Markel Ventures

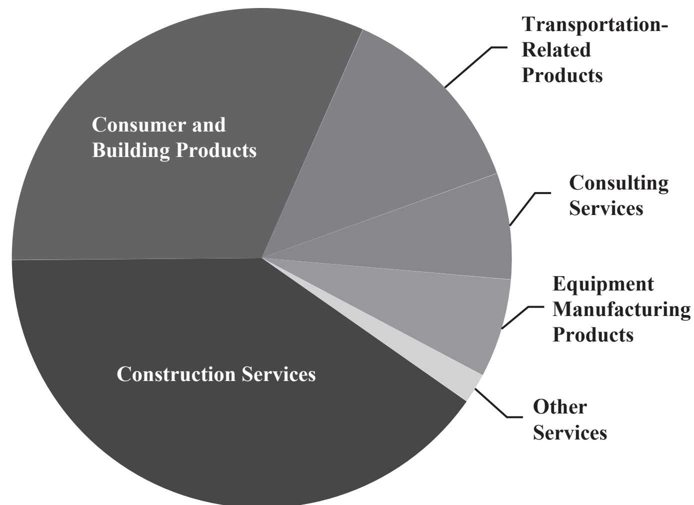
Through our wholly owned subsidiary Markel Ventures, Inc. (Markel Ventures), we own controlling interests in various high-quality businesses that operate in a variety of different industries with the shared goal of positively contributing to the long-term financial performance of Markel Corporation. Management teams for each business operate autonomously and are responsible for developing strategic initiatives, managing day-to-day operations and making investment and capital allocation decisions for their respective companies.

Our corporate management team is responsible for decisions regarding allocation of capital for acquisitions and new investments. Our strategy in making these acquisitions is similar to our strategy for purchasing equity securities. We seek to invest in profitable companies, with honest and talented management, that exhibit reinvestment opportunities and capital discipline, at reasonable prices. We intend to own the businesses acquired for a long period of time. Our chief operating decision maker allocates resources to and assesses the performance of these various businesses in the aggregate as the Markel Ventures segment. See note 2 of the notes to consolidated financial statements included under Item 8 for additional segment reporting disclosures.

The Markel Ventures segment includes a diverse portfolio of specialized businesses from different industries that offer various types of products and services to businesses and consumers across many markets. All of our businesses in this segment are headquartered in the U.S., with subsidiaries of certain businesses located outside of the U.S. During the last three years, our Markel Ventures operations have expanded through acquisitions of majority interests in various businesses, including Metromont LLC and Buckner HeavyLift Cranes in 2021 and Lansing Building Products, LLC in 2020. See note 3 of the notes to consolidated financial statements included under Item 8 for additional details related to these acquisitions. This follows acquisitions of VSC Fire & Security, Inc. in 2019 and Brahmin Leather Works LLC in 2018. We continue to look for acquisition opportunities that align with our investment criteria and strategic objectives around diversification and specialization.

In 2022, our Markel Ventures operations reported revenues of $4.8 billion, operating income of $325.2 million, net income to shareholders of $192.6 million and earnings before interest, income taxes, depreciation and amortization (EBITDA) of $506.3 million. We use Markel Ventures EBITDA, which is a non-GAAP financial measure, as an operating performance measure in conjunction with revenues, operating income and net income. See "Markel Ventures" under Item 7 Management's Discussion & Analysis of Financial Condition and Results of Operations for more information on our Markel Ventures results, including EBITDA.

The following chart displays the types of businesses within our Markel Ventures segment based on 2022 operating revenues. Our senior management team does not manage the Markel Ventures portfolio of businesses at this level of aggregation due to the distinct characteristics of each business and the autonomy with which local management operates each business.



Products and services offered through these types of businesses include:

- Construction Services - Companies that provide distribution services for exterior building products, crane rental services and fire protection and life safety services to other businesses in the U.S. construction market;
- Consumer and Building Products - Companies that produce or build ornamental plants, precast concrete solutions, residential homes, luxury handbags and architectural products, which are primarily sold to consumers in the U.S. retail and housing markets;
- Transportation-Related Products - Companies that manufacture and sell over-the-road car haulers, laminated oak and composite wood flooring and tube and tank trailers primarily used in the U.S. trucking industry;
- Consulting Services - Companies that provide management and technology consulting and retail intelligence services to other businesses primarily in the U.S. market;

- Equipment Manufacturing Products - Companies that manufacture and sell equipment used in commercial baking systems and food processing, as well as dredges, in both the U.S. and international markets; and
- Other Services - Companies that provide healthcare, leasing and investment services.

Markel Ventures businesses encounter a variety of competitors that vary by industry, end market and geographic area. Each Markel Ventures business has several main competitors and numerous smaller ones in most of its respective end markets and geographic areas. Many of the businesses in this segment experience revenue fluctuations over time due to the cyclical nature of supply and demand in their particular industry. For example, the construction industry is cyclical based on certain larger economic trends and factors, including the inflationary and interest rate environment and, for some businesses, the level of government investment. Additionally, many of our businesses experience fluctuation in demand throughout the year based on the seasonality of the products they sell or services they provide. For example, the demand for ornamental plants is particularly high during the spring and summer seasons as compared to the rest of the year. Businesses in this segment are reliant on inputs, such as raw materials and labor, to manufacture products and deliver services, and the operating results of these businesses could be impacted by the ability or inability to source these inputs and obtain price increases from customers in response to increases in the price of these inputs, including the cost of shipping. For example, shipping costs at some of our businesses increased significantly in 2021 and 2022, which has resulted in smaller margins as we have been unable to pass all of these cost increases through to our customers in certain instances. Management teams for each of our businesses proactively manage the risks and challenges posed by cyclicality, seasonality and inflation, among other things, in a variety of ways as appropriate and as needed for their business.

Regulatory Environment

We are subject to extensive state, federal and international regulation and supervision in the jurisdictions in which we do business. Regulations vary from jurisdiction to jurisdiction. Additionally, as a company with publicly-traded securities, we are also subject to certain legal and regulatory requirements applicable generally to public companies, including the rules and regulations of the U.S. Securities and Exchange Commission (SEC) and the New York Stock Exchange relating to reporting and disclosure, accounting and financial reporting, corporate governance and other matters.

The following is a summary of significant regulations that apply to our businesses, but it is not intended to be a comprehensive review of every regulation to which we are subject. For information regarding certain risks associated with regulations applicable to us, see Item 1A Risk Factors.

U.S. Insurance Regulation

State Regulation

Overview. Our U.S. insurance company subsidiaries are subject to varying degrees of regulation and supervision by the states and other jurisdictions in which they do business. In the U.S., authority for the regulation, supervision and administration of the business of insurance in each state is generally delegated to a state insurance commissioner who oversees a regulatory body responsible for the supervision of the business of insurance. State regulatory authorities have broad regulatory, supervisory and administrative powers relating to: solvency standards; corporate conduct; market conduct activities; regulating unfair trade and claims practices; licensing of insurers; licensing and appointment of agents; approval of forms and policies used; the nature of, and limitations on, insurers' investments; the form and content of annual statements and other reports on the financial condition of insurers; and establishment of loss reserves. States also regulate various aspects of the contractual relationships between insurers and independent agents. In addition, the National Association of Insurance Commissioners (NAIC), comprised of the insurance commissioners of each U.S. jurisdiction, develops or amends model statutes and regulations that, in turn, most states adopt.

Group Supervision - Global Supervisory College; Global Common Framework. Regulators within and outside the U.S. are increasingly coordinating the regulation of multinational insurers by conducting a supervisory college. A supervisory college is a forum of the regulators having jurisdictional authority over an insurance holding company's worldwide insurance subsidiaries. The supervisory college meets with executive management to evaluate the insurance group on both a group-wide and legal-entity basis, particularly with respect to its financial data, business strategies, enterprise risk management and corporate governance. The Illinois Department of Insurance is our lead insurance regulator for purposes of conducting our supervisory college.

In 2020, the International Association of Insurance Supervisors adopted its Common Framework for the Supervision of Internationally Active Insurance Groups (ComFrame). ComFrame establishes a comprehensive framework for supervisors to

address group-wide activities and risks of internationally active insurance groups (IAIGs) and lays the groundwork for better supervisory cooperation and coordination. ComFrame requires the designation of a group-wide supervisor (regulator) for each IAIG and imposes a group capital requirement that will be applied to an IAIG in addition to the current legal entity capital requirements imposed by state and international insurance regulators. In response to ComFrame, the NAIC revised the model Insurance Holding Company System Regulatory Act to allow state insurance regulators in the U.S. to be designated as group-wide supervisors for U.S. based IAIGs.

Holding Company Statutes. In addition to regulatory supervision of our U.S. insurance subsidiaries, we are subject to state statutes governing insurance holding company systems. Typically, those statutes require that we periodically file information with the appropriate state insurance commissioner, including information concerning our capital structure, ownership, financial condition, dividend payments and other material transactions with affiliates, and general business operations. These statutes also require approval of changes in control of an insurer or an insurance holding company. Generally, "control" for these purposes is defined as ownership or voting power of 10% or more of a company's voting shares. Additional requirements include group-level reporting, submission of an annual enterprise risk report by a regulated insurance company's ultimate controlling person and providing information regarding an insurer's non-insurer affiliates.

Risk Based Capital Requirements. The NAIC uses a risk based capital (RBC) formula that is designed to measure the capital of an insurer taking into account the company's investments and products. RBC requirements provide a formula which, for property and casualty insurance companies, establishes capital thresholds for four categories of risk: asset risk, insurance risk, interest rate risk and business risk.

Financial Exams. State insurance regulators also prescribe the form and content of statutory financial statements, perform periodic financial examinations of insurers, set minimum reserve and loss ratio requirements, establish standards for permissible types and amounts of investments and require minimum capital and surplus levels. These statutory capital and surplus requirements include RBC rules promulgated by the NAIC.

Statutory Accounting Principles. Each of our U.S. insurance company subsidiaries is required to file detailed quarterly and annual reports, including financial statements, in accordance with prescribed statutory accounting rules, with regulatory officials in the jurisdictions in which they conduct business. The quarterly and annual financial reports filed with the states utilize statutory accounting principles (SAP) that are different from U.S. GAAP. In developing SAP, insurance regulators were primarily concerned with monitoring the solvency of insurance companies to assure an insurer's ability to pay all its current and future obligations to policyholders.

Own Risk and Solvency Assessment and Enterprise Risk Management. We must submit an Own Risk and Solvency Assessment Summary Report (ORSA) annually to our lead insurance regulator. The ORSA is a confidential internal assessment of the material and relevant risks associated with an insurer's current business plan and the sufficiency of capital resources to support those risks. In addition, we must file an annual enterprise risk report with our lead insurance regulator. The report must identify the material risks within the insurance holding company system that could pose enterprise risk to the U.S. insurance subsidiaries.

Rates and Form Filings. The policy forms and various premium rates of our U.S. admitted insurance subsidiaries are subject to regulation in every state in which they conduct business. In many states, rates and policy forms must be filed with the applicable insurance regulator prior to their use, and in some states, rates and forms must be affirmatively approved by the applicable insurance regulator prior to use.

Dividends. The laws of the domicile states of our U.S. insurance subsidiaries govern the amount of dividends that may be paid to our holding company, Markel Corporation. Generally, statutes in the domicile states of our insurance subsidiaries require prior approval for payment of extraordinary, as opposed to ordinary, dividends. See note 22 of the notes to consolidated financial statements included under Item 8.

Market Conduct. State insurance laws and regulations include numerous provisions governing trade practices and the marketplace activities of insurers, including provisions governing marketing and sales practices, data security, compliance of underwriting services to policyholders, confirmation of licensing and appointment of producers, claims management, anti-fraud controls and complaint handling. State regulatory authorities generally enforce these provisions through periodic market conduct examinations.

Investment Regulation. Investments by our U.S. insurance companies must comply with applicable laws and regulations that prescribe the kind, quality and concentration of investments. In general, these laws and regulations permit investments in

federal, state and municipal obligations, corporate bonds, preferred and common equity securities, mortgage loans, real estate and certain other investments, subject to specified limits and certain other qualifications.

Federal Regulation

The U.S. federal government and its regulatory agencies generally do not directly regulate the business of insurance. However, two federal government bodies, the Federal Insurance Office (FIO) and the Financial Stability Oversight Council (FSOC), each created under The Dodd Frank Wall Street Reform and Consumer Protection Act, may impact the regulation of insurance. Although the FIO is prohibited from directly regulating the business of insurance, it has authority to represent the U.S. in international insurance matters and has limited powers to preempt certain types of state insurance laws. The FIO also can recommend to the FSOC that it designate an insurer as an entity posing risks to the U.S. financial stability in the event of the insurer's material financial distress or failure. We have not been so designated. The U.S. federal laws that most affect our day-to-day insurance operations are: the Gramm-Leach-Bliley Act; the Fair Credit Reporting Act; the Health Insurance Portability and Accountability Act of 1996, as amended; the Terrorism Risk Insurance Act of 2002, as amended; anti-money laundering laws and regulations; the Nonadmitted and Reinsurance Reform Act of 2010, as amended; the Foreign Corrupt Practices Act, and the rules and regulations of the Office of Foreign Assets Control.

International Insurance Regulation

Overview. Our international insurance operations are subject to regulation and supervision in various jurisdictions. These regulations, which vary depending on the jurisdiction, include, among others, solvency and market conduct regulations; anti-corruption, anti-money laundering, and anti-terrorism financing guidelines, laws and regulations; various privacy, insurance, tax, tariff, trade and sanctions laws and regulations; and corporate, competition, employment, intellectual property and investment laws and regulations. Outside of the U.S., we have insurance operations domiciled in the U.K., Europe and Bermuda, which are subject to regulation in those jurisdictions. In addition, we conduct business in Canada, Asia and the Middle East, where our businesses also are supervised by local regulatory authorities.

U.K. and European Regulation. We are subject to regulation by the Prudential Regulatory Authority and Financial Conduct Authority in respect of our U.K. insurance businesses. We are also subject to regulation by the Federal Financial Supervisory Authority, better known by its abbreviation BaFin, in respect of our German insurance carrier.

Our U.K. and German insurance businesses are subject to both the E.U.'s General Data Protection Regulation (GDPR) and the Solvency II Directive (Solvency II).

GDPR requires businesses operating in the E.U., and businesses transacting with E.U. citizens, to comply with conditions for processing personal data. Following the U.K.'s exit from the E.U., GDPR was transposed into U.K. law. The E.U. has granted adequacy status to the U.K.'s data protection laws, valid until June 2025 with the possibility of renewal, meaning that they are deemed essentially equivalent to E.U. data protection laws.

Solvency II requires our U.K. and German businesses to maintain certain capital standards and publish risk-related information in the form of a Solvency and Financial Condition Report. Following the U.K.'s exit from the E.U., Solvency II also was transposed into U.K. law as retained law. The U.K. government, under the Financial Services and Markets Bill, plans to repeal certain retained law with an approach to regulation designed for the U.K., including reforms to Solvency II.

Bermuda Regulation. The insurance industry in Bermuda is regulated by the Bermuda Monetary Authority (BMA). Under the Bermuda Insurance Act 1978, and related regulations and standards of the BMA, each Bermuda insurance company is subject to, among other things: licensing, capital, surplus and liquidity requirements; solvency standards; restrictions on dividends and distributions; and periodic examinations of the company and its financial condition. In addition, each insurance company must obtain prior approval of ownership and transfer of shares and maintain a principal office and appoint and maintain a principal representative in Bermuda. The BMA also requires that each insurance company contract for local services, such as corporate secretary, insurance manager and registered representative services, at market rates.

ILS Regulation

Our insurance-linked securities operations are subject to regulation and supervision by various regulatory authorities, both in the U.S. and internationally. Certain of our ILS subsidiaries are organized and regulated as follows:

- registered with the SEC as an investment adviser under the Investment Advisers Act of 1940, as amended,

- registered with the U.S. Commodity Futures Trading Commission as a commodity pool operator or a commodity trading advisor under the Commodity Exchange Act, as amended,
- registered with the BMA as an insurance manager under the Bermuda Insurance Act 1978, and/or
- registered with the BMA as an investment manager under the Bermuda Investments Business Act 2003.

Certain other ILS subsidiaries serve as the investment manager to one or more private funds that are registered with the BMA under the Investment Funds Act 2006, as amended, or the Segregated Accounts Companies Act 2000, as amended. In addition, these operations include business relationships with certain U.S., U.K. and Bermuda insurance companies that are subject to U.S. and international insurance regulation as previously described in this "Regulatory Environment" section.

As a result, subsidiaries involved in our ILS operations are subject to regulations that may impose substantive and material restrictions and requirements on their operations, including, among other things: a broader fiduciary duty to act in the best interests of their clients; disclosure of information about our businesses and conflicts of interests to clients; maintenance of written policies and procedures; maintenance of extensive books and records; restrictions on the types of fees we may charge, including performance fees; restrictions on solicitation arrangements; requirements regarding engaging in transactions with clients; maintenance of an effective compliance program; and other restrictions and requirements applicable to custody of client assets, client privacy, advertising, pay-to-play prohibitions and cybersecurity; as well as possible sanctions, disciplinary actions or other penalties for non-compliance.

Markel Ventures Regulation

Our Markel Ventures businesses are subject to a wide variety of U.S. federal, state, and local laws and regulations, as well as international laws and regulations applicable to their international operations. Specifically, the most significant of these laws and regulations cover the following areas: safety, health, employment, the environment, transportation, U.S. and international trade, anti-corruption, data privacy and security and government contracts.

Human Capital

Our culture is our greatest asset and is defined by the Markel Style. Written in 1986, in preparation for our initial public offering, the Markel Style memorialized how we seek to operate our businesses and treat one another. It continues to provide our guiding principles across our diverse group of businesses. Key within the Markel Style is the encouragement to look for a better way to do things, to challenge management. We also seek spontaneity and flexibility and a respect for authority, but disdain for bureaucracy. Our diverse financial holding company is managed in a way to accomplish these principles. Each of our businesses operates with a high degree of autonomy so long as they operate within the principles of the Markel Style. This allows our managers to make decisions that are best for their employees and customers, as well as our shareholders. We believe this high degree of empowerment leads to the satisfaction that comes from being trusted in the responsibilities one has been given.

Further outlined in the Markel Style is our creed of honesty and fairness in all our dealings; holding the individual's right to self-determination in the highest light; putting aside individual concerns in the spirit of teamwork; and providing an atmosphere in which people can reach their full potential. We greatly value our employees, encourage their career development and reward their pursuit of excellence, while also celebrating a diverse workforce.

At December 31, 2022, we had approximately 20,900 employees, of whom approximately 5,000 were employed within our insurance operations and approximately 15,900 were employed within our Markel Ventures operations.

Insurance

Our principal business markets and underwrites specialty insurance products and within that business exists a well-developed process to ensure effective performance management, including an embedded annual and mid-year review process that enables goal setting, development planning and performance assessment. Within our insurance operations, we also have undertaken significant work over recent years to establish global leadership development programs for different levels of leadership at Markel, including partnering with various renowned business schools to create leading-edge curriculum in this area.

With the Markel Style as our foundation, we have identified five pillars of focus that relate to today's challenges and opportunities—diversity and inclusion, community, innovation, well-being, and recognition. This program is both company and employee led—collectively, we want to bring the values of the Markel Style to life with our actions, not just our words. Our intent is to create an environment where employees are able to authentically bring their true selves to work, a place where

all ideas are heard and diverse perspectives are valued, a culture that prioritizes innovation, the ability to make a difference for our local communities and the wider world, and a foundation for holding ourselves accountable for our own well-being and of those around us.

Employee health and overall well-being is a key priority, and we provide a range of employee and eligible partner plans and programs, including health and voluntary benefits. These offerings include a variety of financial protection programs to help our employees meet their unique investment and savings needs including life insurance, retirement savings with company contributions in most situations and an employee stock purchase plan. Comprehensive employee assistance programs are available in all of our major markets along with other well-being and fitness resources.

We rely on our employees' ideas and input to help make Markel a great place to work. For example, senior leadership conducts regular employee communication meetings, inclusive of question and answer sessions, across our insurance operations providing opportunities for employees to share their ideas on how we can improve employee engagement. In addition, every two years we conduct a major, global employee engagement survey, which in early 2022 garnered 88% participation, and which enables us to identify, focus on and track progress against key engagement drivers and external norms for high performing companies. This survey has generated additional ideas for employee engagement; and we have made meaningful changes and improvements in our human capital practices based on this feedback.

We are committed to embracing all aspects of diversity, including diversity of perspective, which we believe is crucial to sustainable success. Markel accordingly supports and encourages focused efforts to continue to build the diversity of our employee population and the inclusiveness of our culture. Our diversity and inclusion efforts seek to cultivate an inclusive environment in which every employee feels valued, respected and accepted. We believe this environment helps us increase creativity and innovation, foster business connections, serve our customers and maintain our market leadership.

Within our insurance business, our global Diversity and Inclusion (D&I) Steering Committee comprises more than 15 senior managers who are charged with advising on D&I strategy and providing leadership support and advocacy for our D&I efforts. Our Human Resources leadership team works to further shape the D&I strategy for our global workforce, and to ensure the integration of our D&I efforts with our global talent acquisition and development processes. We have various early career programs open to a diverse range of applicants and a regional scholarship program that is focused on underrepresented groups.

Our insurance operations support a range of employee-led D&I networks and resource groups, including our Markel Women's Network, BEAM (Black Engagement at Markel), PRISM (LGBTQ+), Jitneys (Young Professionals), Markel Asian Professionals Network, Markel Veterans Network, UN1DOS (Latin and Hispanic Network), and across our international operations, an Inclusion Network with connections to a number of the London market partner networks. All of these networks and organizations have put in place goals and programming that are focused on education and development, community engagement, talent acquisition and networking/support. Additionally, we continue our global sponsorship of Dive-In, the insurance industry's annual diversity and inclusion festival.

Markel Ventures

Our Markel Ventures operations are comprised of a diverse portfolio of businesses from different industries through which we own controlling interests. The Markel Ventures operations are viewed by management as separate and distinct from our insurance operations with local management teams that direct the strategy and day-to-day operations of their respective companies, including human capital matters. When making these acquisitions, we seek, among other things, businesses whose leadership teams demonstrate equal measures of both integrity and talent. As a result, each Markel Ventures business fosters a culture within their operations, and with their employees, that aligns with the principles of the Markel Style.

Item 1A. RISK FACTORS

A wide range of factors could materially affect our future prospects and performance. The matters addressed in Item 7 Management's Discussion and Analysis of Financial Condition and Results of Operations, including under "Safe Harbor and Cautionary Statement" and "Critical Accounting Estimates", and Item 7A Quantitative and Qualitative Disclosures About Market Risk, as well as other information included or incorporated in this report, describe many of the significant risks that could affect our businesses, results of operations and financial condition. We are also subject to the risks discussed below.

One or more of the risks discussed in this Item 1A. Risk Factors, and others we cannot anticipate, could have material adverse effects on our results of operations and financial condition; and the extent of these effects will depend, at least in part, on the scope, severity, frequency or duration of the specific event or circumstance. In addition, we may take steps to prevent, mitigate or manage potential risks or liabilities, and related developments, and some of those steps may have a material adverse effect on our results of operations and financial condition. Even if an unfavorable outcome does not materialize, these factors, and actions we may take in response, may have a material adverse impact on our reputation or result in substantial expense and disruption.

Headings and sub-headings for the Risk Factors below are for reference purposes only and are not intended to limit or affect in any way the meaning or scope of each Risk Factor.

Risks Primarily Related to Our Insurance Operations

Loss Exposures

We may experience losses or disruptions from catastrophes. As a company with significant property and casualty insurance underwriting operations, we may experience losses from man-made or natural catastrophes. Catastrophes include, but are not limited to, windstorms, hurricanes, earthquakes, tornadoes, derechos, hail, severe winter weather and wildfires and may include pandemics and events related to terrorism, broad reaching cyberattacks, riots and political and civil unrest. While we employ catastrophe modeling tools in our underwriting process, we cannot predict how severe a potential catastrophe will be before it occurs. The extent of losses from catastrophes is a function of the total amount of losses incurred, the number of insureds affected, the frequency and severity of the events, the effectiveness of our catastrophe risk management program and the adequacy of our reinsurance coverage. Most catastrophes occur over a small geographic area; however, some catastrophes may produce significant damage in large, heavily populated areas. In addition, catastrophes may have a material adverse effect on the investment management and incentive fees earned by our insurance-linked securities (ILS) operations and returns on our investments in ILS funds. Catastrophes also may result in significant disruptions in our insurance and other operations, as well as loss of income and assets. If climate change results in an increase in the frequency and/or severity of weather-related catastrophes, we may experience additional or elevated catastrophe-related losses or disruptions, which may be material.

The failure of any of the methods we employ to manage our loss exposures could have a material adverse effect on us. We seek to manage our loss exposures in a variety of ways, including adhering to maximum limitations on policies written in defined geographical zones, limiting program size for each client, establishing per risk and per occurrence limitations for each event, employing coverage restrictions and following prudent underwriting guidelines for each program written. We also seek to manage our loss exposures through geographic and industry diversification. Underwriting is a matter of judgment, involving assumptions about matters that are inherently unpredictable and beyond our control, and for which historical experience and probability analysis may not provide sufficient guidance. One or more future events could result in claims that substantially exceed our expectations, which could have a material adverse effect on our results of operations and financial condition. In addition, we seek to manage our loss exposures by policy terms, coverage exclusions and choice of legal forum. Disputes relating to coverage and choice of legal forum also arise. As a result, various provisions of our policies, such as choice of forum, or coverage limitations or exclusions, may not be enforceable in the manner we intend and some or all of our methods to manage loss exposures may prove ineffective.

The effects of emerging claim and coverage issues on our business are uncertain. As industry practices and legal, judicial, social and other environmental conditions change, unexpected and unintended issues related to claims and coverage may emerge. These issues could have a material adverse effect on our results of operations or financial condition by either broadening coverage beyond our underwriting intent or increasing the frequency and/or severity of claims. For example, rising costs, litigation funding, social inflation, higher adverse verdicts, and legislative changes, such as extended statutes of limitations, may result in higher and more frequent claims over a longer reporting period than originally expected. In some instances, these changes may not become apparent until 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.

We use analytical models to assist our decision making in key areas such as pricing, reserving and capital modeling and actual results may differ materially from the model outputs and related analyses. We use various modeling techniques and data analytics (e.g., scenarios, predictive and stochastic modeling, and forecasting) to analyze and estimate exposures, loss trends and other risks associated with our insurance and ILS businesses. This includes both proprietary and third-party modeled outputs and related analyses to assist us in, among other things, decision-making related to underwriting, pricing, capital allocation, reserving, investing, reinsurance and catastrophe risk. We incorporate numerous assumptions and forecasts about the future level and variability of policyholder behavior, loss frequency and severity, interest rates, equity markets, inflation, capital requirements, and currency exchange rates, among others. The modeled outputs and related analyses from both proprietary models and third-party models are subject to various assumptions, uncertainties, model design errors, complexities and the inherent limitations of any statistical analysis, including those arising from the use of historical internal and industry data and assumptions.

In addition, the modeled outputs and related analyses may from time to time contain inaccuracies, perhaps in material respects, including as a result of inaccurate inputs or applications thereof (whether due to data error, human error or otherwise). Consequently, actual results may differ materially from our modeled results. Our profitability and financial condition substantially depend on the extent to which our actual experience is consistent with assumptions we use in our models and ultimate model outputs. If, based upon these models or other factors, we misprice our products or fail to appropriately estimate the risks we are exposed to, our business, results of operations and financial condition may be materially adversely affected.

Loss Reserves

Our results may be affected because actual insured or reinsured losses differ from our loss reserves. Significant periods of time often elapse between the occurrence of an insured or reinsured loss, the reporting of the loss to us and our payment of that loss. To recognize liabilities for unpaid losses, we establish reserves as balance sheet liabilities representing estimates of amounts needed to pay reported and unreported losses and the related loss adjustment expenses. The process of estimating loss reserves is a difficult and complex exercise involving many variables and subjective judgments. This process may also become more difficult if we experience a period of rising inflation, as has been the case since early 2021.

As part of the reserving process, we review historical data and consider the impact of various factors, such as:

- trends in claim frequency and severity;
- changes in operations;
- changes to mix of business, terms and conditions, limits and layers;
- emerging economic and social trends;
- trends in insurance rates;
- inflation or deflation; and
- changes in the regulatory and litigation environments.

This process assumes that past experience, adjusted for the effects of current developments and anticipated trends, is an appropriate basis for predicting future events. There is no precise method, however, for evaluating the impact of any specific factor on the adequacy of reserves, and actual results will differ from original estimates. As part of the reserving process, we regularly review our loss reserves and make adjustments as necessary. Future increases in loss reserves for our underwriting operations will, and for our programs services operations may, result in additional charges to earnings, which may be material.

In addition, as discussed above, we use analytical models to assist our decision making in loss reserving, and actual results may differ materially from the model outputs and related analyses.

There is generally greater uncertainty in estimating reserves for long-tail coverages, such as general liability, professional liability and workers' compensation, as they require a longer period of time for claims to be reported and settled. The impact of changes in economic and social inflation and medical costs are also more pronounced for long-tail coverages due to the longer settlement period. In addition, reinsurance reserves are subject to greater uncertainty than insurance reserves primarily because a reinsurer relies on (i) the original underwriting decisions and claims decisions made by ceding companies and (ii) information and data from ceding companies. As a result, we are subject to the risk that our ceding companies may not have adequately evaluated the risks reinsured by us and the premiums ceded may not adequately compensate us for the risks we

assume. In addition, reinsurance reserves may be less reliable than insurance reserves because there is generally a longer lapse of time from the occurrence of the event to the reporting of the loss or benefit to the reinsurer and ultimate resolution or settlement of the loss. Reserves for contracts for which we are not the primary insurer, and participate only in excess layers of loss, are also subject to greater uncertainty than insurance reserves for contracts for which we are the primary insurer for many of the same reasons as reinsurance reserves.

Changes in the assumptions and estimates used in establishing reserves for our life and annuity reinsurance book could result in material increases in our estimated loss reserves for such business. Our run-off life and annuity reinsurance book exposes us to mortality risk, which is the risk that the level of death claims may differ from that which we assumed in establishing the reserves for our life and annuity reinsurance contracts. Some of our life and annuity reinsurance contracts expose us to longevity risk, which is the risk that an insured person will live longer than expected when the reserves were established, or morbidity risk, which is the risk that an insured person will become critically ill or disabled. Our reserving process for the life and annuity reinsurance book is designed with the objective of establishing appropriate reserves for the risks we assumed. Among other things, this process relies heavily on analysis of mortality, longevity and morbidity trends, lapse rates, interest rates and expenses. As of December 31, 2022, our reserves for life and annuity benefits totaled $759.0 million.

We expect mortality, morbidity, longevity, and lapse experience to fluctuate somewhat from period to period, but believe they should remain reasonably predictable over a period of many years. Mortality, longevity, morbidity or lapse experience that is less favorable than the mortality, longevity, morbidity or lapse rates that we used in establishing the reserves for a reinsurance agreement will negatively affect our net income because the reserves we originally set for the risks we assumed may not be sufficient to cover the future claims and expense payments. Furthermore, even if the total benefits paid over the life of the contract do not exceed the expected amount, unexpected increases in the incidence of deaths or illness can result in changes to our assumptions in a given reporting period, adversely affecting our net income in any particular reporting period. If there are changes to any of the above factors to the point where a reserve deficiency exists, a charge to earnings will be recorded, which may have a material adverse effect on our results of operations and financial condition.

Ceded Reinsurance

We may be unable to purchase reinsurance protection on terms acceptable to us, or we may be unable to collect on loss recoveries from reinsurers. Our underwriting operations purchase reinsurance and retrocessional reinsurance to manage our net retention on individual risks and mitigate the volatility of losses on our results of operations and financial condition, while providing us with the ability to offer policies with sufficient limits to meet policyholder needs. In addition, we reinsure substantially all of the risks inherent in our program services business, however, we have certain programs that contain limits on our reinsurers' obligations to us that expose us to underwriting risk, including loss ratio caps, aggregate reinsurance limits or exclusion of the credit risk of producers. See note 12 of the notes to consolidated financial statements included under Item 8 for information about ceded reinsurance for our program services businesses.

The ceding of insurance does not legally discharge us from our primary liability for the full amount of the policies. Reliance on reinsurance recoveries may create credit risk as a result of the reinsurer's inability or unwillingness to pay reinsurance claims when due. We generally select well capitalized and highly rated reinsurers and in certain instances we require reinsurers to post substantial collateral to secure the reinsured risks. Deterioration in the credit quality of existing reinsurers or disputes over the terms of reinsurance could result in charges to earnings, which may have a material adverse effect on our results of operations and financial condition. In addition, collateral may not be sufficient to cover the reinsurer's obligation to us, and we may not be able to cause the reinsurer to deliver additional collateral.

As of December 31, 2022, we were the beneficiary of letters of credit, trust accounts and funds withheld in the aggregate amount of $5.0 billion, collateralizing $8.4 billion in reinsurance recoverables. The remaining unsecured reinsurance recoverables are ceded to highly-rated, well capitalized reinsurers. Our reinsurance recoverables are based on estimates, and our actual liabilities may exceed the amount we are able to recover from our reinsurers or any collateral securing the reinsurance recoverables. The failure of a reinsurer to meet its obligations to us, whether due to insolvency, dispute or other unwillingness or inability to pay, or due to our inability to access sufficient collateral to cover our liabilities, could have a material adverse effect on our results of operations and financial condition.

The availability and cost of reinsurance are determined by market conditions beyond our control. There is no guarantee that our desired amounts of reinsurance or retrocessional reinsurance will be available in the marketplace in the future. In addition, available capacity may not be on terms we deem appropriate or acceptable or with companies with whom we want to do

business. This could impact our ability to write certain products and have a material adverse effect on our results of operations and financial condition.

Market Competition and Broker Reliance

Competition in the insurance and reinsurance markets could reduce profits from our insurance operations. Insurance and reinsurance markets are highly competitive. We compete on an international and regional basis with major United States (U.S.), Bermuda, United Kingdom (U.K.), European, and other international insurers and reinsurers and with underwriting syndicates, some of which have greater financial, marketing, and management resources than we do, have greater access to "big data," and may be able to offer a wider range of, or more sophisticated, commercial and personal lines products. Recent industry consolidation, including business combinations among insurance and other financial services companies, has resulted in larger competitors with even greater financial resources. In addition, capital market participants have created alternative products that are intended to compete with reinsurance products.

Similar to other industries, the insurance industry is undergoing rapid and significant technological and other changes. There is increasing focus by traditional insurance industry participants, technology companies, "InsurTech" start-up companies and others on using technology and innovation to simplify and improve the customer experience, increase efficiencies, redesign products, alter business models and effect other potentially disruptive changes in the insurance industry. If we do not anticipate, keep pace with and adapt to technological and other changes impacting the insurance industry, it will harm our ability to compete, decrease the value of our products to customers, and materially and adversely affect our business. Furthermore, innovation, technological change and changing customer preferences in the markets in which we operate also pose other risks to our businesses. For example, they could result in increasing our service, administrative, policy acquisition or general expenses as we seek to distinguish our products and services from those of our competitors or otherwise keep up with such innovation and changes.

Increased competition could result in fewer submissions, lower premium rates, and less favorable policy terms and conditions, which could reduce our underwriting profits, or within our program services operations, our operating profits, and have a material adverse effect on our results of operations and financial condition.

The historical cyclicality in the property and casualty insurance industry could have a material adverse effect on our ability to improve or maintain underwriting profits or to grow or maintain premium volume. The insurance and reinsurance markets have historically been cyclical, characterized by extended periods of intense price competition due to excessive underwriting capacity, and more recently alternative sources of capital, as well as brief periods when shortages of capacity permitted more favorable rate levels. Among our competitive strengths have been our specialty product focus and our niche market strategy. These strengths also make us vulnerable in periods of intense competition to actions by other insurance companies who seek to write additional premiums without appropriate regard for underwriting profitability. At times it could be very difficult for us to grow or maintain premium volume levels without sacrificing underwriting profits. If we are not successful in maintaining rates or achieving rate increases, it may be difficult for us to improve or maintain underwriting profits or to grow or maintain premium volume levels.

Our efforts to develop new products, expand in targeted markets or improve business processes and workflows may not be successful and may increase or create new risks. From time to time, to protect and grow market share or improve our efficiency, we invest in strategic initiatives to:

- develop products that insure risks we have not previously insured, include new coverages or change coverage terms;
- change commission terms;
- change our underwriting processes;
- improve business processes and workflow to increase efficiencies and productivity and to enhance the experience of our customers and producers;
- expand distribution channels; and
- enter geographic markets where we previously have had relatively little or no market share.

We may not be successful in these efforts, and even if we are successful, they may increase or create the following risks, among others:

- demand for new products or expansion into new markets may not meet our expectations;

- new products and expansion into new markets may increase or change our risk exposures, and the data and models we use to manage those exposures may not be as effective as those we use in existing markets or with existing products;
- models underlying automated underwriting and pricing decisions may not be effective;
- efforts to develop new products or markets or to change commission terms may create or increase distribution channel conflicts;
- in connection with the conversion of existing policyholders to a new product, some policyholders' pricing may increase while the pricing for other policyholders may decrease, the net impact of which could negatively impact retention and profit margins; and
- changes to our business processes or workflow, including the use of new technologies, may give rise to execution risk.

These efforts may require us to make substantial expenditures, which may negatively impact results in the near term, and if not successful, could materially and adversely affect our results of operations.

We depend on a few brokers for a large portion of our revenues and the loss of business provided by any one of them could have a material adverse effect on us. We market our insurance and reinsurance worldwide through insurance and reinsurance brokers. For the year ended December 31, 2022, our top three independent brokers represented 28% of the gross premiums written by our underwriting operations. Loss of all or a substantial portion of the business provided by one or more of these brokers could have a material adverse effect on our business.

Financial Strength and Credit Ratings

Our insurance companies and senior debt are rated by various rating agencies, and a downgrade or potential downgrade in one or more of these ratings could have a material adverse effect on us. Financial strength ratings are an important factor in establishing the competitive position of insurance and reinsurance companies. Our senior debt ratings also affect the availability and cost of capital. Certain of our insurance and reinsurance company subsidiaries and our senior debt securities are rated by various rating agencies. Our financial strength and debt ratings are subject to periodic review, and are subject to revision or withdrawal at any time. The financial strength ratings of our insurance subsidiaries are significantly influenced by their statutory surplus amounts and leverage and capital adequacy ratios and other financial metrics. Rating agencies may implement changes to their ratings methodologies or internal models that have the effect of increasing or decreasing the amount of capital our insurance subsidiaries must hold or restrict how the company may deploy its capital in order to maintain its current ratings. For example, for certain of our insurance subsidiaries, rating agencies may take into account in their calculations the collateral provided to us by reinsurers. A change in this practice could adversely impact our ratings. We cannot be sure that we will be able to retain our current, or any future, ratings. If our ratings are reduced from their current levels by one or more rating agencies, our competitive position in our target markets within the insurance industry could suffer and it would be more difficult for us to market our products. A ratings downgrade could result in a substantial loss of business as policyholders and ceding company clients move to other companies with higher claims-paying and financial strength ratings. In addition, a downgrade could trigger contract provisions that allow cedents to terminate their reinsurance contracts on terms disadvantageous to us or require us to collateralize our obligations through trusts or letters of credit. A ratings downgrade could also have a material adverse effect on our liquidity, including the availability of our letter of credit facilities, and limit our access to capital markets, increase our cost of borrowing or issuing debt and require us to post collateral.

The amount of capital that our insurance subsidiaries have and must hold to maintain their financial strength and credit ratings and meet other requirements can vary significantly from time to time and is sensitive to a number of factors, some of which are outside of our control. Capital requirements for our insurance subsidiaries are prescribed by the applicable insurance regulators, while rating agencies establish requirements that inform ratings for our insurance subsidiaries and senior debt securities. Projecting surplus and the related capital requirements is complex and requires making assumptions regarding how our business will perform within the broader macroeconomic environment. Insurance regulators and rating agencies evaluate company capital through financial models that calculate minimum capitalization requirements based on risk-based capital formulas for property and casualty insurance groups and their subsidiaries. In any particular year, capital levels and risk-based capital requirements may increase or decrease depending on a variety of factors including the mix of business written by our insurance subsidiaries and correlation or diversification in the business profile, the amount of additional capital our insurance subsidiaries must hold to support business growth, the value of securities in our investment portfolio, changes in interest rates and foreign currency exchange rates, as well as changes to the regulatory and rating agency models used to determine our required capital.

Insurance Regulation

Our insurance subsidiaries are subject to supervision and regulation that may have a material adverse effect on our operations and financial condition. Our insurance subsidiaries are subject to supervision and regulation by the regulatory authorities in the various jurisdictions in which they conduct business, including foreign and U.S. state insurance regulators. Regulatory authorities have broad regulatory, supervisory and administrative powers relating to, among other things, data protection and data privacy, cybersecurity, solvency standards, licensing, coverage requirements, product terms and conditions, policy rates and forms, business and claims practices, disclosures to consumers, and the form and content of financial reports. In some instances, we follow practices based on our interpretations of regulations or practices that we believe may be generally followed by the industry. These practices may turn out to be different from the interpretations of regulatory authorities. Insurance regulatory authorities have broad authority to initiate investigations or other proceedings, and, in connection with a failure to comply with applicable laws and regulations, could impose adverse consequences, including fines, penalties, injunctions, denial or revocation of an operating license or approval, increased scrutiny or oversight, limitations on engaging in a particular business, or redress to clients. These actions also could result in negative publicity, reputational damage or harm to client, employee or other relationships. Additionally, regulatory and legislative authorities continue to implement enhanced or new regulatory requirements to assure the stability of insurance companies or enhance policyholder protections or, in certain instances, intended to prevent or mitigate future financial crises. Regulatory authorities also may seek to exercise their supervisory or enforcement authority in new or more extensive ways, such as increased capital requirements. These actions, if they occur, could affect the competitive market, as well as the way we conduct our business or manage our capital, and could result in lower revenues and higher costs. As a result, such actions could have a material adverse effect on our results of operations and financial condition.

Regulators may challenge our use of fronting arrangements in states in which our capacity providers are not licensed. Our program services business enters into fronting arrangements with general agents and domestic and foreign insurers that want to access specific U.S. property and casualty insurance business in states in which the capacity providers are not licensed or are not authorized to write particular lines of insurance. Some state insurance regulators may object to these fronting arrangements. In certain states, an insurance commissioner has the authority to prohibit an authorized insurer from acting as an issuing carrier for an unauthorized insurer. In addition, insurance departments in states in which there is no such statutory or regulatory prohibition, could deem the assuming insurer to be transacting insurance business without a license and the issuing carrier to be aiding and abetting the unauthorized sale of insurance.

If regulators in any of the states where we conduct our fronting business were to prohibit or limit those arrangements, we would be prevented or limited from conducting that business for which a capacity provider is not authorized in those states, unless and until the capacity provider is able to obtain the necessary licenses. This could have a material adverse effect on our results of operations and financial condition.

Insurance-Linked Securities

Our ILS operations and our management of third-party capital may expose us to risks. Some of our operating subsidiaries may owe certain legal duties and obligations to third-party investors. A failure to fulfill any of those duties or obligations could result in significant liabilities, penalties or other losses, and harm our businesses and results of operations. In addition, third-party investors may decide not to renew their investments in the funds we manage, which could materially impact the financial condition of those funds, and could, in turn, have a material adverse effect on our results of operations and financial condition. Moreover, we may not be able to maintain or raise additional third-party capital for the funds we manage or for potential new funds and therefore we may forego existing or potential fee income and other income generating opportunities. For example, investment performance at Nephila, as well as the broader ILS market, has been adversely impacted by consecutive years of elevated catastrophe losses, as well as by the COVID-19 pandemic in 2020. These events, as well as volatility in the capital markets, also have impacted investor decisions around allocation of capital to ILS, which in turn have impacted, and may continue to impact, our capital raises and redemptions within the funds we manage, as well as new funds, resulting in a decline in assets under management. See "Critical Accounting Estimates - Goodwill and Intangible Assets" under Item 7. Management's Discussion & Analysis of Financial Condition and Results of Operations for discussion and considerations of these impacts on the valuation of goodwill and intangible assets attributed to our Nephila ILS operations.

Developments at our Markel CATCo operations could have a material adverse effect on us. In December 2018, the U.S. Department of Justice (DOJ), U.S. Securities and Exchange Commission (SEC) and Bermuda Monetary Authority (BMA) initiated inquiries into loss reserves recorded in late 2017 and early 2018 at Markel CATCo Re Ltd. (the Markel CATCo Inquiries). In September 2021, each of the SEC and DOJ notified us that it had concluded its investigation and does not intend

to take any action against Markel CATCo Investment Management Ltd. There are currently no pending requests from the BMA, and it has been over two years since the BMA has contacted the Company in relation to the Markel CATCo Inquiries.

Matters related to or arising from our Markel CATCo operations, including matters of which we are currently unaware, could result in additional claims, litigation, investigations, enforcement actions or proceedings. For example, while prior litigation was dismissed or settled, additional litigation may be filed by investors in the Markel CATCo Funds. We also could become subject to increased regulatory scrutiny, investigations or proceedings in any of the jurisdictions where we operate. If any regulatory authority takes action against us or we enter into an agreement to settle a matter, we may incur sanctions or be required to pay substantial fines or implement remedial measures that could prove costly or disruptive to our businesses and operations. An unfavorable outcome in one or more of these matters, and others we cannot anticipate, could have a material adverse effect on our results of operations and financial condition. Even if an unfavorable outcome does not materialize, these matters, and actions we may take in response, could have an adverse impact on our reputation, limit our access to capital markets and result in substantial expense and disruption.

In addition, we may take steps to mitigate potential risks or liabilities related to or arising from our Markel CATCo operations. For example, see note 21 of the notes to consolidated financial statements included under Item 8 for information regarding a buy-out transaction that accelerated a full return of remaining capital to investors in the Markel CATCo Funds, which are currently in run-off. Other steps we may take to mitigate potential risks or liabilities related to or arising from our Markel CATCo operations could have a material impact on our results of operations or financial condition.

Risks Primarily Related to Our Investments and Access to Capital

Changes in Economic Conditions

Our investment results may be impacted by changes in interest rates, U.S. and international monetary and fiscal policies as well as broader economic conditions. We receive premiums from customers for insuring their risks. We invest these funds until they are needed to pay policyholder claims. Fluctuations in the value of our investment portfolio can occur as a result of changes in interest rates and U.S. and international fiscal, monetary and trade policies as well as broader economic conditions (including, for example, equity market conditions and significant or prolonged inflation or deflation). Although we attempt to take measures to manage the risks of investing in these changing environments, we may not be able to mitigate our sensitivity to them effectively. Despite our mitigation efforts, which include duration and currency targets for asset portfolios, compliance monitoring of these targets and means to reasonably and effectively match asset duration and currency to the duration and currency of the loss reserves, changes in interest rates and U.S. and international fiscal, monetary and trade policies as well as broader economic conditions could have a material adverse effect on our investment results and, consequently, our results of operations and financial condition.

We invest a significant portion of our shareholders' equity in equity securities, which may result in significant variability in our investment results and net income and may have a material adverse effect on shareholders' equity. Additionally, our equity investment portfolio is concentrated, and declines in the value of these significant investments could have a material adverse effect on our financial results and on our ability to carry out our business plans. Equity securities were 59% and 61% of our shareholders' equity at December 31, 2022 and 2021, respectively. Equity securities have historically produced higher returns than fixed maturity securities over long periods of time; however, investing in equity securities may result in significant variability in investment returns from one period to the next. In volatile financial markets, we could experience significant declines in the fair value of our equity investment portfolio, which would result in a material decrease in net income and shareholders' equity. Our equity portfolio is concentrated in particular issuers and industries and, as a result, a decline in the fair value of these concentrated investments also could result in a material decrease in net income and shareholders' equity. A material decrease in shareholders' equity may have a material adverse effect on our ability to carry out our business plans.

Access to Capital

We may require additional capital in the future, which may not be available or may only be available on unfavorable terms. To the extent that cash flows generated by our operations are insufficient to fund future operating requirements, or that our capital position is adversely impacted by a decline in the fair value of our investment portfolio, losses from catastrophe events or otherwise, we may need to raise additional funds through financings or curtail our growth. We also may be required to liquidate fixed maturity securities or equity securities, which may result in realized investment losses. Any further sources of capital, including capacity needed for letters of credit, if available at all, may be on terms that are unfavorable to us. Our access to additional sources of capital will depend on a variety of factors, such as market conditions, the general availability of

credit, the availability of credit to the industries in which we operate, our results of operations, financial condition, credit ratings and credit capacity, as well as pending litigation or regulatory investigations. Our ability to borrow under our revolving credit facility and letter of credit facilities is contingent on our compliance with the covenants and other requirements under those facilities. Similarly, our access to capital may be impaired if regulatory authorities or rating agencies take negative actions against us. Our inability to obtain adequate capital when needed could have a negative impact on our ability to invest in, or take advantage of opportunities to expand, our businesses, such as possible acquisitions or the creation of new ventures, and inhibit our ability to refinance our existing indebtedness on terms acceptable to us. Any of these effects could have a material adverse effect on our results of operations and financial condition.

Our failure to comply with covenants and other requirements under our credit facilities, senior debt and other indebtedness could have a material adverse effect on us. The agreements and indentures relating to our credit facilities, senior debt and other indebtedness, including letter of credit facilities used by certain of our subsidiaries, contain covenants and other requirements. If we fail to comply with those covenants or requirements, the lenders, noteholders or counterparties under those agreements and indentures could declare a default and demand immediate repayment of all amounts owed to them. In addition, where applicable, our lenders may cancel their commitments to lend or issue letters of credit or require us to pledge additional or a different type of collateral. A default under one debt agreement may also put us at risk of a cross-default under other debt agreements or other arrangements. Any of these effects could have a material adverse effect on our results of operations and financial condition.

Our liquidity and our ability to meet our debt and other obligations, and pay dividends on our preferred stock, depend on the receipt of funds from our subsidiaries. We are a holding company, and as a result, our cash flow and our ability to meet our debt and other obligations, and pay dividends on our preferred stock, depend upon the earnings of our subsidiaries and on the distribution of earnings, loans or other payments by our subsidiaries to us. The payment of dividends by our insurance subsidiaries, which account for a significant portion of our operating cash flows, may require prior regulatory notice or approval or may be restricted by capital requirements imposed by regulatory authorities. Similarly, our insurance subsidiaries may require capital contributions from us to satisfy their capital requirements. In addition, our reinsurance contracts typically allow the cedent, upon a reduction in an insurance company's capital in excess of specified amounts, to terminate its contract on terms disadvantageous to us or to exercise other remedies that may adversely affect us. Those contract provisions may have the effect of limiting distributions by our insurance subsidiaries to us.

Risks Related to All of Our Operations

Legal and Regulatory Risks

The legal and regulatory requirements applicable to our businesses are extensive. Failure to comply could have a material adverse effect on us. Each of our businesses is highly dependent on the ability to engage on a daily basis in a large number of financial and operational activities, including, among others, insurance underwriting, claim processing, investment activities, the management of third-party capital and providing products and services to businesses and consumers, many of which are highly complex. These activities are subject to internal guidelines and policies, as well as legal and regulatory requirements, including, among others, those related to privacy and data security, economic and trade sanctions, anti-corruption, anti-bribery and global finance and investments, customer protection and insurance matters. Our continued expansion into new businesses, distribution channels and markets brings about additional requirements. While we believe that we have adopted adequate and effective risk management and compliance programs, compliance risks remain, particularly as we become subject to additional rules and regulations. Failure to comply with, or to obtain, appropriate authorizations or exemptions under any applicable laws and regulations could result in restrictions on our ability to do business or undertake activities that are regulated in one or more of the jurisdictions in which we conduct business. Any such failure could also subject us to fines, penalties, equitable relief and changes to our business practices. In addition, a failure to comply could result in defaults under our senior unsecured debt agreements or credit facilities or damage our businesses or our reputation.

Compliance with applicable laws and regulations is time consuming and personnel- and systems-intensive. Shareholder activism, the current political environment, and the current high level of government intervention and regulatory reform may lead to substantial new regulations and compliance obligations. Any changes in, or the enactment of new, applicable laws and regulations may increase the complexity of the regulatory environment in which we operate, which could materially increase our direct and indirect compliance costs and other expenses of doing business, and have a material adverse effect on our results of operations and financial condition.

Losses from legal and regulatory actions may have a material adverse effect on us. From time to time we may be involved in various legal actions, including at times multi-party or class action litigation, some of which involve claims for substantial

or indeterminate amounts. A significant unfavorable outcome in one or more of these actions could have a material adverse effect on our results of operations and financial condition. We are also involved from time to time in various regulatory actions, investigations and inquiries, including market conduct exams by insurance regulatory authorities. If a regulatory authority takes action against us or we enter into a consent order or agreement to settle a matter, a regulatory authority has the option to require us to pay substantial fines or implement remedial measures that could prove costly or disruptive to our businesses and operations. Even if an unfavorable outcome does not materialize, these matters could have an adverse impact on our reputation and result in substantial expense and disruption. See note 21 of the notes to consolidated financial statements included under Item 8 and Item 3 Legal Proceedings.

We are subject to laws and regulations relating to economic and trade sanctions and bribery and corruption, the violation of which could have a material adverse effect on us. We are required to comply with the economic and trade sanctions and embargo programs administered by the U.S. Department of the Treasury's Office of Foreign Assets Control and similar multi-national bodies and governmental agencies worldwide, as well as applicable anti-corruption laws and anti-bribery and regulations of the U.S. and other jurisdictions where we operate. In some cases we must comply with a large number of new economic, financial and trade sanctions that are imposed over a short period of time, as occurred with the Russia-Ukraine conflict. A violation of a sanction, embargo program, or anti-corruption law, could subject us, and individual employees, to a regulatory enforcement action as well as significant civil and criminal penalties. In addition, a violation could result in defaults under our outstanding indebtedness or credit facilities or damage our businesses or our reputation. Those penalties or defaults, or damage to our businesses or reputation, could have a material adverse effect on our results of operations and financial condition. In some cases the requirements and limitations applicable to the global operations of U.S. companies and their affiliates are more restrictive than, and may even conflict with, those applicable to non-U.S. companies and their affiliates, which also could have a material adverse effect on our results of operations and financial condition.

Employee error and misconduct may be difficult to detect and prevent and may result in significant losses. There have been a number of cases involving misconduct by employees in a broad range of industries in recent years, and we run the risk of misconduct by our employees. Instances of misconduct, fraud, illegal acts, errors, failure to document transactions properly or to obtain proper internal authorization, or failure to comply with regulatory requirements or our internal policies may result in losses or reputational damage. It is not always possible to deter or prevent employee errors or misconduct, and the controls and trainings that we have in place to prevent and detect this activity may not be effective in all cases.

Global Operations

We manage our global operations through a network of business entities, which could result in inconsistent management, governance and oversight practices. We manage our global operations through a network of business entities located in the U.S., Bermuda, the U.K., Europe and elsewhere. These business entities are managed by executives, and supported by shared and centralized services; however, for certain of our businesses, subsidiary-level management is responsible for day-to-day operations, profitability, personnel decisions, the growth of the business, and legal and regulatory compliance, including adherence to applicable local laws. Operating through subsidiary-level management can make it difficult for us to implement strategic decisions and coordinated procedures throughout our global operations. In addition, some of our business entities operate with management, sales, and support personnel that may be insufficient to support growth in their respective locations and industries, without significant central oversight and coordination. We continue to enhance our operating, governance and oversight procedures to effectively support, and improve transparency throughout, our global operations and network of business entities; however, our operating strategy nonetheless could result in inconsistent management, governance, and oversight practices, which may have a material adverse effect on our results of operations and financial condition.

We have substantial international operations and investments, which expose us to increased political, civil, operational and economic risks. A substantial portion of our revenues and income is derived from our operations and investments outside the U.S., including from the U.K., Bermuda and Europe. Our international operations and investments expose us to increased political, civil, operational and economic risks. Deterioration or volatility in foreign and international financial markets or general economic and political and civil conditions could adversely affect our operating results, financial condition and liquidity. Concerns about the economic conditions, capital markets, political, civil and economic stability and solvency of certain countries may contribute to global market volatility. Political and civil changes in the jurisdictions where we operate and elsewhere, some of which may be disruptive, can also interfere with our customers and our activities in a particular location. Our international operations also may be subject to a number of additional risks, particularly in emerging economies, including restrictions such as price controls, capital controls, currency exchange limits, ownership limits and other restrictive or anti-competitive governmental actions or requirements, which could have a material adverse effect on our businesses.

General economic, market or industry conditions could lead to investment losses, adverse effects on our businesses and limit our access to the capital markets. General economic and market conditions and industry specific conditions, including extended economic recessions or expansions; prolonged periods of slow economic growth; inflation or deflation; fluctuations and volatility in foreign currency exchange rates, commodity and energy prices and interest rates; volatility in the credit and capital markets; the imposition of tariffs and other changes in international trade regulation and other factors, could lead to: substantial realized and unrealized investment losses in future periods; declines in demand for, or increased frequency and severity of claims made under, our insurance products; disruptions in global supply chains and increased costs of inputs for our products and services; reduced demand for our services and the products we sell and distribute; and limited or no access to the capital markets. Any of these impacts could have a material adverse effect on our results of operations, financial condition, debt and financial strength ratings or our insurance subsidiaries' capital. Results for many of our Markel Ventures businesses have been, and may continue to be, adversely affected by increased costs of labor and materials, including, with respect to increased materials costs, due to shortages in the availability of certain products, higher shipping costs and inflation. Our efforts to mitigate the impact of these cost increases may not be successful and, even when they are successful, there may be a time lag before the impacts of these efforts are reflected in our results.

Our businesses, results of operations and financial condition could be adversely affected by the ongoing conflict between Russia and Ukraine and related disruptions in the global economy. The global economy has been negatively impacted by the military conflict between Russia and Ukraine. While we have no operations in Russia or Ukraine, some of our businesses have been, and may continue to be, adversely affected by this conflict and its effects. Within our underwriting operations, we have insurance contracts with exposure to losses attributed to the Russia-Ukraine conflict, which we discuss under Item 7 Management's Discussion & Analysis of Financial Condition and Results of Operations. Our other operations do not have significant direct exposure to customers and vendors in Russia or Ukraine. However, certain of our businesses have experienced, and may continue to experience, shortages in materials and increased costs for transportation, energy, and raw materials due in part to the negative impact of the Russia-Ukraine conflict on the global economy.

Furthermore, governments in the U.S., U.K., and European Union, among others, have each imposed export controls on certain products and financial and economic sanctions on certain industry sectors and parties in Russia. These export controls and sanctions, or our failure to comply with them, could result in restrictions on our ability to do business in one or more of the jurisdictions in which we conduct business or have the other adverse effects discussed above under this Item 1A. Risk Factors under "We are subject to laws and regulations relating to economic and trade sanctions and bribery and corruption, the violation of which could have a material adverse effect on us."

We are unable to predict the impact the ongoing conflict will have on our businesses or the global economy. The impact of further escalation of geopolitical tensions related to this conflict, including increased trade barriers or restrictions on global trade, is unknown and could result in, among other things, heightened cybersecurity threats, supply disruptions, protracted or increased inflation, increased energy costs, lower consumer demand, fluctuations in interest and foreign exchange rates and increased volatility in financial markets, any of which could adversely affect our businesses, results of operations and financial condition. In addition, the ongoing conflict may have the effect of triggering or intensifying many of the risks described under this Item 1A Risk Factors under Risks Primarily Related to Our Insurance Operations, Risks Primarily Related to Our Investments and Access to Capital, and Risks Related to All of Our Operations.

Acquisitions, Integration and Retention

The integration of acquired companies may not be as successful as we anticipate. We have completed, and expect to complete, acquisitions in an effort to achieve profitable growth in our underwriting and other insurance operations and to create additional value on a diversified basis in our Markel Ventures operations. Acquisitions present operational, regulatory, strategic and financial risks, as well as risks associated with liabilities arising from the previous operations of the acquired companies. We also must make decisions about the degree to which we integrate acquisitions into our existing businesses, operations and systems, and over what timeframe. Those decisions may adversely affect how successfully the acquired businesses perform, both in the short-term and in the long-term. All of these risks are magnified in the case of a large acquisition. Integration of the operations and personnel of acquired companies may prove more difficult than anticipated, which may result in failure to achieve financial objectives associated with the acquisition or diversion of management attention. In addition, integration of formerly privately-held companies into the management and internal control and financial reporting systems of a publicly-held company presents additional risks. See note 3 of the notes to consolidated financial statements included under Item 8 for information about our recent acquisitions.

Impairment in the value of our goodwill or other intangible assets could have a material adverse effect on our operating results and financial condition. As of December 31, 2022, goodwill and intangible assets totaled $4.4 billion and represented 34% of shareholders' equity. We record goodwill and intangible assets at fair value upon the acquisition of a business. Goodwill represents the excess of amounts paid to acquire businesses over the fair value of the net assets acquired. Goodwill and indefinite-lived intangible assets are evaluated for impairment annually, or more frequently if events or circumstances indicate that their carrying value may not be recoverable. Declines in operating results, divestitures, sustained market declines and other factors that impact the fair value of a reporting unit could result in an impairment of goodwill or intangible assets and, in turn, a charge to net income. Such a charge could have a material adverse effect on our results of operations or financial condition. Developments that adversely affect the future cash flows or earnings of an acquired business may cause the goodwill or intangible assets recorded for it to be impaired. See "Critical Accounting Estimates - Goodwill and Intangible Assets" included under Item 7 Management's Discussion and Analysis of Financial Condition and Results of Operations and note 8 of the notes to consolidated financial statements included under Item 8 for information about our goodwill and intangible assets.

The loss of one or more key executives or an inability to attract and retain qualified personnel could have a material adverse effect on us. Our success depends on our ability to retain the services of our existing key executives and to attract and retain additional qualified personnel in the future. The temporary or permanent loss of the services of any of our key executives or the inability to hire and retain other highly qualified personnel in the future could have a material adverse effect on our ability to conduct or grow our business.

Information Technology Systems and Third-Party Systems and Service Providers

Information technology systems that we use could fail or suffer a security breach or cyberattack, which could have a material adverse effect on us or result in the loss of regulated or sensitive information. Our businesses are dependent upon the operational effectiveness and security of our enterprise systems and those maintained by third parties. Among other things, we rely on these systems to interact with producers, insureds, customers, clients, and other third parties, to perform actuarial and other modeling functions, to underwrite business, to prepare policies and process premiums, to process claims and make claims payments, to prepare internal and external financial statements and information, as well as to engage in a wide variety of other business activities. A significant failure of our enterprise systems, or those of third parties upon which we may rely, whether because of a natural disaster, network outage or a cyberattack on those systems, including ransomware, could compromise our personal, confidential and proprietary information as well as that of our customers and business partners, impede or interrupt our business operations and could result in other negative consequences, including remediation costs, loss of revenue, additional regulatory scrutiny and fines, litigation and monetary and reputational damages. In addition, if we are unable to innovate, develop and acquire new technology, it may leave us more susceptible to these attacks. Like other companies, we have been subject to cyberattacks, malicious viruses and malware, and denial of service attacks and expect that this will continue in the future with greater sophistication and frequency. Despite any controls or protective actions we take against such attacks, those measures may be insufficient to prevent, or mitigate the effects of, a natural disaster, network outage or a cyberattack on our systems. This could result in liability to us, cause our data to be corrupted or stolen and cause us to commit resources to correct those failures.

In addition, we are subject to numerous data privacy and cybersecurity laws and regulations enacted in the jurisdictions in which we do business. A misuse or mishandling of personal, confidential or proprietary information being sent to or received from a customer, business partner, employee or third party could damage our businesses or our reputation or result in significant monetary damages, regulatory enforcement actions, fines and criminal prosecution in one or more jurisdictions. For example, under the European General Data Protection Regulation there are significant punishments for non-compliance which could result in a penalty of up to 4% of a firm's global annual revenue. In addition, a violation of data privacy laws and regulations could result in defaults under our outstanding indebtedness or credit facilities. Those monetary damages, penalties, regulatory or legal actions or defaults, or the damage to our businesses or reputation, could have a material adverse effect on our results of operations and financial condition. Third parties who we utilize to perform certain functions are also subject to these risks, and their failure to adhere to these laws and regulations also could damage our businesses or reputation or result in regulatory intervention, which could have a material adverse effect on our results of operations and financial condition.

Further, we routinely transmit, receive and store personal, confidential and proprietary information by email and other digital means. Although we attempt to protect this personal, confidential and proprietary information, we may be unable to do so in all cases, especially with business partners and other third parties who may not have or use appropriate controls to protect personal, confidential and proprietary information.

While we maintain cyber risk insurance providing first-party and third-party coverages, that insurance may not cover all costs associated with the consequences of an enterprise failure, cyberattack, or breach of systems. A material cyber security breach could have a material adverse effect on our results of operations and financial condition.

Third-party providers may perform poorly, breach their obligations to us or expose us to enhanced risks. Certain of our business functions are performed by third-party providers, and these providers may not perform as expected or may fail to adhere to the obligations owed to us. For example, certain of our business units rely on relationships with a number of third-party administrators under contracts pursuant to which these third-party administrators manage and pay claims on our behalf and advise us with respect to case reserves. In these relationships, we rely on controls incorporated in the provisions of the administration agreement, as well as on the administrator's internal controls, to manage the claims process within our prescribed parameters. In addition, certain of our business units use managing general agents, general agents and other producers to write and administer business on our behalf within prescribed underwriting authorities. Although we monitor these administrators, agents, producers and other service providers on an ongoing basis, our monitoring efforts may not be adequate, or our service providers could exceed their authorities or otherwise breach obligations owed to us, which could result in operational disruption, reputational damage and regulatory intervention and otherwise have a material adverse effect on our results of operation and financial condition.

In addition, we utilize third parties to perform certain technology and business process functions, such as data center hosting, cloud based operating environments, human resources and other outsourced services. We have developed and implemented an outsourcing strategy, however, if third-party providers do not perform as expected, we may experience operational difficulties, increased costs and a loss of business, or we may not realize expected productivity improvements or cost efficiencies. Our use of third parties to perform certain technology and business process functions may expose us to risks related to privacy and data security, which could result in monetary and reputational damages. In addition, our ability to receive services from third-party providers might be impacted by a wide variety of factors, including political and civil instability, supply chain disruptions, volatility or disruptions in the financial markets, wide-spread health issues, unanticipated or additional regulatory requirements or policies. As a result, our ability to conduct our businesses may be adversely affected.

Pandemics

Pandemics have had, and could have, material adverse effects on us. The COVID-19 pandemic has had, and its variants or future pandemics could have, material adverse effects on our underwriting, investment, Markel Ventures and other operations, and on our results of operations and financial condition. The effects of a pandemic, and related governmental responses, may be wide-ranging, costly, disruptive and rapidly changing. Factors that give rise, or may give rise, to those effects include, or may include, the following, as well as others that we cannot predict:

- Insured or reinsured losses from pandemic-related claims that are different, or more extensive, than we expect;
- Government actions or judicial decisions related to insurance or reinsurance coverages or rates, including, for example, requiring retroactive coverage of claims or expanding the scope of coverage;
- Disputes, lawsuits and other legal actions challenging the promptness of coverage determinations, or the coverage determinations themselves, under applicable insurance or reinsurance policies, resulting in increased claims, litigation and related expenses;
- Disruptions, delays and increased costs and risks related to having limited or no access to our facilities, workplace re-entry, employee safety concerns and reductions or interruptions of critical or essential services;
- Continually changing business conditions and compliance obligations; and
- Short or long-term impacts on the cost, availability or timeliness of required raw materials, supplies or services provided by third parties, including services provided by state, federal or foreign governments or government agencies.

In addition, a pandemic may, as has been the case with COVID-19, have the effect of triggering or intensifying many of the risks described elsewhere under this Item 1A. Risk Factors under Risks Primarily Related to Our Insurance Operations, Risks Primarily Related to Our Investments and Access to Capital, and Risks Related to All of Our Operations.

Item 3. LEGAL PROCEEDINGS

Thomas Yeransian v. Markel Corporation

In October 2010, we completed the acquisition of Aspen Holdings, Inc. (Aspen). As part of the consideration for that acquisition, Aspen shareholders received contingent value rights (CVRs). Prior to the December 31, 2017 CVR maturity date, the CVR holder representative, Thomas Yeransian, disputed our prior estimation of the value of the CVRs. On September 15, 2016, Mr. Yeransian filed a suit, Thomas Yeransian v. Markel Corporation (U.S. District Court for the District of Delaware), alleging, among other things, that we are in default under the CVR agreement. The suit seeks: $47.3 million in damages, which represents the unadjusted value of the CVRs; plus interest ($23.6 million through December 31, 2022) and default interest (up to an additional $20.8 million through December 31, 2022, depending on the date any default occurred); and an unspecified amount of punitive damages, costs, and attorneys' fees.

At the initial hearing held February 21, 2017, the court stayed the proceedings and ordered the parties to discuss resolving the dispute pursuant to the independent CVR valuation procedure under the CVR agreement. The parties met on April 5, 2017, but were unsuccessful in reaching agreement on a process for resolving the dispute. We subsequently filed a motion to stay the litigation and compel arbitration, and, on July 31, 2017, the court issued an order granting that motion.

On November 13, 2018, Mr. Yeransian filed a second suit, Thomas Yeransian v. Markel Corporation (U.S. District Court for the District of Delaware), which also alleges that the Company is in default under the CVR agreement. The second suit seeks the same monetary damages and relief as the original suit. We filed a motion to stay this suit until the arbitration for the original suit has concluded and the CVR holders have received the final amount due under the CVR Agreement. The court granted that motion on August 6, 2019.

On June 5, 2020, Yeransian filed a third suit, Thomas Yeransian v. Markel Corporation (U.S. District Court for the District of Delaware). Similar to the first and second suits, the third suit alleges that the Company is in default under the CVR agreement and, in addition, has interfered with the arbitration for the CVR valuation. The third suit seeks the same monetary damages and relief as the original suit and the second suit, as well as other declaratory and non-monetary judgments and orders. We filed a motion to stay this suit, which the court granted on March 16, 2021.

Under the arbitration terms of the CVR Agreement, independent experts were appointed to determine the final value of the CVRs. On September 20, 2021, the experts delivered their report indicating a final CVR valuation of $22.4 million, excluding interest. We had previously paid $8.0 million to the CVR holders, representing 90% of the undisputed value of the CVRs, plus interest of $1.9 million. On September 20, 2021, we paid $20.1 million, which represents $14.1 million for the unpaid portion of the final CVR amount (excluding fees payable to a third party), plus $6.0 million in additional interest.

The stay has been lifted on each pending suit, and the three suits have been consolidated. We have asked the court to dismiss, or grant us summary judgment on, all counts.

We believe Mr. Yeransian's suits to be without merit. We further believe that any material loss resulting from the suits to be remote.

Information About Our Executive Officers

Thomas S. Gayner
Chief Executive Officer since January 2023. Co-Chief Executive Officer from January 2016 to December 2022. President and Chief Investment Officer from May 2010 to December 2015. Chief Investment Officer from January 2001 to December 2015. Director from 1998 to 2004. Director since August 2016. Age 61.

Michael R. Heaton
Executive Vice President since May 2022. President, Markel Ventures from January 2016 to May 2022. President and Chief Operating Officer, Markel Ventures, Inc., a subsidiary, from May 2020 to May 2022; President and Chief Operating Officer, Markel Ventures, Inc., from January 2016 to May 2020. Chief Operating Officer, Markel Ventures, Inc., from September 2013 to December 2015. Age 46.

Andrew G. Crowley
President, Markel Ventures since May 2022. President, Markel Ventures, Inc., a subsidiary, since May 2022. Executive Vice President, Markel Ventures, Inc., from May 2020 to May 2022. Managing Director, Markel Ventures, Inc., from January 2017 to May 2020. Age 40.

Jeremy A. Noble
President, Insurance since January 2023. Senior Vice President and Chief Financial Officer from September 2018 to December 2022. Senior Vice President, Finance from June 2018 to September 2018. Finance Director, Markel International from July 2015 to June 2018. Managing Director, Internal Audit from September 2011 to July 2015. Age 47.

Brian J. Costanzo
Senior Vice President, Finance, Chief Accounting Officer and Controller since October 2022. Principal financial officer since January 2023. Chief Accounting Officer and Controller from June 2021 to October 2022. Controller from December 2019 to June 2021. Segment Controller - U.S. Insurance from March 2014 to December 2019. Age 44.

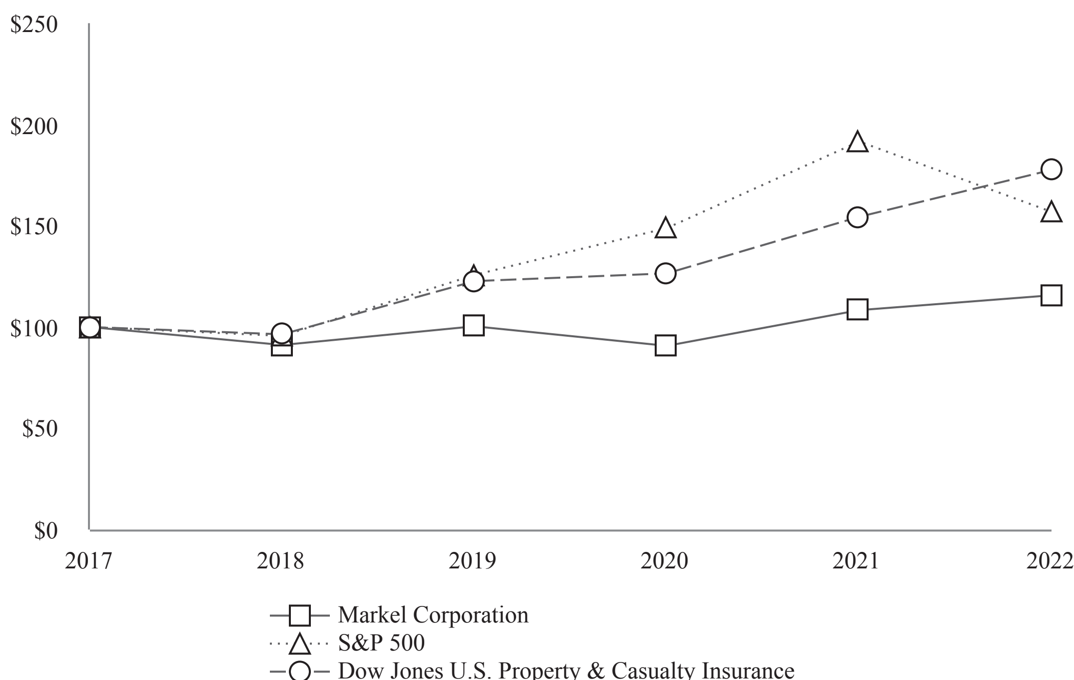
Richard R. Grinnan
Senior Vice President, Chief Legal Officer and Secretary since February 2020. General Counsel and Secretary from June 2014 to February 2020. Assistant General Counsel from August 2012 to June 2014. Age 54.

PART II

Item 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Performance Graph

The following graph compares the cumulative total return (based on share price) on our common stock with the cumulative total return of companies included in the Standard & Poor's (S&P) 500 Index and the Dow Jones U.S. Property & Casualty Insurance Companies Index. We are a diverse financial holding company serving a variety of niche markets, and we believe there are few companies with a mix of business operations comparable to ours. Our principal business markets and underwrites specialty insurance products, and therefore, we have used the Dow Jones U.S. Property & Casualty Insurance Companies Index as our peer group. However, we also own controlling interests in a diverse portfolio of businesses that operate in a variety of industries outside the specialty insurance marketplace. This information is not necessarily indicative of future results.



	Years Ended December 31,					
	2017 [(1)]	2018	2019	2020	2021	2022
Markel Corporation	$ 100	$ 91	$ 100	$ 91	$ 108	$ 116
S&P 500	100	96	126	149	192	157
Dow Jones U.S. Property & Casualty Insurance	100	96	123	126	154	178

(1) $100 invested on December 31, 2017 in our common stock or the listed index. Includes reinvestment of dividends.

Common Stock and Dividend Information

Our common stock trades on the New York Stock Exchange under the symbol MKL. The number of shareholders of record as of February 1, 2023 was approximately 270. The total number of shareholders, including those holding shares in street name or in brokerage accounts, is estimated to be in excess of 210,000. Our current strategy is to retain earnings and, consequently, we have not paid and do not expect to pay a cash dividend on our common stock.

Common Share Repurchases

The following table summarizes our common share repurchases for the quarter ended December 31, 2022.

Issuer Purchases of Equity Securities

	(a) Total Number of Shares Purchased	(b) Average Price Paid per Share	(c) Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs (1)	(d) Approximate Dollar Value of Shares that May Yet Be Purchased Under the Plans or Programs (in thousands)
October 1, 2022 through October 31, 2022	26,454	$ 1,153.94	26,454	$ 555,120
November 1, 2022 through November 30, 2022	19,230	$ 1,249.81	19,230	$ 531,086
December 1, 2022 through December 31, 2022	14,894	$ 1,298.94	14,894	$ 511,740
Total	60,578	$ 1,220.02	60,578	$ 511,740

(1) The Board of Directors approved the repurchase of up to $750 million of our common shares pursuant to a share repurchase program publicly announced in February 2022. Under our share repurchase program, we may repurchase outstanding common shares of our stock from time to time in privately negotiated or open market transactions, including under plans complying with Rule 10b5-1 and Rule 10b-18 under the Securities Exchange Act of 1934. The share repurchase program has no expiration date but may be terminated by the Board at any time.

Securities Authorized for Issuance Under Equity Compensation Plans

See Part III for information on securities authorized for issuance under our equity compensation plans.

Available Information

This document represents Markel Corporation's Annual Report on Form 10-K, which is filed with the U.S. Securities and Exchange Commission. We make available free of charge on or through our website our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and all amendments to those reports as soon as reasonably practicable after such material is electronically filed with or furnished to the U.S. Securities and Exchange Commission. Our website address is www.markel.com.

Transfer Agent

American Stock Transfer & Trust Co., LLC, Operations Center, 6201 15th Avenue, Brooklyn, NY 11219
(800) 937-5449 help@astfinancial.com

Annual Shareholders Meeting

Shareholders, employees and friends of Markel are invited to attend our annual shareholders meeting on May 17, 2023 at the University of Richmond Robins Center at 2:00 p.m. (Eastern Time). More information on the agenda and registration is available at www.markelshareholdersmeeting.com.

Item 7. MANAGEMENT'S DISCUSSION & ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following discussion and analysis includes discussion of changes in our results of operations and financial condition from 2021 to 2022 and should be read in conjunction with the consolidated financial statements and related notes included under Item 8, Item 1 Business, Item 1A Risk Factors and "Safe Harbor and Cautionary Statement" under Item 7. The accompanying consolidated financial statements and related notes have been prepared in accordance with United States (U.S.) generally accepted accounting principles (GAAP) and include the accounts of Markel Corporation and its consolidated subsidiaries, as well as any variable interest entities that meet the requirements for consolidation (the Company). A discussion of changes in our results of operations and financial condition from 2020 to 2021 may be found in Part II Item 7 Management's Discussion and Analysis of Financial Condition and Results of Operations in our 2021 Annual Report on Form 10-K, which was filed with the U.S. Securities and Exchange Commission on February 18, 2022.

Item 7 is divided into the following sections:

- Results of Operations
- Liquidity and Capital Resources
- Critical Accounting Estimates
- Safe Harbor and Cautionary Statement

For a discussion of our significant accounting policies, as well as recently issued accounting pronouncements that we have not yet adopted and their expected effects on our consolidated financial position, results of operations and cash flows, see note 1 of the notes to consolidated financial statements included under Item 8.

Results of Operations

The following table presents the components of operating revenues.

	Years Ended December 31,	
(dollars in thousands)	**2022**	2021
Insurance segment	**$ 6,528,263**	$ 5,465,284
Reinsurance segment	**1,063,347**	1,042,048
Insurance-linked securities, program services and other insurance	**493,746**	342,142
Insurance operations	**8,085,356**	6,849,474
Net investment income	**445,846**	367,406
Net investment gains (losses)	**(1,595,733)**	1,978,534
Other	**(17,661)**	7,184
Investing segment	**(1,167,548)**	2,353,124
Markel Ventures segment	**4,757,527**	3,643,827
Total operating revenues	**$ 11,675,335**	$ 12,846,425

The following table presents the components of comprehensive income (loss) to shareholders.

(dollars in thousands)	Years Ended December 31, 2022	2021
Insurance segment profit	**$ 549,871**	$ 696,413
Reinsurance segment profit (loss)	**83,859**	(55,129)
Insurance-linked securities, program services and other insurance	**295,329**	79,512
Amortization of intangible assets [(1)]	**(99,735)**	(102,971)
Impairment of goodwill [(2)]	**(80,000)**	—
Insurance operations	**749,324**	617,825
Investing segment profit (loss)	**(1,167,548)**	2,353,124
Markel Ventures segment profit [(3)]	**325,238**	272,552
Interest expense	**(196,062)**	(183,579)
Net foreign exchange gains	**140,209**	72,271
Income tax (expense) benefit	**47,636**	(684,458)
Net income attributable to noncontrolling interests	**(112,920)**	(22,732)
Net income (loss) to shareholders	**(214,123)**	2,425,003
Preferred stock dividends	**(36,000)**	(36,000)
Net income (loss) to common shareholders	**(250,123)**	2,389,003
Other comprehensive loss to shareholders	**(1,094,694)**	(346,759)
Comprehensive income (loss) to shareholders	**$ (1,308,817)**	$ 2,078,244

(1) Amortization of intangible assets includes all amortization attributable to our insurance operations. Amortization of intangible assets attributable to our underwriting segments was $38.5 million and $41.2 million for the years ended December 31, 2022 and 2021, respectively; however, we do not allocate amortization of intangible assets between the Insurance and Reinsurance segments. Amortization of intangible assets attributable to our insurance-linked securities, program services and other insurance operations was $61.2 million and $61.8 million for the years ended December 31, 2022 and 2021, respectively.

(2) Impairment of goodwill for the year ended December 31, 2022 was attributable to our Nephila ILS operations.

(3) Segment profit for the Markel Ventures segment includes amortization of intangible assets attributable to Markel Ventures.

Our 2022 results were significantly impacted by decreases in the fair value of our investment portfolio. Net investment losses on our equity portfolio reflect the impact of volatility and overall decline in the public equity markets. The decreases in the fair value of our fixed maturity portfolio were primarily due to increases in interest rates in 2022. Volatility in the public equity and bond markets reflects the impact of economic uncertainty and broader market conditions, which are impacting all three of our operating engines, including high levels of inflation, rising interest rates and global supply chain disruptions.

The change in comprehensive income (loss) to shareholders in 2022 compared to 2021 was primarily due to pre-tax net investment losses of $1.6 billion in 2022, compared to pre-tax net investment gains of $2.0 billion in 2021, as well as pre-tax net unrealized losses on our fixed maturity securities of $1.5 billion in 2022 compared to $504.1 million in 2021.

The components of net income (loss) to shareholders and comprehensive income (loss) to shareholders are discussed in further detail under "Insurance Results," "Investing Results," "Markel Ventures Results," "Interest Expense, Net Foreign Exchange Gains and Income Taxes" and "Comprehensive Income (Loss) to Shareholders and Book Value per Common Share."

Insurance Results

Our Insurance engine includes our underwriting, insurance-linked securities (ILS), program services and other fronting operations. We have a suite of capabilities through which we can access capital to support our customers' risks, which includes our own capital through our underwriting operations and third-party capital through our ILS and program services operations. Our underwriting operations, which are primarily comprised of our Insurance and Reinsurance segments, produce revenues primarily by underwriting insurance contracts and earning premiums in the specialty insurance market. Our insurance-linked securities and program services operations produce revenues primarily through fees earned for investment management services and fronting services, respectively. Our insurance operations also include the underwriting results of run-off lines of business that were discontinued prior to, or in conjunction with, insurance acquisitions, and the results of our run-off life and annuity reinsurance business. The following table presents the components of our Insurance engine gross premium volume and operating revenues.

(dollars in thousands)	Years Ended December 31,		
	2022	2021	% Change
Gross premium volume:			
Underwriting	**$ 9,847,538**	$ 8,485,929	16 %
Program services and other fronting [(1)]	**3,354,144**	2,952,753	14 %
Insurance operations	**$ 13,201,682**	$ 11,438,682	15 %
Operating revenues:			
Insurance segment	**$ 6,528,263**	$ 5,465,284	19 %
Reinsurance segment	**1,063,347**	1,042,048	2 %
Insurance-linked securities, program services and other insurance	**493,746**	342,142	44 %
Insurance operations	**$ 8,085,356**	$ 6,849,474	18 %

(1) Substantially all gross premiums from our program services business and other fronting arrangements were ceded to third parties for the years ended December 31, 2022 and 2021.

Underwriting Results

Underwriting profits are a key component of our strategy to build shareholder value. We believe that the ability to achieve consistent underwriting profits demonstrates knowledge and expertise, commitment to superior customer service and the ability to manage insurance risk. The property and casualty insurance industry commonly defines underwriting profit or loss as earned premiums net of losses and loss adjustment expenses and underwriting, acquisition and insurance expenses. We use underwriting profit or loss and the combined ratio as a basis for evaluating our underwriting performance. The U.S. GAAP combined ratio is a measure of underwriting performance and represents the relationship of incurred losses, loss adjustment expenses and underwriting, acquisition and insurance expenses to earned premiums. The combined ratio is the sum of the loss ratio and the expense ratio. The loss ratio represents the relationship of incurred losses and loss adjustment expenses to earned premiums. The expense ratio represents the relationship of underwriting, acquisition and insurance expenses to earned premiums. A combined ratio less than 100% indicates an underwriting profit, while a combined ratio greater than 100% reflects an underwriting loss.

In addition to the U.S. GAAP combined ratio, loss ratio and expense ratio, we also evaluate our underwriting performance using measures that exclude the impacts of certain items on these ratios. We believe these adjusted measures, which are non-GAAP measures, provide financial statement users with a better understanding of the significant factors that comprise our underwriting results and how management evaluates underwriting performance.

When analyzing our combined ratio, we exclude current accident year losses and loss adjustment expenses attributed to natural catastrophes. We also exclude losses and loss adjustment expenses attributed to certain significant, infrequent loss events, for example, the COVID-19 pandemic and the military conflict between Russia and Ukraine that began following Russia's invasion of Ukraine in February 2022. Due to the unique characteristics of a catastrophe loss and other significant, infrequent events, there is inherent variability as to the timing or loss amount, which cannot be predicted in advance. We believe measures that exclude the effects of catastrophe events, COVID-19 and the Russia-Ukraine conflict are meaningful to understand the underlying trends and variability in our underwriting results that may be obscured by these items.

When analyzing our loss ratio, we evaluate losses and loss adjustment expenses attributable to the current accident year separate from losses and loss adjustment expenses attributable to prior accident years. Prior accident year reserve development, which can either be favorable or unfavorable, represents changes in our estimates of losses and loss adjustment expenses related to loss events that occurred in prior years. We believe a discussion of current accident year loss ratios, which exclude prior accident year reserve development, is helpful since it provides more insight into estimates of current underwriting performance and excludes changes in estimates related to prior year loss reserves. We also analyze our current accident year loss ratio excluding losses and loss adjustment expenses attributable to catastrophes and, in 2022, the Russia-Ukraine conflict. The current accident year loss ratio excluding the impact of catastrophes and other significant, infrequent loss events is also commonly referred to as an attritional loss ratio within the property and casualty insurance industry.

The following table presents summary data for our consolidated underwriting operations, which are comprised predominantly of our Insurance and Reinsurance segments. Our consolidated underwriting results also include results from discontinued lines of business and the retained portion of our program services operations.

	Years Ended December 31,		
(dollars in thousands)	**2022**	2021	% Change
Gross premium volume	**$ 9,843,555**	$ 8,480,494	16 %
Net written premiums	**$ 8,203,390**	$ 7,119,731	15 %
Earned premiums	**$ 7,587,792**	$ 6,503,029	17 %
Underwriting profit	**$ 626,620**	$ 628,085	— %
Underwriting Ratios [1]			Point Change
Loss ratio			
Current accident year loss ratio	**60.8 %**	62.4 %	(1.6)
Prior accident years loss ratio	**(2.2)%**	(7.4)%	5.2
Loss ratio	**58.6 %**	55.1 %	3.5
Expense ratio	**33.2 %**	35.3 %	(2.1)
Combined ratio	**91.7 %**	90.3 %	1.4
Current accident year loss ratio catastrophe impact [2]	**0.6 %**	3.0 %	(2.4)
Current accident year loss ratio Russia-Ukraine conflict impact [2]	**0.5 %**	— %	0.5
Prior accident years loss ratio COVID-19 impact [2]	**(0.1)%**	0.2 %	(0.3)
Current accident year loss ratio, excluding catastrophes and Russia-Ukraine conflict	**59.7 %**	59.4 %	0.3
Combined ratio, excluding current year catastrophes, Russia-Ukraine conflict and COVID-19	**90.7 %**	87.1 %	3.6

(1) Amounts may not reconcile due to rounding.

(2) The point impact of catastrophes, the Russia-Ukraine conflict and COVID-19 is calculated as the associated net losses and loss adjustment expenses divided by total earned premiums.

Premiums

The increase in gross premium volume in our underwriting operations in 2022 was driven by growth within our Insurance segment across all product lines. Net retention of gross premium volume for our underwriting operations was 83% in 2022 compared to 84% in 2021. The decrease in net retention in 2022 was driven by lower retention within our Insurance segment, partially offset by higher retention within our Reinsurance segment. Within our underwriting operations, we purchase reinsurance and retrocessional reinsurance to manage our net retention on individual risks and overall exposure to losses and to enable us to write policies with sufficient limits to meet policyholder needs. The increase in earned premiums in our underwriting operations in 2022 was primarily attributable to higher gross premium volume.

Since 2018, we have seen rate strengthening across most product lines following the continued high level of natural catastrophes and significant losses attributed to the COVID-19 pandemic, as well as general market conditions. However, we began to see rate increases moderate on many of our product lines in 2022. In some product lines, such as directors and officers, we even began to see single digit rate decreases in the latter part of 2022. The overall strengthening of rates in recent years has been most prominent within our professional liability and general liability product lines, reflecting the impacts of both economic and social inflation on loss costs. Recent increases in economic and social inflation have created more uncertainty around the ultimate losses that will be incurred to settle claims on these longer-tail product lines. These factors, as well as the impacts of the low interest rate environment on interest income in recent years, have contributed to the strong rate environment. The primary exception to the favorable rate environment is workers' compensation, where we continue to see low single digit rate decreases given generally favorable loss experience in recent years. When we believe the prevailing market price will not support our underwriting profit targets, the business is not written. As a result of our underwriting discipline, gross premium volume may vary when we alter our product offerings to maintain or improve underwriting profitability.

Combined Ratio

In 2022, underwriting results included $46.2 million and $35.7 million of net losses and loss adjustment expenses attributed to Hurricane Ian and the Russia-Ukraine conflict, respectively. The net losses and loss adjustment expenses from Hurricane Ian and the Russia-Ukraine conflict were net of ceded losses of $115.3 million and $44.3 million, respectively. In 2021, underwriting results included $195.0 million of net losses and loss adjustment expenses attributed to Winter Storm Uri, the floods in Europe and Hurricane Ida (2021 Catastrophes), as well as $15.7 million of net losses and loss adjustment expenses resulting from an increase in our net estimate of ultimate losses and loss adjustment expenses attributed to COVID-19. The net losses and loss adjustment expenses from the 2021 Catastrophes were net of ceded losses of $221.7 million. Excluding these losses from the respective periods, the increase in our consolidated combined ratio in 2022 compared to 2021 was driven by the impact of less favorable development on prior accident years loss reserves within our Insurance segment in 2022 compared to 2021, partially offset by a lower expense ratio within our Insurance segment.

Russia-Ukraine Conflict

Our results reflect underwriting losses from the military conflict between Russia and Ukraine that began following Russia's invasion of Ukraine in February 2022. The ongoing conflict has also contributed to certain aspects of the current economic conditions impacting all of our operations. For further discussion regarding the Russia-Ukraine conflict and risks related to our businesses, see the risk factor titled "Our businesses, results of operations and financial condition could be adversely affected by the ongoing conflict between Russia and Ukraine and related disruptions in the global economy" under Item 1A Risk Factors.

Our losses and loss adjustment expenses from the Russia-Ukraine conflict are primarily attributed to business written within our international insurance and reinsurance operations and are primarily associated with war and terrorism coverages within our marine and energy product lines, as well as our trade credit and surety product lines. We purchase significant excess of loss reinsurance on the impacted product lines to reduce our net exposures, resulting in significant ceded losses. See note 11 of the notes to consolidated financial statements included under Item 8 for further details on our estimate of ultimate gross and net losses and loss adjustment expenses attributed to the Russia-Ukraine conflict.

COVID-19 Pandemic

Our losses from the COVID-19 pandemic were primarily attributed to business written within our international insurance operations and were primarily associated with coverages for event cancellation and business interruption losses on policies where no specific pandemic exclusion existed. Our estimates of ultimate gross and net losses and loss adjustment expenses attributed to COVID-19 are based on reported claims and still include assumptions about coverage, liability and ceded reinsurance contract attachment, which, in some cases, remain subject to judicial review, and represent our best estimate as of December 31, 2022 based upon information currently available. We continue to closely monitor reported claims, claim settlements, ceded reinsurance contract settlements and judicial decisions and may adjust our estimates as new information becomes available.

Insurance Segment

(dollars in thousands)	Years Ended December 31, 2022	2021	% Change
Gross premium volume	**$ 8,606,700**	$ 7,239,676	19 %
Net written premiums	**$ 7,040,176**	$ 5,998,890	17 %
Earned premiums	**$ 6,528,263**	$ 5,465,284	19 %
Underwriting profit	**$ 549,871**	$ 696,413	(21)%
Underwriting Ratios [1]			Point Change
Loss ratio			
Current accident year loss ratio	**60.3 %**	60.6 %	(0.3)
Prior accident years loss ratio	**(2.2)%**	(9.3)%	7.1
Loss ratio	**58.1 %**	51.3 %	6.8
Expense ratio	**33.5 %**	35.9 %	(2.4)
Combined ratio	**91.6 %**	87.3 %	4.3
Current accident year loss ratio catastrophe impact [2]	**0.7 %**	1.7 %	(1.0)
Current accident year loss ratio Russia-Ukraine conflict impact [2]	**0.4 %**	— %	0.4
Prior accident years loss ratio COVID-19 impact [2]	**0.0 %**	(0.1)%	0.1
Current accident year loss ratio, excluding catastrophes and Russia-Ukraine conflict	**59.2 %**	58.9 %	0.3
Combined ratio, excluding current year catastrophes, Russia-Ukraine conflict and COVID-19	**90.6 %**	85.6 %	5.0

(1) Amounts may not reconcile due to rounding.

(2) The point impact of catastrophes, the Russia-Ukraine conflict and COVID-19 is calculated as the associated net losses and loss adjustment expenses divided by total earned premiums.

Premiums

The increase in gross premium volume in our Insurance segment in 2022 was driven by new business volume, strong policy retention levels, more favorable rates and expanded product offerings, resulting in growth across all of our product lines, most notably in our general liability and professional liability product lines. Net retention of gross premium volume was 82% in 2022 compared to 83% in 2021. The decrease in net retention for the year ended December 31, 2022 was primarily due to higher cession rates on our professional liability and personal lines product lines in 2022 compared to 2021, partially offset by the impact of higher retention rates on new programs business. The increase in earned premiums in 2022 was primarily due to higher gross premium volume.

Combined Ratio

The Insurance segment's current accident year losses and loss adjustment expenses in 2022 included $46.2 million and $23.0 million of net losses and loss adjustment expenses attributed to Hurricane Ian and the Russia-Ukraine conflict, respectively. Current accident year losses in 2021 included $94.7 million of net losses and loss adjustment expenses attributed to the 2021 Catastrophes. Excluding these losses from the respective periods, the current accident year loss ratio in 2022 was consistent with 2021. Despite achieving higher premium rates on our professional liability and general liability product lines, we generally kept our estimates of ultimate loss ratios on these product lines for the 2022 accident year consistent with the 2021 accident year due to the unfavorable claims trend within these product lines on prior accident years during 2022 arising from current and anticipated levels of economic and social inflation.

The Insurance segment's 2022 combined ratio included $142.9 million of favorable development on prior accident years loss reserves compared to $506.3 million in 2021. The decrease in favorable development was primarily due to adverse development on our professional liability and general liability product lines in 2022 compared to favorable development in 2021. Adverse development on our professional liability and general liability product lines in 2022 was primarily attributable to unfavorable claim settlements and increased claim frequency and severity on a number of products, including directors and officers, errors and omissions and employment practices liability within professional liability and contractors and excess and umbrella within general liability. Development on prior years loss reserves within our professional liability and general liability product lines in 2022 was impacted by broader market conditions, including the effects of economic and social inflation. These factors have created more uncertainty around the ultimate losses that will be incurred to settle claims on these longer-tail product lines, and as a result, we are approaching reductions to prior year loss reserves on more recent accident years cautiously. Consistent with our reserving philosophy, we are responding quickly to increase loss reserves following any indication of increased claims frequency or severity in excess of our previous expectations, whereas in instances where claims trends are more favorable than we previously anticipated, we are often waiting to reduce loss reserves and will evaluate our experience over additional periods of time.

In 2022, favorable development was most significant on our workers' compensation, programs, property and credit and surety product lines. In 2021, favorable development was most significant on our general liability, property, workers' compensation, professional liability and marine and energy product lines. See note 11 of the notes to consolidated financial statements included under Item 8 for more information on the Insurance segment's prior year loss reserve development.

The decrease in the Insurance segment's expense ratio in 2022 was primarily due to the favorable impact of higher earned premiums in 2022 while maintaining consistent levels of general expenses with 2021, as we continue to focus on scaling our insurance operations.

Reinsurance Segment

	Years Ended December 31,		
(dollars in thousands)	**2022**	2021	% Change
Gross premium volume	**$ 1,229,851**	$ 1,246,143	(1)%
Net written premiums	**$ 1,167,312**	$ 1,126,167	4 %
Earned premiums	**$ 1,063,347**	$ 1,042,048	2 %
Underwriting profit (loss)	**$ 83,859**	$ (55,238)	NM [1]
Underwriting Ratios [2]			Point Change
Loss ratio			
Current accident year loss ratio	**63.6 %**	72.0 %	(8.4)
Prior accident years loss ratio	**(2.4)%**	1.9 %	(4.3)
Loss ratio	**61.2 %**	73.9 %	(12.7)
Expense ratio	**30.9 %**	31.4 %	(0.5)
Combined ratio	**92.1 %**	105.3 %	(13.2)
Current accident year loss ratio catastrophe impact [3] [4]	**— %**	9.6 %	(9.6)
Current accident year loss ratio Russia-Ukraine impact [3]	**1.2 %**	— %	1.2
Prior accident years loss ratio COVID-19 impact [3]	**(0.3)%**	2.1 %	(2.4)
Current accident year loss ratio, excluding catastrophes and Russia-Ukraine conflict	**62.4 %**	62.3 %	0.1
Combined ratio, excluding current year catastrophes, Russia-Ukraine conflict and COVID-19	**91.2 %**	93.6 %	(2.4)

(1) NM - Ratio is not meaningful

(2) Amounts may not reconcile due to rounding.

(3) The point impact of catastrophes, the Russia-Ukraine conflict and COVID-19 is calculated as the associated net losses and loss adjustment expenses divided by total earned premiums.

(4) The point impact of catastrophes does not include the favorable impact of assumed reinstatement premiums associated with the 2021 Catastrophes of $21.7 million for the year ended December 31, 2021. Reinstatement premiums were not significant for the year ended December 31, 2022.

Premiums

The modest decrease in gross premium volume in our Reinsurance segment in 2022 was primarily attributable to non-renewals within our property product lines and the non-renewal of a large treaty within our workers' compensation product line, largely offset by the impact of new business, primarily within our general liability and professional liability product lines, and more favorable premium adjustments within our credit and surety product lines. We discontinued writing property retrocessional reinsurance in 2022 and property reinsurance in 2021, which resulted in a $123.3 million reduction in gross premium volume in 2022 compared to 2021. Significant variability in gross premium volume can be expected in our Reinsurance segment due to individually significant contracts and multi-year contracts.

Net retention of gross premium volume was 95% in 2022 compared to 90% in 2021. The increase in net retention was driven by changes in mix of business. We have experienced growth in highly retained product lines during the year, while the non-renewed property business had a lower retention rate than the rest of the segment.

The increase in earned premiums in 2022 was primarily attributable to growth in gross premium volume within our professional liability and general liability product lines in recent periods, partially offset by the impact of lower gross premiums within our property product lines.

Combined Ratio

The Reinsurance segment's current accident year losses and loss adjustment expenses in 2022 included $12.7 million of net losses and loss adjustment expenses attributed to the Russia-Ukraine conflict. Current accident year losses in 2021 included $100.3 million of net losses and loss adjustment expenses attributed to the 2021 Catastrophes. Excluding these losses from the respective periods, the current accident year loss ratio in 2022 was consistent with 2021. The benefit of higher premium rates on our general liability and professional liability product lines and more favorable premium adjustments in 2022 compared to 2021 was offset by the unfavorable impact of changes in the mix of business within the segment and the benefit in 2021 of $21.7 million of favorable assumed reinstatement premiums on catastrophes. The change in mix of business had an unfavorable impact as the non-renewed property business had a lower attritional loss ratio than the rest of the segment.

The Reinsurance segment's 2022 combined ratio included $26.1 million of favorable development on prior accident years loss reserves, which was primarily attributable to favorable development within our property product lines related to natural catastrophes and our credit and surety product lines. Favorable development on prior years loss reserves in 2022 was partially offset by additional exposures recognized on prior accident years related to net favorable premium adjustments on our general liability, credit and surety and professional liability product lines. In 2021, the combined ratio included $19.9 million of adverse development on prior accident years loss reserves, which was primarily attributable to net adverse development on natural catastrophes and COVID-19 within our property product lines, as well as additional exposures recognized on prior accident years related to net favorable premium adjustments on our professional liability product lines. See note 11 of the notes to consolidated financial statements included under Item 8 for more information on the Reinsurance segment's prior year loss reserve development.

Insurance-linked Securities, Program Services and Other Insurance

The following table presents the components of operating revenues and operating expenses attributable to our insurance-linked securities, program services and other insurance operations, including our run-off block of life and annuity reinsurance contracts, none of which are included in a reportable segment. Underwriting results attributable to these operations include results from discontinued lines of business, which are reported separate from our Insurance and Reinsurance segments, and the retained portion of our program services operations. Investment income earned on the investments that support life and annuity policy benefit reserves are included in our Investing segment.

	Years Ended December 31,					
	2022			2021		
(dollars in thousands)	Operating revenues	Operating expenses	Net	Operating revenues	Operating expenses	Net
Services and other:						
Insurance-linked securities	**$ 109,020**	**$ 125,316**	**$ (16,296)**	$ 202,019	$ 186,510	$ 15,509
Insurance-linked securities - disposition gains	**225,828**	**—**	**225,828**	—	—	—
Program services and other fronting	**149,993**	**27,613**	**122,380**	125,716	20,132	105,584
Life and annuity	**1,040**	**10,723**	**(9,683)**	1,515	16,667	(15,152)
Markel CATCo buy-out	**—**	**101,904**	**(101,904)**	—	—	—
Markel CATCo Re	**—**	**(89,862)**	**89,862**	—	—	—
Other	**11,683**	**19,431**	**(7,748)**	17,195	30,534	(13,339)
	497,564	**195,125**	**302,439**	346,445	253,843	92,602
Underwriting	**(3,818)**	**3,292**	**(7,110)**	(4,303)	8,787	(13,090)
	493,746	**198,417**	**295,329**	342,142	262,630	79,512
Amortization of intangible assets		**61,202**	**(61,202)**		61,789	(61,789)
Impairment of goodwill		**80,000**	**(80,000)**		—	—
	$ 493,746	**$ 339,619**	**$ 154,127**	$ 342,142	$ 324,419	$ 17,723

Insurance-Linked Securities

The decrease in operating revenues and operating expenses in our Nephila insurance-linked securities operations in 2022 was primarily due to the disposition of our Velocity and Volante managing general agent operations during the year. Operating losses in 2022 were driven by costs incurred by Volante in connection with its launch of a Lloyd's of London syndicate prior to disposition.

Since our acquisition of Nephila in 2018, we experienced significant growth in the Velocity and Volante managing general agent operations. In 2022, we realized the significant value created since 2018 through the sale of Velocity and Volante. We sold the majority of our controlling interest in Velocity in February 2022 for total cash consideration of $181.3 million, which resulted in a gain of $107.3 million. Velocity provides risk origination services for our Nephila fund management operations, as well as for third parties, and was a source of growth within our ILS operations since we acquired Nephila in 2018. We continue to have a minority interest in Velocity after the sale, and Velocity will continue to be a source for risk origination for our Nephila fund management operations. We sold our controlling interest in Volante in October 2022 for total cash consideration of $181.9 million of which $155.6 million was cash. This transaction resulted in a gain of $118.5 million. Volante, which has also been a source of growth within our ILS operations, underwrites and administers specialty insurance and reinsurance policies and provides delegated underwriting services to third-party providers of insurance capital.

Following the sales of our Velocity and Volante managing general agent operations, our Nephila ILS operations are solely comprised of our fund management operations. Since acquiring Nephila in 2018, investment performance in the broader ILS market has been adversely impacted by consecutive years of elevated catastrophe losses, most recently with Hurricane Ian in 2022. These events, as well as recent volatility in the capital markets, have impacted investor decisions around allocation of capital to ILS, which in turn has impacted our capital raises and redemptions within the funds we manage. Additionally, increases in the cost of capital during 2022 further impacted the estimated fair value of our fund management operations, and ultimately resulted in an $80.0 million partial impairment of goodwill in 2022. Nephila's net assets under management were $7.2 billion as of December 31, 2022. See "Critical Accounting Estimates - Goodwill and Intangible Assets" for further discussion of goodwill impairment at our Nephila ILS operations.

Program Services and Other Fronting

The increase in operating revenues in our program services and other fronting operations in 2022 was primarily due to higher gross earned premium, on which our fees are based, in 2022 compared to 2021, driven by the expansion of existing programs and growth from new programs, as well as the growth of our other fronting arrangements. Gross written premiums in our program services operations were $2.8 billion and $2.7 billion for the years ended December 31, 2022 and 2021, respectively. Gross written premiums from our other fronting operations, which consist of business written by our underwriting platform on behalf of our ILS operations, were $553.9 million and $223.5 million for the years ended December 31, 2022 and 2021, respectively.

Markel CATCo Buy-Out

In March 2022, we completed a buy-out transaction with Markel CATCo Re Ltd. (Markel CATCo Re) and Markel CATCo Reinsurance Fund Ltd. (the Markel CATCo Funds) that provided for an accelerated return of all remaining capital to investors in the Markel CATCo Funds and resulted in the consolidation of Markel CATCo Re upon completion of the transaction. In order to complete the transaction, we made $101.9 million in payments, net of insurance proceeds, to or for the benefit of investors that were recognized as an expense during the first quarter of 2022. In 2022, results attributable to Markel CATCo Re were primarily related to favorable loss reserve development on the run-off of the reinsurance contracts, all of which were attributable to noncontrolling interest holders in Markel CATCo Re. See note 17 of the notes to consolidated financial statements for further details regarding our Markel CATCo operations and the consolidation of Markel CATCo Re and note 21 for further details about the buy-out transaction.

Investing Results

Our business strategy recognizes the importance of both consistent underwriting and operating profits and superior investment returns to build shareholder value. We rely on sound underwriting practices to produce investable funds. We measure our investment performance by analyzing net investment income earned on our investment portfolio, as well as through net investment gains, which includes unrealized gains on our equity portfolio, and the change in net unrealized gains on available-for-sale investments. Our performance measures also include investment yield and taxable equivalent total investment return. Other income or losses within our investing operations primarily relate to equity method investments in our investing segment, which are managed separately from the rest of our investment portfolio. Based on the potential for volatility in the financial markets, we believe investment performance is best analyzed over several years.

The following table summarizes our consolidated investment performance, which consists predominantly of the results of our Investing segment.

	Years Ended December 31,				
(dollars in thousands)	**2022**	2021	2020	2019	2018
Net investment income	**$ 446,755**	$ 367,417	$ 375,826	$ 442,182	$ 435,258
Net investment gains (losses)	**$(1,595,733)**	$1,978,534	$ 617,979	$1,601,722	$ (437,596)
Change in net unrealized gains (losses) on available-for-sale investments [1]	**$(1,407,316)**	$ (450,096)	$ 442,089	$ 381,890	$ (299,446)
Other	**$ (17,661)**	$ 7,184	$ (3,996)	$ 9,706	$ (1,043)
Investment Ratios					
Investment yield [2]	**2.2 %**	2.0 %	2.4 %	2.9 %	2.8 %
Taxable equivalent total investment return	**(9.5)%**	8.8 %	9.4 %	14.6 %	(1.0)%

(1) The change in net unrealized gains (losses) on available-for-sale investments included a benefit related to an adjustment to decrease our life and annuity benefit reserves of $56.6 million and $63.0 million for the years ended December 31, 2022 and 2021, respectively, and a loss related to an adjustment to increase our life and annuity benefit reserves of $68.2 million and $51.4 million for the years ended December 31, 2020 and 2019, respectively. There was no adjustment to our life and annuity benefit reserves for the year ended December 31, 2018. See note 13 of the notes to consolidated financial statements included under Item 8 for details on our life and annuity benefit reserve adjustments.

(2) Investment yield reflects net investment income as a percentage of monthly average invested assets at amortized cost.

The increase in net investment income in 2022 was primarily attributable to higher interest income on short-term investments and cash equivalents due to higher short-term interest rates in 2022 compared to 2021. Additionally, interest income on our fixed maturity securities increased in 2022, primarily attributable to higher average holdings of fixed maturity securities,

partially offset by a lower yield during 2022 compared to 2021. See note 4(d) of the notes to consolidated financial statements included under Item 8 for further details regarding the components of net investment income.

Net investment losses in 2022 were primarily attributable to decreases in the fair value of our equity portfolio driven by unfavorable market value movements in 2022. Net investment gains in 2021 were primarily attributable to increases in the fair value of our equity portfolio driven by favorable market value movements in 2021. See note 4(e) of the notes to consolidated financial statements included under Item 8 for further details on the components of net investment gains (losses).

The change in net unrealized gains (losses) on available-for-sale investments in 2022 and 2021 was attributable to decreases in the fair value of our fixed maturity investment portfolio as a result of increases in interest rates during 2022 and 2021.

Taxable equivalent total investment return is a non-GAAP financial measure. Taxable equivalent total investment return includes items that impact net income, such as coupon interest on fixed maturity securities, changes in fair value of equity securities, dividends on equity securities and realized investment gains or losses on available-for-sale securities, as well as changes in unrealized gains or losses on available-for-sale securities, which do not impact net income. Certain items that are included in net investment income have been excluded from the calculation of taxable equivalent total investment return, such as amortization and accretion of premiums and discounts on our fixed maturity portfolio, to provide a comparable basis for measuring our investment return against industry investment returns. The calculation of taxable equivalent total investment return also includes the current tax benefit associated with income on certain investments that is either taxed at a lower rate than the statutory income tax rate or is not fully included in U.S. taxable income. We believe the taxable equivalent total investment return is a better reflection of the economics of our decision to invest in certain asset classes. We focus on our long-term investment return, understanding that the level of investment gains or losses may vary from one period to the next.

We believe our investment performance is best analyzed using taxable equivalent total investment return over several years. The following table presents taxable equivalent total investment return before and after the effects of foreign currency movements.

	Years Ended December 31,					Five-Year Annual Return	Ten-Year Annual Return	Twenty-Year Annual Return
	2022	2021	2020	2019	2018			
Equities	**(16.0)%**	29.6 %	15.2 %	30.0 %	(3.5)%	**9.5 %**	**13.2 %**	**11.0 %**
Fixed maturity securities, cash and short-term investments [1]	**(5.8)%**	(0.7)%	5.7 %	6.5 %	1.3 %	**1.3 %**	**2.0 %**	**3.6 %**
Total portfolio, before foreign currency effect	**(9.2)%**	9.0 %	8.6 %	14.4 %	(0.7)%	**4.1 %**	**5.1 %**	**5.5 %**
Total portfolio	**(9.5)%**	8.8 %	9.4 %	14.6 %	(1.0)%	**4.1 %**	**4.8 %**	**5.5 %**

(1) Includes cash and cash equivalents and restricted cash and cash equivalents.

The following table reconciles investment yield to taxable equivalent total investment return.

	Years Ended December 31,				
	2022	2021	2020	2019	2018
Investment yield [1]	**2.2 %**	2.0 %	2.4 %	2.9 %	2.8 %
Adjustment of investment yield from amortized cost to fair value	**(0.5)%**	(0.6)%	(0.5)%	(0.7)%	(0.6)%
Net amortization of net premium on fixed maturity securities	**0.4 %**	0.4 %	0.4 %	0.4 %	0.4 %
Net investment gains (losses) and change in net unrealized investment gains on available-for-sale securities	**(12.5)%**	5.9 %	5.8 %	10.3 %	(3.8)%
Taxable equivalent effect for interest and dividends [2]	**0.1 %**	0.1 %	0.1 %	0.2 %	0.1 %
Other [3]	**0.8 %**	1.0 %	1.2 %	1.5 %	0.1 %
Taxable equivalent total investment return	**(9.5)%**	8.8 %	9.4 %	14.6 %	(1.0)%

(1) Investment yield reflects net investment income as a percentage of monthly average invested assets at amortized cost.

(2) Adjustment to tax-exempt interest and dividend income to reflect a taxable equivalent basis.

(3) Adjustment to reflect the impact of time-weighting the inputs to the calculation of taxable equivalent total investment return.

Markel Ventures Results

Our Markel Ventures segment includes a diverse portfolio of businesses from different industries that offer various types of products and services to businesses and consumers, predominantly in the United States. We measure Markel Ventures' results by its operating income and net income, as well as earnings before interest, income taxes, depreciation and amortization (EBITDA). We consolidate the results of our Markel Ventures subsidiaries on a one-month lag, with the exception of significant transactions or events that occur during the intervening period.

In December 2021, we acquired a controlling interest in Metromont LLC (Metromont), a precast concrete manufacturer and concrete building solutions provider for commercial projects. In August 2021, we acquired a controlling interest in Buckner HeavyLift Cranes (Buckner), a provider of crane rental services for large commercial contractors. See note 3 of the notes to consolidated financial statements included under Item 8 for additional details related to these acquisitions.

The following table summarizes the operating revenues, operating income, EBITDA and net income to shareholders from our Markel Ventures segment.

	Years ended December 31,		
(dollars in thousands)	**2022**	2021	% Change
Operating revenues	**$ 4,757,527**	$ 3,643,827	31 %
Operating income	**$ 325,238**	$ 272,552	19 %
EBITDA	**$ 506,336**	$ 402,700	26 %
Net income to shareholders	**$ 192,601**	$ 174,407	10 %

The increase in operating revenues in 2022 was driven by the contribution from Metromont, which was acquired in December 2021, as well as an increased contribution from Buckner, which was acquired in August 2021. The combined contribution to the increase in operating revenues in 2022 attributable to these acquisitions was $604.6 million. Additionally, operating revenues in 2022 increased as a result of the impact of increased demand and higher prices at many of our other businesses, most notably at our construction services businesses.

The benefit of increases in operating revenues to operating income, EBITDA and net income to shareholders in 2022 was reduced by increased costs of materials and labor across many of our businesses, which reflected the impact of broader economic conditions on our operations during the year. The higher cost of materials was due in part to a shortage in the availability of certain products, the higher cost of shipping and a prolonged period of elevated inflation. We attempted to mitigate the impact of these cost increases through a variety of actions, such as increasing the prices of our products and services, pre-purchasing materials, locking in prices in advance or utilizing alternative sources of materials. Our businesses have had varying levels of success with these efforts, and we have seen conditions stabilize to varying degrees at many of our businesses. However, high labor costs continue to impact our businesses and there can be a time lag before the impacts of changes are reflected in our margins.

The increases in operating income, EBITDA and net income to shareholders in 2022 were primarily due to the impact of higher revenues and improved operating results at our construction services businesses, transportation-related businesses and consulting services businesses, as well as the contribution of Metromont. These increases were partially offset by the impact of lower operating margins at one of our consumer and building products businesses in 2022 compared to 2021.

Markel Ventures EBITDA is a non-GAAP financial measure. We use Markel Ventures EBITDA as an operating performance measure in conjunction with U.S. GAAP measures, including operating income and net income to shareholders, to monitor and evaluate the performance of our Markel Ventures segment. Because EBITDA excludes interest, income taxes, depreciation and amortization, it provides an indicator of economic performance that is useful to both management and investors in evaluating our Markel Ventures businesses as it is not affected by levels of debt, interest rates, effective tax rates or levels of depreciation or amortization resulting from purchase accounting.

The following table reconciles Markel Ventures operating income to Markel Ventures EBITDA.

(dollars in thousands)	Years ended December 31, 2022	2021
Markel Ventures operating income	**$ 325,238**	$ 272,552
Depreciation expense	**102,055**	72,580
Amortization of intangible assets	**79,043**	57,568
Markel Ventures EBITDA	**$ 506,336**	$ 402,700

The following tables present condensed financial information reflecting the financial position, results of operations and cash flows of Markel Ventures, Inc., and also summarizing the amounts recognized in the consolidated financial statements included under Item 8 for the Markel Ventures segment, unless otherwise noted.

CONDENSED BALANCE SHEETS

(dollars in thousands)	December 31, 2022	2021
ASSETS		
Cash and cash equivalents	**$ 315,452**	$ 321,473
Receivables	**636,161**	501,349
Goodwill	**1,153,909**	1,196,590
Intangible assets	**796,297**	766,179
Other assets:		
Inventory	**639,562**	529,250
Property, plant and equipment, net	**1,028,156**	948,971
Right-of-use lease assets	**409,014**	393,551
Other	**337,126**	300,916
Total other assets	**2,413,858**	2,172,688
Total Assets	**$ 5,315,677**	$ 4,958,279
LIABILITIES AND EQUITY		
Debt [(1)]	**$ 1,222,152**	$ 1,140,559
Other liabilities:		
Accounts payable and accrued liabilities	**355,037**	320,375
Lease liabilities	**421,089**	445,683
Other	**625,215**	544,718
Total other liabilities	**1,401,341**	**1,310,776**
Total Liabilities	**2,623,493**	2,451,335
Redeemable noncontrolling interests	**523,154**	461,378
Shareholders' equity [(2)]	**2,172,935**	2,050,675
Noncontrolling interests	**(3,905)**	(5,109)
Total Equity	**2,169,030**	2,045,566
Total Liabilities and Equity	**$ 5,315,677**	$ 4,958,279

(1) Debt as of December 31, 2022 and 2021 included $808.1 million and $853.0 million, respectively, of debt due to other subsidiaries of Markel Corporation, which was eliminated in consolidation.

(2) Shareholders' equity as of December 31, 2022 and 2021 included $1.4 billion of common stock, which represents Markel Corporation's investment in Markel Ventures, Inc. and which was eliminated in consolidation.

CONDENSED STATEMENTS OF INCOME

(dollars in thousands)	Years ended December 31, 2022	2021
OPERATING REVENUES		
Products revenues	**$ 2,427,096**	$ 1,712,120
Services and other revenues	**2,329,522**	1,931,696
Net investment income	**909**	11
Total Operating Revenues	**4,757,527**	3,643,827
OPERATING EXPENSES		
Products expenses	**2,241,736**	1,544,506
Services and other expenses	**2,111,510**	1,769,201
Amortization of intangible assets	**79,043**	57,568
Total Operating Expenses	**4,432,289**	3,371,275
Operating Income	**325,238**	272,552
Net foreign exchange gains	**3,140**	1,119
Interest expense [(1)]	**(46,780)**	(35,031)
Income Before Income Taxes	**281,598**	238,640
Income tax expense	**(61,588)**	(43,626)
Net Income	**220,010**	195,014
Net income attributable to noncontrolling interests	**(27,409)**	(20,607)
Net Income to Shareholders	**$ 192,601**	$ 174,407

(1) Interest expense for the years ended December 31, 2022 and 2021 included intercompany interest expense of $27.4 million and $25.8 million, respectively, which was eliminated in consolidation.

CONDENSED STATEMENTS OF CASH FLOWS

(dollars in thousands)	Years ended December 31, 2022	2021
Cash, cash equivalents, restricted cash and restricted cash equivalents, beginning of year	**$ 321,473**	$ 363,532
Net cash provided by operating activities	**260,286**	187,180
Net cash used by investing activities	**(302,770)**	(585,971)
Net cash provided by financing activities [(1) (2)]	**37,897**	356,562
Effect of foreign currency rate changes on cash, cash equivalents, restricted cash and restricted cash equivalents	**(1,434)**	170
Decrease in cash, cash equivalents, restricted cash and restricted cash equivalents	**(6,021)**	(42,059)
Cash, cash equivalents, restricted cash and restricted cash equivalents, end of year	**$ 315,452**	$ 321,473

(1) Net cash provided by financing activities for the year ended December 31, 2021 included a capital contribution from our holding company, Markel Corporation, of $250.0 million, which was eliminated in consolidation. There were no capital contributions from our holding company for the year ended December 31, 2022.

(2) Net cash provided by financing activities for the year ended December 31, 2022 included net repayments of intercompany debt of $44.9 million, which were eliminated in consolidation. Net cash provided by financing activities for the year ended December 31, 2021 included net additions to intercompany debt of $120.0 million, which were eliminated in consolidation.

Interest Expense, Net Foreign Exchange Gains and Income Taxes

Interest Expense

Interest expense was $196.1 million in 2022 compared to $183.6 million in 2021. The increase in interest expense in 2022 was primarily attributable to higher Markel Ventures interest expense and the issuance of our 3.45% unsecured senior notes issued in May 2021, partially offset by the impact of the retirement of our 4.90% unsecured senior notes in July 2022. See note 14 of the notes to consolidated financial statements included under Item 8 for further details regarding the retirement of our senior long-term debt.

Net Foreign Exchange Gains

Net foreign exchange gains included in net income (loss) were $140.2 million in 2022 compared to $72.3 million in 2021. Net foreign exchange gains are primarily due to the remeasurement of our foreign currency denominated insurance reserves to the U.S. Dollar. The U.S. Dollar strengthened against the Euro and British Pound, the predominant foreign currencies within our insurance operations, during 2022 and 2021, particularly in the second and third quarters of 2022. Pre-tax net foreign exchange losses attributed to changes in exchange rates on available-for-sale securities supporting our insurance reserves, which are included in the changes in net unrealized gains (losses) on available-for-sale investments in other comprehensive loss, were $79.5 million in 2022 compared to $78.0 million in 2021.

Income Taxes

The effective tax rate was 32% in 2022 compared to 22% in 2021. The effective tax rate for 2022 differs from the effective tax rate for 2021, and the statutory rate of 21%, due to the impact of various immaterial items resulting in a net tax benefit that was magnified due to the small pre-tax loss in 2022. See note 15 of the notes to consolidated financial statements included under Item 8 for further discussion of our income taxes.

In August 2022, the U.S. enacted the Inflation Reduction Act of 2022 (the Act). The Act implements a 15% corporate minimum tax based on adjusted financial statement income and a 1% excise tax on stock repurchases effective January 1, 2023. We do not expect these tax law changes to have a material impact on our results of operations, financial condition or cash flows, however, we will continue to evaluate the impact of the Act as additional guidance is issued by the U.S. Treasury.

Comprehensive Income (Loss) to Shareholders and Book Value per Common Share

The following table summarizes the components of comprehensive income (loss) to shareholders.

	Years Ended December 31,	
(dollars in thousands)	**2022**	2021
Net income (loss) to shareholders	**$ (214,123)**	$ 2,425,003
Other comprehensive loss:		
Change in net unrealized gains (losses) on available-for-sale investments, net of taxes	**(1,110,148)**	(354,938)
Other, net of taxes	**15,471**	8,177
Other comprehensive (income) loss attributable to noncontrolling interest	**(17)**	2
Other comprehensive loss to shareholders	**(1,094,694)**	(346,759)
Comprehensive income (loss) to shareholders	**$ (1,308,817)**	$ 2,078,244

Book value per common share decreased 10% from $1,036.20 at December 31, 2021 to $929.27 as of December 31, 2022, primarily due to other comprehensive loss to shareholders in 2022.

Liquidity and Capital Resources

We seek to maintain prudent levels of liquidity and financial leverage for the protection of our policyholders, creditors and shareholders. Our consolidated debt to capital ratio was 24% at December 31, 2022 and 23% at December 31, 2021. The increase reflects a decrease in shareholders' equity, primarily attributable to a decline in the fair value of our investment portfolio, driven by unfavorable movements in the public equity markets and increases in interest rates in 2022.

Holding Company

Our holding company had $3.7 billion and $5.3 billion of investments, cash and cash equivalents and restricted cash and cash equivalents (invested assets) at December 31, 2022 and December 31, 2021, respectively. The decrease in holding company invested assets was primarily due to capital contributions made to our insurance subsidiaries and a decline in the fair value of the holding company investment portfolio, as well as the $350.0 million repayment of our 4.90% unsecured senior notes due July 1, 2022. See note 23 of the notes to consolidated financial statements included under Item 8 for condensed financial information for our holding company.

Within our insurance subsidiaries, we seek to maintain capital that significantly exceeds required capital levels, as prescribed by applicable regulators. A portion of the capital held by many of our insurance subsidiaries includes a portfolio of equity securities, and the unfavorable movements in the public equity markets in 2022 had a significant impact on their investment portfolio valuations, and in turn, the capital within these entities. In order to maintain our target levels of excess capital within the impacted insurance subsidiaries, our holding company made capital contributions totaling $973.5 million in 2022. There were no capital contributions from our holding company to our insurance subsidiaries in 2021. We also received dividends totaling $130.0 million from certain of our insurance subsidiaries in 2022 compared to $1.0 billion in 2021.

The following table presents the composition of our holding company's invested assets.

	December 31,	
	2022	2021
Fixed maturity securities	**4 %**	4 %
Equity securities	**40 %**	53 %
Short-term investments, cash and cash equivalents and restricted cash and cash equivalents	**56 %**	43 %
Total	**100 %**	100 %

After satisfying our interest and principal obligations on our senior long-term debt and notes payable to subsidiaries, as well as any other holding company obligations, excess liquidity at Markel Corporation is available to, among other things, allocate capital to our existing businesses, complete acquisitions, build our portfolio of equity securities or repurchase shares of our common stock.

In February 2022, our Board of Directors approved a new share repurchase program that provides for the repurchase of up to $750 million of common stock. As of December 31, 2022, $511.7 million remained available for repurchases under the program. This share repurchase program has no expiration date but may be terminated by the Board of Directors at any time.

We may from time to time seek to prepay, retire or repurchase our outstanding senior notes or preferred shares, through open market purchases, privately negotiated transactions or otherwise. Those prepayments, retirements or repurchases, if any, will depend on prevailing market conditions, our liquidity requirements, contractual restrictions and other factors.

The holding company relies on dividends from its subsidiaries to meet debt service obligations and pay dividends on our preferred stock. Under the insurance laws of the various states in which our domestic insurance subsidiaries are incorporated, an insurer is restricted in the amount of dividends it may pay without prior approval of regulatory authorities. There are also regulatory restrictions on the amount of dividends that certain of our foreign subsidiaries may pay based on applicable laws in their respective jurisdictions. At December 31, 2022, our domestic insurance subsidiaries and Markel Bermuda Limited could pay ordinary dividends of $1.1 billion during the following twelve months under these laws.

We maintain a corporate revolving credit facility, which provides up to $300 million of capacity for future acquisitions, investments and stock repurchases and for other working capital and general corporate purposes. At our discretion, up to $200 million of the total capacity may be used for letters of credit. We may increase the capacity of the facility by up to $200 million subject to obtaining commitments for the increase and certain other terms and conditions. This facility expires in April 2024. As of December 31, 2022 and 2021, there were no borrowings outstanding under this revolving credit facility.

We were in compliance with all covenants contained in our corporate revolving credit facility at December 31, 2022. To the extent that we are not in compliance with our covenants, access to the revolving credit facility could be restricted. While we believe this to be unlikely, the inability to access the revolving credit facility could adversely affect our liquidity. See note 14 of the notes to consolidated financial statements included under Item 8 for further discussion of our revolving credit facility.

We have access to various capital sources, including dividends from certain of our subsidiaries, holding company invested assets, undrawn capacity under our revolving credit facility and access to the debt and equity capital markets. We believe we have adequate liquidity to meet our capital and operating needs, including that which may be required to support the operating needs of our subsidiaries. However, the availability of these sources of capital and the availability and terms of future financings will depend on a variety of factors. See the "Access to Capital" risk factors under Item 1A Risk Factors for more discussion regarding our access to capital sources.

Cash Flows and Invested Assets

Net cash provided by operating activities was $2.7 billion in 2022 compared to $2.3 billion in 2021. The increase in net cash flows from operating activities for the year ended December 31, 2022 was primarily due to higher net premiums within our Insurance segment, partially offset by $101.9 million of payments made in connection with the Markel CATCo buy-out transaction.

Net cash used by investing activities was $1.7 billion in 2022 compared to $2.9 billion in 2021. In 2022, net cash used by investing activities included net purchases of fixed maturity securities, short-term investments and equity securities of $959.7 million, $846.0 million and $201.0 million, respectively. Net cash used by investing activities was net of $630.0 million of net cash and restricted cash acquired as part of our consolidation of Markel CATCo Re, of which $169.4 million was subsequently distributed to Markel CATCo investors for shares that were redeemed in conjunction with the buy-out transaction. In 2021, net cash used by investing activities included net purchases of fixed maturity and equity securities of $2.5 billion and $54.9 million, respectively, and net sales of short-term investments of $229.0 million. Net cash used by investing activities in 2021 also included $510.9 million of net cash used for the acquisitions of Buckner and Metromont.

In 2022, as interest rates began to rise, we increased our allocation of cash to short-term investments and fixed maturity securities to support our growing underwriting business. Additionally, we increased our purchases of equity securities in 2022 to take advantage of favorable prices following declines in the public equity markets during the year. Cash flow from investing activities is affected by various factors such as anticipated payment of claims, financing activity, acquisition opportunities and individual buy and sell decisions made in the normal course of our investment portfolio management.

Invested assets were $27.4 billion at December 31, 2022 compared to $28.3 billion at December 31, 2021, reflecting a decrease of 3% in 2022. The decline in the fair value of our investment portfolio, driven by unfavorable movements in the public equity markets and increases in interest rates in 2022, was partially offset by cash provided by operating activities. These factors were also the primary drivers of the change in the composition of our investment portfolio. The following table presents the composition of our invested assets.

	December 31,	
	2022	2021
Fixed maturity securities	**43 %**	44 %
Equity securities	**28 %**	32 %
Short-term investments, cash and cash equivalents and restricted cash and cash equivalents	**29 %**	24 %
Total	**100 %**	100 %

Net cash used by financing activities was $595.3 million in 2022, which included $350.0 million to retire our 4.90% unsecured senior notes due July 1, 2022. Financing activities in 2022 also reflected borrowings and repayments at certain our Markel Ventures businesses, primarily on revolving lines of credit. Net cash provided by financing activities was $369.8 million in 2021, which included net proceeds of $591.4 million from our May 2021 senior notes offering. Cash of $290.8 million and $206.5 million was used to repurchase shares of our common stock during 2022 and 2021, respectively.

Cash Obligations

As of December 31, 2022, our primary cash obligations were unpaid losses and loss adjustment expenses, senior long-term debt and other debt and related interest payments, life and annuity benefits and lease liabilities. These cash obligations, as presented in the following table, represent our estimate of total future cash payments and may differ from the corresponding liabilities on our consolidated balance sheet due to present value discounts and other adjustments required for presentation in accordance with U.S. GAAP. The following table summarizes our estimated contractual cash obligations at December 31, 2022 and the estimated amount expected to be paid in 2023.

(dollars in thousands)	Total cash obligations as of December 31, 2022	Cash obligations due in less than 1 year
Unpaid losses and loss adjustment expenses (1)	**$ 21,053,737**	**$ 4,494,980**
Senior long-term debt and other debt (2)	**$ 4,148,007**	**$ 399,604**
Interest payments on senior long-term debt and other debt (3)	**$ 3,414,263**	**$ 169,263**
Life and annuity benefits (4)	**$ 974,212**	**$ 58,650**
Lease liabilities (5)	**$ 661,112**	**$ 100,887**

(1) The actual cash payments for settled claims will vary, possibly significantly, from these estimates. As of December 31, 2022, the average duration of our reserves for unpaid losses and loss adjustment expenses was 3.8 years. See note 11 of the notes to consolidated financial statements included under Item 8 for further details on our loss reserve estimates.

(2) See note 14 of the notes to consolidated financial statements included under Item 8 for further details on the scheduled maturity of principal payments on our senior long-term debt and other debt.

(3) Interest expense is accrued in the period incurred and therefore, only a portion of the future interest payments presented in this table represents a liability on our consolidated balance sheet as of December 31, 2022.

(4) There is inherent uncertainty in the process of estimating the timing of payments for life and annuity benefits and actual cash payments for settled contracts could vary significantly from these estimates. We expect $704.1 million of our cash obligation for life and annuity benefits to be paid beyond five years. See note 13 of the notes to consolidated financial statements included under Item 8 for further details on our estimates for life and annuity benefit reserves.

(5) See note 9 of the notes to consolidated financial statements included under Item 8 for further details on our lease obligations and the expected timing of future payments.

Various of our Markel Ventures subsidiaries maintain revolving credit facilities or lines of credit, which provide up to $620 million of aggregate capacity for working capital and other general operational purposes. A portion of the capacity on certain of these credit facilities may be used as security for letters of credit and other obligations. At December 31, 2022 and 2021, $238.1 million and $94.3 million, respectively, of borrowings were outstanding under these credit facilities.

As of December 31, 2022, one of our Markel Ventures subsidiaries was not in compliance with certain financial covenants of its revolving credit facility, which had an outstanding balance of $97.9 million as of December 31, 2022. The subsidiary is working with its lenders and anticipates amending the facility. This event is not expected to have a material effect on our consolidated financial condition or results of operations. At December 31, 2022, all of our other subsidiaries were in compliance with all covenants contained in their respective credit facilities. To the extent our subsidiaries are not in compliance with their respective covenants, access to their credit facilities could be restricted, which could adversely affect their operations. See note 14 of the notes to consolidated financial statements included under Item 8 for further discussion of our credit facilities.

Restricted Assets and Capital

At December 31, 2022, we had $4.8 billion of invested assets held in trust or on deposit for the benefit of policyholders or ceding companies or to support underwriting activities. Additionally, we have pledged investments and cash and cash equivalents totaling $437.8 million at December 31, 2022 as security for letters of credit that have been issued by various banks on our behalf. These invested assets and the related liabilities are included in our consolidated balance sheet. See note 4(f) of the notes to consolidated financial statements included under Item 8 for further discussion of restrictions over our invested assets.

Our insurance operations require capital to support premium writings, and we remain committed to maintaining adequate capital and surplus at each of our insurance subsidiaries. The National Association of Insurance Commissioners (NAIC) developed a model law and risk-based capital formula designed to help regulators identify domestic property and casualty insurers that may be inadequately capitalized. Under the NAIC's requirements, a domestic insurer must maintain total capital and surplus above a calculated threshold or face varying levels of regulatory action. Capital adequacy of our foreign insurance

subsidiaries is regulated by applicable laws of the United Kingdom, Bermuda and Germany. At December 31, 2022, the capital and surplus of each of our insurance subsidiaries significantly exceeded the amount of statutory capital and surplus necessary to satisfy regulatory requirements.

Critical Accounting Estimates

Critical accounting estimates are those estimates that both are important to the portrayal of our financial condition and results of operations and require us to exercise significant judgment. The preparation of financial statements in accordance with U.S. GAAP requires us to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenues and expenses and the disclosure of material contingent assets and liabilities. These estimates, by necessity, are based on assumptions about numerous factors. Actual results may differ materially from the estimates and assumptions used in preparing the consolidated financial statements. Our accounts with accounting policies that involve critical accounting estimates are unpaid losses and loss adjustment expenses and goodwill and intangible assets.

Unpaid Losses and Loss Adjustment Expenses

Our consolidated balance sheets included estimated unpaid losses and loss adjustment expenses of $20.9 billion and reinsurance recoverables on unpaid losses of $8.0 billion at December 31, 2022 compared to $18.2 billion and $6.9 billion, respectively, at December 31, 2021. Included in these balances were unpaid losses and loss adjustment expenses and reinsurance recoverables on unpaid losses attributable to our program services business and other fronting arrangements totaling $5.2 billion for the year ended December 31, 2022 and $4.2 billion for the year ended December 31, 2021. Additionally, consolidated unpaid losses and loss adjustment expenses as of December 31, 2022 included $347.9 million of fully collateralized reserves attributable to Markel CATCo Re, which we consolidate following the Markel CATCo buy-out. See note 17 of the notes to consolidated financial statements for further details regarding the consolidation of Markel CATCo Re. Our consolidated balance sheets do not include reserves for losses and loss adjustment expenses attributed to unconsolidated subsidiaries or affiliates that we manage through our Nephila insurance-linked securities operations.

We accrue liabilities for unpaid losses and loss adjustment expenses based upon estimates of the ultimate amounts payable. We maintain reserves for specific claims incurred and reported (case reserves) and reserves for claims incurred but not reported (IBNR reserves).

Reported claims are in various stages of the settlement process, and the corresponding reserves for reported claims are based upon all information available to us. Case reserves consider our estimate of the ultimate cost to settle the claims, including investigation and defense of lawsuits resulting from the claims, and may be subject to adjustment for differences between costs originally estimated and costs subsequently re-estimated or incurred. Claims are settled based upon their merits, and some claims may take years to settle, especially if legal action is involved. As of any balance sheet date, all claims have not yet been reported, and some claims may not be reported for many years. As a result, the liability for unpaid losses and loss adjustment expenses includes significant estimates for incurred but not reported claims.

There is normally a time lag between when a loss event occurs and when it is reported to us. The actuarial methods that we use to estimate losses have been designed to address the lag in loss reporting as well as the delay in obtaining information that would allow us to more accurately estimate future payments. There is also often a time lag between cedents establishing case reserves or re-estimating their reserves and notifying us of those new or revised case reserves. As a result, the reporting lag is more pronounced in our reinsurance contracts than in our insurance contracts. On reinsurance transactions, the reporting lag will generally be 60 to 90 days after the end of a reporting period but can be longer in some cases. There may also be a more pronounced reporting lag, as well as reliance on third-party claims handling practices and reserve estimates, on insurance contracts for which we are not the primary insurer and participate only in excess layers of loss. Based on the experience of our actuaries and management, we select loss development factors and trending techniques to mitigate the difficulties caused by reporting lags. At least annually, we evaluate our loss development factors and trending assumptions using our own loss data, as well as cedent-specific and industry data, and update them as needed.

U.S. GAAP requires that IBNR reserves be based on the estimated ultimate cost of settling claims, including the effects of inflation and other social and economic factors, using past experience adjusted for current trends and any other factors that would modify past experience. IBNR reserves are calculated by subtracting paid losses and loss adjustment expenses and case reserves from estimated ultimate losses and loss adjustment expenses. IBNR reserves were 70% of total unpaid losses and loss adjustment expenses at December 31, 2022 compared to 67% at December 31, 2021.

The following table summarizes case reserves and IBNR reserves for our underwriting, program services and other fronting operations, which excludes $347.9 million of fully collateralized reserves attributable to Markel CATCo Re as of December 31, 2022. The amounts in the following table exclude the unamortized portion of any fair value adjustments for unpaid losses and loss adjustment expenses assumed in conjunction with an acquisition and any adjustments to discount reserves.

(dollars in thousands)	Insurance	Reinsurance	Other underwriting	Program services and other fronting	Total
December 31, 2022					
Case reserves	**$ 3,361,400**	**$ 1,234,852**	**$ 70,072**	**$ 1,617,473**	**$ 6,283,797**
IBNR reserves	**8,238,051**	**2,406,235**	**127,531**	**3,586,817**	**14,358,634**
Total	**$ 11,599,451**	**$ 3,641,087**	**$ 197,603**	**$ 5,204,290** [1]	**$ 20,642,431**
December 31, 2021					
Case reserves	$ 3,093,576	$ 1,334,444	$ 53,317	$ 1,485,857	$ 5,967,194
IBNR reserves	6,951,347	2,369,313	218,039	2,730,477	12,269,176
Total	$ 10,044,923	$ 3,703,757	$ 271,356	$ 4,216,334 [1]	$ 18,236,370

(1) Substantially all of the premium written in our program services and other fronting business is ceded, resulting in reinsurance recoverables on unpaid losses of $5.2 billion and $4.2 billion as of December 31, 2022 and 2021, respectively.

Each quarter, our actuaries prepare estimates of the ultimate liability for unpaid losses and loss adjustment expenses based on established actuarial methods. Management reviews these estimates, supplements the actuarial analyses with information provided by claims, underwriting and other operational personnel and determines its best estimate of loss reserves, which is recorded in our consolidated financial statements. Our procedures for determining the adequacy of loss reserves at the end of the year are substantially similar to the procedures applied at the end of each interim period.

Any adjustments to reserves resulting from our interim or year-end reviews, including changes in estimates, are recorded as a component of losses and loss adjustment expenses in the period of the change. Reserve changes that increase previous estimates of ultimate claims cost are referred to as unfavorable or adverse development, or reserve strengthening. Reserve changes that decrease previous estimates of ultimate claims cost are referred to as favorable development.

Program Services and Other Fronting

For our program services business and other fronting arrangements, case reserves are generally established based on reports received from the general agents or reinsurers with whom we do business. Our actuaries review the case loss reserve data received for sufficiency, consistency with historical data and for consistency with other programs we write that have similar characteristics. Ultimate losses and loss adjustment expenses are calculated using either our program experience or, where the program data is not credible, industry experience for similar products or lines of business. Substantially all of the premium written in our program services business and other fronting arrangements is ceded, and net reserves for unpaid losses and loss adjustment expenses as of December 31, 2022 and December 31, 2021 were $10.0 million and $11.6 million, respectively.

Underwriting

For our insurance operations, we are generally notified of insured losses by our insureds, their brokers or the primary insurer in instances in which we participate in excess layers of insured losses on a contract. Based on this information, we establish case reserves by estimating the expected ultimate losses from the claim (including any administrative or legal costs associated with settling the claim). Our claims personnel use their knowledge of the policy provisions and details specific to the claim, along with information provided by internal and external experts, including underwriters, actuaries and legal counsel, to estimate the expected ultimate losses.

For our reinsurance operations, case reserves are generally established based on reports received from ceding companies or their brokers. For excess of loss contracts, we are typically notified of insurance losses on specific contracts and record a case reserve for the estimated expected ultimate losses from the claim. For quota share contracts, we typically receive aggregated claims information and record a case reserve based on that information. As with insurance business, we evaluate this information and estimate the expected ultimate losses.

Our liabilities for unpaid losses and loss adjustment expenses can generally be categorized into two distinct groups, short-tail business and long-tail business. Short-tail business refers to lines of business, such as property, accident and health,

automobile, watercraft and marine hull exposures, for which losses are usually known and paid shortly after the loss actually occurs. Long-tail business describes lines of business for which specific losses take much longer to emerge and may not be known and reported for some time. Given the time frame over which long-tail exposures are ultimately settled, there is greater uncertainty and volatility in these lines than in short-tail lines of business. Our long-tail coverages consist of most casualty lines, including professional liability, products liability, general and excess liability and excess and umbrella exposures, as well as workers' compensation insurance, which have been a significant source growth in premium volume in recent years. Some factors that contribute to the uncertainty and volatility of long-tail business, and thus require a significant degree of judgment in the reserving process, include the effects of unanticipated levels of economic inflation, the impact of social inflation, the inherent uncertainty as to the length of reporting and payment development patterns, the possibility of judicial interpretations or legislative changes, including changes in workers' compensation benefit laws, that might impact future loss experience relative to prior loss experience and the potential lack of comparability of the underlying data used in performing loss reserve analyses.

Our ultimate liability may be greater or less than current reserves. Changes in our estimated ultimate liability for loss reserves generally occur as a result of the emergence of unanticipated loss activity, the completion of specific actuarial or claims studies or changes in internal or external factors. We closely monitor new information on reported claims and use statistical analyses prepared by our actuaries to evaluate the adequacy of our recorded reserves. We are required to exercise considerable judgment when assessing the relative credibility of loss development trends. Our philosophy is to establish loss reserves that are more likely redundant than deficient. This means that we seek to establish loss reserves that will ultimately prove to be adequate. As a result, if new information or trends indicate an increase in frequency or severity of claims in excess of what we initially anticipated, we generally respond quickly and increase loss reserves. If, however, frequency or severity trends are more favorable than initially anticipated, we often wait to reduce our loss reserves until we can evaluate experience in additional periods to confirm the credibility of the trend. In addition, for long-tail lines of business, trends develop over longer periods of time, and as a result, we give credibility to these trends more slowly than for short-tail or less volatile lines of business.

In establishing our liabilities for unpaid losses and loss adjustment expenses, our actuaries estimate an ultimate loss ratio, by accident year or underwriting year, for each of our product lines with input from our underwriting and claims personnel. For product lines in which loss reserves are established on a underwriting year basis, we have developed a methodology to convert from underwriting year to accident year for financial reporting purposes. In estimating an ultimate loss ratio for a particular line of business, our actuaries may use one or more actuarial reserving methods and select from these a single point estimate. To varying degrees, these methods include detailed statistical analysis of past claim reporting, settlement activity, claim frequency and severity, policyholder loss experience, industry loss experience and changes in market and economic conditions, policy forms and exposures. The actuarial methods we use include:

Initial Expected Loss Ratio Method – This method multiplies earned premiums by an expected loss ratio. The expected loss ratio is selected utilizing industry data, our historical data, frequency-severity and rate level forecasts and professional judgment.

Paid Loss Development – This method uses historical loss payment patterns to estimate future loss payment patterns. Our actuaries use the historical loss patterns to develop factors that are applied to current paid loss amounts to calculate expected ultimate losses.

Incurred Loss Development – This method uses historical loss reporting patterns to estimate future loss reporting patterns. Our actuaries use the historical loss patterns to develop factors that are applied to current reported losses to calculate expected ultimate losses.

Bornhuetter-Ferguson Paid Loss Development – This method divides the projection of ultimate losses into the portion that has already been paid and the portion that has yet to be paid. The portion that has yet to be paid is estimated as the product of three amounts: the premium earned for the exposure period, the expected loss ratio and the estimated percentage of ultimate losses that are still unpaid. The expected loss ratio is selected by considering historical loss ratios, adjusted for any known changes in pricing, loss trends, adequacy of case reserves, changes in administrative practices and other relevant factors.

Bornhuetter-Ferguson Incurred Loss Development – This method is identical to the Bornhuetter-Ferguson paid loss development method, except that it uses the estimated percentage of ultimate losses that are still unreported, instead of the estimated percentage of ultimate losses that are still unpaid.

Frequency/Severity – Under this method, expected ultimate losses are equal to the product of the expected ultimate number of claims and the expected ultimate average cost per claim. Our actuaries use historical reporting patterns and severity patterns to develop factors that are applied to the current reported amounts to calculate expected ultimate losses.

Other Methods – There are certain instances when traditional actuarial methods may not be appropriate for estimating unpaid losses and loss adjustment expenses. In these instances, we may employ other actuarial methods.

Each actuarial method has its own set of assumptions and its own strengths and limitations, with no one method being better than the others in all situations. Our actuaries select the reserving methods that they believe will produce the most reliable estimates for the class of business being evaluated. Greater judgment may be required when we introduce new product lines or when there have been changes in claims handling practices, as the statistical data available may be insufficient. In these instances, we may rely upon assumptions applied to similar lines of business, rely more heavily on industry experience, take into account changes in underwriting guidelines and risk selection or review the impact of changes in claims reserving practices with claims personnel. Greater judgment also may be required for product lines that experience a low frequency of high severity claims, particularly when we are reliant on third party case reserve estimates and claims handling practices. In these instances, we may perform detailed claims reviews, analyzing the characteristics of each individual claim, with input from both actuarial and claims personnel to assess the adequacy of the case and IBNR reserves on the underlying product line. Our claims personnel use their knowledge of the specific claims along with internal and external experts, to estimate the expected ultimate losses. While we use our best judgment in establishing our estimate for loss reserves, applying different assumptions and variables could lead to significantly different loss reserve estimates.

A key assumption in most actuarial analyses is that past development patterns will repeat themselves in the future, absent a significant change in internal or external factors that influence the ultimate cost of our unpaid losses and loss adjustment expenses. Our estimates reflect implicit and explicit assumptions regarding the potential effects of external factors, including economic and social inflation, judicial decisions, changes in law, general economic conditions and recent trends in these factors. Our actuarial analyses are based on statistical analysis but also consist of reviewing internal factors that are difficult to analyze statistically, including changes in underwriting and claims handling practices, as well as rate changes. In the London market, and where we act as a reinsurer or participate only in excess layers of insured losses, the timing and amount of information reported about underlying claims are in the control of third parties. This can also affect estimates and require re-estimation as new information becomes available.

We cannot estimate losses from widespread catastrophic events, such as hurricanes and earthquakes, as well as pandemics and wars, using the traditional actuarial methods previously described. In the initial months after a catastrophic event occurs, our actuaries estimate losses and loss adjustment expenses based on claims received to date, industry loss estimates and output from industry, broker and proprietary models, as well as analysis of our ceded reinsurance contracts. We may also perform detailed policy and reinsurance contract level reviews. The availability of data from these procedures varies depending on the timing of the event relative to the point at which we develop our estimate. We also consider loss experience on historical events that may have similar characteristics to the underlying event and current market conditions, including the level of economic inflation. Due to the inherent uncertainty in estimating such losses, these estimates are subject to variability, which increases with the severity and complexity of the underlying event. As additional claims are reported and paid, and industry loss estimates are revised, we incorporate this new information into our analysis and adjust our estimate of ultimate losses and loss adjustment expenses as appropriate.

Loss reserves are established at management's best estimate, which is developed using the actuarially calculated point estimate as the starting point. The actuarial point estimate represents our actuaries' estimate of the most likely amount that will ultimately be paid to settle the losses that have occurred at a particular point in time; however, there is inherent uncertainty in the point estimate as it is the expected value in a range of possible reserve estimates. In some cases, actuarial analyses, which are generally based on statistical analysis, cannot fully incorporate all of the subjective factors that affect development of losses. In other cases, management's perspective of these more subjective factors may differ from the actuarial perspective. Subjective factors influencing the development of management's best estimate include: the credibility and timeliness of claims and loss information received from cedents and other third parties, economic and social inflation, judicial decisions, changes in law, changes in underwriting or claims handling practices, general economic conditions, the risk of moral hazard and other current and developing trends within the insurance and reinsurance markets, including the effects of competition. For example, our loss experience in recent years has reflected higher than anticipated levels of economic inflation, as well as the impacts of social inflation.

In developing its best estimate of loss reserves, management's philosophy is to establish loss reserves that are more likely to be redundant rather than deficient, and therefore, will ultimately prove to be adequate. Management's approach to establishing

loss reserves typically results in loss reserves that exceed the calculated actuarial point estimate. Management also considers the range, or variability, of reasonably possible loss outcomes determined by our actuaries when establishing its best estimate for loss reserves. The actuarial ranges represent our actuaries' estimate of a likely lowest amount and likely highest amount that could ultimately be paid to settle the losses that have occurred at a particular point in time. The range determinations are based on estimates and actuarial judgements and are intended to encompass reasonably likely changes in one or more of the factors that were used to determine the point estimates. Using statistical models, our actuaries establish a range of reasonable reserve estimates for each of our underwriting segments. Additionally, following an acquisition of insurance operations, acquired reserves initially are recorded at fair value, and therefore our recorded loss reserves may be closer to the actuarial point estimate until we build total loss reserves that are consistent with our historic level of confidence. Management's best estimate of net reserves for unpaid losses and loss adjustment expenses exceeded the actuarially calculated point estimate by $688.4 million, or 5.8%, at December 31, 2022, compared to $638.3 million, or 6.0%, at December 31, 2021.

The difference between management's best estimate and the actuarially calculated point estimate in both 2022 and 2021 is primarily associated with our long-tail business due to the subjective factors previously described that affect the development of losses. Certain subjective factors, particularly the credibility and timeliness of claims information, are more pronounced within our reinsurance operations, as previously discussed, and therefore, the percentage difference between management's best estimate and the actuarially calculated point estimate is more significant in our Reinsurance segment than our Insurance segment.

Loss frequency and loss severity are two key measures of loss activity that often result in adjustments to actuarial assumptions relative to ultimate loss reserve estimates. Loss frequency measures the number of claims per unit of insured exposure. When the number of newly reported claims is higher than anticipated, generally speaking, loss reserves are increased. Conversely, loss reserves are generally decreased when fewer claims are reported than expected. Loss severity measures the average size of a claim. When the average severity of reported claims is higher than originally estimated, loss reserves are typically increased. When the average claim size is lower than anticipated, loss reserves are typically decreased.

Our underwriting results in 2022 included $167.4 million of favorable development on prior years loss reserves compared to $479.8 million in 2021. In connection with our quarterly reviews of loss reserves in 2021, the actuarial methods we used exhibited a favorable trend on prior accident years. This trend was observed using statistical analysis of actual loss experience for prior years, particularly with regard to most of our long-tail books of business within the Insurance segment, including our general liability and professional liability product lines. Additionally, as loss reserves are recorded at management's best estimate, which is generally higher than the corresponding actuarially calculated point estimate, the initial reserves established by management are more likely to be redundant than deficient. As actual losses continued to be lower than anticipated in 2021, it became more likely that the underwriting results would prove to be better than originally estimated. Additionally, as most actuarial methods rely upon historical reporting patterns, the favorable trends experienced on earlier accident years resulted in a re-estimation of our ultimate incurred losses on more recent accident years. When we experience loss frequency or loss severity trends that are more favorable than we initially anticipated, we often evaluate the loss experience over a period of several years in order to assess the relative credibility of loss development trends. In 2021, based upon our evaluations of claims development patterns in our long-tail, and often volatile, lines of business, our actuaries reduced their estimates of ultimate losses. Management also gave greater credibility to the favorable trends experienced on earlier accident years, and upon incorporating these favorable trends into its best estimate, we reduced prior years loss reserves on more recent accident years accordingly.

Favorable development in 2022 was net of $70.9 million of adverse development on our professional liability and general liability product lines within our Insurance segment, where the favorable claims and loss trends observed in 2021, and other recent years, were disrupted. Adverse development on these product lines was primarily attributable to unfavorable claim settlements and increased claim frequency and severity on the 2018 and 2019 accident years within our professional liability product lines and the 2016 to 2019 accident years within our general liability product lines. The adverse development on these accident years was across a number of products, including directors and officers, errors and omissions and employment practices liability within professional liability and contractors and excess and umbrella within general liability. Development on prior years loss reserves within our professional liability and general liability product lines in 2022 for these accident years was impacted by broader market conditions, including the effects of economic and social inflation. The impacts of social inflation were most significant on our large, risk-managed excess professional liability accounts, corresponding with a notable rise in the number of class action lawsuits on these years and the recent unfavorable legal environment. The development of this claims trend was influenced by state and federal court closures following the onset of the COVID-19 pandemic in 2020, which has delayed court proceedings for claims on the impacted product lines.

These factors have created more uncertainty around the ultimate losses that will be incurred to settle claims on these longer-tail product lines. On our professional liability product lines, loss development reflected more favorable experience than originally anticipated on the 2020 and 2021 accident years in 2022, however, we are approaching reductions to prior year loss reserves on more recent accident years cautiously. Consistent with our reserving philosophy, we are responding quickly to increase loss reserves following any indication of increased claims frequency or severity in excess of our previous expectations, whereas in instances where claims trends are more favorable than we previously anticipated, we are often waiting to reduce loss reserves and will evaluate our experience over additional periods of time. Additionally, the actuarial methods we used indicated a continued favorable trend in loss frequency and severity on the 2015 and prior accident years for both our professional liability and general liability product lines. Management gave greater credibility to the favorable trend and reduced prior years loss reserves on these earlier accident years accordingly.

Favorable development on prior years loss reserves in 2022 also reflected favorable loss experience across several other product lines, most notably our property and workers' compensation lines of business. This included favorable development on our reserves for natural catastrophes that occurred in prior years, based on additional claims reporting and settlement activity in 2022. On our workers' compensation product line, the actuarial methods we used indicated a continued decline in the loss severity trend on prior accident years in 2022, consistent with our experience in recent years. As actual losses continued to be lower than anticipated in 2022, it became more likely that the underwriting results would prove to be better than originally estimated. Management gave greater credibility to the favorable trend experienced on earlier accident years and upon incorporating these favorable trends into its best estimate, reduced prior years loss reserves on more recent accident years accordingly. While we believe it is likely that there will be additional favorable development on prior years loss reserves in 2023, we caution readers not to place undue reliance on this favorable trend.

Changes in prior years loss reserves, including the trends and factors that impacted loss reserve development in 2022 and 2021, as well as further details regarding the historical development of reserves for losses and loss adjustment expenses and changes in methodologies and assumptions used to calculate reserves for unpaid losses and loss adjustment expenses are discussed in further detail in note 11 of the notes to consolidated financial statements included under Item 8.

The following table summarizes our reserves for net unpaid losses and loss adjustment expenses and the actuarially established high and low ends of a range of reasonable reserve estimates at December 31, 2022. This table excludes the fully collateralized reserves attributable to Markel CATCo Re. As described in note 11 of the notes to consolidated financial statements included under Item 8, unpaid losses and loss adjustment expenses attributable to acquisitions are recorded at fair value as of the acquisition date, which generally consists of the present value of the expected net loss and loss adjustment expense payments plus a risk premium. The net loss reserves presented in this table represent our estimated future payments for losses and loss adjustment expenses, whereas the reserves for unpaid losses and loss adjustment expenses included on the consolidated balance sheet include the unamortized portion of fair value adjustments recorded in conjunction with an acquisition.

(dollars in millions)	Net Loss Reserves Held	Low End of Actuarial Range[(1)]	High End of Actuarial Range[(1)]
Insurance	**$ 9,183.7**	**$ 7,910.8**	**$ 9,883.5**
Reinsurance	**$ 3,303.4**	**$ 2,642.1**	**$ 3,688.4**
Other underwriting	**$ 114.7**	**$ 90.7**	**$ 162.8**

(1) Due to the actuarial methods used to determine the separate ranges for each component of our business, it is not appropriate to aggregate the high or low ends of the separate ranges to determine the high and low ends of the actuarial range on a consolidated basis.

Undue reliance should not be placed on these ranges of estimates as they are only one of many points of reference used by management to determine its best estimate of ultimate losses. Further, actuarial ranges may not be a true reflection of the potential variability between loss reserves estimated at the balance sheet date and the ultimate cost of settling claims. Similar to the development of our estimate of ultimate losses, actuarial ranges are developed based on known events as of the valuation date, while ultimate paid losses are subject to events and circumstances that are unknown as of the valuation date.

During the years ended December 31, 2022 and 2021, we experienced favorable development on prior years loss reserves of 1% and 5%, respectively, of beginning of year net loss reserves. The magnitude of our historical trend of favorable loss reserve development was disrupted in 2022 as a result of the emergence of multiple factors that impacted the claims and loss trends on certain of our professional liability and general liability product lines, which resulted in net adverse loss development on the 2016 to 2019 accident years. On other accident years within these long-tail product lines, claims trends in 2022 were more favorable than we previously anticipated. Additionally, some of the loss development factors observed in 2022 that disrupted our historical favorable trend, including the rise in class action lawsuits and delays in the court systems, are not expected to have as significant of an impact on more recent accident years on the affected product lines. Since 2019, we've experienced meaningful rate increases, tightened our terms and conditions, optimized our portfolio through underwriting action and risk selection, adjusted attachment points, managed limits and diversified our portfolios. However, the impacts of economic and social inflation, among other factors previously discussed, have also created more uncertainty around the ultimate losses that will be incurred to settle claims on our longer-tail product lines. As a result, we are approaching reductions to prior year loss reserves on more recent accident years cautiously. It is difficult for management to predict the duration and magnitude of a trend and, on a relative basis, it is even more difficult to predict the emergence of factors or trends that are unknown today but may have a material impact on loss reserve development. In assessing the likelihood of whether the trends previously discussed will continue and whether other trends may develop, we believe that a reasonably likely movement in prior years loss reserves during 2023 would range from adverse development of 2%, or $200 million, to favorable development of 6%, or $800 million, of December 31, 2022 net loss reserves.

Goodwill and Intangible Assets

Our consolidated balance sheet as of December 31, 2022 included goodwill and intangible assets of $4.4 billion as follows:

	December 31, 2022			
(dollars in millions)	Underwriting	Markel Ventures	Other [1]	Total
Goodwill	**$ 894.4**	**$ 1,153.9**	**$ 590.5**	**$ 2,638.8**
Intangible assets	**362.3**	**796.3**	**588.9**	**1,747.5**
Total	**$ 1,256.7**	**$ 1,950.2**	**$ 1,179.4**	**$ 4,386.3**

(1) Amounts included in Other reflect our operations that are not included in a reportable segment, including our insurance-linked securities operations and our program services operations.

Goodwill and intangible assets are recorded as a result of business acquisitions. Goodwill represents the excess of the amount paid to acquire a business over the net fair value of assets acquired and liabilities assumed at the date of acquisition. Indefinite-lived and other intangible assets are recorded at fair value as of the acquisition date. The determination of the fair value of certain assets acquired, including goodwill and intangible assets, and liabilities assumed involves significant judgment and the use of valuation models and other estimates, which require assumptions that are inherently subjective. During the year ended December 31, 2021, we recorded $497.7 million of goodwill and intangible assets in connection with acquisitions. We did not make any significant acquisitions during the year ended December 31, 2022. See note 3 of the notes to consolidated financial statements included under Item 8 for further details about recent acquisitions.

Intangible assets with definite lives are reviewed for impairment when events or circumstances indicate that their carrying value may not be recoverable. Goodwill and indefinite-lived intangible assets are tested for impairment annually, or when events or circumstances indicate that their carrying value may not be recoverable. A significant amount of judgment is required in performing impairment tests, including the optional assessment of qualitative factors for the annual impairment test, which is used to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying amount. This assessment serves as a basis for determining whether it is necessary to perform a quantitative impairment test.

We completed our annual tests for impairment as of October 1, 2022 based upon results of operations through September 30, 2022. We elected to perform a qualitative assessment for all of our reporting units, with the exception of our Nephila reporting unit, for which we performed a quantitative assessment.

When performing our qualitative assessments, we considered macroeconomic factors such as industry conditions and market conditions. We also considered reporting unit-specific events, actual financial performance versus expectations and management's future business expectations, as well as the amount by which the fair value of the reporting unit exceeded its carrying value at the date of the last quantitative assessment. As part of our qualitative assessment of recently acquired reporting units with material goodwill, we considered the fact that the businesses had been acquired in orderly transactions between market participants, and our purchase price represented fair value at acquisition. For recent acquisitions for which we elected to perform a qualitative assessment, there were no events since acquisition that had a significant adverse impact on the fair value of these reporting units through the assessment date. Based on the results of our qualitative assessments, we believe it is more likely than not that the fair value of each of the assessed reporting units exceeded its respective carrying amount as of the assessment date and December 31, 2022 and none of the assessed reporting units are at risk of a material impairment of goodwill. We considered similar factors to determine if there were any indicators requiring an assessment of the recoverability of our definite lived intangible assets and concluded there were not. However, deterioration of market conditions related to the general economy or the specific industries in which we operate, a sustained trend of weaker than anticipated financial performance within a reporting unit beyond that which we considered or included in our assessments, or further increases in the market-based weighted average cost of capital, among other factors, could impact the impairment analysis and may result in future goodwill or intangible asset impairment charges. See the risk factor titled "Impairment in the value of our goodwill or other intangible assets could have a material adverse effect on our operating results and financial condition" within Item 1A Risk Factors for further discussion of risks associated with our goodwill and intangible assets.

We performed a quantitative impairment assessment for our Nephila reporting unit, which resulted in an $80.0 million impairment of goodwill. We acquired our Nephila operations in 2018 at which time they were recorded at fair value. The Nephila reporting unit serves as an insurance and investment fund manager that offers a broad range of investment products, including insurance-linked securities, catastrophe bonds, insurance swaps and weather derivatives. Nephila receives management fees for these services primarily based on the net asset value of the accounts managed and, for certain funds, incentive fees based on their annual performance. Prior to its sale in February 2022, this reporting unit also included our Velocity managing general agent operations.

We estimated the fair value of our Nephila reporting unit primarily using an income approach based on a discounted cash flow model. The cash flow projections used in the discounted cash flow model included management's best estimate of future growth and margins. The discount rates used to determine the fair value estimates were developed based on a capital asset pricing model using market-based inputs as well as an assessment of the inherent risk in projected future cash flows. Our fair value estimate was negatively impacted by an increase in our discount rate assumption in 2022, reflecting the increased cost of capital due to rising interest rates throughout 2022.

Since acquiring Nephila, investment performance in the broader ILS market has been adversely impacted by consecutive years of elevated catastrophe losses, most recently with Hurricane Ian in 2022. These events, as well as recent volatility in the capital markets, have impacted investor decisions around allocation of capital to ILS, which in turn has impacted our capital raises and redemptions within the funds we manage. Following Hurricane Ian, we have seen more favorable rates on the reinsurance contracts to which the Nephila Reinsurers subscribe, which is reflective of the current property catastrophe market and had a positive impact on Nephila's growth and performance projections. However, the impact of this favorable trend was more than offset by the impact of further declines in investor capital within the funds we manage. Our cash flow assumptions reflect management's best estimate of the reporting unit's future cash flows, based on information currently available, however, these assumptions are inherently uncertain, require a high degree of estimation and judgment and are subject to change depending on the outcome of future events.

Based on the result of our quantitative assessment, the carrying value of our Nephila reporting unit exceeded the estimated fair value of the reporting unit by $80.0 million resulting in a corresponding impairment of goodwill. This reduced the goodwill of the Nephila reporting unit to $221.8 million. We also evaluated our intangible assets within the Nephila reporting unit for impairment and determined they were not impaired.

Safe Harbor and Cautionary Statement

This report contains statements concerning or incorporating our expectations, assumptions, plans, objectives, future financial or operating performance and other statements that are not historical facts. These statements are "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995. Such statements may use words such as "anticipate," "believe," "estimate," "expect," "intend," "predict," "project" and similar expressions as they relate to us or our management.

There are risks and uncertainties that may cause actual results to differ materially from predicted results in forward-looking statements. Factors that may cause actual results to differ are often presented with the forward-looking statements themselves. Additional factors that could cause actual results to differ from those predicted are set forth under Item 1 Business, Item 1A Risk Factors, Item 7 Management's Discussion and Analysis of Financial Condition and Results of Operations and Item 7A Quantitative and Qualitative Disclosures About Market Risk in this report or are included in the items listed below:

- our expectations about future results of our underwriting, investing, Markel Ventures and other operations are based on current knowledge and assume no significant man-made or natural catastrophes, no significant changes in products or personnel and no adverse changes in market conditions;
- the effect of cyclical trends on our underwriting, investing, Markel Ventures and other operations, including demand and pricing in the insurance, reinsurance and other markets in which we operate;
- actions by competitors, including the use of technology and innovation to simplify the customer experience, increase efficiencies, redesign products, alter models and effect other potentially disruptive changes in the insurance industry, and the effect of competition on market trends and pricing;
- our efforts to develop new products, expand in targeted markets or improve business processes and workflows may not be successful and may increase or create new risks (e.g., insufficient demand, change to risk exposures, distribution channel conflicts, execution risk, increased expenditures);
- the frequency and severity of man-made and natural catastrophes (including earthquakes, wildfires and weather-related catastrophes) may exceed expectations, are unpredictable and, in the case of wildfires and weather-related catastrophes, may be exacerbated if, as many forecast, changing conditions in the climate, oceans and atmosphere result in increased hurricane, flood, drought or other adverse weather-related activity;
- we offer insurance and reinsurance coverage against terrorist acts in connection with some of our programs, and in other instances we are legally required to offer terrorism insurance; in both circumstances, we actively manage our exposure, but if there is a covered terrorist attack, we could sustain material losses;
- emerging claim and coverage issues, changing industry practices and evolving legal, judicial, social and other environmental trends or conditions, can increase the scope of coverage, the frequency and severity of claims and the period over which claims may be reported; these factors, as well as uncertainties in the loss estimation process, can adversely impact the adequacy of our loss reserves and our allowance for reinsurance recoverables;
- reinsurance reserves are subject to greater uncertainty than insurance reserves, primarily because of reliance upon the original underwriting decisions made by ceding companies and the longer lapse of time from the occurrence of loss events to their reporting to the reinsurer for ultimate resolution;
- inaccuracies (whether due to data error, human error or otherwise) in the various modeling techniques and data analytics (e.g., scenarios, predictive and stochastic modeling, and forecasting) we use to analyze and estimate exposures, loss trends and other risks associated with our insurance and insurance-linked securities businesses could cause us to misprice our products or fail to appropriately estimate the risks to which we are exposed;
- changes in the assumptions and estimates used in establishing reserves for our life and annuity reinsurance book (which is in runoff), for example, changes in assumptions and estimates of mortality, longevity, morbidity and interest rates, could result in material changes in our estimated loss reserves for such business;
- adverse developments in insurance coverage litigation or other legal or administrative proceedings could result in material increases in our estimates of loss reserves;
- initial estimates for catastrophe losses and other significant, infrequent events (such as the COVID-19 pandemic and the Russia-Ukraine conflict), are often based on limited information, are dependent on broad assumptions about the nature and extent of losses, coverage, liability and reinsurance, and those losses may ultimately differ materially from our expectations;
- changes in the availability, costs, quality and providers of reinsurance coverage, which may impact our ability to write or continue to write certain lines of business or to mitigate the volatility of losses on our results of operations and financial condition;
- the ability or willingness of reinsurers to pay balances due may be adversely affected by industry and economic conditions, deterioration in reinsurer credit quality and coverage disputes, and collateral we hold, if any, may not be sufficient to cover a reinsurer's obligation to us;
- after the commutation of ceded reinsurance contracts, any subsequent adverse development in the re-assumed loss reserves will result in a charge to earnings;

- regulatory actions can impede our ability to charge adequate rates and efficiently allocate capital;
- general economic and market conditions and industry specific conditions, including extended economic recessions or expansions; prolonged periods of slow economic growth; inflation or deflation; fluctuations in foreign currency exchange rates, commodity and energy prices and interest rates; volatility in the credit and capital markets; and other factors;
- economic conditions, actual or potential defaults in corporate bonds, municipal bonds, mortgage-backed securities or sovereign debt obligations, volatility in interest and foreign currency exchange rates and changes in market value of concentrated investments can have a significant impact on the fair value of our fixed maturity securities and equity securities, as well as the carrying value of our other assets and liabilities, and this impact may be heightened by market volatility and our ability to mitigate our sensitivity to these changing conditions;
- economic conditions may adversely affect our access to capital and credit markets;
- the effects of government intervention, including material changes in the monetary policies of central banks, to address financial downturns (such as in response to the COVID-19 pandemic), inflation and other economic and currency concerns;
- the impacts that political and civil unrest and regional conflicts, such as the conflict between Russia and Ukraine, may have on our businesses and the markets they serve or that any disruptions in regional or worldwide economic conditions generally arising from these situations may have on our businesses, industries or investments;
- the significant volatility, uncertainty and disruption caused by health epidemics and pandemics, including the COVID-19 pandemic and its variants, as well as governmental, legislative, judicial or regulatory actions or developments in response thereto;
- changes in U.S. tax laws, regulations or interpretations, or in the tax laws, regulations or interpretations of other jurisdictions in which we operate, and adjustments we may make in our operations or tax strategies in response to those changes;
- a failure or security breach of, or cyberattack on, enterprise information technology systems that we use or a failure to comply with data protection or privacy regulations;
- third-party providers may perform poorly, breach their obligations to us or expose us to enhanced risks;
- our acquisitions may increase our operational and internal control risks for a period of time;
- we may not realize the contemplated benefits, including cost savings and synergies, of our acquisitions;
- any determination requiring the write-off of a significant portion of our goodwill and intangible assets;
- the failure or inadequacy of any methods we employ to manage our loss exposures;
- the loss of services of any senior executive or other key personnel of our businesses could adversely impact one or more of our operations;
- the manner in which we manage our global operations through a network of business entities could result in inconsistent management, governance and oversight practices and make it difficult for us to implement strategic decisions and coordinate procedures;
- our substantial international operations and investments expose us to increased political, civil, operational and economic risks, including foreign currency exchange rate and credit risk;
- our ability to obtain additional capital for our operations on terms favorable to us;
- our compliance, or failure to comply, with covenants and other requirements under our credit facilities, senior debt and other indebtedness and our preferred shares;
- our ability to maintain or raise third-party capital for existing or new investment vehicles and risks related to our management of third-party capital;
- the effectiveness of our procedures for compliance with existing and future guidelines, policies and legal and regulatory standards, rules, laws and regulations;
- the impact of economic and trade sanctions and embargo programs on our businesses, including instances in which the requirements and limitations applicable to the global operations of U.S. companies and their affiliates are more restrictive than, or conflict with, those applicable to non-U.S. companies and their affiliates;
- regulatory changes, or challenges by regulators, regarding the use of certain issuing carrier or fronting arrangements;

- our dependence on a limited number of brokers for a large portion of our revenues and third-party capital;
- adverse changes in our assigned financial strength, debt or preferred share ratings or outlook could adversely impact us, including our ability to attract and retain business, the amount of capital our insurance subsidiaries must hold and the availability and cost of capital;
- changes in the amount of statutory capital our insurance subsidiaries are required to hold, which can vary significantly and is based on many factors, some of which are outside our control;
- losses from litigation and regulatory investigations and actions;
- investor litigation or disputes, as well as regulatory inquiries, investigations or proceedings related to our Markel CATCo operations; delays or disruptions in the run-off of those operations; or the failure to realize the benefits of the transaction that permitted the accelerated return of capital to our Markel CATCo investors; and
- a number of additional factors may adversely affect our Markel Ventures operations, and the markets they serve, and negatively impact their revenues and profitability, including, among others: adverse weather conditions, plant disease and other contaminants; changes in government support for education, healthcare and infrastructure projects; changes in capital spending levels; changes in the housing, commercial and industrial construction markets; liability for environmental matters; supply chain and shipping issues, including increases in freight costs; volatility in the market prices for their products; and volatility in commodity, wholesale and raw materials prices and interest and foreign currency exchange rates.

Results from our underwriting, investing, Markel Ventures and other operations have been and will continue to be potentially materially affected by these factors.

By making forward-looking statements, we do not intend to become obligated to publicly update or revise any such statements whether as a result of new information, future events or other changes. Readers are cautioned not to place undue reliance on any forward-looking statements, which speak only as at their dates.

Item 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Market risk is the risk of economic losses due to adverse changes in the estimated fair value of a financial instrument as the result of changes in equity prices, interest rates, foreign currency exchange rates and commodity prices. Our consolidated balance sheets include assets and liabilities with estimated fair values that are subject to market risk. Our primary market risks are equity price risk associated with investments in equity securities, interest rate risk associated with investments in fixed maturity securities and foreign currency exchange rate risk associated with our international operations.

Our fixed maturity securities and equity securities are recorded at fair value, which is measured based upon quoted prices in active markets, if available. We determine fair value for these investments after considering various sources of information, including information provided by a third-party pricing service. The pricing service provides prices for substantially all of our fixed maturity securities and equity securities. In determining fair value, we generally do not adjust the prices obtained from the pricing service. We obtain an understanding of the pricing service's valuation methodologies and related inputs, which include, but are not limited to, reported trades, benchmark yields, issuer spreads, bids, offers, duration, credit ratings, estimated cash flows and prepayment speeds. We validate prices provided by the pricing service by reviewing prices from other pricing sources and analyzing pricing data in certain instances.

Equity Price Risk

We invest a portion of shareholder funds in equity securities, which have historically produced higher long-term returns relative to fixed maturity securities. We seek to invest in profitable companies, with honest and talented management, that exhibit reinvestment opportunities and capital discipline, at reasonable prices. We intend to hold these investments over the long term and focus on long-term total investment return, understanding that gains or losses on investments may fluctuate from one period to the next. Changes in the fair value of equity securities are recognized in net income.

At December 31, 2022, our equity portfolio was concentrated in terms of the number of issuers and industries. Such concentrations can lead to higher levels of volatility. At December 31, 2022, our ten largest equity holdings represented $3.2 billion, or 42%, of the equity portfolio. Investments in the property and casualty insurance industry represented $1.5 billion, or 19%, of our equity portfolio at December 31, 2022 and included a $997.7 million investment in the common stock of Berkshire Hathaway Inc., a company whose subsidiaries engage in a number of diverse business activities in addition to insurance. We have investment guidelines that set limits on the equity holdings of our insurance subsidiaries.

The following table summarizes our equity price risk and shows the effect of a hypothetical 35% increase or decrease in market prices as of December 31, 2022 and 2021. The selected hypothetical changes do not indicate what could be the potential best or worst case scenarios.

(dollars in millions)	Estimated Fair Value	Hypothetical Price Change	Estimated Fair Value after Hypothetical Change in Prices	Estimated Hypothetical Percentage Increase (Decrease) in Shareholders' Equity
As of December 31, 2022				
Equity securities	**$ 7,672**	**35% increase**	**$ 10,357**	**16.2 %**
		35% decrease	**4,987**	**(16.2)**
As of December 31, 2021				
Equity securities	$ 9,024	35% increase	$ 12,182	17.0 %
		35% decrease	5,866	(17.0)

Interest Rate Risk

Our fixed maturity investments and borrowings are subject to interest rate risk. Increases and decreases in interest rates typically result in decreases and increases, respectively, in the fair value of these financial instruments. Our fixed maturity investments are recorded at estimated fair value in our financial statements, and therefore, changes in interest rates impact our financial position and results of operations. Our borrowings are recorded at amortized cost in our financial statements, and therefore, changes in fair value do not impact our financial position or results of operations.

The majority of our investable assets come from premiums paid by policyholders. These funds are invested predominantly in high-quality government and municipal bonds and mortgage-backed securities that generally match the duration and currency of our loss reserves. As of December 31, 2022, our fixed maturity portfolio had an average duration of 3.9 years and an average rating of "AAA." See note 4(c) of the notes to consolidated financial statements included under Item 8 for details regarding contractual maturity dates of our fixed maturity portfolio. The changes in the estimated fair value of the fixed maturity portfolio are presented as a component of shareholders' equity in accumulated other comprehensive income, net of taxes. We typically hold these fixed maturity investments until maturity, and as a result, unrealized holding gains and losses on these securities are generally expected to reverse as the securities mature.

We work to manage the impact of interest rate fluctuations on our fixed maturity portfolio. The effective duration of the fixed maturity portfolio is managed with consideration given to the estimated duration of our liabilities. We have investment guidelines that limit the maximum duration and maturity of the fixed maturity portfolio.

We use a commercially available model to estimate the effect of interest rate risk on the fair values of our fixed maturity portfolio and borrowings. The model estimates the impact of interest rate changes on a wide range of factors including duration, prepayment, put options and call options. Fair values are estimated based on the present value of cash flows, using a representative set of possible future interest rate scenarios. The model requires that numerous assumptions be made about the future. To the extent that any of the assumptions are invalid, incorrect estimates could result. The usefulness of a single point-in-time model is limited, as it is unable to accurately incorporate the full complexity of market interactions.

The following table summarizes our interest rate risk and shows the effect of hypothetical changes in interest rates as of December 31, 2022 and 2021. The selected hypothetical changes do not indicate what could be the potential best or worst case scenarios.

				Hypothetical Percentage Increase (Decrease) in	
(dollars in millions)	Estimated Fair Value	Hypothetical Change in Interest Rates (bp=basis points)	Estimated Fair Value after Hypothetical Change in Interest Rates	Fair Value of Fixed Maturity Securities	Shareholders' Equity
Fixed Maturity Securities					
As of December 31, 2022					
Total fixed maturity securities	**$ 11,857**	**200 bp decrease**	**$ 12,843**	**8.3 %**	**6.0 %**
		100 bp decrease	**12,334**	**4.0**	**2.9**
		100 bp increase	**11,406**	**(3.8)**	**(2.7)**
		200 bp increase	**10,972**	**(7.5)**	**(5.3)**
As of December 31, 2021					
Total fixed maturity securities	$ 12,587	200 bp decrease	$ 13,841	10.0 %	6.7 %
		100 bp decrease	13,189	4.8	3.2
		100 bp increase	12,022	(4.5)	(3.0)
		200 bp increase	11,490	(8.7)	(5.9)
Liabilities [(1)]					
As of December 31, 2022					
Borrowings	**$ 3,541**	**200 bp decrease**	**$ 4,384**		
		100 bp decrease	**3,922**		
		100 bp increase	**3,225**		
		200 bp increase	**2,962**		
As of December 31, 2021					
Borrowings	$ 5,017	200 bp decrease	$ 6,500		
		100 bp decrease	5,678		
		100 bp increase	4,478		
		200 bp increase	4,036		

(1) Changes in estimated fair value have no impact on shareholders' equity.

Foreign Currency Exchange Rate Risk

We have foreign currency exchange rate risk associated with certain of our international operations' assets and liabilities. We manage this risk primarily by matching assets and liabilities that are subject to foreign exchange rate risk as closely as possible. To assist with this matching, we periodically purchase foreign currency forward contracts and purchase or sell foreign currencies in the open market. Realized and unrealized gains and losses on our forward contracts are recorded in earnings. Our forward contracts generally have maturities of three months.

At both December 31, 2022 and 2021, 90% of our invested assets were denominated in United States (U.S.) Dollars. At December 31, 2022 and 2021, 89% and 86%, respectively, of our reserves for unpaid losses and loss adjustment expenses and life and annuity benefits were denominated in U.S. Dollars. At those dates, the largest foreign currency denominated balances within both our invested assets and reserves for unpaid losses and loss adjustment expenses and life and annuity benefits were the Euro and British Pound Sterling.

At December 31, 2022 and 2021, our foreign currency denominated assets and liabilities that are subject to foreign currency exchange rate risk were substantially matched or hedged.

Credit Risk

Credit risk, which is not considered a market risk, is the risk that an entity becomes unable or unwilling to fulfill their obligation to us. Our primary credit risks are the credit risk within our fixed maturity portfolio and the credit risk related to our reinsurance recoverables within our underwriting, program services and other fronting operations.

Fixed Maturity Investments

Credit risk exists within our fixed maturity portfolio from the potential for loss resulting from adverse changes in an issuer's ability to repay its debt obligations. We monitor our investment portfolio to ensure that credit risk does not exceed prudent levels. We have consistently invested in high credit quality, investment grade securities. As of December 31, 2022, our fixed maturity portfolio had an average rating of "AAA," with 99% rated "A" or better by at least one nationally recognized rating organization. Our policy is to invest in investment grade securities and to minimize investments in fixed maturity securities that are unrated or rated below investment grade. Our fixed maturity portfolio includes securities issued with financial guaranty insurance. We purchase fixed maturity securities based on our assessment of the credit quality of the underlying assets without regard to insurance.

Our fixed maturity portfolio includes securities issued by foreign governments and non-sovereign foreign institutions. General concern exists about foreign countries that experience financial difficulties during periods of adverse economic conditions. We monitor developments in foreign countries, currencies and issuers that could pose risks to our fixed maturity portfolio, including ratings downgrades, political and financial changes and the widening of credit spreads. Our fixed maturity portfolio is highly diversified and comprised of high quality securities.

We obtain information from news services, data providers, rating agencies and various financial market participants to assess potential negative impacts on a country or company's financial risk profile. We analyze concentrations within our fixed maturity portfolio by country, currency and issuer, which allows us to assess our level of diversification with respect to these exposures, reduce troubled exposures should they occur and mitigate any future financial distress that these exposures could cause.

Our fixed maturity portfolio also includes securities issued by municipalities. General concern exists about municipalities that experience financial difficulties during periods of adverse economic conditions. We manage the exposure to credit risk in our municipal bond portfolio by investing in high quality securities and by diversifying our holdings, which are typically either general obligation or revenue bonds related to essential products and services.

Reinsurance Recoverables

We have credit risk to the extent any of our reinsurers are unwilling or unable to meet their obligations under our ceded reinsurance agreements. We monitor changes in the financial condition of each of our reinsurers, and we assess our concentration of credit risk on a regular basis. While we believe our net reinsurance recoverable balances are collectible, deterioration in reinsurers' ability to pay, or collection disputes, could adversely affect our operating cash flows, financial position and results of operations. See note 12 of the notes to consolidated financial statements included under Item 8 for additional details about our reinsurance recoverables and exposures.

Underwriting

Within our underwriting operations, our reinsurance recoverables balance for the ten largest reinsurers was $2.0 billion at December 31, 2022, representing 62% of the $3.1 billion total reinsurance recoverables, before considering allowances for credit losses. Eight of our ten largest reinsurers within our underwriting operations were rated "A" or better by A.M. Best Company (Best). As of December 31, 2022, for both of the remaining reinsurers, which are related parties, collateral held exceeded the related reinsurance recoverable. We were the beneficiary of letters of credit, trust accounts and funds withheld in the aggregate amount of $930.9 million at December 31, 2022, collateralizing reinsurance recoverable balances due from these ten reinsurers.

Within our underwriting operations, we attempt to minimize credit exposure to reinsurers through adherence to internal reinsurance guidelines. To participate in our reinsurance program, prospective companies generally must: (i) maintain a Best or Standard & Poor's rating of "A" (excellent) or better; (ii) maintain minimum capital and surplus of $750 million; and (iii) provide collateral for recoverables in excess of an individually established amount. We also consider qualitative factors when evaluating reinsurers for eligibility to participate in our reinsurance program. In addition, certain foreign reinsurers for our U.S. insurance operations must provide collateral equal to 100% of recoverables, with the exception of reinsurers who have been granted certified or authorized status by an insurance company's state of domicile. Our credit exposure to Lloyd's of London syndicates is managed through individual and aggregate exposure thresholds.

Program Services

Within our program services business, our reinsurance recoverables balance for the ten largest reinsurers was $3.3 billion at December 31, 2022, representing 67% of the $4.9 billion total reinsurance recoverables, before considering allowances for credit losses. We were the beneficiary of letters of credit, trust accounts and funds withheld in the aggregate amount of $2.3 billion at December 31, 2022, collateralizing reinsurance recoverable balances due from these ten reinsurers, and $3.3 billion for our total reinsurance recoverables balance. Five of our ten largest reinsurers were rated "A" or better by Best. For each of the remaining five reinsurers, as of December 31, 2022, collateral held exceeded the related reinsurance recoverable.

Within our program services business, we mitigate credit risk by either selecting well capitalized, highly rated authorized reinsurers or requiring that the reinsurer post substantial collateral to secure the reinsured risks, which, in some instances, exceeds the related reinsurance recoverable. For reinsurers with a credit rating of lower than "A" we employ a stringent collateral monitoring program, under which the majority of the reinsurance recoverable balances is fully collateralized. These collateral requirements are regularly monitored by a credit committee within our program services operations.

Other Fronting

For our other fronting arrangements, which are written on behalf of our ILS operations, our total reinsurance recoverables balance was $479.7 million at December 31, 2022. As of December 31, 2022, our ILS operations held investor collateral in excess of the related reinsurance recoverables. For this business, we require collateral up to a specified level of annual aggregate agreement year losses, which is held in a trust for which we are the beneficiary. The required collateral is monitored regularly against the annual aggregate agreement year losses to ensure adequacy of the reinsurance recoverable in the event of a loss.

Item 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Shareholders and Board of Directors
Markel Corporation:

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Markel Corporation and subsidiaries (the Company) as of December 31, 2022 and 2021, the related consolidated statements of income (loss) and comprehensive income (loss), changes in equity, and cash flows for each of the years in the three-year period ended December 31, 2022, and the related notes (collectively, the consolidated financial statements). In our opinion, the consolidated financial statements 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 years in the three-year period ended December 31, 2022, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), 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, and our report dated February 17, 2023 expressed an unqualified opinion on the effectiveness of the Company's internal control over financial reporting.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. 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 audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated 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 consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matter

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

Estimation of the liability for unpaid losses and loss adjustment expenses for the Company's underwriting operations

As described in Note 11, the Company has recorded a liability for unpaid losses and loss adjustment expenses (loss reserves) of $20.9 billion as of December 31, 2022. Of this amount, $15.4 billion represents loss reserves for the Company's underwriting operations. The Company's actuaries use established actuarial methods and past development patterns to estimate ultimate losses to be paid. For its underwriting operations, loss reserves are established at the Company's best estimates, which incorporate the actuarial point estimates and are adjusted for certain subjective factors.

We identified the assessment of loss reserve estimation for the Company's underwriting operations as a critical audit matter because it involved significant measurement uncertainty. The assessment of actuarial methods and key assumptions used to estimate ultimate losses required specialized actuarial skills and subjective auditor judgment. Key assumptions included weighting of actuarial methods, expected loss ratios, and patterns and variability of loss development.

The following are the primary procedures we performed to address this critical audit matter. With the assistance of actuarial professionals, as appropriate, we evaluated the design and tested the operating effectiveness of internal controls over the Company's loss reserving process for its underwriting operations. This included controls over key assumptions and the determination of loss reserves. Additionally, we also involved actuarial professionals with specialized skills and knowledge, who assisted in:

- assessing the Company's actuarial methodologies by comparing to generally accepted actuarial methodologies and evaluating the weighting of the methods based on common industry practice
- developing independent actuarial estimates for certain product lines using the Company's underlying historical claims and policy data, as well as industry loss reporting and payment data for certain lines
- for certain product lines, assessing the Company's assumptions about future claims reporting and payments for consistency with historical loss development and payment patterns
- developing an independent range of consolidated loss reserves based on actuarial methods and assumptions, comparing those results to the Company's recorded reserves and evaluating the movement of the Company's recorded reserve within our range

/s/ KPMG LLP

We have served as the Company's auditor since 1980.

Richmond, Virginia
February 17, 2023

MARKEL CORPORATION AND SUBSIDIARIES
CONSOLIDATED BALANCE SHEETS

	December 31,	
	2022	2021
	(dollars in thousands)	
ASSETS		
Investments, at estimated fair value:		
Fixed maturity securities, available-for-sale (amortized cost of $12,805,887 in 2022 and $12,061,467 in 2021)	**$ 11,856,835**	$ 12,587,305
Equity securities (cost of $3,100,040 in 2022 and $2,867,899 in 2021)	**7,671,912**	9,023,927
Short-term investments, available-for-sale (estimated fair value approximates cost)	**2,669,262**	1,799,988
Total Investments	**22,198,009**	23,411,220
Cash and cash equivalents	**4,137,432**	3,978,490
Restricted cash and cash equivalents	**1,084,081**	902,457
Receivables	**2,961,056**	2,413,938
Reinsurance recoverables	**8,446,745**	7,293,555
Deferred policy acquisition costs	**925,483**	794,145
Prepaid reinsurance premiums	**2,066,114**	1,798,571
Goodwill	**2,638,838**	2,899,140
Intangible assets	**1,747,464**	1,822,486
Other assets	**3,586,037**	3,163,094
Total Assets	**$ 49,791,259**	$ 48,477,096
LIABILITIES AND EQUITY		
Unpaid losses and loss adjustment expenses	**$ 20,947,898**	$ 18,178,894
Life and annuity benefits	**759,025**	902,980
Unearned premiums	**6,220,748**	5,383,619
Payables to insurance and reinsurance companies	**669,742**	616,665
Senior long-term debt and other debt (estimated fair value of $3,541,000 in 2022 and $5,017,000 in 2021)	**4,103,629**	4,361,266
Other liabilities	**3,438,738**	3,832,084
Total Liabilities	**36,139,780**	33,275,508
Redeemable noncontrolling interests	**523,154**	461,378
Commitments and contingencies		
Shareholders' equity:		
Preferred stock	**591,891**	591,891
Common stock	**3,493,893**	3,441,079
Retained earnings	**9,836,827**	10,446,763
Accumulated other comprehensive income (loss)	**(857,077)**	237,617
Total Shareholders' Equity	**13,065,534**	14,717,350
Noncontrolling interests	**62,791**	22,860
Total Equity	**13,128,325**	14,740,210
Total Liabilities and Equity	**$ 49,791,259**	$ 48,477,096

See accompanying notes to consolidated financial statements.

MARKEL CORPORATION AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF INCOME (LOSS) AND COMPREHENSIVE INCOME (LOSS)

	Years Ended December 31,		
	2022	2021	2020
	(dollars in thousands, except per share data)		
OPERATING REVENUES			
Earned premiums	**$ 7,587,792**	$ 6,503,029	$ 5,612,205
Net investment income	**446,755**	367,417	375,826
Net investment gains (losses)	**(1,595,733)**	1,978,534	617,979
Products revenues	**2,427,096**	1,712,120	1,439,515
Services and other revenues	**2,809,425**	2,285,325	1,689,541
Total Operating Revenues	**11,675,335**	12,846,425	9,735,066
OPERATING EXPENSES			
Losses and loss adjustment expenses	**4,445,589**	3,581,205	3,466,961
Underwriting, acquisition and insurance expenses	**2,515,583**	2,293,739	2,017,627
Products expenses	**2,241,736**	1,544,506	1,256,159
Services and other expenses	**2,306,635**	2,022,935	1,561,120
Amortization of intangible assets	**178,778**	160,539	159,315
Impairment of goodwill	**80,000**	—	—
Total Operating Expenses	**11,768,321**	9,602,924	8,461,182
Operating Income (Loss)	**(92,986)**	3,243,501	1,273,884
Interest expense	**(196,062)**	(183,579)	(177,582)
Net foreign exchange gains (losses)	**140,209**	72,271	(95,853)
Income (Loss) Before Income Taxes	**(148,839)**	3,132,193	1,000,449
Income tax (expense) benefit	**47,636**	(684,458)	(168,682)
Net Income (Loss)	**(101,203)**	2,447,735	831,767
Net income attributable to noncontrolling interests	**(112,920)**	(22,732)	(15,737)
Net Income (Loss) to Shareholders	**(214,123)**	2,425,003	816,030
Preferred stock dividends	**(36,000)**	(36,000)	(18,400)
Net Income (Loss) to Common Shareholders	**$ (250,123)**	$ 2,389,003	$ 797,630
OTHER COMPREHENSIVE INCOME (LOSS)			
Change in net unrealized gains (losses) on available-for-sale investments, net of taxes:			
Net holding gains (losses) arising during the period	**$ (1,155,054)**	$ (348,315)	$ 356,159
Reclassification adjustments for net gains (losses) included in net income (loss)	**44,906**	(6,623)	(3,386)
Change in net unrealized gains (losses) on available-for-sale investments, net of taxes	**(1,110,148)**	(354,938)	352,773
Change in foreign currency translation adjustments, net of taxes	**(9,259)**	(213)	29,847
Change in net actuarial pension loss, net of taxes	**24,730**	8,390	(6,998)
Total Other Comprehensive Income (Loss)	**(1,094,677)**	(346,761)	375,622
Comprehensive Income (Loss)	**(1,195,880)**	2,100,974	1,207,389
Comprehensive income attributable to noncontrolling interests	**(112,937)**	(22,730)	(15,755)
Comprehensive Income (Loss) to Shareholders	**$ (1,308,817)**	$ 2,078,244	$ 1,191,634
NET INCOME (LOSS) PER COMMON SHARE			
Basic	**$ (23.57)**	$ 176.92	$ 55.67
Diluted	**$ (23.57)**	$ 176.51	$ 55.63

See accompanying notes to consolidated financial statements.

MARKEL CORPORATION AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CHANGES IN EQUITY

(dollars in thousands)	Preferred Stock	Common Stock	Retained Earnings	Accumulated Other Comprehensive Income (Loss)	Total Shareholders' Equity	Noncontrolling Interests	Total Equity	Redeemable Noncontrolling Interests
December 31, 2019	$ —	$3,404,919	$7,457,176	$ 208,772	$ 11,070,867	$ 7,549	$11,078,416	$ 177,562
Cumulative effect of adoption of ASC 326, *Financial Instruments—Credit Losses*			(3,827)	—	(3,827)	—	(3,827)	—
Cumulative effect of change in accounting policy			22,302	—	22,302	—	22,302	—
January 1, 2020	—	3,404,919	7,475,651	208,772	11,089,342	7,549	11,096,891	177,562
Net income			816,030	—	816,030	3,226	819,256	12,511
Other comprehensive income			—	375,604	375,604	—	375,604	18
Comprehensive Income					1,191,634	3,226	1,194,860	12,529
Issuance of preferred stock	591,891	—	—	—	591,891	—	591,891	—
Repurchase of common stock	—	—	(26,832)	—	(26,832)	—	(26,832)	—
Preferred stock dividends	—	—	(18,400)	—	(18,400)	—	(18,400)	—
Restricted stock awards expensed	—	29,779	—	—	29,779	—	29,779	—
Acquisition of Lansing	—	—	—	—	—	—	—	43,566
Adjustment of redeemable noncontrolling interests	—	—	(28,705)	—	(28,705)	—	(28,705)	28,705
Purchase of noncontrolling interest	—	(6,131)	—	—	(6,131)	—	(6,131)	(7,029)
Other	—	(227)	(260)	—	(487)	4,117	3,630	(9,691)
December 31, 2020	591,891	3,428,340	8,217,484	584,376	12,822,091	14,892	12,836,983	245,642
Net income			2,425,003	—	2,425,003	7,257	2,432,260	15,475
Other comprehensive loss			—	(346,759)	(346,759)	—	(346,759)	(2)
Comprehensive Income					2,078,244	7,257	2,085,501	15,473
Repurchase of common stock	—	—	(206,518)	—	(206,518)	—	(206,518)	—
Preferred stock dividends	—	—	(36,000)	—	(36,000)	—	(36,000)	—
Restricted stock awards expensed	—	30,916	—	—	30,916	—	30,916	—
Acquisition of Buckner	—	—	—	—	—	—	—	26,438
Acquisition of Metromont	—	—	—	—	—	—	—	269,908
Adjustment of redeemable noncontrolling interests	—	—	46,874	—	46,874	—	46,874	(46,874)
Purchase of noncontrolling interest	—	(18,779)	—	—	(18,779)	—	(18,779)	(38,214)
Other	—	602	(80)	—	522	711	1,233	(10,995)
December 31, 2021	591,891	3,441,079	10,446,763	237,617	14,717,350	22,860	14,740,210	461,378
Net income (loss)			**(214,123)**	**—**	**(214,123)**	**86,739**	**(127,384)**	**26,181**
Other comprehensive income (loss)			**—**	**(1,094,694)**	**(1,094,694)**	**—**	**(1,094,694)**	**17**
Comprehensive Income (Loss)					**(1,308,817)**	**86,739**	**(1,222,078)**	**26,198**
Repurchase of common stock	**—**	**—**	**(290,796)**	**—**	**(290,796)**	**—**	**(290,796)**	**—**
Preferred stock dividends	**—**	**—**	**(36,000)**	**—**	**(36,000)**	**—**	**(36,000)**	**—**
Restricted stock awards expensed	**—**	**41,684**	**—**	**—**	**41,684**	**—**	**41,684**	**—**
Adjustment of redeemable noncontrolling interests	**—**	**—**	**(69,896)**	**—**	**(69,896)**	**—**	**(69,896)**	**69,896**
Adjustment to Metromont purchase price allocation	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**(22,485)**
Disposition of Velocity	**—**	**—**	**—**	**—**	**—**	**(22,059)**	**(22,059)**	**—**
Disposition of Volante	**—**	**—**	**—**	**—**	**—**	**(3,490)**	**(3,490)**	**—**
Redemption of Markel CATCo Re noncontrolling interests	**—**	**—**		**—**	**—**	**(22,261)**	**(22,261)**	**—**
Other	**—**	**11,130**	**879**	**—**	**12,009**	**1,002**	**13,011**	**(11,833)**
December 31, 2022	**$591,891**	**$3,493,893**	**$9,836,827**	**$ (857,077)**	**$ 13,065,534**	**$ 62,791**	**$13,128,325**	**$ 523,154**

See accompanying notes to consolidated financial statements.

MARKEL CORPORATION AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CASH FLOWS

	Years Ended December 31,		
	2022	2021	2020
	(dollars in thousands)		
OPERATING ACTIVITIES			
Net income (loss)	**$ (101,203)**	$ 2,447,735	$ 831,767
Adjustments to reconcile net income (loss) to net cash provided by operating activities:			
Deferred income tax expense (benefit)	**(281,752)**	453,905	(2,733)
Depreciation and amortization	**366,954**	336,393	307,069
Net investment losses (gains)	**1,595,733**	(1,978,534)	(617,979)
Net foreign exchange losses (gains)	**(140,209)**	(72,271)	95,853
Gain on sale of businesses, net	**(225,832)**	(22,085)	—
Impairment of goodwill	**80,000**	—	—
Increase in receivables	**(653,261)**	(372,491)	(28,174)
Increase in reinsurance recoverables	**(1,168,483)**	(1,312,258)	(549,654)
Increase in deferred policy acquisition costs	**(140,630)**	(139,609)	(61,569)
Increase in prepaid reinsurance premiums	**(271,292)**	(347,982)	(34,480)
Increase in unpaid losses and loss adjustment expenses	**2,383,268**	2,042,486	1,383,430
Decrease in life and annuity benefits	**(47,419)**	(54,591)	(44,651)
Increase in unearned premiums	**886,393**	970,246	354,679
Increase in payables to insurance and reinsurance companies	**210,810**	131,559	76,586
Other	**216,365**	191,564	27,443
Net Cash Provided By Operating Activities	**2,709,442**	2,274,067	1,737,587
INVESTING ACTIVITIES			
Proceeds from sales, maturities, calls and prepayments of fixed maturity securities	**1,152,335**	708,111	862,333
Cost of fixed maturity securities purchased	**(2,112,066)**	(3,165,323)	(1,129,781)
Proceeds from sales of equity securities	**242,010**	200,570	1,360,090
Cost of equity securities purchased	**(442,991)**	(255,436)	(192,437)
Net change in short-term investments	**(846,019)**	228,955	(829,457)
Additions to property and equipment	**(254,712)**	(145,249)	(101,301)
Acquisitions, net of cash acquired	**(79,000)**	(517,439)	(554,127)
Consolidation of Markel CATCo Re, net	**629,955**	—	—
Distributions to Markel CATCo Re noncontrolling interests for buy-out transaction	**(169,380)**	—	—
Proceeds from sale of businesses, net	**201,370**	40,720	—
Other	**8,294**	(32,711)	72,932
Net Cash Used By Investing Activities	**(1,670,204)**	(2,937,802)	(511,748)
FINANCING ACTIVITIES			
Additions to senior long-term debt and other debt	**1,034,052**	1,198,505	223,183
Repayment of senior long-term debt and other debt	**(1,255,005)**	(486,730)	(275,996)
Repurchases of common stock	**(290,796)**	(206,518)	(26,832)
Issuance of preferred stock, net	**—**	—	591,891
Dividends paid on preferred stock	**(36,000)**	(36,000)	(18,400)
Other	**(47,562)**	(99,490)	(59,290)
Net Cash Provided (Used) By Financing Activities	**(595,311)**	369,767	434,556
Effect of foreign currency rate changes on cash, cash equivalents, restricted cash and restricted cash equivalents	**(103,361)**	(41,734)	55,901
Increase (decrease) in cash, cash equivalents, restricted cash and restricted cash equivalents	**340,566**	(335,702)	1,716,296
Cash, cash equivalents, restricted cash and restricted cash equivalents at beginning of year	**4,880,947**	5,216,649	3,500,353
CASH, CASH EQUIVALENTS, RESTRICTED CASH AND RESTRICTED CASH EQUIVALENTS AT END OF YEAR	**$ 5,221,513**	$ 4,880,947	$ 5,216,649

See accompanying notes to consolidated financial statements.

1. Summary of Significant Accounting Policies

Markel Corporation is a diverse financial holding company serving a variety of niche markets. Markel Corporation's principal business markets and underwrites specialty insurance products. Through its wholly owned subsidiary, Markel Ventures, Inc. (Markel Ventures), Markel Corporation also owns controlling interests in various businesses that operate outside of the specialty insurance marketplace. See note 2 for details regarding reportable segments.

a) Basis of Presentation. The accompanying consolidated financial statements have been prepared in accordance with United States (U.S.) generally accepted accounting principles (GAAP) and include the accounts of Markel Corporation and its consolidated subsidiaries, as well as any variable interest entities (VIEs) that meet the requirements for consolidation (the Company). All significant intercompany balances and transactions have been eliminated in consolidation. The Company consolidates the results of its Markel Ventures subsidiaries on a one-month lag, with the exception of significant transactions or events that occur during the intervening period. Certain prior period amounts have been reclassified to conform to the current period presentation.

b) Use of Estimates. The preparation of financial statements in accordance with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenues and expenses and the disclosure of contingent assets and liabilities. Management periodically reviews its estimates and assumptions. Quarterly reviews include evaluating the adequacy of reserves for unpaid losses and loss adjustment expenses and contingencies. Estimates and assumptions for goodwill and intangible assets are reviewed in conjunction with an acquisition, and goodwill and indefinite-lived intangible assets are reassessed at least annually for impairment. Actual results may differ materially from the estimates and assumptions used in preparing the consolidated financial statements.

c) Investments. Available-for-sale investments and equity securities are recorded at estimated fair value. Available-for-sale investments include fixed maturity securities and short-term investments. Fixed maturity securities include government and municipal bonds and mortgage-backed securities with original maturities of more than one year. Short-term investments include certificates of deposit, commercial paper, discount notes and treasury bills with original maturities of one year or less. Unrealized gains and losses on available-for-sale investments, net of income taxes, are included in other comprehensive income. Unrealized gains and losses on equity securities, net of income taxes, are included in net income as net investment gains or losses. The Company completes a detailed analysis each quarter to assess declines in the fair value of its available-for-sale investments. Any impairment losses on the Company's available-for-sale investments are recorded as an allowance, subject to reversal.

Premiums and discounts are amortized or accreted over the lives of the related fixed maturity securities as an adjustment to the yield using the effective interest method. Dividend and interest income are recognized when earned. Accrued interest receivable is excluded from both the estimated fair value and the amortized cost basis of available-for-sale securities and included within other assets on the Company's consolidated balance sheets. Any uncollectible accrued interest receivable is written off in the period it is deemed uncollectible. Realized investment gains or losses on available-for-sale investments are included in net income. Realized gains or losses from sales of available-for-sale investments are derived using the first-in, first-out method on the trade date.

See note 4 and note 5 for further details regarding the Company's investment portfolio.

d) Cash and Cash Equivalents. The Company considers all investments with original maturities of 90 days or less to be cash equivalents. The carrying value of the Company's cash and cash equivalents approximates fair value.

e) Restricted Cash and Cash Equivalents. Cash and cash equivalents that are restricted as to withdrawal or use are recorded as restricted cash and cash equivalents. The carrying value of the Company's restricted cash and cash equivalents approximates fair value.

f) Receivables. Receivables include amounts receivable from agents, brokers and insureds, which represent premiums that are both currently due and amounts not yet due on insurance and reinsurance policies. Premiums for insurance policies are generally due at inception. Premiums for reinsurance policies generally become due over the period of coverage based on the policy terms. Changes in the estimate of reinsurance premiums written will result in an adjustment to premiums receivable in

the period they are determined. Receivables also include amounts receivable from contracts with customers, which represent the Company's unconditional right to consideration for satisfying the performance obligations outlined in the contract.

The Company monitors credit risk associated with receivables, taking into consideration the fact that in certain instances in the Company's insurance operations credit risk may be reduced by the Company's right to offset loss obligations or unearned premiums against premiums receivable. An allowance is established for credit losses expected to be incurred over the life of the receivable, which is recorded net of this allowance. The allowance is charged to net income in the period the receivable is recorded and revised in subsequent periods to reflect changes in the Company's estimate of expected credit losses. See note 7 for further details regarding receivables.

g) Reinsurance Recoverables. Amounts recoverable from reinsurers are estimated in a manner consistent with the claim liability associated with the reinsured business. The Company evaluates the financial condition of its reinsurers and monitors concentration of credit risk to minimize its exposure to significant losses from individual reinsurers. To further reduce credit exposure on reinsurance recoverables, the Company has received collateral, including letters of credit and trust accounts, from certain reinsurers. Cash collateral related to these reinsurance agreements is available, without restriction, when the Company pays losses covered by the reinsurance agreements. An allowance is established for credit losses expected to be incurred over the life of the reinsurance recoverable, which is recorded net of this allowance. The allowance is charged to net income in the period the recoverable is recorded and revised in subsequent periods to reflect changes in the Company's estimate of expected credit losses. As of December 31, 2022 and 2021, the allowance for credit losses associated with the Company's reinsurance recoverables was not material to the consolidated financial statements.

h) Deferred Policy Acquisition Costs. Costs directly related to the acquisition of insurance premiums are deferred and amortized over the related policy period, generally one year. The Company only defers acquisition costs incurred that are related directly to the successful acquisition of new or renewal insurance contracts, including commissions to agents and brokers, salaries and benefits and premium taxes. Commissions received related to reinsurance premiums ceded are netted against broker commissions in determining acquisition costs eligible for deferral. To the extent that future policy revenues on existing policies are not adequate to cover related costs and expenses, deferred policy acquisition costs are charged to earnings. The Company does not consider anticipated investment income in determining whether a premium deficiency exists. See note 2(a) and (f) for further details regarding policy acquisition costs, as well as note 24 for details regarding a change to the Company's policy for accounting for deferred policy acquisition costs.

i) Goodwill and Intangible Assets. Goodwill and intangible assets are recorded as a result of business acquisitions. Goodwill represents the excess of the amount paid to acquire a business over the net fair value of assets acquired and liabilities assumed at the date of acquisition. Indefinite-lived and other intangible assets are recorded at fair value as of the acquisition date. The determination of the fair value of certain assets acquired and liabilities assumed involves significant judgment and the use of valuation models and other estimates, which require assumptions that are inherently subjective. Goodwill and indefinite-lived intangible assets are tested for impairment at least annually. The Company completes an annual test during the fourth quarter of each year based upon the results of operations through September 30. Intangible assets with definite lives are amortized using the straight-line method over their estimated useful lives, generally five to 20 years, and are reviewed for impairment when events or circumstances indicate that their carrying value may not be recoverable. See note 8 for further details regarding goodwill and intangible assets.

j) Equity Method Investments. The Company holds certain investments that are required to be accounted for under the equity method, whereby they initially are recorded at cost within other assets on the consolidated balance sheets and subsequently increased or decreased by the Company's proportionate share of the net income or loss of the investee and other transactions impacting the investee's equity. The Company records its proportionate share of net income or loss of the investee in services and other revenues. The Company records its proportionate share of other comprehensive income or loss of the investee as a component of other comprehensive income. Dividends or other equity distributions in excess of the Company's cumulative equity in earnings of the investee are recorded as a reduction of the investment. The Company reviews equity method investments for impairment when events or circumstances indicate that a decline in the fair value of the investment below its carrying value is other-than-temporary. See note 6 for further details regarding the Company's equity method investments.

k) Property and Equipment. Property and equipment is maintained primarily by certain of the Company's Markel Ventures businesses and is stated at cost less accumulated depreciation. Depreciation of property and equipment is calculated using the straight-line method over the estimated useful lives of the respective assets. Property and equipment, net of accumulated depreciation, was $1.2 billion and $1.1 billion as of December 31, 2022 and 2021, respectively, and is included in other assets on the Company's consolidated balance sheets.

l) Leases. The present value of future lease payments for the Company's leases with terms greater than 12 months is included on the consolidated balance sheets as lease liabilities and right-of-use lease assets.

The Company's lease portfolio primarily consists of operating leases for real estate. Total expected lease payments are based on the lease payments specified in the contract and the stated term, including any options to extend or terminate that the Company is reasonably certain to exercise. The Company accounts for lease components and any associated non-lease components within a contract as a single lease component, and therefore allocates all of the expected lease payments to the lease component.

The lease liability, which represents the Company's contractual obligation to make lease payments, is calculated based on the present value of expected lease payments over the remaining lease term, discounted using the Company's collateralized incremental borrowing rate at the lease commencement date. The lease liability is then adjusted for any prepaid rent, lease incentives received or capitalized initial direct costs to determine the lease asset, which represents the Company's right to use the underlying asset for the lease term. Lease liabilities and lease assets are included in other liabilities and other assets, respectively, on the Company's consolidated balance sheets.

Total lease costs are primarily comprised of rental expense for operating leases, which is recognized on a straight line basis over the lease term. Rental expense attributable to the Company's underwriting operations is included in underwriting, acquisition and insurance expenses and rental expense attributable to the Company's other operations is included in products expenses and services and other expenses in the consolidated statements of income and comprehensive income. See note 9 for further details regarding leases.

m) Inventories. Inventories are maintained at certain of the Company's Markel Ventures businesses and consist primarily of raw materials, work-in-process and finished goods. Inventories are generally valued using the first-in-first-out method and stated at the lower of cost or net realizable value. Inventories were $639.6 million and $529.3 million as of December 31, 2022 and 2021, respectively, and are included in other assets on the Company's consolidated balance sheets.

n) Redeemable Noncontrolling Interests. The Company owns controlling interests in various companies through its Markel Ventures operations. In some cases, the Company has the option to acquire the remaining equity interests, and the remaining equity interests have the option to sell their interests to the Company, in the future. The redemption value of the remaining equity interests is generally based on the respective company's earnings in specified periods preceding the redemption date. The redeemable noncontrolling interests are currently redeemable or become redeemable between 2023 and 2032.

The Company recognizes changes in the redemption value that exceed the carrying value of redeemable noncontrolling interests to retained earnings as if the balance sheet date was also the redemption date. Changes in the redemption value also result in an adjustment to net income to common shareholders in the calculation of basic and diluted net income per common share. See note 19 for further details regarding the calculation of basic and diluted net income per common share.

o) Income Taxes. The Company records deferred income taxes to reflect the net tax effect of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and their tax bases. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in years in which those temporary differences are expected to be recovered or settled. Deferred tax assets are reduced by a valuation allowance when management believes it is more likely than not that some, or all, of the deferred tax assets will not be realized. The Company recognizes the tax benefit from an uncertain tax position taken or expected to be taken in income tax returns only if it is more likely than not that the tax position will be sustained upon examination by tax authorities, based on the technical merits of the position. Tax positions that meet the more likely than not threshold are then measured using a probability weighted approach, whereby the largest amount of tax benefit that is greater than 50% likely of being realized upon ultimate settlement is recognized. The Company recognizes interest and penalties related to uncertain tax positions in income tax expense. See note 15 for further details regarding income taxes.

p) Unpaid Losses and Loss Adjustment Expenses. Unpaid losses and loss adjustment expenses on the Company's property and casualty insurance business are based on evaluations of reported claims and estimates for losses and loss adjustment expenses incurred but not reported. Estimates for losses and loss adjustment expenses incurred but not reported are based on reserve development studies, among other things. Recorded reserves are estimates, and the ultimate liability may be greater or less than the estimates. See note 11 for further details regarding unpaid losses and loss adjustment expenses.

q) Life and Annuity Benefits. The Company has a run-off block of life and annuity reinsurance contracts that subject the Company to mortality, longevity and morbidity risks. The assumptions used to determine policy benefit reserves are generally

locked-in for the life of the contract unless an unlocking event occurs. To the extent existing policy reserves, together with the present value of future gross premiums and expected investment income earned thereon, are not adequate to cover the present value of future benefits, settlement and maintenance costs, the locked-in assumptions are revised to current best estimate assumptions and a charge to earnings for life and annuity benefits is recognized at that time. Because of the assumptions and estimates used in establishing reserves for life and annuity benefit obligations and the long-term nature of these reinsurance contracts, the ultimate liability may be greater or less than the estimates. Results attributable to the run-off of life and annuity reinsurance contracts are included in services and other revenues and services and other expenses in the Company's consolidated statements of income and comprehensive income. Investment income earned on the investments that support the policy benefit reserves are included in net investment income. See note 13 for further details regarding life and annuity benefits and note 1(x) for information on changes to the accounting for life and annuity benefits beginning in 2023.

r) Revenue Recognition.

Property and Casualty Premiums

Insurance premiums written are generally recorded at the inception of a policy and earned on a pro rata basis over the policy period, typically one year. The cost of reinsurance ceded is initially recorded as prepaid reinsurance premiums and is amortized over the reinsurance contract period in proportion to the amount of insurance protection provided. Premiums ceded are netted against premiums written. For multi-year contracts where insurance premiums are payable in annual installments, written premiums are recorded at the inception of the contract based on management's best estimate of total premiums to be received. For contracts where the cedent has the ability to unilaterally commute or cancel coverage within the term of the policy, premiums are generally recorded on an annual basis or up to the contract cancellation point. The remaining premiums are estimated and included as written at each successive anniversary date within the multi-year term.

Assumed reinsurance premiums are recorded at the inception of each contract based upon contract terms and information received from cedents and brokers and are earned on a pro rata basis over the coverage period, or for multi-year contracts, in proportion with the underlying risk exposure to the extent there is variability in the exposure through the coverage period. Changes in reinsurance premium estimates are expected and may result in significant adjustments in any period. These estimates change over time as additional information regarding changes in underlying exposures is obtained. Any subsequent differences arising on such estimates are recorded as premiums written in the period they are determined and are earned on a pro rata basis over the coverage period, or immediately if the coverage period has ended. The Company uses the periodic method to account for assumed reinsurance from foreign reinsurers as a result of the sufficiency of the information provided by the reinsurer, which is consistent with its accounting for assumed reinsurance from U.S. reinsurers.

Certain contracts that the Company writes provide for reinstatement of coverage. Reinstatement premiums are the premiums for the restoration of the insurance or reinsurance limit of a contract to its full amount after a loss occurrence by the insured or reinsured. The Company accrues for reinstatement premiums resulting from losses recorded. Such accruals are based upon contractual terms and management judgment is involved with respect to the amount of losses recorded. Changes in estimates of losses recorded on contracts with reinstatement premium features will result in changes in reinstatement premiums based on contractual terms. Reinstatement premiums are recognized at the time losses are recorded and are generally earned on a pro rata basis over the remaining coverage period.

Other Revenues

Other revenues primarily relate to the Company's Markel Ventures, insurance-linked securities (ILS) and program services operations and consist of revenues from the sale of products and services. Revenues are recognized when, or as, control of the promised goods or services is transferred to the Company's customers, in an amount that reflects the consideration the Company expects to be entitled to in exchange for those goods or services. Contracts with customers generally have an original term of one year or less. For contracts with customers that have an original term greater than one year, the Company recognizes revenue at the amount for which it has a right to invoice for the products delivered or services performed. Certain customers may receive volume rebates or credits for products and services, which are accounted for as variable consideration. The Company estimates these amounts based on the expected amount to be provided to the customer and reduces revenues recognized by a corresponding amount. The Company does not expect significant changes to its estimates of variable consideration over the term of the contracts.

Payment terms for products and services vary by the type of product or service offered and the location of the customer, and payment is typically received at or shortly after the point of sale. For certain products, the Company requires partial payment

in the form of a deposit before the products are delivered to the customer, which is included in other liabilities on the Company's consolidated balance sheets.

Through its Markel Ventures operations, the Company has several different businesses that manufacture or produce a variety of products, including ornamental plants, precast concrete, equipment used in baking systems, over-the-road transportation equipment, portable dredges, residential homes and flooring for the trucking industry. Most of the Company's product revenues are recognized when the products are shipped to the customer or the products arrive at the agreed upon destination with the end customer. Some of the Company's contracts include multiple performance obligations. For such arrangements, revenues are allocated to each performance obligation based on the relative standalone selling price, which is derived from amounts stated in the contract.

Through its Markel Ventures operations, the Company also has several different businesses that provide various types of services, including distribution of exterior building products, fire protection and life safety services and consulting services. Service revenues are generally recognized over the term of the contracts based on hours incurred or as services are provided.

The Company's other revenues also include investment management fee income and through 2022, managing general agent (MGA) commissions for services provided through the Company's ILS operations. Investment management fee income is recognized over the period in which investment management services are provided and is calculated and recognized monthly, typically based on the net asset value of the accounts managed. For certain accounts, the Company is also entitled to participate, on a fixed-percentage basis, in any net income generated in excess of an agreed-upon threshold as established by the underlying investment management agreements. In general, net income is calculated at the end of each calendar year and incentive fees are payable annually. Incentive fee income is recognized at the conclusion of the contractual performance period, when the uncertainty related to performance has been resolved. MGA commissions are based on the direct written premiums of the insurance contracts placed. Commissions received for these services are generally recognized when the related policy is written.

Program services fees, or ceding fees, received in exchange for providing access to the U.S. property and casualty insurance market are based on the gross premiums written on behalf of general agent and capacity provider clients. Ceding fees are earned in a manner consistent with the recognition of the gross premiums earned on the underlying insurance policies, generally on a pro rata basis over the terms of the underlying policies reinsured.

See note 10 for further details regarding products, services and other revenues.

s) Program Services. In connection with its program services business, the Company enters into contractual agreements with both producing general agents and reinsurers, whereby the general agents and reinsurers are typically obligated to each other for payment of insurance amounts, including premiums, commissions and losses. To the extent these funds are not the obligation of the Company and are settled directly between the general agent and the reinsurer, no receivables or payables are recorded for these amounts. All obligations of the Company's insurance subsidiaries owed to or on behalf of their policyholders are recorded by the Company and, to the extent appropriate, offsetting reinsurance recoverables are recorded.

t) Foreign Currency Transactions. The U.S. Dollar is the Company's reporting currency and the primary functional currency of its foreign underwriting operations. The functional currencies of the Company's other foreign operations are the currencies of the primary economic environments in which the majority of their business is transacted.

Foreign currency transaction gains and losses are the result of exchange rate changes on transactions denominated in currencies other than the functional currency at each foreign entity. Monetary assets and liabilities are remeasured to the functional currency at current exchange rates, with resulting gains and losses included in net foreign exchange gains within net income. Non-monetary assets and liabilities are remeasured to the functional currency at historic exchange rates. Available-for-sale securities are recorded at fair value with resulting gains and losses, including the portion attributable to movements in exchange rates, included in the change in net unrealized gains on available-for-sale investments, net of taxes within other comprehensive income. While the Company attempts to naturally hedge its exposure to foreign currency fluctuations by matching assets and liabilities in the same currencies, there is a financial statement mismatch between the gains or losses recorded in net income related to insurance reserves denominated in non-functional currencies and the gains or losses recorded in other comprehensive income related to the available-for-sale securities held in non-functional currencies supporting the reserves.

Assets and liabilities of foreign operations denominated in a functional currency other than the U.S. Dollar are translated into the U.S. Dollar at current exchange rates, with resulting gains or losses included, net of taxes, in the change in foreign

currency translation adjustments within other comprehensive income. See note 20 for further details regarding the components of other comprehensive income.

u) Comprehensive Income. Comprehensive income represents all changes in equity that result from recognized transactions and other economic events during the period. Other comprehensive income refers to revenues, expenses, gains and losses that under U.S. GAAP are included in comprehensive income but excluded from net income, such as unrealized gains or losses on available-for-sale investments, foreign currency translation adjustments and changes in net actuarial pension loss. See note 20 for further details regarding other comprehensive income.

v) Net Income Per Common Share. Basic net income per common share is computed by dividing adjusted net income to shareholders by the weighted average number of common shares outstanding during the year. Diluted net income per common share is computed by dividing adjusted net income to shareholders by the weighted average number of common shares and dilutive potential common shares outstanding during the year. See note 19 for further details regarding the calculation of basic and diluted net income per common share.

w) Variable Interest Entities. The Company determines whether it has relationships with entities defined as VIEs in accordance with Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC) 810, *Consolidation*. Under this guidance, a VIE is consolidated by the variable interest holder that is determined to be the primary beneficiary.

An entity in which the Company holds a variable interest is a VIE if any of the following conditions exist: (a) the total equity investment at risk is not sufficient to permit the entity to finance its activities without additional subordinated financial support, (b) as a group, the holders of equity investment at risk lack either the direct or indirect ability through voting rights or similar rights to make decisions about an entity's activities that most significantly impact the entity's economic performance or the obligation to absorb the expected losses or right to receive the expected residual returns, or (c) the voting rights of some investors are disproportionate to their obligation to absorb the expected losses of the entity, their rights to receive the expected residual returns of the entity, or both and substantially all of the entity's activities either involve or are conducted on behalf of an investor with disproportionately few voting rights.

The primary beneficiary is defined as the variable interest holder that is determined to have the controlling financial interest as a result of having both (a) the power to direct the activities of a VIE that most significantly impact the economic performance of the VIE and (b) the obligation to absorb losses or right to receive benefits from the VIE that could potentially be significant to the VIE.

The Company determines whether an entity is a VIE at the inception of its variable interest in the entity and upon the occurrence of certain reconsideration events. The Company continually reassesses whether it is the primary beneficiary of VIEs in which it holds a variable interest. See note 17 for further details regarding the Company's involvement with VIEs.

x) Recent Accounting Pronouncements.

Accounting Standards Not Yet Adopted

In August 2018, the FASB issued Accounting Standards Update (ASU) No. 2018-12, *Financial Services—Insurance (Topic 944): Targeted Improvements to the Accounting for Long-Duration Contracts*. The FASB subsequently issued several ASUs as amendments to ASU No. 2018-12. The standard requires insurance companies with long duration contracts to: (1) review and, if there is a change, update the assumptions used to measure expected cash flows at least annually; (2) update the discount rate assumption at each reporting date; and (3) enhance certain qualitative and quantitative disclosures. ASU No. 2018-12 becomes effective for the Company during the first quarter of 2023 and will be applied using a modified retrospective approach that requires restatement of prior periods presented, including a cumulative adjustment to accumulated other comprehensive income as of January 1, 2021 (the transition date). The standard will, among other things, impact the discount rate used in estimating reserves for the Company's life and annuity reinsurance portfolio, which is in runoff. Currently, the discount rate assumption is locked-in for the life of the contracts, unless there is a loss recognition event. The adoption of ASU 2018-12 will result in a decrease to accumulated other comprehensive income of $15.3 million, net of taxes, as a result of changing the discount rate assumption as of January 1, 2021. However, the cumulative impact of changes in the discount rate assumption through the January 1, 2023 adoption date is based on the discount rate assumption determined as of the adoption date. Based on increases in interest rates between the transition date and the adoption date, the cumulative increase to accumulated other comprehensive income as of January 1, 2023 will be $89.6 million, net of taxes.

In October 2021, the FASB issued ASU No. 2021-08, *Business Combinations (Topic 805): Accounting for Contract Assets and Contract Liabilities from Contracts with Customer*s, which becomes effective for the Company during the first quarter of 2023. ASU No. 2021-08 requires contract assets and liabilities accounted for under FASB ASC 606, *Revenue from Contracts with Customers*, to be recorded at the acquisition date as if the acquirer entered into those contracts itself on the contract inception dates, rather than at fair value. At adoption, ASU No. 2021-08 will not impact the Company's financial position, results of operations or cash flows, but prospectively, this ASU will impact amounts recorded by the Company for assets acquired and liabilities assumed in conjunction with certain acquisitions.

2. Segment Reporting Disclosures

The chief operating decision maker reviews the Company's ongoing underwriting operations on a global basis in the following two segments: Insurance and Reinsurance. In determining how to allocate resources and assess the performance of the Company's underwriting results, management considers many factors, including the nature of the insurance product sold, the type of account written and the type of customer served. The Insurance segment includes all direct business and facultative placements written on a risk-bearing basis within the Company's underwriting operations. The Reinsurance segment includes all treaty reinsurance written on a risk-bearing basis within the Company's underwriting operations. All investing activities related to the Company's insurance operations are included in the Investing segment.

The chief operating decision maker reviews and assesses Markel Ventures' performance in the aggregate, as a single operating segment. The Markel Ventures segment primarily consists of controlling interests in a diverse portfolio of businesses that operate in various industries.

The Company's other operations primarily consist of the results of the Company's insurance-linked securities operations and program services business. Other operations also include results for lines of business discontinued prior to, or in conjunction with, acquisitions, including development on asbestos and environmental loss reserves and results attributable to the run-off of life and annuity reinsurance business, which are monitored separately from the Company's ongoing underwriting operations. For purposes of segment reporting, none of these other operations are considered to be reportable segments.

Segment profit for each of the Company's underwriting segments is measured by underwriting profit. The property and casualty insurance industry commonly defines underwriting profit as earned premiums net of losses and loss adjustment expenses and underwriting, acquisition and insurance expenses. Underwriting profit does not replace operating income or net income computed in accordance with U.S. GAAP as a measure of profitability. Underwriting profit or loss provides a basis for management to evaluate the Company's underwriting performance. Segment profit for the Company's underwriting segments may also include other revenues and expenses that are attributable to the Company's underwriting operations that are not captured in underwriting profit. Segment profit for the Investing segment is measured by income from the Company's investment portfolio, which is comprised of net investment income and net investment gains. Segment profit for the Investing segment also includes income from equity method investments, which is included within services and other revenues. Segment profit for the Markel Ventures segment is measured by operating income.

For management reporting purposes, the Company allocates assets to its underwriting operations and to its Investing and Markel Ventures segments and certain of its other operations, including its insurance-linked securities and program services operations. Underwriting assets include assets attributed to the Company's Insurance and Reinsurance segments, discontinued underwriting lines of business, as well as assets that are not specifically allocated to the Company's other operations. Generally, the Company manages its underwriting assets in the aggregate and therefore does not allocate assets to individual underwriting segments.

a) The following tables summarize the Company's segment disclosures.

(dollars in thousands)	Insurance	Reinsurance	Investing	Markel Ventures	Other [1]	Consolidated
	Year Ended December 31, 2022					
Gross premium volume	$ 8,606,700	$ 1,229,851	$ —	$ —	$ 3,365,131	$ 13,201,682
Net written premiums	7,040,176	1,167,312	—	—	(4,098)	8,203,390
Earned premiums	6,528,263	1,063,347	—	—	(3,818)	7,587,792
Losses and loss adjustment expenses:						
Current accident year	(3,936,425)	(676,610)	—	—	—	(4,613,035)
Prior accident years	142,924	26,052	—	—	(1,530)	167,446
Underwriting, acquisition and insurance expenses:						
Amortization of policy acquisition costs	(1,375,539)	(279,567)	—	—	—	(1,655,106)
Other underwriting expenses	(809,352)	(49,363)	—	—	(1,762)	(860,477)
Underwriting profit (loss)	549,871	83,859	—	—	(7,110)	626,620
Net investment income	—	—	445,846	909	—	446,755
Net investment losses	—	—	(1,595,733)	—	—	(1,595,733)
Products revenues	—	—	—	2,427,096	—	2,427,096
Services and other revenues	—	—	(17,661)	2,329,522	497,564	2,809,425
Products expenses	—	—	—	(2,241,736)	—	(2,241,736)
Services and other expenses	—	—	—	(2,111,510)	(195,125)	(2,306,635)
Amortization of intangible assets [2]	—	—	—	(79,043)	(99,735)	(178,778)
Impairment of goodwill	—	—	—	—	(80,000)	(80,000)
Segment profit (loss)	$ 549,871	$ 83,859	$ (1,167,548)	$ 325,238	$ 115,594	$ (92,986)
Interest expense						(196,062)
Net foreign exchange gains						140,209
Loss before income taxes						$ (148,839)

(1) Other represents the total profit (loss) attributable to the Company's operations that are not included in a reportable segment, as well as amortization of intangible assets attributable to the underwriting segments, which is not allocated between the Insurance and Reinsurance segments.

(2) Segment profit for the Markel Ventures segment includes amortization of intangible assets attributable to Markel Ventures. Amortization of intangible assets attributable to the Company's underwriting segments, included in Other, was $38.5 million for the year ended December 31, 2022.

(dollars in thousands)	Year Ended December 31, 2021 Insurance	Reinsurance	Investing	Markel Ventures	Other [(1)]	Consolidated
Gross premium volume	$ 7,239,676	$ 1,246,143	$ —	$ —	$ 2,952,863	$ 11,438,682
Net written premiums	5,998,890	1,126,167	—	—	(5,326)	7,119,731
Earned premiums	5,465,284	1,042,048	—	—	(4,303)	6,503,029
Losses and loss adjustment expenses:						
Current accident year	(3,311,185)	(749,815)	—	—	—	(4,061,000)
Prior accident years	506,292	(19,928)	—	—	(6,569)	479,795
Underwriting, acquisition and insurance expenses:						
Amortization of policy acquisition costs	(1,153,049)	(266,217)	—	—	—	(1,419,266)
Other underwriting expenses	(810,929)	(61,326)	—	—	(2,218)	(874,473)
Underwriting profit (loss)	696,413	(55,238)	—	—	(13,090)	628,085
Net investment income	—	—	367,406	11	—	367,417
Net investment gains	—	—	1,978,534	—	—	1,978,534
Products revenues	—	—	—	1,712,120	—	1,712,120
Services and other revenues	—	—	7,184	1,931,696	346,445	2,285,325
Products expenses	—	—	—	(1,544,506)	—	(1,544,506)
Services and other expenses	—	109	—	(1,769,201)	(253,843)	(2,022,935)
Amortization of intangible assets [(2)]	—	—	—	(57,568)	(102,971)	(160,539)
Segment profit (loss)	$ 696,413	$ (55,129)	$ 2,353,124	$ 272,552	$ (23,459)	$ 3,243,501
Interest expense						(183,579)
Net foreign exchange gains						72,271
Income before income taxes						$ 3,132,193

(1) Other represents the total profit (loss) attributable to the Company's operations that are not included in a reportable segment, as well as amortization of intangible assets attributable to the underwriting segments, which is not allocated between the Insurance and Reinsurance segments.

(2) Segment profit for the Markel Ventures segment includes amortization of intangible assets attributable to Markel Ventures. Amortization of intangible assets attributable to the Company's underwriting segments, included in Other, was $41.2 million for the year ended December 31, 2021.

(dollars in thousands)	Year Ended December 31, 2020 Insurance	Reinsurance	Investing	Markel Ventures	Other [1]	Consolidated
Gross premium volume	$ 6,029,024	$ 1,130,923	$ —	$ —	$ 2,106,718	$ 9,266,665
Net written premiums	4,977,662	960,123	—	—	(5,547)	5,932,238
Earned premiums	4,688,448	929,348	—	—	(5,591)	5,612,205
Losses and loss adjustment expenses:						
Current accident year	(3,373,085)	(700,240)	—	—	—	(4,073,325)
Prior accident years	554,586	51,755	—	—	23	606,364
Underwriting, acquisition and insurance expenses:						
Amortization of policy acquisition costs	(988,668)	(240,493)	—	—	—	(1,229,161)
Other underwriting expenses	(712,280)	(74,379)	—	—	(1,807)	(788,466)
Underwriting profit (loss)	169,001	(34,009)	—	—	(7,375)	127,617
Net investment income	—	—	375,581	245	—	375,826
Net investment gains	—	—	617,979	—	—	617,979
Products revenues	—	—	—	1,439,515	—	1,439,515
Services and other revenues	—	—	(3,996)	1,355,199	338,338	1,689,541
Products expenses	—	—	—	(1,256,159)	—	(1,256,159)
Services and other expenses	—	(41,461)	—	(1,232,150)	(287,509)	(1,561,120)
Amortization of intangible assets [2]	—	—	—	(52,572)	(106,743)	(159,315)
Segment profit (loss)	$ 169,001	$ (75,470)	$ 989,564	$ 254,078	$ (63,289)	$ 1,273,884
Interest expense						(177,582)
Net foreign exchange losses						(95,853)
Income before income taxes						$ 1,000,449

(1) Other represents the total profit (loss) attributable to the Company's operations that are not included in a reportable segment, as well as amortization of intangible assets attributable to the underwriting segments, which is not allocated between the Insurance and Reinsurance segments.

(2) Segment profit for the Markel Ventures segment includes amortization of intangible assets attributable to Markel Ventures. Amortization of intangible assets attributable to the Company's underwriting segments, included in Other, was $41.9 million for the year ended December 31, 2020.

b) The following amounts attributable to the Markel Ventures segment are also reviewed, or included in measures reviewed, by the Company's chief operating decision maker.

(dollars in thousands)	Years Ended December 31, **2022**	2021	2020
Depreciation expense	**$ 102,055**	$ 72,580	$ 60,284
Interest expense [1]	**$ 46,780**	$ 35,031	$ 46,664
Income tax expense	**$ 61,588**	$ 43,626	$ 45,815
Capital expenditures	**$ 225,230**	$ 124,451	$ 75,404

(1) Interest expense for the years ended December 31, 2022, 2021 and 2020 included intercompany interest expense of $27.4 million, $25.8 million and $32.0 million, respectively, which was eliminated in consolidation.

c) The following table summarizes earned premiums by major product grouping within each underwriting segment.

	Years Ended December 31,		
(dollars in thousands)	**2022**	2021	2020
Insurance segment:			
General liability	**$ 1,927,721**	$ 1,564,221	$ 1,261,411
Professional liability	**1,739,983**	1,523,536	1,141,034
Property	**428,563**	362,637	356,934
Marine and energy	**585,885**	495,897	458,050
Personal lines	**489,648**	451,095	405,210
Programs	**384,952**	222,410	238,909
Workers' compensation	**385,054**	354,337	338,186
Credit and surety	**193,701**	161,155	151,397
Other products	**392,756**	329,996	337,317
Total Insurance	**6,528,263**	5,465,284	4,688,448
Reinsurance segment:			
Professional liability	**398,839**	320,646	243,645
General liability	**382,482**	314,699	195,468
Specialty	**275,033**	276,943	298,267
Property	**6,993**	129,760	191,968
Total Reinsurance	**1,063,347**	1,042,048	929,348
Other	**(3,818)**	(4,303)	(5,591)
Total earned premiums	**$ 7,587,792**	$ 6,503,029	$ 5,612,205

The Company does not manage products at this level of aggregation as it offers a diverse portfolio of products and manages these products in logical groupings within each underwriting segment.

During the years ended December 31, 2022, 2021 and 2020, 80%, 80% and 79%, respectively, of gross premiums written in the Company's underwriting segments were attributed to risks or cedents located in the United States. Substantially all of the gross premiums written in the Company's program services and other fronting businesses during 2022, 2021 and 2020 were attributed to risks located in the United States.

Most of the Company's gross written premiums are placed through insurance and reinsurance brokers. During the years ended December 31, 2022, 2021 and 2020, the Company's top three independent brokers accounted for 28%, 28% and 31% of gross premiums written in the Company's underwriting segments. During the years ended December 31, 2022, 2021 and 2020, the top three independent brokers accounted for 19%, 19% and 20%, respectively, of gross premiums written in the Insurance segment and 88%, 84% and 84%, respectively, of gross premiums written in the Reinsurance segment.

d) The following table summarizes total products revenues and services and other revenues by major product and service grouping within the Company's Markel Ventures segment.

(dollars in thousands)	Years Ended December 31, 2022	2021	2020
Products:			
Consumer and building	**$ 1,510,130**	$ 911,422	$ 814,697
Transportation-related	**612,467**	474,839	351,559
Equipment manufacturing	**304,499**	325,859	273,259
Total products revenues	**2,427,096**	1,712,120	1,439,515
Services and other:			
Construction	**1,910,403**	1,554,592	915,696
Consulting	**326,549**	277,902	283,386
Other	**92,570**	99,202	156,117
Total services and other revenues	**2,329,522**	1,931,696	1,355,199
Total products revenues and services and other revenues	**$ 4,756,618**	$ 3,643,816	$ 2,794,714

The Company does not manage the Markel Ventures portfolio of businesses at this level of aggregation due to the distinct characteristics of each business and the autonomy with which each business operates. Management reviews and assesses the performance of the Markel Ventures businesses in the aggregate at the Markel Ventures segment level, while individual management teams are responsible for developing strategic initiatives, managing day-to-day operations and making investment and capital allocation decisions for their respective companies.

During the years ended December 31, 2022, 2021 and 2020, the portion of Markel Ventures segment revenues attributable to U.S. operations was 96%, 95%, and 95%, respectively.

e) The following table reconciles segment assets to the Company's consolidated balance sheets.

(dollars in thousands)	December 31, 2022	2021
Segment assets:		
Investing	**$ 26,982,280**	$ 28,277,801
Underwriting	**8,853,559**	8,111,316
Markel Ventures	**5,315,677**	4,958,279
Total segment assets	**41,151,516**	41,347,396
Other operations	**8,639,743**	7,129,700
Total assets	**$ 49,791,259**	$ 48,477,096

f) The following table summarizes deferred policy acquisition costs, unearned premiums and unpaid losses and loss adjustment expenses.

(dollars in thousands)	Deferred Policy Acquisition Costs	Unearned Premiums	Unpaid Losses and Loss Adjustment Expenses
December 31, 2022			
Insurance segment	**$ 677,921**	**$ 4,015,252**	**$ 11,616,386**
Reinsurance segment	**247,562**	**921,541**	**3,581,699**
Other underwriting	**—**	**9,473**	**197,602**
Total underwriting	**925,483**	**4,946,266**	**15,395,687**
Program services and other fronting	**—**	**1,274,482**	**5,204,290**
Markel CATCo Re (see note 17)	**—**	**—**	**347,921**
Total	**$ 925,483**	**$ 6,220,748**	**$ 20,947,898**
December 31, 2021			
Insurance segment	$ 574,181	$ 3,350,054	$ 10,051,994
Reinsurance segment	219,964	802,824	3,639,210
Other underwriting	—	—	271,356
Total underwriting	794,145	4,152,878	13,962,560
Program services and other fronting	—	1,230,741	4,216,334
Total	$ 794,145	$ 5,383,619	$ 18,178,894

3. Acquisitions and Dispositions

Volante

In October 2022, the Company sold its controlling interest in its Volante managing general agent companies (Volante) for total consideration of $181.9 million, of which $155.6 million was cash. This transaction resulted in a gain of $118.5 million that was included in services and other revenue. Volante underwrites and administers specialty insurance and reinsurance policies and provides delegated underwriting services to third-party providers of insurance capital.

Velocity

In February 2022, the Company sold the majority of its controlling interest in its Velocity managing general agent companies (Velocity) for total cash consideration of $181.3 million, of which $165.6 million was received in 2022. This transaction resulted in a gain of $107.3 million that was included in services and other revenues. Velocity provides risk origination services for the Company's Nephila insurance-linked securities fund management operations, as well as for third parties. The Company retained a minority interest in Velocity that was recorded at fair value as of the transaction date ($47.4 million) and is accounted for under the equity method.

Metromont LLC

In December 2021, the Company acquired 51% of Metromont LLC (Metromont), a precast concrete manufacturer and concrete building solutions provider for commercial projects. Under the terms of the acquisition agreement, the Company has the option to acquire the remaining equity interests and the remaining equity holders have the option to sell their interests to the Company in the future. The redemption value of the remaining equity interests is generally based on Metromont's earnings in specified periods preceding the redemption date. Total consideration for the transaction was $274.5 million, all of which was cash.

As of December 31, 2021, the purchase price was preliminarily allocated to the acquired assets and liabilities of Metromont based on estimated fair value at the acquisition date. During 2022, the Company completed the process of determining the fair value of the assets acquired and liabilities assumed with Metromont and recognized goodwill of $101.6 million, intangible assets of $230.0 million and redeemable noncontrolling interests of $247.4 million. The final purchase price allocation reflected differences from the preliminary purchase price allocation, including an $86.1 million increase in the amount recognized for intangible assets upon completion of a third-party valuation and a $22.5 million decrease in the allocation to redeemable noncontrolling interests, all of which resulted in a $117.7 million decrease to goodwill from the preliminary amount recognized. Goodwill is primarily attributable to expected future earnings and cash flow potential of Metromont, of which the Company's share is deductible for income tax purposes. Intangible assets include $175.0 million of customer relationships and $55.0 million of trade names, which are being amortized over 17 years and 15 years, respectively. Results attributable to Metromont are included in the Company's Markel Ventures segment.

Buckner HeavyLift Cranes

In August 2021, the Company acquired 90% of the holding company for the Buckner HeavyLift Cranes companies (Buckner), a provider of crane rental services for large commercial contractors. Under the terms of the acquisition agreement, the Company has the option to acquire the remaining equity interests and the remaining equity holders have the option to sell their interests to the Company in the future. The redemption value of the remaining equity interests is generally based on Buckner's earnings in specified periods preceding the redemption dates. Total consideration for the transaction was $237.9 million, all of which was cash.

As of December 31, 2021, the purchase price was preliminarily allocated to the acquired assets and liabilities of Buckner based on estimated fair value at the acquisition date. During 2022, the Company completed the process of determining the fair value of the assets acquired and liabilities assumed with Buckner and recognized goodwill of $109.9 million, intangible assets of $60.0 million and fixed assets of $290.4 million, primarily related to cranes. The final purchase price allocation reflected differences from the preliminary purchase price allocation, including a $42.2 million decrease in the amount recognized for the cranes upon completion of a third-party valuation, which resulted in a $35.3 million net increase to goodwill from the preliminary amount recognized. Goodwill is primarily attributable to expected future earnings and cash flow potential of Buckner, and it is not deductible for income tax purposes. Intangible assets include $50.0 million of customer relationships and $10.0 million of trade names, which are being amortized over 7 years and 15 years, respectively. Additionally, the Company assumed long-term debt of $165.1 million and recognized redeemable noncontrolling interests of $26.4 million. Results attributable to Buckner are included in the Company's Markel Ventures segment.

Lansing Building Products, LLC

In April 2020, the Company acquired a controlling interest in Lansing Building Products, LLC, a supplier of exterior building products and materials to professional contractors throughout the U.S., which simultaneously acquired the distribution business of Harvey Building Products to enhance geographic reach and scale (together, Lansing), bringing the Company's ownership in Lansing to 91%. Under the terms of the acquisition agreement, the Company has the option to acquire the remaining equity interests and the remaining equity holders have the option to sell their interests to the Company in the future. The redemption value of the remaining equity interests is generally based on Lansing's earnings in specified periods preceding the redemption dates. Total consideration for both transactions was $559.2 million, all of which was cash.

The purchase price was allocated to the acquired assets and liabilities of Lansing based on estimated fair value at the acquisition date. The Company recognized goodwill of $287.1 million, which is primarily attributable to expected future earnings and cash flow potential of Lansing. The majority of the goodwill recognized is not deductible for income tax purposes. The Company also recognized other intangible assets of $210.0 million, which included $188.0 million of customer relationships and $22.0 million of trade names, which are being amortized over a weighted average period of 16 years and 14 years, respectively. The Company also recognized redeemable noncontrolling interests of $43.6 million. Results attributable to Lansing are included in the Company's Markel Ventures segment.

4. Investments

a) The following tables summarize the Company's available-for-sale investments. Commercial and residential mortgage-backed securities include securities issued by U.S. government-sponsored enterprises and U.S. government agencies. The net unrealized holding gains (losses) in the tables below are presented before taxes and any reserve deficiency adjustments for life and annuity benefit reserves. See note 13.

	December 31, 2022			
(dollars in thousands)	Amortized Cost	Gross Unrealized Holding Gains	Gross Unrealized Holding Losses	Estimated Fair Value
Fixed maturity securities:				
U.S. Treasury securities	**$ 3,050,089**	**$ 2,363**	**$ (138,493)**	**$ 2,913,959**
U.S. government-sponsored enterprises	**871,463**	**154**	**(106,079)**	**765,538**
Obligations of states, municipalities and political subdivisions	**3,973,911**	**6,503**	**(247,231)**	**3,733,183**
Foreign governments	**1,473,658**	**2,843**	**(169,723)**	**1,306,778**
Commercial mortgage-backed securities	**2,109,721**	**395**	**(169,668)**	**1,940,448**
Residential mortgage-backed securities	**553,591**	**6**	**(26,804)**	**526,793**
Asset-backed securities	**1,693**	**—**	**(53)**	**1,640**
Corporate bonds	**771,761**	**836**	**(104,101)**	**668,496**
Total fixed maturity securities	**12,805,887**	**13,100**	**(962,152)**	**11,856,835**
Short-term investments	**2,663,560**	**5,760**	**(58)**	**2,669,262**
Investments, available-for-sale	**$ 15,469,447**	**$ 18,860**	**$ (962,210)**	**$ 14,526,097**

	December 31, 2021			
(dollars in thousands)	Amortized Cost	Gross Unrealized Holding Gains	Gross Unrealized Holding Losses	Estimated Fair Value
Fixed maturity securities:				
U.S. Treasury securities	$ 2,489,032	$ 2,633	$ (21,471)	$ 2,470,194
U.S. government-sponsored enterprises	753,029	28,997	(6,439)	775,587
Obligations of states, municipalities and political subdivisions	4,007,211	266,575	(7,862)	4,265,924
Foreign governments	1,394,771	134,071	(9,488)	1,519,354
Commercial mortgage-backed securities	1,928,775	69,810	(8,152)	1,990,433
Residential mortgage-backed securities	699,136	27,084	(170)	726,050
Asset-backed securities	3,035	46	—	3,081
Corporate bonds	786,478	54,475	(4,271)	836,682
Total fixed maturity securities	12,061,467	583,691	(57,853)	12,587,305
Short-term investments	1,805,300	28	(5,340)	1,799,988
Investments, available-for-sale	$ 13,866,767	$ 583,719	$ (63,193)	$ 14,387,293

b) The following tables summarize gross unrealized investment losses on available-for-sale investments by the length of time that securities have continuously been in an unrealized loss position.

	December 31, 2022					
	Less than 12 months		12 months or longer		Total	
(dollars in thousands)	Estimated Fair Value	Gross Unrealized Holding Losses	Estimated Fair Value	Gross Unrealized Holding Losses	Estimated Fair Value	Gross Unrealized Holding Losses
Fixed maturity securities:						
U.S. Treasury securities	**$ 735,605**	**$ (30,583)**	**$ 1,907,922**	**$ (107,910)**	**$ 2,643,527**	**$ (138,493)**
U.S. government-sponsored enterprises	**413,495**	**(40,488)**	**331,391**	**(65,591)**	**744,886**	**(106,079)**
Obligations of states, municipalities and political subdivisions	**2,474,289**	**(164,537)**	**348,943**	**(82,694)**	**2,823,232**	**(247,231)**
Foreign governments	**900,322**	**(115,324)**	**300,423**	**(54,399)**	**1,200,745**	**(169,723)**
Commercial mortgage-backed securities	**1,611,603**	**(117,482)**	**305,217**	**(52,186)**	**1,916,820**	**(169,668)**
Residential mortgage-backed securities	**516,423**	**(25,232)**	**9,342**	**(1,572)**	**525,765**	**(26,804)**
Asset-backed securities	**1,640**	**(53)**	**—**	**—**	**1,640**	**(53)**
Corporate bonds	**496,766**	**(74,542)**	**153,035**	**(29,559)**	**649,801**	**(104,101)**
Total fixed maturity securities	**7,150,143**	**(568,241)**	**3,356,273**	**(393,911)**	**10,506,416**	**(962,152)**
Short-term investments	**774,480**	**(58)**	**—**	**—**	**774,480**	**(58)**
Total	**$ 7,924,623**	**$ (568,299)**	**$ 3,356,273**	**$ (393,911)**	**$11,280,896**	**$ (962,210)**

At December 31, 2022, the Company held 1,400 available-for-sale securities in an unrealized loss position with a total estimated fair value of $11.3 billion and gross unrealized losses of $962.2 million. Of these 1,400 securities, 246 securities had been in a continuous unrealized loss position for one year or longer and had a total estimated fair value of $3.4 billion and gross unrealized losses of $393.9 million.

	December 31, 2021					
	Less than 12 months		12 months or longer		Total	
(dollars in thousands)	Estimated Fair Value	Gross Unrealized Holding Losses	Estimated Fair Value	Gross Unrealized Holding Losses	Estimated Fair Value	Gross Unrealized Holding Losses
Fixed maturity securities:						
U.S. Treasury securities	$ 2,236,637	$ (18,433)	$ 97,173	$ (3,038)	$ 2,333,810	$ (21,471)
U.S. government-sponsored enterprises	381,495	(5,640)	14,010	(799)	395,505	(6,439)
Obligations of states, municipalities and political subdivisions	393,249	(6,941)	23,589	(921)	416,838	(7,862)
Foreign governments	322,813	(8,596)	25,564	(892)	348,377	(9,488)
Commercial mortgage-backed securities	345,616	(7,765)	9,189	(387)	354,805	(8,152)
Residential mortgage-backed securities	12,828	(159)	269	(11)	13,097	(170)
Corporate bonds	193,786	(4,271)	—	—	193,786	(4,271)
Total fixed maturity securities	3,886,424	(51,805)	169,794	(6,048)	4,056,218	(57,853)
Short-term investments	228,870	(5,340)	—	—	228,870	(5,340)
Total	$ 4,115,294	$ (57,145)	$ 169,794	$ (6,048)	$ 4,285,088	$ (63,193)

At December 31, 2021, the Company held 277 available-for-sale securities in an unrealized loss position with a total estimated fair value of $4.3 billion and gross unrealized losses of $63.2 million. Of these 277 securities, 13 securities had been in a continuous unrealized loss position for one year or longer and had a total estimated fair value of $169.8 million and gross unrealized losses of $6.0 million.

The Company completes a detailed analysis each quarter to assess whether the decline in the fair value of any investment below its cost basis is the result of a credit loss. All available-for-sale securities with unrealized losses are reviewed. The Company considers many factors in completing its quarterly review of securities with unrealized losses for credit-related impairment to determine whether a credit loss exists, including the extent to which fair value is below cost, the implied yield to maturity, rating downgrades of the security and whether or not the issuer has failed to make scheduled principal or interest payments. The Company also takes into consideration information about the financial condition of the issuer and industry factors that could negatively impact the capital markets.

If the decline in fair value of an available-for-sale security below its amortized cost is considered to be the result of a credit loss, the Company compares the estimated present value of the cash flows expected to be collected to the amortized cost of the security. The extent to which the estimated present value of the cash flows expected to be collected is less than the amortized cost of the security represents the credit loss, which is recorded as an allowance and recognized in net income. The allowance is limited to the difference between the fair value and the amortized cost of the security. Any remaining decline in fair value represents the non-credit portion of the impairment, which is recognized in other comprehensive income. The Company did not have an allowance for credit losses as of December 31, 2022 or 2021.

Quarterly, the Company also considers whether it intends to sell an available-for-sale security or if it is more likely than not that it will be required to sell a security before recovery of its amortized cost. In these instances, a decline in fair value is recognized in net income based on the fair value of the security at the time of assessment, resulting in a new cost basis for the security. As of December 31, 2022, the Company did not intend to sell or believe it would be required to sell any available-for-sale securities in an unrealized loss position before recovery of their amortized cost.

c) The amortized cost and estimated fair value of fixed maturity securities at December 31, 2022 are shown below by contractual maturity.

(dollars in thousands)	Amortized Cost	Estimated Fair Value
Due in one year or less	**$ 1,363,418**	**$ 1,337,550**
Due after one year through five years	**3,926,756**	**3,708,752**
Due after five years through ten years	**3,115,913**	**2,787,686**
Due after ten years	**1,734,795**	**1,553,966**
	10,140,882	**9,387,954**
Commercial mortgage-backed securities	**2,109,721**	**1,940,448**
Residential mortgage-backed securities	**553,591**	**526,793**
Asset-backed securities	**1,693**	**1,640**
Total fixed maturity securities	**$ 12,805,887**	**$ 11,856,835**

Expected maturities may differ from contractual maturities because borrowers may have the right to call or prepay obligations with or without penalties, and the holders may have the right to put the securities back to the issuer. Based on expected maturities, the estimated average duration of fixed maturity securities at December 31, 2022 was 3.9 years.

d) The following table presents the components of net investment income.

	Years Ended December 31,		
(dollars in thousands)	**2022**	2021	2020
Interest:			
Fixed maturity securities	**$ 294,417**	$ 283,366	$ 288,421
Short-term investments	**33,493**	2,475	6,400
Cash and cash equivalents	**28,890**	479	7,921
Dividends on equity securities	**107,213**	98,099	89,303
	464,013	384,419	392,045
Investment expenses	**(17,258)**	(17,002)	(16,219)
Net investment income	**$ 446,755**	$ 367,417	$ 375,826

e) The following table presents the components of net investment gains (losses) included in net income (loss) and the change in net unrealized gains (losses) included in other comprehensive income (loss). Gross realized investment gains and losses on fixed maturity securities, short-term investments and other investments were not material to the consolidated financial statements and are presented on a net basis in the following table.

(dollars in thousands)	Years Ended December 31, **2022**	2021	2020
Fixed maturity securities, short-term investments and other investments:			
Net realized investment gains (losses)	**$ (40,983)**	$ 37,908	$ 14,780
Equity securities:			
Change in fair value of securities sold during the period	**(14,884)**	25,902	(470,008)
Change in fair value of securities held at the end of the period	**(1,539,866)**	1,914,724	1,073,207
Total change in fair value	**(1,554,750)**	1,940,626	603,199
Net investment gains (losses)	**$ (1,595,733)**	$ 1,978,534	$ 617,979
Change in net unrealized gains (losses) on available-for-sale investments included in other comprehensive income (loss):			
Fixed maturity securities	**$ (1,474,890)**	$ (504,133)	$ 507,903
Short-term investments	**11,014**	(8,951)	2,344
Reserve deficiency adjustment for life and annuity benefit reserves (see note 13)	**56,560**	62,988	(68,158)
Net increase (decrease)	**$ (1,407,316)**	$ (450,096)	$ 442,089

f) Total restricted assets are included on the Company's consolidated balance sheets as follows.

(dollars in thousands)	December 31, **2022**	2021
Investments	**$ 4,160,842**	$ 4,403,414
Restricted cash and cash equivalents	**1,084,081**	902,457
Total	**$ 5,244,923**	$ 5,305,871

The following table presents the components of restricted assets.

(dollars in thousands)	December 31, **2022**	2021
Assets held in trust or on deposit to support underwriting activities	**$ 4,807,135**	$ 4,895,627
Assets pledged as security for letters of credit	**437,788**	410,244
Total	**$ 5,244,923**	$ 5,305,871

g) At December 31, 2022 and 2021, investments in securities issued by the U.S. Treasury, U.S. government agencies and U.S. government-sponsored enterprises were the only investments in any one issuer that exceeded 10% of shareholders' equity.

5. Fair Value Measurements

FASB ASC 820, *Fair Value Measurements and Disclosures,* establishes a three-level hierarchy that prioritizes the inputs to valuation techniques used to measure fair value. The fair value hierarchy gives the highest priority to quoted prices in active markets for identical assets or liabilities (Level 1) and the lowest priority to unobservable inputs (Level 3). If the inputs used to measure the assets or liabilities fall within different levels of the hierarchy, the classification is based on the lowest level input that is significant to the fair value measurement of the asset or liability.

Classification of assets and liabilities within the hierarchy considers the markets in which the assets and liabilities are traded and the reliability and transparency of the assumptions used to determine fair value. The hierarchy requires the use of observable market data when available. The levels of the hierarchy are defined as follows:

- Level 1 – Inputs to the valuation methodology are quoted prices (unadjusted) for identical assets or liabilities traded in active markets.
- Level 2 – Inputs to the valuation methodology include quoted prices for similar assets or liabilities in active markets, quoted prices for identical or similar assets or liabilities in markets that are not active, inputs other than quoted prices that are observable for the asset or liability and market-corroborated inputs.
- Level 3 – Inputs to the valuation methodology are unobservable for the asset or liability and are significant to the fair value measurement.

In accordance with ASC 820, the Company determines fair value based on the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. In determining fair value, the Company uses various methods, including the market, income and cost approaches. The Company uses valuation techniques that maximize the use of observable inputs and minimize the use of unobservable inputs. The following section describes the valuation methodologies used by the Company to measure assets and liabilities at fair value, including an indication of the level within the fair value hierarchy in which each asset or liability is generally classified.

Available-for-sale investments and equity securities. Available-for-sale investments and equity securities are recorded at fair value on a recurring basis. Available-for-sale investments include fixed maturity securities and short-term investments. Fair value is determined by the Company after considering various sources of information, including information provided by a third-party pricing service. The pricing service provides prices for substantially all of the Company's fixed maturity securities and equity securities. In determining fair value, the Company generally does not adjust the prices obtained from the pricing service. The Company obtains an understanding of the pricing service's valuation methodologies and related inputs, which include, but are not limited to, reported trades, benchmark yields, issuer spreads, bids, offers, duration, credit ratings, estimated cash flows and prepayment speeds. The Company validates prices provided by the pricing service by reviewing prices from other pricing sources and analyzing pricing data in certain instances.

The Company has evaluated the various types of securities in its investment portfolio to determine an appropriate fair value hierarchy level based upon trading activity and the observability of market inputs. Level 1 investments include those traded on an active exchange, such as the New York Stock Exchange. Level 2 investments include U.S. Treasury securities, U.S. government-sponsored enterprises, municipal bonds, foreign government bonds, commercial mortgage-backed securities, residential mortgage-backed securities, asset-backed securities and corporate debt securities. Level 3 investments include the Company's investments in insurance-linked securities funds that are not traded on an active exchange and are valued using unobservable inputs.

Fair value for available-for-sale investments and equity securities is measured based upon quoted prices in active markets, if available. Due to variations in trading volumes and the lack of quoted market prices, fixed maturity securities are classified as Level 2 investments. The fair value of fixed maturity securities is normally derived through recent reported trades for identical or similar securities, making adjustments through the reporting date based upon available market observable data previously described. If there are no recent reported trades, the fair value of fixed maturity securities may be derived through the use of matrix pricing or model processes, where future cash flow expectations are developed based upon collateral performance and discounted at an estimated market rate. Significant inputs used to determine the fair value of obligations of states, municipalities and political subdivisions, corporate bonds and obligations of foreign governments include reported trades, benchmark yields, issuer spreads, bids, offers, credit information and estimated cash flows. Significant inputs used to determine the fair value of commercial mortgage-backed securities, residential mortgage-backed securities and asset-backed securities include the type of underlying assets, benchmark yields, prepayment speeds, collateral information, tranche type and volatility, estimated cash flows, credit information, default rates, recovery rates, issuer spreads and the year of issue.

Due to the significance of unobservable inputs required in measuring the fair value of the Company's investments in certain insurance-linked securities funds, these investments are classified as Level 3 within the fair value hierarchy. The fair value of the securities is derived using their reported net asset value (NAV) as the primary input, as well as other observable and unobservable inputs as deemed necessary by management. Management has obtained an understanding of the inputs, assumptions, process and controls used to determine NAV, which is calculated by an independent third party. Unobservable inputs to the NAV calculations include assumptions around premium earnings patterns and loss reserve estimates for the underlying securitized reinsurance contracts. The Company's valuation policies and procedures for Level 3 investments are determined by management. Fair value measurements are analyzed quarterly to ensure the change in fair value from prior periods is reasonable relative to management's understanding of the underlying investments, recent market trends and external market data.

Senior long-term debt and other debt. Senior long-term debt and other debt is carried at amortized cost with the estimated fair value disclosed on the consolidated balance sheets. Senior long-term debt and other debt is classified as Level 2 within the fair value hierarchy due to variations in trading volumes and the lack of quoted market prices. Fair value is generally derived through recent reported trades, making adjustments through the reporting date, if necessary, based upon available market observable data including U.S. Treasury securities and implied credit spreads. Significant inputs used to determine the fair value of senior long-term debt and other debt include reported trades, benchmark yields, issuer spreads, bids and offers.

The following tables present the balances of assets measured at fair value on a recurring basis by level within the fair value hierarchy.

	December 31, 2022			
(dollars in thousands)	Level 1	Level 2	Level 3	Total
Assets:				
Investments:				
Fixed maturity securities, available-for-sale:				
U.S. Treasury securities	$ —	$ **2,913,959**	$ —	$ **2,913,959**
U.S. government-sponsored enterprises	—	**765,538**	—	**765,538**
Obligations of states, municipalities and political subdivisions	—	**3,733,183**	—	**3,733,183**
Foreign governments	—	**1,306,778**	—	**1,306,778**
Commercial mortgage-backed securities	—	**1,940,448**	—	**1,940,448**
Residential mortgage-backed securities	—	**526,793**	—	**526,793**
Asset-backed securities	—	**1,640**	—	**1,640**
Corporate bonds	—	**668,496**	—	**668,496**
Total fixed maturity securities, available-for-sale	—	**11,856,835**	—	**11,856,835**
Equity securities:				
Insurance, banks and other financial institutions	**2,952,689**	—	**899**	**2,953,588**
Industrial, consumer and all other	**4,718,324**	—	—	**4,718,324**
Total equity securities	**7,671,013**	—	**899**	**7,671,912**
Short-term investments, available-for-sale	**2,510,164**	**159,098**	—	**2,669,262**
Total investments	$ **10,181,177**	$ **12,015,933**	$ **899**	$ **22,198,009**

(dollars in thousands)	December 31, 2021			
	Level 1	Level 2	Level 3	Total
Assets:				
Investments:				
Fixed maturity securities, available-for-sale:				
U.S. Treasury securities	$ —	$ 2,470,194	$ —	$ 2,470,194
U.S. government-sponsored enterprises	—	775,587	—	775,587
Obligations of states, municipalities and political subdivisions	—	4,265,924	—	4,265,924
Foreign governments	—	1,519,354	—	1,519,354
Commercial mortgage-backed securities	—	1,990,433	—	1,990,433
Residential mortgage-backed securities	—	726,050	—	726,050
Asset-backed securities	—	3,081	—	3,081
Corporate bonds	—	836,682	—	836,682
Total fixed maturity securities, available-for-sale	—	12,587,305	—	12,587,305
Equity securities:				
Insurance, banks and other financial institutions	3,307,755	—	56,472	3,364,227
Industrial, consumer and all other	5,659,700	—	—	5,659,700
Total equity securities	8,967,455	—	56,472	9,023,927
Short-term investments, available-for-sale	1,619,496	180,492	—	1,799,988
Total investments	$ 10,586,951	$ 12,767,797	$ 56,472	$ 23,411,220

The following table summarizes changes in Level 3 investments measured at fair value on a recurring basis.

(dollars in thousands)	**2022**	2021
Equity securities, beginning of period	**$ 56,472**	$ 58,493
Purchases	**—**	18,900
Sales	**(56,335)**	(15,015)
Net investment gains (losses)	**762**	(5,906)
Equity securities, end of period	**$ 899**	$ 56,472

Level 3 investments previously included the Company's investment in an insurance-linked securities fund managed by Markel CATCo Investment Management Ltd. (MCIM). In 2022, the Company's remaining investment was redeemed ($41.3 million) in conjunction with a buy-out transaction that provided for an accelerated return of all remaining capital to investors. See note 17 for further details about the Company's Markel CATCo operations and the buy-out transaction.

Except as disclosed in note 3 and note 8, the Company did not have any assets or liabilities measured at fair value on a non-recurring basis during the years ended December 31, 2022 and 2021.

6. Equity Method Investments

The Company holds certain investments that are accounted for under the equity method of accounting. The Company's equity method investments, which are included in other assets on the consolidated balance sheets, totaled $494.0 million and $459.7 million as of December 31, 2022 and 2021, respectively. The Company's proportionate share of earnings in its equity method investments was a loss of $22.9 million for the year ended December 31, 2022, income of $15.0 million for the year ended December 31, 2021 and a loss of $3.4 million for the year ended December 31, 2020.

The Company's most significant equity method investment is an investment in Hagerty, Inc. (Hagerty), which is accounted for on a quarter lag. Hagerty is an automotive enthusiast brand offering integrated membership products and programs as well as a specialty insurance provider focused on the global automobile enthusiast market. The Company's ownership interest in Hagerty was 23% as of December 31, 2022 and 2021. The Company's investment is comprised of Class A common shares, which are listed for trading on the New York Stock Exchange, as well as Class V common shares, associated with the

Company's original investment, that have special voting rights and can be converted on a one-for-one basis into Class A common shares. The Company accounts for its investment under the equity method as it is deemed to have the ability to exercise significant influence over Hagerty's operating and financial policies through a combination of its voting interest, its right to designate a board member and business it conducts with Hagerty. As of December 31, 2022 and 2021, the carrying value of the Company's investment in Hagerty was $245.1 million and $256.6 million, respectively.

As of December 31, 2022 and 2021, the estimated value of the Company's investment, based on the closing stock price of Hagerty's Class A common shares, was $656.0 million and $1.1 billion, respectively. See note 18 for further details regarding related party transactions with Hagerty.

7. Receivables

The following table presents the components of receivables.

(dollars in thousands)	December 31, 2022	December 31, 2021
Insurance		
Amounts receivable from agents, brokers and insureds	**$ 2,176,295**	$ 1,740,864
Other insurance	**83,728**	133,350
Markel Ventures	**645,189**	510,382
Other	**77,961**	50,379
	2,983,173	2,434,975
Allowance for credit losses	**(22,117)**	(21,037)
Receivables	**$ 2,961,056**	$ 2,413,938

8. Goodwill and Intangible Assets

The following table presents a rollforward of the components of goodwill by reportable segment.

(dollars in thousands)	Insurance	Reinsurance	Markel Ventures	Other[1]	Total
January 1, 2021	$ 772,700	$ 122,745	$ 901,045	$ 808,134	$ 2,604,624
Acquisitions	—	—	293,838	—	293,838
Foreign currency movements and other adjustments	2,012	—	1,707	(3,041)	678
December 31, 2021 [2]	$ 774,712	$ 122,745	$ 1,196,590	$ 805,093	$ 2,899,140
Acquisitions	**—**	**—**	**41,905**	**—**	**41,905**
Dispositions	**—**	**—**	**—**	**(132,455)**	**(132,455)**
Impairment of goodwill	**—**	**—**	**—**	**(80,000)**	**(80,000)**
Adjustments to preliminary purchase price allocation	**—**	**—**	**(83,358)**	**—**	**(83,358)**
Foreign currency movements and other adjustments	**(3,084)**	**—**	**(1,228)**	**(2,082)**	**(6,394)**
December 31, 2022 [2]	**$ 771,628**	**$ 122,745**	**$ 1,153,909**	**$ 590,556**	**$ 2,638,838**

(1) Amounts included in Other reflect the Company's operations that are not included in a reportable segment and are primarily related to the Company's program services and insurance-linked securities operations.

(2) As of December 31, 2022, goodwill was net of accumulated impairment losses of $190.6 million, of which $171.9 million was in Other and $18.7 million was in Markel Ventures. As of December 31, 2021, goodwill was net of accumulated impairment losses of $110.6 million, of which $91.9 million was in Other and $18.7 million was in Markel Ventures.

The Company completed its annual tests for goodwill and indefinite-lived intangible asset impairment as of October 1, 2022 based upon results of operations through September 30, 2022. See note 1 for further details regarding impairment testing. Impairment of goodwill was $80.0 million for the year ended December 31, 2022. There was no impairment of goodwill during 2021 or 2020 and no impairment of indefinite-lived intangible assets during 2022, 2021 or 2020.

The Company performed a quantitative impairment assessment for the Nephila reporting unit, which resulted in an $80.0 million impairment of goodwill, reducing the goodwill of the Nephila reporting unit to $221.8 million. The Company also evaluated the intangible assets within the Nephila reporting unit for impairment and determined they were not impaired.

The Company estimated the fair value of the Nephila reporting unit primarily using an income approach based on a discounted cash flow model. The cash flow projections used in the discounted cash flow model included the Company's best estimate of future growth and margins. The discount rates used to determine the fair value estimates were developed based on a capital asset pricing model using market-based inputs as well as an assessment of the inherent risk in projected future cash flows. The Company's fair value estimate was negatively impacted by an increase in the discount rate assumption in 2022, reflecting the increased cost of capital due to rising interest rates throughout 2022. Since acquiring Nephila in 2018, investment performance in the broader ILS market has been adversely impacted by consecutive years of elevated catastrophe losses, most recently with Hurricane Ian in 2022. These events, as well as recent volatility in the capital markets, have impacted investor decisions around allocation of capital to ILS, which in turn has impacted capital raises and redemptions within the funds Nephila manages. Following Hurricane Ian, Nephila has seen more favorable rates on the reinsurance contracts to which the Nephila Reinsurers subscribe, which is reflective of the current property catastrophe market and had a positive impact on Nephila's growth and performance projections. However, the impact of this favorable trend was more than offset by the impact of further declines in investor capital within the funds Nephila manages. Cash flow assumptions reflect the Company's best estimate of the reporting unit's future cash flows, based on information currently available, however, these assumptions are inherently uncertain, require a high degree of estimation and judgment and are subject to change depending on the outcome of future events.

The following table presents a rollforward of net intangible assets by reportable segment.

(dollars in thousands)	Underwriting[1]	Markel Ventures	Other[2]	Total
January 1, 2021	$ 442,639	$ 623,120	$ 716,959	$ 1,782,718
Acquisitions	—	203,879	—	203,879
Amortization of intangible assets	(41,182)	(57,568)	(61,789)	(160,539)
Foreign currency movements and other adjustments	(202)	(3,252)	(118)	(3,572)
December 31, 2021	$ 401,255	$ 766,179	$ 655,052	$ 1,822,486
Acquisitions	**—**	**21,614**	**—**	**21,614**
Dispositions	**—**	**—**	**(2,716)**	**(2,716)**
Amortization of intangible assets	**(38,533)**	**(79,043)**	**(61,202)**	**(178,778)**
Adjustments to preliminary purchase price allocation	**—**	**86,773**	**—**	**86,773**
Foreign currency movements and other adjustments	**(400)**	**774**	**(2,289)**	**(1,915)**
December 31, 2022	**$ 362,322**	**$ 796,297**	**$ 588,845**	**$ 1,747,464**

(1) Amounts included in Underwriting reflect the intangible assets associated with the Company's underwriting segments, which are not allocated between the Insurance and Reinsurance segments.

(2) Amounts included in Other reflect the Company's operations that are not included in a reportable segment and are primarily related to the Company's program services and insurance-linked securities operations.

Amortization of intangible assets is estimated to be $174.0 million for 2023, $172.1 million for 2024, $165.6 million for 2025, $157.5 million for 2026 and $149.9 million for 2027. Indefinite-lived intangible assets were $92.4 million at both December 31, 2022 and 2021.

The following table presents the components of intangible assets.

	December 31,			
	2022		2021	
(dollars in thousands)	Gross Carrying Amount	Accumulated Amortization	Gross Carrying Amount	Accumulated Amortization
Customer relationships	**$ 1,425,330**	**$ (498,987)**	$ 1,379,739	$ (405,057)
Investment management agreements	**464,000**	**(120,394)**	468,000	(92,478)
Broker relationships	**204,972**	**(117,386)**	206,855	(109,210)
Trade names	**293,194**	**(118,976)**	238,331	(100,023)
Technology	**113,170**	**(92,646)**	113,200	(82,845)
Agent relationships	**92,000**	**(34,756)**	92,000	(28,622)
Insurance licenses	**74,333**	**—**	74,333	—
Renewal rights	**21,449**	**(21,449)**	21,449	(21,449)
Other	**148,326**	**(84,716)**	145,695	(77,432)
Total	**$ 2,836,774**	**$ (1,089,310)**	$ 2,739,602	$ (917,116)

9. Leases

The Company's leases primarily consist of operating leases for real estate and have remaining terms of up to 20 years. Total lease costs for operating leases were $126.3 million, $115.4 million and $94.4 million for the years ended December 31, 2022, 2021 and 2020, respectively.

The following table summarizes details for the Company's operating leases recorded on the consolidated balance sheets.

	December 31,	
(dollars in thousands)	**2022**	2021
Right-of-use lease assets	**$ 526,704**	$ 533,702
Lease liabilities	**$ 554,394**	$ 571,337
Weighted average remaining lease term	**11.7 years**	10.8 years
Weighted average discount rate	**3.1 %**	3.0 %

The following table summarizes maturities of the Company's operating lease liabilities as of December 31, 2022, which reconciles to total operating lease liabilities included in other liabilities on the Company's consolidated balance sheet.

Years Ending December 31,	*(dollars in thousands)*
2023	**$ 100,887**
2024	**85,030**
2025	**71,474**
2026	**60,729**
2027	**51,702**
2028 and thereafter	**291,290**
Total lease payments	**661,112**
Less imputed interest	**(106,718)**
Total operating lease liabilities	**$ 554,394**

10. Products, Services and Other Revenues

The amount of revenues from contracts with customers for the years ended December 31, 2022, 2021 and 2020 was $4.8 billion, $3.8 billion and $2.9 billion, respectively.

The following table presents revenues from contracts with customers by segment and type, all of which are included in products revenues and services and other revenues in the consolidated statements of income (loss) and comprehensive income (loss), along with a reconciliation to total products revenues and services and other revenues.

	Years Ended December 31,								
	2022			2021			2020		
(dollars in thousands)	Markel Ventures	Other	Total	Markel Ventures	Other	Total	Markel Ventures	Other	Total
Products	**$ 2,379,399**	**$ —**	**$ 2,379,399**	$1,668,448	$ —	$ 1,668,448	$1,396,706	$ —	$ 1,396,706
Services	**2,265,413**	**43,875**	**2,309,288**	1,863,706	134,850	1,998,556	1,295,734	116,476	1,412,210
Investment management	**—**	**79,209**	**79,209**	—	86,257	86,257	—	117,193	117,193
Total revenues from contracts with customers	**4,644,812**	**123,084**	**4,767,896**	3,532,154	221,107	3,753,261	2,692,440	233,669	2,926,109
Program services and other fronting	**—**	**147,612**	**147,612**	—	123,823	123,823	—	102,989	102,989
Disposition gains	**—**	**225,828**	**225,828**	—	—	—	—	—	—
Other	**111,806**	**(16,621)**	**95,185**	111,662	8,699	120,361	102,274	(2,316)	99,958
Total	**$ 4,756,618**	**$ 479,903**	**$ 5,236,521**	$3,643,816	$ 353,629	$ 3,997,445	$2,794,714	$ 334,342	$ 3,129,056

Receivables from contracts with customers were $624.1 million and $626.1 million as of December 31, 2022 and 2021, respectively.

11. Unpaid Losses and Loss Adjustment Expenses

a) The following table presents a reconciliation of consolidated beginning and ending reserves for losses and loss adjustment expenses.

	Years Ended December 31,		
(dollars in thousands)	**2022**	2021	2020
Gross reserves for losses and loss adjustment expenses, beginning of year	**$ 18,178,894**	$ 16,222,376	$ 14,728,676
Reinsurance recoverables on unpaid losses, beginning of year	**6,876,317**	5,736,659	5,253,415
Net reserves for losses and loss adjustment expenses, beginning of year	**11,302,577**	10,485,717	9,475,261
Effect of foreign currency rate changes on beginning of year balance	**(160,622)**	(54,736)	68,368
Effect of adoption of ASC 326, *Financial Instruments—Credit Losses*	**—**	—	3,849
Adjusted net reserves for losses and loss adjustment expenses, beginning of year	**11,141,955**	10,430,981	9,547,478
Incurred losses and loss adjustment expenses:			
Current accident year	**4,613,035**	4,061,000	4,073,325
Prior accident years	**(167,446)**	(478,930)	(606,414)
Total incurred losses and loss adjustment expenses	**4,445,589**	3,582,070	3,466,911
Payments:			
Current accident year	**580,537**	637,169	749,887
Prior accident years	**2,396,446**	2,066,290	1,779,980
Total payments	**2,976,983**	2,703,459	2,529,867
Effect of foreign currency rate changes on current year activity	**(5,468)**	(4,253)	1,195
Net reserves for losses and loss adjustment expenses of Markel CATCo Re (see note 17)	**347,921**	—	—
Net reserves for losses and loss adjustment expenses of insurance companies sold	**—**	(2,762)	—
Net reserves for losses and loss adjustment expenses, end of year	**12,953,014**	11,302,577	10,485,717
Reinsurance recoverables on unpaid losses, end of year	**7,994,884**	6,876,317	5,736,659
Gross reserves for losses and loss adjustment expenses, end of year	**$ 20,947,898**	$ 18,178,894	$ 16,222,376

Catastrophe Losses

In 2022, current accident year losses and loss adjustment expenses included $46.2 million of net losses and loss adjustment expenses attributed to Hurricane Ian, all of which were within the Company's Insurance segment. These losses and loss adjustment expenses were net of ceded losses of $115.3 million. The Company also had gross losses and loss adjustment expenses of $850.0 million within its program services and other fronting operations attributed to Hurricane Ian, all of which were ceded to third-party reinsurers managed through the Company's insurance-linked securities operations, which hold sufficient investor collateral to support the Company's related reinsurance recoverables. See note 18 for further details regarding related party transactions with third parties managed through the Company's insurance-linked securities operations.

In 2021, current accident year losses and loss adjustment expenses included $195.0 million of net losses and loss adjustment expenses from Winter Storm Uri, European Floods and Hurricane Ida (2021 Catastrophes). The net losses and loss adjustment expenses on the 2021 Catastrophes for the year ended December 31, 2021 were net of ceded losses of $221.7 million.

In 2020, current accident year losses and loss adjustment expenses included $172.2 million of net losses and loss adjustment expenses from Hurricanes Isaias, Laura, Sally, Delta and Zeta, as well as wildfires in the western U.S. and the derecho in Iowa (2020 Catastrophes). The net losses and loss adjustment expenses on the 2020 Catastrophes for the year ended December 31, 2020 were net of ceded losses of $125.7 million.

Russia-Ukraine Conflict

In 2022, current accident year losses and loss adjustment expenses also included $35.7 million of net losses and loss adjustment expenses attributed to the Russia-Ukraine conflict. These losses and loss adjustment expenses were net of ceded losses of $44.3 million. The gross and net losses and loss adjustment expenses attributed to the Russia-Ukraine conflict represent the Company's best estimates as of December 31, 2022 based upon information currently available. The Company's estimates for these losses are based on reported claims, detailed underwriting, actuarial and claims reviews of policies and in-force assumed reinsurance contracts for potential exposures, as well as analysis of ceded reinsurance contracts and analysis provided by the Company's brokers and claims counsel. These estimates include various assumptions about what areas within the affected regions have incurred losses, the nature and extent of such losses, which remain difficult to verify, as well as assumptions about coverage, liability and reinsurance. Given the significant levels of ceded reinsurance on certain of the impacted policies, a significant portion of any additional incurred losses may be ceded. While the Company believes the gross and net reserves for losses and loss adjustment expenses for the Russia-Ukraine conflict as of December 31, 2022 are adequate based on information currently available, the Company continues to closely monitor reported claims, ceded reinsurance contract attachment, government actions and areas impacted by the conflict and may adjust its estimates as new information becomes available.

COVID-19 Losses

In 2020, current accident year losses and loss adjustment expenses included $358.3 million of net losses and loss adjustment expenses attributed to the COVID-19 pandemic. These losses and loss adjustment expenses were net of ceded losses of $106.2 million. In 2021, the Company increased its estimate of net losses and loss adjustments expenses by $15.7 million. In 2022, the Company decreased its estimate of net losses and loss adjustment expenses by $5.4 million.

The gross and net losses and loss adjustment expenses attributed to COVID-19 represent the Company's best estimates as of December 31, 2022 based upon information currently available. The Company's estimates are based on reported claims and still include assumptions about coverage, liability and ceded reinsurance contract attachment, which, in some cases, remain subject to judicial review. While the Company believes the gross and net reserves for losses and loss adjustment expenses for COVID-19 as of December 31, 2022 are adequate based on information available at this time, the Company continues to closely monitor reported claims, claim settlements, ceded reinsurance contract settlements and judicial decisions and may adjust its estimates as new information becomes available.

b) Reserving Methodology

The Company uses a variety of techniques to establish the liabilities for unpaid losses and loss adjustment expenses based upon estimates of the ultimate amounts payable. The Company maintains reserves for specific claims incurred and reported (case reserves) and reserves for claims incurred but not reported (IBNR reserves), which include expected development on reported claims. The Company does not discount its reserves for losses and loss adjustment expenses to reflect estimated present value, except for reserves held for a run-off book of United Kingdom (U.K.) motor business. Additionally, reserves assumed in connection with an acquisition are recorded at fair value at the acquisition date. The fair value adjustment includes an adjustment to reflect the acquired reserves for losses and loss adjustment expenses at present value plus a risk premium, the net of which is amortized to losses and loss adjustment expenses within the consolidated statements of income.

As of any balance sheet date, all claims have not yet been reported, and some claims may not be reported for many years. As a result, the liability for unpaid losses and loss adjustment expenses includes significant estimates for incurred but not reported claims.

There is normally a time lag between when a loss event occurs and when it is reported to the Company. The actuarial methods that the Company uses to estimate losses have been designed to address the lag in loss reporting as well as the delay in obtaining information that would allow the Company to more accurately estimate future payments. There is also often a time lag between cedents establishing case reserves or re-estimating their reserves and notifying the Company of those new or revised case reserves. As a result, the reporting lag is more pronounced in reinsurance contracts than in the insurance contracts. On reinsurance transactions, the reporting lag will generally be 60 to 90 days after the end of a reporting period, but can be longer in some cases. There may also be a more pronounced reporting lag, as well as reliance on third-party claims handling practices and reserve estimates, on insurance contracts for which the Company is not the primary insurer and participates only in excess layers of loss. Based on the experience of the Company's actuaries and management, the Company selects loss development factors and trending techniques to mitigate the difficulties caused by reporting lags. At least annually, the Company evaluates its loss development factors and trending assumptions using its own loss data, as well as cedent-specific and industry data, and updates them as needed.

IBNR reserves are based on the estimated ultimate cost of settling claims, including the effects of inflation and other social and economic factors, using past experience adjusted for current trends and any other factors that would modify past experience. IBNR reserves are calculated by subtracting paid losses and loss adjustment expenses and case reserves from estimated ultimate losses and loss adjustment expenses. IBNR reserves were 70% of total unpaid losses and loss adjustment expenses at December 31, 2022 compared to 67% at December 31, 2021.

In establishing liabilities for unpaid losses and loss adjustment expenses, the Company's actuaries estimate an ultimate loss ratio, by accident year or underwriting year, for each product line with input from underwriting and claims personnel. For product lines in which loss reserves are established on an underwriting year basis, the Company has developed a methodology to convert from underwriting year to accident year for financial reporting purposes. In estimating an ultimate loss ratio for a particular line of business, the actuaries may use one or more actuarial reserving methods and select from these a single point estimate. To varying degrees, these methods include detailed statistical analysis of past claim reporting, settlement activity, claim frequency and severity, policyholder loss experience, industry loss experience and changes in market and economic conditions, policy forms and exposures. Greater judgment may be required when new product lines are introduced or when there have been changes in claims handling practices, as the statistical data available may be insufficient. Greater judgment also may be required for product lines that experience a low frequency of high severity claims, particularly when the Company is reliant on third party case reserve estimates and claims handling practices. These estimates also reflect implicit and explicit assumptions regarding the potential effects of external factors, including economic and social inflation, judicial decisions, changes in law, general economic conditions and recent trends in these factors. Management believes the process of evaluating past experience, adjusted for the effects of current developments and anticipated trends, is an appropriate basis for predicting future events.

Estimates for losses from widespread catastrophic events, such as hurricanes and earthquakes, as well as pandemics and wars, are based on claims received to date, industry loss estimates and output from both industry, broker and proprietary models, as well as analysis of the Company's ceded reinsurance contracts. The Company may also perform detailed policy and reinsurance contract level reviews. The availability of data from these procedures varies depending on the timing of the event relative to the point at which the Company develops its estimates. The Company also considers loss experience on historical events that may have similar characteristics to the underlying event and current market conditions, including the level of economic inflation. Due to the inherent uncertainty in estimating such losses, these estimates are subject to variability, which increases with the severity and complexity of the underlying event. As additional claims are reported and paid, and industry loss estimates are revised, the Company incorporates this new information into its analysis and adjusts its estimate of ultimate losses and loss adjustment expenses as appropriate. For example, both the gross and net losses on Hurricane Ian and the 2021 and 2020 Catastrophes, as of December 31, 2022 represent the Company's best estimates based upon information currently available. For Hurricane Ian, these estimates are still dependent on assumptions about coverage, liability and reinsurance. While the Company believes the gross and net reserves for these events as of December 31, 2022 are adequate, it continues to closely monitor reported claims and may adjust its estimates as new information becomes available.

Loss reserves are established at management's best estimate, which is developed using the actuarially calculated point estimate as the starting point. The actuarial point estimate represents the actuaries' estimate of the most likely amount that will ultimately be paid to settle the losses that have occurred at a particular point in time; however, there is inherent uncertainty in the point estimate as it is the expected value in a range of possible reserve estimates. In some cases, actuarial analyses, which are generally based on statistical analysis, cannot fully incorporate all of the subjective factors that affect development of losses. In other cases, management's perspective of these more subjective factors may differ from the actuarial perspective. Subjective factors influencing the development of management's best estimate include: the credibility and timeliness of claims and loss information received from cedents and other third parties, economic and social inflation, judicial decisions, changes in law, changes in underwriting or claims handling practices, general economic conditions, the risk of moral hazard and other current and developing trends within the insurance and reinsurance markets, including the effects of competition. For example, the Company's loss experience in recent years has reflected higher than anticipated levels of economic inflation, as well as the impacts of social inflation.

Inherent in the Company's reserving practices is the desire to establish loss reserves that are more likely redundant than deficient, and therefore, will ultimately prove to be adequate. This approach to establishing loss reserves typically results in loss reserves that exceed the calculated actuarial point estimate. However, following an acquisition of insurance operations, acquired reserves initially are recorded at fair value, and therefore the acquired loss reserves may be closer to the actuarial point estimate until the Company builds total loss reserves that are consistent with the Company's historic level of confidence. Management continually attempts to improve its loss estimation process by refining its ability to analyze loss development patterns, claim payments and other information, but uncertainty remains regarding the potential for adverse development of estimated ultimate liabilities.

The Company's ultimate liability may be greater or less than current reserves. Changes in the Company's estimated ultimate liability for loss reserves generally occur as a result of the emergence of unanticipated loss activity, the completion of specific actuarial or claims studies or changes in internal or external factors that impact the assumptions used to derive the Company's estimates. The Company closely monitors new information on reported claims and uses statistical analyses prepared by its actuaries to evaluate the adequacy of recorded reserves. Management exercises judgment when assessing the relative credibility of loss development trends.

Management currently believes the Company's gross and net reserves are adequate. However, there is no precise method for evaluating the impact of any significant factor on the adequacy of reserves, and actual results will differ from original estimates.

c) Prior Accident Year Loss Development

The following tables summarize, by segment, the product lines with the most significant changes in prior accident years loss reserves for the years ended December 31, 2022, 2021 and 2020, along with the corresponding accident years and the trends and factors that impacted management's best estimate of ultimate losses and loss adjustment expenses on underlying products in each of these product lines. The Company does not estimate losses at this level of aggregation as it offers a diverse portfolio of products and manages these products in logical groupings within each underwriting segment. As a result of the trends and factors described in the following tables, the Company's actuaries adjusted their estimates of the ultimate liability for unpaid losses and loss adjustment expenses. Additionally, for those product lines with favorable development on prior accident years loss reserves, management has now given more credibility to the favorable trends observed by the Company's actuaries and after also incorporating these favorable trends into its best estimate, reduced prior years loss reserves accordingly. The unfavorable claims and loss trends experienced on certain accident years within the Company's professional liability and general liability product lines in 2022 reflected broader market conditions, including the effects of economic and social inflation, as well as delays in court proceedings that began in 2020 and disrupted the development of the claims trend. These trends were most impactful on the 2018 and 2019 accident years for the professional liability product lines and the 2016 to 2019 accident years for the general liability product lines. Consistent with the Company's reserving philosophy, management is responding quickly to increase loss reserves following any indication of increased claims frequency or severity in excess of previous expectations.

	Year Ended December 31, 2022		
(dollars in millions)	Loss Development	Accident Years with Most Significant Development	Trends and Factors Impacting Loss Estimates
Insurance segment:			
Professional liability			
2018 and 2019 accident years	$ **121.0**	2018 and 2019	Unfavorable claims settlements and increased claim frequency and severity, primarily on directors and officers, errors and omissions and employment practices liability lines
All other accident years	**(91.1)**	Several	More favorable loss experience and lower loss severity than previously anticipated
General liability			
2016 to 2019 accident years	**61.6**	2016 to 2019	Unfavorable claims settlements and increased claim frequency and severity, primarily on contractors and excess and umbrella lines
All other accident years	**(20.5)**	Several	Lower loss frequency and severity than previously anticipated
Workers' compensation	**(62.1)**	2016 to 2021	Lower loss severity than previously anticipated
Programs	**(48.3)**	2020 and 2021	Lower than expected frequency of claims
Property	**(48.1)**	2020 and 2021	Lower loss severity than originally anticipated as well as favorable development on COVID-19
Credit and surety	**(31.7)**	2019 to 2021	Lower than expected frequency of claims
Other products	**(23.7)**		
Total Insurance	**(142.9)**		
Reinsurance segment:			
Property	**(29.2)**	2017 to 2019	Favorable development on catastrophe events
Credit and surety	**(22.9)**	Several	Favorable commutations on mortgage insurance contracts
Premium adjustments	**53.1**	2020 and 2021	Recognition of additional exposures on prior accident years related to net favorable premium adjustments primarily on general liability, credit and surety and professional liability
Other products	**(27.1)**		
Total Reinsurance	**(26.1)**		
Other underwriting	**1.6**		
Total decrease	$ **(167.4)**		

(dollars in millions)	Year Ended December 31, 2021 Loss Development	Accident Years with Most Significant Development	Trends and Factors Impacting Loss Estimates
Insurance segment:			
General liability	$ (139.7)	Several	Lower than expected frequency of claims and more favorable experience than originally anticipated across several sub-product lines
Property	(96.5)	2018 to 2020	Lower than expected frequency of large claims as well as favorable development on COVID-19 and catastrophe events
Workers' compensation	(79.0)	Several	Lower loss severity than originally anticipated
Marine and energy	(60.0)	2018 to 2020	Lower loss frequency and severity than originally anticipated
Professional liability	(54.7)	Several	Lower loss frequency and severity than originally anticipated
Other products	(76.4)		
Total Insurance	(506.3)		
Reinsurance segment:			
Property	35.0	2020	Adverse development on COVID-19 and catastrophe events
Professional liability	29.2	Several	Recognition of additional exposures on prior accident years related to net favorable premium adjustments
General liability	(19.2)	2011, 2012, 2017 and 2020	Favorable development on COVID-19 and catastrophe events as well as lower than expected paid losses on reported claims
Credit and surety	(16.6)	2020	Favorable commutations on mortgage insurance contracts
Other products	(8.5)		
Total Reinsurance	19.9		
Other underwriting	6.6		
Total decrease	$ (479.8)		

(dollars in millions)	Year Ended December 31, 2020 Loss Development	Accident Years with Most Significant Development	Trends and Factors Impacting Loss Estimates
Insurance segment:			
General liability	$ (131.8)	Several	More favorable claims experience than originally anticipated across several sub-product lines
Professional liability	(128.9)	Several	More favorable claims experience than originally anticipated across several sub-product lines
Workers' compensation	(92.3)	2017 to 2019	Lower loss severity than originally anticipated
Marine and energy	(46.0)	2016 to 2019	Lower than expected frequency of claims
Other products	(155.6)		
Total Insurance	(554.6)		
Reinsurance segment:			
Property	(68.4)	2017 to 2019	Lower than expected severity of claims
Public entity	34.4	2016 to 2019	Higher than expected frequency and severity of claims
Professional liability	21.0	2016 to 2019	Recognition of additional exposures on prior accident years related to net favorable premium adjustments and higher than expected loss severity and claims frequency
Other products	(38.8)		
Total Reinsurance	(51.8)		
Total decrease	$ (606.4)		

d) Historic Loss Development

The following tables present undiscounted loss development information, by accident year, for the Company's Insurance and Reinsurance segments, including cumulative incurred and paid losses and allocated loss adjustment expenses, net of reinsurance, as well as the corresponding amount of IBNR reserves as of December 31, 2022. This level of disaggregation is consistent with how the Company analyzes loss reserves for both internal and external reporting purposes. The loss development information for the years ended December 31, 2013 through 2021 is presented as supplementary information. All amounts included in the following tables related to transactions denominated in a foreign currency have been translated into U.S. Dollars using the exchange rates in effect at December 31, 2022.

The difference between the segment loss development implied by the tables for the year ended December 31, 2022 and actual losses and loss adjustment expenses recognized on prior accident years for the Insurance and Reinsurance segments for the year ended December 31, 2022 is primarily attributed to the fact that amounts presented in these tables exclude amounts attributed to the 2012 and prior accident years. Favorable development on 2012 and prior accident years for the year ended December 31, 2022 totaled $50.8 million and $36.9 million for the Insurance and Reinsurance segments and reflects modest favorable development across many of the Company's product lines on accident years prior to 2013.

The remaining difference between the segment loss development implied by the tables for the year ended December 31, 2022 and actual losses and loss adjustment expenses on prior accident years is attributed to the fact that amounts presented in these tables exclude unallocated loss adjustment expenses and exclude amounts attributable to reserve discounting and fair value adjustments recorded in conjunction with acquisitions, as well as differences in the presentation of foreign currency movements, as previously described, none of which are material to the Insurance or Reinsurance segments.

The Insurance segment table that follows also includes claim frequency information, by accident year. The Company defines a claim as a single claim incident, per policy, which may include multiple claimants and multiple coverages on a single policy. Claim counts include claims closed without a payment as well as claims where the Company is monitoring to determine if an exposure exists, even if a reserve has not been established.

All of the business contained within the Company's Reinsurance segment represents treaty business that is assumed from other insurance or reinsurance companies, for which the Company does not have access to the underlying claim counts. Further, this business includes both quota share and excess of loss treaty reinsurance, through which only a portion of each reported claim results in losses to the Company. As such, the Company has excluded claim count information from the Reinsurance segment disclosures.

Insurance Segment

(dollars in millions)	Ultimate Incurred Losses and Allocated Loss Adjustment Expenses, Net of Reinsurance										Total of Incurred-but-Not-Reported Liabilities, Net of Reinsurance	Cumulative Number of Reported Claims
	Unaudited									As of December 31,		
	As of December 31,											
Accident Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	**2022**	**December 31, 2022**	
2013	$1,724.9	$1,683.4	$1,514.7	$1,452.6	$1,406.2	$1,360.8	$1,315.6	$1,296.6	$1,292.8	**$ 1,283.7**	**$ 43.3**	**91,000**
2014		1,850.8	1,680.7	1,613.0	1,556.8	1,508.6	1,487.4	1,455.2	1,457.7	**1,438.2**	**52.8**	**86,000**
2015			1,769.1	1,695.0	1,571.9	1,517.8	1,487.2	1,455.2	1,451.2	**1,442.2**	**65.9**	**89,000**
2016				1,858.0	1,854.2	1,756.3	1,703.9	1,677.1	1,669.8	**1,682.3**	**86.9**	**101,000**
2017					2,312.1	2,179.6	2,061.0	2,018.2	2,004.7	**2,023.7**	**103.5**	**139,000**
2018						2,432.4	2,325.5	2,099.9	2,061.6	**2,153.7**	**194.9**	**193,000**
2019							2,556.6	2,299.1	2,244.4	**2,295.5**	**335.6**	**228,000**
2020								3,083.4	2,974.7	**2,914.7**	**1,042.6**	**179,000**
2021									3,085.7	**2,909.0**	**1,483.0**	**137,000**
2022										**4,097.4**	**2,791.3**	**121,000**
Total										**$22,240.4**		

	Cumulative Paid Losses and Allocated Loss Adjustment Expenses, Net of Reinsurance									
	Unaudited									As of December 31,
	As of December 31,									
Accident Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	**2022**
2013	$ 270.2	$ 568.9	$ 774.9	$ 943.8	$1,031.6	$1,092.9	$1,116.4	$1,150.2	$1,163.9	**$ 1,178.2**
2014		329.6	652.6	886.6	1,052.9	1,157.3	1,240.4	1,288.8	1,308.8	**1,339.9**
2015			321.0	660.7	870.9	1,034.0	1,142.1	1,230.9	1,260.6	**1,293.0**
2016				370.3	747.4	975.4	1,160.0	1,288.3	1,351.9	**1,427.5**
2017					436.0	983.9	1,275.6	1,511.1	1,620.1	**1,741.0**
2018						492.2	1,019.3	1,346.9	1,498.3	**1,674.8**
2019							523.9	1,082.4	1,261.4	**1,574.1**
2020								807.8	1,150.9	**1,518.1**
2021									474.3	**988.5**
2022										**834.4**
Total										**$13,569.5**
All outstanding liabilities for unpaid losses and loss adjustment expenses before 2013, net of reinsurance										**237.4**
Total liabilities for unpaid losses and loss adjustment expenses, net of reinsurance										**$ 8,908.3**

Variability in claim counts is primarily attributable to claim counts associated with a personal lines product with high claim frequency and low claim severity, which the Company did not write from 2014 to 2016. The related net incurred losses and allocated loss adjustment expenses are not material to the Insurance segment.

Reinsurance Segment

(dollars in millions)	Ultimate Incurred Losses and Allocated Loss Adjustment Expenses, Net of Reinsurance										Total of Incurred-but-Not-Reported Liabilities, Net of Reinsurance
	Unaudited									As of December 31,	
	As of December 31,										
Accident Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	**2022**	**December 31, 2022**
2013	$ 579.4	$ 571.8	$ 538.3	$ 525.4	$ 533.2	$ 496.1	$ 478.2	$ 480.0	$ 475.3	**$ 476.9**	**$ 32.7**
2014		569.2	552.1	524.4	563.1	542.2	519.3	503.8	505.3	**501.2**	**60.3**
2015			523.1	508.8	523.7	515.0	503.9	498.6	486.3	**486.6**	**84.4**
2016				509.1	518.5	519.0	516.9	526.8	550.9	**554.3**	**69.8**
2017					895.7	928.7	934.7	936.0	908.2	**920.4**	**105.6**
2018						749.5	775.3	767.9	772.1	**767.8**	**150.7**
2019							662.0	675.6	689.2	**702.7**	**223.4**
2020								680.2	732.7	**742.4**	**344.0**
2021									735.5	**736.7**	**446.9**
2022										**662.6**	**614.1**
Total										**$ 6,551.6**	

	Cumulative Paid Losses and Allocated Loss Adjustment Expenses, Net of Reinsurance									
	Unaudited									As of December 31,
	As of December 31,									
Accident Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	**2022**
2013	$ 70.6	$ 153.4	$ 205.5	$ 263.2	$ 295.6	$ 324.9	$ 343.3	$ 358.1	$ 369.5	**$ 383.4**
2014		97.4	155.6	220.5	267.0	302.9	335.7	352.9	369.3	**379.4**
2015			63.6	131.2	202.0	252.7	299.6	324.1	343.7	**360.3**
2016				79.0	167.9	237.9	294.3	346.0	379.4	**419.5**
2017					157.4	358.1	479.2	560.9	624.5	**693.5**
2018						87.0	243.7	344.7	414.4	**484.5**
2019							53.5	173.6	268.4	**359.6**
2020								93.5	203.7	**309.8**
2021									79.5	**187.8**
2022										**24.2**
Total										**$ 3,602.0**
All outstanding liabilities for unpaid losses and loss adjustment expenses before 2013, net of reinsurance										**388.0**
Total liabilities for unpaid losses and loss adjustment expenses, net of reinsurance										**$ 3,337.6**

The following table presents supplementary information about average historical claims duration as of December 31, 2022 based on the cumulative incurred and paid losses and allocated loss adjustment expenses presented above.

	Average Annual Percentage Payout of Incurred Losses by Age (in Years), Net of Reinsurance									
Unaudited	1	2	3	4	5	6	7	8	9	10
Insurance	22.0 %	21.9 %	13.8 %	11.3 %	7.1 %	5.3 %	2.9 %	2.1 %	1.6 %	1.1 %
Reinsurance	12.5 %	16.4 %	13.1 %	10.4 %	8.2 %	6.3 %	4.6 %	3.3 %	2.2 %	2.9 %

The following table reconciles the net incurred and paid loss development tables to the liability for losses and loss adjustment expenses on the consolidated balance sheet.

(dollars in thousands)	December 31, 2022
Net outstanding liabilities	
Insurance segment	**$ 8,908,308**
Reinsurance segment	**3,337,587**
Other underwriting	**89,563**
Program services and other fronting	**9,982**
Markel CATCo Re (see note 17)	**347,921**
Liabilities for unpaid losses and loss adjustment expenses, net of reinsurance	**12,693,361**
Reinsurance recoverable on unpaid losses	
Insurance segment	**2,425,560**
Reinsurance segment	**277,854**
Other underwriting	**56,968**
Program services and other fronting	**5,234,502**
Total reinsurance recoverable on unpaid losses	**7,994,884**
Unallocated loss adjustment expenses	**326,275**
Unamortized discount, net of acquisition fair value adjustments, included in unpaid losses and loss adjustment expenses	**(66,622)**
	259,653
Total gross liability for unpaid losses and loss adjustment expenses	**$ 20,947,898**

e) The Company has exposure to asbestos and environmental (A&E) claims primarily resulting from policies written by acquired insurance operations before their acquisition by the Company. The Company's exposure to A&E claims originated from umbrella, excess and commercial general liability insurance policies and assumed reinsurance contracts that were written on an occurrence basis from the 1970s to mid-1980s. Exposure also originated from claims-made policies that were designed to cover environmental risks provided that all other terms and conditions of the policy were met. A&E claims include property damage and clean-up costs related to pollution, as well as personal injury allegedly arising from exposure to hazardous materials. Development on A&E loss reserves is monitored separately from the Company's ongoing underwriting operations and is not included in a reportable segment.

At December 31, 2022, A&E reserves were $153.2 million and $54.5 million on a gross and net basis, respectively. At December 31, 2021, A&E reserves were $218.6 million and $66.2 million on a gross and net basis, respectively.

The Company's reserves for losses and loss adjustment expenses related to A&E exposures represent management's best estimate of ultimate settlement values based on statistical analysis of these reserves by the Company's actuaries. A&E exposures are subject to significant uncertainty due to potential loss severity and frequency resulting from the uncertain and unfavorable legal climate. A&E reserves could be subject to increases in the future, however, management believes the Company's gross and net A&E reserves at December 31, 2022 are adequate.

12. Reinsurance

In reinsurance and retrocession transactions, an insurance or reinsurance company transfers, or cedes, all or part of its exposure in return for a premium. The ceding of insurance does not legally discharge the Company from its primary liability for the full amount of the policies, and the Company will be required to pay the loss and bear collection risk if the reinsurer fails to meet its obligations under the reinsurance or retrocessional agreement. A credit risk exists with ceded reinsurance to the extent that any reinsurer is unable to meet the obligations assumed under the reinsurance or retrocessional contracts. Allowances are established for credit losses expected to be recognized over the life of the reinsurance recoverables.

Within its underwriting operations, the Company uses reinsurance and retrocessional reinsurance to manage its net retention on individual risks and overall exposure to losses while providing it with the ability to offer policies with sufficient limits to meet policyholder needs.

Within the Company's underwriting operations, at December 31, 2022 and 2021, balances recoverable from the ten largest reinsurers, by group, represented 62% and 63%, respectively, of reinsurance recoverables before considering reinsurance allowances and collateral. At December 31, 2022, the largest reinsurance balance was due from RenaissanceRe and represented 11% of reinsurance recoverables before considering reinsurance allowances and collateral.

Within its program services and other fronting businesses, the Company generally enters into quota share reinsurance agreements whereby the Company cedes to the capacity providers (reinsurers) substantially all of its gross liability under all policies issued by and on behalf of the Company by a general agent. However, there are certain programs that contain limits on the reinsurers' obligations to the Company that expose the Company to underwriting risk, including loss ratio caps, exclusions of the credit risk of producers and aggregate reinsurance limits that the Company believes are unlikely to be exceeded. The Company also remains exposed to the credit risk of the reinsurer, or the risk that one of its reinsurers becomes insolvent or otherwise unable or unwilling to pay policyholder claims. This credit risk is generally mitigated by either selecting well capitalized, highly rated authorized capacity providers or requiring that the capacity provider post substantial collateral to secure the reinsured risks, which, in some instances, exceeds the related reinsurance recoverable.

Within the Company's program services business, at December 31, 2022 and 2021, balances recoverable from the ten largest reinsurers, by group, represented 67% and 68%, respectively, of reinsurance recoverables before considering reinsurance allowances and collateral. At December 31, 2022, the largest reinsurance balance was due from Lloyd's of London (Lloyd's) and represented 13% of reinsurance recoverables before considering reinsurance allowances and collateral. All of the Company's other fronting business is conducted on behalf of its Nephila ILS operations; therefore, all of the reinsurance recoverables within these operations are attributable to entities it manages. See note 18.

The following tables summarize the effect of reinsurance and retrocessional reinsurance on premiums written and earned.

	Year Ended December 31, 2022			
(dollars in thousands)	Direct	Assumed	Ceded	Net Premiums
Underwriting:				
Written	**$ 8,085,812**	**$ 1,761,726**	**$ (1,640,165)**	**$ 8,207,373**
Earned	**$ 7,379,766**	**$ 1,589,920**	**$ (1,378,191)**	**$ 7,591,495**
Program services and other fronting:				
Written	**2,644,138**	**710,006**	**(3,358,127)**	**(3,983)**
Earned	**2,688,804**	**656,885**	**(3,349,392)**	**(3,703)**
Consolidated:				
Written	**$ 10,729,950**	**$ 2,471,732**	**$ (4,998,292)**	**$ 8,203,390**
Earned	**$ 10,068,570**	**$ 2,246,805**	**$ (4,727,583)**	**$ 7,587,792**

	Year Ended December 31, 2021			
(dollars in thousands)	Direct	Assumed	Ceded	Net Premiums
Underwriting:				
Written	$ 6,863,229	$ 1,622,700	$ (1,360,763)	$ 7,125,166
Earned	$ 6,275,078	$ 1,482,755	$ (1,250,392)	$ 6,507,441
Program services and other fronting:				
Written	2,644,955	307,798	(2,958,188)	(5,435)
Earned	2,453,990	261,591	(2,719,993)	(4,412)
Consolidated:				
Written	$ 9,508,184	$ 1,930,498	$ (4,318,951)	$ 7,119,731
Earned	$ 8,729,068	$ 1,744,346	$ (3,970,385)	$ 6,503,029

(dollars in thousands)	Year Ended December 31, 2020 Direct	Assumed	Ceded	Net Premiums
Underwriting:				
Written	$ 5,715,038	$ 1,444,967	$ (1,222,390)	$ 5,937,615
Earned	$ 5,357,888	$ 1,394,239	$ (1,134,501)	$ 5,617,626
Program services and other fronting:				
Written	2,038,743	67,917	(2,112,037)	(5,377)
Earned	2,084,888	74,847	(2,165,156)	(5,421)
Consolidated:				
Written	$ 7,753,781	$ 1,512,884	$ (3,334,427)	$ 5,932,238
Earned	$ 7,442,776	$ 1,469,086	$ (3,299,657)	$ 5,612,205

Substantially all of the premiums written and earned in the Company's program services and other fronting operations for the years ended December 31, 2022, 2021 and 2020 were ceded. The percentage of consolidated ceded earned premiums to gross earned premiums was 38%, 38% and 37% for the years ended December 31, 2022, 2021 and 2020, respectively. The percentage of consolidated assumed earned premiums to net earned premiums was 30%, 27% and 26% for the years ended December 31, 2022, 2021 and 2020, respectively.

Substantially all of the incurred losses and loss adjustment expenses in the Company's program services and other fronting operations were ceded. These losses totaled $3.0 billion and $2.5 billion for the years ended December 31, 2022 and 2021, respectively.

The following table summarizes the effect of reinsurance and retrocessional reinsurance on losses and loss adjustment expenses in the Company's underwriting operations.

(dollars in thousands)	Years ended December 31, **2022**	2021	2020
Gross losses and loss adjustment expenses	**$ 5,281,424**	$ 4,477,752	$ 4,189,948
Ceded losses and loss adjustment expenses	**(834,648)**	(893,230)	(722,619)
Net losses and loss adjustment expenses	**$ 4,446,776**	$ 3,584,522	$ 3,467,329

13. Life and Annuity Benefits

The following table presents reserves for life and annuity benefits.

(dollars in thousands)	December 31, **2022**	2021
Life	**$ 102,321**	$ 113,797
Annuities	**628,441**	753,971
Accident and health	**28,263**	35,212
Total	**$ 759,025**	$ 902,980

Life and annuity benefit reserves are compiled on a reinsurance contract-by-contract basis and are discounted using standard actuarial techniques and cash flow models. Since the development of the life and annuity reinsurance reserves is based upon cash flow projection models, the Company must make estimates and assumptions based on cedent experience, industry mortality tables, and expense and investment experience, including a provision for adverse deviation. The assumptions used to determine policy benefit reserves are generally locked-in for the life of the contract unless an unlocking event occurs. Loss recognition testing is performed to determine if existing policy benefit reserves, together with the present value of future gross premiums and expected investment income earned thereon, are adequate to cover the present value of future benefits, settlement and maintenance costs. If the existing policy benefit reserves are not sufficient, the locked-in assumptions are revised to current best estimate assumptions and a charge to earnings for life and annuity benefits is recognized at that time. See note 1(x) for information on changes to the accounting for life and annuity benefits beginning in 2023.

Life and annuity benefit reserves are also adjusted to the extent unrealized gains on the investments supporting the policy benefit reserves would result in a reserve deficiency if those gains were realized. As of December 31, 2021, the cumulative increase to life and annuity benefits attributable to unrealized gains on the underlying investment portfolio totaled $56.6 million, all of which reversed in 2022 as a result of an increase in the market yield on the investment securities supporting the policy benefit reserves. During 2021, the Company decreased life and annuity benefits by $63.0 million, reflecting an increase in the market yield on the investment securities supporting the policy benefit reserves, and increased the change in net unrealized holding gains included in other comprehensive loss by a corresponding amount. During 2020, the Company increased life and annuity benefits by $68.2 million, as a result of a decrease in the market yield on the investment securities supporting the policy benefit reserves, and decreased the change in net unrealized holding gains included in other comprehensive income by a corresponding amount.

Because of the assumptions and estimates used in establishing the Company's reserves for life and annuity benefit obligations and the long-term nature of these reinsurance contracts, the ultimate liability may be greater or less than the estimates. The average discount rate for the life and annuity benefit reserves was 2.3% as of December 31, 2022.

As of December 31, 2022, the largest life and annuity benefits reserve for a single contract was 33.7% of the total.

None of the annuities included in life and annuity benefits on the consolidated balance sheets are subject to discretionary withdrawal.

14. Senior Long-Term Debt and Other Debt

The following table summarizes the Company's senior long-term debt and other debt.

	December 31,	
(dollars in thousands)	**2022**	2021
4.90% unsecured senior notes, due July 1, 2022, interest payable semi-annually, net of unamortized discount of $159 in 2021	**$ —**	$ 349,815
3.625% unsecured senior notes, due March 30, 2023, interest payable semi-annually, net of unamortized discount of $50 in 2022 and $251 in 2021	**249,940**	249,702
3.50% unsecured senior notes, due November 1, 2027, interest payable semi-annually, net of unamortized discount of $1,161 in 2022 and $1,445 in 2021	**298,502**	298,136
3.35% unsecured senior notes, due September 17, 2029, interest payable semi-annually, net of unamortized discount of $1,668 in 2022 and $1,916 in 2021	**297,997**	297,700
7.35% unsecured senior notes, due August 15, 2034, interest payable semi-annually, net of unamortized discount of $800 in 2022 and $868 in 2021	**129,004**	128,932
5.0% unsecured senior notes, due March 30, 2043, interest payable semi-annually, net of unamortized discount of $4,535 in 2022 and $4,759 in 2021	**245,214**	244,978
5.0% unsecured senior notes, due April 5, 2046, interest payable semi-annually, net of unamortized discount of $5,689 in 2022 and $5,933 in 2021	**493,585**	493,310
4.30% unsecured senior notes, due November 1, 2047, interest payable semi-annually, net of unamortized discount of $3,669 in 2022 and $3,821 in 2021	**295,691**	295,512
5.0% unsecured senior notes, due May 20, 2049, interest payable semi-annually, net of unamortized discount of $6,900 in 2022 and $7,161 in 2021	**591,927**	591,621
4.15% unsecured senior notes, due September 17, 2050, interest payable semi-annually, net of unamortized discount of $4,917 in 2022 and $5,095 in 2021	**494,342**	494,138
3.45% unsecured senior notes, due May 7, 2052, interest payable semi-annually, net of unamortized discount of $8,182 in 2022 and $8,461 in 2021	**590,689**	590,378
Other debt, at various interest rates ranging from 2.1% to 9.9%	**416,738**	327,044
Senior long-term debt and other debt	**$ 4,103,629**	$ 4,361,266

In May 2021, the Company issued $600 million of 3.45% unsecured senior notes due May 2052. Net proceeds to the Company were $591.4 million, before expenses. The Company used a portion of these proceeds to retire its 4.90% unsecured senior notes due July 1, 2022 ($350.0 million aggregate principal outstanding at December 31, 2021).

The Company's 7.35% unsecured senior notes due August 15, 2034 are not redeemable. The Company's other unsecured senior notes are redeemable by the Company at any time, subject to payment of a make-whole premium to the noteholders. None of the Company's senior long-term debt is subject to any sinking fund requirements.

The Company's other debt includes $414.1 million and $287.6 million associated with its Markel Ventures subsidiaries as of December 31, 2022 and 2021, respectively, which includes amounts outstanding on their respective credit facilities. The Markel Ventures debt is non-recourse to the holding company and generally is secured by the assets of those subsidiaries.

Various of the Company's Markel Ventures subsidiaries maintain revolving credit facilities or lines of credit, which provide up to $620 million of aggregate capacity for working capital and other general operational purposes. A portion of the capacity on certain of these credit facilities may be used as security for letters of credit and other obligations. At December 31, 2022 and 2021, $238.1 million and $94.3 million, respectively, of borrowings were outstanding under these credit facilities. As of December 31, 2022, one of the Company's Markel Ventures subsidiaries was not in compliance with certain financial covenants of its revolving credit facility, which had an outstanding balance of $97.9 million as of December 31, 2022. The subsidiary is working with its lenders and anticipates amending the facility. This event is not expected to have a material effect on the Company’s consolidated financial condition or results of operations. At December 31, 2022, all of the Company's other subsidiaries were in compliance with all covenants contained in their respective credit facilities.

The estimated fair value of the Company's senior long-term debt and other debt was $3.5 billion and $5.0 billion at December 31, 2022 and 2021, respectively.

The following table summarizes the future principal payments due at maturity on senior long-term debt and other debt as of December 31, 2022.

Years Ending December 31,	*(dollars in thousands)*
2023	**$ 399,604**
2024	**27,180**
2025	**24,934**
2026	**25,637**
2027	**444,335**
2028 and thereafter	**3,226,317**
Total principal payments	**$ 4,148,007**
Net unamortized discount	**(37,572)**
Net unamortized debt issuance costs	**(6,806)**
Senior long-term debt and other debt	**$ 4,103,629**

The Company maintains a corporate revolving credit facility which provides up to $300 million of capacity for future acquisitions, investments and stock repurchases, and for other working capital and general corporate purposes. At the Company's discretion, up to $200 million of the total capacity may be used for letters of credit. The Company may increase the capacity of the facility by up to $200 million subject to obtaining commitments for the increase and certain other terms and conditions. The Company pays interest on balances outstanding under the facility and a utilization fee for letters of credit issued under the facility. The Company also pays a commitment fee (0.20% at December 31, 2022) on the unused portion of the facility based on the Company's leverage ratio as calculated under the credit agreement. The credit agreement includes financial covenants that require that the Company not exceed a maximum leverage ratio and maintain a minimum amount of consolidated net worth, as well as other customary covenants and events of default. At December 31, 2022 and 2021, the Company had no borrowings outstanding under this revolving credit facility. This facility expires in April 2024. As of December 31, 2022, the Company was in compliance with all covenants contained in its corporate revolving credit facility.

To the extent that the Company or any of its subsidiaries are not in compliance with the covenants under their respective credit facilities, access to such credit facilities could be restricted.

The Company paid $197.3 million, $178.6 million and $178.2 million in interest on its senior long-term debt and other debt during the years ended December 31, 2022, 2021 and 2020, respectively.

15. Income Taxes

Income (loss) before income taxes includes the following components, based on country of domicile.

(dollars in thousands)	Years Ended December 31, 2022	2021	2020
U.S. operations	**$ (109,311)**	$ 2,263,748	$ 1,003,714
Foreign operations	**(39,528)**	868,445	(3,265)
Income (loss) before income taxes	**$ (148,839)**	$ 3,132,193	$ 1,000,449

Income tax expense (benefit) includes the following components, based on the taxing authority to which taxes are paid. The Company's most significant U.K. and Bermuda subsidiaries have elected to be taxed as domestic corporations for U.S. tax purposes. U.S. income tax also includes state income tax expense, which is not material to the consolidated financial statements.

(dollars in thousands)	Years Ended December 31, 2022	2021	2020
Current:			
U.S. income tax	**$ 222,074**	$ 200,742	$ 182,046
Foreign income tax	**12,042**	29,811	(10,631)
Total current tax expense	**234,116**	230,553	171,415
Deferred:			
U.S. income tax	**(300,850)**	438,240	(557)
Foreign income tax	**19,098**	15,665	(2,176)
Total deferred tax expense (benefit)	**(281,752)**	453,905	(2,733)
Income tax expense (benefit)	**$ (47,636)**	$ 684,458	$ 168,682

For foreign subsidiaries that the Company has not elected to treat as domestic corporations for U.S. tax purposes, the Company is subject to the U.S. Global Intangible Low Taxes Income (GILTI) tax. The Company recognizes the impact of the GILTI tax as incurred, and for the years ended December 31, 2022, 2021 and 2020, GILTI tax was not material to the consolidated financial statements. Additionally, U.S. income taxes have not been recognized on any undistributed earnings of the Company's foreign subsidiaries that are considered indefinitely reinvested, the amount of which is not material to the consolidated financial statements.

The Company made net income tax payments of $251.5 million, $204.9 million and $241.7 million in 2022, 2021 and 2020, respectively. Income taxes payable were $2.2 million and $31.3 million at December 31, 2022 and 2021, respectively, and were included in other liabilities on the consolidated balance sheets. Income taxes receivable were $9.9 million and $18.9 million at December 31, 2022 and 2021, respectively, and were included in other assets on the consolidated balance sheets.

The following table presents a reconciliation of the Company's income taxes using the U.S. corporate income tax rate to the Company's income tax expense (benefit).

(dollars in thousands)	Years Ended December 31, 2022		2021		2020	
U.S. corporate tax rate	**$ (31,256)**	**21.0 %**	$ 657,760	21.0 %	$ 210,093	21.0 %
Increase (decrease) resulting from:						
Tax-exempt investment income	**(16,063)**	**10.8**	(16,109)	(0.5)	(16,415)	(1.6)
Foreign operations	**5,335**	**(3.6)**	14,443	0.5	6,500	0.6
Impairment of goodwill	**16,800**	**(11.3)**	—	0.0	—	0.0
Markel CATCo Re income not subject to tax	**(18,871)**	**12.7**	—	0.0	—	0.0
Nondeductible (deductible) losses on certain foreign investments	**(160)**	**0.1**	1,240	0.0	(38,666)	(3.9)
Other	**(3,421)**	**2.3**	27,124	0.9	7,170	0.7
Income tax expense (benefit)	**$ (47,636)**	**32.0 %**	$ 684,458	21.9 %	$ 168,682	16.8 %

The following table presents the components of domestic and foreign deferred tax assets and liabilities.

(dollars in thousands)	December 31, 2022	December 31, 2021
Assets:		
Unpaid losses and loss adjustment expenses	**$ 170,518**	$ 186,759
Unearned premiums	**161,243**	139,350
Lease liabilities	**132,735**	135,795
Life and annuity benefits	**54,893**	78,777
Accrued incentive compensation	**39,469**	50,806
Net operating loss carryforwards	**25,305**	47,510
Tax credit carryforwards	**18,264**	21,734
Other differences between financial reporting and tax bases	**65,250**	66,951
Total gross deferred tax assets	**667,677**	727,682
Less valuation allowance	**(16,943)**	(23,352)
Total gross deferred tax assets, net of allowance	**650,734**	704,330
Liabilities:		
Investments	**761,421**	1,401,871
Goodwill and other intangible assets	**180,186**	185,195
Deferred policy acquisition costs	**161,220**	146,601
Property, plant and equipment	**144,259**	126,846
Right-of-use lease assets	**127,398**	127,313
Other differences between financial reporting and tax bases	**113,065**	129,866
Total gross deferred tax liabilities	**1,487,549**	2,117,692
Net deferred tax liability	**$ 836,815**	$ 1,413,362

Deferred tax assets and liabilities are recorded on the consolidated balance sheets on a net basis by taxing jurisdiction. As of December 31, 2022 and 2021, the Company's consolidated balance sheets included net deferred tax liabilities of $874.0 million and $1.4 billion, respectively, in other liabilities and net deferred tax assets of $37.2 million and $18.4 million, respectively, in other assets.

At December 31, 2022, the Company had tax credit carryforwards of $18.3 million, substantially all of which related to foreign tax credits to be used against U.S. income tax. The Company expects to utilize all tax credit carryforwards before expiration. The earliest any of these credits will expire is 2031.

At December 31, 2022, the Company also had net operating losses of $82.0 million that can be used to offset future taxable income, most of which is attributable to losses of certain branch operations in Europe incurred in their local jurisdictions. The Company's ability to use the majority of these losses is not subject to expiration. As described below, the deferred tax assets related to losses at certain of the Company's subsidiaries and branches are offset by valuation allowances.

At December 31, 2022, the Company had total gross deferred tax assets of $667.7 million. The Company has a valuation allowance of $16.9 million to offset gross deferred tax assets primarily attributable to cumulative net operating losses at certain of the Company's subsidiaries and branches. The Company believes that it is more likely than not that it will realize the remaining $650.7 million of gross deferred tax assets through generating taxable income or the reversal of existing temporary differences attributable to the gross deferred tax liabilities. Additionally, the Company's net deferred tax liability for investments includes deferred tax assets attributed to its unrealized losses on fixed maturity securities. The Company has the ability and intent to execute a tax planning strategy such that it is more likely than not that all of these deferred tax assets will be realized.

At December 31, 2022, the Company did not have any material unrecognized tax benefits. The Company does not anticipate any changes in unrecognized tax benefits during 2023 that would have a material impact on the Company's income tax provision.

The Company is subject to income tax in the U.S. and in foreign jurisdictions. The Internal Revenue Service is currently examining the Company's 2017 U.S. federal income tax return. The Company believes its income tax liabilities are adequate as of December 31, 2022, however, these liabilities could be adjusted as a result of this examination. With few exceptions, the Company is no longer subject to income tax examination by tax authorities for years ended before January 1, 2017.

16. Employee Benefit Plans

a) The Company maintains defined contribution plans for employees of its U.S. insurance operations in accordance with Section 401(k) of the U.S. Internal Revenue Code of 1986. Employees of the Company's Markel Ventures subsidiaries are provided post-retirement benefits under separate defined contribution plans. The Company also provides various defined contribution plans for employees of its international insurance operations, which are in line with local market terms and conditions of employment. Expenses relating to the Company's defined contribution plans were $57.9 million, $52.7 million and $48.6 million in 2022, 2021 and 2020, respectively.

b) The Terra Nova Pension Plan is a defined benefit plan that covers certain employees in the Company's international insurance operations who meet the eligibility conditions set out in the plan. The plan has been closed to new participants since 2001, and employees have not accrued benefits for future service in the plan since April 2012. The projected benefit obligations of the Terra Nova Pension Plan as of December 31, 2022 and 2021 were $108.5 million and $210.2 million, respectively, and the related fair value of plan assets was $171.7 million and $243.6 million, respectively. The corresponding net asset for pension benefits, also referred to as the funded status of the plan, at December 31, 2022 and 2021 was included in other assets on the Company's consolidated balance sheets.

17. Variable Interest Entities

MCIM, a wholly-owned consolidated subsidiary of the Company, is an insurance-linked securities investment fund manager and reinsurance manager headquartered in Bermuda. Results attributable to MCIM are not included in a reportable segment.

MCIM serves as the insurance manager for Markel CATCo Re Ltd. (Markel CATCo Re), a Bermuda Class 3 reinsurance company, and as the investment manager for Markel CATCo Reinsurance Fund Ltd., a Bermuda exempted mutual fund company comprised of multiple segregated accounts (Markel CATCo Funds). Voting shares in Markel CATCo Reinsurance Fund Ltd. and Markel CATCo Re are held by MCIM, which has the power to direct the activities that most significantly impact the economic performance of these entities. The Markel CATCo Funds issued multiple classes of nonvoting, redeemable preference shares to investors, and the Markel CATCo Funds are primarily invested in nonvoting preference shares of Markel CATCo Re. The underwriting results of Markel CATCo Re are attributed to investors through its nonvoting preference shares. Both Markel CATCo Re and the Markel CATCo Funds were placed into run-off in July 2019.

In March 2022, the Company completed a buy-out transaction with Markel CATCo Re and the Markel CATCo Funds that provided for an accelerated return of all remaining capital to investors in the Markel CATCo Funds. Under the terms of the transaction, the Company provided cash funding of $45.1 million to purchase substantially all of the Markel CATCo Funds' interests in Markel CATCo Re. See note 21 for further details regarding the terms of the buy-out transaction. As part of the transaction, substantially all of the preference shares held by investors in the Markel CATCo Funds were redeemed, including preference shares previously held by the Company. See note 5 for details regarding the Company's investment in the Markel CATCo Funds.

During June 2022, the Company received a return of $24.9 million of the capital it provided in March 2022 and the related preference shares were redeemed. As of December 31, 2022, the Company's investment in the remaining preference shares of Markel CATCo Re totaled $20.1 million, which comprised 23% of the equity of Markel CATCo Re. Through that investment, the Company has exposure to adverse loss development on reinsurance contracts previously written by Markel CATCo Re for loss events that occurred from 2014 to 2020. If loss reserves held by Markel CATCo Re are sufficient to settle claims on the remaining open contracts, the Company will receive a full return of the remaining $20.1 million in capital. Favorable development on loss reserves held by Markel CATCo Re, less operating expenses, will be distributed to the Markel CATCo Funds, and ultimately to investors in the Markel CATCo Funds.

Markel CATCo Re is considered a VIE, as the equity at risk does not have the right to receive residual returns that exceed the capital provided by the Company in the buy-out transaction. As a result of the preference shares acquired by the Company in the buy-out transaction, and the voting shares held by its consolidated subsidiary, MCIM, the Company consolidates Markel CATCo Re as its primary beneficiary. Results attributed to the run-off of Markel CATCo Re are reported with the Company's other ILS operations, within services and other revenues and expenses, and are not included in a reportable segment. For the

year ended December 31, 2022, there was $89.9 million of favorable loss reserve development on the run-off of reinsurance contracts written by Markel CATCo Re, all of which was included in services and other expenses and attributable to noncontrolling interests.

The Company's consolidated balance sheet includes the following amounts attributable to Markel CATCo Re.

(dollars in thousands)		December 31, 2022
Assets		
Cash and cash equivalents	$	104,443
Restricted cash and cash equivalents		317,577
Other assets and receivables due from cedents		41,357
Total Assets	$	463,377
Liabilities and Equity		
Unpaid losses and loss adjustment expenses	$	347,921
Other liabilities		26,717
Total Liabilities		374,638
Shareholders' equity		21,139
Noncontrolling interests		67,600
Total Equity		88,739
Total Liabilities and Equity	$	463,377

In connection with the buy-out transaction, the Company also entered into a tail risk cover with Markel CATCo Re. Through this contract, the Company has $142.7 million of uncollateralized exposure to adverse development on loss reserves held by Markel CATCo Re for loss exposures in excess of limits that the Company believes are unlikely to be exceeded.

18. Related Party Transactions

The Company engages in certain related party transactions in the normal course of business at arm's length.

Insurance-Linked Securities

Within the Company's insurance-linked securities operations, the Company provides investment and insurance management services through Nephila Holdings Ltd. (together with its subsidiaries, Nephila). Nephila serves as the investment manager to several Bermuda based private funds (the Nephila Funds). To provide access for the Nephila Funds to a variety of insurance-linked securities in the property catastrophe, climate and specialty markets, Nephila also acts as an insurance manager to certain Bermuda Class 3 and 3A reinsurance companies, Lloyd's Syndicate 2357 and Lloyd's Syndicate 2358 (collectively, the Nephila Reinsurers). Nephila receives management fees for investment and insurance management services provided through its insurance-linked securities operations primarily based on the net asset value of the accounts managed, and, for certain funds, incentive fees based on their annual performance. Prior to the disposition of Velocity in February 2022, Nephila also provided managing general agent services to the Nephila Reinsurers in exchange for commissions. For the years ended December 31, 2022, 2021 and 2020, total revenues attributed to unconsolidated entities managed by Nephila were $79.5 million, $141.9 million and $152.0 million, respectively.

Through the Company's program services and other fronting operations, as well as its underwriting operations, the Company has programs with Nephila through which the Company writes insurance policies that are either partially or fully ceded to Nephila Reinsurers. Through the Company's program services and other fronting platforms, Nephila utilizes certain of the Company's licensed insurance companies to write U.S. catastrophe exposed property risk that is then ceded to Nephila Reinsurers. For the years ended December 31, 2022, 2021 and 2020, gross premiums written through the Company's program services and other fronting platforms on behalf of Nephila were $1.0 billion, $689.2 million and $412.4 million, respectively, all of which were ceded to Nephila Reinsurers. Through the Company's insurance underwriting operations, the Company has a quota share agreement with Nephila through which it cedes a portion of its property business to Nephila Reinsurers. For the years ended December 31, 2022, 2021 and 2020, the Company's underwriting operations ceded premiums of $65.6 million, $55.0 million and $47.6 million, respectively, to Nephila Reinsurers as part of its quota share agreement.

As of December 31, 2022 and 2021, reinsurance recoverables on the consolidated balance sheets included $1.4 billion and $807.0 million, respectively, due from Nephila Reinsurers. Under its programs with Nephila Reinsurers, the Company bears underwriting risk for annual aggregate agreement year losses in excess of a limit the Company believes is unlikely to be exceeded. To the extent losses under these programs exceed the prescribed limits, the Company is obligated to pay such losses to the cedents without recourse to the Nephila Reinsurers. While the Company believes losses under these programs are unlikely, those losses, if incurred, could be material to the Company's consolidated results of operations and financial condition.

The Company has also entered into other assumed and ceded reinsurance transactions with the Nephila Reinsurers in the normal course of business, which are not material to the Company's consolidated financial statements.

Hagerty

The Company holds a minority ownership interest in Hagerty, which operates primarily as a managing general agent and also includes Hagerty Reinsurance Limited (Hagerty Re), a Bermuda Class 3 reinsurance company. Through the Company's underwriting operations, the Company underwrites insurance for Hagerty, and a portion of this insurance is ceded to Hagerty Re. For the years ended December 31, 2022, 2021 and 2020, the Company's gross written premiums attributable to Hagerty were $689.7 million, $596.9 million and $506.7 million, respectively, of which $456.6 million, $338.9 million and $239.3 million, respectively, were ceded to Hagerty Re. As of December 31, 2022 and 2021, reinsurance recoverables on the consolidated balance sheets included $159.7 million and $95.6 million, respectively, due from Hagerty Re.

19. Shareholders' Equity

a) The Company has 50,000,000 shares of no par value common stock authorized. The following table presents a rollforward of changes in common shares issued and outstanding.

	Years Ended December 31,	
(in thousands)	**2022**	2021
Issued and outstanding common shares, beginning of year	**13,632**	13,783
Issuance of common shares	**24**	18
Repurchase of common shares	**(233)**	(169)
Issued and outstanding common shares, end of year	**13,423**	13,632

b) The Company also has 10,000,000 shares of no par value preferred stock authorized, of which 600,000 shares were issued and outstanding at December 31, 2022 and 2021. The Company has the option to redeem the preferred shares:

- in whole but not in part, at any time, within 90 days after the occurrence of a "rating agency event," at $1,020 per preferred share, plus accrued and unpaid dividends,
- in whole but not in part, at any time, within 90 days after the occurrence of a "regulatory capital event" at $1,000 per preferred share, plus accrued and unpaid dividends, or
- in whole or in part, on June 1, 2025, or every fifth anniversary of that date, at $1,000 per preferred share, plus accrued and unpaid dividends.

A "rating agency event" means that any nationally recognized statistical rating organization that publishes a rating for the Company amends, clarifies or changes the criteria it uses to assign equity credit to securities like the preferred shares, which results in shortening the length of time that the preferred shares are assigned a particular level of equity credit or in the lowering of the equity credit assigned to the preferred shares.

A "regulatory capital event" means that the Company becomes subject to capital adequacy supervision by a capital regulator and determines that, under such capital adequacy guidelines, the liquidation preference amount of the preferred shares would not qualify as capital.

The preferred shares rank senior to the Company's common stock with respect to the payment of dividends and liquidation rights. Holders of the preferred shares are entitled to receive non-cumulative cash dividends, when, as and if declared by the Board of Directors, from the original issue date, semi-annually in arrears on the first day of June and December of each year. The Company accrues dividends when they are declared by the Board of Directors. To the extent declared, these dividends will accrue, on the liquidation preference of $1,000 per share, at a fixed annual rate of 6.00% from the original issue date to

June 1, 2025. After June 1, 2025, the dividend rate will reset every five years and accrue at an annual rate equal to the five-year U.S. Treasury Rate as of two business days prior to the reset date, plus 5.662%. Dividends will not be cumulative and will not be mandatory. Accordingly, if dividends are not declared for any dividend period, then dividends for that dividend period will not accrue and will not be payable.

For both years ended December 31, 2022 and 2021, the Company declared and paid dividends on preferred shares of $36.0 million, or $60.00 per share.

c) The following table presents net income (loss) per common share and diluted net income (loss) per common share.

	Years Ended December 31,		
(in thousands, except per share amounts)	**2022**	2021	2020
Net income (loss) to common shareholders	**$ (250,123)**	$ 2,389,003	$ 797,630
Adjustment of redeemable noncontrolling interests	**(69,896)**	46,874	(28,705)
Adjusted net income (loss) to common shareholders	**$ (320,019)**	$ 2,435,877	$ 768,925
Basic common shares outstanding	**13,580**	13,768	13,811
Dilutive potential common shares from restricted stock units and restricted stock [1] [2]	**—**	32	12
Diluted common shares outstanding	**13,580**	13,800	13,823
Basic net income (loss) per common share	**$ (23.57)**	$ 176.92	$ 55.67
Diluted net income (loss) per common share [1] [2]	**$ (23.57)**	$ 176.51	$ 55.63

(1) The Company has issued grants and awards of restricted stock units to employees as performance, retention or hiring incentives, as well as awards of restricted stock to non-employee directors, under its equity incentive compensation plan. At December 31, 2022, there were 116,431 shares available for future awards under the Company's equity incentive compensation plan.

(2) The impact of 33 thousand shares from restricted stock units and restricted stock was excluded from the computation of diluted net loss per common share for the year ended December 31, 2022 because the effect would have been anti-dilutive.

20. Other Comprehensive Income

Other comprehensive income includes changes in net unrealized gains (losses) on available-for-sale investments, which is comprised of net holding gains (losses) arising during the period, changes in unrealized other-than-temporary impairment losses, if any, and reclassification adjustments for net realized gains included in net income. Other comprehensive income also includes changes in foreign currency translation adjustments and changes in net actuarial pension loss. The following table presents the change in accumulated other comprehensive income (loss) by component, net of noncontrolling interests.

(dollars in thousands)	Unrealized Gains (Losses) on Available-for-Sale Investments	Foreign Currency	Net Actuarial Pension Loss	Accumulated other comprehensive income (loss)
December 31, 2019	$ 346,037	$ (86,249)	$ (51,016)	$ 208,772
Total other comprehensive income (loss) before income taxes	442,089	29,829	(8,849)	463,069
Income tax (expense) benefit	(89,316)	—	1,851	(87,465)
Total other comprehensive income (loss)	352,773	29,829	(6,998)	375,604
December 31, 2020	$ 698,810	$ (56,420)	$ (58,014)	$ 584,376
Total other comprehensive income (loss) before income taxes	(450,096)	(2,091)	10,663	(441,524)
Income tax (expense) benefit	95,158	1,880	(2,273)	94,765
Total other comprehensive income (loss)	(354,938)	(211)	8,390	(346,759)
December 31, 2021	$ 343,872	$ (56,631)	$ (49,624)	$ 237,617
Total other comprehensive income (loss) before income taxes	**(1,407,316)**	**(9,677)**	**31,222**	**(1,385,771)**
Income tax (expense) benefit	**297,168**	**401**	**(6,492)**	**291,077**
Total other comprehensive income (loss)	**(1,110,148)**	**(9,276)**	**24,730**	**(1,094,694)**
December 31, 2022	**$ (766,276)**	**$ (65,907)**	**$ (24,894)**	**$ (857,077)**

21. Commitments and Contingencies

a) In March 2022, the Company completed a buy-out transaction with Markel CATCo Re and the Markel CATCo Funds, which are currently in run-off, that provided for an accelerated return of all remaining capital to investors in the Markel CATCo Funds. Under the terms of the transaction, the Company provided cash funding of $45.1 million to purchase substantially all of the Markel CATCo Funds' investments in Markel CATCo Re and also provided tail risk cover of $142.7 million to Markel CATCo Re to allow for the release of collateral to investors. In order to complete the transaction, the Company also made $101.9 million in additional payments, net of insurance proceeds, to or for the benefit of investors, which were recognized as an expense to the Company and included in services and other expenses for the year ended December 31, 2022. In conjunction with the buy-out transaction, all investors holding securities in the Markel CATCo Funds, the Markel CATCo Group Companies (MCIM, the Markel CATCo Funds and Markel CATCo Re), Markel Corporation and each of their related parties, among others, granted mutual releases of all claims related to the transaction, the Markel CATCo Group Companies' businesses and the investors' investments in the Funds, including any pending litigation. See note 17 for further details about the Company's Markel CATCo operations and the buy-out transaction.

b) Contingencies arise in the normal course of the Company's operations and are not expected to have a material impact on the Company's financial condition or results of operations.

22. Statutory Financial Information

a) The following table summarizes statutory capital and surplus for the Company's insurance subsidiaries.

(dollars in thousands)	December 31, 2022	December 31, 2021
United States	**$ 5,236,793**	$ 4,493,310
United Kingdom	**$ 749,495**	$ 736,575
Bermuda	**$ 1,895,132**	$ 2,106,606
Germany	**$ 125,194**	$ 95,693

As of December 31, 2022, the Company's actual statutory capital and surplus significantly exceeded the regulatory requirements. As a result, the amount of statutory capital and surplus necessary to satisfy regulatory requirements is not significant in relation to actual statutory capital and surplus.

The following table summarizes statutory net income (loss) for the Company's insurance subsidiaries.

(dollars in thousands)	Years Ended December 31, 2022	2021	2020
United States	**$ 689,341**	$ 705,908	$ 616,135
United Kingdom	**$ 35,719**	$ 56,546	$ (25,776)
Bermuda	**$ (144,239)**	$ 556,275	$ 228,740
Germany	**$ (2,471)**	$ 1,780	$ (4,628)

Amounts presented for the Company's U.S. insurance subsidiaries have been calculated in accordance with prescribed statutory accounting rules. For the Company's international insurance subsidiaries, the regulations that govern the calculation of statutory capital and surplus do not provide requirements for the calculation of net income. Rather, such amounts are reported in accordance with a basis of accounting permitted by their respective regulator. Amounts presented for the Company's U.K., Bermuda and German insurance subsidiaries have been calculated in accordance with U.K. GAAP, U.S. GAAP and German GAAP, respectively.

United States

The laws of the domicile states of the Company's U.S. insurance subsidiaries govern the amount of dividends that may be paid to the Company. Generally, statutes in the domicile states of the Company's U.S. insurance subsidiaries require prior approval for payment of extraordinary, as opposed to ordinary, dividends. As of December 31, 2022, the Company's U.S. insurance

subsidiaries could pay up to $655.6 million to the holding company during the following 12 months under the ordinary dividend regulations.

In converting from U.S. statutory accounting principles to U.S. GAAP, typical adjustments include deferral of policy acquisition costs, differences in the calculation of deferred income taxes and the inclusion of net unrealized gains or losses relating to fixed maturity securities in shareholders' equity. The Company does not use any permitted statutory accounting practices that are different from prescribed statutory accounting practices which impact statutory capital and surplus.

United Kingdom

The Company's U.K. insurance subsidiary, Markel International Insurance Company Limited (MIICL), and its Lloyd's managing agent, Markel Syndicate Management Limited (MSM), are authorized by the Prudential Regulation Authority (PRA) and regulated by both the PRA and the Financial Conduct Authority (FCA). The PRA oversees compliance with established periodic auditing and reporting requirements, minimum solvency margins and individual capital assessment requirements under the Solvency II Directive (Solvency II) and imposes dividend restrictions, while both the PRA and the FCA oversee compliance with risk assessment reviews and various other requirements. MIICL is required to give advance notice to the PRA for any transaction or proposed transaction with a connected or related person. MSM is required to satisfy the solvency requirements of Lloyd's. In addition, the Company's U.K. subsidiaries must comply with the United Kingdom Companies Act of 2006, which provides that dividends may only be paid out of profits available for that purpose. Earnings of the Company's U.K. insurance subsidiaries are available for distribution to the holding company to the extent not otherwise restricted.

Bermuda

The Company's Bermuda insurance subsidiary, Markel Bermuda Limited (MBL), is subject to enhanced capital requirements in addition to minimum solvency and liquidity requirements. The enhanced capital requirement is determined by reference to a risk-based capital model that determines a control threshold for statutory capital and surplus by taking into account the risk characteristics of different aspects of the insurer's business. At December 31, 2022, MBL satisfied both the enhanced capital requirements and the minimum solvency and liquidity requirements.

Under the Bermuda Insurance Act, MBL is prohibited from paying or declaring dividends during a fiscal year if it is in breach of its enhanced capital requirement, solvency margin or minimum liquidity ratio or if the declaration or payment of the dividend would cause a breach of those requirements. If an insurer fails to meet its solvency margin or minimum liquidity ratio on the last day of any financial year, it is prohibited from declaring or paying any dividends during the next financial year without the approval of the Bermuda Monetary Authority (BMA). Further, MBL is prohibited from declaring or paying, in any financial year, dividends of more than 25% of its total statutory capital and surplus as set forth in its previous year's statutory balance sheet unless at least seven days before payment of those dividends it files with the BMA an affidavit stating that it will continue to meet its solvency margin and minimum liquidity ratio. MBL must obtain the BMA's prior approval for a reduction by 15% or more of the total statutory capital as set forth in its previous year's financial statements. In addition, as a long-term insurer, MBL may not declare or pay a dividend to any person other than a policyholder unless the value of the assets in its long-term business fund, as certified by MBL's approved actuary, exceeds the liabilities of its long-term business. The amount of the dividend cannot exceed the aggregate of that excess and any other funds legally available for the payment of the dividend. As of December 31, 2022, MBL could pay up to $473.8 million to the holding company during the following 12 months without making any additional filings with the BMA.

Germany

The Company's German insurance subsidiary, Markel Insurance SE, is regulated by the Federal Financial Conduct Authority in Germany and is also subject to capital and solvency requirements under Solvency II.

b) Lloyd's sets the corporate members' required capital annually based on each syndicates' business plans, rating environment, reserving environment and input arising from Lloyd's discussions with, among others, regulatory and rating agencies. Such required capital is referred to as Funds at Lloyd's (FAL) and comprises cash and investments. The amount of cash and investments held as FAL as of December 31, 2022 was $873.0 million. Of this amount, $335.4 million was provided by the holding company and is not available for general use by the Company. The remaining amount, provided by the Company's insurance subsidiaries, is not available for distribution to the holding company. The Company's corporate member may also be required to maintain funds under the control of Lloyd's in excess of its capital requirements and such funds also may not be available for distribution to the holding company.

23. Markel Corporation (Parent Company Only) Financial Information

The following parent company only condensed financial information reflects the financial position, results of operations and cash flows of Markel Corporation.

CONDENSED BALANCE SHEETS

	December 31,	
	2022	2021
	(dollars in thousands)	
ASSETS		
Investments, at estimated fair value:		
Fixed maturity securities, available-for-sale (amortized cost of $164,100 in 2022 and $210,111 in 2021)	**$ 154,039**	$ 228,705
Equity securities (cost of $1,107,796 in 2022 and $1,771,597 in 2021)	**1,473,116**	2,784,189
Short-term investments, available-for-sale (estimated fair value approximates cost)	**1,436,387**	1,474,997
Total Investments	**3,063,542**	4,487,891
Cash and cash equivalents	**594,101**	763,985
Restricted cash and cash equivalents	**21,146**	15,485
Receivables	**13,070**	18,770
Investments in consolidated subsidiaries	**12,905,353**	13,298,971
Notes receivable from subsidiaries	**60,111**	135,756
Income taxes receivable	**—**	48,344
Other assets	**445,875**	408,161
Total Assets	**$ 17,103,198**	$ 19,177,363
LIABILITIES AND SHAREHOLDERS' EQUITY		
Senior long-term debt	**$ 3,686,892**	$ 4,034,223
Notes payable to subsidiaries	**—**	32,753
Income taxes payable	**120,616**	—
Net deferred tax liability	**148,365**	295,289
Other liabilities	**81,791**	97,748
Total Liabilities	**4,037,664**	4,460,013
Shareholders' equity:		
Preferred stock	**591,891**	591,891
Common stock	**3,493,893**	3,441,079
Retained earnings	**9,836,827**	10,446,763
Accumulated other comprehensive income (loss)	**(857,077)**	237,617
Total Shareholders' Equity	**13,065,534**	14,717,350
Total Liabilities and Shareholders' Equity	**$ 17,103,198**	$ 19,177,363

CONDENSED STATEMENTS OF INCOME (LOSS) AND COMPREHENSIVE INCOME (LOSS)

	Years Ended December 31,		
	2022	2021	2020
		(dollars in thousands)	
REVENUES			
Net investment income	**$ 34,781**	$ 9,099	$ 22,037
Dividends on common stock of consolidated subsidiaries	**278,557**	1,081,988	466,244
Net investment gains (losses):			
Net realized investment gains	**7,620**	23,652	27,774
Change in fair value of equity securities	**(397,906)**	514,727	82,389
Net investment gains (losses)	**(390,286)**	538,379	110,163
Gain on sale of subsidiary	**107,293**	—	—
Other revenues (losses)	**(29,487)**	11,078	(4,011)
Total Revenues	**858**	1,640,544	594,433
EXPENSES			
Services and other expenses	**111,848**	22,379	1,025
Interest expense	**172,125**	185,568	187,562
Net foreign exchange losses (gains)	**(13,143)**	(6,236)	6,823
Total Expenses	**270,830**	201,711	195,410
Income (Loss) Before Equity in Undistributed Earnings (Losses) of Consolidated Subsidiaries and Income Taxes	**(269,972)**	1,438,833	399,023
Equity in undistributed earnings (losses) of consolidated subsidiaries	**(69,971)**	1,081,976	400,289
Income tax (expense) benefit	**125,820**	(95,806)	16,718
Net Income (Loss) to Shareholders	**(214,123)**	2,425,003	816,030
Preferred stock dividends	**(36,000)**	(36,000)	(18,400)
Net Income (Loss) to Common Shareholders	**$ (250,123)**	$ 2,389,003	$ 797,630
OTHER COMPREHENSIVE INCOME (LOSS) TO SHAREHOLDERS			
Change in net unrealized gains (losses) on available-for-sale investments, net of taxes:			
Net holding gains (losses) arising during the period	**$ (24,465)**	$ (5,885)	$ 21,482
Consolidated subsidiaries' net holding gains (losses) arising during the period	**(1,130,589)**	(342,430)	334,677
Reclassification adjustments for net gains (losses) included in net income (loss) to shareholders	**1,965**	(34)	(14,937)
Consolidated subsidiaries' reclassification adjustments for net gains (losses) included in net income (loss) to shareholders	**42,941**	(6,589)	11,551
Change in net unrealized gains (losses) on available-for-sale investments, net of taxes	**(1,110,148)**	(354,938)	352,773
Consolidated subsidiaries' change in foreign currency translation adjustments, net of taxes	**(9,276)**	(211)	29,829
Consolidated subsidiaries' change in net actuarial pension loss, net of taxes	**24,730**	8,390	(6,998)
Total Other Comprehensive Income (Loss) to Shareholders	**(1,094,694)**	(346,759)	375,604
Comprehensive Income (Loss) to Shareholders	**$ (1,308,817)**	$ 2,078,244	$ 1,191,634

CONDENSED STATEMENTS OF CASH FLOWS

	Years Ended December 31,		
	2022	2021	2020
		(dollars in thousands)	
OPERATING ACTIVITIES			
Net income (loss) to shareholders	**$ (214,123)**	$ 2,425,003	$ 816,030
Adjustments to reconcile net income (loss) to shareholders to net cash provided by operating activities	**487,259**	(2,213,261)	(708,162)
Net Cash Provided By Operating Activities	**273,136**	211,742	107,868
INVESTING ACTIVITIES			
Proceeds from sales, maturities, calls and prepayments of fixed maturity securities	**13,047**	37,607	319,502
Proceeds from sales of equity securities	**65,379**	105,700	276,637
Cost of equity securities purchased	**(16,660)**	(73,644)	(90,459)
Net change in short-term investments	**58,970**	(224,646)	(522,666)
Return of capital from subsidiaries	**—**	17,193	15,164
Decrease (increase) in notes receivable due from subsidiaries	**75,645**	(50,000)	(25,000)
Capital contributions to subsidiaries [1]	**(94,585)**	(271,729)	(605,426)
Proceeds from sale of subsidiary	**165,615**	—	—
Cost of equity method investments	**—**	(38,550)	(4,917)
Other	**4,779**	(5,368)	17,984
Net Cash Provided (Used) By Investing Activities	**272,190**	(503,437)	(619,181)
FINANCING ACTIVITIES			
Repayment of senior long-term debt	**(350,000)**	—	—
Additions to senior long-term debt	**—**	591,354	—
Decrease in notes payable to subsidiaries	**(32,753)**	—	(50,000)
Repurchases of common stock	**(290,796)**	(206,518)	(26,832)
Issuance of preferred stock, net	**—**	—	591,891
Dividends paid on preferred stock	**(36,000)**	(36,000)	(18,400)
Other	**—**	(1,181)	15
Net Cash Provided (Used) By Financing Activities	**(709,549)**	347,655	496,674
Increase (decrease) in cash, cash equivalents, restricted cash and restricted cash equivalents	**(164,223)**	55,960	(14,639)
Cash, cash equivalents, restricted cash and restricted cash equivalents at beginning of year	**779,470**	723,510	738,149
CASH, CASH EQUIVALENTS, RESTRICTED CASH AND RESTRICTED CASH EQUIVALENTS AT END OF YEAR	**$ 615,247**	$ 779,470	$ 723,510

[1] The holding company made non-cash capital contributions in the form of investments to its subsidiaries totaling $924.0 million and $49.5 million for the years ended December 31, 2022 and 2020, respectively. There were no non-cash capital contributions made to subsidiaries for the year ended December 31, 2021.

24. Immaterial Correction to Prior Period Financial Statements for Accounting Policy Change

The Company defers and amortizes costs directly related to the successful acquisition of new or renewal insurance contracts over the related policy period, generally one year. Previously, the Company did not defer salaries and benefits associated with the successful acquisition of insurance contracts, as such amounts were quantified and assessed each period and were deemed not to be material to the consolidated financial statements. Effective January 1, 2022, the Company changed its accounting policy to defer salaries and benefits associated with the successful acquisition of insurance contracts in accordance with the requirements of FASB ASC 944, *Financial Services–Insurance*.

To reflect the change in accounting policy, the Company made a cumulative adjustment to increase deferred policy acquisition costs by $28.2 million, increase deferred tax liabilities by $5.9 million and increase retained earnings by $22.3 million as of January 1, 2020, which is the beginning of the earliest year presented in the consolidated financial statements included herein. These increases in deferred policy acquisition costs, deferred tax liabilities and retained earnings are reflected as increases to the previously reported amounts in the Company's consolidated balance sheet as of December 31, 2021 and as an adjustment to retained earnings as of January 1, 2020 in the accompanying consolidated statement of changes in equity for the year ended December 31, 2020. The Company considered both the quantitative and qualitative factors within the provisions of U.S. Securities and Exchange Commission Staff Accounting Bulletin (SAB) No. 99, Materiality, and SAB No. 108, *Considering the Effect of Prior Year Misstatements when Quantifying Misstatements in Current Year Financial Statements* and determined that the impact of the change in accounting policy was not material to the Company's previously issued consolidated financial statements. The Company did not adjust the amounts previously presented in the consolidated statements of income and comprehensive income for the years ended December 31, 2020 and 2021 for the change in accounting policy as the effects were not material. The cumulative income statement effect for those periods was included in the consolidated statement of loss and comprehensive loss for the year ended December 31, 2022.

Item 9A. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

As of December 31, 2022, we evaluated the effectiveness of the design and operation of our disclosure controls and procedures (Disclosure Controls), as defined under Rules 13a-15(e) and 15d-15(e) of the Securities Exchange Act of 1934 (Exchange Act). This evaluation was conducted under the supervision and with the participation of our management, including the Principal Executive Officer (PEO) and the Principal Financial Officer (PFO).

Based upon this evaluation, the PEO and PFO concluded that effective Disclosure Controls were in place to ensure that the information required to be disclosed in reports we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission's rules and forms.

Management's Report On Internal Control Over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting, as defined in Rules 13a-15(f) and 15d-15(f) of the Exchange Act. Our 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.

Management does not expect that its internal control over financial reporting will prevent all error and all fraud. A control system, no matter how well conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met. Internal control over financial reporting is a process that involves human diligence and compliance and is subject to lapses in judgment and breakdowns resulting from human failures. Because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that all control issues and instances of fraud, if any, have been detected. The design of any system of internal control over financial reporting also is based in part upon certain assumptions about the likelihood of future events, and there can be no assurance that any design will succeed in achieving its stated goals under all potential future conditions.

Under the supervision and with the participation of management, including the PEO and the PFO, we evaluated the effectiveness of our 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. Based on our evaluation, we have concluded that we maintained effective internal control over financial reporting as of December 31, 2022.

KPMG LLP, our independent registered public accounting firm, has issued an attestation report on the effectiveness of our internal control over financial reporting as of December 31, 2022, which is included herein.

Changes in Internal Control Over Financial Reporting

There were no changes in our internal control over financial reporting during the fourth quarter of 2022 that materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Shareholders and Board of Directors
Markel Corporation:

Opinion on Internal Control Over Financial Reporting

We have audited Markel Corporation and subsidiaries' (the Company) 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. 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 the Committee of Sponsoring Organizations of the Treadway Commission.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of December 31, 2022 and 2021, the related consolidated statements of income (loss) and comprehensive income (loss), changes in equity, and cash flows for each of the years in the three-year period ended December 31, 2022, and the related notes (collectively, the consolidated financial statements), and our report dated February 17, 2023 expressed an unqualified opinion on those consolidated financial statements.

Basis for Opinion

The Company's management is responsible 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 the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. 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 audit also included performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

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.

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.

/s/ KPMG LLP

Richmond, Virginia
February 17, 2023

PART III

Except for the information set forth under "Information About Our Executive Officers" in Part I, the information required by Part III (Items 10, 11 (excluding information required pursuant to Item 402(v) of Regulation S-K), 12, 13 and 14) will be incorporated by reference from the Company's Proxy Statement for its 2023 Annual Meeting of Shareholders pursuant to instructions G(1) and G(3) of the General Instructions to Form 10-K.

Our independent registered public accounting firm is KPMG LLP, Richmond, VA, Auditor Firm ID: 185.

PART IV

Item 15. EXHIBIT 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 Item 8.

	Page Number
Report of Independent Registered Public Accounting Firm	10K - 71
Consolidated Balance Sheets—December 31, 2022 and 2021	10K - 73
Consolidated Statements of Income (Loss) and Comprehensive Income (Loss)—Years Ended December 31, 2022, 2021 and 2020	10K - 74
Consolidated Statements of Changes in Equity—Years Ended December 31, 2022, 2021 and 2020	10K - 75
Consolidated Statements of Cash Flows—Years Ended December 31, 2022, 2021 and 2020	10K - 76
Notes to Consolidated Financial Statements	10K - 77

Other schedules are omitted because they are not required, information therein is not applicable, or is reflected in the consolidated financial statements or notes to consolidated financial statements.

(b) Exhibits

See Exhibit Index.

EXHIBIT INDEX

Exhibit No.	Document Description
3.1(a)	Amended and Restated Articles of Incorporation (incorporated by reference from Exhibit 3.1 in the Registrant's report on Form 8-K filed with the Commission May 13, 2011)
3.1(b)	Articles of Amendment to the Amended and Restated Articles of Incorporation (incorporated by reference from Exhibit 3.1 in the Registrant's report on Form 8-K filed with the Commission May 27, 2020)
3.2	Bylaws, as amended and restated January 1, 2023**
4.1	Description of Registrant's Securities**
4.2(a)	Indenture dated as of June 5, 2001 between Markel Corporation and The Chase Manhattan Bank, as Trustee (incorporated by reference from Exhibit 4.1 in the Registrant's report on Form 8-K filed with the Commission June 5, 2001)
4.2(b)	Form of Third Supplemental Indenture dated as of August 13, 2004 between Markel Corporation and JPMorgan Chase Bank (formerly known as The Chase Manhattan Bank), as Trustee, including form of the securities as Exhibit A (incorporated by reference from Exhibit 4.2 in the Registrant's report on Form 8-K filed with the Commission August 11, 2004)
4.2(c)	Form of Eighth Supplemental Indenture dated as of March 8, 2013 between Markel Corporation and The Bank of New York Mellon (as successor to The Chase Manhattan Bank), as Trustee, including form of the securities as Exhibit A (incorporated by reference from Exhibit 4.2 in the Registrant's report on Form 8-K filed with the Commission March 7, 2013)
4.2(d)	Form of Ninth Supplemental Indenture dated as of March 8, 2013 between Markel Corporation and The Bank of New York Mellon (as successor to The Chase Manhattan Bank), as Trustee, including form of the securities as Exhibit A (incorporated by reference from Exhibit 4.3 in the Registrant's report on Form 8-K filed with the Commission March 7, 2013)
4.2(e)	Form of Tenth Supplemental Indenture dated as of April 5, 2016 between Markel Corporation and The Bank of New York Mellon (as successor to The Chase Manhattan Bank), as Trustee, including form of the securities as Exhibit A (incorporated by reference from Exhibit 4.2 in the Registrant's report on Form 8-K filed with the Commission March 31, 2016)
4.2(f)	Eleventh Supplemental Indenture dated as of November 2, 2017 between Markel Corporation and The Bank of New York Mellon (as successor to The Chase Manhattan Bank), as Trustee, including form of the securities as Exhibit A (incorporated by reference from Exhibit 4.2 in the Registrant's report on Form 8-K filed with the Commission November 2, 2017)
4.2(g)	Twelfth Supplemental Indenture dated as of November 2, 2017 between Markel Corporation and The Bank of New York Mellon (as successor to The Chase Manhattan Bank), as Trustee, including form of the securities as Exhibit A (incorporated by reference from Exhibit 4.3 in the Registrant's report on Form 8-K filed with the Commission November 2, 2017)
4.2(h)	Thirteenth Supplemental Indenture, dated as of May 20, 2019, between Markel Corporation and The Bank of New York Mellon (as successor to The Chase Manhattan Bank), as Trustee, including form of the securities as Exhibit A (incorporated by reference from Exhibit 4.2 in the Registrant's report on Form 8-K filed with the Commission May 20, 2019)
4.2(i)	Fourteenth Supplemental Indenture, dated as of September 17, 2019, between Markel Corporation and The Bank of New York Mellon (as successor to The Chase Manhattan Bank), as Trustee, including form of the securities as Exhibit A (incorporated by reference from Exhibit 4.2 in the Registrant's report on Form 8-K filed with the Commission September 17, 2019)
4.2(j)	Fifteenth Supplemental Indenture, dated as of September 17, 2019, between Markel Corporation and The Bank of New York Mellon (as successor to The Chase Manhattan Bank), as Trustee, including form of the securities as Exhibit A (incorporated by reference from Exhibit 4.3 in the Registrant's report on Form 8-K filed with the Commission September 17, 2019)
4.2(k)	Sixteenth Supplemental Indenture, dated as of May 7, 2021, between Markel Corporation and The Bank of New York Mellon (as successor to The Chase Manhattan Bank), as Trustee, including form of the securities as Exhibit A (incorporated by reference from Exhibit 4.2 in the Registrant's report on Form 8-K filed with the Commission May 7, 2021)

The registrant hereby agrees to furnish to the Securities and Exchange Commission, upon request, a copy of all other instruments defining the rights of holders of long-term debt of the registrant and its subsidiaries.

Exhibit No.	Document Description
10.1(a)	Credit Agreement, dated as of April 10, 2019, among Markel Corporation, Markel Bermuda Limited, Markel Global Reinsurance Company, Alterra Finance LLC, the lenders party from time to time thereto, and Wells Fargo Bank, National Association, as administrative agent (incorporated by reference from Exhibit 10.1 in the Registrant's report on Form 8-K filed with the Commission April 12, 2019)
10.1(b)	First Amendment to Credit Agreement, dated as of December 13, 2019, among Markel Corporation, Markel Bermuda Limited, Markel Global Reinsurance Company, Alterra Finance LLC and Wells Fargo National Association (incorporated by reference from Exhibit 10.1(b) in the Registrant's Report on Form 10-K filed with the Commission for the year ended December 31, 2019)
10.2	Form of Amended and Restated Employment Agreement with Anthony F. Markel (incorporated by reference from Exhibit 10.4 in the Registrant's report on Form 10-K filed with the Commission for the year ended December 31, 2008)*
10.3(a)	Amended and Restated Employment Agreement with Steven A. Markel (incorporated by reference from Exhibit 10.1 in the Registrant's report on Form 10-Q filed with the Commission for the quarter ended September 30, 2015)*
10.3(b)	Amendment dated as of December 31, 2017 to Amended and Restated Employment Agreement with Steven A. Markel (incorporated by reference from Exhibit 10.6 in the Registrant's report on Form 10-K filed with the Commission for the year ended December 31, 2017)*
10.4(a)	Form of Amended and Restated Executive Employment Agreement with Thomas S. Gayner and Richard R. Whitt, III (incorporated by reference from Exhibit 10.4 in the Registrant's report on Form 10-K filed with the Commission for the year ended December 31, 2021)*
10.4(b)	Amendment to Executive Employment Agreement with Richard R. Whitt, III (incorporated by reference from Exhibit 10.1 in the Registrant's report on 10-Q filed with the Commission for the quarter ended September 30, 2022)*
10.5	Form of Amended and Restated Executive Employment Agreement with Andrew G. Crowley, Robert C. Cox, Michael R. Heaton, Jeremy A. Noble and Richard R. Grinnan (incorporated by reference from Exhibit 10.5 in the Registrant's report on Form 10-K filed with the Commission for the year ended December 31, 2021)*
10.6(a)	Markel Corporation Voluntary Deferral Plan (incorporated by reference from Exhibit 10.14 in the Registrant's report on Form 10-K filed with the Commission for the year ended December 31, 2015)*
10.6(b)	Amendment to Markel Corporation Voluntary Deferral Plan (incorporated by reference from Exhibit 10.20 in the Registrant's report on Form 10-K filed with the Commission for the year ended December 31, 2018)*
10.6(c)	Amendment to Markel Corporation Voluntary Deferral Plan (incorporated by reference from Exhibit 10.1 in the Registrant's report on Form 10-Q filed with the Commission for the quarter ended September 30, 2019)*
10.7(a)	Markel Corporation Omnibus Incentive Plan (incorporated by reference from Appendix B in the Registrant's Proxy Statement and Definitive 14A filed with the Commission April 2, 2003)*
10.7(b)	May 2010 Restricted Stock Units Deferral Election Form (incorporated by reference from Exhibit 10.2 in the Registrant's report on Form 10-Q filed with the Commission for the quarter ended June 30, 2010)*
10.8(a)	Markel Corporation 2012 Equity Incentive Compensation Plan (incorporated by reference from Appendix A in the Registrant's Proxy Statement and Definitive 14A filed with the Commission March 16, 2012)*
10.8(b)	Restricted Stock Units Deferral Election Form for the 2012 Equity Incentive Compensation Plan (incorporated by reference from Exhibit 10.24 in the Registrant's report on Form 10-K filed with the Commission for the year ended December 31, 2012)*
10.9	Markel Corporation Executive Bonus Plan, as amended and restated May 14, 2018 (incorporated by reference from Exhibit 10.1 in the Registrant's report on Form 10-Q filed with the Commission for the quarter ended June 30, 2018)*
10.10(a)	2016 Equity Incentive Compensation Plan (incorporated by reference from Exhibit 10.1 in the Registrant's report on Form 8-K filed with the Commission May 19, 2016)*
10.10(b)	Form of Performance-Based Restricted Stock Unit Award Agreement (adopted 2019) for Executive Officers for the 2016 Equity Incentive Compensation Plan (incorporated by reference from Exhibit 10.15(i) in the Registrant's report on Form 10-K filed with the Commission for the year ended December 31, 2019)*

10.10(c)	Form of Restricted Stock Award Agreement for Outside Directors for the 2016 Equity Incentive Compensation Plan (incorporated by reference from Exhibit 10.2 in the Registrant's report on Form 10-Q filed with the Commission for the quarter ended June 30, 2020)*
10.10(d)	Form of Performance-Based Restricted Stock Unit Award Agreement (adopted 2021) for Executive Officers for the 2016 Equity Incentive Compensation Plan (incorporated by reference from Exhibit 10.1(a) in the Registrant's report on Form 10-Q filed with the Commission for the quarter ended March 31, 2021)*
10.10(e)	Form of Time-Based Restricted Stock Unit Award Agreement (adopted 2021) for Executive Officers for the 2016 Equity Incentive Compensation Plan (incorporated by reference from Exhibit 10.1(b) in the Registrant's report on Form 10-Q filed with the Commission for the quarter ended March 31, 2021)*
10.10(f)	Form of Performance-Based Restricted Unit Award Agreement (adopted 2022) for Executive Officers for the 2016 Equity Incentive Compensation Plan* **
10.10(g)	Form of Time-Based Restricted Stock Unit Award Agreement (adopted 2022) for Executive Officers for the 2016 Equity Incentive Compensation Plan* **
10.10(h)	Restricted Stock Units Deferral Election Form**
10.11	Markel Corporation 2020 Employee Stock Purchase Plan (incorporated by reference from Exhibit 10.1 in the Registrant's report on Form 8-K filed with the Commission May 15, 2020)*
21	Certain Subsidiaries of Markel Corporation**
23	Consent of KPMG LLP**
31.1	Certification of Principal Executive Officer Pursuant to Rule 13a-14(a)/ 15d-14(a)**
31.2	Certification of Principal Financial Officer Pursuant to Rule 13a-14(a)/ 15d-14(a)**
32.1	Certification furnished Pursuant to 18 U.S.C. Section 1350**
101	The following consolidated financial statements from Markel Corporation's Annual Report on Form 10-K for the year ended December 31, 2022, filed on February 17, 2023, formatted in Inline XBRL: (i) Consolidated Balance Sheets, (ii) Consolidated Statements of Income (Loss) and Comprehensive Income (Loss), (iii) Consolidated Statements of Changes in Equity, (iv) Consolidated Statements of Cash Flows and (v) Notes to Consolidated Financial Statements.**
104	Cover Page Interactive Data File (embedded within the Inline XBRL document)

* Indicates management contract or compensatory plan or arrangement
** Filed with this report

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.

MARKEL CORPORATION

/s/ Thomas S. Gayner	/s/ Brian J. Costanzo
Thomas S. Gayner Chief Executive Officer (Principal Executive Officer) February 17, 2023	Brian J. Costanzo Senior Vice President, Finance, Chief Accounting Officer and Controller (Principal Financial Officer) February 17, 2023

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.

Signatures	Title	Date
/s/ Steven A. Markel Steven A. Markel	Chairman of the Board	February 17, 2023
/s/ Thomas S. Gayner Thomas S. Gayner	Director, Chief Executive Officer (Principal Executive Officer)	February 17, 2023
/s/ Brian J. Costanzo Brian J. Costanzo	Senior Vice President, Finance, Chief Accounting Officer and Controller (Principal Financial Officer) (Principal Accounting Officer)	February 17, 2023
/s/ Mark M. Besca Mark M. Besca	Director	February 17, 2023
/s/ K. Bruce Connell K. Bruce Connell	Director	February 17, 2023
/s/ Greta J. Harris Greta J. Harris	Director	February 17, 2023
/s/ Morgan E. Housel Morgan E. Housel	Director	February 17, 2023
/s/ Diane Leopold Diane Leopold	Director	February 17, 2023
/s/ Anthony F. Markel Anthony F. Markel	Director	February 17, 2023
/s/ Harold L. Morrison, Jr. Harold L. Morrison, Jr.	Director	February 17, 2023
/s/ Michael O'Reilly Michael O'Reilly	Director	February 17, 2023
/s/ A. Lynne Puckett A. Lynne Puckett	Director	February 17, 2023

DIRECTORS

Steven A. Markel
Chairman of the Board

Mark M. Besca
Retired Leader of Long-Term Value and Stakeholder Capitalism initiative,
New York Office Managing Partner and a Lead and Senior Advisory Partner of Fortune 500 companies
EY (formerly Ernst & Young, LLP)

K. Bruce Connell
Retired Executive Vice President and Group Chief Underwriting Officer
XL Capital Ltd.

Thomas S. Gayner
Chief Executive Officer
Markel Corporation

Greta J. Harris
President and Chief Executive Officer
Better Housing Coalition

Morgan E. Housel
Partner
The Collaborative Fund

Diane Leopold
Executive Vice President and Chief Operating Officer
Dominion Energy

Anthony F. Markel
Retired Vice Chairman, President and Chief Operating Officer
Markel Corporation

Harold L. Morrison, Jr.
Retired Senior Vice President, Chubb Group and
Division President, Field Operations, North America Insurance
Chubb Insurance Company

Michael O'Reilly
Retired Vice Chairman and Chief Financial Officer
The Chubb Corporation

A. Lynne Puckett
Senior Vice President and General Counsel
Celanese Corporation

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